

PROJECT MANUAL

**FIRE CAMP 13 WOOLSEY FIRE RECONSTRUCTION
PROJECT
1250 S ENCINAL CANYON ROAD
MALIBU, CA 90265**

SPECS. NO.7823R1; C.P. NO. 88721

**Huitt-Zollars, Inc.
555 West 5th Street, Suite 2950, Los Angeles, CA 90013**

SEPTEMBER 24, 2024

**COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
BUSINESS RELATIONS AND CONTRACTS DIVISION
900 SOUTH FREMONT AVENUE
ALHAMBRA, CA 91803-5311
(626) 458-2584
EMAIL: RRUBIO@DPW.LACOUNTY.GOV**

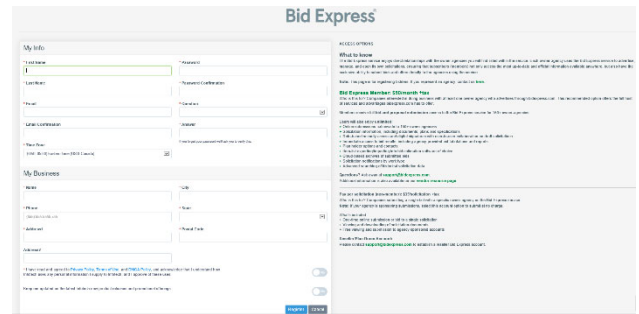
Infotech® Vendor Manager Account

Only one Infotech® account for each business is required to register for the Bid Express® (www.bidexpress.com) service. All other employees will then create accounts through an invitation sent by the manager.

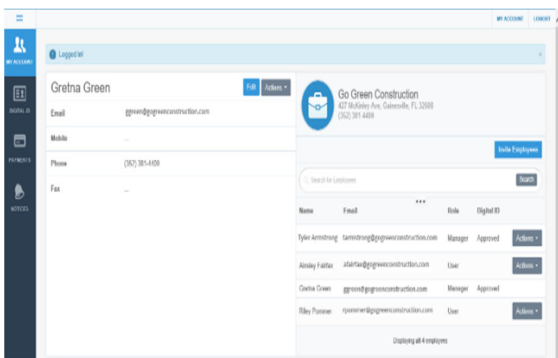
Whether you need to pay to bid on a solicitation depends on the agency. Some agencies sponsor solicitations for their vendors. A FREE tag will display for any solicitation not requiring a fee. Solicitations will either require an electronic signature or an Infotech Digital ID for bid submission. If the agency requires a Digital ID, you will be prompted to generate one. Do not pay for a solicitation or generate an ID until prompted to by a solicitation you select for bidding.

Register for a Manager Account

The first person to register for an Infotech account within a business is assigned managing access. As a manager, you can invite other employees to join the business account and change their roles. Your email address is your username for the account and to where Infotech services sends email notifications.



1. Navigate to www.bidexpress.com and click **Register** at the top right.
2. Fill out the registration form, and click the **Register** button. Your email address will be your username.
3. A message with a confirmation link will be sent to your email address. Click the Activate Account link within the email to activate your account.
4. Enter your password and click **Activate**.



Invite Employees

Invite employees to create a user account for your business. Emails will be sent to those invited. You will receive an email when the account has been created. Employees are assigned the role of user for the account.

1. Click **Invite Employees**. Enter one email address per line for each employee.
2. Click **Invite Employees**.

Change Employee Role

You will need to update the role of those employees you want to manage the account. You must also change each user's role within the Bid Express service itself. Please see the online help if you need assistance.

1. Click **Actions** for the employee and choose **Change Role**.
2. Select the manager role, and click **Change Role**.

PREPARED BY

infotech

Support hours: 7:00 am - 8:00 pm ET // 1-888-352-2439 Option 1 // support@bidexpress.com

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infotechinc.com

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Infotech Vendor User Account

Only one Infotech account for each business is required to register for the Bid Express service at www.bidexpress.com. All employees of a business will then create user accounts through an invitation sent by the manager.

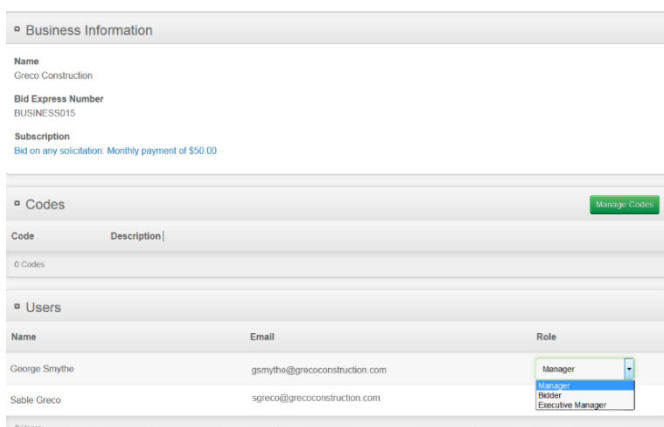
Register for a User Account

To join an existing business account, please ask a user of a manager account to send you an invitation. Once the invitation is sent, you'll receive an email to activate your account. Your email address is your username. Infotech services will send email notifications to this address.

Upon receipt of the email:

1. Select the **Create Account** link within the email.
2. Fill out the Account Activation form. Your email address will be your username.
3. Once the form is complete, click the **Activate** button.

The My Account page opens, displaying your account information and other employees within your company using Infotech services. You are automatically assigned a user role for the account and an Executive Manager read-only role for the Bid Express service. Any user with manager role can change your role.



Solicitations will either require an electronic signature or an Infotech Digital ID for bid submission. If the agency requires a Digital ID, you will be prompted to generate one. Do not pay for a solicitation or generate an ID until prompted to by a solicitation you selected for bidding.

The Account Activation form includes fields for First Name (Gretl), Last Name (Summers), Password, Password Confirmation, Question, and Answer. It also features a checkbox for 'I have read and agreed to Privacy Policy, Terms of Use, and DMCA Policy'.

Welcome to the Bid Express service

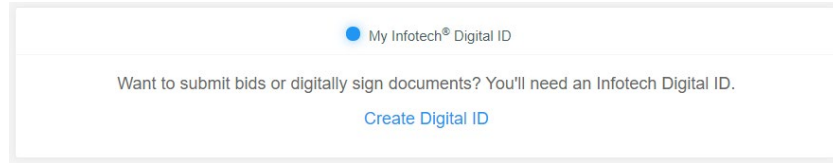
If you are planning on submitting bids, a user with a manager account for the Bid Express service must change your role within the Bid Express service itself. Please see the knowledge center if you need assistance.

Whether you need to pay to bid on a solicitation depends on the agency. Some agencies sponsor accounts for their vendors. A FREE tag will display for any solicitation not requiring a fee.

Solicitations will either require an electronic signature or

Understand and apply for Infotech® Multi-Browser Digital IDs

An Infotech® Digital ID confirms your identity as the authorized signer of your company and allows you to securely sign documents, such as bids or contracts, in an Infotech service.



Why do I need a Digital ID?

When you sign a document or submit a bid, we want to make sure you're you.

The authorized signer for your company must have a Digital ID created and approved before using any feature that requires a digital signature, such as advertising a solicitation, conducting a bid opening, submitting a bid in the Bid Express® service, or signing a contract document in the Doc Express® service.

The new Digital IDs can be used with any web browser, like Chrome or Edge.

The process

There are three parts to applying for a Digital ID.

- Application – apply for the ID
- Installation – after your identification has been verified, you'll install the ID
- Test – to make sure your ID works

ID application

Before you begin

- If you already have a Digital ID, delete the backup copy of your current Digital ID. You'll create a new backup as part of the ID installation process.
- You'll need access to your email in order to receive a verification code.
- You'll need a copy of the your driver's license, passport, or state ID in a file that can be uploaded.
- The phone number entered should be the applicant's phone number, not the person filling out the application (if it's not the applicant).

- An Infotech customer support representative will call the you, hopefully within one business day, to confirm their identification. It may take up to seven days.

Ready to apply for your Digital ID?

Go to your account pages by selecting **My Account** from the **three lines** in the upper left corner. Click **Digital ID** from the sidebar menu.

1. Click **Create Digital ID** to start the application.
2. Get the security code from your email and come back to the generate ID process.
3. Enter your account password and the code. Click **Next**.
4. Read the creation information and click **Next**.
5. Click **Attach Identification**. Navigate to and select the file containing the your ID and click **Open**.
6. Enter your name EXACTLY as it appears in the ID, including any punctuation marks or suffixes (like Jr.), and in legal order. Click **Next**.
7. Enter the contact phone number of the applicant.
8. Enter the state where the company headquarters are located. Click **Next**.
9. Review your business information. Confirm that the name of the person listed is the authorized signer for your company and your company name matches how you would like to submit bids to the agency. Click **Submit**.

The Infotech Digital ID allows you to submit or open bids via the Bid Express service and digitally sign and encrypt documents via the Doc Express service.

Please enter your account password and the security code we emailed to you.

Password *

Please enter your account password
Security Code *

Please enter the 6-digit code we emailed to you

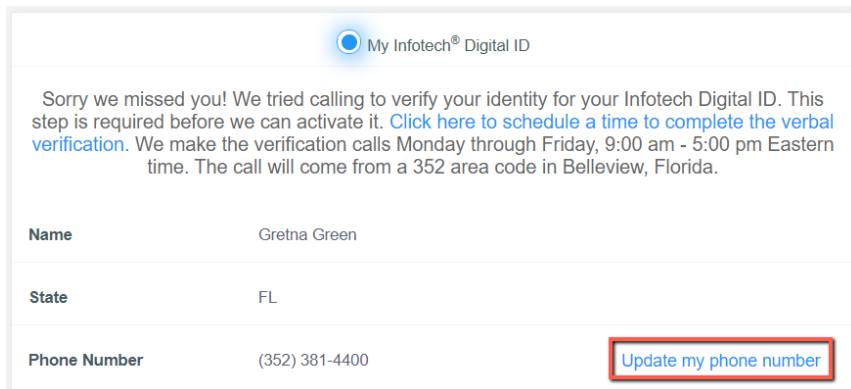
Next

A member of the customer support team will call you after the application is processed, hopefully within one business day, to confirm who you are. Once that happens, you'll get an email with instructions on installing your multi-browser Digital ID.

Need to change your phone number?

The phone number entered on the application should be the one of the applicant, not the phone number of the person entering the information (if they are different people).

1. Click the **Digital ID** tab from the My Account pages.
2. Select **Update my phone number**.
3. Enter the correct phone number in the New Phone Number field and click **Update**.



My Infotech® Digital ID

Sorry we missed you! We tried calling to verify your identity for your Infotech Digital ID. This step is required before we can activate it. [Click here to schedule a time to complete the verbal verification.](#) We make the verification calls Monday through Friday, 9:00 am - 5:00 pm Eastern time. The call will come from a 352 area code in Belleview, Florida.

Name	Gretna Green
State	FL
Phone Number	(352) 381-4400

[Update my phone number](#)

ID installation

Before you begin

- When installing the ID, log in to the Infotech service from the same device and use the same browser as when you created the ID.
- Create the backup ID when prompted and save it to an external media, such as a flash drive. You'll need it if you use a different computer or if you experience data loss. If you create the ID on a laptop using Chrome, you can't use it on a laptop using Edge or Desktop using Chrome unless you import it. The service will let you know if you have to import your ID.
- The service does not keep a copy of your ID file.
- If you haven't yet deleted the backup file of your old Digital ID, now's a good time to do it.

Ready to install your Digital ID?

Once your business information has been checked, you'll receive an email with a link to install your ID.

1. Click the link, or log in to your account. You can manage the installation of your Digital ID from the Digital ID tab of the My Account page.
2. Click **Install Digital ID**.
3. Create your backup ID by clicking **Back Up Your Digital ID**.
4. Click **Back Up**.



5. If you see a Save As window, navigate to the flash drive or other external media where you will save your backup Digital ID. If you don't see the window, your backup ID was saved in your Downloads folder. Copy the backup to the flash drive or other external media.

Test or import your Digital ID

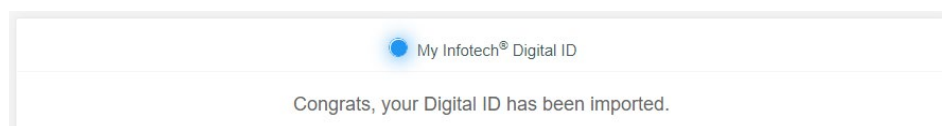
Once you've applied for, installed, and made a backup copy of your multi-browser Digital ID, test it out to make sure there will be no problems when bidding. Use a different browser or computer and import your backup ID. If you can import it without any problems, your ID was successfully created.

Before you begin

If you didn't backup your ID when it was installed, please do it now. Use the same computer and browser from when you created the Digital ID, and click **Back Up** on the Digital ID page. If you see a Save As window, navigate to the flash drive or other external media where you will save your backup Digital ID. If you don't see the window, your backup ID was saved in your Downloads folder. Copy the backup to the flash drive or other external media.

Ready to test or import your Digital ID?

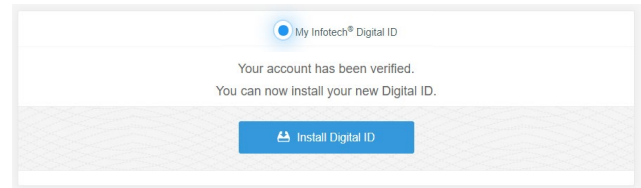
1. Log in to the service using a different browser than the one where your Digital ID was created. For example, if you created the ID using Chrome, log in to the service using Edge.
2. Go to your account pages by selecting **My Account** from the **three lines** in the upper left corner. Click **Digital ID** from the sidebar menu.
3. If you see a message that the service couldn't find your Digital ID, then you're using a good browser to test your ID. If you don't see the message, use a different browser.
4. Click **Import my Digital ID**.
5. Click **Select backup file**.
6. Navigate to and select your backup ID file. It will be named **FIRST LAST Digital ID.json**. Click **Open**.



If your ID didn't import, please contact customer support: support@bidexpress.com. A member of our customer support team will be happy to assist you.

Infotech® Multi-Browser Digital ID installation and backup

Once you've applied for an Infotech® multi-browser Digital ID and had your identity verified by a member of the Infotech customer support team, your ID will need to be installed before it can be used.



Before you begin

- When installing the ID, log in to the Infotech service from the same device and use the same browser as when you created the ID.
- Create the backup ID when prompted and save it to an external media, such as a flash drive. You'll need it if you use a different computer or if you experience data loss. If you create the ID on a laptop using Chrome, you can't use it on a laptop using Edge or Desktop using Chrome unless you import it. The service will let you know if you have to import your ID.
- The service does not keep a copy of your ID file.
- If you haven't yet deleted the backup file of your old Digital ID, now's a good time to do it.

Ready to install your Digital ID?

Once your business information has been checked, you'll receive an email with a link to install your ID.

1. Click the link, or log in to your account. You can manage the installation of your Digital ID from the Digital ID tab of the My Account page.
2. Click **Install Digital ID**.
3. Create your backup ID by clicking **Back Up Your Digital ID**.
4. Click **Back Up**.
5. If you see a Save As window, navigate to the flash drive or other external media where you will save your backup Digital ID. If you don't see the window, your backup ID was saved in your Downloads folder. Copy the backup to the flash drive or other external media.



Test or import your Digital ID

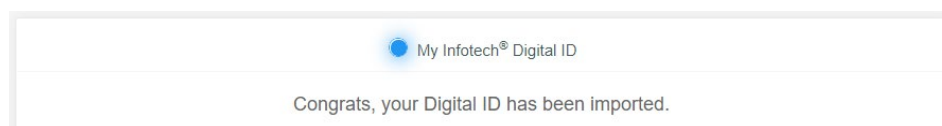
Once you've applied for, installed, and made a backup copy of your multi-browser Digital ID, test it out to make sure there will be no problems when bidding. Use a different browser or computer and import your backup ID. If you can import it without any problems, your ID was successfully created.

Before you begin

If you didn't backup your ID when it was installed, please do it now. Use the same computer and browser from when you created the Digital ID, and click **Back Up** on the Digital ID page. If you see a Save As window, navigate to the flash drive or other external media where you will save your backup Digital ID. If you don't see the window, your backup ID was saved in your Downloads folder. Copy the backup to the flash drive or other external media.

Ready to test or import your Digital ID?

1. Log in to the service using a different browser than the one where your Digital ID was created. For example, if you created the ID using Chrome, log in to the service using Edge.
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4. Click **Import my Digital ID**.
5. Click **Select backup file**.
6. Navigate to and select your backup ID file. It will be named **FIRST LAST Digital ID.json**. Click **Open**.



If your ID didn't import, please contact customer support: support@bidexpress.com. A member of our customer support team will be happy to assist you.

Bid Express® Vendor Roles and Access

Each member of your business must be assigned a Bid Express® role by a manager on the **My Profiles** tab. Managers cannot change their own role. Each role can access specific parts of the Bid Express service.

The vendor roles listed here are for the Bid Express service. To invite employees to your business or change an employee’s ability to issue invitations to others, please see the *Infotech® Account* guide.

The vendor can choose from these roles.

Role	Abilities
Manager	<p>Managers can:</p> <ul style="list-style-type: none"> • Assign roles • Purchase subscriptions • Edit business information • Select a solicitation for bidding • Create, edit, withdraw, or submit bids • Ask questions in the Q&A forum of solicitations <p>This role must have a Digital ID if working with owner–agencies that require Digital IDs.</p>
Bidder	<p>Bidders can:</p> <ul style="list-style-type: none"> • Select a solicitation for bidding • Create, edit, withdraw, or submit bids • Ask questions in the Q&A forum of solicitations <p>This role must have a Digital ID if working with owner–agencies that require Digital IDs.</p>
Executive Manager	<p>Executive Managers:</p> <ul style="list-style-type: none"> • Have read–only access to everything, but cannot edit anything • Can ask questions in the Q&A forum of solicitations <p>This role does not need a Digital ID.</p>

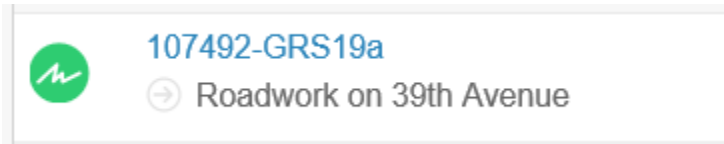
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Support hours: 7:00 am - 8:00 pm ET // 1-888-352-2439 Option 1 // support@bidexpress.com
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Electronic Signatures

All solicitations or requests for proposal on the Bid Express® service use either an Infotech® Digital ID or an electronic signature for verifying authorization to submit the bid. This signature graphic on the Solicitations tab indicates an electronic signature is required.



If you are not sure if you need an electronic signature or a Digital ID, please call customer support at 888 352-2439, and choose option 1.

Any member of your business with the correct role can edit and submit bids that use electronic signatures.

Submit a Bid with an Electronic Signature

All your items and other components of the solicitation should be complete before you submit a bid or response with an electronic signature.

1. Select the bid from the **Bids** tab if it is not already open.
2. Click **Submit Bid** or **Submit Response** at the top of the page.
3. The Bid Express service displays a submit bid or submit response window that authorizes the service to use your electronic signature to sign and encrypt your bid. Enter your electronic signature.
4. Click **Submit Bid** or **Submit Response**. The Bid Express service submits your bid and returns to the bid page and displays a bid submitted message. You will also receive an email confirmation of your submission.

A 'Confirm' dialog box with a close button in the top right corner. It contains a checked checkbox with the text: 'By checking this box and entering my name in the space below, I certify that I have the authority to sign the attached document and submit it from Bid Express account [Gretna Green].'. Below this is a 'Signed By' label and a text input field containing 'Gretna Green'. At the bottom are two buttons: 'Submit Bid' (green) and 'Cancel' (grey).

How to Bid

The actions you take when preparing a bid for a solicitation in the Bid Express® service can also be taken when you prepare a response to an RFP.

To start your bid or response, select the project from the **Solicitations** tab and click **Select For Bidding** or **Respond**. Solicitations with a FREE tag are sponsored by the agency. You must pay for the ones without the tag, either with a monthly subscription or the pay-as-you-go option.

Once the solicitation is selected, the Bid Express service moves and opens it on the **Bids** tab.

There is some information that applies to every section of the solicitation:

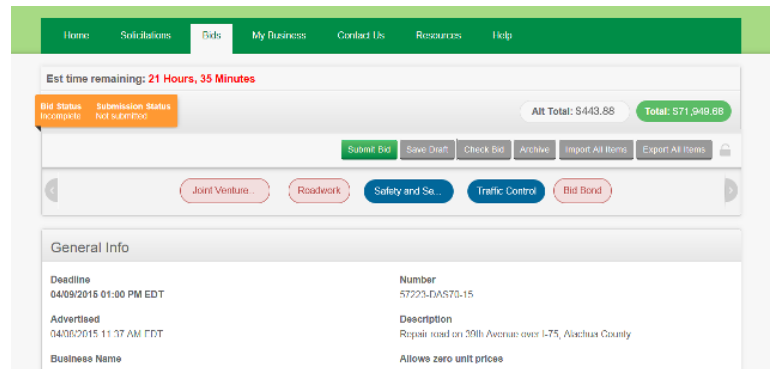
- Any member of your business with the correct role can edit and submit bids that use electronic signatures.
- Only members of your business that have approved Infotech® Digital IDs can edit and submit bids that require Digital IDs. Because IDs are stored on your computer, the user who selects the solicitation for bidding is the only one who should edit and submit it. Other members can work on the bid and then export their work to share with that user.
- Select the No Bid check box for any optional components on which you are not bidding. If all components of a bid are optional, at least one must be filled in completely in order for your bid to be marked complete.
- Fields marked with an asterisk (*) are required. Your bid will be incomplete if any required fields are left blank (unless those fields are in an optional component on which you're not bidding).
- If a component is an alternate, then the owner-agency may award the component independently of the solicitation award.
- Jump to a specific section of the bid by using the Go To options under the bid header.
- If you submit a bid and then receive an email notification that the owner-agency has changed the solicitation, you will have to update and resubmit your bid or it will be marked out-of-date.
- Use the Check Bid or Check Response feature to check for incomplete fields before submitting.

General Info		Electronic Signature Required	
Deadline	07/12/2017 02:00 PM EDT	Number	47852-SE18
Advised	07/10/2017 02:53 PM EDT	Description	new bridge construction Alachua county
Revised	07/10/2017 02:59 PM EDT	Allows zero unit prices and labor	Yes
Business Name	City Agency	Allows negative unit prices and labor	Yes

Submit bid

Bids that require a Digital ID cannot be submitted using a mobile device. For these bids, you must be using Windows operating system version 8 or newer and access the Bid Express service through Internet Explorer version 11 or newer.

Bids that require electronic signatures can be submitted using other operating systems and most web browsers. The actions you take when submitting a bid for a solicitation can also be taken when you submit a response to an RFP.



Once your bid or response is ready, you must submit it to the owner–agency. Owner–agencies will not be able to see your bid until after the bid deadline has passed, and they will only be able to see your last submitted bid, though they will be able to view the envelope after the deadline and without opening bids.

1. Select the bid from the **Bids** tab if it is not already open.
2. Click **Check Bid** or **Check Response** and fix any errors.
3. Click **Submit Bid** or **Submit Response** at the top of the page.
4. The Bid Express service displays a warning if the bid is incomplete and highlights the incomplete fields in red. Click **OK** to submit the bid or click **Cancel** to return to the bid page and fix any errors.
5. If you click **OK**, or if your bid is complete, the Bid Express service displays a submit bid or submit response window that authorizes the service to use your Digital ID or electronic signature to sign and encrypt your bid. Enter your electronic signature if necessary.
6. Click **Submit Bid** or **Submit Response**. The Bid Express service submits your bid and returns to the bid page and displays a bid submitted message.

Submission status

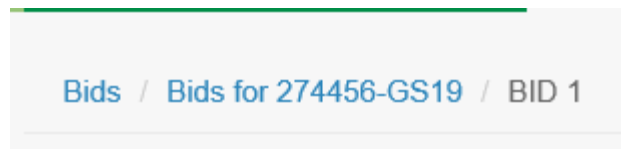
The Submission status bar in the top left corner of your solicitation displays the current submission status of your bid, from not yet submitted to the date and time it was submitted, and if it was complete.

Orange: Either your bid or response has not yet been submitted, or the submission has changed. This may mean the agency has changed the solicitation and issued an update, or that you changed the content of your bid, both of which require you to resubmit. It may also mean the last submission was incomplete, meaning all required fields were not filled in prior to submitting. Click **Check Bid** or **Check Response** to find the incomplete information.

Blue: A completed bid or response has been submitted at the posted date and time. If someone else in your business also submits bids, this may not be the time you submitted the bid.

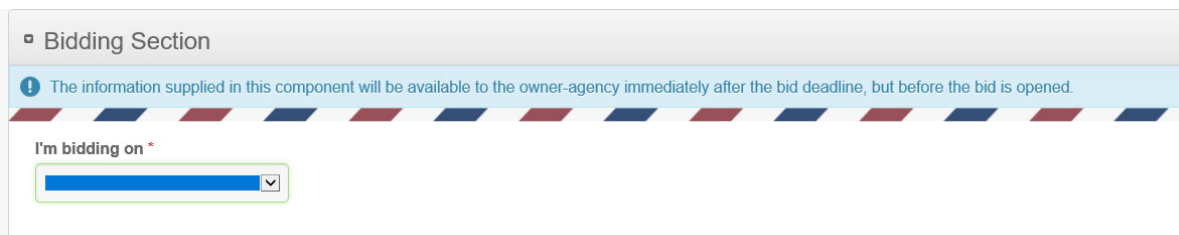
Bid Express® Vendor Multiple Bid Solicitations or Responses

Some agencies in the Bid Express® service have the option of creating solicitations or RFPs that will accept multiple bids or responses. If the solicitation or response you are bidding on allows you to submit separate bids for different work types or scopes of work, the navigation trail displays the number of the current bid; for example, BID 1.



If you are using the Bid Express pay-as-you-go payment option, you pay only one time for the solicitation.

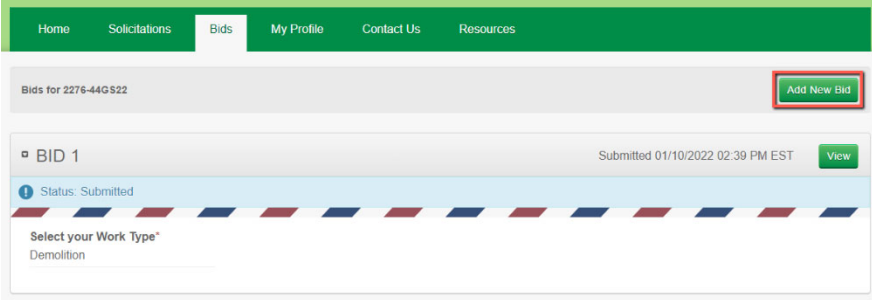
Many agencies will use the envelope component, identifiable by the striped banner, at the beginning of a multi-bidding solicitation. This enables you to differentiate between the bids you submitted on a single solicitation. The agency can view the information you entered in the envelope after the bid deadline but before bids are opened.



Once you submit your bid, you'll be taken to a page that shows your bid submission history (and the envelope, if applicable) and the **Add New Bid** button to create your next bid.

1. Fill out the bid or response as normal.
2. Submit your bid or response.

- 3. If you are bidding or responding again, click **Add New Bid** in the solicitation header and repeat the process for the next bid.








A bid submission receipt will be emailed to you each time you submit a bid. These receipts will include the bid number in the subject line and email body to make it easy to keep track of how many bids you and your company submitted.

Updating a Bid or Response

To update your bid or response, locate the solicitation or RFP number from the **Bids** tab if you are not already there.

Select the arrow for the solicitation to see the bids you've already submitted.

	2276-44GS22 Viaduct Removal South work includ...	01/11/2022 01:15 PM EST	City Agency		
	BID 1	01/11/2022 01:15 PM EST	City Agency		Submitted
	BID 2	01/11/2022 01:15 PM EST	City Agency		Submitted but Updated
	BID 3	01/11/2022 01:15 PM EST	City Agency		Draft

- Click the solicitation number to see your list of submitted bids and to add a new bid.
- From there, click **Add New Bid**, click **View** to see a bid that's already been submitted, or click **Open** to see the draft of your bid.
- Click the bid number to see the details for that bid.

Make any necessary changes. Save or submit your bid.

LOS ANGELES REGIONAL

CONTRACTOR DEVELOPMENT AND BONDING PROGRAM

THE FOUR PILLARS OF CONTRACTOR DEVELOPMENT



The Contractor Development and Bonding Program assists contractors with their contracting capacity and business growth.

Assessment & Technical Assistance

- Enrollment in our Contractor Development and Bonding Program.
- Personal Account Manager to provide a professional assessment of your current capacity and growth needs.
- One-on-one consultation to develop a work plan aligned with your business needs and goals.
- Facilitated referrals to Program Partners and resources.
- Contracting opportunities and industry-related workshops and events sent via our *LA Contractor Weekly* bulletin.
- Referrals to specific project opportunities.

PRIME CONTRACTOR PARTNERSHIPS

EDUCATION, TRAINING & CONTRACT SUPPORT

BONDING, CONTRACT FINANCING & PROJECT ASSISTANCE

ASSESSMENT & TECHNICAL ASSISTANCE

Bonding, Contract Financing & Project Assistance

- Assistance with obtaining or increasing bonding.
- Access to collateral support for bid performance and payment bonds for qualified contractors.*
- Contract review, project assessment, and field support for Program-bonded or financed contracts.
- Assistance with project risk identification and mitigation.
- Access to contract cash flow funding.
- Accounting cost subsidy for CPA-prepared financial statements.

**L.A. County has limited capacity.*

Education, Training & Contract Support

- Group Classes on public construction best practices led by industry experts.
- Contract-specific support on Regional Bond Program-supported contracts.
- Creation of individualized Contractor Profile to assist with business marketing.

Prime Contractor Partnerships

- Strategic alliances with Program Prime contractors including matchmaking and referrals.
- Networking with public agency staff and peer contractors.

PROGRAM SPONSORS



ADMINISTERED BY



Merriwether & Williams
INSURANCE SERVICES

... Of Like Minds

550 S Hope St., Suite 1835 | Los Angeles, CA 90071

Phone: 213-259-3000 | mwisinfo@imwis.com

www.imwis.com



Los Angeles County Contractor Development and Bonding Program



FREQUENTLY ASKED QUESTIONS

*“An inclusionary program to
build a stronger region”*

What services does the County’s Contractor Development and Bonding Program (CDABP) provide?

The County’s CDABP extends comprehensive capacity building, technical, bonding and contract financing assistance to small and diverse contractors seeking to pursue County construction-related contracts. Starting with a thorough assessment of your current business status, we identify areas of opportunity in order to help you better position your firm to successfully compete for and complete County contracts.

After your assessment, you’ll be assigned a dedicated Account Manager who will work closely with you to tailor a technical assistance work plan and financial resources specific to your needs, which may include:

- ✓ One-on-one consultations
- ✓ Training clinics and learning immersion academies
- ✓ Help with prime contractor pre-qualifications
 - » Facilitation of prime or prime-sub contractor introductions
 - » Project/bid matches
- ✓ Assistance obtaining bonding, including bonding collateral support, if needed, and contract financing
- ✓ If you are awarded a County-related contract with bonding support, you will also receive on-going project assistance to help you successfully complete your contract.

Who is eligible to participate in the CDABP? Eligible firms include local small and diverse businesses who are certified or eligible for certification within one of the County’s business enterprise categories. For detailed information on the County’s certification programs, visit their Small Business Certifications webpage (https://iddweb.isd.lacounty.gov/DCA_eComplaint/SmallBusinessCertifications).

Why should small and diverse businesses enroll in the CDABP? LA County’s CDABP provides game-changing resources for small and diverse businesses who want to expand their capacity and improve their opportunities for winning County contracts. For example, the inability to secure or increase bonding often impedes small and diverse contractors from bidding and/or pre-qualifying with prime firms and participating on public works projects. This program helps reduce such barriers, even offering bonding collateral support (standard surety bond premiums and commissions charged are not covered by the CDABP).

Similarly, not having access to the capital needed to fund the cost of doing the contract work that you’ve been awarded can be a major challenge, and little to no assistance is available through traditional lending sources. Through the CDABP, the County provides for up to \$250,000 of contract-based financing with a low origination fee and very low interest rate, and not tied to your financials or credit.

This is a particularly good time to enroll, because in November 2021, President Joe Biden signed a \$1.2 trillion infrastructure investment plan supporting a range of construction projects in localities across the nation, including Los Angeles County. If you are a small or diverse local business, the CDABP can assist you in competing for upcoming construction contracts!

My subcontracted work hasn't required bonding in the past, so how would I benefit from participating in the CDABP? While you may not always need to provide a bond for some subcontracted work, a bond will always be required if you want to bid directly with the County on small prime contracts – and being “bondable” is a significant competitive advantage when bidding on many subcontracting opportunities. Becoming “bondable” demonstrates that your company’s capacity to perform work has been assessed and vetted by a third party, which is then reflected in the dollar amount for which you can bond. Even when a bond for subcontract work is not required, it is quite common to be asked to demonstrate that your company is “bondable” in order to meet contract owner or prime requirements. Pre-qualification requirements often include demonstrating your bond underwriting and/or financial capacity to perform work. The CDABP will assist you in meeting advance requirements with primes or prime-sub contractors pursuing or performing County work.

What is the cost to participate in the CDABP? The CDABP is sponsored by the County of Los Angeles, so, with one exception, all services are offered at no cost to participating contractors! If needed, the only cost you may incur is for having a Certified Public Accountant (CPA) prepare a financial statement for your company, a requirement for bonding. For those who qualify, the program even provides a one-time subsidy toward this CPA-prepared company financial statement. If the subsidy is provided to you, you will be asked to pay the first \$500 toward the preparation of your financial statement and any costs in excess of what the \$3,200 subsidy covers.

The CDABP is one of the County’s tools to effectively support and increase the inclusion and participation of small and diverse contractors on County projects. Because barriers impede access, CDABP is intended to reduce and eliminate barriers wherever possible.

When should I look to enroll in the County’s program? Should I wait until I’ve identified a County project for which I want to bid? Don’t wait, enroll now! The earlier you enroll and have your company assessed, the sooner you’ll be able to receive expert guidance and support in bidding suitable County projects. For example, getting pre-approved for a specific bonding amount will not only boost your company’s credentials, but will also help you confidently identify and pursue County contracting opportunities within that range. Your CDABP Account Manager will be helping you every step of the way, including steering you toward opportunities with CDABP program prime partners. By planning ahead, your firm will be better positioned for consideration by the County’s prime and larger contractors, who are always seeking qualified and certified firms to meet their project participation goals.

How long will it take for me to get approved for bonding or contract financing? The timing of the bonding or contract financing process depends mostly on you. The initial steps of preparing an underwriting package for bonding or prequalifying you for contract financing require gathering information about your company. If you have the necessary documentation and information complete and readily available, then the next steps of the process can move quickly. Your CDABP Account Manager is always on hand to answer questions and help guide you through the process.

Must I already be working with a bonding broker in order to participate? You do not already need to be working with a bonding broker. The CDABP will work with any bonding broker with whom you’ve already established a relationship that you wish to continue. In fact, the program can also work with your current surety agent to increase your existing bonding capacity with them as well. However, if you do not have a current broker, the program can provide for your consideration a list of brokers who work with smaller contractors and with program surety partners.

We look forward to hearing from you! Reach us at:

213-258-3000 | MWISInfo@imwis.com | www.LAConDev.com



PROJECT MANUAL - TABLE OF CONTENTS
BIDDING AND CONTRACT REQUIREMENTS

<u>DIVISON 00</u>	<u>BID REQUIREMENTS</u>	<u>PAGE(S)</u>
Section 00 01 00	Instructions to Bidders	1-36
Section 00 03 00	Form of Bid	1-3
Section 00 03 10	Best Management Practices	1-1
Section 00 03 11	Construction and Demolition Debris Recycling Requirements	1-1
Section 00 03 12	Insurance Requirements	1-1
Section 00 03 13	Local and Targeted Worker Hire Program – Mandatory Jobs Coordinator	1-1
Section 00 04 00	Attestation of Contractor’s Qualifications	1-3
Section 00 04 10	Bid Bond	1-1
Section 00 04 30	List of Subcontractors	1-2
Section 00 04 35	Community Business Enterprise Participation Form	1-2
Section 00 04 38	Request for County Program Preference Consideration	1-2
Section 00 04 38A	Subconsultant Certification Form	1-1
Section 00 04 40	Equals	1-2
Section 00 04 50	Noncollusion Affidavit	1-1
Section 00 04 60	Attestation of Willingness to Consider GAIN/GROW Participants	1-1
Section 00 04 65	3-Year Contracting History	1-1
Section 00 04 70	False Claims	1-2
Section 00 04 71	Civil Litigation History	1-2
Section 00 04 72	Criminal Convictions	1-2
Section 00 04 73	Debarment	1-2
Section 00 04 74	Labor Law/Prevailing Wage	1-2
Section 00 04 75	Integrated Pest Management Program Compliance Certification	1-1
Section 00 04 76	Charitable Contributions Certification	1-1
Section 00 04 77	Prospective Contractor List of Terminated Contracts	1-1
Section 00 04 78	SB 1439 Questionnaire	1-2
Section 00 04 79	Contribution and Agent Declaration Form	1-5
Section 00 04 85	Contractor Employee Jury Service Program	1-1
Section 00 04 90	Contractor's Industrial Safety Record	1-1
Section 00 04 91	Injury and Illness Prevention Plan and Code of Safe Practices Affidavit	1-1

Section 00 04 92	Bidder's Organization Questionnaire/Affidavit	1-2
Section 00 04 93	Certification of Compliance with the County's Defaulted Property Tax Reduction Program	1-1
Section 00 04 94	Avoidance of Conflict of Interest	1-1
Section 00 04 95	Familiarity with the County Lobbyist Ordinance Certification	1-1
Section 00 04 96	Proposer's EEO Certification	1-1
Section 00 04 97	Compliance with Fair Chance Employment Hiring Practices Certification	1-1
Section 00 04 98	Zero Tolerance Human Trafficking Policy Certification	1-1
Section 00 04 99	Disallowed Cost Attestation	1-1

CONTRACT FORMS

Section 00 05 00	Sample Agreement	1-27
Section 00 06 10	Bond of Faithful Performance	1-1
Section 00 06 20	Payment Bond for Labor and Materials	1-1

CONDITIONS OF THE CONTRACT

Section 00 07 00	General Conditions	1-54
Section 00 08 00	Supplemental Conditions	1-10
Section 00 09 12	Local and Targeted Worker Hire Program	1-17

DIVISION 1

GENERAL REQUIREMENTS

Section 01 00 00	Project General Requirements	1-6
Section 01 14 00	Alteration Project Procedures	1-4
Section 01 26 13	Contractor's Request for Information	1-4
Section 01 29 73	Schedule of Values	1-2
Section 01 29 76	Progress Payment Procedures	1-8
Section 01 31 00	Coordination and Meetings	1-5
Section 01 31 19	Progress Meetings	1-2
Section 01 32 00	Construction Schedules	1-13
Section 01 32 33	Photographic Documentation	1-2
Section 01 33 00	Submittals	1-11
Section 01 33 23	Shop Drawings, Product Data and Samples	1-6
Section 01 35 46	Indoor Air Quality Procedures	1-3
Section 01 45 00	Quality Control	1-6
Section 01 50 00	Temporary Facilities	1-4
Section 01 57 00	Storm Water Pollution Prevention	1-7

Section 01 57 19	Temporary and Environmental Controls	1-8
Section 01 60 00	Product Handling	1-2
Section 01 66 00	Transport, Handling and Storage	1-2
Section 01 74 19	Construction and Demolition Debris Recycling	1-2
Section 01 74 23	Final Cleaning	1-3
Section 01 75 00	Project Added Stock	1-2
Section 01 77 00	Contract Closeout	1-7
Section 01 78 23	Operations and Maintenance	1-5
Section 01 78 36	Guarantees and Warranties	1-3
Section 01 78 39	Project Record Documents	1-3

DIVISION 02 **EXISTING CONDITIONS**

Section 02 41 20	Selective Building Demolition
------------------	-------------------------------

DIVISION 03 **CONCRETE**

Section 03 10 00	Concrete Forming and Accessories
Section 03 20 00	Concrete Reinforcing
Section 03 30 00	Cast in Place Concrete
Section 03 35 10	Concrete Flatwork Finishing and Curing
Section 03 54 16	Hydraulic Cement Underlayment

DIVISION 05 **METALS**

Section 05 05 12	Hot-Dip Galvanizing
Section 05 12 00	Structural Steel Framing
Section 05 40 00	Cold Formed Metal Framing
Section 05 44 00	Cold Formed Metal Trusses
Section 05 50 00	Metal Fabrications

DIVISION 06 **WOOD, PLASTICS AND COMPOSITES**

Section 06 05 73	Wood Treatment
Section 06 16 43	GMF Gypsum Sheathing
Section 06 41 19	Plastic Laminate-Clad Wood Casework

DIVISION 07 **THERMAL AND MOISTURE PROTECTION**

Section 07 21 50	Building Enclosure Insulation
Section 07 25 13	Sheet Weather-Resistive Barriers

Section 07 41 13	Metal Roof Panels
Section 07 42 13	Formed Metal Wall Panels
Section 07 62 00	Sheet Metal Flashing and Trim
Section 07 65 26	SASM Flashing
Section 07 92 00	Joint Sealants

DIVISION 08 **OPENINGS**

Section 08 12 13	Standard Hollow Metal Frames
Section 08 13 13	Standard Hollow Metal Doors
Section 08 14 16	Flush Wood Doors
Section 08 31 16	Access Panels
Section 08 51 13	Aluminum Windows
Section 08 83 13	Mirrored Glass

DIVISION 09 **FINISHES**

Section 09 05 16	Preparation of Concrete Substrates for Finish Flooring
Section 09 22 16	Lightgauge Metal Framing
Section 09 22 26	Metal Suspension Systems
Section 09 28 15	GMF Gypsum Tile Backing Board
Section 09 29 00	Gypsum Board
Section 09 30 00	Tiling
Section 09 51 13	Acoustical Panel Ceilings
Section 09 65 13	Resilient Base and Accessories
Section 09 65 16	Resilient Sheet Flooring
Section 09 81 33	Acoustical Insulation, Sealants, and Accessories
Section 09 91 00	Painting Paint Products Schedule
Section 09 97 23	Penetrating Concrete Floor Sealer

DIVISION 10 **SPECIALTIES**

Section 10 14 13	Regulatory Signage
Section 10 28 13	Commercial Toilet Accessories
Section 10 28 14	Commercial Shower Accessories
Section 10 44 00	Fire Protection Specialties

DIVISION 11 **EQUIPMENT**

Section 11 31 00	Residential Appliance
------------------	-----------------------

Section 11 34 00 Ceiling Fans

DIVISION 12 FURNISHINGS

Section 12 24 13 Roller Window Shades
Section 12 36 64 Quartz Agglomerate Countertops

DIVISION 22 PLUMBING

Section 22 05 17 Sleeves and Sleeve Seals for Plumbing Piping
Section 22 05 18 Escutcheons for Plumbing Piping
Section 22 05 19 Meters and Gages for Plumbing Piping
Section 22 05 23 General Duty Valves for Plumbing Piping
Section 22 05 48 Vibrations and Seismic Controls for Plumbing Piping and Equipment
Section 22 05 53 Identification for Plumbing Piping and Equipment
Section 22 07 16 Plumbing Equipment Insulation
Section 22 07 19 Plumbing Piping Insulation
Section 22 08 00 Commissioning of Plumbing
Section 22 11 16 Domestic Water Piping
Section 22 11 19 Domestic Water Piping Specialties
Section 22 11 23 Domestic Water Pumps
Section 22 13 16 Sanitary Waste and Vent Piping
Section 22 13 19 Sanitary Waste Piping Specialties
Section 22 35 00 Domestic-Water Heaters
Section 22 40 00 Plumbing Fixtures

DIVISION 23 HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

Section 23 05 13 Common Motor Requirements for HVAC Equipment
Section 23 05 17 Sleeves and Sleeve Seals for HVAC Piping
Section 23 05 18 Escutcheons for HVAC Piping
Section 23 05 29 Hangers and Supports for HVAC Piping and Equipment
Section 23 05 48 Vibration and Seismic Controls for HVAC
Section 23 05 55.3 Identification for HVAC Piping and Equipment
Section 23 05 93 Testing Adjusting and Balancing for HVAC
Section 23 07 13 Duct Insulation
Section 23 07 19 HVAC Piping Insulation
Section 23 11 23 Natural Gas Piping
Section 23 33 00 Air Duct Accessories
Section 23 34 13 Axial HVAC Fans

Section 23 34 16	Centrifugal HVAC Fans
Section 23 82 19	Fan Coil Units

DIVISION 26 ELECTRICAL

Section 26 05 00	Common Work Results for Electrical
Section 26 05 19	Low-Voltage Electrical Power Conductors and Cables
Section 26 05 26	Grounding and Bonding for Electrical Systems
Section 26 05 29	Hangers and Supports for Electrical Systems
Section 26 05 33	Raceways and Boxes for Electrical Systems
Section 26 05 44	Precast Manholes and Handholes
Section 26 05 48	Vibration and Seismic Controls for Electrical Systems
Section 26 05 53	Identification for Electrical Systems
Section 26 05 72	Overcurrent Protective Device Short-Circuit Study
Section 26 05 73	Overcurrent Protective Device Coordination Study
Section 26 05 74	Overcurrent Protective Device Arc-Flash Study
Section 26 09 23	Lighting Control Devices
Section 26 09 43	Relay-Based Lighting Controls
Section 26 24 13	Switchboards
Section 26 24 16	Panelboards
Section 26 27 13	Electricity Metering
Section 26 27 26	Wiring Devices
Section 26 28 13	Fuses
Section 26 28 16	Enclosed Switches and Circuit Breakers
Section 26 51 00	Interior Lighting
Section 26 56 00	Exterior Lighting

ATTACHMENTS

1. Geotechnical Evaluation: Fire Camp 13 BOQ Building Replacement Project
2. Limited Hazardous Materials Survey Report
3. Security Clearance Form

SECTION 00 01 00

INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.01 COPIES OF BIDDING DOCUMENTS

- a. Complete set of the Bidding Documents may be downloaded for free from the Los Angeles County Public Works website <http://dpw.lacounty.gov/go/constructioncontracts>.
- b. Complete sets of Bidding Documents shall be used in preparing bids; the County does not assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- c. All Bidders for this solicitation are strongly encouraged to register at <http://dpw.lacounty.gov/general/contracts/opportunities/>. Only those Bidders registered for this solicitation through the DPW website will receive automatic notification when any update to this solicitation is made. **County does not have an obligation to notify any Bidders other than through the DPW website automatic notification system.**
- d. Electronic Submission of Bid

Bids will only be accepted electronically through BidExpress, a secure online bidding service website, at www.bidexpress.com.

To submit the bid electronically, register with BidExpress, one week prior to the bid opening date. Once the Bidder is registered, an invitation will be sent to the Bidder to allow access to the solicitation on www.bidexpress.com. A Infotech/BidExpress Set-up Guide is included as an Enclosure for reference. There is a nominal service fee to use BidExpress.

Visit the Infotech Knowledge Center at the following link for more information: [Bid Express® help guides](https://infotechinc.zendesk.com/hc/en-us/categories/360003900254-Bid-Express-at-www-bidexpress-com).
<https://infotechinc.zendesk.com/hc/en-us/categories/360003900254-Bid-Express-at-www-bidexpress-com>.

- e. The bid opening will be held using Microsoft Teams, or County accepted platform. The information and link to access the bid opening will be posted on Public Works website, on the project information link. Any changes to this procedure will be issued in a Notice to Bidders for this project.

1.02 QUALIFICATIONS OF BIDDERS AND SUBCONTRACTORS

- a. The Bidder and each listed subcontractor must have a valid license, issued by the Contractors' State License Board, for the type of work proposed to be performed by the Bidder and each listed subcontractor under the contract. The required license(s) is required at time of bid in order to be considered a responsive bid.
- b. This project requires the Bidder to possess a license classification of "B" at time of bid.
- c. In addition to Article 1.02, a. and b., the specifications set forth require specialty licenses, experience requirements, and required certifications from manufacturers concerning approved installers. The apparent successful Bidder shall be required to demonstrate to the County's satisfaction within 10 calendar days of the bid opening that the Bidder and proposed subcontractors (whether required to be listed or not) possess these specialty licenses, experience requirements, and required certifications.
- d. All Bidders and their subcontractors must be registered with the Department of Industrial Relations. Qualified contractors and subcontractors are listed on searchable database at:
<https://services.dir.ca.gov/gsp>.

1.03 EXAMINATION OF CONTRACT DOCUMENTS AND SITE

- a. Before submitting a bid, each Bidder must: a) examine the Contract Documents thoroughly; b) visit the site to familiarize himself with local conditions that may in any manner affect cost, progress, or performance of the Work; c) become familiar with federal, state, and local laws, ordinances, rules, and regulations that may in any manner affect cost, progress, or performance of the Work; and d) study and carefully correlate Bidder's observations with the Contract Documents.
- b. The submission of a bid will constitute an incontrovertible representation by the Bidder that Bidder has complied with every requirement of this Article and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the Work.

1.04 INTERPRETATIONS

- a. All questions about the meaning or intent of the Contract Documents shall be submitted to the Department in writing. Replies will be issued by Notice to Bidders. Questions received less than ten (10) calendar days prior to the date for opening of bids will not be answered. Only questions answered by formal written notice will be binding. Oral and other interpretations or clarifications will be without legal effect.

1.05 BID SECURITY

- a. Bid security is required of each Bidder and shall be made payable to Los Angeles County, in an amount of ten percent (10%) of the Bidder's bid price, in the form of cash, a certified check, a cashier's check, or a bid bond issued by a California-admitted Surety.
- b. The bid security of the successful Bidder will be retained until such Bidder has executed the Agreement and contract security, whereupon it will be returned; if the successful Bidder fails to execute and deliver the Agreement and furnish the required insurance and contract security within fourteen (14) calendar days of notification from County, the County may annul the Notice of Award and the bid security of that Bidder may be forfeited. The bid security of any Bidder whom the County believes to have a reasonable chance of receiving the award may be retained until the earlier of the effective date of the contract or the ninety-first (91) day after bid opening. Bid security of other Bidders will be returned within thirty (30) days of the bid opening.

1.06 CONTRACT TIME

- a. The number of days within which, or the date by which, the Work is to be completed (the contract time) is set forth in Section 01 00 00, "Project General Requirements." By submitting a bid, each Bidder agrees that the contract time is reasonable and the Bidder is capable of performing all Work within the contract time.

1.07 LIQUIDATED DAMAGES

- a. Provisions for liquidated damages, if any, are set forth in Section 01 00 00, "Project General Requirements."

1.08 SUBSTITUTE MATERIAL AND EQUIPMENT

- a. The Contract, if awarded, will be on the basis of material and equipment described in the Drawings or specified in the Specifications unless the Bidder complied with the procedure for substitution of Equals as set forth in the General Conditions.
- b. If any proposed substitution of an Equal is determined by the County to not be an Equal, the Contractor must complete the Work in accordance with the Drawings and Specifications for the accepted bid amount.

1.09 SUBCONTRACTORS

- a. In accordance with Sections 4100 to 4113, inclusive of the Public Contract Code of the State of California, Contractors shall list, on the form provided, the name, license number, business location and classification of work for each subcontractor who will perform work, labor, or render service on the construction work in excess of one-half (1/2) of one percent (1%) of the total bid.

1.10 FORM OF BID

- a. The Form of bid is attached hereto. Additional copies may be obtained from Contracts Administration Section, Business Relations and Contracts Division, 8th Floor.
- b. The bid price of each item on the form must be stated in words and numerals; in case of a conflict, words will take precedence. Bid prices must be given for all bid items shown on the Form of Bid, including all additive alternatives. Failure to provide prices for all bid items may result in a determination by the County that the Form of Bid is nonresponsive.
- c. Bids by corporations must be executed in the corporate name by the President or a Vice-President (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of corporation shall be shown below the signature.
- d. Bids by partnership must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.
- e. All names must be typed or printed below the signature.

- f. Bid Documents, Form of Bid, Section 00 03 00, must confirm receipt of any Notice to Bidders (if any).

1.11 SUBMITTAL OF BIDS

- a. Bids will only be accepted electronically through BidExpress, a secure online bidding service website, at www.bidexpress.com. Bids shall be submitted at the time indicated in the Information for Bidders.

1. The following documents shall be submitted at the time of bid.

Required bid form documents:

- Section 00 03 00 Form of Bid
- Section 00 03 10 Best Management Practices
- Section 00 03 11 Construction and Demolition
Debris Recycling Requirements
- Section 00 03 12 Insurance Requirements
- Section 00 03 13 LTWHP Jobs Coordinator
- Section 00 04 00 Attestation of Contractor's Qualifications
- Section 00 04 10 Bid Bond (scanned copy)
- Section 00 04 30 List of Subcontractors
- Section 00 04 38 Request for Preference Consideration
- Section 00 04 38A Subconsultant Certification Form
- Section 00 04 78 SB 1439 Questionnaire-primary firm
- Section 00 04 79 Contribution and Agent Declaration
Form-primary firm

Failure to confirm receipt of any Notice to Bidder(s) provided to bidders on Form of Bid, Section 00 03 00, as required, may result in a determination that the apparent low bidder is nonresponsive and/or nonresponsible.

2. Original Bid Bond shall be mailed in within two (2) calendar days from the bid opening. This is required only from the first, second, and third apparent lowest bidders.
3. The following document shall not be submitted at time of bid. Section 00 04 40, Equals, will only be required from the first, second, and third apparent lowest bidders and returned to the County no later than two (2) calendar days from the bid opening.

- Section 00 04 40 Equals

- b. No mention shall be made of sales tax or use tax, as all bid prices submitted will be considered as including such tax.
- c. The County may consider nonresponsive any bid not prepared and submitted in accordance with the provisions herein and, therefore, reserves the right to reject any or all bids so submitted. The County also reserves the right to accept alternative bids when called for and when items are to be bid on as units, to accept the bid for the list of such items in its entirety, or to accept any portion or portions of same.
- d. **The following documents shall not be submitted at the time of bid. These forms will be required only from the first, second, and third apparent lowest bidders and returned to the County no later than seven (7) calendar days from the bid opening.**

Section 00 04 35	Community Business Enterprises (CBE) Participation Form. If the bidder does not meet the 25% CBE participation goal, provide documentation of bidder's good faith efforts to utilize CBEs. Refer to Article 1.16 of these Instructions to Bidders.
Section 00 04 50	Noncollusion Affidavit
Section 00 04 60	Attestation of Willingness to Consider GAIN/GROW Participants
Section 00 04 65	3-Year Contracting History
Section 00 04 70	False Claims
Section 00 04 71	Civil Litigation History
Section 00 04 72	Criminal Convictions
Section 00 04 73	Debarment
Section 00 04 74	Labor Law/Prevailing Wage
Section 00 04 75	Integrated Pest Management Program Compliance Certification
Section 00 04 76	Charitable Contributions Certification
Section 00 04 77	Prospective Contractor List of Terminated Contracts
Section 00 04 78	SB 1439 Questionnaire-subconsultants/subcontractors
Section 00 04 79	Contribution and Agent Declaration Form-subconsultants/subcontractors
Section 00 04 85	Contractor Employee Jury Service Program-primary firm and subconsultants/subcontractors

Section 00 04 90	Contractor's Industrial Safety Record
Section 00 04 91	Injury and Illness Prevention Plan and Code of Safe Practices Affidavit
Section 00 04 92	Bidder's Organization Questionnaire/Affidavit
Section 00 04 93	Certification of Compliance with the County's Defaulted Property Tax Reduction Program
Section 00 04 94	Avoidance of Conflict of Interest
Section 00 04 95	Familiarity with the County Lobbyist Ordinance Certification
Section 00 04 96	Proposer's EEO Certification
Section 00 04 97	Compliance with Fair Chance Employment Hiring Practices Certification
Section 00 04 98	Zero Tolerance Human Trafficking Policy Certification
Section 00 04 99	Disallowed Cost Attestation

- e. Upon the County's request, each bidder agrees to provide the County with a cost breakdown of the bid in Construction Specification Institute (CSI) format. Failure to provide this information may result in a determination that the Bidder is nonresponsive and/or not responsible.

1.12 MODIFICATION AND WITHDRAWAL OF BIDS

- a. Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a bid must be executed) and delivered to the place where bids are to be submitted or by a Bidder's representative with proper identification and verification, at any time prior to the closing time for receipt of bids.
- b. Relief of Bidders shall be as provided in Sections 5100-5107, inclusive, of the Public Contract Code of the State of California.

1.13 OPENING OF BIDS

- a. Bids shall be opened publicly, read aloud, and the amount of the base bids and alternates (if any) shall be made available after the opening of bids.
- b. Preliminary bids results will be posted on the same day on the Department of Public Works Website: <http://dpw.lacounty.gov/general/contracts/opportunities/>.

1.14 AWARD OF CONTRACT

- a. If the County determines to award a contract, it shall be awarded to a responsive and responsible Bidder with the lowest bid price with preference to businesses that are certified by the County as a Local Small Business Enterprise, as set forth in Article 1.30 of these Instructions to Bidders. If there are alternatives, the lowest bid price shall be determined by adding the lump sum bid and the price of all alternatives. This does not preclude the Board of Supervisors from selecting any combination of alternates after the lowest responsible bidder has been determined. The Board of Supervisors reserves the right to reject any or all bids or to waive in the public interest technical errors and discrepancies in bids submitted.
- b. The Board shall have the right to delay the award of the contract for 90 days after bids are opened and declared, unless otherwise agreed to by the County and Bidders. Bidders may withdraw their bids 91 calendar days after bids are publicly opened and declared by submitting written notice addressed to the Department. In evaluating bids, the County shall consider whether or not the bids comply with requirements, alternatives, and unit prices, if requested in the Form of Bid.
- c. Extended Overhead Daily Rate

Extended Overhead Daily Rate is the sum of the Contractor's home office and field office overhead as applicable to this project.

The Bid Form contains an Extended Overhead Daily Rate which will be used to determine the additional compensation due the Contractor for each day of Compensable Delay. The number of days of Compensable Delay shown as a multiplier in the paragraph below is not intended as an estimate of the number of days of Compensable Delay, as defined in Section 00 07 00, General Conditions, Article 17.F.2 may be greater or lesser than the 30 days shown below.

The Extended Overhead Daily Rate in the Bid Form will be used in the evaluation of bids by multiplying the Extended Overhead Daily Rate times 30 days of Compensable Delay and adding it to the bidder's Lump Sum Bid price. However, the amount of the multiplied Extended Overhead Daily Rate for 30 days of Compensable Delay will not be included in the base contract amount.

d. Consultant Services Agreement

Following the determination of the successful bidder by the County, the County will issue a consultant services agreement for the preparation of the baseline construction schedule. The successful bidder shall return the signed consultant services agreement within three days of the County's issuance. Upon the County's receipt of the signed consultant services agreement, the County will authorize preparation of the Detailed Network Construction Schedule in accordance with Section 01 32 00 and preparation of the Schedule of Values in accordance with Section 01 29 73 of the project specifications. Only after acceptance by the County of the Detailed Network Construction Schedule in accordance with the minimum requirements set forth in Section 01 32 00, Construction Schedule, Section 01 29 73, Schedule of Values, Section 01 33 00, Submittals, and execution by the bidder of a contract for the entire project will the County execute a contract for the construction of the project.

Upon receipt by the County, of an acceptable Detailed Network Construction Schedule, Schedule of Values, and list of Submittals, the Bidder shall receive payment of the sum of Three Thousand Dollars (\$3,000) as compensation to perform the work required to provide a Detailed Network Construction Schedule, Schedule of Values, and list of Submittals. The payment of \$3,000 shall be deducted from the overall construction contract base bid and shall not be in addition to it.

e. Failure to Produce Detailed Network Schedule and Schedule of Values

The Contractor must have or obtain expertise in the type of automated scheduling specified. The successful Bidder will have ten (10) calendar days from the issuance of a Notice to Proceed under the consultant services agreement to submit its Detailed Network Construction Schedule and Schedule of Values. The successful Bidder will have three (3) calendar days to provide County requested revisions to the Detailed Network Construction Schedule and Schedule of Values provided under the Consultant Services Agreement.

Submission of an acceptable Detailed Network Construction Schedule and Schedule of Values is a condition precedent to the execution of the construction contract by the County. Failure to meet these requirements may result in a determination and a recommendation that the Board of Supervisors determine that the successful Bidder is non-responsible because such failure reflects on the Bidder's ability to manage the work.

f. Execution of Contract by Bidder

Following bid opening and upon notification from Public Works, the apparent successful Bidder will be required to deliver within fourteen (14) calendar

days to the offices of Public Works certificate(s) issued by the insurance carrier(s), payment and performance bonds, and three (3) signed and notarized contract signature pages. The contract pages must be signed by the corporate president and secretary, managing partner or sole proprietor.

g. Execution of Contract by County

When the Board of Supervisors or the Director has formally awarded the contract to the Successful Bidder, the County will execute the contract and issue the fully executed contract to the Contractor followed by the Notice to Proceed.

h. Failure to Resolve Equals

In accordance with the General Conditions, paragraph 2, subparagraph d, the first, second and third apparent lowest bidders will have two (2) calendar days after the bid opening to submit their list of Equals and ten (10) calendar days after the bid opening to submit all substantiating data and test results.

i. Protest Policy

The County will handle and process any and all protests in connection with this Bid according to the County of Los Angeles Contracting Manual, Countywide Construction Contracting Policy Guidelines, no. P-05-04, "Bid Protests", dated March 31, 2003. Bidders who wish to file a protest shall do so in accordance with the requirements specified in Construction Contracting Policy Guideline no. P-05-04, which can be found at <http://dpw.lacounty.gov/general/bids/BidProtests.pdf>

Policy Overview

The County of Los Angeles will process bid protests in a timely and consistent manner to assure that all prospective contractors/consultants are accorded fair and equal consideration for the award of County contracts.

Purpose and Scope

The purpose of this Policy Guideline is to convey the County's general course of action for addressing bid protests asserted by prospective contractors. This guideline will address the administrative guidelines for protests arising from the acquisition of construction and construction-related services under both the Invitation for Bid (IFB) and Request for Proposal (RFP) methods of solicitation.

Application and Responsibility

This Policy Guideline applies to all County departments involved in the contractor selection process for construction and construction-related contracts.

Policy Guidelines

1. **Introduction.** Protests received by the County before contract award shall be immediately forwarded to the contract analyst issuing the IFB or RFP. The contract analyst will prepare a written response, reviewed by County Counsel if necessary, and approved by the department/agency head or his/her designee.
2. **Timely Filing.** The protest of a likely contract award to the apparent lowest bidder (IFB) or best-qualified firm or consultant (RFP) must be made prior to contract award. Untimely notice will not serve the interests of either party. Protests should be received by the County at the earliest practical time.
3. **Post-Award Protests.** With respect to protests received after contract award, the County will not suspend contract performance or terminate the awarded contract unless so directed by the Board.
4. **Protest Format.** The protesting party's protest should reference all pertinent County, State, Federal, or local laws or regulations that are relied upon in support of the protest. Any documents relevant to the protest should be submitted. The County, at its discretion, may decide the protest without requesting further submittal(s) from the party submitting the protest. Thus, the initial protest should include all matters that the party wishes the County to consider in deciding the protest outcome. Such matters include, but are not limited to, the following:
 - (1) The name and address of the party and its relationship to the procurement.
 - (2) Identification of the proposed project or contract.
 - (3) Description of the nature of the protest.
 - (4) Identification of the provision(s) of the solicitation, regulations, or laws upon which the protest is based (i.e., identification of the technical specifications or item of content in the IFB/RFP).
 - (5) Copies of all (or any) documentation supporting the allegations in the protest.
 - (6) Statement of the specific relief requested.
5. **Protest Submittal.** The best interests of the parties are served if the protest is (1) filed with the Contract Analyst, (2) filed in a timely fashion, and (3) filed in the format and detail described in Protest Format above. A contractor may also appear in person before the Board. The Board,

acting in the best interests of the County, may decide to continue with the award and acquisition subject to resolution of the protest.

6. **Protest Remedies.** A decision by the responsible official will be made based on the merits of the protest. A written response will be provided by the County and all findings and specified remedies will be considered final. The Board may suspend a contract upon a finding that the protest has merit and is based on solid legal principles.
7. **Authority for Administration of Protests.** The responsible official may assign Contract Analysts to conduct the administrative processing of protests filed with the County. Assigned Contract Analysts shall be responsible for proper distribution of protest submittals and responses, coordination of staff evaluation of the protest, compliance with the time limits stated herein, and maintenance of all documents related to the protest. The responsible official shall request County Counsel to review and advise the Contract Analyst concerning any legal issues involved in protests.

1.15 PERFORMANCE AND OTHER BONDS

- a. The General Conditions and Supplementary Conditions set forth requirements as to performance bonds and other bonds. When the successful Bidder delivers the executed Agreement to the County, it shall be accompanied by the required contract security.

1.16 COMMUNITY BUSINESS ENTERPRISE (CBE) PARTICIPATION

- a. The County encourages the participation of Community Business Enterprises (CBE) in the project and has established a goal of twenty-five percent (25%) CBE participation which all contractors must aspire to meet. Participation in the Work is based on total monetary value of the proposed subcontract. CBEs are defined as Minority/Women/Disadvantaged/Disabled Veteran/Lesbian, Gay, Bisexual, Transgender, Queer, and Questioning owned Business Enterprises (M/W/D/DVBE/LGBTQQ).
- b. Bidders shall meet the established goal as indicated above. If the Bidder does not meet this established goal, Bidder shall document its good faith efforts to utilize CBEs. The Bidder shall submit the documentation of its good faith efforts to the County. County will evaluate the Bidder's good faith efforts to meet the CBE participation goal by the following criteria:
 1. Bidder attended any pre-solicitation or pre-bid meetings scheduled by the County to inform all Bidders of the CBE program requirements for the Project.

2. Bidder identified and selected specific items of the Project for which the contract will be awarded to be performed by CBEs to provide an opportunity for participation by those enterprises.
 3. Bidder advertised, not less than ten (10) calendar days before the date the bids are opened, in one or more daily or weekly newspaper trade association publications, minority- or trade-oriented publications, trade journals, or other media, specified by the local agency for CBEs that are interested in participating in the Project.
 4. Bidder provided written notice of his or her interest in bidding on the contract to the CBEs required to be notified by the Project specifications not less than ten (10) calendar days prior to the opening of bids.
 5. Bidder followed up initial solicitations of interest by contacting the enterprises to determine with certainty whether the enterprises were interested in performing specific items of the Project.
 6. Bidder provided interested CBEs with information about the plans, specifications, and requirements for selected subcontracting or material supply work.
 7. Bidder requested assistance from minority and women community organizations; minority and women contractor groups; local, state, or federal minority and women business assistance offices; or other organizations that provide assistance in the recruitment and placement of minority or women business enterprises, if any are available.
 8. Bidder negotiated in good faith with the CBEs, and did not unjustifiably reject as unsatisfactory bids prepared by any CBE.
 9. Where applicable, the Bidder advised and made efforts to assist interested CBEs in obtaining bonds, lines of credit, or insurance required by these Contract Documents.
 10. Bidder's efforts to obtain CBE participation could reasonably be expected by the County to produce a level of participation sufficient to meet the goals and requirements of the County.
- c. Bidder may request for a certified CBE listing via email the County of Los Angeles Office of Small Business at:

osb@dcbalacounty.gov

For additional information, contact the County of Los Angeles Department of Consumer and Business Affairs (Small Business Services). The website is: dcbalacounty.gov. The County of Los Angeles Certification Portal from the Office of Small business is at the same website for firms seeking County certification.

- d. Contractors, material, and services and supplies vendors interested in becoming registered as certified minority or women business enterprises may contact the County of Los Angeles Countywide Contract Compliance Section, at (626) 943-5619.
- e. The first, second, and third apparent lowest bidders are required to submit documentation which describes the Bidder's good faith efforts to utilize CBEs within the timeframe indicated in Article 1.11 Submittal of Bids, paragraph d.

1.17 BEST MANAGEMENT PRACTICE (BMP) REQUIREMENTS

- a. Contractor shall comply with the Los Angeles County Department of Public Works Construction Site Best Management Practices (BMP's) Manual, latest edition. A copy of the BMP Manual can be obtained at the Los Angeles County Department of Public Works Cashier's Office, 900 South Fremont Avenue, Alhambra, CA 91803, or call (626) 458-6959. Specific requirements for this Project are listed in Sections 00 03 10, 01 00 00, and 01 57 00.
- b. Contractor shall use Construction and Demolition Debris Recycling Best Management Practices. Specific requirements are listed in Section 01 74 19. Copies of the Best Management Practices handbook are available at the Cashier's Office at the Department of Public Works at no cost to bidders.

1.18 RECYCLED BOND PAPER-CONTRACT LANGUAGE

Consistent with the Board of Supervisor's policy to reduce the amount of solid waste deposited at the County landfills, the Contractor agrees to use recycled content paper to the maximum extent possible on the project.

1.19 IMPROPER CONSIDERATIONS

- a. **Attempt to Secure Favorable Treatment**
It is improper for any County officer, employee, or agent to solicit consideration, in any form, from a Bidder with the implication, suggestion or statement that the Bidder's provision of the consideration may secure more favorable treatment for the Bidder in the award of a Contract or that the

Bidder's failure to provide such consideration may negatively affect the County's consideration of the Bidder's submission. A Bidder must not offer or give either directly or through an intermediary, consideration, in any form, to a County officer, employee, or agent for the purpose of securing favorable treatment with respect to the award of a Contract.

b. Notification to County

A Bidder must immediately report any attempt by a County officer, employee, or agent to solicit such improper consideration. The report must be made to the Los Angeles County Fraud Hotline at (800) 544-6861 or <https://fraud.lacounty.gov/>. Failure to report such a solicitation may result in the Bidder's submission being eliminated from consideration.

c. Form of Improper Consideration

Among other items, such improper consideration may take the form of cash, discounts, services, the provision of travel or entertainment, or tangible gifts.

1.20 CONSIDERATION OF GAIN/GROW PROGRAM PARTICIPANTS FOR EMPLOYMENT

As a threshold requirement for consideration for contract award, Bidders/Proposers shall demonstrate a proven record of hiring the County's Department of Public Social Services' (DPSS) Greater Avenues for Independence (GAIN) or General Relief Opportunity for Work (GROW) participants or shall attest to a willingness to consider GAIN/GROW participants for any future employment opening if they meet the minimum qualifications for that opening. Additionally, Bidders/Proposers shall attest to a willingness to provide employed GAIN/GROW participants access to Bidders/Proposers' employee mentoring program, if available, to assist these individuals in obtaining permanent employment and/or promotional opportunities.

The County will refer GAIN/GROW participants by job category to the Contractor. DPSS may be contacted at the following locations:

Central County	(323) 730-6452
East San Fernando Valley	(818) 729-8933
Palmdale-Lancaster	(661) 575-2646
Pomona	(909) 392-3071
San Gabriel Valley	(626) 927-2723
South County	(310) 603-8359
Southeast County	(323) 261-3065
West County	(310) 655-7725
West San Fernando Valley	(818) 718-4337

Bidders/Proposers who are unable to meet this requirement shall not be considered for contract award.

1.21 CHILD SUPPORT COMPLIANCE PROGRAM

Contractor is required to fully comply with all applicable state and federal reporting requirements relating to employment reporting for its employees. Contractor is required to fully comply with all lawfully served wage and earnings assignment orders and notices of assignment. Failure to comply with state and federal reporting requirements regarding employees, or failure to implement lawfully served wage and earnings assignment orders or notices of assignment, constitutes a default under the contract, and failure to cure the default within 90 days of notice by the County, shall subject the contract to termination. Failure to comply with these requirements may be cause for debarment.

1.22 FEDERAL EARNED INCOME CREDIT

Contractor shall notify its employees, and shall require each subcontractor to notify its employees, that they may be eligible for the Federal Earned Income Credit under the Federal income tax laws. Such notice shall be provided in accordance with the requirements set forth in Internal Revenue Service Notice 1015.

1.23 REDUCTION OF SOLID WASTE

Consistent with the Board of Supervisors' policy to reduce the amount of solid waste deposited at the County landfills, the Contractor agrees to use recycled-content paper to the maximum extent possible on the project.

1.24 INJURY AND ILLNESS PREVENTION PLAN (IIPP) AND CODE OF SAFE PRACTICES (CSP) AFFIDAVIT

The apparent low Bidder shall submit Section 00 04 91, INJURY and ILLNESS PREVENTION PLAN (IIPP) AND CODE OF SAFE PRACTICES (CSP) affidavit no later than seven (7) calendar days after the bid opening. The affidavit requires that the Bidder shall have an IIPP and a CSP which complies with Cal/OSHA Regulations, and that all subcontractors supplying employees to the jobsite will be required to prove to the Contractor that they have an IIPP and a CSP which complies with Cal/OSHA Regulations, and that their jobsite employees have been trained on IIPP and CSP.

Failure to submit this affidavit as required, may result in a determination that the apparent low Bidder is nonresponsive.

1.25 DETERMINATION OF BIDDER RESPONSIBILITY

- a. A responsible Bidder is a Bidder who has demonstrated the attribute of trustworthiness, as well as quality, fitness, capacity and experience to satisfactorily perform the contract. It is the County's policy to conduct business only with responsible consultants.
- b. Bidders are hereby notified that, in accordance with Chapter 2.202 of the County Code, the County may determine whether the Bidder is responsible based on a review of the Bidder's performance on any contracts, including but not limited to County contracts. Particular attention will be given to violations of labor laws related to employee compensation and benefits, and evidence of false claims made by the Bidder against public entities. Labor law violations which are the fault of subcontractors and of which the Bidder had no knowledge shall not be the basis of a determination that the Bidder is not responsible.
- c. The County may declare a Bidder to be non-responsible for purposes of this contract if the Board of Supervisors, in its discretion, finds that the Bidder has done any of the following: (1) violated a term of a contract with the County; (2) committed an act or omission which negatively reflects on the Bidder's quality, fitness or capacity to perform a contract with the County, any other public entity, or a nonprofit corporation created by the County, or engaged in a pattern or practice which negatively reflects on same; (3) integrity or business honesty; or (4) made or submitted a false claim against the County or any other public entity.
- d. If there is evidence that the highest ranked Bidder may not be responsible, the Department shall notify the Bidder in writing of the evidence relating to the Bidder's responsibility, and its intention to recommend to the Board of Supervisors that the Bidder be found not responsible. The Department shall provide the Bidder and/or the Bidder's representative with an opportunity to present evidence as to why the Bidder should be found to be responsible and to rebut evidence which is the basis for the Department's recommendation.
- e. If the Bidder presents evidence in rebuttal to the Department, the Department shall evaluate the merits of such evidence, and based on that evaluation, make a recommendation to the Board of Supervisors. The final decision concerning the responsibility of the Bidder shall reside with the Board of Supervisors.
- f. The terms shall also apply to proposed subcontractors of Bidders on County contracts.

1.26 BIDDER DEBARMENT

- a. The Bidder is hereby notified that, in accordance with Chapter 2.202 of the County Code, the County may debar the Bidder from proposing on, or being

awarded, and/or performing work on other County contracts for a specified period of time, which generally will not exceed five years but may exceed five years or be permanent if warranted by the circumstances, and the County may terminate any or all of the Bidder's existing contracts with the County, if the Board of Supervisors finds, in its discretion, that the Bidder has done any of the following: (1) violated a term of a contract with the County or a nonprofit corporation created by the County; (2) committed an act or omission which negatively reflects on the Bidder's quality, fitness or capacity to perform a contract with the County, any other public entity, or a nonprofit corporation created by the County, or engaged in a pattern or practice which negatively reflects on same; (3) committed an act or offense which indicates a lack of business integrity or business honesty; or (4) made or submitted a false claim against the County or any other public entity.

- b. If there is evidence that the highest ranked Bidder may be subject to debarment, the Department shall notify the Bidder in writing of the evidence which is the basis for the proposed debarment, and shall advise the Bidder of the scheduled date for a debarment hearing before the Contractor Hearing Board.
- c. The Contractor Hearing Board shall conduct a hearing where evidence on the proposed debarment is presented. The Bidder and/or the Bidder's representative shall be given an opportunity to submit evidence at that hearing. After the hearing, the Contractor Hearing Board shall prepare a tentative proposed decision, which shall contain a recommendation regarding whether the Bidder should be debarred, and, if so, the appropriate length of time of the debarment. The Bidder and the Department shall be provided an opportunity to object to the tentative proposed decision prior to its presentation to the Board of Supervisors.
- d. After consideration of any objections, or if no objections are received, a record of the hearing, the proposed decision and any other recommendation of the Contractor Hearing Board shall be presented to the Board of Supervisors. The Board of Supervisors shall have the right to modify, deny or adopt the proposed decision and recommendation of the Contractor Hearing Board.
- e. If a Bidder has been debarred for a period longer than five years, that Bidder may, after the debarment has been in effect for at least five years; submit a written request for review of the debarment determination to reduce the period of debarment or terminate the debarment. The County may, in its discretion, reduce the period of debarment or terminate the debarment if it finds that the Bidder has adequately demonstrated one or more of the following: (1) elimination of the grounds for which the debarment was imposed; (2) a bona fide change in ownership or management; (3) material evidence discovered after debarment was imposed; or (4) any other reason that is in the best interests of the County.

- f. The Contractor Hearing Board will consider requests for review of a debarment determination only where (1) the Bidder has been debarred for a period longer than five years; (2) the debarment has been in effect for at least five years; and (3) the request is in writing, states one or more of the grounds for reduction of the debarment period or termination of the debarment, and includes supporting documentation. Upon receiving an appropriate request, the Contractor Hearing Board will provide notice of the hearing on the request. After the hearing, the Contractor Hearing Board shall conduct a hearing where evidence on the proposed reduction of debarment period or termination of debarment is presented. This hearing shall be conducted and the request for review decided by the Contractor Hearing Board pursuant to the same procedures as for a debarment hearing.

The Contractor Hearing Board's proposed decision shall contain a recommendation on the request to reduce the period of debarment or terminate the debarment. The Contractor Hearing Board shall present its proposed decision and recommendation to the Board of Supervisors. The Board of Supervisors shall have the right to modify, deny, or adopt the proposed decision and recommendation of the Contractor Hearing Board.

- g. These terms shall also apply to proposed subcontractors of Bidders on County contracts.

1.27 CONTRACTOR EMPLOYEE JURY SERVICE PROGRAM

The prospective contract is subject to provisions of the County's ordinance entitled Contractor Employee Jury Service ("Jury Service Program") as codified in Sections 2.203.010 through 2.203.090 of the Los Angeles County Code.

- a. Unless Contractor has demonstrated to the County's satisfaction either that Contractor is not a "Contractor" as defined under the Jury Service Program (Section 2.203.020 of the County Code) or that Contractor qualifies for an exception to the Jury Service Program (Section 2.203.070 of the County Code), Contractor shall have and adhere to a written policy that provides that its Employees shall receive from the Contractor, on an annual basis, no less than five days of regular pay for actual jury service. The policy may provide that Employees deposit any fees received for such jury service with the Contractor or that the Contractor deduct from the Employee's regular pay the fees received for jury service.
- b. For purposes of this Section, "Contractor" means a person, partnership, corporation or other entity which has a contract with the County or a subcontract with a County contractor and has received or will receive an aggregate sum of \$50,000 or more in any 12-month period under one or more County contracts or subcontracts. "Employee" means any California resident who is a full-time employee of Contractor. "Full time" means 40

hours or more worked per week, or a lesser number of hours if the lesser number is a recognized industry standard and is approved as such by the County. If Contractor uses any subcontractor to perform services for the County under the Contract, the subcontractor shall also be subject to the provisions of this Section. The provisions of this Section shall be inserted into any such subcontract agreement and a copy of the Jury Service Program shall be attached to the agreement.

- c. If a contractor does not fall within the Jury Service Program's definition of "Contractor" or if it meets any of the exceptions to the Jury Service Program, then the contractor must so indicate in the Certification Form and Application for Exception and include with its submission all necessary documentation to support the claim such as tax returns or a collective bargaining agreement, if applicable. Upon reviewing the contractor's application, the County will determine, in its sole discretion, whether the contractor falls within the definition of Contractor or meets any of the exceptions to the Jury Service Program. The County's decision will be final.
- d. If a contractor is not required to comply with the Jury Service Program when the contract commences, the contractor will have a continuing obligation to review the applicability of its "exception status" from the Jury Service Program, and the contractor must immediately notify the County if the contractor at any time either comes within the Jury Service Program's definition of "contractor" or if the contractor no longer qualifies for an exception to the Program. In either event, the contractor must immediately implement a written policy consistent with the Jury Service Program. The County may also require, at any time during the contract and at its sole discretion, that a contractor demonstrate to the County's satisfaction that the contractor either continues to remain outside the Jury Service Program's definition of "Contractor" and/or the contractor continues to qualify for an exception to the Program.
- e. If a contractor uses a subcontractor to perform services for the County under the contract, the subcontractor shall also be subject to the provisions of the Jury Service Program, unless the subcontractor 1) does not fall within the definition of "contractor" or 2) meets one of the exceptions to the Jury Service Program. The provisions of the Jury Service Program must be inserted into any applicable agreement and a copy of the Jury Service Program shall be attached to the agreement.
- f. A contractor's violation of the Jury Service Program may constitute a material breach of the contract. In the event of such material breach, County may, in its sole discretion, terminate the contract and/or bar a contractor from the

award of future County contracts for a period of time consistent with the seriousness of the breach.

1.28 VENDOR REGISTRATION WITH THE COUNTY OF LOS ANGELES

All potential bidders/proposers with the County of Los Angeles are required to register in WebVen and have a valid vendor number assigned to them. The vendor number is required by the Auditor-Controller and is necessary for any payments to be made to a contractor who is awarded a County project. Vendor registration can be done online at <http://camisvr.co.la.ca.us/webven> or calling the County's Internal Service Department Central Purchasing Vendor Relations Unit at (323) 267-2650. If you are awarded a contract and you do not have a valid vendor number, your payments will be delayed until you are registered.

1.29 NO PAYMENT FOR SERVICES PROVIDED FOLLOWING EXPIRATION/TERMINATION OF AGREEMENT

Contractor shall have no claim against County for payment for any money or reimbursement, of any kind whatsoever, for any service provided by Contractor after the expiration or other termination of this Agreement. Should Contractor receive any such payment it shall immediately notify County and shall immediately repay all such funds to County. Payment by County for services rendered after expiration/termination of this Agreement shall not constitute a waiver of County's right to recover such payment from Contractor. This provision shall survive the expiration or other termination of this Agreement.

1.30 COUNTY'S PREFERENCE PROGRAM: LOCAL SMALL BUSINESS ENTERPRISE

Overview of County's Preference Program

The County of Los Angeles has The Local Small Business Enterprise (LSBE) preference program. The Board of Supervisors encourages business participation in the County's contracting process by continually streamlining and simplifying our selection process and expanding opportunities for these businesses to compete for County opportunities.

The LSBE Preference Program requires that a business must complete County of Los Angeles certification prior to requesting a preference in a solicitation. This program and how to obtain certification are further explained in this solicitation.

The maximum percentage of a LSBE Preference Program preference shall be 7 percent of the lowest responsible bidder meeting specifications and the maximum financial value shall be one hundred fifty thousand dollars (\$150,000) for any bid.

Sanctions and financial penalties may apply to a business that knowingly, and with intent to defraud, seeks to obtain or maintain certification as a certified LSBE when not qualified.

a. Local Small Business Enterprise (LSBE) Preference Program

The County will give LSBE preference during the solicitation process to businesses that meet the definition of a LSBE, consistent with Chapter 2.204.030C.1 of the Los Angeles County Code. An LSBE is defined as a business: 1) certified by the State of California as a small business and has had its principal place of business located in Los Angeles County for at least one year; or 2) certified as a small business enterprise with other certifying agencies pursuant to the Department of Consumer and Business Affairs's (DCBA) inclusion policy that: a) has its principal place of business located in Los Angeles County, and b) has revenues and employee sizes that meet the State's Department of General Services requirements. **The business must be certified by the Department of Consumer and Business Affairs as meeting the requirements set forth above prior to requesting the LSBE Preference in a solicitation.**

To apply for certification as an LSBE, businesses should contact the County of Los Angeles Department of Consumer and Business Affairs at <http://dcba.lacounty.gov>

Certified LSBEs may only request the preference if the certification process has been completed and certification is affirmed. Businesses must complete and submit Section 00 04 38 Request for Preference Consideration Form and submit a letter of certification from the County of Los Angeles Department of Consumer and Business Affairs (DCBA) with their proposal. As shown on the County DCBA letter, the certification must be valid as of the bid due date.

Information about the State's small business enterprise certification regulations is in the California Code of Regulations, Title 2, Subchapter 8, Section 1896 et seq., and is also available on the California Department of General Services Office of Small Business Certification and Resources Web site at <http://www.pd.dgs.ca.gov/smbus/default>.

- b. Should one or more of the Bidders request and be granted the Local Small Business Enterprise (LSBE) Preference, the bid amount shall be adjusted as follows:

Local Small Business Enterprise (LSBE) Preference: Seven percent of the lowest bid amount will be calculated, which shall not exceed \$150,000, and that amount will be deducted from the bid amounts submitted by all LSBE bidders who requested and were granted the LSBE Preference.

The contract award will be the bidder's original bid price, not the price with preference(s) that is used for evaluation purposes.

Preference Program Enterprises (PPEs) - Prompt Payment Program

It is the intent of the County that Certified Preference Program Enterprises (PPEs) receive prompt payment for services they provide to County Departments. Prompt payment is defined as fifteen (15) calendar days after receipt of an approved, undisputed invoice which has been properly matched against documents such as a receiving, shipping, or services delivered report, or any other validation of receipt document consistent with Board Policy 3.035 (Preference Program Payment Liaison and Prompt Payment Program).

1.31 NOTICE TO EMPLOYEES REGARDING THE SAFELY SURRENDERED BABY LAW

The Contractor shall notify and provide to its employees, and shall require each subcontractor to notify and provide to its employees, a fact sheet regarding the Safely Surrendered Baby Law, its implementation in Los Angeles County, and how to safely surrender a baby. The fact sheet is available on the Internet at www.babysafela.org for printing purposes.

The Contractor acknowledges that the County places a high priority on the implementation of the Safely Surrendered Baby Law. The Contractor understands that it is the County's policy to encourage all County Contractors to voluntarily post the County's "Safely Surrendered Baby Law" poster in a prominent position at the Contractor's place of business. The County's Department of Children and Family Services will supply the Contractor with the poster to be used.

1.32 REQUIRED CERTIFICATION/DISCLOSURE

Bids must provide full disclosure on violations and civil/criminal legal actions as provided for on the bidding requirement forms Sections 00 04 70, 00 04 71, 00 04 72, 00 04 73, and 00 04 74. Failure to complete these forms may result in a determination that the Bidder is nonresponsive and/or not responsible.

1.33 NOTIFICATION TO COUNTY OF PENDING ACQUISITIONS/MERGERS BY BIDDING COMPANY

The Bidder shall notify the County of any pending acquisitions/mergers of its company unless otherwise legally prohibited from doing so. If the Bidder is restricted from legally notifying the County of pending acquisitions/mergers, then it should notify the County of the actual acquisitions/mergers as soon as the law allows and provide to the County the legal framework that restricted it from notifying the County prior to the actual acquisitions/mergers. This information shall be

provided by the Bidder on Section 00 04 92 - Bidder's Organization Questionnaire/Affidavit. Failure of the Bidder to provide this information may eliminate its bid from any further consideration. Bidder shall have a continuing obligation to notify the County and update any changes to its response in Section 00 04 92 - Bidder's Organization Questionnaire/Affidavit during the solicitation.

1.34 COUNTY'S DEFAULTED PROPERTY TAX REDUCTION PROGRAM

The prospective contract is subject to the requirements of the County's Defaulted Property Tax Reduction Program (Los Angeles County Code, Chapter 2.206). Prospective contractors should carefully read the Defaulted Tax Program Ordinance and the pertinent provisions of the sample contract which are incorporated by reference into and made a part of this solicitation. The Defaulted Tax Program applies to both contractors and their subcontractors.

Bidders/proposers shall be required to certify that they are in full compliance with the provisions of the Defaulted Tax Program and shall maintain compliance during the term of any contract that may be awarded pursuant to this solicitation or shall certify that they are exempt from the Defaulted Tax Program by completing Certification of Compliance with the County's Defaulted Property Tax Reduction Program required forms. Failure to maintain compliance, or to timely cure defects, may be cause for termination of a contract or initiation or debarment proceedings against the non-compliant contractor (Los Angeles County Code, Chapter 2.202).

Bids/proposals that fail to comply with the certification requirements of the Defaulted Tax Program will be considered non-responsive and excluded from further consideration.

1.35 Intentionally Omitted

1.36 LOCAL AND TARGETED WORKER HIRE PROGRAM

Local and Targeted Worker Hire Program applies to this project.

- A. At least 30 percent of total California construction labor hours worked on each project must be performed by a qualified Local Resident. Where allowable, contractors are encouraged to achieve higher participation levels for Local Residents.
- B. At least 10 percent of total California hours worked shall be performed by County residents classified as a Targeted Worker facing barriers to employment. Hours worked by a Targeted Worker who is also a Local Resident may be applied towards the 30 percent Local Resident hire goal. A Target Worker is a resident of the County who has indices of career-limiting circumstances, specifically, one or more of the following:

1. Has a documented annual income at or below 100 percent of the Federal Poverty Level;
2. No high school diploma or GED;
3. A history of involvement with the criminal justice system;
4. Protracted unemployment (receiving unemployment benefits for at least 6 months);
5. Is a current recipient of government cash or food assistance benefits;
6. Is homeless or has been homeless within the last year;
7. Is a custodial single parent;
8. Is a former foster youth; or
9. Is a veteran, or is the eligible spouse of a veteran of the United States armed forces, under Section 2(a) of the Jobs for Veterans Act (38 U.S.C.4215[a]).
10. Eligible Migrant and seasonal farmworkers
11. English Language Learners
12. Older Individuals (55+)
13. Disabled
14. Individuals with Low Levels of Literacy

C. A Local Resident is defined as an individual living within the Tier 1 or Tier 2 ZIP Codes of the County. Before employing worker(s) from Tier 2 ZIP Codes, the available pool of local residents whose primary place of residence is within Tier 1 ZIP Codes must first be exhausted. Tier 1 means ZIP Codes within five (5) miles of the proposed project site, and where the average percentage of households living below 200 percent of the Federal Poverty Level (FPL) is greater than the County average for such households. Tier 2 means any ZIP Codes within the County where the average percentage of households living below 200 percent of the FPL is greater than the County average for such households. This definition shall also apply to affordable housing projects and for privately financed developments located on County property.

D. Contractor shall comply with the provision required under the Local and Targeted Hire Program in the Agreement.

E. In addition, there shall be a **mandatory** requirement to use a Jobs Coordinator to be hired directly by the contractor, prior to the start of work on the project. The Jobs Coordinator is an independent third-party individual, entity, or employee with whom the Prime Contractor enters into a contract or employs to facilitate the implementation of the Local and Targeted Worker Hiring Requirements of this Agreement. The Jobs Coordinator may be selected from the approved Jobs Coordinators list available as Form 00 09 12-5. If the Prime Contractor utilizes an employee as a Jobs Coordinator, the Jobs Coordinator must be able to demonstrate or document to the County the minimum qualifications and/or experience to fulfill the duties and responsibilities as outlined in Sections 2.02 and 2.03.

- F. Per State Labor Code, a minimum ratio of one apprentice hour for every five journeyman hours shall be enforced, and contractors shall strive to obtain half of all apprentice hours on the project be performed by Local and Targeted Workers. Hours worked by an apprentice who is also a Targeted Worker or a Local Resident may be applied towards the 30 percent Local Resident and/or the 10 percent Targeted Worker hire goals.

1.37 Contractor CARD Track/Monitoring Database

The County maintains the Contractor Alert Reporting Database (CARD), which is used to track/monitor poorly performing contractors. When a County department identifies a significant performance/non-compliance issue(s) with a contractor, the department will provide notice to the contractor and will give the contractor an opportunity to correct the issue(s). If the contractor does not take any appropriate steps to correct the issue(s), the County department will enter the contractor, along with any other relevant information pertaining to the contractor's performance issue(s), into CARD.

The information entered into CARD can be accessed by all County departments, and will be used, along with any other relevant information not included in CARD, in determining bidder responsibility. If a department reviews this information and determines that a finding of non-responsibility should be pursued, the department will adhere to the guidelines specified in the Los Angeles County Code Chapter 2.202, and the County's Implementation Procedures for Determinations of Contractor Non-Responsibility and Contractor Debarment.

1.38 Time Off for Voting

The Contractor shall notify its employees, and shall require each subcontractor to notify and provide to its employees, information regarding the time off for voting law (Elections Code Section 14000). Not less than 10 days before every statewide election, every Contractor and subcontractors shall keep posted conspicuously at the place of work, if practicable, or elsewhere where it can be seen as employees come or go to their place of work, a notice setting forth the provisions of Section 14000.

1.39 ADDITIONAL BIDDER REQUIREMENTS

- a. **A pre-bid conference** and site visitation will be **held on Thursday, October 3, at 10:00 a.m.**, at the project site to provide information regarding the project, bidding process and answer questions that potential bidders may have. Interested parties are requested to meet promptly at **1250 Encinal Canyon Road, Malibu, CA 90265**. Attendance is strongly encouraged but not mandatory.
- b. NO ADDITIONAL REQUIREMENTS.

1.40 PUBLIC WORKS CONTRACTOR REGISTRATION PROGRAM

- a. This project is a public work as defined in Section 1720 of the California Labor Code, and subject to compliance monitoring and enforcement by the Department of Industrial Relations (DIR).
- b. A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to requirements of Section 4104 of the California Public Contract Code, or engage in the performance of any contract for public works, unless currently registered with the Department of Industrial Relations and qualified to perform public work pursuant to California Labor Code Section 1725.5.
- c. The County shall not accept any bid nor award any contract without proof of the contractor and subcontractor's current registration to perform the project. A copy of the confirmed registration from the Department of Industrial Relations website (<https://services.dir.ca.gov/gsp>) must be attached in applicable part of the bid package. The bid submitted by an unregistered contractor shall be basis for considering the bid non-responsive [with limited exceptions from this requirement for bid purposes only under Labor Code Section 1771.1].
- d. An inadvertent error in listing an unregistered subcontractor pursuant to Labor Code Section 1725.5 in a bid proposal shall be grounds for considering the bid non-responsive, unless:
 - (1) The subcontractor is registered prior to the bid opening.
 - (2) Within 24 hours after the bid opening, the subcontractor is registered and has paid the penalty registration fee specified in subparagraph (E) of paragraph (2) of subdivision (a) of Section 1725.5.
 - (3) The subcontractor is replaced by another registered subcontractor pursuant to Section 4107 of the Public Contract Code.
- e. All contractors and subcontractors must furnish certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement) in a format prescribed by the Labor Commission.
- f. The prime contractor is required to post job site notices prescribed below:

8 Calif. Code Reg. §16451(d):

“This public works project is subject to monitoring and investigative activities by the Compliance Monitoring Unit (CMU) of the Division of Labor Standards Enforcement, Department of Industrial Relations, State of California. This Notice is intended to provide information to all workers employed in the execution of the contract for public work and to all contractors and other persons having access to the job site to enable the CMU to ensure compliance with and enforcement of prevailing wage laws on public works projects.

“The prevailing wage laws require that all workers be paid at least the minimum hourly wage as determined by the Director of Industrial Relations for the specific classification (or type of work) performed by workers on the project. These rates are listed on a separate job site posting of minimum prevailing rates required to be maintained by the public entity which awarded the public works contract. Complaints concerning nonpayment of the required minimum wage rates to workers on this project may be filed with the CMU at any office of the Division of Labor Standards Enforcement (DLSE).

Local Office Telephone Number:

*Division of Labor Standards Enforcement Office
320 W. Fourth Street, Suite 450
Los Angeles, CA 90013
(213) 620-6330*

“Complaints should be filed in writing immediately upon discovery of any violations of the prevailing wage laws due to the short period of time following the completion of the project that the CMU may take legal action against those responsible.

“Complaints should contain details about the violations alleged (for example, wrong rate paid, not all hours paid, overtime rate not paid for hours worked in excess of 8 per day or 40 per week, etc) as well as the name of the employer, the public entity which awarded the public works contract, and the location and name of the project.

“For general information concerning the prevailing wage laws and how to file a complaint concerning any violation of these prevailing wage laws, you may contact any DLSE office. Complaint forms are also available at the Department of Industrial Relations website found at <http://www.dir.ca.gov/Public-Works/PublicWorks.html>.”

- g. In addition, electronic certified payroll records must be submitted to the County through an online system designated by the County when requested by County.

1.41 MENTAL HEALTH SERVICES FOR CRITICAL INCIDENTS

In the event of a serious accident on the Project site, the Los Angeles County Department of Mental Health (DMH) will, if requested, respond. The response may be within a few hours or as long as a few days after the incident, depending on when the request was made. The services DMH will provide include crisis intervention, normalization of the stress response that survivors may be experiencing, stress management techniques and resources if the stress reactions increase in frequency or intensity. Requests for services may be made by calling the DMH Emergency Outreach Bureau Deputy Director, (213) 738-4924, during normal business hours or the ACCESS Center, (800) 854-7771, evenings, holidays, and weekends.

1.42 CONTRACTOR INDEPENDENCE/PROHIBITION FROM PARTICIPATION IN FUTURE SOLICITATION(S)

In accordance with Board Policy No. 5.090, Contractor Independence, The County Board of Supervisors has adopted a countywide policy that prohibits any person, or any firm or any subsidiary of a firm (collectively "firm") from submitting a bid or proposal in any County solicitation process where the person or firm, assisted in the development of the solicitation document(s).

A Bidder/Proposer, or a Contractor or its subsidiary or Subcontractor ("Bidder/Proposer/Contractor"), is prohibited from submitting a bid or proposal in a County solicitation if the Bidder/Proposer/Contractor has provided advice or consultation for the solicitation. A Bidder/Proposer/Contractor is also prohibited from submitting a bid or proposal in a County solicitation if the Bidder/Proposer/Contractor has developed or prepared any of the solicitation materials on behalf of the County. A violation of this provision will result in the disqualification of the Bidder/Contractor/Proposer from participation in the County solicitation or the termination or cancellation of any resultant County contract.

1.43 Background and Security Investigations

Background and security investigations of Contractor's staff may be required at the discretion of the County as a condition of beginning and continuing work under any resulting Contract. The cost of background checks is the responsibility of the Contractor.

1.44 LOCAL SMALL BUSINESS ENTERPRISE/SOCIAL ENTERPRISE/DISABLED VETERANS BUSINESS ENTERPRISE UTILIZATION

Local Small Business Enterprise means a business that is certified by the County of Los Angeles as a Local Small Business Enterprise (Local SBE), consistent with Chapter 2.204 of the Los Angeles County Code.

1. When requested by the County, the contractor shall provide to the County

via methods specified by the County, such as submission of electronic live (or dynamic) data on invoices for the prime and all subcontractors using County-designated third party software system or to a County approved website, or other means of submitting expenditure information on subcontractors, including but not limited to the following information: the name, business address, California Contractor License number and telephone number/email address of each subcontractor who will perform work or labor for the contractor on the Project in an amount in excess of one-half of 1 percent of the contractor's total bid. In addition, the contractor shall be required to provide each of the specified subcontractors' Local SBE status (i.e., whether any of the listed subcontractors are Local SBE's), Social Enterprise (SE) status, and Disabled Veterans Business Enterprise status, and the proposed monetary amount of the work the subcontractor will perform on the Project. In addition, at the time of submittal of the final invoice, the contractor shall indicate, via methods specified by the County, the actual dollar amounts paid to each listed subcontractor who performed work on the project.

2. Contractor's failure to comply with the provisions of this Article is a material breach of the Agreement. The parties agree that it will be impracticable or extremely difficult to fix the extent of actual damages resulting from the failure to the Contractor to comply with this Article. The parties agree that under the current circumstances a reasonable estimate of such damages is specified in the Schedule for Liquidated Damages for Local Small Business Enterprise Utilization hereunder, and that the Contractor shall be liable to the County for said amounts.

If in the judgment of the Director, or his/her designee, the Contractor is deemed to be in non-compliance with the terms and obligations assumed hereby, the Director or his/her designee, at his/her option, in addition to, or in lieu of, other remedies provided herein in this Agreement, may deduct and withhold liquidated damages from County's final payment to the Contractor as follows:

SCHEDULE FOR LIQUIDATED DAMAGES FOR LOCAL SMALL BUSINESS ENTERPRISE/SOCIAL ENTERPRISE/DISABLED VETERANS BUSINESS ENTERPRISE UTILIZATION

<u>Final Invoice Price</u>	<u>Liquidated Damages</u>
Up to \$100,000	\$50.00 plus 0.1% of contract amount
\$100,001 to \$500,000	\$150.00 plus 0.07% of all over \$100,000
Over \$500,000	\$430.00 plus 0.05% of all over \$500,000

1.45 Proposer's Acknowledgement of County's Commitment to Zero Tolerance Human Trafficking

On October 4, 2016, the Los Angeles County Board of Supervisors approved a motion taking significant steps to protect victims of human trafficking by establishing a zero tolerance human trafficking policy. The policy prohibits contractors engaged in human trafficking from receiving contract awards or performing services under a County contract.

Contractors are required to complete 00 04 98 Zero Tolerance Human Trafficking Policy Certification, certifying that they are in full compliance with the County's Commitment to Zero Tolerance Human Trafficking provision as defined in "Compliance with County's Zero Tolerance Human Trafficking" in the Agreement. Further, contractors are required to comply with the requirements under said provision for the term of any contract awarded pursuant to this solicitation.

1.46 Claims

Notwithstanding Article 1.5 (commencing with Section 20104) of Chapter 1 of Part 3, Section 9204 of the Public Contract Code shall apply to any claim by the Contractor in connection with the Project.

a) Upon receipt of a claim pursuant to Section 9204 of the Public Contract Code, the County will conduct a reasonable review of the claim and, within a period not to exceed 45 Days, provide the Contractor a written statement identifying what portion of the claim is disputed and what portion is undisputed. Upon receipt of a claim, the Contractor and the County may, by mutual agreement, extend the aforementioned time period.

b) The Contractor shall furnish reasonable documentation to support the claim.

c) If Board approval is needed to provide the Contractor a written statement identifying the disputed portion and the undisputed portion of the claim, and the Board does not meet within the 45 Days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, the County will have up to 3 Days following the next duly publicly noticed meeting of the Board after the 45-Day period, or extension, expires to provide the Contractor a written statement identifying the disputed portion and the undisputed portion.

d) Any payment due on an undisputed portion of the claim will be processed and made within 60 Days after the County issues its written statement. If the County fails to issue a written statement, paragraph (j) shall apply.

e) If the Contractor disputes the County's written response, or if the County fails to respond to a claim issued pursuant to Section 9204 within the time prescribed, the Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the County will schedule a meet and confer conference within 30 Days for settlement of the dispute.

f) Within 10 business days (Monday-Thursday) following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the County will provide the Contractor a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim will be processed and made within 60 Days after the County issues its written statement. Any disputed portion of the claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation, with the County and the Contractor sharing the associated costs equally. The County and the Contractor shall mutually agree to a mediator within 10 business days after the disputed portion of the claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the claim remaining in dispute shall be subject to applicable procedures outside those established in Section 9204.

g) Mediation shall include any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in Section 9204.

h) Unless otherwise agreed to by the County and the Contractor in writing, the mediation conducted pursuant to Section 9204 shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.

i) Section 9204 does not preclude the County from requiring arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program, if mediation under Section 9204 does not resolve the parties' dispute.

j) Failure by the County to respond to a claim from the Contractor within the time periods described in this subdivision or to otherwise meet the time requirements of Section 9204 shall result in the claim being deemed rejected in its entirety. A claim that is denied by reason of the County's failure to have responded to a claim, or its failure to otherwise meet the time requirements of Section 9204, shall not constitute an adverse finding with regard to the merits of the claim or the responsibility or qualifications of the claimant.

k) Amounts not paid in a timely manner as required by Section 9204 will bear interest at 7 percent per annum.

l) If a Subcontractor or a lower tier Subcontractor lacks legal standing to assert a claim against the County because privity of the Contract does not exist, the Contractor may present to the County a claim on behalf of a Subcontractor or lower tier Subcontractor. A Subcontractor may request in writing, either on its own behalf or on behalf of a lower tier Subcontractor, that the Contractor present a claim for work which was performed by the Subcontractor or by a lower tier Subcontractor on behalf of the Subcontractor. The Subcontractor requesting that the claim be presented to the County shall furnish reasonable documentation to support the claim. Within 45 Days of receipt of this written request, the Contractor shall notify the Subcontractor in writing as to whether

the Contractor presented the claim to the County and, if the original Contractor did not present the claim, provide the Subcontractor with a statement of the reasons for not having done so.

m) A waiver of the rights granted by Section 9204 is void and contrary to public policy, provided, however, that (1) upon receipt of a claim, the Contractor and the County may mutually agree to waive, in writing, mediation and proceed directly to the commencement of a civil action or binding arbitration, as applicable; and (2) the County may prescribe reasonable change order, claim, and dispute resolution procedures and requirements in addition to the provisions of Section 9204, so long as the contractual provisions do not conflict with or otherwise impair the timeframes and procedures set forth in Section 9204.

1.47 Proposer's Acknowledgement of County's Commitment to Fair Chance Employment Hiring Practices

On May 29, 2018, the Los Angeles County Board of Supervisors approved a Fair Chance Employment Policy in an effort to remove job barriers for individuals with criminal records. The policy requires businesses that contract with the County to comply with fair chance employment hiring practices set forth in California Government Code Section 12952, Employment Discrimination: Conviction History (Section 12952).

Contractors are required to complete Compliance with Fair Chance Employment Hiring Practices Certification (Required Forms), certifying that they are in full compliance with Section 12952, as indicated in the Sample Contract. Further, contractors are required to comply with the requirements under Section 12952 for the term of any contract awarded pursuant to this solicitation.

1.48 Default Method of Payment: Direct Deposit or Electronic Funds Transfer (EFT)

The County, at its sole discretion, has determined that the most efficient and secure default form of payment for goods and/or services provided under an agreement/contract with the County shall be Electronic Funds Transfer (EFT) or direct deposit, unless an alternative method of payment is deemed appropriate by the Auditor-Controller (A-C).

Upon contract award or at the request of the A-C and/or the contracting department, the Contractor shall submit a direct deposit authorization request with banking and vendor information, and any other information that the A-C determines is reasonably necessary to process the payment and comply with all accounting, record keeping, and tax reporting requirements.

Any provision of law, grant, or funding agreement requiring a specific form or method of payment other than EFT or direct deposit shall supersede this requirement with respect to those payments.

Upon contract award or at any time during the duration of the agreement/contract, a Contractor may submit a written request for an exemption to this requirement. The A-C, in consultation with the contracting department(s), shall decide whether to approve exemption requests.

1.49 Disallowed Cost

If Proposer's compliance with a County contract has been reviewed by the Department of the Auditor-Controller within the last 10 years, Proposer must not have unresolved questioned costs identified by the Auditor-Controller, in an amount over \$100,000.00, that are confirmed to be disallowed costs by the contracting County department, and remain unpaid for six months or more from the date of disallowance, unless such disallowed costs are the subject of current good faith negotiations to resolve the disallowed costs, in the opinion of the County.

1.50 Compliance with the County Policy of Equity

The consultant acknowledges that the County takes its commitment to preserving the dignity and professionalism of the workplace very seriously, as set forth in the County Policy of Equity (CPOE) (<https://ceop.lacounty.gov/>). The consultant further acknowledges that the County strives to provide a workplace free from discrimination, harassment, retaliation and inappropriate conduct based on a protected characteristic, and which may violate the CPOE. The consultant, its employees and subconsultants acknowledge and certify receipt and understanding of the CPOE. Failure of the consultant, its employees or its subconsultants to uphold the County's expectations of a workplace free from harassment and discrimination, including inappropriate conduct based on a protected characteristic, may subject the consultant to termination of contractual agreements as well as civil liability.

1.51 Integrated Pest Management (IPM) Program Compliance

1.51.1 The County of Los Angeles is a permittee to a National Pollutant Discharge Elimination System Permit (NPDES Permit) issued by the Los Angeles Regional Water Quality Control Board to reduce or eliminate pollutants moved into surface water through storm water management systems and facilities. One of the conditions of the NPDES Permit is the implementation of an Integrated Pest Management Program (IPM Program) crafted to reduce the impact of pesticides and fertilizers to surface water.

1.51.2 The prospective contract is subject to the requirements of the County's IPM Program. Two main components of the Program include a training component for contractor employees who apply pesticides on County owned or maintained property, as well as monthly and annual reporting to the Los Angeles County Department of Agricultural Commissioner/ Weights and Measures (ACWM).

1.51.3 Proposers are required to complete Integrated Pest Management Program Compliance Certification in Required Forms, acknowledging and certifying compliance with the County's Integrated Pest Management Program, Compliance with County's Integrated Pest Management Program in Sample Contract. Further, contractors are required to comply with the requirements under said provision for the term of any contract awarded pursuant to this solicitation.

1.52 COVID-19 Vaccinations of County Contractor Personnel

When applicable and required by the County, the Contractor shall comply with all other applicable local, departmental, State, and federal laws, regulations, and requirements for COVID-19.

1.53 Contractor Development and Bonding Program

Contractor Development and Bonding Program (CDABP) - Administered by the Chief Executive Office of the County of Los Angeles for all County Construction Contracting Departments. The CDABP provides a broad range of contractor technical assistance, training, and support in qualifying for bonds, as well as contract financing for County awarded contracts. CDABP assistance is available to prime and subcontractors. The CDABP is a County funded resource designed to reduce the barriers to small and diverse firms seeking to bid and contract on County projects. For information on the CDABP, please contact Contract Analyst.

1.54 Intentionally Omitted

1.55 Contribution and Agent Declaration

[Government Code Section 84308](#) requires a party to a contract proceeding to disclose any contribution of more than \$250 made to a County officer within the preceding twelve (12) months by the party or their agent. State regulations require this disclosure to be made at the time an application is filed, and, if a contribution is made during the contract proceeding, within 30 days of making a contribution or on the date on which the party first appears before or communicates with the agency regarding the proceeding after making the contribution, whichever is earliest. All Bidders are advised that they and all of their Subcontractors must complete and return as part of the bid, the **Contribution and Agent Declaration Form**. Bidders are further advised that they and their Subcontractors must update the Contribution and Agent Declaration Form throughout the pendency of the solicitation if a contribution is made after the initial disclosure when the proposal is submitted, and as requested at any time by the County prior to contract award. Failure by the Bidder or any Subcontractor(s) to complete and submit the required **Contribution and Agent Declaration Form**, and failure by the Bidder or any Subcontractor(s) to update the declaration as required by law or as otherwise requested by the County, may eliminate the proposal from

further consideration and/or the Proposer may be disqualified from a contract award, as determined in the County's sole discretion. Further, all Bidders and their Subcontractors are prohibited under [Government Code Section 84308](#) from making a contribution of more than \$250 to a County officer for twelve (12) months after the date a final decision is made in the contract proceeding involving this solicitation.



Americans with Disabilities Act (ADA) Information

Individuals requiring reasonable accommodations may request written materials in alternate formats, physical accessibility accommodations, sign language interpreters or other reasonable accommodations by contacting our departmental Americans with Disabilities Act Coordinator at (626) 458-7337, from 7:30 a.m. to 5:00 p.m., Monday through Thursday (excluding holidays). Persons who are hearing impaired may make contact by first dialing the California Relay Service at 7-1-1. Requests should be made at least one week in advance to ensure availability. When making a reasonable accommodation request, please reference Business Relations and Contracts Division **[BRC-2]**.

* * *

SECTION 00 03 00

FORM OF BID TO BE USED BY BIDDERS

The undersigned proposes to furnish all materials, labor, and equipment required for the construction to complete the Fire Camp 13 Woolsey Fire Reconstruction Project, in accordance with Drawings and Specifications 7823R1, including addenda thereto, if any, adopted by the Board of Supervisors, and on file in the office of the Board of Supervisors, as follows:

The lowest bid price shall be determined by adding the following items: Lump Sum Bid in Words (1) + [Extended Overhead Daily Rate (2) x Multiplied by 30 days] = Total Lump Sum Bid. Preference as stated in Section 00 01 00, 1.30, will be applied to the Total Lump Sum Bid, if applicable, to determine the final total bid amount.

1. LUMP SUM BID:

The lump sum bid for the work, including Best Management Practices (BMP) and Construction and Demolition Debris Recycling, and Mandatory Jobs Coordinator requirements complete according to the Drawings and Specifications, will be:

(\$ _____) (_____)
Lump sum bid in figures Lump sum bid in words

2. EXTENDED OVERHEAD DAILY RATE:

The daily rate for the sum of the Contractor's field office and home office overhead applicable to this project, for each day of compensable delay will be:

(\$ _____) (_____)
Daily rate in figures Daily rate in words

3. COUNTY PROGRAM PREFERENCE:

The Local Small Business Enterprise Program Preference is provided by the County for purposes of bid evaluation only, as specified in Article 1.30 of Section 00 01 00. If Bidder is a qualifying Local Small Business Enterprise, check “yes” in the box below. Section 00 04 38 Request for County Program Preference Consideration must be submitted at the time of bid with a copy of the certification letter issued by the County of Los Angeles Department of Consumer and Business Affairs. If non-qualifying, check “no” in the appropriate box.

LSBE Yes No

4. RECEIPT OF NOTICE TO BIDDERS: (IF APPLICABLE)

I hereby certify and declare that I have received, reviewed and incorporated Notice to Bidders X dated XXXXXXXX into my Bid.

Executed this day of _____ (Month and Year)

By: _____
(Authorized Signature of a Principal Owner, Officer, or Manager)

NOTE: Any alteration or addition to the Form of Bid may invalidate same. All blank spaces shall be filled out completely. Line out nonapplicable blanks. An incomplete form may invalidate bid. The County reserves the right to waive any informalities or to reject any or all bids or to accept any alternatives when called for.

I (We) certify that on _____, 20____, License No. _____, license classification(s) _____, was issued to me (us), in the name of _____, by the Contractors' State License Board, pursuant to California Statutes of 1929, as amended, and that said license has not been revoked.

Firm Ownership Information

Check where applicable:

- 1. Minority-Owned
- Woman-Owned
- Disadvantaged-Owned
- Disabled Veteran-Owned
- LGBTQQ-Owned

- 2. An individual
- A corporation. Name
 state or territory of
 Incorporation

- A copartnership
- A joint venture

Race/Ethnic Composition

For statistical purposes only.

- Black/African American
- Hispanic/Latino
- Asian or Pacific Islander
- Native Americans
- Subcontinent Asian
- White

If a copartnership or joint venture, list names of individuals comprising same below

Date signed _____, 20____

Respectfully submitted,

Place _____
 City and State

Firm Name (if applicable)

Bidder's address, E-mail address, and telephone:

Number and Street

Signature and Print Name

City and State Zip Code

Title and E-mail Address

Telephone

Signature and Print Name

Fax

Title and E-mail Address

SECTION 00 03 10

BEST MANAGEMENT PRACTICES (BMP) REQUIREMENTS

Best Management Practices (BMPs) shall be defined as any program, technology, process, siting criteria, operating method, measure or device which controls, prevents, removes, or reduces Storm Water pollution. The Contractor shall comply with the Los Angeles County Department of Public Works Construction Site Best Management Practices (BMP's) Manual, latest edition.

BMPs for contractor activities shall be continuously implemented throughout the year. BMPs for erosion and sediment control shall be implemented as required in Section 01 57 00. BMPs for erosion and sediment control shall also be implemented prior to the commencement of any contractor activity or construction operation.

The County, as a permittee, is subject to enforcement actions by the State Water Resources Control Board, Environmental Protection Agency, and private citizens. The County will assess the Contractor a penalty of \$1,000 for each calendar day that the Contractor has not fully implemented the BMPs specified for the Contract and/or is otherwise in noncompliance with these provisions in accordance with Section 01 57 00. In addition, the County will deduct from the final payment due the Contractor, the total amount of any fines levied on the County, plus legal and staff costs, as a result of the Contractor's lack of compliance with these provisions and/or less than complete implementation of the specified BMPs.

Full compensation for the implementation of BMPs, including the construction, deployment, maintenance, removal, and the furnishing of all necessary labor, equipment, and materials, shall be considered as included in the bid price of the total lump sum price bid in Section 00 03 00.

The lump sum bid for the IMPLEMENTATION OF BMPs for construction work according to Sections 01 00 00, 01 57 00, and 01 74 23 Specifications, will be:

(\$ _____) (_____)
BMP's lump sum bid in figures BMP's lump sum bid in words

Name of Bidder (Firm Name)

SECTION 00 03 12

INSURANCE REQUIREMENTS

The premium for the Builders Risk shall be included with the Lump Sum Bid, Section 00 03 00, and shall not be in addition to it.

Builders Risk:

Such coverage is required for this Project and shall supersede Section 00 07 00, Builder's Risk Course of Construction Insurance, Article 45, and shall:

1. Insure against damage from perils covered by the Causes-of-Loss Special Form (ISO form CP 10 30), and the perils of earthquake, flood, risk of transit loss, loss during storage (both onsite and offsite), and collapse during construction (without restricting collapse coverage to specified perils).
2. If Contractor's work involves testing air conditioning systems, boilers, pressure vessels, major machinery or major electrical panels, policy shall include coverage for such testing.
3. Be written on a completed-value basis and cover the entire value of the construction Project, including County-furnished materials and equipment, against loss or damage until completion and acceptance by the County.

The amount for Builders Risk according to Section 00 08 00 of the Specifications, will be:

(\$ _____)
Amount in figures

(_____)
Amount in words

Name of Bidder (Firm Name)

SECTION 00 03 13

**LOCAL AND TARGETED WORKER HIRE PROGRAM – MANDATORY JOBS
COORDINATOR**

The fee for the mandatory jobs coordinator shall be included with the Lump Sum Bid, Section 00 03 00, and shall not be in addition to it.

Mandatory Jobs Coordinator:

The County of Los Angeles has implemented a **mandatory** Local and Targeted Worker Hire Policy (LTWHP) which can be located in Section 00 09 12. There shall be a **mandatory** requirement to use a Jobs Coordinator to be hired directly by the contractor, prior to the start of work on the project. The Jobs Coordinator is an independent third-party individual, entity, or employee with whom the Prime Contractor enters into a contract or employs to facilitate the implementation of the Local and Targeted Worker Hiring Requirements of this Agreement.

(\$ _____)
Fee Amount in figures

(_____)
Amount in words

Name of Jobs Coordinator _____

Address _____

Phone Number & Email _____

SECTION 00 04 00

ATTESTATION OF CONTRACTOR'S QUALIFICATIONS

General Contractor's Firm Name (as shown on bid): _____

As specified in the bidding documents, in order to qualify to bid on this project, the General Contractor must have completed within the last five years, at least two similar projects for a public entity, each with a construction value of at least \$900,000, and including, but not limited to, one or a combination of the following: (1) a new one-story, type III-B,, at least 1,000 square feet Building; (2) a remodeled one-story, type II-B, at least 900 square feet Building; (3) a new, type II-B, at least 1,200 square feet canopy.

The general contractor hereby certifies to the County of Los Angeles that it possesses the qualifying experience.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge.

Executed this _____ day of _____, 2024 at _____
(Month) (City and State)

By: _____
(Signature of owner or officer of the General Contractor)

(Title)

SECTION 00 04 00

ATTESTATION OF CONTRACTOR'S QUALIFICATIONS

The general contractor shall submit verification and justification of its qualifying experience on this County provided form as part of its bid submittal. Failure to submit the information at the time of bid and to meet requirements for qualifying experience may result in a determination by the County that the Bidder is non-responsive and/or not qualified.

The County will determine, in its sole discretion, whether or not the information provided meets the requirements for qualifying experience in order for the general contractor to be considered a qualified bidder for this project.

As specified in the bidding documents, in order to qualify to bid on this project, the General Contractor must have completed within the last five years, at least two similar projects for a public entity, each with a construction value of at least \$900,000, and including, but not limited to, one or a combination of the following:

- (1) a new one-story, type III-B,, at least 1,000 square feet Building;**
- (2) a remodeled one-story, type II-B, at least 900 square feet Building;**
- (3) a new, type II-B, at least 1,200 square feet canopy.**

PROJECT 1:

Select the type of project (must check one box):

- 1. A new one-story, type III-B, at least 1,000 square ft. building
- 2. A remodeled one-story, type II-B, at least 900 square ft. building
- 3. A new, type II-B, at least 1,200 square ft. canopy

Project Name	Total Square Footage	Owner (Public Entity) Contact Name and Address	Owner Phone and Email Address	Final Contract Value (\$900,000 minimum value)	Date Completed (2019-present)
			Phone: Email:		

Project description:

PROJECT 2:

Select the type of project (must check one box):

- 1. A new one-story, type III-B, at least 1,000 square ft. building
- 2. A remodeled one-story, type II-B, at least 900 square ft. building
- 3. A new, type II-B, at least 1,200 square ft. canopy

Project Name	Total Square Footage	Owner Contact Name and Address	Owner Phone and Email Address	Final Contract Value (\$900,000 minimum value)	Date Completed (2019-present)
			Phone: Email:		

Project description:



SECTION 00 04 10
BID BOND

KNOW ALL PERSONS BY THESE PRESENTS:

That we, _____

(Bidder and Address)

as Principal and _____

(Surety and Address)

as Surety, as held and firmly bound unto the County of Los Angeles, hereinafter called the County, in the penal sum of ten percent (10%) of the total amount of the bid of the Principal above named, submitted by said Principal to the County, for the work described below, for the payment of which sum in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION of this obligation of such that:

WHEREAS, the Principal has submitted the above-mentioned Bid to the County, for certain construction specifically described as follows, for which bids are to be opened on _____

_____ for _____
(date of bid opening) (description of work, including location, project name, and project ID as it appears on the bid)

Now, THEREFORE, if the aforesaid Principal is awarded the contract and, within the time and manner required under the bidding or contract documents, after prescribed forms are presented to him for signature, enters into written contract, in the prescribed form, in accordance with the bids, and files the two bonds with the County, one to guarantee faithful performance and the other to guarantee payment for labor and materials, as required by the law, then this obligation shall be null and void; otherwise, it shall be and remain in full force and virtue.

In the event suit is brought upon this bond by the County and judgment is recovered, the Surety shall pay all costs incurred by the County in such suit, including a reasonable attorney's fee to be fixed by the court.

IN WITNESS WHEREOF, we have hereunto set our hands and seals on this _____ day of _____, 20____.

(SEAL) _____
Principal
(SEAL) _____
Signature and Title

Surety

Signature and Title

SECTION 00 04 30

SUBCONTRACTOR LISTING AND SUBCONTRACTING

Prime Contractors shall be governed by the provisions of Sections 4100 to 4113, inclusive, of the Public Contract Code of the State of California and shall set forth in their bids, on forms provided for same, the name and California contractor license number of each Subcontractor who will perform work or labor or render service to the prime Contractor in or about the construction of the work or improvement in amount in excess of one-half (1/2) of one percent (1%) of the prime Contractor's total bid.

Failure by a prime Contractor to specify a Subcontractor for any portion of the work in excess of one-half (1/2) of one percent (1%) of the total bid constitutes an agreement between the prime Contractor and the County that he is fully qualified to perform that portion of the work himself and will perform that portion of the work himself.

No prime Contractor whose bid is accepted shall substitute any person as subcontractor in place of the subcontractor listed, nor shall any subcontract be assigned or transferred except as provided for in the above Sections of the Public Contract Code of the State of California.

Prime Contractors in violation of any of the provisions of Sections 4100 to 4113, inclusive, of the Public Contract Code of the State of California are subject to possible cancellation of contract and monetary penalties as well as disciplinary action by the Contractors' State License Board.

LIST OF SUBCONTRACTORS

The following is a list of the proposed subcontractors to whom I (we) propose to sublet a portion or portions of this work.

<u>NAME</u>	<u>LICENSE NUMBER</u>	<u>LOCATION OF THE PLACE OF BUSINESS</u>	<u>CLASSIFICATION OF WORK TO BE EXECUTED</u>	<u>DIR REGISTRATION NUMBER AND EXPIRATION DATE</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

SECTION 00 04 35

COMMUNITY BUSINESS ENTERPRISES (CBE) PARTICIPATION FORM

Contractors are required to indicate their good faith effort in CBE participation by indicating on this form their proposed involvement on this project. CBEs are Minority/Women/Disadvantaged/Disabled Veteran/Lesbian, Gay, Bisexual, Transgender, Queer, and Questioning owned Business Enterprises (MBE/WBE/DBE/DVBE/LGBTQQ).

LIST OF CBE PARTICIPATION

The following is a list of certified CBE subcontractors or suppliers to whom I (we) propose to sublet or procure a portion or portions of this work.

<u>NAME/ADDRESS</u>	<u>TYPE OF WORK OR PRODUCT</u>	<u>INDICATE MBE/ WBE/DBE/ DVBE/LGBTQQ</u>	<u>PERCENTAGE OF TOTAL CONTRACT VALUE</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

<u>NAME/ADDRESS</u>	<u>TYPE OF WORK OR PRODUCT</u>	<u>INDICATE MBE/ WBE/DBE/ DVBE/LGBTQQ</u>	<u>PERCENTAGE OF TOTAL CONTRACT VALUE</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

SECTION 00 04 38

REQUEST FOR PREFERENCE CONSIDERATION—LOW BID SOLICITATION

INSTRUCTIONS: Bidders requesting preference consideration must complete and include this form in their bid. In order to qualify for preference, firm must be certified by the County of Los Angeles Department of Consumer and Business Affairs (DCBA). Please reference and ATTACH your Certification Letter issued by DCBA to determine Federal/Non-Federal preference eligibility.

PREFERENCE NOT REQUESTED

OR

<input type="checkbox"/> PREFERENCE REQUESTED (SELECT ALL THAT APPLY) Preference	
Program	Reference
<input type="checkbox"/> Request for Local Small Business Enterprise (LSBE) Program Preference <input type="checkbox"/> Certification for Non-Federally Funded County Solicitations <input type="checkbox"/> Certification for Federally Funded County Solicitations	LACC 2.204 PCC 2002

DECLARATION: I DECLARE UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE INFORMATION IS TRUE AND CORRECT.

PRIMARY FIRM NAME: _____

PRINT NAME: _____


TITLE: _____

SIGNATURE: _____

DATE: _____

LOS ANGELES COUNTY COMMUNITY BUSINESS ENTERPRISE (CBE) INFORMATION

TITLE		REFERENCE			
1 FIRM/ORGANIZATION INFORMATION		The information requested below is for statistical purposes only. On final analysis and consideration of award, contractor/vendor will be selected without regard to race/ethnicity, color, religion, sex, national origin, age, sexual orientation or disability.			
Total Number of Employees in California:					
Total Number of Employees (including owners). If the firm has more than one office location, all personnel from all offices must be included:					
Race/Ethnic Composition of Firm. Enter the make-up of Owners/Partners/Associate Partners into the following categories:					
Race/Ethnic Composition	Owners/Partners/ Associate Partners		Percentage of how ownership of the firm is distributed		
	Male	Female	Male	Female	
Black/African American			%	%	
Hispanic/Latino			%	%	
Asian or Pacific Islander			%	%	
Native Americans			%	%	
Subcontinent Asian			%	%	
White			%	%	

TITLE		REFERENCE				
2 CERTIFICATION AS MINORITY, WOMEN, DISADVANTAGED, DISABLED VETERAN, AND LESBIAN, GAY, BISEXUAL, TRANSGENDER, QUEER, AND QUESTIONING-OWNED (LGBTQQ) BUSINESS ENTERPRISE		If your firm is currently certified as a minority, women, disadvantaged, disabled veteran or lesbian, gay, bisexual, transgender, queer, and questioning-owned business enterprise by a public agency, complete the following.				
		 Check if not applicable				
Agency Name	Minority	Women	Disadvantaged	Disabled Veteran	LGBTQQ	

SECTION 00 04 38 A Subconsultant Certification Form

1. Certification as Minority, Women, Disadvantaged, Disabled Veteran, and Lesbian, Gay, Bisexual, Transgender, Queer, and Questioning-Owned Business Enterprises: If any of your subconsultants/subcontractors is currently certified as these certifications by a public agency, complete the following and attach a copy of the proof of certification. Also include County of Los Angeles Local Small Business Enterprise/Social Enterprise/Disabled Veteran Business Enterprise certified subconsultants/subcontractors. All Subcontractors/Subconsultants listed in the bid/proposal shall be listed below. (Make a copy of this form, if necessary).

	Subconsultant Name	Local Small Business Enterprise	Small Business Enterprise	Minority	Women-Owned	Disadvantaged Business	Disabled Veteran Business Enterprise	Social Enterprise	Lesbian, Gay, Bisexual, Transgender, Queer, and Questioning-Owned Business Enterprise
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

2. Declaration: I declare under penalty of perjury under the laws of the State of California that the above information is true and accurate.

Print Name:	Authorized Signature	Title	Date

SECTION 00 04 40
EQUALS

The undersigned desires to use the material, product, thing, or service described below, as "an equal" to such items as specified. In accordance with the General Conditions, Paragraph 2, Sub-paragraph D, the first, second, and third apparent low bidder will have two (2) calendar days after the bid opening to submit their list of equals and ten (10) calendar days after the bid opening to submit all substantiating data and test results. In accordance with Sub-paragraph E, the County, in its sole discretion, shall determine whether the substantiating data demonstrates that "an equal" submittal(s) is equal in all respects to the item specified in the bid documents. If the County determines that "an equal" submittal(s) has not been substantiated to be equal in all respects, the item specified in the bid documents shall be furnished and/or installed by Contractor without modification of the bid amount or contract documents. If the County finds that "an equal" submittal(s) is equivalent to the respective item(s) specified in the bid documents, then the undersigned may furnish such item(s), together with all necessary labor, materials, equipment, and incidentals required to perform and complete the work.

Date _____, 20____

Phone No. _____

Contractor's Name

Contractor's Address

Materials, apparatus, or equipment specified for which Bidder proposes "an equal." (Indicate where specified and page number.)

Complete description of the materials, apparatus, or equipment the Bidder desires to use as "an equal" and name of Subcontractor if different.

1. _____

2. _____

3.

4.

5.

6.

SECTION 00 04 50

NONCOLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER

State of California

ss.

County of

_____, being first duly sworn, deposes and says that he or she is _____ of _____ the party making the foregoing bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the Bidder has not directly or indirectly induced or solicited any other Bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any Bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the Bidder or any other Bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other Bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the Bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____ [date], at _____ [city], _____ [state]."

Signature

Date

SECTION 00 04 60

**ATTESTATION OF WILLINGNESS TO CONSIDER
GAIN/GROW PARTICIPANTS**

As a threshold requirement for consideration for contract award, Bidder/Proposer shall demonstrate a proven record for hiring GAIN/GROW participants or shall attest to a willingness to consider GAIN/GROW participants for any future employment opening if they meet the minimum qualifications for that opening. Additionally, Bidder/Proposer shall attest to a willingness to provide employed GAIN/GROW participants access to the Bidder/Proposer's employee mentoring program, if available, to assist these individuals in obtaining permanent employment and/or promotional opportunities.

To report all job openings with job requirements to obtain qualified GAIN/GROW participants as potential employment candidates, Bidder/Proposer shall email:
GAINGROW@DPSS.LACOUNTY.GOV and BSERVICES@WDACS.LACOUNTY.GOV.

Bidder/Proposers unable to meet this requirement shall not be considered for contract award.

Bidder/Proposer shall complete all of the following information, sign where indicated below, and return this form with their proposal.

A. Bidder/Proposer has a proven record of hiring GAIN/GROW participants.

_____ YES (subject to verification by County) _____ NO

B. Bidder/Proposer is willing to provide DPSS with all job openings and job requirements to consider GAIN/GROW participants for any future employment openings if the GAIN/GROW participant meets the minimum qualifications for the opening. "Consider" means that Proposer is willing to interview qualified GAIN/GROW participants.

_____ YES _____ NO

C. Bidder/Proposer is willing to provide employed GAIN/GROW participants access to its employee-mentoring program, if available.

_____ YES _____ NO _____ N/A (Program not available)

Proposer's Organization: _____

Signature: _____

Print Name: _____

Title: _____ Date: _____

Telephone No: _____ Email: _____

SECTION 00 04 65 3-YEAR CONTRACTING HISTORY

LIST ALL CURRENT AND COMPLETED CONTRACTS WITH THE COUNTY FOR THE PAST THREE YEARS (Begin with the most recent project)

Contract Type/Description _____ Contract Number _____ Type of Work _____ Department _____ Contract Amount _____ Address _____ \$ _____ County Contact Name/Phone _____ / _____ Date of Contract _____ IF CONSTRUCTION Architect Name/Phone _____ / _____ Type of Facility _____	Contract Type/Description _____ Contract Number _____ Type of Work _____ Department _____ Contract Amount _____ Address _____ \$ _____ County Contact Name/Phone _____ / _____ Date of Contract _____ IF CONSTRUCTION Architect Name/Phone _____ / _____ Type of Facility _____
--	--

Contract Type/Description _____ Contract Number _____ Type of Work _____ Department _____ Contract Amount _____ Address _____ \$ _____ County Contact Name/Phone _____ / _____ Date of Contract _____ IF CONSTRUCTION Architect Name/Phone _____ / _____ Type of Facility _____	Contract Type/Description _____ Contract Number _____ Type of Work _____ Department _____ Contract Amount _____ Address _____ \$ _____ County Contact Name/Phone _____ / _____ Date of Contract _____ IF CONSTRUCTION Architect Name/Phone _____ / _____ Type of Facility _____
--	--

Contract Type/Description _____ Contract Number _____ Type of Work _____ Department _____ Contract Amount _____ Address _____ \$ _____ County Contact Name/Phone _____ / _____ Date of Contract _____ IF CONSTRUCTION Architect Name/Phone _____ / _____ Type of Facility _____	Contract Type/Description _____ Contract Number _____ Type of Work _____ Department _____ Contract Amount _____ Address _____ \$ _____ County Contact Name/Phone _____ / _____ Date of Contract _____ IF CONSTRUCTION Architect Name/Phone _____ / _____ Type of Facility _____
--	--

SECTION 00 04 70

FALSE CLAIMS

Bidders/Proposers shall provide either the certification requested below or the information requested on the next page. **Failure to certify or provide the requested information may result in a determination that the Bidder/Proposer is non-responsive. Failure to fully and accurately provide the requested certification or information may result in a determination that the Bidder/Proposer is not responsible.**

“False Claims Act”, as used herein, is defined as either or both the Federal False Claims Act, 31 U.S.C. Sections 3729 et seq., and the California False Claims Act, Government Code Sections 12650 et seq.

FALSE CLAIMS ACT CERTIFICATION

If the Bidder/Proposer has no False Claims Act violations as described above, complete the following:

I, _____, hereby certify that neither
(print name of owner, officer, manager, or licensee responsible for submission of Bid/Proposal)

(Bidder/Proposer name as shown on Bid/Proposal)
nor _____
(name of responsible managing person licensed by Contractors' State License Board)

has been determined by a court or tribunal of competent jurisdiction to have violated the False Claims Act as defined above.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this _____ day _____ at _____
(month and year) (city and state)

by _____
(signature of owner, officer, manager, or licensee responsible for submission of Bid/Proposal)

FALSE CLAIMS ACT VIOLATIONS

With regard to any determinations by a tribunal or court of competent jurisdiction that the False Claims Act, as defined above, has been violated by (1) the Bidder/Proposer submitting this Bid/Proposal, including any person who is an officer of, or in a management position with, or has an ownership interest in the contracting entity which is submitting this Bid/Proposal, or (2) the qualifying person licensed by the State Contractors' License Board to perform the work described in the Bid/Proposal, including any such person when they were an officer, manager, owner, or responsible managing employee of a construction contractor other than the Bidder/Proposer submitting this Bid/Proposal, Bidder/Proposer shall provide on the following page labeled “False Claim Act Violations Information:” (1) the date of the determination of the violation, (2) the identity of tribunal or court and the case name or number, if any, (3) the identity of government contract or project involved, (4) the identity of government agency involved, 5) the amount of fine imposed, and (6) any exculpatory information of which the County should be aware.

FALSE CLAIMS ACT VIOLATIONS INFORMATION

(1) Date of determination of the violation:

(2) Identity of tribunal or court and the case name or number, if any: _____

(3) Government contract or project involved: _____

(4) Government agency involved: _____

(5) Amount of fine imposed: _____

(6) Exculpatory information: _____

Declaration: I declare under penalty of perjury that the above information is true and correct.

Executed this _____ day of _____ at _____
(month and year) (city and state)

by _____
(signature of owner, officer, manager, or licensee responsible for submission of Bid/Proposal)

SECTION 00 04 71
CIVIL LITIGATION HISTORY

Bidder/Proposer shall provide either the certification requested below or information requested on the next page. **Failure to provide such certification or information may result in a determination that the Bidder/Proposer is nonresponsive. Failure to fully and accurately provide the requested certification or information may result in a determination that the Bidder/Proposer is not responsible.**

For the two (2) years preceding the date of submittal of this Bid/Proposal, identify any civil litigation arising out of the performance of a construction contract within the State of California in which the (1) Bidder/Proposer submitting this Bid/Proposal, including any person who is an officer of, or in a management position with, or has an ownership interest in the contracting entity which is submitting this Bid/Proposal, or (2) the qualifying person licensed by the State Contractors' License Board to perform the work described in this Bid/Proposal, including any such person when they were an officer, manager, owner, or responsible managing employee of a construction contractor other than the Bidder/Proposer submitting this Bid/Proposal, was a named plaintiff or defendant in a lawsuit brought by or against the Owner. Do not include litigation which is limited solely to enforcement of mechanics' liens or stop notices. Provide on the following page labeled "Civil Litigation History Information:" (1) the name and court case identification number of each case, (2) the jurisdiction in which it was filed, and (3) the outcome of the litigation, e.g., whether the case is pending, a judgment was entered, a settlement was reached, or the case was dismissed. If a settlement was reached within the two years preceding the date of submittal of this Bid/Proposal, please provide the dollar value of the settled claim(s). The dollar value may be marked as confidential if Bidder/Proposer does not want the settlement information to be public record.

CIVIL LITIGATION CERTIFICATION

If the Bidder/Proposer has no civil litigation history to report as described above, complete the following:

I, _____, hereby certify that neither
(print name of owner, officer, manager, or licensee responsible for submission of Bid/Proposal)

(Bidder/Proposer name as shown on Bid/Proposal)

nor _____
(name of responsible managing person licensed by the Contractors' State License Board)

has been involved in civil litigation as described above.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this _____ day of _____ at _____
(month and year) (city and state)

by _____
(signature of owner, officer, manager, or licensee responsible for submission of Bid/Proposal)

CIVIL LITIGATION HISTORY INFORMATION

(1) Name of Case: _____

Court case identification number: _____

(2) Jurisdiction in which case was filed: _____

(3) Outcome of the case: _____

(1) Name of Case: _____

Court case identification number: _____

(2) Jurisdiction in which case was filed: _____

(3) Outcome of the case: _____

Declaration: I declare under penalty of perjury that the above information is true and correct.

Executed this _____ day of _____ at _____
(month and year) (city and state)

by _____
(signature of owner, officer, manager, or licensee responsible for submission of Bid/Proposal)

SECTION 00 04 72

CRIMINAL CONVICTIONS

Bidder/Proposer shall provide either the certification requested below or information requested on the next page. **Failure to provide such certification or information may result in a determination that the Bidder/Proposer is nonresponsive. Failure to fully and accurately provide the requested certification or information may result in a determination that the Bidder/Proposer is not responsible.**

For the five (5) years preceding the date this Bid/Proposal is due, identify on the following page any criminal conviction in any jurisdiction of the United States for a violation of law arising out of the performance of a construction contract (1) by the Bidder/Proposer submitting this Bid/Proposal, including any person who is an officer of, or in a management position with, or has an ownership interest in the contracting entity which is submitting this Bid/Proposal, or (2) by the qualifying person licensed by the State Contractors' License Board to perform the work described in the Bid/Proposal, including any such person when they were an officer, manager, owner, or responsible managing employee of a construction contractor other than the Bidder/Proposer submitting this Bid/Proposal. Provide on the following page labeled "Criminal Convictions Information:" (1) the date of conviction, (2) the name and court case identification number, (3) the identity of the law violated, (4) the identity of the prosecuting agency, (5) the contract or project involved, (6) the punishment imposed, and (7) any exculpatory information of which the Agency should be aware.

CRIMINAL CONVICTION CERTIFICATION

If the Bidder/Proposer has no criminal convictions to report as described above, complete the following:

I, _____, hereby certify that neither
(print name of owner, officer, manager, or licensee responsible for submission of Bid/Proposal)

(Bidder/Proposer name as shown on Bid/Proposal)

nor _____
(name of responsible managing person licensed by the Contractors' State License Board)

has been convicted of a criminal violation as described above.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this _____ day of _____ at _____
(month and year) (city and state)

by _____
(signature of owner, officer, manager, or licensee responsible for submission of Bid/Proposal)

Criminal Convictions

CRIMINAL CONVICTIONS INFORMATION

(1) Date of conviction: _____

(2) Name of case: _____

Court case identification number: _____

(3) Identity of the law violated: _____

(4) Identity of the prosecuting agency: _____

(5) Contract or project involved: _____

(6) Punishment imposed: _____

(7) Exculpatory information: _____

Declaration: I declare under penalty of perjury that the above information is true and correct.

Executed this _____ day of _____ at _____
(month and year) (city and state)

by _____
(signature of owner, officer, manager, or licensee responsible for submission of Bid/Proposal)

SECTION 00 04 73

DEBARMENTS

Bidder/Proposer shall provide either the certification requested below or the information requested on the next page. **Failure to provide such certification or information may result in a determination that the Bidder/Proposer is nonresponsive. Failure to fully and accurately provide the requested certification or information may result in a determination that the Bidder/Proposer is not responsible.**

For the ten (10) years preceding the date this Bid/Proposal is due, identify on the following page any debarment by any Federal, State, or local public agency arising out of the performance of a construction contract (1) by the Bidder/Proposer submitting this Bid/Proposal, including any person who is an officer of, or in a management position with, or has an ownership interest in the contracting entity which is submitting this Bid/Proposal, or (2) by the qualifying person licensed by the Contractors' State License Board to perform the work described in the Bid/Proposal, including any debarment of any such person when they were an officer, manager, owner, or responsible managing employee of a construction contractor other than the Bidder/Proposer submitting this Bid/Proposal. Provide on the following page labeled "Debarment Information:" (1) the date of debarment and the duration of the debarment, (2) the project name or contract from which the debarment arose, (3) the identify of the debarring agency, (4) stated reason for debarment, and (5) any exculpatory information of which the Agency should be aware.

HISTORY OF DEBARMENT CERTIFICATION

If the Bidder/Proposer has no debarments to report as described above, complete the following:

I, _____, hereby certify that neither
(print name of owner, officer, manager, or licensee responsible for submission of Bid/Proposal)

(Bidder/Proposer name as shown on Bid/Proposal)

nor _____
(name of responsible managing person licensed by Contractors' State License Board)

has been debarred as described above.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this _____ day of _____ at _____
(month and year) (city and state)

by _____
(signature of owner, officer, manager, or licensee responsible for submission of Bid/Proposal)

DEBARMENT INFORMATION

(1) Date and duration of debarment: _____

(2) Project name or contract involved: _____

(3) Debarring agency: _____

(4) Stated reason for debarment: _____

(5) Exculpatory information: _____

Declaration: I declare under penalty of perjury that the above information is true and correct.

Executed this _____ day of _____ at _____
(month and year) (city and state)

by _____
(signature of owner, officer, manager, or licensee responsible for submission of Bid/Proposal)

SECTION 00 04 74

LABOR LAW/PAYROLL VIOLATIONS

Bidder/Proposer shall provide the certification requested below or the information requested on the next page. **Failure to provide such certification or information may result in a determination that the Bidder/Proposer is nonresponsive. Failure to fully and accurately provide the requested certification or information may result in a determination that the Bidder/Proposer is not responsible.**

“Labor law/payroll violation” means for purposes of this disclosure a violation of the Davis-Bacon Act (40 USC section 276a) and/or a violation of California Labor Code sections 1720 through 1861 concerning the payment of prevailing wages, employment of apprentices and hours and working conditions.

For the three (3) years preceding the date this Bid/Proposal is due, identify on the following page any determination made by any Federal, State, or local public agency of a labor law/payroll violation arising out of the performance of a construction contract (1) by the Bidder/Proposer submitting this Bid/Proposal, including any person who is an officer of, or in a management position with, or has an ownership interest in the contracting entity which is submitting this Bid/Proposal, or (2) by the qualifying person licensed by the Contractors’ State License Board to perform the work described in the Bid/Proposal, including any such person when they were an officer, manager, owner, or responsible managing employee of a construction contractor other than the Bidder/Proposer submitting this Bid/Proposal. Provide on the following page labeled “Labor Law/Payroll Violations Information:” (1) the date of the determination of the violation, (2) the case number, if any, or other identifying information for the proceeding, (3) the identity of the government contract or project involved, (4) the identity of the government agency involved, (5) the description of violation, (6) the amount of any civil wage and penalty assessment, and (7) any exculpatory information of which the Agency should be aware.

LABOR LAW/PAYROLL VIOLATION CERTIFICATION

If the Bidder/Proposer has no labor law/payroll violations to report as described above, complete the following:

I, _____, hereby certify that neither
(print name of owner, officer, manager, or licensee responsible for submission of Bid/Proposal)

(Bidder/Proposer name as shown on Bid/Proposal)

nor _____
(name of responsible managing person licensed by Contractors’ State License Board)

has been determined to have violated any Federal, State, or local labor laws as described above.
I declare under penalty of perjury that the foregoing is true and correct.

Executed this _____ day of _____ at _____
(month and year) (city and state)

by _____
(signature of owner, officer, manager, or licensee responsible for submission of Bid/Proposal)

LABOR LAW/PAYROLL VIOLATIONS INFORMATION

(1) Date of violation determination: _____

(2) Case number: _____

(3) Government contract or project involved: _____

(4) Government agency involved: _____

(5) Description of the violation (attach disposition letter): _____

(6) Amount of any civil wage and penalty assessment: _____

(7) Exculpatory information: _____

Declaration: I declare under penalty of perjury that the above information is true and correct.

Executed this _____ day of _____ at _____
(month and year) (city and state)

by _____
(signature of owner, officer, manager, or licensee responsible for submission of Bid/Proposal)

SECTION 00 04 75

INTEGRATED PEST MANAGEMENT PROGRAM COMPLIANCE CERTIFICATION

Company Name:		
Company Address:		
City:	State:	Zip Code:
Telephone Number:	Email address:	
Solicitation/Contract for	Services	

PROPOSER CERTIFICATION

The County of Los Angeles is a permittee to a National Pollutant Discharge Elimination System Permit (NPDES Permit) issued by the Los Angeles Regional Water Quality Control Board to reduce or eliminate pollutants moved into surface water through storm water management systems and facilities. One of the conditions of the NPDES Permit is the Integrated Pest Management Program (IPM Program) which was developed to reduce the impact of pesticides and fertilizers to surface water. Among other things, the IPM Program imposes requirements to County Purchasing and Contracting, which are outlined in Integrated Pest Management Program Compliance of the proposed Contract. The entire Countywide IPM Program is available at www.lacountyipm.org

Proposer acknowledges and certifies compliance with Integrated Pest Management Program Compliance of the proposed Contract and agrees that proposer or a member of its staff performing work under the proposed Contract will be in compliance, **when applicable**. Proposer further acknowledges that noncompliance with the County's IPM Program may result in rejection of any proposal, or cancellation of any resultant Contract, at the sole judgment of the County.

I declare under penalty of perjury under the laws of the State of California that the information herein is true and correct and that I am authorized to represent this company.

Print Name:	Title:
Signature:	Date:

SECTION 00 04 76
CHARITABLE CONTRIBUTIONS CERTIFICATION

Company Name

Address

Internal Revenue Service Employer Identification Number

California Registry of Charitable Trusts "CT" number (if applicable)

The Nonprofit Integrity Act (SB 1262, Chapter 919) added requirements to California's Supervision of Trustees and Fundraisers for Charitable Purposes Act which regulates those receiving and raising charitable contributions.

Check the Certification below that is applicable to your company.

Proposer or Contractor has examined its activities and determined that it does not now receive or raise charitable contributions regulated under California's Supervision of Trustees and Fundraisers for Charitable Purposes Act. If Proposer engages in activities subjecting it to those laws during the term of a County contract, it will timely comply with them and provide County a copy of its initial registration with the California State Attorney General's Registry of Charitable Trusts when filed.

OR

Proposer or Contractor is registered with the California Registry of Charitable Trusts under the CT number listed above and is in compliance with its registration and reporting requirements under California law. Attached is a copy of its most recent filing with the Registry of Charitable Trusts as required by Title 11 California Code of Regulations, sections 300-301 and Government Code sections 12585-12586.

Signature

Date

Please Print Name and Title of Signer

PROSPECTIVE CONTRACTOR LIST OF TERMINATED CONTRACTS

Contractor's Name: _____

Proposer must list all contracts that have been terminated within the past three years. Terminated contracts are those contracts terminated by an agency or firm before the contract's expiration date. Any and all terminated contracts should be accompanied with "Reason for termination". It should be noted that contracts that naturally expired need not be listed. The County is only seeking information on contracts that were terminated prior to expiration.

1. Name of Firm	Address of Firm	Contact Person	Telephone # ()	Email
Name or Contract No.		Reason for Termination:		
2. Name of Firm	Address of Firm	Contact Person	Telephone # ()	Email
Name or Contract No.		Reason for Termination:		
3. Name of Firm	Address of Firm	Contact Person	Telephone # ()	Email
Name or Contract No.		Reason for Termination:		
4. Name of Firm	Address of Firm	Contact Person	Telephone # ()	Email
Name or Contract No.		Reason for Termination:		

**SECTION 00 04 78
SB 1439 QUESTIONNAIRE**

Proposers/Subconsultants/Subcontractors are all required to complete the SB 1439 Questionnaire.

If a question is not applicable, enter "N/A."

<p><i>PARTIES</i></p> <p><u>All</u> applicants, bidders, or proposers for a license/permit/franchise or other entitlement for use.</p>	<p>Individual/Company Name:</p> <p>Prime or subcontractor?</p> <p>Parent?</p> <p>Subsidiaries</p> <p>Related Business Entities?</p> <p>Any other entities directed or controlled by the individual or company?</p> <p>Name of party who signs an agreement:</p>
<p><i>PARTIES' AGENTS</i></p> <p>List all agents paid by <u>each</u> applicant or bidder for license/permit/franchise, or other entitlement for use.</p>	<p>Name:</p> <p>Company name (if any):</p> <p>Name:</p> <p>Company name (if any):</p>
<p><i>PARTICIPANTS</i></p> <p>List all individuals and/or businesses who contacted your Department to oppose or support the application with a financial interest in the decision.</p>	<p>Individual/Company Name:</p> <p>Prime or subcontractor?</p> <p>Parent?</p> <p>Subsidiaries?</p> <p>Related Business Entities?</p> <p>Any other entities directed or controlled by the individual or company?</p>
<p><i>PARTICIPANTS' AGENTS</i></p> <p>List all agents paid by <u>each</u> participant who contacted your Department opposed or supported the application who has a financial interest in the decision.</p>	<p>Name:</p> <p>Company name (if any):</p>
<p><i>CONTRIBUTIONS</i></p> <p>Did any party, participant or their agents to this agenda item disclose they made a campaign contribution of \$250 or more to a decision-maker during the permit, licensing, leasing or approval process <i>on or after Jan. 1, 2023?</i></p>	<p>Date of contribution:</p> <p>Name of Contributor:</p> <p>Recipient Name:</p> <p>Amount:</p>

**SECTION 00 04 78
SB 1439 QUESTIONNAIRE**

It is Proposers'/Subconsultants'/Subcontractors' sole responsibility to inform Public Works immediately of any changes in the submitted information after submission.

Proposers/Subconsultants/Subcontractors declare under penalty of perjury that the information stated in this form is true and accurate.

I declare under penalty of perjury under the laws of the State of California that the information herein is true and correct and that I am authorized to represent this company.

Print Name:	Title:
Signature:	Date:

REQUIRED FORM
CONTRIBUTION AND AGENT DECLARATION FORM

This form must be completed separately by all bidders/proposers, including all prime contractors and subcontractors, and by all applicants for licenses, permits, and other entitlements for use issued by the County of Los Angeles ("County").

Pursuant to the Levine Act (Government Code section 84308), a member of the Board of Supervisors, other elected County officials (the Sheriff, Assessor, and the District Attorney), and other County employees and/or officers ("County Officers") are disqualified and not able to participate in a proceeding involving contracts, franchises, licenses, permits and other entitlements for use if the County Officer received more than \$250 in contributions in the past 12 months from the bidder, proposer or applicant, any paid agent of the bidder, proposer, or applicant, or any financially interested participant who actively supports or opposes a particular decision in the proceeding.

State law requires you to disclose information about contributions made by you, your company, and lobbyists and agents paid to represent you. Failure to complete the form in its entirety may result in significant delays in the processing of your application and potential disqualification from the procurement or application process.

You must fully answer the applicable questions below. You ("Declarant"), or your company, if applicable, including all entities identified below (collectively, "Declarant Company") must also answer the questions below. The term "employee(s)" shall be defined as employees, officers, partners, owners, or directors of Declarant Company.

An affirmative response to any questions will not automatically cause the disqualification of your bid/proposal, or the denial of your application for a license, permit or other entitlement. However, failure to answer questions completely, in good faith, or providing materially false answers may subject a bidder/proposer to disqualification from the procurement.

This material is intended for use by bidders/proposers, including all prime contractors and subcontractors, and by all applicants for licenses, permits, and other entitlements for use issued by the County of Los Angeles and does not constitute legal advice. If you have questions about the Levine Act and how it applies to you, you should call your lawyer or contact the Fair Political Practices Commission for further guidance.

REQUIRED FORM
CONTRIBUTION AND AGENT DECLARATION FORM

Complete each section below. State "none" if applicable.

A. **COMPANY OR APPLICANT INFORMATION**

1) Declarant Company or Applicant Name:

- a) If applicable, identify all subcontractors that have been or will be named in your bid or proposal:
- b) If applicable, variations and acronyms of Declarant Company's name used within the past 12 months:
- c) Identify all entities or individuals who have the authority to make decisions for you or Declarant Company about making contributions to a County Officer, regardless of whether you or Declarant Company have actually made a contribution:

[IF A COMPANY, ANSWER QUESTIONS 2 - 3]

- 2) Identify only the Parent(s), Subsidiaries and Related Business Entities that Declarant Company has controlled or directed, or been controlled or directed by. "Controlled or directed" means shared ownership, 50% or greater ownership, or shared management and control between the entities.
 - a) Parent(s):
 - b) Subsidiaries:
 - c) Related Business Entities:
- 3) If Declarant Company is a closed corporation (non-public, with under 35 shareholders), identify the majority shareholder.
- 4) Identify all entities (proprietorships, firms, partnerships, joint ventures, syndicates, business trusts, companies, corporations, limited liability companies, associations, committees, and any other organization or group of persons acting in concert) whose contributions you or Declarant Company have the authority to direct or control.

REQUIRED FORM
CONTRIBUTION AND AGENT DECLARATION FORM

- 5) Identify any individuals such as employees, agents, attorneys, law firms, lobbyists, and lobbying firms who are or who will act on behalf of you or Declarant Company and who will receive compensation to communicate with a County Officer regarding the award or approval of **this** contract or project, license, permit, or other entitlement for use.

*(Do **not** list individuals and/or firms who, as part of their profession, either (1) submit to the County drawings or submissions of an architectural, engineering, or similar nature, **or** (2) provide purely technical data or analysis, **and** who will not have any other type of communication with a County agency, employee, or officer.)*

- 6) If you or Declarant Company are a 501(c)(3) non-profit organization, identify the compensated officers of your organization and the compensated members of your board.

B. CONTRIBUTIONS

- 1) Have you or the Declarant Company solicited or directed your employee(s) or agent(s) to make contributions, whether through fundraising events, communications, or any other means, to a County Officer in the past 12 months? If so, provide details of each occurrence, including the date.

Date (contribution solicited, or directed)	Recipient Name (elected official)	Amount

*Please attach an additional page, if necessary.

- 2) Disclose all contributions made by you or any of the entities and individuals identified in Section A to a County officer in the past 12 months.

Date (contribution made)	Name (of the contributor)	Recipient Name (elected official)	Amount

*Please attach an additional page, if necessary.

REQUIRED FORM

CONTRIBUTION AND AGENT DECLARATION FORM

C. DECLARATION

By signing this Contribution and Agent Declaration form, you (Declarant), or you and the Declarant Company, if applicable, attest that you have read the entirety of the Contribution Declaration and the statements made herein are true and correct to the best of your knowledge and belief. (Only complete the one section that applies.)

There are _____ additional pages attached to this Contribution Declaration Form.

COMPANY BIDDERS OR APPLICANTS

I, _____ (Authorized Representative), on behalf of _____ (Declarant Company), at which I am employed as _____ (Title), attest that after having made or caused to be made a reasonably diligent investigation regarding the Declarant Company, the foregoing responses, and the explanation on the attached page(s), if any, are correct to the best of my knowledge and belief. Further, I understand that failure to answer the questions in good faith or providing materially false answers may subject Declarant Company to consequences, including disqualification of its bid/proposal or delays in the processing of the requested contract, license, permit, or other entitlement.

IMPORTANT NOTICE REGARDING FUTURE AGENTS AND FUTURE CONTRIBUTIONS:

By signing this Contribution and Agent Declaration form, you also agree that, if Declarant Company hires an agent, such as, but not limited to, an attorney or lobbyist during the course of these proceedings and will compensate them for communicating with the County about this contract, project, permit, license, or other entitlement for use, you agree to inform the County of the identity of the agent or lobbyist and the date of their hire. You also agree to disclose to the County any future contributions made to members of the County Board of Supervisors, another elected County officer (the Sheriff, Assessor, and the District Attorney), or any other County officer or employee by the Declarant Company, or, if applicable, any of the Declarant Company's proposed subcontractors, agents, lobbyists, and employees who have communicated or will communicate with the County about this contract, license, permit, or other entitlement after the date of signing this disclosure form, and within 12 months following the approval, renewal, or extension of the requested contract, license, permit, or entitlement for use.

Signature

Date

REQUIRED FORM

CONTRIBUTION AND AGENT DECLARATION FORM

INDIVIDUAL BIDDERS OR APPLICANTS

I, _____, declare that the foregoing responses and the explanation on the attached sheet(s), if any, are correct to the best of my knowledge and belief. Further, I understand that failure to answer the questions in good faith or providing materially false answers may subject me to consequences, including disqualification of my bid/proposal or delays in the processing of the requested license, permit, or other entitlement.

IMPORTANT NOTICE REGARDING FUTURE AGENTS AND FUTURE CONTRIBUTIONS:

If I hire an agent or lobbyist during the course of these proceedings and will compensate them for communicating with the County about this contract, project, permit, license, or other entitlement for use, I agree to inform the County of the identity of the agent or lobbyist and the date of their hire. I also agree to disclose to the County any future contributions made to members of the County Board of Supervisors, another elected County official (the Sheriff, Assessor, and the District Attorney), or any other County officer or employee by me, or an agent such as, but not limited to, a lobbyist or attorney representing me, that are made after the date of signing this disclosure form, and within 12 months following the approval, renewal, or extension of the requested contract, license, permit, or entitlement for use.

Signature

Date

SECTION 00 04 85
COUNTY OF LOS ANGELES CONTRACTOR EMPLOYEE JURY SERVICE PROGRAM
APPLICATION FOR EXCEPTION AND CERTIFICATION FORM

The County's solicitation for this contract/purchase order (Request for Proposal or Invitation for Bid) is subject to the County of Los Angeles Contractor Employee Jury Service Program (Program), Los Angeles County Code, Chapter 2.203. All bidders or proposers, whether a contractor or subcontractor, must complete this form to either: 1) request an exception from the Program requirements; or 2) certify compliance. Upon review of the submitted form, the County department will determine, in its sole discretion, whether the bidder or proposer is exempted from the Program.

Company Name:		
Company Address:		
City:	State:	Zip Code:
Telephone Number:		
Solicitation For (Type of Goods or Services):		

If you believe the Jury Service Program does not apply to your business, check the appropriate box in Part I (attach documentation to support your claim); or, complete Part II to certify compliance with the Program. Whether you complete Part I or II, please sign and date this form below.

Part I: Jury Service Program is not Applicable to my Business

- My business does not meet the definition of "contractor," as defined in the Program as it has not received an aggregate sum of \$50,000 or more in any 12-month period under one or more County contracts or subcontracts (this exception is not available if the contract/purchase order itself will exceed \$50,000). I understand that the exception will be lost and I must comply with the Program if my revenues from the County exceed an aggregate sum of \$50,000 in any 12-month period.
- My business is a small business as defined in the Program. It: 1) has ten or fewer employees; and, 2) has annual gross revenues in the preceding 12 months which, if added to the annual amount of this contract, are \$500,000 or less; and 3) is not an affiliate or subsidiary of a business dominant in its field of operation as defined below. I understand that the exemption will be lost and I must comply with the Program if the number of employees in my business and my gross annual revenues exceed the above limits.

"Dominant in its field of operation" means having more than ten employees, including full-time and part-time employees, and annual gross revenues in the preceding 12 months, which, if added to the annual amount of the contract awarded, exceed \$500,000.

"Affiliate or subsidiary of a business dominant in its field of operation" means a business which is at least 20 percent owned by a business dominant in its field of operation, or by partners, officers, directors, majority stockholders, or their equivalent of a business dominant in that field of operation.

- My business is subject to a Collective Bargaining Agreement (attach agreement) that expressly provides that it supersedes all provisions of the Program.

OR

Part II: Certification of Compliance

- My business has and adheres to a written policy that provides, on an annual basis, no less than five days of regular pay for actual jury service for full-time employees of the business who are also California residents, **or** my company will have and adhere to such a policy prior to award of the contract.

I declare under penalty of perjury under the laws of the State of California that the information stated above is true and correct.

Print Name:	Title:
Signature:	Date:

To be submitted with each Bid for a contract

Project Identification _____

Bid Date _____

This information must include all construction work undertaken in the State of California by the Bidder and any partnership, joint venture, or corporation that any principal of the Bidder participated in as a principal or owner for the last five calendar years and the current calendar year prior to the date of Bid submittal. Separate information shall be submitted for each particular partnership, joint venture, corporate, or individual Bidder. The Bidder may attach any additional information or explanation of data which he would like taken into consideration in evaluating the safety record. An explanation must be attached of the circumstances surrounding any and all fatalities.

SECTION 00 04 90
CONTRACTOR'S INDUSTRIAL SAFETY RECORD
5-Calendar Years Prior to Current Year

	2019	2020	2021	2022	2023	TOTAL	CURRENT YEAR (2024)
1. No. of Contracts							
2. Total dollar amount of contracts (in thousands of dollars)							
*3. No. of fatalities							
*4. No. of lost workdays due to injuries							
*5. No. of days of restricted work activity due to injuries							
*6. Injuries without lost workdays							

*The information required for these items is the same as required for columns 1, 4, 5, and 6, Log and Summary of Occupational Injuries and Illnesses, CAL/OSHA Form 200.

The above information was compiled from the records that are available to me at this time and I declare under penalty of perjury that the information is true and accurate within the limitations of those records.

Name of Bidder (Print)

Signature

Address

Contractors' State License No. & Classification

City

Telephone

SECTION 00 04 91

INJURY AND ILLNESS PREVENTION PLAN (IIPP)
AND CODE OF SAFE PRACTICES (CSP) AFFIDAVIT

The apparent low Bidder shall submit this form to the County which states that the Bidder has an IIPP which complies with Cal/OSHA Regulations and CSP, that all subcontractors supplying employees to the jobsite will be required to prove to the Contractor that they have an IIPP which complies with Cal/OSHA Regulations and a CSP, and that their jobsite employees have been trained on IIPP and CSP.

Failure to submit this affidavit as required may result in a determination that the successful Bidder is nonresponsive and/or nonresponsible.

I, _____, hereby certify to the County

of Los Angeles on behalf of _____
the following:

1. The Contractor identified above has an injury and illness Prevention Plan (IIPP) and a Code of Safe Practices (CSP) which comply with Cal/OSHA Regulations.
2. The employees of the Contractor identified above who will be assigned to the jobsite have been trained on the IIPP and CSP.
3. All subcontractors supplying employees to the jobsite will be required to prove to the Contractor that they have an IIPP and a CSP which comply with Cal/OSHA Regulations and their jobsite employees have been trained on the IIPP and CSP.

I declare under penalty of perjury under the law of the State of California that the foregoing is true and correct.

Executed this _____ day of _____
(month and year)

at _____

By _____

SECTION 00 04 92

BIDDER'S ORGANIZATION QUESTIONNAIRE/AFFIDAVIT

Please complete, date and sign this form and place it in your Bid. The person signing the form must be authorized to sign on behalf of the Bidder and to bind the applicant in a Contract.

1. If your firm is a corporation, state its legal name (as found in your Articles of Incorporation) and State of Incorporation:

_____	_____	_____
Name	State	Year Inc.

2. If your firm is a partnership or a sole proprietorship, state the name of the proprietor or managing partner:

3. If your firm is doing business under one or more DBA's, please list all DBA's and the County(ies) of registration:

Name	County of Registration	Year Became DBA
_____	_____	_____
_____	_____	_____

4. Is your firm wholly or majority owned by, or a subsidiary of, another firm: _____ if yes,
Name of parent firm: _____
State of incorporation or registration of parent firm: _____

5. Please list any other names your firm has done business as within the last five (5) years.

Name	Year of Name Change
_____	_____
_____	_____

6. Indicate if your firm is involved in any pending acquisition/merger, including the associated company name. If not applicable, so indicate below.

Bidder acknowledges that if any false, misleading, incomplete, or deceptively unresponsive statements in connection with this Bid are made, the Bidder may be rejected. The evaluation and determination in this area shall be at the Director's sole judgment and his/her judgment shall be final:

Bidder's Name

Address:

e-mail address: _____ Telephone number: _____

Fax number: _____

On behalf of _____ (Bidder's name), I _____
(Name of Bidder's authorized representative), certify that the information contained in this Bidder's Organization Questionnaire/Affidavit is true and correct to the best of my information and belief.

Signature

Internal Revenue Service
Employer Identification Number

Title

California Business License Number

Date

County WebVen Number

SECTION 00 04 93

**CERTIFICATION OF COMPLIANCE WITH THE COUNTY'S
DEFAULTED PROPERTY TAX REDUCTION PROGRAM**

Company Name:		
Company Address:		
City:	State:	Zip Code:
Telephone Number:	Email address:	
Solicitation/Contract For _____	Services:	

The Proposer/Bidder/Contractor certifies that:

- It is familiar with the terms of the County of Los Angeles Defaulted Property Tax Reduction Program, Los Angeles County Code Chapter 2.206; **AND**

To the best of its knowledge, after a reasonable inquiry, the Proposer/Bidder/Contractor is not in default, as that term is defined in Los Angeles County Code Section 2.206.020.E, on any Los Angeles County property tax obligation; **AND**

The Proposer/Bidder/Contractor agrees to comply with the County's Defaulted Property Tax Reduction Program during the term of any awarded contract.

- OR -

-
- I am exempt from the County of Los Angeles Defaulted Property Tax Reduction Program, pursuant to Los Angeles County Code Section 2.206.060, for the following reasons:

I declare under penalty of perjury under the laws of the State of California that the information stated above is true and correct.

Print Name:	Title:
Signature:	Date:

SECTION 00 04 94

AVOIDANCE OF CONFLICT OF INTEREST

The Los Angeles County Code, Section 2.180.010, provides as follows:

CONTRACTS PROHIBITED

Notwithstanding any other section of this Code, the County shall not contract with, and shall reject any proposals submitted by, the persons or entities specified below, unless the Board of Supervisors finds that special circumstances exist which justify the approval of such contract:

1. Employees of the County or of public agencies for which the Board of Supervisors is the governing body;
2. Profit-making firms or businesses in which employees described in number 1 serve as officers, principals, partners, or major shareholders;
3. Persons who, within the immediately preceding 12 months, came within the provisions of number 1, and who:
 - a. Were employed in positions of substantial responsibility in the area of service to be performed by the contract; or
 - b. Participated in any way in developing the contract or its service specifications; and
4. Profit-making firms or businesses in which the former employees, described in number 3, serve as officers, principals, partners, or major shareholders.

Contracts submitted to the Board of Supervisors for approval or ratification shall be accompanied by an assurance by the department submitting, district or agency that the provisions of this section have not been violated.

Proposer Name (please print)

Proposer's Official Title (please print)

Proposer's Signature

SECTION 00 04 95
FAMILIARITY WITH THE COUNTY LOBBYIST ORDINANCE
CERTIFICATION

The Proposer certifies that it is familiar with the terms of the County of Los Angeles Lobbyist Ordinance, Los Angeles Code Chapter 2.160. The Proposer also certifies that all persons acting on behalf of the Proposer organization have and will comply with it during the proposal process.

Signature: _____

Date: _____

SECTION 00 04 96

PROPOSER'S EEO CERTIFICATION

Company Name

Address

Internal Revenue Service Employer Identification Number

GENERAL

In accordance with provisions of the County Code of the County of Los Angeles, the Proposer certifies and agrees that all persons employed by such firm, its affiliates, subsidiaries, or holding companies are and will be treated equally by the firm without regard to or because of race, religion, ancestry, national origin, or sex and in compliance with all anti-discrimination laws of the United States of America and the State of California.

CERTIFICATION	YES	NO
1. Proposer has written policy statement prohibiting discrimination in all phases of employment.	()	()
2. Proposer periodically conducts a self-analysis or utilization analysis of its work force.	()	()
3. Proposer has a system for determining if its employment practices are discriminatory against protected groups.	()	()
4. When problem areas are identified in employment practices, Proposer has a system for taking reasonable corrective action to include establishment of goal and/or timetables.	()	()

Signature

Date

Name and Official Title (please print)

SECTION 00 04 97
COMPLIANCE WITH FAIR CHANCE EMPLOYMENT
HIRING PRACTICES CERTIFICATION

Company Name:		
Company Address:		
City:	State:	Zip Code:
Telephone Number:	Email address:	
Solicitation/Contract for _____ Services		

PROPOSER/CONTRACTOR CERTIFICATION

The Los Angeles County Board of Supervisors approved a Fair Chance Employment Policy in an effort to remove job barriers for individuals with criminal records. The policy requires businesses that contract with the County to comply with fair chance employment hiring practices set forth in California Government Code Section 12952, Employment Discrimination: Conviction History (California Government Code Section 12952), effective January 1, 2018.

Proposer/Contractor acknowledges and certifies compliance with fair chance employment hiring practices set forth in California Government Code Section 12952 and agrees that Proposer/Contractor and staff performing work under the Contract will be in compliance. Proposer/Contractor further acknowledges that noncompliance with fair chance employment practices set forth in California Government Code Section 12952 may result in rejection of any proposal, or termination of any resultant Contract, at the sole judgment of the County.

I declare under penalty of perjury under the laws of the State of California that the information herein is true and correct and that I am authorized to represent this company.

Print Name:	Title:
Signature:	Date:

SECTION 00 04 98

**ZERO TOLERANCE HUMAN TRAFFICKING
POLICY CERTIFICATION**

Company Name:		
Company Address:		
City:	State:	Zip Code:
Telephone Number:	Email address:	
Solicitation/Contract for _____ Services		

PROPOSER CERTIFICATION

Los Angeles County has taken significant steps to protect victims of human trafficking by establishing a zero tolerance human trafficking policy that prohibits contractors found to have engaged in human trafficking from receiving contract awards or performing services under a County contract.

Proposer acknowledges and certifies compliance with (Compliance with County's Zero Tolerance Human Trafficking Policy) of the proposed Contract and agrees that proposer or a member of his staff performing work under the proposed Contract will be in compliance. Proposer further acknowledges that noncompliance with the County's Zero Tolerance Human Trafficking Policy may result in rejection of any proposal, or cancellation of any resultant Contract, at the sole judgment of the County.

I declare under penalty of perjury under the laws of the State of California that the information herein is true and correct and that I am authorized to represent this company.

Print Name:	Title:
Signature:	Date:

SECTION 00 04 99

DISALLOWED COST ATTESTATION

Company Name:		
Company Address:		
City:	State:	Zip Code:
Telephone Number:	Email address:	
Solicitation/Contract for _____ Services		

PROPOSER ATTESTATION

If Proposer's compliance with a County contract has been reviewed by the Department of the Auditor-Controller within the last 10 years, Proposer must not have unresolved questioned costs identified by the Auditor-Controller, in an amount over \$100,000.00, that are confirmed to be disallowed costs by the contracting County department, and remain unpaid for six months or more from the date of disallowance, unless such disallowed costs are the subject of current good faith negotiations to resolve the disallowed costs, in the opinion of the County.

Proposer acknowledges and certifies compliance with the above paragraph.

I declare under penalty of perjury under the laws of the State of California that the information herein is true and correct and that I am authorized to represent this company.

Print Name:	Title:
Signature:	Date:

SECTION 00 05 00

AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____ 2XXX,
by and between the COUNTY OF LOS ANGELES, State of California (hereinafter called
the County), and

CONTRACTOR
A California Corporation
ADDRESS
CITY, STATE, ZIP
TELEPHONE

(hereinafter called the Contractor),

WITNESSETH:

1. Contractor's Services

That the Contractor, in consideration of the promises of the County hereinafter set forth, hereby agrees to furnish all tools, equipment, labor, and material necessary to perform and complete in a good and workmanlike manner,

PROJECT NAME
ADDRESS
SPECS NO.

within the time and in accordance with the recommendation of the Director of the Los Angeles County Public Works, dated month-day, 2XXX, Plans and Specifications Number, the Notice Inviting Bids, Notice to Bidders A, etc. (if any), and the lump sum bid of the Contractor, including Additive Alternates 1, all of which are incorporated herein as though fully set forth, and are hereby agreed by the parties to constitute the Contract documents.

2. Consideration

That the County agrees, in consideration of the performance of this Contract, to pay to the Contractor, and the Contractor agrees to accept in full satisfaction for the work done hereunder, a sum of amount in words Dollars (\$ amount: base bid amount minus schedule fee minus extended overhead and minus unit, if applicable) which sum shall be paid to the Contractor at the time and in the manner set forth in the specifications.

3. Extended Overhead Daily Rate

The Contractor's Extended Overhead Daily Rate is \$XXX, as set forth in the Contractor's Form of Bid, Section 00 03 00, which Extended Overhead Daily Rate shall be payable to the Contractor for each day of Compensable Delay to fully compensate the Contractor for any damages resulting from or associated with Compensable Delay, including, but not limited to, home office and field office overhead, as specified in Specification Section 00 01 00, Instructions to Bidders, 1.14c and in accordance with Specification Section 00 07 00, General Conditions, Article 17, Time Extensions and Compensation for Delay.

4. Notice to Employees Regarding the Federal Earned Income Credit

Contractor shall notify its employees, and shall require each subcontractor to notify its employees, that they may be eligible for the Federal Earned Income Credit under the Federal income tax laws. Such notice shall be provided in accordance with the requirement set forth in Internal Revenue Service Notice 1015.

5. County Rights

The County may employ, either during or after performance of this Contract, any right of recovery the County may have against the Contractor by any means it deems appropriate including, but not limited to, set-off, action at law or in equity, withholding, recoupment, or counterclaim. The rights and remedies of the County under this Contract are in addition to any right or remedy provided by California law.

6. Fair Labor Standards Act

Contractor shall comply with all applicable provisions of the Federal Fair Labor Standards Act, and shall indemnify, defend, and hold harmless County, its agents, officers, and employees from any and all liability including, but not limited to, wages, overtime pay, liquidated damages, penalties, court costs, and attorneys' fees arising under any wage and hour law including, but not limited to, the Federal Fair Labor Standards Act for services performed by Contractor's employees for which County may be found jointly or solely liable.

7. Prevailing Wage Requirements

a. Prevailing Wages

The services provided in this Contract constitute "public works" as defined in California Labor Code 1720, and are therefore subject to payment of prevailing wages, compliance monitoring and enforcement by the Department of Industrial Relations (DIR).

The Director of the DIR has established the general prevailing rate of per diem wages for each craft, classification, type of worker, or mechanic needed to execute public works and improvements. The current general prevailing wage rate determinations are available at www.dir.ca.gov/dlsr/pwd/index.htm. The Contractor is required to pay its agents and employees the applicable, current prevailing wage rate and is responsible for selecting the classification of workers required to perform this service.

The Contractor agrees to comply with the provisions of Section 1775 of the California Labor Code relating to the payment of prevailing wages, the utilization of apprentices in accordance to LC 1777.5, and the assessment of penalties determined by the California Labor Commissioner. Pursuant to Section 1773.2 of the California Labor Code, copies of the prevailing rate of per diem wages are on file at the Los Angeles County Public Works, Construction Division, and will be made available for inspection by request to the Contract Analyst. Future effective wage rates will be on file with the Department of Industrial Relations. The new wage rates shall become effective on the day following the expiration date of the current determinations and apply to the Contract in the same manner as if they had been included or referenced in the Contract.

b. Work Records

The Contractor shall comply with the requirements of Section 1812 of the Labor Code. The Contractor shall maintain an accurate written record of all employees working on the project each calendar day. The record shall include each employee's name, Social Security number, job classification, and the actual number of hours worked.

c. Posting of Notices

The Contractor shall comply with the provisions of Section 1773.2 of the Labor Code. The Contractor shall post a copy of the prevailing wage rates at the worksite and comply with applicable law including posting of jobsite notices required by 8 California Code Reg. §16451(d):

“This public works project is subject to monitoring and investigative activities by the Compliance Monitoring Unit (CMU) of the Division of Labor Standards Enforcement, Department of Industrial Relations, State of California. This Notice is intended to provide information to all workers employed in the execution of the Contract for public work and to all contractors and other persons having access to the jobsite to enable the CMU to ensure compliance with and enforcement of prevailing wage laws on public works projects.

The prevailing wage laws require that all workers be paid at least the minimum hourly wage as determined by the Director of Industrial Relations for the specific classification (or type of work) performed by workers on the project. These rates are listed on a separate jobsite posting of minimum prevailing rates required to be maintained by the public entity, which awarded the public works Contract. Complaints concerning nonpayment of the required minimum wage rates to workers on this project may be filed with the CMU at any office of the Division of Labor Standards Enforcement (DLSE).

Local Office Telephone Number:

*Division of Labor Standards Enforcement Office
320 West Fourth Street, Suite 450
Los Angeles, CA 90013
(213) 620-6330*

Complaints should be filed in writing immediately upon discovery of any violations of the prevailing wage laws due to the short period of time following the completion of the project that the CMU may take legal action against those responsible.

Complaints should contain details about the violations alleged (for example, wrong rate paid, not all hours paid, overtime rate not paid for hours worked in excess of 8 hours per day or 40 hours per week, etc.) as well as the name of the employer, the public entity which awarded the public works Contract, and the location and name of the project.

For general information concerning the prevailing wage laws and how to file a complaint concerning any violation of these prevailing wage laws, you may contact any DLSE office. Complaint forms are also available at the Department of Industrial Relations website found at <http://www.dir.ca.gov/Public-Works/PublicWorks.html>.”

d. Certified Payroll Records

The Contractor shall comply with the requirements of Section 1776 of the Labor Code. Contractor and Subcontractors, if any, must furnish certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement) in a format prescribed by the Labor Commissioner.

- e. When requested by the County, electronic certified payroll records must be submitted to the County, through an online system designated by the County.

8. Mental Health Services for Critical Incidents

In the event of a serious accident on the Project site, the Los Angeles County

Department of Mental Health (DMH) will, if requested, respond. The response may be within a few hours or as long as a few days after the incident, depending on when the request was made. The services DMH will provide include crisis intervention, normalization of the stress response that survivors may be experiencing, stress management techniques and resources if the stress reactions increase in frequency or intensity. Requests for services may be made by calling the DMH Emergency Outreach Bureau Deputy Director, (213) 738-4924, during normal business hours or the ACCESS Center, (800) 854-7771, evenings, holidays, and weekends.

9. Employment Eligibility Verification

Contractor warrants that it fully complies with all Federal statutes and regulations regarding employment of aliens and others, and that all its employees performing services hereunder meet the citizenship or alien status requirements contained in Federal statutes and regulations. Contractor shall obtain, from all covered employees performing services hereunder, all verifications and other documentation of employment eligibility status required by Federal statutes and regulations as they currently exist and as they may be hereafter amended. Contractor shall retain such documentation for all covered employees for the period prescribed by law. Contractor shall indemnify, defend, and hold harmless County, its officers, and employees from employer sanctions and any other liability which may be assessed against Contractor or County in connection with any alleged violation of Federal statutes or regulations pertaining to the eligibility for employment of persons performing services under this Agreement.

10. Contractor Responsibility and Debarment

- a. A responsible Contractor is a Contractor who has demonstrated the attribute of trustworthiness, as well as quality, fitness, capacity, and experience to satisfactorily perform the Contract. It is the County's policy to conduct business only with responsible contractors.
- b. The Contractor is hereby notified that, in accordance with Chapter 2.202 of the County Code, if the County acquires information concerning the performance of the Contractor on this or other Contracts which indicates that the Contractor is not responsible, the County may, in addition to other remedies provided in the Contract, debar the Contractor from bidding or proposing on, or being awarded, and/or performing work on County Contracts for a specified period of time, which generally will not exceed five years but may exceed five years or be permanent if warranted by the circumstances, and terminate any or all existing Contracts the Contractor may have with the County.
- c. The County may debar a Contractor if the Board of Supervisors finds, in its discretion, that the Contractor has done any of the following: (1) violated a

term of a Contract with the County or a nonprofit corporation created by the County; (2) committed an act or omission which negatively reflects on the Contractor's quality, fitness or capacity to perform a Contract with the County, any other public entity, or a nonprofit corporation created by the County, or engaged in a pattern or practice which negatively reflects on same; (3) committed an act or offense which indicates a lack of business integrity or business honesty, or (4) made or submitted a false claim against the County or any other public entity.

- d. If there is evidence that the Contractor may be subject to debarment, the Department will notify the Contractor in writing of the evidence which is the basis for the proposed debarment and will advise the Contractor of the scheduled date for a debarment hearing before the Contractor Hearing Board.
- e. The Contractor Hearing Board will conduct a hearing where evidence on the proposed debarment is presented. The Contractor and/or the Contractor's representative shall be given an opportunity to submit evidence at that hearing. After the hearing, the Contractor Hearing Board shall prepare a tentative proposed decision, which shall contain a recommendation regarding whether the Contractor should be debarred, and, if so, the appropriate length of time of the debarment. The Contractor and the Department shall be provided an opportunity to object to the tentative proposed decision prior to its presentation to the Board of Supervisors.
- f. After consideration of any objections, or if no objections are submitted, a record of the hearing, the proposed decision and any other recommendation of the Contractor Hearing Board shall be presented to the Board of Supervisors. The Board of Supervisors shall have the right to modify, deny or adopt the proposed decision and recommendation of the Hearing Board.
- g. If the Contractor has been debarred for a period longer than five years, that Contractor may, after the debarment has been in effect for at least five years, submit a written request for review of the debarment determination to reduce the period of debarment or terminate the debarment. The County may, in its discretion, reduce the period of debarment or terminate the debarment if it finds that the Contractor has adequately demonstrated one or more of the following: (1) elimination of the grounds for which the debarment was imposed; (2) a bona fide change in ownership or management; (3) material evidence discovered after debarment was imposed; or (4) any other reason that is in the best interests of the County.
- h. The Contractor Hearing Board will consider a request for review of a debarment determination only where (1) the Contractor has been debarred for a period longer than five years; (2) the debarment has been in effect for at

least five years; and (3) the request is in writing, states one or more of the grounds for reduction of the debarment period or termination of the debarment and includes supporting documentation. Upon receiving an appropriate request, the Contractor Hearing Board will provide notice of the hearing on the request. At the hearing, the Contractor Hearing Board shall conduct a hearing where evidence on the proposed reduction of debarment period or termination of debarment is presented. This hearing shall be conducted and the request for review decided by the Contractor Hearing Board pursuant to the same procedures as for a debarment hearing.

The Contractor Hearing Board's proposed decision shall contain a recommendation on the request to reduce the period of debarment or terminate the debarment. The Contractor Hearing Board shall present its proposed decision and recommendation to the Board of Supervisors. The Board of Supervisors shall have the right to modify, deny, or adopt the proposed decision and recommendation of the Contractor Hearing Board.

- i. These terms shall also apply to subcontractors of County Contractors.

11. Compliance with Jury Service Program

This Contract is subject to provisions of the County's ordinance entitled Contractor Employee Jury Service (Jury Service Program) as codified in Sections 2.203.010 through 2.203.090 of the Los Angeles County Code.

- a. Unless Contractor has demonstrated to the County's satisfaction either that Contractor is not a Contractor as defined under the Jury Service Program (Section 2.203.020 of the County Code) or that Contractor qualifies for an exception to the Jury Service Program (Section 2.203.070 of the County Code), Contractor shall have and adhere to a written policy that provides that its employees shall receive from the Contractor, on an annual basis, no less than five days of regular pay for actual jury service. The policy may provide that Employees deposit any fees received for such jury service with the Contractor or that the Contractor deduct from the employee's regular pay the fees received for jury service.
- b. For purposes of this Section, Contractor means a person, partnership, corporation or other entity which has a Contract with the County or a subcontract with a County contractor and has received or will receive an aggregate sum of \$50,000 or more in any 12-month period under one or more County Contracts or Subcontracts. Employee means any California resident who is a full-time employee of Contractor. Full-time means 40 hours or more worked per week, or a lesser number of hours if: (1) the lesser number is a recognized industry standard as determined by the County, or (2) Contractor has a long-standing practice that defines the lesser number of hours as full-time. Full-time employees providing short-term, temporary services of 90 days or less within a 12-month period are not

considered full-time for purposes of the Jury Service Program. If Contractor uses any subcontractor to perform services for the County under the Contract, the subcontractor shall also be subject to the provisions of this Section. The provisions of this Section shall be inserted into any such subcontract Agreement and a copy of the Jury Service Program shall be attached to the Agreement.

- c. If Contractor is not required to comply with the Jury Service Program when the Contract commences, Contractor shall have a continuing obligation to review the applicability of its exception status from the Jury Service Program, and Contractor shall immediately notify County if Contractor at any time either comes within the Jury Service Program's definition of Contractor or if Contractor no longer qualifies for an exception to the Program. In either event, Contractor shall immediately implement a written policy consistent with the Jury Service Program. The County may also require, at any time during the Contract and at its sole discretion, that Contractor demonstrate to the County's satisfaction that Contractor either continues to remain outside the Jury Service Program's definition of Contractor and/or that Contractor continues to qualify for an exception to the Program.
- d. Contractor's violation of this Section of the Contract may constitute a material breach of the Contract. In the event of such material breach, County may, in its sole discretion, terminate the Contractor and/or bar Contractor from the award of future County Contracts for a period of time consistent with the seriousness of the breach.

12. No Payment for Services Provided Following Expiration/Termination of Agreement

Contractor shall have no claim against County for payment for any money or reimbursement, of any kind whatsoever, for any service provided by Contractor after the expiration or other termination of this Agreement. Should Contractor receive any such payment it shall immediately notify County and shall immediately repay all such funds to County. Payment by County for services rendered after expiration/termination of this Agreement shall not constitute a waiver of County's right to recover such payment from Contractor. This provision shall survive the expiration or other termination of this Agreement.

13. Notice to Employees Regarding the Safely Surrendered Baby Law

- a. The Contractor shall notify and provide to its employees and shall require each subcontractor to notify and provide to its employees, a fact sheet regarding the Safely Surrendered Baby Law, its implementation in the County of Los Angeles, and where and how to safely surrender a baby. The fact sheet is available on the Internet at www.babysafela.org for printing purposes.

- b. The Contractor acknowledges that the County places a high priority on the implementation of the Safely Surrendered Baby Law. The Contractor understands that it is the County's policy to encourage all County Contractors to voluntarily post the County's Safely Surrendered Baby Law in a prominent position at the Contractor's place of business. The Contractor will also encourage its Subcontractors, if any, to post this poster in a prominent position in the Subcontractor's place of business. The County's Department of Children and Family Services will supply the Contractor with the poster to be used.

14. Assignment by Contractor/Mergers or Acquisitions

- a. The Contractor shall notify the County of any pending acquisitions/mergers of its company unless otherwise legally prohibited from doing so. If the Contractor is restricted from legally notifying the County of pending acquisitions/mergers, then it should notify the County of the actual acquisitions/mergers as soon as the law allows and provide to the County the legal framework that restricted it from notifying the County prior to the actual acquisitions/mergers.
- b. The Contractor shall not assign, exchange, transfer, or delegate its rights or duties under this Contract, whether in whole or in part, without the prior written consent of County, in its discretion, and any attempted assignment, delegation, or otherwise transfer of its rights or duties, without such consent shall be null and void. For purposes of this sub-paragraph, County consent shall require a written amendment to the Contract, which is formally approved and executed by the parties. Any payments by the County to any approved delegate or assignee on any claim under this Contract shall be deductible, at County's sole discretion, against the claims, which the Contractor may have against the County.
- c. Any assumption, assignment, delegation, or takeover of any of the Contractor's duties, responsibilities, obligations, or performance of same by any person or entity other than the Contractor, whether through assignment, subcontract, delegation, merger, buyout, or any other mechanism, with or without consideration for any reason whatsoever without County's express prior written approval, shall be a material breach of the Contract which may result in the termination of this Contract. In the event of such termination, County shall be entitled to pursue the same remedies against Contractor as it could pursue in the event of default by Contractor.

15. Contractor's Warranty of Compliance with County's Defaulted Property Tax Reduction Program

Contractor acknowledges that County has established a goal of ensuring that all individuals and businesses that benefit financially from County through contract are current in paying their property tax obligations (secured and unsecured roll) in order to mitigate the economic burden otherwise imposed upon County and its taxpayers.

Unless contractor qualifies for an exemption or exclusion, contractor warrants and certifies that to the best of its knowledge it is now in compliance, and during the term of this contract will maintain compliance, with Los Angeles County Code Chapter. 2.206.

16. Termination for Breach of Warranty to Maintain Compliance with County's Defaulted Property Tax Reduction Program

Failure of contractor to maintain compliance with the requirements set forth in Article X "Contractor's Warranty of Compliance with County's Defaulted Property Tax Reduction Program" shall constitute default under this contract. Without limiting the rights and remedies available to County under any other provision of this contract, failure of contractor to cure such default within 10 days of notice shall be grounds upon which County may terminate this contract and/or pursue debarment of contractor, pursuant to County Code Chapter 2.206.

17. Time Off for Voting

The Contractor shall notify its employees and shall require each subcontractor to notify and provide to its employees, information regarding the time off for voting law (Elections Code Section 14000). Not less than 10 days before every statewide election, every Contractor and Subcontractors shall keep posted conspicuously at the place of work, if practicable, or elsewhere where it can be seen as employees come or go to their place of work, a notice setting forth the provisions of Section 14000.

18. Contractor CARD Track/Monitoring Database

The County maintains the Contractor Alert Reporting Database (CARD), which is used to track/monitor poorly performing contractors. When a County department identifies a significant performance/non-compliance issue(s) with a contractor, the department will provide notice to the contractor and will give the contractor an opportunity to correct the issue(s). If the contractor does not take any appropriate steps to correct the issue(s), the County department will enter the contractor, along with any other relevant information pertaining to the contractor's performance issue(s), into CARD.

The information entered into CARD can be accessed by all County departments, and will be used, along with any other relevant information not included in CARD, in determining bidder responsibility. If a department reviews this information and determines that a finding of non-responsibility should be pursued, the department will adhere to the guidelines specified in the Los Angeles County Code Chapter 2.202, and the County's implementation Procedures for Determinations of Contractor Non-Responsibility and Contractor Debarment.

The County maintains databases that track/monitor contractor performance history. Information entered into such databases may be used for a variety of purposes, including determining whether a bidder is responsible for the purposes of a future County contract.

19. Contractor Independence/Prohibition from Participation in Future Solicitation(s)

The County Board of Supervisors has adopted a countywide policy that prohibits any person, or any firm [collectively "firm"] or any subsidiary of a firm from submitting a bid or proposal in any County solicitation process where the person or firm, assisted in the development of the solicitation document(s).

A Proposer, or a Contractor or its subsidiary or Subcontractor ("Proposer/Contractor"), is prohibited from submitting a bid or proposal in a County solicitation if the Proposer/Contractor has provided advice or consultation for the solicitation. A Proposer/Contractor is also prohibited from submitting a bid or proposal in a County solicitation if the Proposer/Contractor has developed or prepared any of the solicitation materials on behalf of the County. A violation of this provision shall result in the disqualification of the Contractor/Proposer from participation in the County solicitation or the termination or cancellation of any resultant County Contract. This provision shall survive the expiration, or other termination of this Agreement.

20. Background and Security Investigations

20.1 Each of Contractor's staff performing services under this Contract, who is in a designated sensitive position, as determined by County in County's sole discretion, shall undergo and pass a background investigation to the satisfaction of County as a condition of beginning and continuing to perform services under this Contract. Such background investigation must be obtained through fingerprints submitted to the California Department of Justice to include State, local, and federal-level review, which may include, but shall not be limited to, criminal conviction information. The fees associated with the background investigation shall be at the expense of the Contractor, regardless of whether the member of Contractor's staff passes or fails the background investigation.

20.2 If a member of Contractor's staff does not pass the background investigation, County may request that the member of Contractor's staff be removed immediately from performing services under the Contract. Contractor shall comply with County's request at any time during the term of the Contract. County will not provide to Contractor or to Contractor's staff any information obtained through the County's background investigation.

- 20.3 County, in its sole discretion, may immediately deny or terminate facility access to any member of Contractor's staff that does not pass such investigation to the satisfaction of the County or whose background or conduct is incompatible with County facility access.
- 20.4 Disqualification of any member of Contractor's staff pursuant to this Paragraph shall not relieve Contractor of its obligation to complete all work in accordance with the terms and conditions of this Contract.

21. Local Small Business Enterprise/Social Enterprise/Disabled Veterans Business Enterprise Utilization

Local Small Business Enterprise means a business that is certified by the County of Los Angeles as a Local Small Business Enterprise (Local SBE), consistent with Chapter 2.204 of the Los Angeles County Code.

- 21.1 When requested by the County, the contractor shall provide to the County via methods specified by the County, such as submission of electronic live (or dynamic) data on invoices for the prime and all Subcontractors using County-designated third party software system or to a County approved website, or other means of submitting expenditure information on Subcontractors, including but not limited to the following information: the name, business address, California Contractor License number and telephone number/email address of each subcontractor who will perform work or labor for the contractor on the Project in an amount in excess of one-half of 1 percent of the Contractor's total bid. In addition, the Contractor shall be required to provide each of the specified Subcontractors' Local SBE status (i.e., whether any of the listed Subcontractors are Local SBE's), Social Enterprise status, and Disabled Veterans Business Enterprise status and the proposed monetary amount of the work the subcontractor will perform on the Project. In addition, at the time of submittal of the final invoice, the Contractor shall indicate, via methods specified by the County, the actual dollar amounts paid to each listed Subcontractor who performed work on the project.
- 21.2 Contractor's failure to comply with the provisions of this Article is a material breach of the Agreement. The parties agree that it will be impracticable or extremely difficult to fix the extent of actual damages resulting from the failure to the Contractor to comply with this Article. The parties agree that under the current circumstances a reasonable estimate of such damages is specified in the Schedule for Liquidated Damages for Local Small Business Enterprise Utilization hereunder, and that the Contractor shall be liable to the County for said amounts.

If in the judgment of the Director, or his/her designee, the Contractor is

deemed to be in non-compliance with the terms and obligations assumed hereby, the Director or his/her designee, at his/her option, in addition to, or in lieu of, other remedies provided herein in this Agreement, may deduct and withhold liquidated damages from County's final payment to the Contractor as follows:

SCHEDULE FOR LIQUIDATED DAMAGES FOR LOCAL SMALL BUSINESS ENTERPRISE/SOCIAL ENTERPRISE/DISABLED VETERANS BUSINESS ENTERPRISE UTILIZATION

<u>Final Invoice Price</u>	<u>Liquidated Damages</u>
Up to \$100,000	\$50.00 plus 0.1% of contract amount
\$100,001 to \$500,000	\$150.00 plus 0.07% of all over 100,000
Over \$500,000	\$430.00 plus 0.05% of all over \$500,000

22. Compliance with County's Zero Tolerance Human Trafficking

Contractor acknowledges that the County has established a Zero Tolerance Human Trafficking Policy prohibiting Contractors from engaging in human trafficking.

If a Contractor or member of Contractor's staff is convicted of a human trafficking offense, the County shall require that the Contractor or member of Contractor's staff be removed immediately from performing services under the Contract. County will not be under any obligation to disclose confidential information regarding the offenses other than those required by law.

Disqualification of any member of Contractor's staff pursuant to this paragraph shall not relieve Contractor of its obligation to complete all work in accordance with the terms and conditions of this Contract.

23. Claims

Notwithstanding Article 1.5 (commencing with Section 20104) of Chapter 1 of Part 3, Section 9204 of the Public Contract Code shall apply to any claim by the Contractor in connection with the Project.

- a. Upon receipt of a claim pursuant to Section 9204 of the Public Contract Code, the County will conduct a reasonable review of the claim and, within a period not to exceed 45 Days, provide the Contractor a written statement identifying what portion of the claim is disputed and what portion is undisputed. Upon receipt of a claim, the Contractor and the County may, by mutual agreement, extend the aforementioned time period.
- b. The Contractor shall furnish reasonable documentation to support the claim.

- c. If Board approval is needed to provide the Contractor a written statement identifying the disputed portion and the undisputed portion of the claim, and the Board does not meet within the 45 Days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, the County will have up to 3 Days following the next duly publicly noticed meeting of the Board after the 45-Day period, or extension, expires to provide the Contractor a written statement identifying the disputed portion and the undisputed portion.
- d. Any payment due on an undisputed portion of the claim will be processed and made within 60 Days after the County issues its written statement. If the County fails to issue a written statement, paragraph (j) shall apply.
- e. If the Contractor disputes the County's written response, or if the County fails to respond to a claim issued pursuant to Section 9204 within the time prescribed, the Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the County will schedule a meet and confer conference within 30 Days for settlement of the dispute.
- f. Within 10 business days (Monday-Thursday) following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the County will provide the Contractor a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim will be processed and made within 60 Days after the County issues its written statement. Any disputed portion of the claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation, with the County and the Contractor sharing the associated costs equally. The County and the Contractor shall mutually agree to a mediator within 10 business days after the disputed portion of the claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the claim remaining in dispute shall be subject to applicable procedures outside those established in Section 9204.
- g. Mediation shall include any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in Section 9204.

- h. Unless otherwise agreed to by the County and the Contractor in writing, the mediation conducted pursuant to Section 9204 shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.
- i. Section 9204 does not preclude the County from requiring arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program, if mediation under Section 9204 does not resolve the parties' dispute.
- j. Failure by the County to respond to a claim from the Contractor within the time periods described in this subdivision or to otherwise meet the time requirements of Section 9204 shall result in the claim being deemed rejected in its entirety. A claim that is denied by reason of the County's failure to have responded to a claim, or its failure to otherwise meet the time requirements of Section 9204, shall not constitute an adverse finding with regard to the merits of the claim or the responsibility or qualifications of the claimant.
- k. Amounts not paid in a timely manner as required by Section 9204 will bear interest at 7 percent per annum.
- l. If a Subcontractor or a lower tier Subcontractor lacks legal standing to assert a claim against the County because privity of the Contract does not exist, the Contractor may present to the County a claim on behalf of a Subcontractor or lower tier Subcontractor. A Subcontractor may request in writing, either on its own behalf or on behalf of a lower tier Subcontractor, that the Contractor present a claim for work which was performed by the Subcontractor or by a lower tier Subcontractor on behalf of the Subcontractor. The Subcontractor requesting that the claim be presented to the County shall furnish reasonable documentation to support the claim. Within 45 Days of receipt of this written request, the Contractor shall notify the Subcontractor in writing as to whether the Contractor presented the claim to the County and, if the original Contractor did not present the claim, provide the Subcontractor with a statement of the reasons for not having done so.
- m. A waiver of the rights granted by Section 9204 is void and contrary to public policy, provided, however, that (1) upon receipt of a claim, the Contractor and the County may mutually agree to waive, in writing, mediation and proceed directly to the commencement of a civil action or binding arbitration, as applicable; and (2) the County may prescribe reasonable change order, claim, and dispute resolution procedures and requirements in addition to the provisions of Section 9204, so long as the contractual provisions do not conflict with or otherwise impair the timeframes and procedures set forth in Section 9204.

24. Compliance with Fair Chance Employment Practices

Contractor, and its subcontractors, must comply with fair chance employment hiring practices set forth in [California Government Code Section 12952](#). Contractor's violation of this paragraph of the Contract may constitute a material breach of the Contract. In the event of such material breach, County may, in its sole discretion, terminate the Contract.

25. Default Method of Payment: Direct Deposit or Electronic Funds Transfer

25.1 The County, at its sole discretion, has determined that the most efficient and secure default form of payment for goods and/or services provided under an agreement/ contract with the County shall be Electronic Funds Transfer (EFT) or direct deposit, unless an alternative method of payment is deemed appropriate by the Auditor-Controller (A-C).

25.2 The Contractor shall submit a direct deposit authorization request via the website <https://directdeposit.lacounty.gov> with banking and vendor information, and any other information that the A-C determines is reasonably necessary to process the payment and comply with all accounting, record keeping, and tax reporting requirements.

25.3 Any provision of law, grant, or funding agreement requiring a specific form or method of payment other than EFT or direct deposit shall supersede this requirement with respect to those payments.

25.4 At any time during the duration of the agreement/contract, a Contractor may submit a written request for an exemption to this requirement. Such request must be based on specific legal, business or operational needs and explain why the payment method designated by the A-C is not feasible and an alternative is necessary. The A-C, in consultation with the contracting department(s), shall decide whether to approve exemption requests.

26. Disallowed Cost

If Proposer's compliance with a County contract has been reviewed by the A-C within the last 10 years, Proposer must not have unresolved questioned costs identified by the A-C, in an amount over \$100,000.00, that are confirmed to be disallowed costs by the contracting County department, and remain unpaid for six months or more from the date of disallowance, unless such disallowed costs are the subject of current good faith negotiations to resolve the disallowed costs, in the opinion of the County.

27. Compliance with the County Policy of Equity

The consultant acknowledges that the County takes its commitment to preserving

the dignity and professionalism of the workplace very seriously, as set forth in the County Policy of Equity (CPOE) (<https://ceop.lacounty.gov/>). The contractor further acknowledges that the County strives to provide a workplace free from discrimination, harassment, retaliation and inappropriate conduct based on a protected characteristic, and which may violate the CPOE. The contractor, its employees and subcontractors acknowledge and certify receipt and understanding of the CPOE. Failure of the Contractor, its employees or its Subcontractors to uphold the County's expectations of a workplace free from harassment and discrimination, including inappropriate conduct based on a protected characteristic, may subject the contractor to termination of contractual agreements as well as civil liability.

28. Integrated Pest Management Program Compliance

Contractor acknowledges that County has established an Integrated Pest Management Program (the Program) which aims to reduce or eliminate pollutants moved into surface water through storm water management systems and facilities. Contractor certifies compliance on Integrated Pest Management Program Compliance Certification in Required Forms, that contractor has reviewed, understands, and will adhere to the County's IPM Program requirements as set forth in Integrated Pest Management Program Compliance and at: www.lacountyipm.org

Contractor must ensure and certify that its employees who apply pesticides on County owned or maintained property are appropriately trained. The training, which must be conducted on an annual basis, but no later than June 30th of each calendar year, must meet the County's minimum requirements under the Program.

Employee training may be self-certified by Contractors, provided the County has the ability to audit the training, and must include, at a minimum, the following:

- The potential for pesticide-related surface water toxicity;
- Proper use, handling, and disposal of pesticides;
- Least toxic methods of pest prevention and control, including IPM; and
- Reduction of pesticide use.

All users of commercial pesticides are required by State law to provide a monthly pesticide report to the Los Angeles County Department of Agricultural Commissioner/ Weights and Measures (ACWM). In addition to the mandatory monthly reporting requirement, Contractor shall provide to the Department, with a copy to the ACWM, an annual summary of the pesticides used outdoors on County-owned or maintained property by Fiscal Year (July 1 to June 30). For each pesticide, the summary shall include all of the following:

- Product trade name

- Active ingredient(s)
- EPA Registration Number
- Total amount used

The units reported shall be appropriate to the product (gallons, ounces, pounds, etc.).

29. Termination for Improper Consideration

County may, by written notice to Contractor, immediately terminate the right of Contractor to proceed under this Agreement if it is found that consideration, in any form, was offered or given by Contractor, either directly or through an intermediary, to any County officer, employee, or agent with the intent of securing the Agreement or securing favorable treatment with respect to the award, amendment, or extension of the Agreement or the making of any determinations with respect to Contractor's performance pursuant to the agreement. In the event of such termination, County shall be entitled to pursue the same remedies against Contractor as it could pursue in the event of default by Contractor.

Contractor shall immediately report any attempt by a County officer or employee to solicit such improper consideration. The report shall be made either to County manager charged with the supervision of the employee or to County A-C's Employee Fraud Hotline at (213) 974-0914 or (800) 544-6861.

Among other items, such improper consideration may take the form of cash, discounts, service, the provision of travel or entertainment, or tangible gifts.

30. Gratuities

Contractor is advised that it is improper for any County officer, employee, or agent to solicit consideration, in any form, from Contractor with the implication, suggestion, or statement that Contractor's provision of the consideration, or failure to provide consideration, may cause favorable or unfavorable treatment, respectively, for the Contractor relating to the amendment or extension of the Contract or the making of any determinations with respect to Contractor's performance under this Contract. A Contractor shall not offer or give, either directly or through an intermediary, such improper consideration, in any form, to a County officer, employee, or agent for the purpose of securing favorable treatment as described herein.

A Contractor shall immediately report any attempt by a County officer, employee, or agent to solicit such improper consideration. The report shall be made either to the County manager charged with the supervision of the employee or to the County Auditor-Controller's Employee Fraud Hotline at (800) 544-6861.

Among other items, such improper consideration may take the form of cash; discounts; services; and the provision of travel, entertainment, or tangible gifts.

Note that Contractor's failure to adhere to this requirement could subject this Contract to Termination for Improper Consideration paragraph in this Agreement.

31. Facsimile/Electronic Representations

The County and the Contractor hereby agree to regard facsimile/electronic representations of original signatures of authorized officers of each party, when appearing in appropriate places on the Agreement, Change Orders and amendments prepared, and received via communications facilities, as legally sufficient evidence that such original signatures have been affixed to amendments to this Contract, such that the parties need not follow up facsimile/electronic transmissions of such documents with subsequent (non-facsimile/electronic) transmission of "original" versions of such documents. Electronic signatures include facsimile or e-mail electronic signatures. Each executed counterpart shall be deemed an original. All counterparts, taken together, constitute the executed Agreement. The parties hereby acknowledge and agree that electronic records and electronic signatures, as well as facsimile signatures, used in connection with the execution of this Agreement and electronic signatures, facsimile signatures or signatures transmitted by electronic mail in so-called pdf format shall be legal and binding and shall have the same full force and effect as if a paper original of this Agreement had been delivered had been signed using a handwritten signature. Contractor and County (i) agree that an electronic signature, whether digital or encrypted, of a party to this Agreement is intended to authenticate this writing and to have the same force and effect as a manual signature, (ii) intend to be bound by the signatures (whether original, faxed or electronic) on any document sent or delivered by facsimile or, electronic mail, or other electronic means, (iii) are aware that the other party will rely on such signatures, and (iv) hereby waive any defenses to the enforcement of the terms of this Agreement based on the foregoing forms of signature. If this Agreement has been executed by electronic signature, all parties executing this document are expressly consenting under the United States Federal Electronic Signatures in Global and National Commerce Act of 2000 ("E-SIGN") and California Uniform Electronic Transactions Act ("UETA")(Cal. Civ. Code § 1633.1, et seq.), that a signature by fax, e-mail or other electronic means shall constitute an Electronic Signature to an Electronic Record under both E-SIGN and UETA with respect to this specific transaction.

32. Advertising and Other External Communications About the Project

Consultant/Contractor shall obtain the County's prior written approval before disclosing or communicating any information concerning the award of the contract, the progress of the work, or the completion of the work, to any non-party, including but not limited to outside media and news organizations. This requirement includes, but is not limited to: (1) a Consultant/Contractor's, application for an award or any

other recognition of the project; and (2) any advertising or promotion of the project and/or the Consultant/Contractor's role on the project. The County retains the sole discretion as to the release of such information, including the right to deny the request for disclosure, the right to direct the timing of the disclosure, and/or the right to direct Consultant/Contractor to make revisions to the information prior to disclosure.

33. COVID-19 Requirement for County Contractor Personnel

When applicable and required by the County, the Contractor shall comply with all other applicable local, departmental, State, and federal laws, regulations, and requirements for COVID-19.

34. **Campaign Contribution Prohibition Following Final Decision in Contract Proceeding**

Pursuant to Government Code Section 84308, Contractor and its Subcontractors, are prohibited from making a contribution of more than \$250 to a County officer for twelve (12) months after the date of the final decision in the proceeding involving this Contract. Failure to comply with the provisions of Government Code Section 84308 and of this paragraph, may be a material breach of this Contract as determined in the sole discretion of the County.

35. Federally Funded Work

This provision will apply when federally funded or potentially federally funded work is needed by County. In accordance with Federal Executive Order 12549 and 12689 (Debarment and Suspension), individuals or entities that have been debarred by the Federal government may not receive work under this Contract as a Contractor or Subcontractor. Contractors and/or Subcontractors listed on the governmental exclusions in the System for Award Management (SAM) are not eligible to receive federally funded work under this contract. See Office of Management and Budget guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension". The SAM exclusions contains the names of parties debarred, suspended, or otherwise excluded by Federal agencies as well as parties declared ineligible under statutory or regulatory authority.

For federally funded work, the Project Manager will, before assigning work or Notice to Proceed to the Contractor, verify that the Contractor is not listed on the governmental exclusions in the SAM as a party excluded or ineligible by Federal agencies to participate in federally funded projects. For your reference, a List of Debarred Contractors by U.S. Department of Labor's (DOL) Office of Federal Contract Compliance Programs (OFCCP) may be obtained by going to the following website:

<https://sam.gov/content/home>.

If the Contractor is listed on the governmental exclusions in the SAM as a party excluded or ineligible by Federal agencies to participate in federally funded projects, then said Contractor will not be offered the work. The Project Manager will notify the Contractor of their negative standing in the SAM. The Project Manager will also notify the Contractor of their ineligibility to receive any federally funded work under this contract, until the Contractor is able to satisfactorily correct the issue. The Contractor shall notify the Project Manager when the Contractor has corrected their negative standing in the SAM, and the Contractor is no longer listed on the governmental exclusions in the SAM.

If the Contractor is not listed on the governmental exclusions in the SAM as a party excluded or ineligible by Federal agencies to participate in federally funded projects, Public Works may offer said Contractor the federally funded work. In addition, if applicable, the Contractor is required to verify that its subcontractors/subconsultants are not listed on the governmental exclusions in the SAM, before assigning federally funded work to its subcontractors/subconsultants.

IN WITNESS WHEREOF, the County has, by order of its Board of Supervisors, caused these presents to be subscribed by the Director of the Los Angeles County Public Works, and the Contractor has hereunto subscribed its corporate name and affixed its corporate seal by its duly authorized officers the day, month, and year herein first above written.

COUNTY OF LOS ANGELES

NAME OF CONTRACTOR

By _____
Deputy Director
Los Angeles County Public Works

By _____
President

Type/Print Name

By _____
Secretary

Type/Print Name

CLASSIFICATION LICENSE NO.
Contractor

APPROVED AS TO FORM:

DAWYN R. HARRISON
County Counsel

By _____
Senior Deputy County Counsel

Type/Print Name

BOND FOR FAITHFUL PERFORMANCE

KNOW ALL PERSONS BY THESE PRESENTS:

That we, Contractor, a California Corporation, as principal, and

(name and address)

as surety, are held and firmly bound unto the County of Los Angeles, State of California, in the sum of AMOUNT IN WORDS DOLLARS (\$ amount), lawful money of the United States, for the payment of which sum, well and truly to be made, we bind ourselves, jointly and severally, firmly by these presents.

The condition of the foregoing obligation is such that whereas said principal has been awarded and is about to enter into the annexed Contract with the County of Los Angeles, State of California, for

PROJECT
PLACE
SPECS.

and is required by said County to give this bond in connection with the execution of said Contract.

NOW, THEREFORE, if the said principal shall well and truly do and perform all of the covenants and obligations of said Contract on its part to be done and performed at the times and in the manner specified therein, then this obligation shall be null and void, otherwise it shall be and remain in full force and effect. No premature payment by said County to said principal shall exonerate any surety unless the Board of Supervisors of said County shall have actual notice that such payment is premature at the time it is ordered by said Board, and then only to the extent that such payment shall result in loss to such surety, but in no event more than the amount of such premature payment. The surety hereby waives notice of any change, including changes of time, to said Contract or related subcontractors, purchase orders and other obligations.

BOND FOR FAITHFUL PERFORMANCE
Page 2

WITNESS our hands this _____ day of _____, 2XXX.

NAME OF CONTRACTOR

President

Type/Print Name

Secretary

Type/Print Name

APPROVED AS TO FORM:

DAWYN R. HARRISON
County Counsel

Surety

By _____
Senior Deputy County Counsel

Attorney-in-Fact

Type/Print Name

Type/Print Name

PAYMENT BOND FOR LABOR AND MATERIALS

KNOW ALL PERSONS BY THESE PRESENTS:

That we, Contractor, a California corporation, as principal, and

(name and address)

as surety, are held firmly bound unto the County of Los Angeles, State of California, hereinafter referred to as the County, in the sum of AMOUNT IN WORDS DOLLARS (\$XXXXXXX) lawful money of the United States, for the payment of which sum, well and truly made, we bind ourselves, jointly and severally, firmly by these presents.

The condition of the above obligation is such that, whereas said principal has been awarded and is about to enter into a written Contract with the County for:

PROJECT
PLACE
SPECS. NO. XXXX

which is hereto attached, made a part hereof, and to which reference is hereby made for all, and is required by said County to give this bond in connection with the execution of said Contract.

NOW, THEREFORE, if said principal, as contractor in said Contract, or principal's Subcontractor, fails to pay any of the persons referred to in Section 9100 of the Civil Code of the State of California for labor performed, skills, or other necessary services bestowed, site improvement made, equipment leased, or appliances, equipment, implements, machinery, materials, power, provender, provisions, teams, or trucks furnished or used in, upon, or about the performance of this work contracted to be done, or for amounts due under the Unemployment Insurance Code with respect to work or labor performed by such claimant, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the Contractor and Subcontractors pursuant to Section 13020 of the Unemployment Insurance Code, with Respect to such work and labor, said surety shall pay for the same in an amount not exceeding the sum specified above, and if suit is brought upon this bond, a reasonable attorney's fee to be fixed by the court. This bond is executed pursuant to Chapter 7 of Division 3, Part 4, Title 15 of the Civil Code of the State of California, and shall inure to the benefit of any of the persons referred to in said Civil Code Section 9100, as it now exists or

PAYMENT FOR BOND FOR LABOR AND MATERIALS

Page 2

may hereafter be amended, so as to give a right of action to such persons or their assigns in any suit brought upon this bond. No premature payment by said County to said principal shall exonerate any surety unless the Board of Supervisors of said County shall have actual notice that such payment is premature at the time and it is ordered by said Board, and then only to the extent that such payment shall result in loss to such surety, but in no event more than the amount of such premature payment.

It is agreed that any alterations in the work to be done or increase or decrease of the materials to be furnished, which may be made pursuant to the terms of said Contract shall not in any way release either the principal or surety hereunder, nor shall any extensions of time granted under the provisions of said Contract release either the principal or surety, and notice of such alterations or extensions of this Contract is hereby waived by the surety.

WITNESS our hands this _____ day of _____, 2XXX

NAME OF CONTRACTOR

President

Type/Print Name

Secretary

Type/Print Name

APPROVED AS TO FORM:

DAWYN R. HARRISON
County Counsel

Surety

By _____
Senior Deputy County Counsel

Attorney-in-Fact

Type/Print Name

Type/Print Name

CERTIFICATION

SUBJECT: PROJECT
ADDRESS
CITY, STATE
SPECS. NO.

I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for Worker's Compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this Contract.

NAME OF CONTRACTOR

Contractor's Signature

Print Name

Date

STATEMENT OF UNDERSTANDING

SUBJECT: PROJECT
ADDRESS
CITY, STATE
SPECS.

As the Contractor of the project, I have reviewed the Best Management Practices Handbooks, California Storm Water Quality Association, Menlo Park, CA and have proposed the implementation of the Best Management Practices (BMPs) applicable to effectively minimize the negative impacts of this Project's construction activities on the surrounding water quality. The selected BMPs will be installed, monitored, and maintained to ensure their effectiveness. The BMPs that I have not chosen for implementation are redundant or deemed not applicable to the proposed construction activities. If at any time, site conditions and/or the County official warrant re-evaluation and revisions of the chosen BMPs, the appropriate changes will be made without unnecessary delay. I am aware that failure to properly implement and maintain the BMPs necessary to prevent the discharge of pollutants from this project could result in significant penalties and/or delays.

NAME OF CONTRACTOR

Signature

Print Name

Date

SECTION 00 06 10
BOND FOR FAITHFUL PERFORMANCE

KNOW ALL PERSONS BY THESE PRESENTS:

That we, CONTRACTOR, a California Corporation, as principal, and _____, as surety, are held and firmly bound unto the COUNTY OF LOS ANGELES, State of California, in the sum of XXX DOLLARS (\$), lawful money of the United States, for the payment of which sum, well and truly to be made, we bind ourselves, jointly and severally, firmly by these presents.

The condition of the foregoing obligation is such that whereas said principal has been awarded and is about to enter into the annexed contract with the County of Los Angeles, State of California, for

PROJECT
PLACE
SPECS. NO.

and is required by said County to give this bond in connection with the execution of said contract;

NOW, THEREFORE, if the said principal shall well and truly do and perform all of the covenants and obligations of said contract on its part to be done and performed at the times and in the manner specified therein, then this obligation shall be null and void, otherwise it shall be and remain in full force and effect. No premature payment by said County to said principal shall exonerate any surety unless the Board of Supervisors of said County shall have actual notice that such payment is premature at the time it is ordered by said Board, and then only to the extent that such payment shall result in loss to such surety, but in no event more than the amount of such premature payment. The surety hereby waives notice of any change, including changes of time, to said contract or related subcontracts, purchase orders and other obligations. The surety hereby waives notice of any change, including changes of time, to said contract or related subcontractors, purchase orders and other obligations.

WITNESS our hands this _____ day of _____, 20

CONTRACTOR

President

APPROVED AS TO FORM:

DAWYN R. HARRISON
County Counsel

Secretary

By _____
Senior Deputy County Counsel

Surety

Attorney-in-Fact

SECTION 00 06 20
PAYMENT BOND FOR LABOR AND MATERIALS

KNOW ALL PERSONS BY THESE PRESENTS:

That we, CONTRACTOR, a California corporation, as principal, and _____ as surety, are held firmly bound unto the COUNTY OF LOS ANGELES, State of California, hereinafter referred to as the County, in the sum of DOLLARS (\$) lawful money of the United States, for the payment of which sum, well and truly made, we bind ourselves, jointly and severally, firmly by these presents.

The condition of the above obligation is such that, whereas said principal has been awarded and is about to enter into a written contract with the County for:

NAME OF PROJECT
PLACE
SPECS. NO.

which is hereto attached, made a part hereof, and to which reference is hereby made for all particulars, and is required by said County to give this bond in connection with the execution of said contract.

NOW, THEREFORE, if said principal, as contractor in said contract, or principal's subcontractor, fails to pay any of the persons referred to in Section 9100 of the Civil Code of the State of California for labor performed, skills or other necessary services bestowed, site improvement made, equipment leased, or appliances, equipment, implements, machinery, materials, power, provender, provisions, teams, or trucks furnished or used in, upon, or about the performance of this work contracted to be done, or for amounts due under the Unemployment Insurance Code with respect to work or labor performed by such claimant, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the contractor and subcontractors pursuant to Section 13020 of the Unemployment Insurance Code, with respect to such work and labor, said surety shall pay for the same in an amount not exceeding the sum specified above, and if suit is brought upon this bond, a reasonable attorney's fee to be fixed by the court. This bond is executed pursuant to Chapter 7 of Division 3, Part 4, Title 15 of the Civil Code of the State of California, and shall inure to the benefit of any of the persons referred to in said Civil Code Section 9100, as it now exists or may hereafter be amended, so as to give a right of action to such persons or their assigns in any suit brought upon this bond. No premature payment by said County to said principal shall exonerate any surety unless the Board of Supervisors of said County shall have actual notice that such payment is premature at the time and it is ordered by said Board, and then only to the extent that such payment shall result in loss to such surety, but in no event more than the amount of such premature payment.

It is agreed, that any alterations in the work to be done, or increase or decrease of the materials to be furnished, which may be made pursuant to the terms of said contract shall not in any way release either the principal or surety hereunder, nor shall any extensions of time granted under the provisions of said contract release either the principal or surety, and notice of such alterations or extensions of this contract is hereby waived by the surety.

WITNESS our hands this _____ day of _____, 20

CONTRACTOR

President

Secretary

Surety

Attorney-in-Fact

APPROVED AS TO FORM:

DAWYN R. HARRISON
County Counsel

By _____
Senior Deputy County Counsel

SECTION 00 07 00

GENERAL CONDITIONS

- A. Bid Form, Equals, Use of Drawings & Manual**
1. Bid Forms
 2. Equals
 3. Additional Sets of Drawings and Project Manual
- B. Drawings & Specifications**
4. Drawings and Specifications
 5. Contract Documents and Order of Precedence
 6. Interpretation of Drawings and Specifications
 7. Project Manual
 8. Standard Specifications
 9. Substitutions Required Because of Federal Government Restrictions or Lack of Product Availability
 10. As-Built Drawings
 11. Reference Materials
- C. Schedule, Changes in Work**
12. Construction Schedule
 13. County's Right to Delay Commencement of the Work
 14. Updated Schedules
 15. Changes in the Work
 16. Provisions for Extras
 17. Time Extensions and Compensation for Delay
- D. Inspection/Permits, Tests, Quality, Warranties**
18. Observation
 19. Permits, Licenses, and Inspections
 20. Tests
- E. Substantial Completion, Occupancy by County**
21. Substantial Completion
 22. Occupancy by County
- F. Employment Requirements**
23. Workers
 24. Hours of Work
 25. Saturday, Sunday, Holidays, and Overtime Work
 26. Prevailing Wage Scale
 27. Employment of Indentured Apprentices
 28. Affirmative Action Plan for Equal Employment Opportunity

G. Contractor Responsibilities, Restrictions

29. Payroll Records
30. Quality of Work and Material
31. Responsibility of Contractor and of Contractor's Representative on the Work
32. Repairing Damaged Work
33. List of Subcontractors and Subletting Work
34. Advertising
35. Certificate as to Compliance with Certain Regulations
36. Coordination with Others and Other Contracts
37. Contractor's Construction Equipment
38. Contractor Personnel
39. Audits and Records
40. Warranty and Corrections to Work
41. Hazardous Material
42. Contractor Safety Requirements

H. Indemnification and Insurance

43. Indemnification
44. General Insurance Requirements
45. Insurance Coverage Requirements--Types and Limits
46. Not used.
47. Not used.

I. Legal/Other

48. Assignment
49. Patents
50. Suspension and/or Termination of Work and/or Contract
51. Contractor's Warranty of Adherence to County's Child Support Compliance Program
52. Contractor's Acknowledgment of County's Commitment to Child Support Enforcement
53. Limitation of Liability
54. Forum Selection
55. Waiver
56. Prior Agreements
57. Progress Payments
58. Acceptance of Final Payment as Release
59. Substitution of Securities for Retention
60. Resolution of Construction Claims
61. Conflict of Interest
62. Anti-Trust Claims
63. County's Quality Assurance Plan
64. Laws, Codes and Regulations to Be Observed

SECTION 00 07 00

GENERAL CONDITIONS

1. **BID FORMS:**

One copy of the Bid Forms accompany this Project Manual for Bidder's use.

Should these specifications be issued without the Bid Forms, or should the copy be lost or damaged, the Bidder must notify the Department of Public Works, in order that he/she may receive the forms or he/she may copy the forms bound into the Project Manual. All bids must be submitted on these forms or a facsimile thereof.

The Bidder shall not attach his bid to the returned Project Manual, nor use the Bid Forms, which are bound therein.

2. **EQUALS:**

- A. Except as may be provided in the Proprietary Specification Section of these General Conditions, whenever any material, product, thing or service is specified or indicated in the Bid Documents by brand, trade, patent or proprietary name and/or by the name of the manufacturer, the item so specified or indicated shall be deemed to be followed by the words "or equal."
- B. While preparing the bid, the Bidder may, at its own risk, submit an item not specified in the Bid Documents as an "or equal" for consideration by the County. Failure to do so within the time frame described in Subparagraph D below shall bar the Bidder from proposing or substituting an "or equal" item for an item specified in the Bid Documents.
- C. If the Bidder includes an "or equal" item with the bid, the Bidder must submit sufficient data to the County to substantiate the specific characteristics and qualities which make the "or equal" item the equivalent in all respects of the item specified in the Bid Documents as described in Subparagraph D below. The Bidder shall furnish such substantiating data or arrange for any necessary tests to verify the equivalent qualities of the "or equal" item at the Bidder's sole expense.
- D. The first, second and third apparent low bidder will have two (2) calendar days after the bid opening to submit their list of Equals (Section 00 04 40) and ten (10) calendar days after the bid opening to submit all substantiating data and test results. No list of Equals will be accepted after the close of

business two (2) calendar days after bids are opened. Likewise, no substantiating data and test results will be accepted after the close of business ten (10) calendar days after bids are opened.

- E. The County, in its sole discretion, shall determine whether the substantiating data demonstrates that an "or equal" item is equal in all respects to the item specified in the Bid Documents. If the County determines that the "or equal" item has not been substantiated to be equal in all respects, the item specified in the Bid Documents shall be furnished and/or installed by Contractor without modification of the bid amount or Contract Documents.
- F. The Contract Time for completion of the Work specified in the Contract Documents shall not be affected by any circumstances whatsoever arising from the provisions of this article.
- G. The Contract Documents, Drawings, and Specifications have been prepared to complement and accommodate certain specified equipment, products, or systems and any modifications, adjustment, or redesign required to assimilate any County approved substitution or "or equal" equipment, products, or systems shall be at the Contractor's expense. Contractor shall provide a complete and workable application and shall satisfy design criteria and aesthetic values to the sole satisfaction of the County.

3. ADDITIONAL SETS OF DRAWINGS AND PROJECT MANUAL:

Upon award of contract, the Contractor will be furnished with eight (8) full-size sets of Drawings. Up to twenty additional sets may be furnished upon request. Project Manuals will be issued with each set of Drawings for construction use.

4. DRAWINGS AND SPECIFICATIONS:

Specifications are intended to establish the standards for quality, performance, and technical requirements for all labor, workmanship, material, methods, and equipment necessary to complete the Work shown or reasonably implied on the Drawings and Specifications. The Drawings are intended to establish the scope, arrangement, graphic detail, and to illustrate the contract requirements. The Drawings and Specifications are intended to compliment and supplement one another, and any part of the Work that may be mentioned or indicated in the one and not represented in the other shall be done the same as if it had been mentioned or represented in both. Work, materials, or equipment of a minor nature which may not be specifically mentioned in the specifications or indicated on the Drawings, but which may be reasonably assumed as necessary for the completeness of the Work,

shall be performed and or supplied by the Contractor the same as if it were shown on the Drawings or described in the Specifications. In case of discrepancy either in the figures, on the drawings, or in the specifications, the matter shall be promptly submitted to the Director, or the Director's representative, who shall promptly make a determination in writing.

5. CONTRACT DOCUMENTS AND ORDER OF PRECEDENCE:

A. In the event that any provision(s) in any component part of the Contract Documents conflicts with any provision(s) of any other component part, the following order of precedence among the Contract Documents' component parts shall govern:

1. Written Amendments and Change Orders to the Contract in reverse chronological order
2. Addenda and Notices to Bidders in reverse chronological order
3. County-Contractor Agreement
4. Project Manual and Drawings
5. Performance Bond
6. Labor and Material Payment Bond

B. In the event there is a conflict between or among any provisions within one of the component parts of the Contract Documents, the higher standard or the more stringent requirement shall govern.

6. INTERPRETATION OF DRAWINGS AND SPECIFICATIONS:

A. The Director, or his/her authorized representative, will interpret the meaning of any part of the Drawings and Specifications about which any misunderstanding may arise. Should there appear to be any inconsistency or discrepancy in or between the Drawings and Specifications, the Contractor shall refer the matter to the Director, and then proceed without delay to complete the Work under question after the matter has been resolved by the Director. Should the Contractor proceed with the Work without referring the matter to, or obtaining resolution from the Director, Contractor does so on Contractor's own responsibility and without recourse to the County or County's employees, agents, etc.

B. If the Contractor disagrees with the interpretation of the Director, or his/her authorized representative, they shall promptly, and within ten (10) days after receipt of the interpretation, file a written request for a hearing before the Disputes Review Board as provided herein. Such written request shall

outline in detail areas and scope of the Contractor's disagreement with the interpretation. The Contractor shall continue with the Work in accordance with the Director's interpretation, maintaining accurate and complete records of all cost and time impacts related to the Work involved in the disputed interpretation. These records shall be filed with the Director in a timely manner as the Work progresses.

C. The Disputes Review Board selected by the Director is composed of three County personnel having a grade of Section Head or higher. The Board will convene to hear all matters related to the dispute within forty-five (45) calendar days after receipt of an acceptable request to convene. An acceptable "request for hearing" is defined as a request that outlines in detail the following:

1. Areas and scope of disagreement with the interpretation.
2. All areas of inconsistency/discrepancy in the drawings and/or specifications related to the dispute. Cite the specific drawings, details, specification sections, and paragraphs.

The Director shall determine whether a hearing will be conducted and may reject the request for hearing on the basis of information presented in the request.

D. The hearing will be informal and formal rules of evidence will not apply. The Board will submit its recommendation within a reasonable period of time following conclusion of the hearing. The Director will promptly render an interpretation notice to the Contractor.

7. PROJECT MANUAL:

A. The Project Manual is divided for convenience into divisions and sections as set forth in the Table of Contents preceding these General Conditions. Format is based upon the CSI Master Format for Construction Specifications. Schedules of Work included in these sections are given for convenience and shall not be considered as a comprehensive list of items necessary to complete the Work of any section.

B. Where devices or items, or parts thereof are referred to in the singular, it is intended that such reference shall apply to as many such devices, items, or parts as are required to properly complete the Work.

8. STANDARD SPECIFICATIONS:

- A. Where these Specifications or the Building Code stipulate that a material shall conform to the American Society for Testing Materials (ASTM) specifications or other recognized standards, the Contractor shall, when so required, deliver to the Department an affidavit or certificate in triplicate, signed by the manufacturer or supplier that the material furnished conforms to specifications or standards mentioned. When tests are required, the results of such tests shall be delivered to the Department.
- B. References to the "Building Code" are to the edition of the applicable Building Code listed on the drawings, including any amendments thereto.

9. SUBSTITUTIONS REQUIRED BECAUSE OF FEDERAL GOVERNMENT RESTRICTIONS OR LACK OF PRODUCT AVAILABILITY:

- A. In the event that certain materials or equipment specified are entirely unobtainable or not obtainable in sufficient quantities or within a reasonable time, due to Federal Government restrictions or other causes growing out of the national defense or war programs, the awarding entity may permit the use of equal and equivalent materials of other type of manufacture in their place. Before such substitutions can be made, the Contractor shall submit a written statement to the awarding entity setting forth in full the reasons why the materials specified are unobtainable and describing in full the materials which he proposed to supply in their place. Substitutions shall not be made until the approval of the awarding entity, in writing, has first been obtained.
- B. Should a specified item not be obtainable due to product unavailability, the awarding entity may permit the use of equal and equivalent materials of other type of manufacture in their place. Contractor shall follow the procedure identified in Paragraph A above in order to obtain approval.

10. AS-BUILT DRAWINGS:

- A. The Contractor shall keep one (1) complete and up-to-date set of prints at all times on the job, reserved for use as a record set of changes from the bid set. Throughout the duration of the construction work, this set of prints shall be the responsibility of the Contractor to maintain as a record of all field changes including underground runs, which are installed in locations other than those indicated on the Contract Drawings and those that have been indicated as to be field run as located. The lines shall be located on the Drawing dimensionally from a fixed point, such as a street-curb line, or

centerline, or a permanent structure. A copy of the updated as-built prints and as-built specifications shall be made available to the County Project Manager with the monthly progress payment requests.

- B. Contractor progress payment will be contingent upon the as-built drawings and specifications being maintained in current status, and the County Inspector will not approve progress payments unless these as-built drawings and specifications are current.
- C. As a condition to certifying the final payment under this Contract, within 30 calendar days after substantial completion, the Contractor will submit to the Project Manager the original set of as-built prints as well as the set of as-built specifications. If needed, a complete set of blue line prints of the Drawings will be furnished to the Contractor for which the as-built drawings are required. All variations from the Contract Drawings and any additional information required by the Specifications shall be entered on the as-built drawings and specifications as they occur, neatly and legibly, in ink of a contrasting color or otherwise marked as approved by the County. Each set of as-built drawings and specification shall be signed and dated before being accepted by the County representative at the completion of the Work.

11. REFERENCE MATERIALS:

The Contractor shall furnish and maintain on-site reference material including at least one copy of all applicable codes referenced in the Contract Documents as necessary for the performance of the Work specified.

12. CONSTRUCTION SCHEDULE:

- A. All time limits stated in the Contract Documents are of the essence of the Contract. The Contractor shall prosecute the Work at such time and in such manner that Substantial Completion of the Work shall occur in accordance with the Contract and the Contract Time, including authorized adjustments thereto.
- B. The Contractor shall provide a Contract Schedule for the Work in accordance with the requirements of Section 01 32 00, Construction Schedule.
- C. The term "day" when used in the Contract Documents shall mean calendar day unless otherwise specifically designated.

13. COUNTY'S RIGHT TO DELAY COMMENCEMENT OF THE WORK:

The Department, on behalf of the County, shall have the right to direct that the Contractor shall withhold actual commencement of the Work of construction until sufficient material, in the opinion of the Department, has been delivered to the site of the Work to insure completion of the Work without interruption, and the Contractor shall comply with such instructions when issued. The Contractor shall be granted an extension of the completion time of the contract equal to the number of working days delay caused to Contractor pursuant to Contractor's compliance with such instructions.

14. UPDATED SCHEDULES:

Updated schedules shall be attached with the Contractor's request for payment and shall be a condition required prior to payment. Each schedule shall include a narrative report defining problem areas, anticipated delays, and their impact on the schedule, and the corrective action that shall be taken by the Contractor and its affect.

15. CHANGES IN THE WORK:

A. Written Changes

1. The County may, at any time, without notice to the Surety, make changes in the Work within the general scope of the Contract, including changes:
 - a. in the Specifications and the Drawings;
 - b. in the method or manner of performance of the Work;
 - c. in the facilities, equipment, materials, services, or site to be furnished by the County;
 - d. directing acceleration in the performance of the Work; or
 - e. directing the Contractor to suspend, delay, or interrupt all or any part of the Work for such period of time as the County may determine to be appropriate for the convenience of the County.
2. Such changes shall be made in accordance with either of the following methods:

- a. By a written Supplemental Agreement ordered by the County (or awarding authority if other than the County) in the manner specified by Public Contract Code Sections 20136, 20137, 20138, or 20145, or other successor statutes.
 - b. By written Change Order, signed by the Director, in the manner and amounts specified by Public Contract Code Section 20142 or its successor statutes.
3. If any change or proposed change under this paragraph causes or would cause an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the Work, whether changed or not changed by any such order, the Contractor may request an equitable adjustment under the terms of this paragraph and under "Construction Schedule," Section 01 32 00. At County's option, the County may negotiate an equitable adjustment for the price and time impact for the proposed changed Work either prior to, or after, directing the Contractor to proceed.
4. In the event the County elects to evaluate a bid prior to directing the Contractor to proceed, the County will issue a notice describing the proposed Change Order in the form of a Request for "Quotations" (RFQ). If the Contractor does not respond within fourteen (14) days after receipt of the notice, or such other time as agreed upon, with an equitable adjustment requested in accordance with Paragraph B.5.(b) under "Equitable Adjustments," the County may issue a Change Order with no change in the Contract Amount or Contract Time. The Contractor shall not proceed with any aspect of the proposed changed Work, or delay, suspend, or interrupt any unchanged Work until the County issues the Change Order.
5. If, in the opinion of the Director, it is in the County's best interest and it is deemed necessary to proceed with a required change in the Contract Documents, and time precludes thorough analysis of the Contractor's proposal, or the parties fail to reach an agreement, the Director may order the Contractor to proceed (Proceed Order) on the basis of a tentative price based on the best estimate available at the time, with the firm price to be determined later. If a Proceed Order is issued, the Contractor shall submit his proposal for the changes in the Work within thirty (30) days after the Proceed Order or completion of the changed Work, whichever is later. All charges arising out of a

Proceed Order are to be documented and verified in a manner acceptable to the Director.

6. In the event that the County requires certain Work to be accomplished and the Contractor fails in the discharge of any or all of his responsibilities described hereinbefore, the County may issue a Unilateral Change Order which is a change order issued by or at the direction of the County without the full and timely agreement of the Contractor.
 - a. A Unilateral Change Order may be issued before, during or after the changed Work is physically accomplished under the following conditions:
 1. The Contractor fails to submit price and/or time extension proposal for the changed Work within thirty (30) days of receipt of the request for "Quotations" or within a reasonable time thereafter as specified by the County.
 2. The Contractor fails or refuses to execute a Change Order by affixing his signature thereto within thirty (30) days of receipt or within a reasonable time thereafter as specified by the County.
 3. The County notifies the Contractor in writing that the Change Order is considered to be unilateral and is to be an effective change to the Contract. A notation will be made on the face of the Change Order that it is unilateral and the effective date thereof. Normal distribution of copies will then be made.
7. Any other written order including direction, instruction, interpretation, or determination from the County that causes a change in the Contractor's obligations may be treated as a proposed Change Order as provided in Part B of this Article, "Constructive Changes."
8. Except as provided in this Article, no order, statement, or conduct of the County shall be treated as a Change Order under this clause or entitle the Contractor to an equitable adjustment.

9. No equitable adjustment request by the Contractor shall be allowed if asserted after Final Payment of the Contract.

B. Constructive Changes

1. Notice: The primary purpose of this paragraph is to obtain prompt reporting of County conduct or changed conditions either caused by an act of God (Public Contract Code Section 7105) or digging trenches or other excavations that extend deeper than four feet below the surface (Public Contract Code Section 7104) that the Contractor considers to constitute a change to this Contract. Except for changes identified as such in writing and signed by the County or the Director, the Contractor shall notify the County in writing within fourteen (14) days from the date of County conduct (including actions, inactions, and written communications) that the Contractor regards as a change to the Contract. On the basis of the most accurate information available to the Contractor, the notice shall state:
 - a. The date, nature, and circumstances of the conduct regarded as a change;
 - b. The name, function, and activity of each Contractor official, agent, or employee involved in or knowledgeable about such conduct;
 - c. The identification of any documents and the substance of any communication involved in such conduct;
 - d. In the instance of alleged acceleration of scheduled performance or delivery, the basis upon which it arose;
 - e. The particular elements of Contract performance for which the Contractor may seek an equitable adjustment under this clause, including:
 1. What specific Contract Drawings or specific sections of the Specifications have been, or may be, affected by the alleged change;
 2. What labor or materials or both have been, or may be, added, deleted, or wasted by the alleged change;

4. Appeals: In the event the Contractor does not agree with the County's response under B.3 above, the Contractor may submit a request to the Disputes Review Board.
5. Equitable Adjustment:
 - a. If the County confirms that the County's conduct effected a change as alleged by the Contractor, the Contract will be modified in writing accordingly in conformance with Part A of this Article, "Written Changes". Except for a proposed change to the Drawings or Specifications, no request for equitable adjustment under this paragraph shall be allowed for any costs incurred more than fourteen (14) days before the Contractor gives written notice under Part B of this Article.
 - b. In the case of a necessary change to the Drawings or Specifications for which the County is responsible, the equitable adjustment shall include the cost and time extension for delay reasonably incurred by the Contractor in attempting to comply with the Drawings or Specifications before the necessary change is identified. When the cost of property made obsolete or in excess as a result of a change confirmed by the County under this paragraph is included in the equitable adjustment, the County will have the right to prescribe the manner of disposition of the property or its proceeds. The equitable adjustment shall not include increased costs or time extensions for delay resulting from the Contractor's failure to provide notice or to continue performance as provided respectively in Paragraphs (1) and (2) above of this part.

C. Compensation for Changes in the Work

1. Changes in the Work issued and signed by the Contractor pursuant to the requirements of this Contract represent and constitute full and final settlement for all costs and time (hereinafter referred to as compensation) associated with the Work (or event) described therein. Compensation is defined to include all direct and indirect labor costs, all material and equipment expenses, and all impact costs related to and/or occasioned by the Work described therein, as well as all taxes, insurance, and profit. It is agreed that the basis of compensation to the Contractor for Work either added or deleted by Changes in the Work shall be determined by one or more of the following methods

below. All amounts for overhead, profit, insurance, and all other direct and indirect costs of the changes in the Work (except for bonds as provided in Paragraph C.2 shall be computed in accordance with percentages set forth in Paragraph C.1.c and C.8.c of this Article.

a. Method A

By unit prices for items of Work scheduled to be done under the unit price provisions of the Contract. The cost or credit for such added or omitted Work shall be determined by multiplying the number of units added to or omitted from the Work by the applicable unit price.

b. Method B

By agreed lump sum. All lump sum quotations prepared by the Contractor shall be supported by legible and itemized cost by trades. The itemized breakdown accompanying the quotation shall quantify all added and deleted labor, material, and construction equipment directly involved. The Contractor must also obtain and furnish with quotation, itemized breakdown(s) as described above, signed by each subcontractor or vendor participating in the change regardless of tier. All labor cost, including associated fringe benefits and insurance costs, shall be verified by certified payrolls and/or standard rates in accordance with the Prevailing Wage Scale.

c. Method C

If neither Method A nor Method B are agreed upon before the changes to the Work are commenced, then the Contractor shall be paid as follows:

The actual cost, documented to the satisfaction of the County, of labor, materials, and equipment furnished by the Contractor and/or the actual cost of subcontractor Work incurred by the Contractor as provided in Paragraph C.8, plus the following percentages which are considered fair and reasonable compensation for overhead, profit, insurance, and all other direct and indirect costs of the Changes in the Work (except for bonds as provided in Paragraph C.2:

- 18% of the cost of labor as provided in Paragraph C.3 where furnished by the Contractor;
- 15% of the cost of materials as provided in Paragraph C.4 where furnished by the Contractor;
- 10% of the actual cost of equipment as provided in Paragraph C.5; and
- 5% of the actual cost of the first tier subcontract Work as provided in Paragraph C.8.

Overhead charges shall include those charges as specified in Paragraph C.3.c below.

d. Unilateral Change Order

1. The terms of a Unilateral Change Order, including the change in Contract price and/or completion date shall, in the County's judgment, be fair and reasonable.
 2. When a Unilateral Change Order has been issued, it will have the full force and effect of a Contract modification. It will be included in schedules, payment applications, reports, and all official records of the Contract. The issuance of a Unilateral Change Order will not prejudice any of the Contractor's rights to make claims or appeal disputed matters under other provisions of the Contract.
 3. If the Contractor objects to a Unilateral Change Order, Contractor shall state, in writing, specific objections to, or specific points of disagreement with, the Work described in the Unilateral Change Order within thirty (30) days of receipt of such Change Order.
2. To the total additional cost of the Work as computed by any of the three above methods, the Contractor may add, upon furnishing to the County satisfactory evidence of the cost thereof, the actual cost of additional bond premiums incurred by the Contractor as a result of the additional cost to the Work up to a sum not to exceed 1.5 percent (1.5%) of the additional cost to the Work.

3. Labor: The cost of labor used in performing the Work, whether the employer is the Contractor, Subcontractor, or other forces, will be the sum of the following:
 - a. The gross actual wages paid including income tax withholdings but not including any employer payments to or on behalf of the workmen for health and welfare, pension, vacation, insurance, and similar purposes.
 - b. To the actual gross wages, as defined above, a percentage will be applied based upon current applicable labor rates concerning payments made to or on behalf of workmen other than actual wages. This percentage shall constitute full compensation for all payments other than actual gross wages as specified below. The Contractor shall compute a separate percentage for each craft, or a composite percentage for all crafts if so approved by the County. All computed percentages shall be submitted to the County for approval within thirty (30) days after receipt of Notice to Proceed with the changes to the Work or as directed by the County prior to any changed Work being performed.
 - c. The charges for labor shall include all classifications through foremen when engaged in the actual and direct performance of the Work. They shall not include charges for such overhead personnel as superintendents, assistant superintendents, office personnel, timekeepers, and maintenance mechanics.
4. Materials: The cost of materials required for the accomplishment of the Work shall be the delivered cost to the purchaser, whether Contractor, subcontractor, or other forces, from the supplier thereof, except as the following are applicable:
 - a. If cash trade discount by the actual supplier is offered or available to the purchaser, it shall be credited to the County if such discount was taken.
 - b. If materials are procured by the purchaser by any method which is not a direct purchase from and a direct billing by the actual supplier, to such purchaser, the cost of such materials, including handling, shall be deemed to be the price to the actual supplier as determined by the County.

- c. If the materials are obtained from a supply or source owned wholly or in part by the purchaser, payment therefore will not exceed the lesser of the price paid by the purchaser for similar materials furnished from said source on Contract items or the current wholesale price for such materials delivered to the worksite, whichever price is lower.
 - d. The cost of such materials shall not exceed the lowest current wholesale price at which such materials are available in the quantities concerned, delivered to the job site, less discounts as provided in Subparagraph 4.a.
 - e. If the Contractor does not furnish satisfactory evidence of the cost of such materials from the actual supplier thereof, the cost shall then be determined in accordance with Subparagraph 4.d.
5. Equipment: Equipment rented/leased by the Contractor or subcontractor and utilized on this project for the purposes of this Article shall be paid for on the basis of arms-length rental agreements entered into and invoices paid by the Contractor or subcontractor for that equipment. These invoices shall be submitted as evidence of the expense incurred.
- a. The Contractor or subcontractor shall be paid for the use of owned equipment at prices for the use of machinery and equipment determined by using 80 percent (80%) of equipment use costs published by the Associated Equipment Distributors, which edition is in effect at the time of the change. Contractor or subcontractor-owned equipment required to be on stand-by or to be present on the site, even though idle, shall be paid for at 50 percent (50%) of the owned equipment rate established above.
 - b. The Contractor or subcontractor shall furnish all data which might assist the County in the establishment of such rates.
 - 1. Operators of equipment will be paid for as provided under Subparagraph C.3 above.

2. All equipment shall be in good working condition and suitable for the purpose for which the equipment is to be used. Contractor is responsible for any necessary repairs and ongoing maintenance of said equipment.
 3. Unless otherwise specified, manufacturer's ratings and manufacturer modifications shall be used to classify equipment for the determination of applicable equipment rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer.
 4. Individual pieces of equipment or tools having a new value of five hundred dollars (\$500.00) or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefore.
6. Equipment Located at the Site: The time to be paid for equipment located at the site shall be the time the equipment is required for the changed Work being performed. Moving time, loading, unloading, and hauling will not be paid for if the equipment is already located at the Site.
7. Equipment Not Located at the Site: For the use of equipment moved to the Site and used exclusively for changed Work, the Contractor will be paid the rates hereinbefore specified, as follows:
- a. The period shall begin at the time the equipment is unloaded at the site; shall include each day that the equipment is at the site, excluding Saturdays, Sundays, and other legal holidays unless the changes to the Work are performed on such days; and shall terminate at the end of the day on which the County directs the Contractor to discontinue the use of such equipment. The maximum time to be paid per day will not exceed eight (8) hours without prior written approval from the Director.
 - b. Payment for transporting, loading, and unloading equipment will be made only when such equipment has been moved to the site for the sole and express purpose of accomplishing the changed Work.

8. Subcontracts: The cost for Subcontract work will be the actual cost to the Contractor or subcontractor for Work performed by a Subcontractor as follows:
- a. The cost incurred by the first tier subcontractor for labor, materials, and equipment as limited by Paragraphs C.3, C.4, and C.5; plus
 - b. The following percentages which are considered fair and reasonable compensation for overhead, profit, insurance and all other direct and indirect costs of the changes in the Work (except for bonds as provided in Paragraph C.2:
 - 18% of the cost of labor as provided in Paragraph C.3;
 - 15% of the cost of materials as provided in Paragraph C.4;
 - 10% of the cost of equipment as provided in Paragraph C.5.
 - c. To the total additional cost to the Work as computed in accordance with Paragraphs 8.a and 8.b above, the subcontractor, upon furnishing satisfactory evidence of the cost thereof, the actual cost of additional bond premiums incurred by the Subcontractor as a result of the additional cost to the Work up to a sum not to exceed 1.5 percent (1.5%) of the additional cost to the Work.

16. PROVISIONS FOR EXTRAS:

No new Work of any kind performed hereunder shall be considered as extra Work outside the scope of the Contract unless a separate estimate is given for said Work before it is commenced, the same is approved by the Department as reasonable and equitable, and it has been ordered under one of the three methods set forth in article, "CHANGES IN THE WORK," Paragraphs A, B, or C. Except for extra Work ordered by the Department according to unit prices or by changes or additions in the Work embraced in a Change Order issued by it, any extra Work performed will not be paid for by the County. The Contractor will prepare and submit change order requests as directed by the County Project Manager.

17. TIME EXTENSIONS AND COMPENSATION FOR DELAY:

- A. Adjustments in the Contract Time shall be governed by the principles of this Article and shall be made in accordance with the conditions stated in Specification Section 01 32 00, Construction Schedule.
- B. Actions or inactions of the County, or events for which the County has assumed contractual responsibility, which would independently delay the date of Substantial Completion beyond the current Contract Completion Date shall be designated as Compensable delays.
- C. Events which are outside the control of, and without the fault or negligence of either the County or the Contractor, which would independently delay the date of Substantial Completion beyond the current Contract Completion Date shall be designated as Excusable delays. Unless the County considers that extreme circumstances warrant consideration, extensions of time because of inclement weather will not be granted.
- D. Actions or inactions of the Contractor, or events for which the Contractor has assumed contractual responsibility, which would independently delay the date of Substantial Completion beyond the current Contract Completion Date shall be designated as non-excusable delays.
- E. Concurrent delay is any combination of the above three types of delay occurring on a calendar date, except in cases where the combination consists of two or more instances of the same type of delay occurring on a calendar date.
- F. Any event, action, inaction, or other cause which may give rise to a delay shall constitute a basis for adjustment in:
 - 1. Contract Time, only if it can be demonstrated that the date of Substantial Completion will be delayed beyond the current Contract Completion Date and that the delay is classified as a Compensable or Excusable delay; and/or
 - 2. Contract Amount, only if it can be demonstrated that the Contractor's time-related costs to complete the Work will be increased and the delay is classified as a Compensable delay.

18. OBSERVATION:

- A. All Work shall meet with the approval of the Department and shall be completed in conformity with the Drawings and Project Manual approved by, and on file with, the Los Angeles County Board of Supervisors, such Drawings and the Project Manual will be made part of the Contract to be entered into for the Work referred to herein. The County at its discretion may require the contractor to obtain approval/clearance from the Inspector of Record for certain items to ensure the quality of the work.
- B. The Department or its representative will have access to the Work at all times. The Contractor will furnish all facilities for inspection at the construction site, and at shops or yards, and shall not cover up any Work until the same has been approved by the Department. If Work should be covered up before being inspected, the Contractor will be required to remove such portions of the Work as may be necessary to disclose the part in question.
- C. The County of Los Angeles or its authorized representatives will be given access to the Work at all times. Such access will not be subject to restrictions which are not directly related to the provision and maintenance of health and safety.
- D. The Contractor will be issued a "Notice of Noncompliance" for any portion of the contract Work that does not satisfy the requirements of the Drawings and Specifications. No Work subject to a "Notice of Noncompliance" will be paid for by the County until such Work is brought into full compliance with the Drawings and Specifications to the satisfaction of the County. The Contractor must obtain the County's approval for all corrected deficiencies and/or non-compliant work prior to proceeding with work that may be affected by the deficient and/or non-compliant work. The Contractor shall not build on or conceal work that is deficient and/or non-compliant. Furthermore, work that is built or dependent upon item(s) that are deficient and/or not-compliant will not be approved on the progress payment request.
- E. An Inspection Notice will be issued if the contract Work has not been executed in full compliance with the Drawings and Specifications. The Contractor is responsible for bringing all Work subject to an Inspection Notice into full compliance with the Drawings and Specifications at no additional cost to the County.

- F. Technical Reports may be generated for the purpose of evaluating the quality, correctness, functionality, etc., of the Contractor's Work or performance under this contract in accordance with the requirements of the Drawings and Specifications.

19. PERMITS, LICENSES, AND INSPECTIONS:

- A. The Contractor will obtain and pay for all permits required for the Work except the following "no-fee" permits: building, electrical, mechanical, plumbing, and sewer Work. Further, the Contractor will obtain and pay for all permits incidental to the Work or made necessary by Contractor's operation. This includes Contractor/Manufacturer designated structures such as prefabricated buildings, light poles, special shoring, and the like. The Contractor shall also pay for the plan check of prefabricated buildings.
- B. To comply with Section 3800 of the Labor Code of the State of California, the Contractor and all Subcontractors requiring a permit (building, plumbing, grading, electrical, etc.) shall file a Workers' Compensation Certificate with the Department of Public Works, Business Relations and Contracts Division, Contracts Administration Section.
- C. Exclusive of off-site inspection specified to be the County's responsibility, the Contractor will arrange and pay for all off-site inspection of the Work including certification thereof required by the specifications, drawings, or by governing authorities.
- D. The County will provide on-site inspection of the Work and will arrange for off-site inspection when noted on the drawings and/or when specified in the various technical sections of the Specifications as the responsibility of the County. All other required inspection will be the responsibility of the Contractor.
- E. The County will not pay any costs for licenses required in the performance of the Work. The Contractor shall assume this responsibility in total.

20. TESTS:

A. County's Responsibilities

- 1. The County reserves the right to test or require the Contractor to obtain "called tests" of any materials or performance over and above "required tests" as defined in the following Paragraph B.1, and

provided such "called tests" show the Work meets the specified requirements, the County will pay for the cost of the tests. If the Contractor was required to obtain the test from a third party, the County will reimburse the Contractor on the basis of Contractor's certified statement of the results and costs, with appropriate supporting documentation.

B. Contractor's Responsibilities

1. The Contractor will arrange and pay for all tests of materials or performance as required by the Specifications or by ordinance or governing authority. These are defined as "required tests".
2. The Contractor shall pay for all "called tests" as defined in preceding subparagraph A.1, when the test results show the materials or performance fails to meet the specified requirements. Immediately thereafter, the Contractor, at Contractor's own expense, shall remove the improper Work and replace same with materials or performance meeting the specified requirements. The Contractor shall also bear the expense of any tests required of the replaced Work, and of any subsequent removal, replacement, and testing as may be necessary to obtain materials or performance meeting the specified requirements.

21. SUBSTANTIAL COMPLETION:

- A. The date of Substantial Completion of the Work, or designated portion thereof as set forth in the Contract Documents, is the date certified by the County when construction is sufficiently complete, in accordance with the Contract Documents, so the County may occupy or use the Work, or designated portion thereof, for the use for which it is intended.
- B. When the Contractor considers that the Work, or designated portion thereof as set forth in the Contract Documents, is substantially complete as defined above, the Contractor shall prepare for submission to the County a list of items to be completed or corrected. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. When the County determines that the Work or designated portion thereof is substantially complete, it will issue a Certificate of Substantial Completion which shall establish the date of Substantial Completion. The Certificate shall state the responsibilities of the County and the Contractor for security, maintenance, heat, utilities, damage to the Work, and insurance, and shall list remaining items to be corrected or

completed. The Work not fully completed or corrected shall be completed to the satisfaction of the County within thirty (30) calendar days after Substantial Completion, or within a period of time mutually agreed upon between the Contractor and the County. In the event the Contractor fails to complete or correct the remaining items within the allotted time, the County may complete or correct the items and deduct the cost thereof from the Contract amount.

- C. Warranties required by the Contract Documents, as discussed in Article 40 of the General Conditions, shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.
- D. Upon Substantial Completion of the Work or designated portions thereof, and upon application of the Contractor, the County, in County's sole discretion, may release and/or reduce the amounts retained subject to the limitations of Public Contract Code Section 9203.
- E. In accordance with the General Conditions, the County reserves the right to occupy substantially completed portions of the Work and any such portion shall be subject to the above provisions for Substantial Completion.

22. OCCUPANCY BY THE COUNTY:

- A. The Contractor, Contractor's employees, and representatives will be admitted by the County to the premises for the purpose of executing the Work to be performed under this contract, but they shall have no tenancy.
- B. It is further understood that the County shall have the right to take temporary possession of, or use any portion of, any substantially completed part of the Work. Before taking possession of any Work, the County shall furnish the Contractor a list of items of Work remaining to be performed or corrected on those portions of the Work that the County intends to take possession of or use. However, a failure of the County to list any item of Work shall not relieve the Contractor of responsibility for complying with the terms of the Contract. The County's possession or use shall not be deemed an acceptance of any Work under the Contract.
- C. While the County has such possession or use, the Contractor shall be relieved of the responsibility for the loss of, or damage to, the Work in place resulting from the County's possession or use. If prior possession or use by the County delays the progress of the Work or causes additional expense to the Contractor, an adjustment may be made in the Contract Amount or the

Contract Time, under the applicable scheduling and cost provisions of this Contract.

23. WORKERS:

None but workers skilled in the various trades required on this contract shall be employed upon the Work. Any mechanic or laborer employed upon the Work who, in the opinion of the Department, is non-cooperative or who shall prove careless or incompetent, shall be immediately removed from the Work by the Contractor, when notified to do so, and shall not be re-employed upon the Work.

24. HOURS OF WORK:

Work in excess of eight (8) hours per day will be permitted by employees of contractors under this Contract only so long as Section 1815 of the Labor Code of California is complied with by such contractors.

25. SATURDAY, SUNDAY, HOLIDAY, AND OVERTIME WORK:

A. No construction Work shall be done on Saturdays, Sundays, or holidays recognized by the County government and no Work shall be performed outside of normal Working hours without the consent of the Department, unless required under these specifications. In any event, all Work shall be subject to approval of the Department. Prior to the start of such Work, the Contractor shall arrange with the Department for the continuous or periodical inspection of the Work and tests of materials, when necessary. If requests are made by contractors for permission to Work overtime, nights, Saturdays, Sundays, or holidays, and such requests are granted, the Contractor shall bear all extra expense to the County or the awarding entity for inspection and other incidental expenses caused by such overtime work. If Contractor is requested, in the interest of the awarding entity, to work overtime by the Department; or if overtime Work is specifically required by these Specifications, all extra expense of inspection will be paid by the County. Should the Contractor find it necessary in order to complete the Work according to schedule to perform certain of Contractor's operations on Saturdays, Sundays, holidays or overtime, these operations shall be performed as part of the Work included in the contract price and shall not constitute a basis for additional payments. Refer to above paragraph for the obligations for the Contractor to assume the cost of inspections.

B. The County reserves the right to order in writing Work outside of normal working hours to avoid inconvenience of occupants of existing facilities or to

perform special operations that, in the judgment of the Department best serve the intent of the Contract Documents and the orderly prosecution of the Work. If the County elects to order Work outside of normal working hours, the Contractor shall make all arrangements to supply an adequate Work force for the task to be accomplished and will be compensated for the premium portion of the wages paid, plus labor burdens applicable to the premium portion only of the wages paid. Contractor shall submit copies of Contractor's payrolls indicating the premium wages actually paid, and the County will issue a Change Order to reimburse the Contractor for Contractor's actual costs only.

26. PREVAILING WAGE SCALE:

- A. The Contractor shall comply with all provisions of the Labor Code of the State of California.
- B. Under the provisions of said Labor Code, the State Department of Industrial Relations will ascertain the prevailing hourly rate in dollars and details pertinent thereto for each craft, classification or type of workers, or mechanic needed to execute any contract which may be awarded by the awarding entity.
- C. Particulars of the current Prevailing Wage Scale, which are applicable to the Work contemplated under these Specifications, are filed with the awarding entity and the Department and must be posted at the project site.

27. EMPLOYMENT OF INDENTURED APPRENTICES:

- A. Contractor shall comply with Section 1777.5 and 1777.7, Labor Code, State of California.
- B. All Contractors shall employ registered apprentices at a ratio of not less than one hour of apprentice's work for every five hours of labor performed by a journeyman. Contractors shall be responsible for the compliance of all Subcontractors.
- C. Contractor and Subcontractors shall keep an accurate record showing the name of the craft and wage rate of each apprentice and journeyman employed by each entity. Subcontractor shall provide, weekly, such records to the Contractor. Records shall be made available to the Division of Apprenticeship Standards and the County of Los Angeles or the awarding entity, for the purpose of determining compliance. Failure to comply may

result in withholding payments and other penalties as provided by the Labor Code.

28. AFFIRMATIVE ACTION PLAN FOR EQUAL EMPLOYMENT OPPORTUNITY:

- A. The following provisions pertaining to equal employment opportunity are incorporated into this Contract. All references herein to "Contractor" shall be deemed to refer to the "general" Contractor.
- B. During the performance of any construction Contract in excess of \$10,000, the Contractor agrees as follows:
 - 1. The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor certifies and agrees that all persons employed by such firm, Contractor's affiliates, subsidiaries, or holding companies are, and will be, treated equally by the firm without regard to or because of race, color, religion, sex, or national origin and in compliance with all anti-discrimination laws of the United States of America and the State of California.
 - 2. In all advertisements for labor or other personnel, or requests for employment of any nature, the Contractor shall state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.
 - 3. The Contractor shall deal with Contractor's Subcontractors without regard to or because of race, color, religion, sex or national origin.
 - 4. The Contractor shall comply with current Federal employment and reporting requirements for County-funded construction contracts. Specifically, the Contractor shall make a good faith effort to comply with federal employment goals for minority and female employment and shall report minority and female employment data in a timely manner on the federal form provided by the contract awarding authority.
 - 5. The Contractor shall send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract of understanding, a notice, to be provided by the contract

awarding authority, advising the said labor union or workers' representative of the Contractor's commitments under this section.

6. The Contractor shall allow the County access to Contractor's employment records during regular business hours to verify compliance with these provisions when so requested by the County.
7. The Contractor agrees that if the County finds that any of the above provisions has been violated, the same shall constitute a material breach of contract upon which the County may determine to cancel, terminate, or suspend the Contract. While the County reserves the right to determine independently that the anti-discrimination provisions of the Contract have been violated, in addition, a determination by the Federal Equal Employment Opportunity Commission or the California Fair Employment and Housing Commission that the Contractor has violated federal or state anti-discrimination laws may constitute a finding by the County of Los Angeles that the Contractor has violated the anti-discrimination provisions of the Contract.
8. At County's option, and in lieu of canceling, terminating, or suspending the Contract, the County may impose damages for any violation of the anti-discrimination provisions of this paragraph, in the amount of two hundred dollars (\$200) for each violation found and determined. The County and Contractor specifically agree that the aforesaid amount shall be imposed as liquidated damages, and not as a forfeiture or penalty. It is further specifically agreed that the aforesaid amount is presumed to be the amount of damages sustained by reason of any such violation, because, from the circumstances and the nature of the violation, it is impracticable and extremely difficult to fix actual damages.
9. The Contractor shall include the provisions of the foregoing Paragraphs B.1. through B.8. in every subcontract, so that such provisions will be binding upon each Subcontractor performing Work required by this contract.

29. PAYROLL RECORDS:

- A. The Contractor shall comply with the requirements of Section 1771.4 and Section 1776 of the Labor Code, State of California. The Contractor and its subcontractors shall furnish the records specified in Section 1776 directly to the Labor Commissioner in an electronic format, in the manner prescribed by

the Labor Commissioner, on the Department of Industrial Relations website. The Contractor and its subcontractors shall maintain payroll records as enumerated in Labor Code Section 1776 (a). When requested by the County, the Contractor and its subcontractors shall submit to the County a copy of all weekly certified payrolls, indicating that the wage rates are not less than those determined by the State of California Department of Industrial Relations and the classifications set forth for each laborer or mechanic conform with the Work they performed. Contractor shall submit a weekly payroll report" (Form 347, A-1-131, or similar) shall accompanied by a written declaration, made under penalty of perjury. The Contractor shall be responsible for the submission of copies of payrolls for all subcontractors within ten (10) days after their payroll period. Failure of the Contractor to comply with the Labor Code requirements to pay prevailing wages and to maintain certified payroll records may result in withholding from progress payments amounts for underpaid wages and penalties as authorized by the Labor Code.

- B. When requested by the County, the Contractor, all subcontractors, and some subconsultants will be required to submit certain certified payrolls and labor compliance documentation electronically at the discretion of, and in the manner specified by the County.

Electronic submittal will be a web-based system, accessed on the World Wide Web by a web browser. The Contractor, its subcontractors, and certain subconsultants will be given a log on identification and password to access the web-based labor compliance reporting system.

Use of the web-based system will entail additional data entry of weekly payroll information including; employee identification, labor classification, total hours worked and hours worked on this project, wage and benefit rates paid, etc. In addition, the Contractor may use payroll and accounting software that is capable of interfacing with the web-based system. The payroll and accounting software must be capable of generating a 'comma delimited file' or 'comma separated value (CSV) file' that will interface with the web-based system.

This requirement applies to all subcontractors, subconsultants, and vendors required to submit certified payrolls and provide labor compliance documentation. The information may be used to provide statistical informational data to public or jurisdictional agencies.

30. QUALITY OF WORK AND MATERIAL:

- A. All materials, parts, and equipment furnished by the Contractor shall be new, first quality, and free from defects and imperfections. Workmanship shall be in accordance with the best standard practices.
- B. Any item or Work installed by the Contractor, but not in conformance with the drawings and specifications, shall be removed by and at the Contractor's expense upon written request from the County.
- C. If such items or Work are not removed or satisfaction obtained by the County within thirty (30) calendar days of such request, then the County may have such items or Work removed and Work completed to conform to drawings and specifications at the Contractor's expense.

31. RESPONSIBILITY OF CONTRACTOR AND OF CONTRACTOR'S REPRESENTATIVE ON THE WORK:

The Contractor shall give personal attention and supervision to the Work until same is entirely completed. In the absence of the Contractor from the Work, he shall have a representative in charge who shall be competent to superintend and direct the progress of the Work and who shall be authorized to receive instructions and to act for the Contractor on all matters related to the Work. The name of this representative shall be sent by letter to the Department immediately after the awarding of the contract.

32. REPAIRING DAMAGED WORK:

- A. All portions of the Work that may be damaged by accident or in the course of or on account of building operations, or by reason of any other cause whatsoever during the progress of the Work, shall be carefully and neatly repaired or reconstructed and the whole left in first-class condition and turned over to the County ready for use.
- B. Should any part of the Work of this contract be cut into or damaged by other Contractors, the Contractor and party causing such damage shall make adjustments between themselves relative to reconstruction or repairs and payment for same.

33. LIST OF SUBCONTRACTORS AND SUBLETTING WORK:

- A. No part of the construction Work shall be done as piece Work, nor shall it be let to a Subcontractor after the execution of the original contract except as provided by law. In case part of the Work should be sublet, these General

Conditions shall govern each trade insofar as they may apply to the Work of that trade.

- B. Where more than one Contractor or where Subcontractors are engaged upon the Work, they shall coordinate their efforts (in accordance with Article 36 of these General Conditions regarding other contractors, or under the control and guidance of the General Contractor), and shall be responsible, one to the other, for any damage or injury to the work.
- C. Bidders and Contractor shall be governed by the provisions of Sections 4100 to 4113, inclusive, of the Public Contract Code of the State of California. Bidders shall set forth in their Bids, on forms provided for same, the name and location of the mill, shop, or office of each Subcontractor who shall perform the Work or labor or render service to the Contractor in or about the construction of the Work, and the portion of the Work which shall be done by each Subcontractor.
- D. No subcontract shall be assigned or transferred except as provided in the above sections of the Public Contract Code of the State of California.
- E. In case any Work is let to a Subcontractor, the Contractor shall be at all times responsible for the Work so done to same extent as if the Contractor were doing or had done the Work.
- F. If a Subcontractor is named who shall perform the Work or labor or render service to the Contractor with respect to a material specified or indicated by patent or proprietary name and/or by the name of the manufacturer, and such Subcontractor cannot reasonably act with like respect to the material offered as an equal then, the Bidder shall, in his Bid Form, include with the pertinent data to be listed on the "Equals" page(s), the name and address of the Subcontractor who shall act with respect to the equal material.
- G. In accordance with Public Contract Code Sections 4100, et seq., the Bidder must list all subcontractors who shall perform in excess of one-half of one percent of the Work. (See Subcontractors' Section of the Instructions to Bidders.)

34. ADVERTISING:

No advertising matter shall be attached or painted on surfaces of buildings, fences, or canopies, except that names of Contractors and Subcontractors, with their addresses and the designation of their particular branch, may be shown on signs of

a removable type. Size and location of such signs shall be subject to approval of the Department. The Contractor shall provide a project identification signboard as specified.

35. CERTIFICATE AS TO COMPLIANCE WITH CERTAIN REGULATIONS:

- A. The Contractor shall file with the Department, prior to the acceptance of the Work, a certificate in form, substantially as follows:
- B. I (We) hereby certify that all Work has been performed and materials supplied in accordance with the drawings, specifications, and contract documents for the above Work, and that:
 - 1. Not less than the prevailing rates of wages as ascertained by the Department has been paid to laborers, workers, and mechanics employed on this Work.
 - 2. There have been no unauthorized substitution of Subcontractors; nor have any unauthorized subcontracts been entered into.
 - 3. No subcontract was assigned or transferred or performed by anyone other than the original Subcontractor; except as provided in Sections 4100-4113, inclusive, of the Public Contract Code.

(Signed) _____
Contractor

36. COORDINATION WITH OTHERS AND OTHER CONTRACTS:

- A. The County reserves the right to award other contracts for any Work on any portion of the project not included in this Contract.
- B. Where coordination with other Contractors is required, the Contractor shall make the appropriate provisions in Contractor's CPM schedule for the access to the site by those Contractors, the schedules of Work developed by them, and any coordination required between any of those Contractors and between any of them and this Contractor.
- C. The Contractor shall perform the Work of the Contract so that it will properly coordinate and fit the Work performed by other Contractors. He shall give the other Contractors every reasonable opportunity to perform their Work, store materials, and place equipment thereof, and fit their Work to the Work of other Contractors. They shall furnish to the other Contractors all

information necessary in order that they may properly connect and fit their Work to Contractor's in ample time, so that they may have reasonable opportunity to prepare their Work therefore. They shall make the Work of this Contract ready to receive the Work of the other Contractors at the time fixed thereof, and shall fit this Work to that of the other Contractors at the time fixed therefore.

- D. The Contractor shall cooperate with others in the prosecution of all Work and shall not interfere with material, equipment, or workers of the County or other Contractors engaged by the County at the site of the Work.
- E. All Contractors engaged in Work at the site shall have, insofar as practical, equal use of the premises and facilities. In case of disagreement regarding such use, the matter shall be referred to the Department, whose decision relative to said use shall govern.
- F. If any part of the Contractor's Work depends on proper execution or results upon the Work of any other separate Contractor, the Contractor shall inspect and promptly report to the Director any apparent discrepancies or defects in such Work that render it unsuitable for such proper execution and results. Failure of the Contractor to inspect and report shall constitute an acceptance of the other contractor's Work as fit and proper to receive the Contractor's Work, except as to defects which may develop in the other separate contractor's Work after the execution of the Contractor's Work.
- G. Should the Contractor cause damage to the Work or property of any separate Contractor on the project, the Contractor shall, upon due notice, settle with such other Contractor by agreement or arbitration if it will so settle. If such separate Contractor sues the County or initiates an arbitration proceeding on account of any damage alleged to have been so sustained, the County shall notify the Contractor who shall defend such proceedings at the Contractor's expense, and if any judgment or award against the County arises therefrom, the Contractor shall pay or satisfy it and shall reimburse the County for all attorney's fees and court or arbitration costs which the County has incurred.

37. CONTRACTOR'S CONSTRUCTION EQUIPMENT:

The Contractor shall furnish and maintain all equipment such as stairs, ramps, runways, scaffolds, hoists, etc., required for the proper execution of the Work. All such equipment and construction shall meet all requirements of all ordinances and laws applicable thereto.

38. CONTRACTOR PERSONNEL:

- A. The Contractor agrees to employ only orderly and competent workers, skillful in the performance of the type of Work required under this Contract, to do the Work and agrees that whenever the County informs the Contractor in writing that any workers on the Site are incompetent or disorderly, such Worker shall be discharged from the Work and shall not again be employed on the Work without the County's written consent.
- B. The Contractor shall give adequate attention to the faithful prosecution and completion of this Contract and shall keep on the Site at all times during project's progress, competent personnel superintendent and any necessary assistants to supervise and direct the Work. Grounds for removal of Contractor personnel specifically include (but is not limited to) the failure or refusal of such personnel to adhere to the Contractor's planned Construction Schedule as developed by the Contractor under Section 01 32 00.

39. AUDITS AND RECORDS:

The Contractor shall maintain all data and records pertinent to the Work performed under this Contract, in accordance with generally accepted accounting principles, and shall preserve and make available all data and records until the expiration of four (4) years from the date of final payment under this Contract, or for such longer period, if any, as is required by applicable statute or by other articles of this Contract. The authorized representatives of the County shall have access to all such data and records for such time period to inspect, audit, and make copies thereof during normal business hours. Contractor covenants and agrees that it shall require that any subcontractor utilized in the performance of this Contract shall permit the authorized representatives of the Los Angeles County Department of Public Works to similarly inspect and audit all data and records of said Subcontractors relating to the performance of said Subcontractors under this Contract for the same time period.

40. WARRANTY AND CORRECTIONS TO WORK:

- A. In addition to any other warranties in the Contract Documents, the Contractor warrants that Work performed under this Contract conforms to the Contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any Subcontractor or supplier at any tier.

- B. Corrections to the Work may be required during construction or any applicable warranty period. At the County's option, the cost of such corrections may be withheld from progress payments.
- C. This warranty shall continue for a period of one (1) year from the date of Substantial Completion of the Work. If the County takes occupancy of any part of the Work before Substantial Completion, a warranty covering that specific portion of the Work shall begin for a period of one year from the date the County takes beneficial occupancy. The County will notify the Contractor in writing of the scope of any partial occupancy and the specific items under warranty.
- D. The Contractor shall remedy at the Contractor's expense any failure to conform to the requirements of the Contract Documents or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to County-owned or controlled real or personal property, when that damage is the result of:
 - 1. The Contractor's failure to conform to or comply with Contract requirements; or
 - 2. Any defect of Contractor-furnished equipment, material, workmanship, or design.
- E. The Contractor shall restore any Work damaged in fulfilling the terms and conditions of this Article. The Contractor's warranty with respect to Work repaired or replaced shall be extended for one (1) year from the date of repair or replacement.
- F. The Director shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.
- G. If the Contractor fails to remedy any failure, defect, or damage within ten (10) working days (or immediately in the case of an emergency where delay would cause serious risk of loss or damage) after receipt of notice, the County shall have the right to remove, replace, repair, or otherwise remedy the failure, defect, or damage, and all direct and indirect costs of such removal, replacement, repair, and correction, including compensation for additional professional services, shall be paid by the Contractor.
- H. With respect to all warranties, express or implied, from Subcontractors, manufacturers, or suppliers for Work performed and materials furnished under this contract, the Contractor shall:

1. Obtain all warranties that would be given in normal commercial practice;
 2. Require all warranties to be executed, in writing, for the benefit of the County, if directed by the Director; and
 3. Enforce all warranties for the benefit of the County, if directed by the Director.
- I. In the event the Contractor's warranty has expired, the County may bring suit at County's expense to enforce a Subcontractor's, manufacturer's or supplier's warranty.
- J. Unless a defect is caused by the Contractor or Subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the County, nor for the repair of any damage that results from any defect in County-furnished material or design.
- K. This warranty shall not limit the County's rights under other articles of this Contract or as provided by law with respect to latent defects, gross mistakes, or fraud.
- L. The terms of this Article do not relieve the Contractor of any legal liability for defects discovered after one year from the date of occupancy. The obligations imposed by this article shall survive termination of the Contract.

41. HAZARDOUS MATERIAL

- A. Hazardous Material is any product, substance, chemical, crude oil (or any products, by-products, or fractions thereof), whose nature, quantity, and/or intensity of existence, use, manufacture, disposal, transportation, spill, release or effect, either by itself or in combination with other material or materials in, on or about the project site: (a) is or becomes potentially injurious to the public health, safety or welfare, environment, or the project site; (b) is or becomes regulated or monitored by any governmental authority; or (c) may, according to statutory or common law theory, such as nuisance (public or private), waste, trespass, negligence, strict liability, or tort, be a basis for liability in tort, or be a basis for liability to third parties.

- B. Contractor shall notify the County when the Contractor has reason to suspect the presence of any Hazardous Material on the project site, whether or not such material was generated by Contractor or the County.
- C. In the event the presence of hazardous material is suspected or discovered on the project site, the County shall retain an independent testing laboratory to determine the nature of the material encountered and whether corrective measures or remedial action is required.
- D. Except as may be otherwise provided herein, the Contractor shall not be obligated to commence or continue Work in the affected area until any known or suspected hazardous material discovered on the project site has been removed, or rendered or determined to be harmless by the County, as certified by an independent testing laboratory and approved by the appropriate government agency.
- E. In the event the presence of hazardous materials on the project site is not caused by the Contractor, the County shall pay for all costs of testing and remediation, if any, and shall compensate Contractor any additional costs incurred or project delay in accordance with the applicable provisions of changes in the work herein. In addition, the County shall defend indemnify and hold harmless the Contractor and its agents, officers, directors and employees from and against any and all claims, damages, losses, costs, and expenses incurred in connection with or arising out of relating to the performance of the Work in the area affected by the hazardous material.
- F. In the event the presence of hazardous materials on the project site is caused by the Contractor, the Contractor shall pay for all costs of testing and remediation, if any, and shall compensate the County for any additional costs incurred as a result of Contractor's generation of hazardous material on the project site. In addition, the Contractor shall defend, indemnify, and hold harmless the County and its Special Districts and agents, officers, and employees from and against any and all claims, damages, losses, costs, and expenses incurred in connection with, or arising out of, or relating to, the presence of hazardous material on the project site.
- G. The terms of this hazardous material provision shall survive the completion of the Work and/or any termination of this Contract.

42. CONTRACTOR SAFETY REQUIREMENTS:

In the performance of this Contract, the Contractor shall comply with all applicable federal, state, and local laws governing safety, health, and sanitation.

- A. **Jobsite Safety:** The Contractor shall be solely responsible for ensuring that all work performed under the Contract is performed in strict compliance with all applicable Federal, State and local occupational safety regulations. The Contractor shall provide at its expense all safeguards, safety devices, and protective equipment, and shall take any and all actions appropriate to providing a safe jobsite.

- B. **Project Safety Official:** The Contractor shall designate in writing a Project Safety Official who shall be at the jobsite at all times, and who shall be thoroughly familiar with the Contractor's Injury and Illness Prevention Program (IIPP) and Code of Safe Practices (CSP). The Project Safety Official shall be available at all times to abate any potential safety hazards and shall have the authority and responsibility to shut down an operation, if necessary. Failure by the Contractor to provide the required Project Safety Official shall be grounds for the County to direct the cessation of all work activities and operations at no cost to the County until such time as the Contract is in compliance.

- C. **Safety Indemnification:** To the extent allowed by law, the Contractor agrees to defend, indemnify and hold harmless the County and its officers, employees, and agents from and against any and all investigations, complaints, citations, liability, expense (including defense costs and legal fees), claims and/or causes of action for damages of any nature whatsoever, including but not limited to injury or death to employees of the Contractor, its subcontractors or County attributable to any alleged act or omission of the Contractor or its subcontractor which is in violation of any CAL/OSHA regulation. The obligation to defend, indemnify and hold harmless includes all investigations and proceedings associated with purported violations of Section 336.10 of Title 8 of the California Code of Regulations pertaining to multi-employer work sites. The County may deduct from any payment otherwise due the Contractor any costs incurred or anticipated to be incurred by the County, including legal fees and staff costs, associated with any investigation or enforcement proceeding brought by CAL/OSHA arising out of the Project.

43. INDEMNIFICATION:

- A. Until the Work is completed and accepted by the awarding entity, the Contractor shall indemnify, defend, and hold harmless the County, its Special Districts, elected and appointed officials, officers, employees, agents, and trustees (the indemnified parties) from and against any and all liability, loss, injury, or damage including (but not limited to) demands, claims, actions,

fees, costs and expenses (including attorney and expert witness fees) arising from or connected with the Contractor's acts and/or errors and omissions arising from and/or relating to the Project. This indemnification does not apply to liability caused by the active negligence of the County.

- B. The Contractor shall assume all risks and bear all cost for loss of, damage to, or missing or stolen equipment, tools, vehicles, and materials owned, hired, leased, or used by the Contractor for this Project.

44. GENERAL INSURANCE REQUIREMENTS:

Without limiting the Contractor's indemnification, the Contractor shall provide and maintain, during the term of this Agreement, the insurance specified in this Agreement. Such insurance shall be primary to, and not contributing with, any insurance or self-insurance programs maintained by the County and such coverage shall be provided and maintained at the Contractor's own expense.

- A. Evidence of Insurance: Certificate(s) or other evidence of coverage satisfactory to the County shall be delivered to the project contract analyst (as identified in the Invitation for Bids) at Los Angeles County Department of Public Works, Business Relations and Contracts Division, Contracts Administration Section, P.O. Box 1460, Alhambra, CA 91802-1460, prior to commencing services under this Agreement. Such certificate(s) or other evidence shall:

1. Specifically identify this Agreement, including the project name and specification number.
2. Clearly evidence all insurance required in this Agreement.
3. Contain the express condition that the County is to be given written notice by the issuing insurance company by mail at least 30 days in advance of cancellation for all policies evidenced on the certificate of insurance.
4. Include a copy of the additional insured endorsement to the commercial general liability policy, adding the indemnified parties (the County of Los Angeles and its Special Districts) as insureds for all activities arising from this Agreement.
5. Show the Contractor's insurance as primary to the County's insurance and self-insurance programs. This may be evidenced by adding the following statement to the additional insured endorsement, "It is

further agreed that the insurance afforded by this policy is primary to any insurance or self-insurance programs maintained by the additional insureds, and the additional insureds insurance and self-insurance programs are excess and non-contributing to the named insureds insurance.”

6. Confirm deductibles or self-insured retentions shall not exceed \$25,000, and the deductibles/retentions apply on a “per occurrence” or “per loss” basis. The County retains the right to require the Contractor to provide a bond guaranteeing payment of all such retained losses and costs attributable to the Contractor’s retention, or, withhold payment to Contractor in the amount of all or any deductibles/retentions as the County deems appropriate.
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- B. Insurer Financial Ratings: Insurance is to be provided by an insurance company authorized to do business in California and acceptable to the County, with an A.M. Best rating of not less than A:IX, unless otherwise approved by the County.
 - C. Waiver of Subrogation: The Contractor agrees to release the indemnified parties and waive its rights of recovery against the indemnified parties under the insurance policies specified in this Agreement.
 - D. Cancellation of or Changes in Insurance: Contractor shall provide County with, or Contractor’s insurance policies shall contain a provision that County shall receive, written notice of cancellation or any change in Required Insurance, including insurer, limits of coverage, term of coverage or policy period. The written notice shall be provided to County at least ten (10) days in advance of cancellation for non-payment of premium and thirty (30) days in advance for any other cancellation or policy change. Failure to provide written notice of cancellation or any change in Required Insurance may constitute a material breach of the Contract, in the sole discretion of the County, upon which the County may suspend or terminate this Contract.
 - E. Failure to Maintain Insurance: Contractor’s failure to maintain or to provide acceptable evidence that it maintains the Required Insurance shall constitute a material breach of the Contract, upon which County immediately may withhold payments due to Contractor, and/or suspend or terminate this Contract. County, at its sole discretion, may obtain damages from Contractor resulting from said breach. Alternatively, the County may purchase the Required Insurance, and without further notice to Contractor, deduct the premium cost from sums due to Contractor or pursue Contractor reimbursement.

- F. Sub-Contractor Insurance Coverage Requirements: Contractor shall include all Sub-Contractors as insureds under Contractor's own policies, or shall provide County with each Sub-Contractor's separate evidence of insurance coverage. Contractor shall be responsible for verifying each Sub-Contractor complies with the Required Insurance provisions herein, and shall require that each Sub-Contractor name the County and Contractor as additional insureds on the Sub-Contractor's General Liability policy. Contractor shall obtain County's prior review and approval of any Sub-Contractor request for modification of the Required Insurance.

45. INSURANCE COVERAGE REQUIREMENTS--TYPES AND LIMITS:

The County's insurance requirements specify that Contractors should obtain coverage from insurance companies acceptable to the County who have a current A.M. Best rating of not less than A:IX. A Best rating of A:IX indicates that the company evidences strong financial strength and ability to meet their ongoing financial obligations to policyholders.

A. Builders Risk Course of Construction Insurance: Such coverage shall:

1. Insure against damage from perils covered by the Causes-of-Loss Special Form (ISO form CP 10 30), and be endorsed to include earthquake, flood, ordinance or law coverage, coverage for temporary offsite storage, debris removal, pollutant cleanup and removal, testing, preservation of property, excavation costs, landscaping, shrubs and plants and full collapse coverage during construction (without restricting collapse coverage to specified perils).
2. If Contractor's work involves testing air conditioning systems, boilers, pressure vessels, major machinery or major electrical panels, policy shall include coverage for such testing.
3. Be written on a completed-value basis and cover the entire value of the construction Project, including County-furnished materials and equipment, against loss or damage until completion and acceptance by the County. See Supplementary Conditions, Section 00 08 00, Article 7, Insurance Coverage Requirements—Types and Limits, for additional information regarding replacement value of County-furnished materials and equipment.

B. General Liability Insurance: Such coverage shall be written on ISO policy form CG 00 01 or its equivalent. See Supplementary Conditions, Section 00 08 00, Article 7, Insurance Coverage Requirements—Types and Limits, for

additional information regarding limits, occurrence, policy aggregate, and products/completed operations aggregate.

C. Automobile Liability Insurance: Such coverage shall be written on ISO form CA 00 01 or its equivalent. Such insurance shall include coverage for all “owned,” “hired,” and “non-owned” automobiles, or coverage for “any auto.” See Supplementary Conditions, Section 00 08 00, Article 7, Insurance Coverage Requirements—Types and Limits, for additional information regarding liability limits.

D. Workers Compensation and Employers Liability Insurance: Such coverage shall provide workers compensation benefits, as required by the Labor Code of the State of California. Such policy shall be endorsed to waive subrogation against the County for injury to the Contractor’s employees. If the Contractor’s employees will be engaged in maritime employment, the coverage shall provide the benefits required by the U.S. Longshore and Harbor Workers Compensation Act, Jones Act, or any other Federal law to which the Contractor is subject.

1. In all cases, the above insurance shall include Employers Liability coverage with limits not less than:

- a. Each accident: \$1 million
- b. Disease – policy limit: \$1 million
- c. Disease – each employee: \$1 million

E. Performance Security Requirements:

Prior to execution of the Contract, the Contractor shall file surety bonds with the County in the amounts and for the purposes noted below, and on bond forms provided by the County. All bonds issued in compliance with the Contract shall be duly executed by a solvent surety company that is authorized by the State of California, is listed in the U.S. Department of Treasury’s Listing of Approved Sureties (Annual Circular 570) and is satisfactory to the County, and it shall pay all premiums and costs thereof and incidental thereto (see <http://www.fms.treas.gov/c570/>).

1. Materials and Labor Bond (Payment Bond): Shall be in the sum of not less than 100% of the Contract price to assure the payment of claims of material men supplying materials to the Contractor, subcontractors, mechanics, and laborers employed by the Contractor on the Work. This bond shall be so conditioned as to inure to the benefit of persons furnishing materials for or performing labor upon the Work. This bond

shall be maintained by the Contractor in full force and effect until the Work is completed and accepted by the County, and until all claims for materials, labor, and subcontracts are paid.

2. Bond for Faithful Performance: Shall be in the sum of not less than 100% of the Contract price to assure the faithful performance of the Contract. This bond shall be so conditioned as to assure the faithful performance by the Contractor of all Work under said Contract, within the time limits prescribed, including any maintenance and warranty provisions, in a manner that is satisfactory and acceptable to the County, that all materials and workmanship supplied by the Contractor will be free from original or developed defects, and that should original or developed defects or failures appear within a period of one year from the date of acceptance of the Work by the County, the Contractor shall, at Contractor's own expense, make good such defects and failures and make all replacements and adjustments required, within a reasonable time after being notified by the County to do so, and to the approval of the Department of Public Works. This bond shall be maintained by the Contractor in full force and effect during the performance of the Work of the Contract and for a period of one year after acceptance of the Work by the County.

Each bond shall be signed by both the Contractor (as Principal) and the surety.

Should any surety or sureties upon said bonds or any of them become insufficient or be deemed unsatisfactory by the County, the Contractor shall replace said bond or bonds with good and sufficient sureties within ten days after receiving notice from the County that the surety or sureties are insufficient or unsatisfactory. Should any surety or sureties be deemed insufficient or unsatisfactory, no payment(s) shall be deemed due or will be made under this Contract until the new sureties shall qualify and be accepted by the County.

46. Not used.

47. Not used.

48. ASSIGNMENT:

- A. The Contractor shall not assign this Contract without the consent of the County. The Contractor shall be bound by and comply with all applicable provisions of the Labor Code of the State of California and shall keep

informed of and observe and comply with and cause all of Contractor's agents and employees to observe and comply with all federal, state, and local laws which in any way affect the conduct of the Work of this Contract.

- B. Work performed on County-owned property, irrespective of political subdivision location, shall be governed by the County Building Laws, and Work performed outside the property lines of County-owned property shall be governed by the local laws of the County, city, or other municipal government having jurisdiction.

49. PATENTS:

In the event that any patented article, material, or process is to be installed or used in the performance of the Work as shown on the drawings or particular specifications therefore, the Contractor shall pay the royalty chargeable and shall save, keep, and bear the County harmless from all damage, costs, and expenses by reason of any infringement of the patent therefor, or by reason of the failure to pay the royalty chargeable for use thereof, and any loss to the County or the awarding entity in the event that the County is enjoined from using such patented article or material and the incidental damage caused by the loss of use and damage to County property or awarding entity in removing same, and cost of replacing the article or material the use of which is enjoined. Provided further the Bond for Faithful Performance shall be deemed to expressly apply to this provision of the specifications.

50. SUSPENSION AND/OR TERMINATION OF WORK AND/OR CONTRACT:

A. Suspension of Work

1. The Director may order the Contractor in writing to suspend, delay or interrupt all or any part of the Work for such period of time as he may determine to be appropriate for the convenience of the County.
2. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize incurring costs allocable to the Work covered by the order during the period of Work stoppage.
3. If the performance of all or any part of the Work is, for an unreasonable period of time, suspended, delayed, or interrupted by (a) an act of the County in the administration of this Contract, or (b) by the County's failure to act within the time specified in this Contract (or, if no time is specified, within a reasonable time), an adjustment shall

be made for any increase in cost of performance of this Contract (excluding profit) necessarily caused by such unreasonable suspension, delay, or interruption, and the Contract modified in writing accordingly. However, no adjustment shall be made under this Article for any suspension, delay, or interruption to the extent (a) that performance would have been suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor, or (b) for which an adjustment is provided for or excluded under any other provision of this Contract.

4. No claim under this paragraph shall be allowed (a) for any costs incurred more than fourteen (14) calendar days before the Contractor shall have notified the County in writing of the act or failure to act involved, (but this requirement shall not apply as to a claim resulting from a suspension order), and (b) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of such suspension, delay, or interruption, but not later than the date of final payment. No part of any claim based on the provisions of this clause shall be allowed if not supported by adequate evidence showing that the cost would not have been incurred but for a delay within the provisions of this Article.

B. Termination for Convenience

1. The Director may, whenever the interests of the County so require, terminate this Contract, in whole or in part, for the convenience of the County. The County shall give written notice of the termination to the Contractor specifying the part of the Contract terminated and the date termination becomes effective.
 - a. The Contractor shall incur no further obligations in connection with the terminated Work, and, on the date set in the notice of termination, the Contractor shall stop Work to the extent specified. The Contractor shall also terminate outstanding orders and subcontracts as they relate to the terminated Work. The Contractor shall settle the liabilities and claims arising out of the termination of subcontracts and orders connected with the terminated Work. The County may direct the Contractor to assign the Contractor's right, title, and interest under the terminated orders or subcontracts to the County. The Contractor must still complete the Work not terminated by the notice of termination and may incur obligations as are necessary to do so.

- b. The County may require the Contractor to transfer title and deliver to the County in the manner and to the extent directed by the County: (a) the fabricated or unfabricated parts, Work in process, completed Work, supplies, and other material produced or acquired for the Work terminated; and (b) the completed or partially completed plans, drawings, information, and other property that, if the Contract had been completed, would be required to be furnished to the County. The Contractor shall, upon direction of the County, protect and preserve property in the possession of the Contractor in which the County has an interest. If the County does not exercise this right, the Contractor shall use its best efforts to sell such supplies and manufacturing materials for the benefit of the County.

- c. If the parties are unable to agree on the amount of a termination settlement, the County shall pay the Contractor the following amounts:
 - 1. For Contract Work performed before the effective date of termination, the total (without duplication of any items) of:
 - (a) The percentage of the Contract price which equals the percentage (%) of Work completed in accordance with the schedule of values, less prior progress payments, and any applicable Liquidated Damages. The amounts of outstanding Stop Notices shall be withheld until the Stop Notices are resolved as provided by law.
 - (b) The cost of settling and paying terminated subcontracts and orders that are properly chargeable to the terminated portion of the Work;

 - 2. The reasonable costs of effectuating the settlement of the Work terminated, including:
 - (a) Accounting, clerical, and other expenses reasonably necessary for the preparation of termination settlement bids and supporting data;

- (b) The termination and settlement of subcontracts (excluding the amounts of such settlements); and
- (c) Storage, transportation, and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory.

C. Termination for Default

1. If the Contractor refuses or fails (a) to commence the Work within the time required by this Contract, (b) to prosecute the Work or any separable part with the diligence that will ensure completion within the time specified in this Contract, including any authorized extension, (c) to provide sufficient and properly skilled workers or proper materials or equipment to complete the Work in an acceptable manner and without delay, (d) to promptly pay its subcontractors, laborers, and materialmen, (e) to perform any of Contractor's other obligations under this Contract, or (f) to complete the Work within the time specified in this Contract ("events of default"), the County may, by written notice to the Contractor, terminate the right to proceed with the Work (or the separable part of the Work). In this event, the County may take over the Work and complete it by contract or otherwise, and may take possession of and use any materials, appliances, and plant on the site necessary for completing the Work. The Contractor and Contractor's sureties shall be liable for any damage to the County resulting from events of the default, whether or not the Contractor's right to proceed with the Work is terminated. This liability includes any increased costs incurred by the County in completing the Work.
2. The Contractor's right to proceed shall not be terminated because of delays, nor will the Contractor be charged with damages under this article, if:
 - a. The delay in completing the Work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor (examples of such causes include: (i) acts of God, (ii) acts of the public enemy, (iii) acts of the County in either its public or contractual capacity, (iv) acts of another Contractor in the performance of a contract with the County, (v) fires, (vi) floods, (vii) epidemics, (viii) quarantine restrictions, (ix) strikes, (x) freight embargoes, (xi) unusually severe

weather, or (xii) delays of Subcontractors or Suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the Subcontractors or Suppliers); and,

- b. The Contractor, within fourteen (14) calendar days from the beginning of any delay (unless extended by the County), notifies the County in writing of the causes of the delay in accordance with Specification Section 001310, Construction Schedule. The County shall ascertain the facts and the extent of the delay. If, in the judgment of the County, the findings warrant such action, the time for completing the Work shall be extended by Change Order. The findings of the County will be final and conclusive on the parties.
3. If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of the County.
4. The rights and remedies of the County in this article are in addition to any other rights and remedies provided by law or under this Contract. Time is of the essence for all delivery, performance, submittal, and completion dates in this Contract.

D. Termination for Improper Consideration

1. County may, by written notice to Contractor, immediately terminate the right of Contractor to proceed under this Contract if it is found that consideration, in any form, was offered or given by Contractor, either directly or through an intermediary, to any County officer, employee, or agent with the intent of securing the Contract or securing favorable treatment with respect to the award, amendment, or extension of the Contract or the making of any determinations with respect to the Contractor's performance pursuant to the Contract. In the event of such termination, County shall be entitled to pursue the same remedies against Contractor as it could pursue in the event of default by the Contractor.
2. Contractor shall immediately report any attempt by a County officer or employee to solicit such improper consideration. The report shall be made either to the County manager charged with the supervision of

the employee or to the County Auditor-Controller's Employee Fraud Hotline at (213) 974-0914 or (800) 544-6861.

3. Among other items, such improper consideration may take the form of cash, discounts, services, the provision of travel or entertainment, or tangible gifts.

- E. Notice of suspension or termination for any reason shall be given in writing and shall be complete one day after deposit in the United States mail in a sealed envelope with postage prepaid and directed to the Contractor at Contractor's address as filed with the County, or upon personal delivery to any person whose actual knowledge of such suspension or termination would be sufficient notice to the Contractor. Actual knowledge of such suspension or termination by an individual Contractor or by a copartner, if the Contractor be a partnership or by the president, vice-president, secretary or general manager, if the Contractor be a corporation, or by the managing agent regularly in charge of the Work on behalf of said Contractor, shall in any case be sufficient notice.

51. CONTRACTOR'S WARRANTY OF ADHERENCE TO COUNTY'S CHILD SUPPORT COMPLIANCE PROGRAM:

- A. Contractor acknowledges that County has established a goal of ensuring that all individuals who benefit financially from County through Contract are in compliance with their court-ordered child, family, and spousal support obligations in order to mitigate the economic burden otherwise imposed upon County and its taxpayers.

- B. As required by County's Child Support Compliance Program (County Code Chapter 2.200) and without limiting Contractor's duty under this Contract to comply with all applicable provisions of law, Contractor warrants that it is now in compliance and shall, during the term of this Contract, maintain compliance with employment and wage reporting requirements as required by the Federal Social Security Act (42 USC Section 653a) and California Unemployment Insurance Code Section 1088.5, and shall implement all lawfully serviced Wage and Earnings Withholding Orders or District Attorney Notices of Wage and Earnings Assignment for Child or Spousal Support, pursuant to Code of Civil Procedure Section 706.031 and Family Code Section 5246(b).

- C. Failure of Contractor to maintain compliance with these requirements shall constitute a default by Contractor under this Contract. Without limiting the rights and remedies available to County under any other provision of this

Contract, failure to cure such default within ninety (90) days of notice by the Los Angeles County District Attorney shall be grounds upon which the County Board of Supervisors may terminate this Contract.

52. CONTRACTOR'S ACKNOWLEDGMENT OF COUNTY'S COMMITMENT TO CHILD SUPPORT ENFORCEMENT:

Contractor acknowledges that County places a high priority on the enforcement of child support laws and the apprehension of child support evaders. Contractor understands that it is County's policy to encourage all County Contractors to voluntarily post County's L.A.'s Most Wanted: Delinquent Parents poster in a prominent position at Contractor's place of business. County's District Attorney will supply Contractor with the poster to be used.

53. LIMITATION OF LIABILITY:

A. This project may be awarded by or the Contract may be assigned to a joint powers authority or a nonprofit corporation established by the awarding entity. Bonds, certificates of participation, or other evidences of indebtedness will be issued by a joint powers authority or nonprofit corporation or the awarding entity or the County, for the purpose of constructing the Work contemplated by these Drawings and Specifications. The proceeds of said sale shall be the sole source of funds for payment of all Work to be done and all claims of any kind that may be made under the provisions of this Contract. Neither the awarding entity, nor (if different) the issuing entity, nor any individual parties thereto, nor the County, nor the County's agents and Special Districts, shall have any liability whatsoever to the Contractor or others arising out of, or in any way connected with, Work to be performed hereunder, save and except as such liability may be paid and discharged out of said proceeds, and except as specifically provided for in these specifications. Contractor shall look solely to said proceeds for payment of Work to be done or any claims whatsoever that may be asserted hereunder. Contractor expressly releases and discharges the awarding entity, the issuing entity, and the County and each of them from any and all liability, cost, or expenses save and except such liability, cost, and expense as may be paid for out of said proceeds.

B. The issuing entity will adopt a policy to sell and issue bonds, certificates of participation, or other evidences of indebtedness at such times and in sufficient amounts to ensure that funds are provided for the prompt payment, as installments become due, for Work performed hereunder.

54. FORUM SELECTION:

Specs. No. 7823R1

General Conditions
00 07 00-49

Contractor hereby agrees to submit to the jurisdiction of the courts of the State of California. The exclusive venue of any action brought by Contractor, on Contractor's behalf or on the behalf of any Subcontractor, which arises from this agreement or is concerning or connected with services performed pursuant to this agreement, shall be deemed to be in the courts of the State of California located in Los Angeles County, California.

55. WAIVER:

The waiver by the County of any term, covenant, or condition herein contained shall not be deemed to be a waiver of such term, covenant, or condition on any subsequent breach of the same or any other term, covenant, or condition herein contained.

56. PRIOR AGREEMENTS:

This Contract contains all of the agreements of the parties hereto with respect to any matter covered or mentioned in this agreement and no prior agreements or understanding pertaining to any such matter shall be effective for any purpose. No provision of this Contract may be amended or added to except by an agreement in writing signed by the parties hereto or their respective successor-in-interest.

57. PROGRESS PAYMENTS:

In accordance with Public Contract Code Section 20104.50, the County shall make progress payments within thirty (30) days after receipt of an undisputed and properly submitted payment request from a Contractor on a construction contract. Interest shall be paid to the Contractor equivalent to the legal rate set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure if the County fails to make payment within the thirty (30) days. If the payment request is determined not to be a proper payment request suitable for payment, it shall be returned to the Contractor as soon as practicable, but not later than seven (7) days after receipt accompanied by a document setting forth in writing the reasons why the payment request is not proper. The Contractor will prepare and submit progress payments as directed by the County Project Manager.

58. ACCEPTANCE OF FINAL PAYMENT AS RELEASE:

The acceptance by the Contractor of the final payment shall be and shall operate as a release to the County and the awarding entity of all claims and all liability to the Contractor for all things done or furnished in connection with this Work and for every act and neglect of the County, awarding entity, and others relating to or arising out

of this Work. No payment, however final or otherwise, shall operate to release the Contractor or his sureties from any obligation under this contract or the Performance and Payment Bond.

59. SUBSTITUTION OF SECURITIES FOR RETENTION:

In accordance with Public Contracts Code Section 22300 et seq., the Contractor may substitute securities for retention monies to be withheld to ensure performance under this Contract. At the request and expense of the Contractor, securities equivalent to the amount withheld may be deposited with the County, or with an approved State or Federally chartered bank as the escrow agent. The County will then pay such retention moneys to the Contractor. It is the Contractor's obligation to secure the services of a state or federally chartered bank to act as escrow agent. Securities eligible for investment include those listed in Government Code Section 16430 or bank or savings and loan certificates of deposit. The Contractor shall be the beneficial owner of any securities substituted for retention monies withheld and shall receive any interest earned by the securities. The standard form of the County's Escrow Agreement is on file at the Business Relations and Contracts Division of the Department of Public Works. The terms of that Agreement are incorporated by reference.

60. RESOLUTION OF CONSTRUCTION CLAIMS:

The provision of Public Contract Code 20104 et seq. relating to the resolution of construction claims of three hundred seventy-five thousand dollars (\$375,000) or less which arise between a Contractor and a local agency are hereby incorporated in this Contract.

61. CONFLICT OF INTEREST:

No County employee whose position in County enables him to influence the award of this agreement or any competing agreement, and no spouse or economic dependent of such employee, shall be employed in any capacity by Contractor herein, or have any other direct or indirect financial interest in this Agreement.

62. ANTI-TRUST CLAIMS:

In entering into a public works Contract or a Subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or Subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the 44 Cartwright Act (Chapter 2, commencing with Section

16700, of Part 2, Division 7, of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works Contract or Subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

63. COUNTY'S QUALITY ASSURANCE PLAN:

The County or its agent will evaluate Contractor's performance under this agreement on not less than an annual basis. Such evaluation will include assessing Contractor's compliance with all contract terms and performance standards. Contractor deficiencies which County determines are severe or continuing, and that may place performance of the agreement in jeopardy if not corrected, will be reported to the Board of Supervisors. The report will include improvement/corrective action measures taken by the County and Contractor. If improvement does not occur consistent with the corrective action measures, County may terminate this agreement or impose other penalties as specified in this agreement.

64. LAWS, CODES AND REGULATIONS TO BE OBSERVED:

- A. The Contractor shall become familiar and comply with all Federal, State, County and City laws, ordinances or regulations controlling the action or operation of those engaged in the work, or affecting materials used, and operate in accordance therewith.
- B. In accordance with this requirement, it has not been considered necessary to enumerate all wiring, plumbing and other requirements covered by the codes. The Contractor, in making a bid, agrees that the requirements of such ordinances will be as carefully adhered to as if they were specifically set forth in the specifications.
- C. The Contractor shall hold harmless the County and all of its officers, agents and servants against any claims or liability arising from, or based upon the violation of such laws, by-laws, ordinances, regulations, orders or decrees, whether by the Contractor or the Contractor's employees, except where the instance of violation is done in accordance with the specifications.
- D. Work performed on County-owned property, irrespective of political subdivision location, shall be governed by the County Building Laws; and work performed outside the property lines of County-owned property shall be governed by the local laws of the County, City, or other municipal government having jurisdiction.

* * *

SECTION 00 08 00

SUPPLEMENTARY CONDITIONS

1. **DEFINITIONS:**

Whenever the following words appear in the Contract Documents, they will be construed to have the following meanings:

- a. "County" means the County of Los Angeles.
- b. "Awarding Entity/County" means either the County; the County, as agent for such joint powers authority or nonprofit corporation as may be involved in the issuance of bonds, certificates of participation or other evidences of indebtedness to finance the work contemplated herein; or said joint powers authority or nonprofit corporation.
- c. "Board of Supervisors" means the Board of Supervisors, County of Los Angeles, California.
- d. "Department" means the Department of Public Works.
- e. "Owner" means the County of Los Angeles, represented by the Department of Public Works.
- f. "Director" means the Director of the Department of Public Works or his authorized representative.
- g. "Architect" means Huitt-Zollars, Inc., or their authorized representative.
- h. "Project Manual" means the manual prepared for the project, consisting of the Bid and Contract Requirements, Conditions of the Contract, and Technical Specifications.
- i. "Contract" means the agreement which has been executed by the Contractor and the County.
- j. "Contract Documents" means those documents identified in Paragraph 5 of the General Conditions.

- k. "Contractor" means the Prime Contractor awarded the Contract by the Board of Supervisors.
- l. "Award of Contract" means the date the Board of Supervisors awards the construction Contract to the Contractor.
- m. "Notice to Proceed" means the date the Director authorizes the Contractor to proceed with the Contract work.
- n. "Acceptance of the Project" means Los Angeles County Board of Supervisors or Director's acceptance of the work.
- o. "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The work may constitute the whole or a part of the project.
- p. "The Project" is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include Work by the County or others.
- q. "Substantial Completion" means the Date of Substantial Completion of the Work, or designated portion thereof as set forth in the Contract Documents, certified by the County when construction is sufficiently complete, in accordance with the Contract Documents, so the County may occupy or use the Work, or designated portion thereof, for the use for which it is intended.
- r. "Disputes Review Panel" reviews all matters related to disputes over the interpretation of the Drawings and Specifications.
- s. "Notice to Bidders" means any written modification to the Contract Documents issued prior to the bid date.
- t. "Day" means calendar day unless otherwise specified.
- u. "Drawings" means the graphical and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the work, generally including plans, elevations, sections, details, schedules, and diagrams.

- v. "Specifications" means that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the work, and performance of related services.
- w. "Inspection Notice": A sequentially numbered written notice issued to the Contractor for the purpose of, but not limited to, the following:
 - 1) Define items/installations that deviate from the Contract Documents and which payment may be withheld.
 - 2) Alert as to problem areas prior to issuing Noncompliance.
 - 3) Void previously issued Inspection or Noncompliance Notice when corrections have been made.
 - 4) Give notice of approval.
 - 5) Provide general project information.
 - 6) Define delinquent submittals.
 - 7) Advise Contractor of not complying with safety requirements.
- x. "Noncompliance Notice": A sequentially numbered written notice issued to the Contractor that defines materials, installations, and/or situations that do not comply with codes or the Contract Documents and which payment cannot be made. The statement "remove and replace" will be included when required.

2. PAYMENTS:

Payments on account of the Work comprising the original Contract shall be made upon demand of the Contractor as follows:

- a. A working day of the month shall be selected by the County and the Contractor, which day shall remain constant throughout the life of the project, and vary only as needed to fall on a working day. A payment request equal to ninety percent (95%) of the labor performed and material actually installed

in the work during the previous thirty (30) days or since the last payment request shall be submitted by the Contractor and presented to the County for payment.

- b. A payment request for the (5%) withheld from the monthly progress payments shall be submitted by the Contractor to the County upon completion and acceptance by the County of all the work called for under the original Contract.
- c. In the event of payment on account of additional work for a Change Order, supplemental agreement, or unit price authorization, the retention shall be as stipulated by the original Contract.
- d. When progress payments are to be made, no payment on account of the work and at any time while there is work in progress, will be considered an acknowledgment that any or certain portions of the work have been done in accordance with the Drawings and Specifications. Should there be any balance due the Contractor at the time of the acceptance of the work such balance shall be paid upon said acceptance.
- e. All demands for payment shall be itemized and rendered in six (6) copies by the Contractor and shall be certified by the Director when found by him to be correct. Payment will be made to the Contractor within thirty (30) days after the approval by the Director.
- f. Cost of bonds or liability insurance shall not be included as an item in the demands for monthly progress payments. In the compilation of demands for progress payments, neither stipulated nor bid unit prices for deductions shall be used as the basis for computing prices for the work completed.
- g. When the Contractor has requested payments that would bring his total payment to fifty percent (50%) of the Contract, all subcontractors and material suppliers on record with the Contract Analyst will be notified by U. S. Mail regarding the status of such payment.

Subcontractors and material suppliers of record will be advised to refer to their rights under the Civil Code relating to the "Stop Notices" and other means or methods of securing payment for their work or materials.

3. PAYMENT FOR STORED MATERIAL:

The Department, at its discretion, may authorize "Progress Payments" at the invoiced price, minus retention specified under "Payments", for:

- a. Material and equipment delivered to the site but not incorporated in the Work.
- b. Material and equipment delivered and stored off the site in a bonded warehouse or other location within Los Angeles County, which warehouse or other location is satisfactory to and has been approved by the Department.
- c. The provisions allowing prepayment for materials will be applied to large items of equipment and construction materials of special manufacture or order for the job, such as:
 1. Electrical switchgear, generators, and transformers over 15 KVA.
 2. Mechanical items including air handlers over 15 horsepower, boilers, chillers, and fabricated ductwork.
 3. Reinforcing steel and structural steel when fabricated to job requirements.
 4. Carpeting, floor tile or ceiling tiles.
 5. Electrical fixtures (less lamps) and light standards.
 6. Door and security hardware.
 7. Window wall assemblies.
 8. Precast concrete members such as wall panels, "tees" or girders.

Contractor must furnish with his Request for Payment acceptable evidence showing such material and/or equipment has been paid for in full, together with a verified statement that same is/are free from all liens and encumbrances and will be utilized in the Work covered by this Contract and a material list sufficient for physical inventory at the storage location. All shop drawings and material submittals must be approved prior to authorizing payments.

All storage, handling and rehandling costs, insurance and responsibility for protection and proper installation of such material and equipment, is the obligation of

the Contractor. No payment, pursuant to this provision for material or equipment, shall in any way relieve the Contractor of its responsibility to obtain or provide, at its expense, any such material or equipment, or release the Contractor from any of its obligations under this Contract.

Department may enter upon the premises where the material and/or equipment is stored for inspection, checking, or any other purpose it deems necessary. The Contractor will be reimbursed for any Los Angeles County taxes levied against such material or equipment while so stored, upon presentation of a receipted tax bill for same.

4. EQUIPMENT LAYOUT DRAWINGS:

When any section of the specifications requires the submittal of an "Equipment Layout Drawing", the Contractor shall coordinate all work under various sections of the Specifications to assure that no interferences occur in the rooms or areas for which such drawings have been required and that necessary clearances are provided.

Installation of affected equipment shall not proceed until required drawings have been approved by the Department.

5. AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS:

The following forms and reports are required to be completed by the Contractor and/or Subcontractors according to the instructions furnished for each and at the time shown below for each:

- a. Within ten (10) working days of subcontract award:
 - Contractor's Notification of Subcontracts Awarded
- b. Prior to commencement of work:
 - Notice of EEO Commitment
- c. During the construction period:
 - Monthly Employment Utilization Report (form CC257)

6. SURVEY OPERATIONS:

The Contractor shall be responsible for all survey and layout operations and shall be responsible for the following:

- a. Locate elevations of all improvements, establish control points and bench marks adequate for the use of all trades so that all parts of the work are within the specified and indicated tolerances.
- b. As the work proceeds, verify all grades, lines, and dimensions indicated on the drawings, and report errors and inconsistencies to the Architect in writing. Do not proceed until errors and inconsistencies are corrected.
- c. Maintain staking as required by construction progress and maintain construction progress and maintain control points and benchmarks until final completion of the project.

7. INSURANCE COVERAGE REQUIREMENTS—TYPES AND LIMITS:

A. Builders Risk Course of Construction Insurance:

1. Replacement value of County-furnished materials and equipment for this Project is valued at \$2,000,000.
2. If new Work involves a major addition/renovation that could affect the structural integrity of the existing structure, Contractor shall insure the new Work and the existing structure for the total cost of the Contract plus the value of the existing structure.
3. Insure against damage from perils covered by the Causes-of-Loss Special Form (ISO form CP 10 30), and the perils of earthquake, flood, risk of transit loss, loss during storage (both onsite and offsite), and collapse during construction (without restricting collapse coverage to specified perils). If Project involves testing air conditioning systems, boilers, pressure vessels, major machinery or major electrical panels, policy shall include coverage for such testing.
4. Cover all property to be installed (including labor) for the full Contract value (without coinsurance) against loss or damage until completion and acceptance by the County.

5. Such coverage shall be equal to the total Contract cost.

B. General Liability Insurance:

Minimum coverage requirements shall provide limits of not less than \$1,000,000 per occurrence, \$2,000,000 policy aggregate, and \$2,000,000 products/completed operations aggregate.

C. Automobile Liability Insurance:

Minimum coverage requirements shall provide a limit of liability not less than \$1,000,000 per accident.

D. Workers Compensation and Employers Liability Insurance: Such coverage shall provide workers compensation benefits, as required by the Labor Code of the State of California. Such policy shall be endorsed to waive subrogation against the County for injury to the Contractor's employees. If the Contractor's employees will be engaged in maritime employment, the coverage shall provide the benefits required by the U.S. Longshore and Harbor Workers Compensation Act, Jones Act, or any other Federal law to which the Contractor is subject.

1. In all cases, the above insurance shall include Employers Liability coverage with limits not less than:

- i. Each accident: \$1 million
- ii. Disease – policy limit: \$1 million
- iii. Disease – each employee: \$1 million

E. Asbestos Liability or Contractors Pollution Liability Insurance:

If construction requires remediation of asbestos or pollutants or application or handling of pollutants. Such insurance shall cover liability for personal injury and property damage arising from the release, discharge, escape, dispersal, or emission of asbestos or pollutants, whether gradual or sudden, and include coverage for the costs and expenses associated with voluntary clean-up, testing, monitoring, and treatment of asbestos in compliance with governmental mandate or requests. If the asbestos or pollutant will be removed from the construction site, asbestos or pollution liability is also required under the contractor's or subcontractor's Automobile Liability Insurance. Contractor shall maintain limits of not less than \$1 million.

8. CERTIFICATE OF INSURANCE:

a. Refer to General Conditions, Articles 43, 44, and 45, regarding insurance.

b. Certificate of Insurance shall include the following statement:

"It is further understood and agreed that these insurance policies comply with the Contract requirements of this project."

c. The cancellation clause shall be modified to read as follows:

"Should any of the above-described policies be canceled before the expiration date thereof, the issuing company will mail 30 days written notice to the below-named certificate holder.

d. The Certificate of Insurance shall clearly state that the County of Los Angeles and its Special Districts are named as Additional Insured.

e. Include the name of the project and specification number on all insurance certificates.

9. CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT:

The Contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act of 1970 (42 U.S.C. 1857 et seq.) and the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.) as amended. Violations shall be reported to the County and the Regional Office of the Environmental Protection Agency.

10. LOBBYING OF COUNTY OFFICIALS:

Contractor and each County lobbyist or County lobbying firm as defined in Los Angeles County Code Section 2.160.010, retained by Contractor, shall fully comply with the County Lobbyist Ordinance, Los Angeles County Code Chapter 2.160. Failure on the part of Contractor or any County lobbyist or County lobbying firm retained by Contractor to fully comply with the County Lobbyist Ordinance shall constitute a material breach of this Contract upon which County may immediately terminate or suspend this Contract.

11. CORRESPONDENCE:

All correspondence shall be addressed to the County of Los Angeles, Department of Public Works, P.O. Box 1460, Alhambra, California 91802-1460, Attention: Project Management Division. This address shall be included in all contracts with subcontractors and suppliers.

12. EMPLOYMENT OF LAID-OFF COUNTY EMPLOYEES - SKILLED TRADES AND OTHERS:

- a. Should Contractor, or any Subcontractor performing more than \$250,000 of the Contract value, require additional or replacement personnel to perform services under this Contract, other than the performance of a skilled trade, Contractor shall give first consideration for such employment openings to qualified former County employees who are on a re-employment list.
- b. Should Contractor, or any Subcontractor performing more than \$250,000 of the Contract value, require additional or replacement personnel to perform a skilled trade not covered by an existing union hiring agreement under this Contract, Contractor is encouraged to consider for such employment openings qualified County employees who are targeted for layoff or qualified former County employees who are on a re-employment list. In no event shall the County be liable for any cost, delay, or impact claims arising out of efforts to hire such present and former County employees.

* * *

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10/2009

SECTION 00 09 12

COUNTYWIDE LOCAL AND TARGETED WORKER HIRE PROGRAM - MANDATORY

PART 1 – GENERAL

1.01 SUMMARY

This Section 00 09 12 includes:

Part 1 – General

1.01 – Summary

1.02 – Definitions

1.03 – Local and Targeted Worker Hire Program (LTWHP)

Part 2 – Administration

2.01 – Administration & Compliance

2.02 – Jobs Coordinator Minimum Qualifications

2.03 – Responsibilities of the Jobs Coordinator

2.04 – Community Service Providers

Part 3 – Forms

3.01 – Form 00 09 12-A: LTWHP Craft Employee Request Form

3.02 – Form 00 09 12-B: LTWHP Workforce Utilization Plan

3.03 – Form 00 09 12-C: FPL List of Zip Codes

3.04 – Form 00 09 12-D: Local and Targeted Worker Hire Status Report

3.05 – Form 00 09 12-E: Approved Jobs Coordinators List

1.01 **MANDATORY HIRING GOALS FOR THIS PROJECT**

The County of Los Angeles has implemented a Local and Targeted Worker Hire Policy (LTWHP) to facilitate the hiring of Local and Targeted workers. Pursuant to this policy, this project has a **mandatory goal** of at least 30 percent of total California Construction Labor Hours worked be performed by a qualified Local Resident and at least 10 percent of total California Construction Labor Hours worked on this project shall be performed by County residents classified as a Targeted Worker. Hours worked by a Targeted Worker who is also a Local Resident may be applied towards both the mandatory 30 percent Local Hire and 10 percent Targeted Worker Hire goals.

Including, a minimum ratio of one apprentice hour for every five journeyman hours shall be enforced, per State Labor code requirement, and the Contractor will strive to obtain half of all apprentice hours on the project be performed by Local and Targeted Workers.

In addition, there shall be a **mandatory** requirement to use a Jobs Coordinator to be hired directly by the Contractor, prior to the start of work on the project. The Jobs Coordinator is an independent third-party individual, entity, or employee with whom the Contractor enters into a contract or employs to facilitate the implementation of the Local and Targeted Worker Hiring Requirements of this Agreement. The Jobs Coordinator may be selected from the approved Jobs Coordinators list available as Form 00 09 12-E. If the Contractor utilizes an employee as a Jobs Coordinator, the Jobs Coordinator must be able to demonstrate or document to the County the minimum qualifications and/or experience to fulfill the duties and responsibilities as outlined in Sections 2.02 and 2.03.

1.02 DEFINITIONS

Terms used in the implementation of the LTWHP shall be defined as follows:

- A. **California Construction Labor Hours** – Includes all craft worker hours performed on the project by California residents, excluding the hours performed by off-site material fabricators, designers, project office staff, or vendors.
- B. **Certified Payroll Reports** – The Contractor shall comply with the requirements of Section 1776 of the Labor Code, State of California for the submission of Certified Payroll Reports (CPR). The Contractor and its subcontractors shall submit a copy of all CPR's to the County on a monthly basis, no later than on the first Monday of the subsequent month. Contractor and its subcontractors shall submit all CPR's to the County electronically if an online system is designated by the County.
- C. **Community Service Providers** – A network of public and private partners working to support workers and businesses by serving their employment and training needs. These providers include local one-stop job/career centers funded by the Federal Workforce Innovation and Opportunities Act (WIOA). These centers help businesses find skilled workers and connect customers to work related training and education; most services are available at no cost. Examples of Community Service Providers are listed in Section 2.04.
- D. **Craft Employee Request Form** – The form used by the Contractor and its subcontractors to request dispatch of craft workers (including, but not limited to, apprentices and journeymen), who are Local Residents or Targeted Workers, from a Community Service Provider or union hiring hall

in the event that assistance in obtaining such workers is needed. The request form is submitted by the Contractor/subcontractors, completed and executed by the Community Service Provider or union hiring hall, and a copy retained by the Contractor for auditing purposes.

- E. **Jobs Coordinator** – An individual or firm that facilitates implementation of the Targeted Worker hiring requirements of the County of Los Angeles for the Contractor/subcontractors. The Jobs Coordinator must be able to demonstrate or document to the County the requisite qualifications and/or experience to fulfill the duties and responsibilities as outlined in Section 2.02 and 2.03.
- F. **Local and Targeted Worker Hire Status Report** – A monthly report required to be submitted to the County as listed on Form 00 09 12-D.
- G. **Local Resident** – A Local Resident is defined as an individual whose primary place of residence is within the Tier 1 or Tier 2 ZIP Codes of the County, as listed in Forms 00 09 12-A and 00 09 12-C.
- H. **Workforce Utilization Plan** – Form 00 09 12-B submitted by the Contractor on behalf of itself and its subcontractors prior to commencing work, specifying a Workforce Utilization Plan, which contains the workforce plan and schedule for the hiring of qualified Local Residents and Targeted Workers, including the use of the subcontractors' workforce to meet the LTWHP hiring goal. The Contractor shall submit updates of the Workforce Utilization Plan to reflect changes in project conditions, schedules, or subcontractors.
- I. **Targeted Worker** - A Targeted Worker is an individual who is a County resident and faces at least one or more of the following barriers to employment:
 - 1. Has a documented annual income at or below 100 percent of the Federal Poverty Level;
 - 2. No high school diploma or GED;
 - 3. A history of involvement with the criminal justice system;
 - 4. Protracted unemployment (receiving unemployment benefits for at least 6 months);
 - 5. Is a current recipient of government cash or food assistance benefits;
 - 6. Is homeless or has been homeless within the last year;
 - 7. Is a custodial single parent;
 - 8. Is a former foster youth; or

9. Is a veteran, or is the eligible spouse of a veteran of the United States armed forces, under Section 2(a) of the Jobs for Veterans Act (38 U.S.C.4215[a]).
 10. Eligible Migrant and seasonal farmworkers
 11. English Language Learners
 12. Older Individuals (55+)
 13. Disabled
 14. Individuals with Low levels of Literacy
 15. Multi-Craft Core Curriculum (MC3) program graduates.
- J. **Tier 1 Zip Codes** – Tier 1 ZIP Codes are those Zip codes listed in Form 00 09 12-A.
- K. **Tier 2 Zip Codes** – Tier 2 ZIP Codes are those Zip codes listed in Form 00 09 12-C.

1.03 LOCAL AND TARGETED WORKER HIRE PROGRAM

- A. The Contractor and its subcontractors shall meet the following minimum mandatory Local Resident and Targeted Worker hiring requirements:
1. At least 30 percent of total California Construction Labor Hours worked on the project must be performed by a qualified Local Resident;
 2. And at least 10 percent of total California Construction Labor Hours worked on the project shall be performed by a Targeted Worker. The hours worked by a Targeted Worker who is also a Local Resident may also be applied towards the 30 percent Local Resident hiring goal.
 3. A minimum ratio of one apprentice hour for every five journeyman hours shall be enforced, per State Labor code requirement, and the Contractor will strive to obtain half of all apprentice hours on the project be performed by Local and Targeted Workers.
 4. In addition, there shall be a mandatory requirement to use a Jobs Coordinator, as that term is defined in Section 1.02, to facilitate implementation of the Targeted hiring requirements of this Policy; and the Contractor shall ensure the mandatory hiring requirements provided for Local and Targeted Workers are met in accordance with this Policy.
- B. The available pool of Local Residents whose primary place of residence is within Tier 1 ZIP Codes (listed under Form 00 09 12-A), must first be

exhausted in the manner specified in Section 2.01G before employing worker(s) from Tier 2 ZIP Codes (listed under Form 00 09 12-C).

- C. All California Construction Labor Hours shall be included in the calculation for the percentage requirements set forth in Section 1.03 A.
- D. The Contractor and its subcontractors shall not discriminate against or give preference to any particular individual or group based on race, color, gender, sexual orientation, age or disability.

PART 2 – ADMINISTRATION

2.01 ADMINISTRATION & COMPLIANCE

- A. Prior to start of work on the project, the Contractor shall perform the following:
 - 1. The Contractor shall hire a Jobs Coordinator for the project in accordance with Section 2.02.
 - 2. The Contractor and all subcontractors of every tier shall coordinate with the Jobs Coordinator for services to support their efforts in meeting the targeted hiring percentages as described in Section 1.01 of this Specification.
- B. The Contractor and its subcontractors shall use the Craft Employee Request Form (Form 00 09 12-A) for all requests for dispatch of qualified Local Residents and Targeted craft workers (including apprentices and journeymen) in the event that assistance in obtaining such workers is needed from a Community Service Provider, union hiring hall, or other source.
- C. Prior to commencing work, the Contractor, on behalf of itself and its subcontractors, shall submit a Workforce Utilization Plan (Form 00 09 12-B) to the County Project Manager that contains the workforce hiring plan and schedule for the hiring of qualified Local and Targeted Workers and the assignment and use of the subcontractors' workforce to meet the Local Worker Hiring requirement. The Contractor, thereafter, shall submit updates of the Workforce Utilization Plan to reflect changes in project conditions, schedule, or subcontractors.
- D. No later than the 15th calendar day of each month, the Contractor shall submit to the designated County representative a completed Local and Targeted Hire Status Report containing the relevant information for the preceding month. The Local and Targeted Hire Status Report shall contain, at a minimum, the information specified below for Contractor and its subcontractors:

1. For each California Project Craft Worker (apprentices and journeymen): (a) the total labor hours, total number of all workers (apprentices and journeymen), hours worked on the project; and (b) the wages earned on the project.
 2. Total number of Local Residents (apprentices and journeymen), hours worked (apprentices and journeymen), segregated by Tier 1 and Tier 2 Residency Preference Areas, and wages earned by each Local Resident.
 3. Total number of Targeted Worker hours worked (apprentices and journeymen by Tier 1 and Tier 2 Residency Preference Areas) and Targeted worker data and workers demographic profile.
 4. Total number of hours worked by Local Residents by subcontractor.
- E. No later than the 15th calendar day of each month, the Contractor and all its subcontractors shall submit the Local and Targeted Hire Status Report to the designated County representative (or submit the data online if the County elects to provide an online system), to demonstrate progress in meeting the Workforce Utilization Plan. Failure to submit the Local and Targeted Worker Hire Status Report to the designated County representative shall be deemed to constitute zero percent local hire participation for the month and the County may retain the Monthly Mandatory Compliance Withholding (MMCW) amount.
- F. The County may, in its sole discretion, elect to provide an online system for the Contractor and all of its subcontractors to input the data required in the Local and Targeted Worker Hire Status Report. If the County so elects, the Contractor and subcontractors shall utilize that online system in lieu of completing and submitting the Local and Targeted Worker Hire Status Report.
- G. The Contractor and its subcontractors shall first meet the Local and Targeted Worker Hire participation requirement by employing qualified workers from the Tier 1 Preference Area. If the Contractor is unable to meet their entire Local and Targeted Worker Hire need from this area, it must submit to the Project Manager a statement certifying that it has exhausted all available qualified Local and Targeted Workers from this area during a 48-hour period before pursuing workforce from the Tier 2 Preference Area.
- H. The Contractor's compliance with the approved Workforce Utilization Plan will be evaluated monthly using the Local and Targeted Hire Status Report.
- I. To enforce compliance on contracts containing mandatory hiring goals, an amount will be withheld from the monthly progress payment to the Contractor in proportion to the deficit percentage of the mandated Local and Targeted Hiring Goal percentage and the actual percentage obtained. The maximum that may be withheld during the duration of the project is one percent of the

total construction contract amount, but not to exceed \$500,000, comprised of 0.75 percent for Local Worker goal compliance, and 0.25 percent for Targeted Worker goal compliance. This amount is called the Monthly Mandatory Compliance Withholding (MMCW) amount. The percentage of the MMCW that will be withheld for a given month will be the same as the percentage of the deficit in achieving the LTWHP targets for that month.

The maximum MMCW amount is determined as follows:

Construction Contract Value X .75% ÷ Number of months in baseline construction schedule = MMCW for Local Workers

Construction Contract Value X .25% ÷ Number of months in baseline construction schedule = MMCW for Targeted Workers

- J. If the Targeted Worker Hiring mandatory requirements of the Policy have not been satisfied as required for a project, the Contractor nonetheless may be deemed to be in compliance if the Contractor demonstrates both (a) that the Contractor and each of its subcontractors have complied with all other requirements of the Policy, and (b) that the Contractor and each of its subcontractors have satisfactorily demonstrated the following:

Documented contact with the Department of Workforce Development, Aging and Community Services, America Job Centers or with an agency that supports and provides employment and training services for Targeted Workers in construction employment, and in which instance the agency did not refer a qualified Targeted Worker to the Contractors or subcontractor within 48 hours of the job request for fair consideration of the Targeted Worker.

- K. At the conclusion of the project, the County will conduct a final evaluation of the Contractor's compliance with the Workforce Utilization Plan as described in Section 2.01.C and execute a final release of funds, if applicable, as described in Section 2.01.I. The Contractor's failure to meet the Local and Targeted Worker Hiring Requirement in Section 1.01 by the conclusion of the project shall result in the County imposing liquidated damages and deducting such amount otherwise owed to the Contractor in its final payment. The County will not be required to pay interest on any amounts withheld during the term of the contract.

- L. The County and Contractor specifically agree that the MMCW amount, minus the total value of previous releases, in direct proportion to the actual Local and Targeted hire participation levels achieved by the Contractor consistent with the Workforce Utilization Plan, shall be imposed as liquidated damages, and not as a forfeiture or penalty. It is further specifically agreed that the aforesaid

amount is presumed to be the amount of damages sustained due to the Contractor's inability to achieve the Local and Targeted Worker Hiring Requirement in Section 1.01.

- M. For construction contracts where the work is performed for a private County Lessee, the Lessee shall be responsible for administration of all aspects of this Section 2.01, including the calculation and collection of the Local Hire Participation Compliance Rectification Amount. At the conclusion of the project, the Lessee shall pay over the designated County representative any such amounts collected and shall provide a full report to the designated County Representative of all monthly information required to be collected in this Section 2.01.

2.02 JOBS COORDINATOR MINIMUM QUALIFICATIONS

- A. If the Jobs Coordinator is selected from the approved list provided on Form 00 09 12-E, that Jobs Coordinator shall be deemed to meet the minimum qualifications. No additional qualification information need be provided.
- B. If the Contractor desires to utilize a Jobs Coordinator not listed on Form 00 09 12-E (*i.e.*, a Contractor employee or other non-listed firm), the Contractor must be able to demonstrate that the selected Jobs Coordinator meets the minimum qualifications listed in this Section 2.02. When requested by the County, the Contractor shall provide documentation sufficient to satisfy the County, in the County's sole discretion, that the selected Jobs Coordinator meets the minimum qualifications listed in this Section 2.02.
- C. A minimum of 3 years' experience as providing Jobs Coordinator services. Successful candidates for Jobs Coordinators must be able to demonstrate the in-depth ability, experience, and possess the necessary staff capable of providing required services.
- D. A successful Jobs Coordinator must demonstrate they possess working relationships with the Building Trades, Targeted Workers and signatory craft councils and unions operating within County of Los Angeles' jurisdiction by describing previous interactions, relationships, and partnerships with these party's/groups.
- E. A successful Jobs Coordinator must be able to demonstrate that it has experience on projects similar in scale to the current project.
- F. A successful Jobs Coordinator must demonstrate that they possess experience with Targeted Worker populations.

- G. A successful Jobs Coordinator must have experience in working with work-source centers, faith-based organizations and other Community Based Organizations (CBOs).
- H. A successful Jobs Coordinator must be familiar with incentive programs and tax credit subsidies provided by the State and Federal government to hire workers that fit the corresponding category. Jobs Coordinator to describe their experience in working with these programs

2.03 RESPONSIBILITIES OF THE JOBS COORDINATOR

The Contractor shall ensure that the selected Jobs Coordinator effectively performs the following duties:

- A. The Jobs Coordinator shall develop, create, design and market specific programs to attract Targeted Workers for construction opportunities (e.g. handouts and fliers for “walk-ins” demonstrating program entrance procedures).
- B. The Jobs Coordinator shall coordinate services for Contractor to use in the recruitment of Targeted Workers.
- C. The Jobs Coordinator shall educate and assist Contractor on incentives provided by state or federal programs for on-the-job training and employer tax credits.
- D. The Jobs Coordinator shall conduct orientations, job fairs and community outreach meetings in the local community.
- E. The Jobs Coordinator shall screen and certify the Targeted Workers status.
- F. The Jobs Coordinator shall establish a referral and retention tracking mechanism for placed Targeted workers and apprentices.
- G. The Jobs Coordinator shall network with the various work source centers, community and faith-based organizations and other non-profit entities that provide qualified Local and/or Targeted Workers.
- H. The Jobs Coordinator shall coordinate with the various building trades crafts for referral and placement of Targeted Workers.

- I. The Jobs Coordinator shall maintain a database of pre-qualified Targeted Workers for referral.
- J. The Jobs Coordinator shall be the point of contact to provide information about available job opportunities on projects.
- K. The Jobs Coordinator shall assist the subcontractors with their documentation effort and other reports as it relates to their Targeted Worker hiring requirements.
- L. The Jobs Coordinator shall work closely with County staff, the Building Trades, and subcontractors in achieving the Targeted hiring goals.

2.04 COMMUNITY SERVICE PROVIDERS

Examples of Community Service Providers that may be used by Contractor and subcontractors to identify Local Residents and Targeted Workers include:

- Los Angeles County Workforce Development, Aging, and Community Services: <http://wdacs.lacounty.gov/>
- LA Jobs: <https://www.jobsla.org/vosnet/Default.aspx>
- Cal Jobs: <http://www.caljobs.ca.gov/vosnet/Default.aspx>
- Helmets to Hardhats: <https://www.helmetstohardhats.org>
- America's Job Center of California: <http://www.americasjobcenter.ca.gov/>

PART 3 – FORMS

Form 00 09 12-A: LTWHP Craft Employee Request Form

Form 00 09 12-B: LTWHP Workforce Utilization Plan for Fire Camp 13 Woolsey Fire Reconstruction Project

Form 00 09 12-C: FPL List of Zip Codes

Form 00 09 12-D: Local and Targeted Worker Hire Status Report

Form 00 09 12-E: Approved Jobs Coordinators List



DISPATCH REQUESTOR: _____
(Contractor and Subcontractor Name)

DATE: _____

LOCAL AND TARGETED WORKER HIRE PROGRAM
00 09 12-A CRAFT EMPLOYEE REQUEST FORM - MANDATORY
FIRE CAMP 13 WOOLSEY FIRE RECONSTRUCTION PROJECT

County of Los Angeles requires that at least 30 percent of total California Construction Labor Hours worked on the project must be performed by a qualified Local Resident. Additionally, at least 10 percent of total California Construction Labor Hours worked on the project shall be performed by a Targeted Worker. The hours worked by a Targeted Worker who is also a Local Resident may also be applied towards the 30 percent Local Resident hiring goal. The available pool of Local Residents whose primary place of residence is within Tier 1 ZIP Codes, listed below, must first be exhausted in the manner specified in Section 2.01G before employing worker(s) from Tier 2 ZIP Codes (listed under Form 00 09 12-C).

EMAIL FORM TO:

Community Organization Name: _____ Tel: _____ Email: _____
Local Union Name: _____ Tel: _____ Email: _____
GC or Sub Compliance Office: Name: _____ Tel: _____ Email: _____
LTWHP Coordinator Name: _____ Tel: _____ Email: _____
Project Manager Name: _____ Tel: _____ Email: _____

TIER 1 RESIDENCY AREA ZIP CODES: Local and Targeted Workers in these zip codes shall be first dispatched to **FIRE CAMP 13 WOOLSEY FIRE RECONSTRUCTION PROJECT**.

X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

TIER 2 RESIDENCY AREA ZIP CODES: Local and Targeted Workers from these zip codes shall be referred for project work after all available qualified workers in the Tier 1 Residency Preference area have been exhausted to **FIRE CAMP 13 WOOLSEY FIRE RECONSTRUCTION PROJECT**. **There are no applicable Tier 1 Zip Codes, please proceed to Tier 2 Zip Codes in 00 09 12-C.**
See Form 00 09 12-C.

CRAFT WORKER REQUEST:

QTY#	CRAFT POSITION	JOURNEYMAN OR APPRENTICE LEVEL	LOCAL and TARGETED WORKER (TIER 1 RESIDENCY AREA REQUIRED)	LOCAL and TARGETED WORKER (TIER 2 RESIDENCY AREA)	TARGETED WORKER	DATE	TIME

Please have the worker(s) report to the following project site address indicated below:

Project Name _____
Site Address: _____ Report to: _____
On-site Tel #: _____ On-site Fax: _____
Comment or special instructions: _____

Completed by Community Service Provider Organization or Union

Received By: _____ Date Received: _____ Dispatch Date: _____

Requested Dispatch Available for Dispatch Unavailable for Dispatch

Tier 1 Residency Worker *See instruction below.
Tier 2 Residency Worker Qualified Targeted Worker

*Attach letter stating reason for not dispatching local and targeted worker(s) who reside in the Tier 1 and Tier 2 Area zip codes.

Print Dispatcher Name: _____ Phone: _____

Contractor: All Contractors

Workforce Utilization Plan / Projection Hours

Project Name: Fire Camp 13 Woolsey Fire Reconstruction Project

Date: _____

Project Duration: 240 Calendar Days

	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Total
PROJECTED PROJECT HOURS														
Local Hours (Tier 1)	50	0	0	0	0	0	0	0	0	0	0	0	0	50
Local Hours (Tier 2)	100	0	0	0	0	0	0	0	0	0	0	0	0	100
Total Project Hours	500	0	0	0	0	0	0	0	0	0	0	0	0	500
Total Local Hours (%)	30%													30%
Targeted Worker Hours	50	0	0	0	0	0	0	0	0	0	0	0	0	50
Targeted Worker Hours (%)	10%													10%
ACTUAL PROJECT HOURS														
Local Hours (Tier 1)	75	0	0	0	0	0	0	0	0	0	0	0	0	75
Local Hours (Tier 2)	100	0	0	0	0	0	0	0	0	0	0	0	0	100
Total Project Hours	500	0	0	0	0	0	0	0	0	0	0	0	0	500
Total Local Hours (%)	35%													35%
Targeted Worker Hours	50	0	0	0	0	0	0	0	0	0	0	0	0	50
Targeted Worker Hours (%)	10%													10%

**COUNTY OF LOS ANGELES
LOCAL AND TARGETED WORKER HIRE POLICY
QUALIFYING ZIP CODES**

Tier 1, 2 and Qualifying Zip Codes are defined as:

Tier 1 Zip Code: A Tier 1 Qualified Local Resident is defined as a County resident whose primary residency is: (1) within five (5) miles of the proposed project site; and (2) is within a Qualifying Zip Code. If a qualifying Zip Code is partially located within the 5-mile radius, then the entire Zip Code is considered as a Tier I Zip Code, and workers living in that entire Zip Code area may qualify as Tier I hiring.

Tier 2 Zip Code: A Tier 2 Qualified Local Resident is defined as a County resident whose primary residency is: (1) within a Qualifying Zip code; and (2) that Qualifying Zip Code is beyond five (5) miles of the proposed project site.

Qualifying Zip Code: A Qualifying Zip Code is defined as a zip code within the County of Los Angeles, where either: (1) the average percentage of households living below 200 percent of the Federal Poverty Level (FPL) for that individual's primary residency's Zip Code is greater than the County average for such households; or (2) the Zip Code is one of 11 additional Zip Codes determined by the Board on September 6, 2011 to be a Zip Code where at least 30 percent of the population is living in poverty, and with an unemployment rate of at least 150 percent of the national average.

Zip Code	Region	SD1	SD2	SD3	SD4	SD5
90001	Florence / South Central (City of LA)		X		X	
90002	Watts (City of LA)		X		X	
90003	South Central (City of LA)		X			
90004	Hancock Park (City of LA)	X	X	X		
90005	Koreatown (City of LA)		X			
90006	Pico Heights (City of LA)	X	X			
90007	South Central (City of LA)	X	X			
90008	Baldwin Hills / Crenshaw (City of LA) / Leimert Park (City of LA)		X			
90010	Wilshire Blvd (City of LA)		X			
90011	South Central (City of LA)	X	X			
90012	Civic Center (City of LA) / Chinatown (City of LA)	X				
90014	Los Angeles	X				
90015	Downtown Los Angeles (City of LA)	X	X			
90016	West Adams (City of LA)		X			
90017	Los Angeles	X				
90018	Jefferson Park (City of LA)		X			
90019	Country Club Park (City of LA) / Mid City (City of LA)		X			
90020	Hancock Park (City of LA)		X			
90021	Downtown Los Angeles (City of LA)	X				
90022	East Los Angeles	X			X	
90023	East Los Angeles (City of LA)	X			X	
90026	Echo Park / Silverlake (City of LA)	X				
90028	Hollywood (City of LA)			X		X
90029	Downtown Los Angeles (City of LA)	X		X		
90031	Montecito Heights (City of LA)	X				
90032	El Sereno (City of LA) / Monterey Hills (City of LA)	X				
90033	Boyle Heights (City of LA)	X				
90034	Palms (City of LA)		X	X		
90035	West Fairfax (City of LA)		X	X		
90036	Park La Brea (City of LA)		X	X		
90037	South Central (City of LA)		X			
90038	Hollywood (City of LA)			X		
90040	Commerce, City of	X			X	
90042	Highland Park (City of LA)	X				
90043	Hyde Park (City of LA) / View Park / Windsor Hills		X			

**COUNTY OF LOS ANGELES
LOCAL AND TARGETED WORKER HIRE POLICY
QUALIFYING ZIP CODES**

Zip Code	Region	SD1	SD2	SD3	SD4	SD5
90044	Athens		X			
90047	South Central (City of LA)		X			
90057	Westlake (City of LA)	X				
90058	Vernon	X	X		X	
90059	Watts (City of LA) / Willowbrook		X		X	
90061	South Central (City of LA)		X			
90062	South Central (City of LA)		X			
90063	City Terrace	X				
90089	Exposition Park(City of LA)		X			
90201	Bell / Bell Gardens / Cudahy				X	
90220	Compton / Rancho Dominguez		X			
90221	East Rancho Dominguez		X		X	
90222	Compton / Rosewood / Willowbrook		X		X	
90242	Downey				X	
90247	Gardena		X			
90250	Hawthorne (Holly Park) / Lawndale (Federal Bldg)		X			
90255	Huntington Park / Walnut Park		X		X	
90262	Lynwood				X	
90270	Maywood				X	
90280	South Gate		X		X	
90301	Inglewood		X			
90302	Inglewood		X			
90303	Inglewood		X			
90304	Lennox		X			
90401	Santa Monica			X		
90501	Torrance		X		X	
90601	Whittier	X			X	
90602	Whittier	X			X	
90640	Montebello	X			X	
90706	Bellflower				X	
90716	Hawaiian Gardens				X	
90723	Paramount				X	
90731	San Pedro (City of LA) / Terminal Island (City of LA)				X	
90744	Wilmington (City of LA)		X		X	
90802	Long Beach				X	
90804	Long Beach				X	
90805	North Long Beach (Long Beach)		X		X	
90806	Long Beach				X	
90810	Carson / Long Beach		X		X	
90813	Long Beach				X	
91001	Altadena					X
91046	City of Glendale					X
91103	Pasadena					X
91201	Glendale					X
91203	Glendale					X
91204	Glendale (Tropico)					X
91205	Glendale (Tropico)					X
91303	Canoga Park (City of LA)			X		
91331	Arleta (City of LA) / Pacoima (City of LA)			X		X
91335	Reseda (City of LA)			X		
91340	San Fernando			X		
91342	Lake View Terrace (City of LA) / Sylmar (City of LA)			X		X
91343	North Hills (City of LA)			X		
91352	Sun Valley (City of LA)			X		X
91401	Van Nuys (City of LA)			X		
91402	Panorama City (City of LA)			X		
91405	Van Nuys (City of LA)			X		

**COUNTY OF LOS ANGELES
LOCAL AND TARGETED WORKER HIRE POLICY
QUALIFYING ZIP CODES**

Zip Code	Region	SD1	SD2	SD3	SD4	SD5
91406	Van Nuys (City of LA)			X		
91411	Van Nuys (City of LA)			X		
91502	Burbank					X
91601	North Hollywood (City of LA)					X
91605	North Hollywood			X		X
91606	North Hollywood			X		X
91702	Angeles National Forest	X				X
91706	Baldwin Park / Irwindale	X				X
91731	El Monte	X				
91732	El Monte	X				
91733	South El Monte	X				
91744	Cityof Industry / La Puente / Valinda	X				
91746	Bassett / City of Industry / La Puente	X				
91754	Monterey Park	X				
91755	Monterey Park	X				
91766	Phillips Ranch / Pomoona / Chino	X				
91767	Pomona	X				X
91768	Pomona	X				
91770	Rosemead	X				X
91776	San Gabriel	X				X
91803	Alhambra	X				
93243	Lebec					X
93534	Lancaster					X
93535	Hi Vista					X
93543	Littlerock / Juniper Hills					X
93550	Palmdale / Lake Los Angeles / Sierra Madre					X
93552	Palmdale					X
93553	Littlerock / Juniper Hills / Pearblossom / Llano					X
93560	North Lancaster					X
93591	Palmdale/Lake Los Angeles					X



**LOCAL AND TARGETED HIRE STATUS REPORT
LOS ANGELES COUNTY**

Project: SAMPLE NAME
 Supervisorial District: SD 4
 Project Code: PW13950
 Contractor(s): Multiple Contractors
 Craft(s): Multiple Crafts
 Construction Contract Amount: \$0.00
 Mandatory Local and Targeted Hiring Goal: 30.00%

From Date: 9/1/2016
 To Date: 9/30/2016
 Total Forecast Hours: 0.00
 Total Project Hours to Date: 0.00
 Total Hours Percent Complete: 10.00%

Area	Total Number of Workers Sep 01-Sep 30	% of Total Workers Sep 01-Sep 30	Total Hours Worked Sep 01-Sep 30	% of Total Hours Worked Sep 01-Sep 30	Cumulative Total Number of Workers	Cumulative % of Total Workers	Cumulative Total Hours Worked	% of Total Hours Worked	Cumulative Wages w/ Benefits	Cumulative Number of Foremen	Cumulative Foremen Hours	Cumulative Foreman Hours %	Cumulative Number of Journeymen	Cumulative Journeyman Hours	Cumulative Journeyman Hours %	Cumulative Number of Apprentices	Cumulative Apprentice Hours	Cumulative Apprentice Hours %
Tier 1	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Tier 2	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Other in LA County (non-local)	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Outside of LA County	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Employees Not In Specified Zip Lists	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Local and Targeted Workers																		
Local Resident (Tier 1 + Tier 2)	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Targeted Worker	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Demographic Profile																		
African American	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Asian	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Caucasian	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Hispanic	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Native American	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Not Specified	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Two Or More Races	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Other	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Male	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Female	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Veteran	0	0.00%	0.00	0.00%	0	0.00%	0.00	0.00%	\$0.00	0	0.00	0.00%	0	0.00	0.00%	0	0.00	0.00%
Total Employees	0		0.00		0		0.00		\$0.00	0	0.00		0	0.00		0	0.00	

SAMPLE

JOB COORDINATOR PANEL

as of December 2023

<p>Casamar Group, LLC Joe Garcia 23335 Alamos Lane Newhall, CA 91321 TEL: 661.254-2373 Fax: 661.253.0549 jgarcia@casamargroup.com</p>	<p>Del Richardson & Associates, Inc. Del Richardson 510 S. La Brea Avenue Inglewood, CA 90301 TEL: 310.645.3729 ext. 229 FAX: 310.645.3355 Del.Richardson@drainc.com</p>
<p>Harris & Associates John W. Harris 865 S. Figueroa Street Los Angeles, CA 90017 TEL: 213.489.9833 FAX: 626.316.7103 john@jwharrislaw.com</p>	<p>Managed Career Solutions, Inc. Philip Starr 3333 Wilshire Blvd., Suite 405 Los Angeles, CA 90010 TEL: 213.355.5312 FAX: 213.381.5053 pstarr@mcscareergroup.com</p>
<p>Mindful Integration of Construction Services Theodora Oyie, MBA 5665 Wilshire Blvd. #1114 Los Angeles, CA 90036 TEL: 323. 383.9844 inclusion@mics.us</p>	<p>Modern Times, Inc. Joseph Hernandez 1892 E. Altadena Drive Altadena, CA 91001 TEL: 213.810.6105 FAX: 626.316.7103 joe@moderntimesinc.com</p>
<p>Onesimus, Inc Michael Richardson 129 E. 136th Street Los Angeles, CA 90061 TEL: 310.701.0359 profitableanduseful@gmail.com</p>	<p>Pacific Resources Services Corporation Ben Ocasio 11421 Lambert Ave. El Monte, CA 91732 TEL: 626.800.4006 FAX: 626.800.4140 bocasio@pacificresourceservices.com</p>
<p>Padilla & Associates, Inc. Patricia Padilla 211 East City Place Drive Santa Ana, CA 92705 TEL: 714.225.0116 ppadilla@padillainc.com</p>	<p>PDA Consulting, Inc. Pamela Penn 8901 S. La Cienega Blvd. Suite 201 Inglewood, CA 90301 TEL: 310.910.0940 pamela.penn@pdaconsultinggroup.com</p>
<p>Playa Vista Job Opportunities and Business Services Mary Taylor 4112 S. Main Street Los Angeles, CA 90037 TEL: 323.432.3955 FAX: 323.432.3995 mtaylor@pvjobs.org</p>	<p>TransCal Services, LLC Jeffery Henderson 6109 S. Western Ave., Suite 308 Los Angeles, CA 90047 TEL: 323.305.6470 FAX: 323.305.6471 jhenderson@transcalservices.com</p>
<p>TSG Enterprises, Inc. dba The Solis Group Elizabeth Solis 131 N. El Molino Ave., Suite 100 Pasadena, CA 91101 TEL: 626.685.6989 FAX: 626.685.6985 elizabeths@thesolisgroup.com</p>	<p>Power2Workers Christiana Faulkner 5505 S. Vermont Ave. Los Angeles, CA 90037 TEL: 323.920.6674 christiana@power2workers.org</p>



Metro

SECTION 01 00 00

PROJECT GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of the Contract (1.02)
- B. Permanent Utility Services (1.03)
- C. Work not Included (1.04)
- D. Drawings (1.05)
- E. Time of Completion (1.06)
- F. Long Lead Time Materials and Equipment (1.07)
- G. Liquidated Damages (1.08)
- H. Examination of Site and Work (1.09)
- I. Cooperation (1.10)
- J. Restrictions to the Work (1.11)
- K. Cutting and Patching (1.12)
- L. Air Quality Management District Rules (1.13)
- M. Shop Drawings (1.14)
- N. Cleaning (1.15)
- O. Existing Utility Lines (1.16)
- P. Protective Measures (1.17)
- Q. Project Administration (1.18)
- R. Best Management Practices (BMP) Requirements (1.19)
- S. Work In Progress Under Other Contracts (1.20)

1.02 SCOPE OF THE CONTRACT

- A. Work to be done under the Contract consists of furnishing all materials, all equipment, and performing the Work required by these Specifications and the Drawings hereinafter, described and necessary, to complete the construction of the Fire Camp 13 Woolsey Fire Reconstruction Project.
- B. The work includes but is not limited to the following: Reconstruction of a one-story approximately 1,248 SF building to be used as sleeping quarters for the California Department of Corrections officers. Reconstruction of an approximately 1,403 SF shade structure outdoor exercise area. Remodel of an existing one story, approximately 992 SF classroom building.

1.03 PERMANENT UTILITY SERVICES

The Work shall include all operations necessary to place required utility services in

operating condition, including service lines from points of connection shown on Drawings, permanent meters, connections, and inspections. The work (when so scheduled) includes installation of telephone conduit, backboards, and terminal cabinets as shown, and cooperation with the serving utility company for the installation of other telephone equipment and cables. The County will arrange and pay for telephone switchboards, instruments, and cables.

All other expenses in connection with utility service installations shall be borne by the Contractor; however, upon receipt of certified cost statements, the County will reimburse Contractor for all charges made by serving companies in connection with permanent utility service installations.

Drawing notes and/or specification provisions of trade sections concerning utilities shall take precedence over the foregoing provisions.

1.04 WORK NOT INCLUDED

All items indicated on the Drawings as "N.I.C." (not in contract).

1.05 DRAWINGS

The Work shall conform to the Drawings entitled Fire Camp 13 Reconstruction Project with sheet numbers and titles as listed on Sheet G-001 of the Drawings.

1.06 TIME OF COMPLETION

- A. The work to be performed under the contract shall be completed within 240 calendar days, beginning with the date stipulated in the written notice to proceed issued by the Director.
- B. Failure to complete the work by the identified completion date will be subject to the Liquidated Damages identified in Paragraph 1.08.
- C. Final Payment Request shall be submitted within twenty (20) days after completion of the contract work, including all punch list items.

1.07 LONG LEAD TIME MATERIALS AND EQUIPMENT

- A. The Contractor shall make every effort to demand of his Subcontractors and suppliers, relative to long lead time items, that they order such items well in advance of the scheduled time of installation. Time extensions for late ordering of such materials will not be allowed.

1.08 LIQUIDATED DAMAGES

- A. All time limits stated in the Contract Documents are of the essence of the Contract and should the Contractor fail to complete the work required to be done on or before the time of completion as set forth in these specifications, including any authorized extension of time, it is mutually understood and agreed by and between the awarding entity and the Contractor that the use by the public of the Contract Work will be correspondingly delayed, and that by reason thereof, the awarding entity and the public will necessarily suffer great damages; that such damages from the nature of the case will be extremely difficult and impractical to fix; and that the awarding entity and the Contractor have endeavored to fix the amount of said damages in advance as follows:
 - 1. The sum of \$1,500 a day for each day's delay in the completion of the work beyond the time limit stipulated in Paragraph 1.06.
- B. It is further mutually understood and agreed by and between the awarding entity and the Contractor that the sum of liquidated damages set forth above will be additive to a total of \$1,500 a day for each and every day's delay in the event that the time limits, as hereinbefore specified, are concurrently exceeded. Any authorized extensions of time will be added to the time limits stipulated.
- C. The Extended Overhead Daily Rate is not applicable when it is determined that liquidated damages apply due to a Contractor's delay.

1.09 EXAMINATION OF SITE AND WORK

- A. Bidders must examine the location, physical conditions, and surroundings of the proposed Work and judge for themselves the extent to which these factors will influence the performance of the Contract Work.
- B. The plans for the Work show conditions as they are supposed or believed by the Department to exist, but it is not intended, or to be inferred, that the conditions as shown thereon constitute a representation, express or implied by the County or its officers, that such conditions are actually existent, nor shall the Contractor be relieved of the liability under his Contract, nor the County, or any of its officers, be liable for any loss sustained by the Contractor as a result of any variance between conditions as shown on the plans or referred to in the Specifications and the actual conditions revealed during the progress of the Work.

- C. The County will conduct a prebid conference and job walk of the project site on October 3, 2024 at 10:00 a.m.

1.10 COOPERATION

In the entrance and exit of all workers and in bringing in, storing, or removing of materials and the erection and maintenance of equipment and in the manner and time of prosecuting the work, the Contractor shall cooperate with those in authority on the premises to prevent the entrance of those whose presence is forbidden or undesirable, and he shall observe all rules and regulations in force on the premises and avoid undue interference with the convenience, sanitation, and routine of County departments occupying the premises.

1.11 RESTRICTIONS TO THE WORK

- A. The Department reserves the right to determine which of the Contractor's operations are noise, dust, or dirt producing, or which disrupt utility service, or which constitute blocking of passageways, exits, entrances, etc., or which in any way constitute an interference in the proper function of the building.
- B. Contractor shall maintain clear access to all protection equipment at all times, including access to fire hydrants.
- C. Control of Tools: During the progress of the work, all hand tools, including power driven hand tools, cables, ropes, and other implements shall be transported and retained, except when in use in an approved locked toolbox. Care shall be taken that no tool is left unguarded or left where it might be taken by an unauthorized person.
- D. All work by the Contractor is subject to inspection at any time and without notice by the County.
- E. The working hours are Monday through Friday between 7:00 a.m. to 4:00 p.m. unless otherwise specified by the County.

1.12 CUTTING AND PATCHING

The Contractor shall perform all cutting, patching, and finishing operations occasioned by the Work under the Contract, whether or not such operations are indicated on the Drawings or specifically mentioned in the various sections of the Specifications. All such operations shall be performed in the best practices of the various trades involved and to the satisfaction of the Department. All patching and finishing materials shall match existing adjacent surfaces in every respect, including

design, type and quality of materials, finish, and color. Cutting, patching, and finishing shall include all such operations in existing areas required by the Work under the Contract.

1.13 AIR QUALITY MANAGEMENT DISTRICT RULES

The Contractor shall become familiar with requirements of the South Coast Air Quality Management District Rules 50, 66, 66.1, 66.2, 403, and 1113. The Contractor is responsible for conforming to and using materials which meet the requirements of the above-specified rules.

1.14 SHOP DRAWINGS

Furnish shop drawings as required in the various sections of the Specifications or as requested by the Department. Unless otherwise specified, submit six (6) copies of shop drawings to the Department for review. One set will be returned to Contractor marked "no exceptions noted" or "exceptions noted." If changes are required, six (6) copies of corrected shop drawings shall be delivered to the Department. Shop drawings shall be of sufficient size and scale to clearly show all details; shop drawings of millwork and cabinet work shall show molding full size. No materials shall be furnished or Work done on items requiring shop drawings prior to acceptance. Acceptance of shop drawings shall not relieve the Contractor from responsibility for deviations from the Contract Documents, nor from responsibility for errors or omissions of any sort in the shop drawings. Neither does such acceptance relieve the Contractor from his responsibility for the correct installation, or for the proper operation in service, of items requiring shop drawings.

1.15 CLEANING

During progress of Work and upon completion of each part of the Work as defined by the sections into which these Specifications are divided or as separated by the various trades involved in the Work, each area shall be cleaned of debris emanating from the Work. The Contractor shall remove excess materials, waste, rubbish, and debris, and his construction and installation equipment from the premises. Any dirt and stains caused by the Work under the Contract shall be removed from the surfaces of the structures and from equipment and fixtures. Final acceptance of the Work done under these Specifications will not be given until the cleaning has been inspected and approved by the Department.

1.16 EXISTING UTILITY LINES

Except as indicated on the Drawings or in the Specifications, the Contractor will not be liable for the rerouting of existing active underground lines, which may be discovered during the progress of the Work.

1.17 PROTECTIVE MEASURES

The Contractor shall provide and maintain substantial and adequate protection as may be required to protect new and existing Work and all items of equipment and furnishings for the entire duration of Work.

The Contractor shall repair or make good any and all damage or loss he may cause to the building or other County property to the full satisfaction of the Department.

1.18 PROJECT ADMINISTRATION

All materials supplied and all Work done by the Contractor shall be under the general administration of the Department and in accordance with the Drawings and Specifications.

1.19 BEST MANAGEMENT PRACTICES (BMP) REQUIREMENTS

A. The Contractor shall comply with Section 01 57 00 (for projects less than one acre), Section 01 57 00 (for projects greater than one acre), the Los Angeles County Department of Public Works Construction Site Best Management Practices (BMP's) Manual, latest edition. A copy of the BMP Manual can be obtained at the Los Angeles County Department of Public Works Cashier's Office, 900 South Fremont Avenue, Alhambra, CA 91803, (626) 458-6959.

B. Related Work: Cleaning; Section 01 74 23.

1.20 WORK IN PROGRESS UNDER OTHER CONTRACTS

It is anticipated that the work of a developer may be concurrently in progress with the work of this contract. Refer to General Conditions articles, "Other Contracts" and Cooperation with Others."

* * * *

SECTION 01 14 00

ALTERATION PROJECT PROCEDURES

1.00 GENERAL

1.01 CONTRACTOR'S USE OF THE PREMISES

- A. The Contractor will be restricted in the use of the site to that area designated by the County. If the allotted space is too restrictive, provide a written request to the County, identifying the amount of additional area required, the reason why the existing area is inadequate, and any incentives for the County to provide the additional space.
- B. Obtain and pay for the use of additional storage or work areas if required for operations.

1.02 INTERRUPTION OF EXISTING SERVICES

- A. The facility is in continuous operation.
- B. If an interruption of any existing utilities and/or equipment operations to the existing building will be required provide the County a minimum of 7 days notice for minor interruption and 14 days advance notice for major interruption, obtain County's permission and if required by the County, interrupt service only during non-business hours unless otherwise noted in the Contract Documents. Interruptions affecting areas outside the tenant improvement space constitutes a major interruption.

1.03 PROTECTION OF EXISTING IMPROVEMENTS

- A. Take all precautions necessary to protect existing building, utilities and other site improvements from damage due to the work of this Project, and be responsible for their restoration of any damaged property to its original condition if damage is a result of the Contractor's construction activities.
- B. Cooperate with County to sequence the work so as not to unnecessarily interfere with operation of occupied facilities. Prior to demolition or construction work, consult with County to determine a construction schedule which will permit the existing facilities to function without interruption. Thereafter, Contractor shall provide County's Representative with a minimum of fourteen days advance notice, in writing, of anticipated portion of the Work which may, because of noise or otherwise, require advance operational planning.
- C. In planning and performing the Work, make every effort to maintain all pollutants, including noise, dirt and dust levels at the absolute minimum possible.

- D. Continuously maintain ingress and egress to and from existing building for purposes of fire and emergency entrance and escape, loading and delivery, and building maintenance, to the satisfaction of the County and authorities having jurisdiction.
- E. Protect all utilities against interruption, damage or contamination during construction; if necessary, provide temporary utilities to maintain services continuously. Such utilities shall include, but shall not be limited to, electricity, water, gas, sewerage, telephone, data, oxygen, nitrous oxide, vacuum and compressed air.
- F. Provide temporary barriers to separate occupied areas from work areas. Seal all joints to create dust-proof enclosures.
- G. Limit equipment and vehicles in ingress and egress and use of service areas to the minimum essential to operations. If there is unavoidable conflict with Contractor's equipment in such areas, upon request of County, remove such equipment immediately to facilitate emergency services, and within a reasonable time, for all other services.

1.04 DAMAGE AND RESTORATION

- A. Damage to existing or new work caused by equipment or other operations, whether accidental or made necessary by reason of Contract requirements, shall be restored or replaced as specified or directed by the County, at Contractor's sole expense.
- B. Restoration shall be equal to the original work, and finishes shall match the appearance of, as nearly as possible, like existing adjacent work. Restoration shall be subject to acceptance by the County and shall be made as necessary at Contractor's sole expense.
- C. Work not properly restored or where not capable of being restored as intended under these specifications shall be removed and replaced as directed by County, at Contractor's sole expense.

2.00 PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. New materials: As specified in product Sections; match existing products and work for patching and extending work.
- B. Type and quality of existing products: Determine by inspection and testing products where necessary, referring to existing work as a standard.

3.00 EXECUTION

3.01 EXAMINATION

- A. Verify that demolition is complete and areas are ready for installation of new work.
- B. If actual conditions differ from conditions shown on the Contract Documents, immediately report the differing conditions to the Director and wait for written instructions.
- C. Beginning of work means acceptance of existing conditions.

3.02 PREPARATION

- A. Cut, move or remove items as necessary for access to alterations and renovation work. Replace and restore at completion.
- B. Remove unsuitable material not marked for salvage. Replace materials as specified for finish work.
- C. Remove debris and abandoned items from area.
- D. Prepare surfaces and remove surface finishes to provide for proper installation of new work and finishes.
- E. Close openings in exterior surfaces to protect existing work and salvage items from weather and extremes of temperature and humidity.

3.03 INSTALLATION

- A. Coordinate work of alterations and renovation to expedite completion.
- B. Designated areas: Complete in all respects.
- C. Remove, cut and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to original condition.
- D. Install products as specified in each Section.

3.04 TRANSITIONS

- A. Where new work abuts or aligns with existing, perform a smooth and even transition. Patch work to match existing adjacent work in texture and appearance.

- B. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along with a straight line at a natural line of division and make recommendations to Director.

3.05 REPAIR OF DAMAGED SURFACES

- A. Patch or replace portions of existing surfaces which become damaged, lifted, discolored or showing other imperfections.
- B. Repair substrate prior to patching finish.

3.06 FINISHES

- A. Finish surfaces as specified in each Section.
- B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

* * *

SECTION 01 26 13

CONTRACTOR'S REQUEST FOR INFORMATION

PART 1 - GENERAL

1.01 SUMMARY

- A. This section covers general requirements for Contractor's Requests for Information (RFI).
- B. The Contractor will prepare and submit RFIs as directed by the County Project Manager.
- C. Related Sections:
 - 1. General and Supplementary Conditions for changes in the Work.
 - 2. Section 01 31 19: Progress Meetings
 - 3. Section 01 33 00: Submittals

1.02 SUBMITTALS

- A. Submit a Request for Information to the County when:
 - 1. An unforeseen condition or constructability question occurs.
 - 2. Questions regarding information in the Contract Documents arise.
 - 3. Information not found in the Contract Documents is required.
- B. When possible, request such clarification either verbally or in writing at the next scheduled Project meeting. When the RFI is answered at the Project meeting, number the RFI and enter the response into the meeting minutes.
 - 1. When the urgency of the need or the complexity of the item makes clarification at the next scheduled Project meeting impractical, prepare and submit a formal written RFI to the County.
- C. RFIs shall be submitted within a reasonable time frame so as not to interfere with or impede the progress of the Work. The Contractor shall make every effort to keep the number of RFIs to a minimum. If the number of RFIs becomes unwieldy, the County may require the Contractor to abandon the RFI process and submit requests as either submittals, substitutions, or requests for change.

- D. When the response to an RFI effects the cost or time duration of the project, notify the County in accordance with the General Conditions at the time of the submittal. Notification shall occur prior to commencing such work, so that the change order process can be initiated.
1. At time of the time of submittal of the RFI, notify the County to the time available before the response will cause a time or cost impact to the Project.
 2. An answered RFI shall not be construed as approval to perform extra work.
- E. Form of Submittal:
1. Submit legible written RFIs on a standard CSI or AIA preprinted form or other such form as approved in advance by the County. Each request shall include the following information:
 - a. Project name, as listed on the Contract Documents, and County Specs. Number;
 - b. Date;
 - c. RFI number;
 - d. Name, address, telephone and e-mail address of the Contractor;
 - e. Number and title of affected Specification Section(s);
 - f. Drawing numbers and detail numbers as appropriate;
 - g. Indicate if the RFI will result in a time or cost impact;
 - h. Clear, concise explanation of information or clarification requested;
 - i. Blank, lined spaces for Architect's response;
 - j. Signature block for County to acknowledge review of Architect's response;
 - k. Mark each page of each RFI attachment in the lower right corner with the RFI number;
 - l. Number submitted RFIs consecutively; and
 - m. Sign and stamp all RFI forms. RFIs from subcontractor or material suppliers shall be submitted through the Contractor. Contractor shall review all such information request prior to submitting to the County.
- F. RFIs not meeting the requirements of this Section will not be answered and any consequential impact on the project shall be the sole responsibility of the Contractor. Unanswered RFIs will be returned with a stamp or notification "Not Reviewed."
- G. RFI Log: Contractor shall maintain and update the log weekly and furnish to the County when requested. The log shall contain the following minimum information:

- a. RFI number
- b. Date submitted
- c. Brief description of content or subject
- d. Date answered

H. Allow a minimum of five (5) working days for review and response. The response time will be increased if more information is required, when the RFI is submitted out of sequence, or if in the opinion of the County, more time is required to answer the RFI.

1.03 QUALITY ASSURANCE

1. Carefully review the Contract Documents before submitting a RFI to the County. Verify that the information requested is not indicated in the Contract Documents or cannot be determined from a careful review.
 1. The County may not answer RFIs for information that is readily available in the Contract Documents.
2. RFIs requesting clarification of coordination issues, shall include the Contractor's suggested solution as an attachment to the RFI.
 1. Such coordination issues include, but are not limited to, pipe and duct routing, clearances, specific locations of work shown diagrammatically, and similar items.
 2. Provide scale drawings or sketches indicating the proposed solution.
 3. RFIs which do not include a suggested solution will not be answered.
3. Do not use RFIs for the following:
 1. To request approval of submittals.
 2. To request approval of substitutions.
 3. To request changes to the Contract Documents and to confirm action taken by the Contractor for requested changes/substitutions to the Contract Documents.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

(Not Applicable)

* * *

SECTION 01 29 73

SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Submit to the Department, six (6) copies of an accurate and realistic Schedule of Values allocated to the various portions of the work, ten (10) calendar days from issuance of Notice to Proceed under the Consultant Services Agreement.
- B. The Contractor will prepare and submit the Schedule of Values as directed by the County Project Manager.
- C. The Schedule of Values, unless objected to by the Department, shall become the basis for the Contractor's applications for payment.
 - 1. Upon request by the Department, support values given with data that will substantiate their correctness.
- D. Related requirements specified elsewhere.
 - 1. Section 01 00 00, "Project General Requirements".

1.02 FORM OF SUBMITTAL

- A. Type schedule on 8-1/2" x 11" white bond paper. Identify schedule with:
 - 1. Title of project and location.
 - 2. Specification number.
 - 3. Name and address of Contractor.
 - 4. Date of submission.
- B. Schedule shall list the installed value of the component parts of the work in sufficient detail to serve as a basis for computing values for progress

payments during construction.

- C. Use the Table of Contents of the project specifications as a basis for the format for listing component items.
 - 1. Identify each line item with the number and title of the respective section of the specifications.
- D. List sub-values of major products or operations for each line item. Additional sub-values may be requested by the Department.
- E. Costs for the various portions of the work:
 - 1. Each item shall include a directly proportional amount of the Contractor's overhead and profit.
 - 2. For items on which progress payments will be requested, list the total installed value, including Contractor's overhead and profit.
- F. A similar detailed schedule, itemizing costs and/or credits in a form satisfactory to the Department, shall accompany all quotations for changes in the work or for extra work. Refer to article entitled "Provisions for Extras" in the General Conditions of the project specifications.
- G. Round off figures to nearest ten (\$10) dollars wherever possible.
- H. The sum of all values listed in the schedule shall equal the total contract sum.

1.03 REVIEW AND RESUBMITTAL

- A. After review by the Department, revise and resubmit Schedule as required. Resubmit revised Schedule in same manner.
- B. Progress payments will not be made until Schedule has been approved.

* * *

SECTION 01 29 76

PROGRESS PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
 - 1. Division 1 Section "Allowances" for procedural requirements governing handling and processing of allowances.
 - 2. Division 1 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 3. Division 1 Section "Unit Prices" for administrative requirements governing use of unit prices.
 - 4. Division 1 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule. [**Cost-loaded CPM Schedule may serve to satisfy requirements for the Schedule of Values.**]
 - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

- a. Application for Payment forms with Continuation Sheets.
 - b. Submittals Schedule.
 - c. Contractor's Construction Schedule.
2. Submit the Schedule of Values to **County Project Manager** at earliest possible date but no later than **seven [7]** days before the date scheduled for submittal of initial Applications for Payment.
 3. Subschedules: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.
- B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 2. Submit draft of payment application for County review and approval.
 3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value.
 - 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate. **Include separate line items under required principal subcontracts for operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training in the amount of 5 percent of the Contract Sum.**
 5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

6. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If specified, include evidence of insurance or bonded warehousing.
7. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
9. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
10. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by **County Project Manager** and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Progress payments shall be submitted to County Project Manager by the last day of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
- D. Payment Application Forms: Use County standard as form for Applications for Payment.

- E. Payment Application Forms: Use forms provided by Owner for Applications for Payment. Sample copies are included at end of this Section.
- F. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. The County will return incomplete applications without action.
 - 1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
 - 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- G. Transmittal: Submit three [3] signed and notarized original copies of each Application for Payment to **Project Manager** by a method ensuring receipt **within 24 hours**. One copy shall include waivers of lien and similar attachments if required.
 - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
 - 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 - 2. When an application shows completion of an item, submit final or full waivers.
 - 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 - 4. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.
- I. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
 - 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 - 2. When an application shows completion of an item, submit final or full waivers.
 - 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 - 4. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 - 5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

- J. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of Values.
 3. Contractor's Construction Schedule (preliminary if not final).
 4. Products list.
 5. Schedule of unit prices.
 6. Submittals Schedule (preliminary if not final).
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants.
 9. Copies of building permits.
 10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 11. Initial progress report.
 12. Report of preconstruction conference.
 13. Certificates of insurance and insurance policies.
 14. Performance and payment bonds.
 15. Data needed to acquire Owner's insurance.
 16. Initial settlement survey and damage report if required.
- K. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- L. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. "Contractor's Affidavit of Payment of Debts and Claims."
 5. "Contractor's Affidavit of Release of Liens."
 6. "Consent of Surety to Final Payment."
 7. Evidence that claims have been settled.
 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took

possession of and assumed responsibility for corresponding elements of the Work.

9. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

SAMPLE APPLICATION AND CERTIFICATE FOR PAYMENT ATTACHED.

* * *

APPLICATION AND CERTIFICATE FOR PAYMENT

TO: LACDPW - PROJECT MANAGEMENT DIVISION II
 PUBLIC WORKS HEADQUARTERS BLDG.
 900 SOUTH FREMONT AVENUE, 5TH FLOOR
 ALHAMBRA, CA 91803

Project:
Contract No:
CP No.:

Application No: #REF!
Invoice No: #REF!
Period To: #REF!

From: Contractor

Project No: #REF!
Invoice Date: #REF!
Contract Date: #REF!

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment as, shown below, in connection with the contract.
 Continuation sheet is attached.

1 ORIGINAL CONTRACT SUM	\$	-
2 Net change by Change Orders	\$	-
3 CONTRACT SUM TO DATE	\$	-
4 TOTAL COMPLETED & STORED TO DATE	\$	-
(Column G on Continuation Sheet)		
5 RETAINAGE		
a 0.00% of Completed Work	\$	-
(Column D+E on Continuation Sheet)		
b 0.00% of Stored Material	\$	-
(Column F on Continuation Sheet)		
Total Retainage (Line 5a+5b or Total in Column I on Continuation Sheet)	\$	-
6 TOTAL EARNED LESS RETAINAGE	\$	-
(Line 4 less Line 5 Total)		
7 LESS PREVIOUS CERTIFICATES FROM PAYMENT		
(Line 6 from prior Certificate)		
8 CURRENT PAYMENT DUE	\$	-
9 BALANCE TO FINISH, INCLUDING RETAINAGE		
(Line 3 less Line 6)		

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Previously approved Change Orders	\$ -	\$ -
Change Orders approved this period	\$ -	\$ -
TOTALS	\$ -	\$ -
Net Change Order Total	\$ -	\$ -

To the best of my knowledge and belief, I certify that all items, units, quantities, and prices of work shown on this application for payment are corrects; that all the work has been performed and material supplied in full accordance with the terms and conditions of this Contract on this projects; that this application for payment is a true and correct statement of the contract account up to and including the last day of period covered by this application and that no part 'Current Payment Due' has been received.

CONTRACTOR:
 BY: _____ Date: _____

CERTIFIED AND APPROVED AS PER TERMS OF CONTRACT

To the best of my knowledge and belief, I certify that this application for payment does not exceed ()% of the value of the work completed since the previous application for payment, if any plus ()% of the value acceptable or stored materials for incorporation into work, but not installed, if any.

I further certify that this application for payment covers full payment for work completed since the previous application for payment and that any payment for prefabricated stored materials does not exceed ()% of the value of the materials.

AMOUNT CERTIFIED..... \$ -

BY: _____ Date: _____

Inspector

BY: _____ Date: _____

Architect/Engineer

BY: _____ Date: _____

County Project Manager

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptable of payment are without prejudice to any rights of the Owner or Contractor under this Contract except as set forth in the Contract.

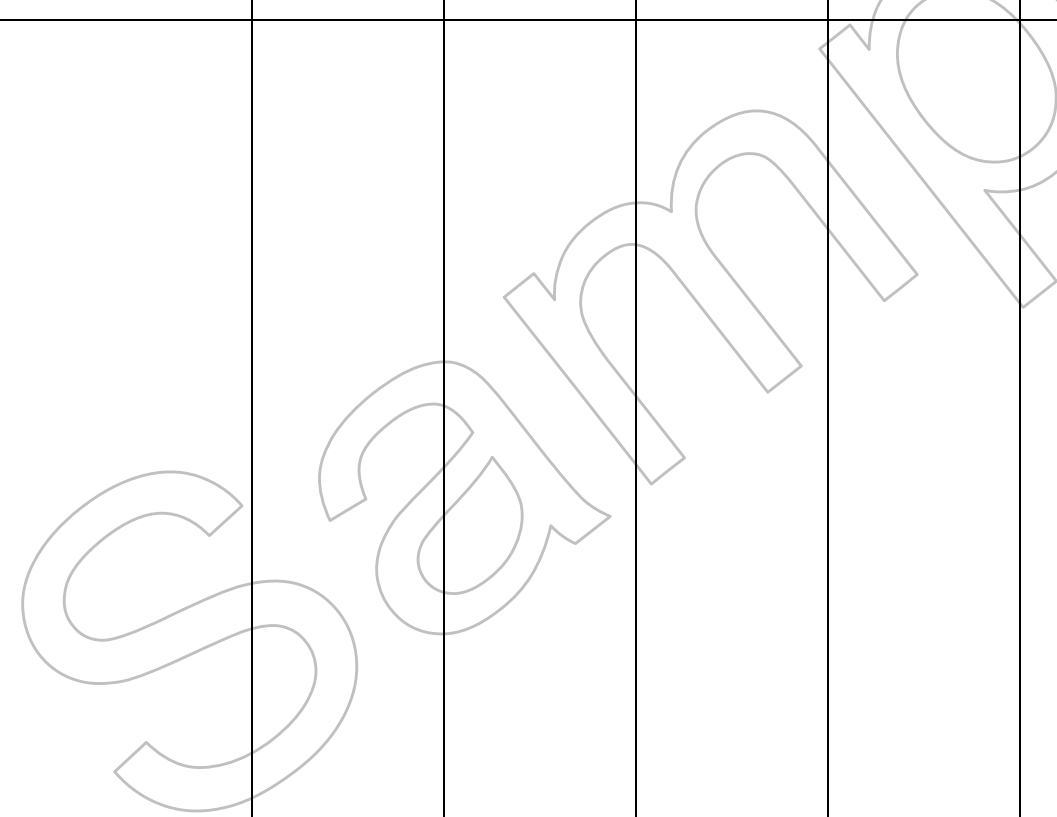


AIA Document G703™ – 1992

Continuation Sheet

AIA Document G702™–1992, Application and Certificate for Payment, or G732™–2009, Application and Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor’s signed certification is attached.
 In tabulations below, amounts are in US dollars.
 Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO:

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D WORK COMPLETED		F MATERIALS PRESENTLY STORED <i>(Not in D or E)</i>	G		H BALANCE TO FINISH <i>(C – G)</i>	I RETAINAGE <i>(If variable rate)</i>
			D + E FROM PREVIOUS APPLICATION	THIS PERIOD		(D + E + F) TOTAL COMPLETED AND STORED TO DATE	(G ÷ C) %		
									
GRAND TOTAL									

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

SECTION 01 31 00

COORDINATION AND MEETINGS

PART 1 – GENERAL

1.01 SECTION INCLUDES:

- A. Coordination
- B. Preconstruction Meeting
- C. Progress Meetings
- D. Preinstallation Meetings

1.02 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various Sections of the Project Manual to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later and for accommodating items to be installed by the County.
- B. Coordinate sequence of work to accommodate County occupancy as specified in Section 01 00 00.

1.03 PRECONSTRUCTION MEETING

- A. Construction Manager/County Project Manager will schedule a meeting after Notice of Award.
- B. Attendance Required: Architect, Project Coordinator, Prime Contractors, Major Subcontractors, Project Inspector and key County personnel.
- C. Agenda:
 - 1. Contract Agreement
 - a. Transmit Performance and Material Bonds to Architect
 - b. Review General/Supplementary Conditions
 - c. Deferred Approvals
 - 2. Receive documentation from Contractor
 - a. Construction Schedule
 - b. Schedule of Values

- c. List of Subcontractors with Addresses and Phone Numbers
 - d. List of Submittals and Estimated Date of Submittal
- 3. Project Administration
 - a. Application for Payment, Project Schedule, Lien Release, As-built Documents, Contract Administration
 - b. Change Orders and Proposal Requests
 - c. Submittals and Substitutions, Deferred Approvals
 - d. Site Meetings
 - e. Testing Lab
 - f. Verified Reports
- 4. Special County Conditions
 - a. Temporary Facilities
 - b. County Occupancy
 - c. Work by County
 - d. Access to Site – County Contract
- 5. Construction Process
 - a. Contractor to give Overview of Construction
 - b. Contractor to identify items to be selected by Architect/County and date selections must be made.
 - c. Contractor to review special requirements for equipment, safety, and noise.
- 6. Project Close-Out
 - a. Close-out Binder
 - b. As-Built Documents
 - c. Final Verified Reports
- D. Architect to record minutes and distribute copies within three days after meeting to participants, Architect and those affected by decisions made.

1.05 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the work as needed.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

- C. Attendance Required: Project Coordinator, Prime Contractors, major Subcontractors and suppliers, Project Inspector, key County personnel and Architect as appropriate to agenda topics for each meeting.
- D. Agenda
 - 1. Review Minutes of Previous Meetings
 - 2. Review of Work Progress
 - 3. Field Observations, Problems, and Decisions
 - 4. Identification of problems which impede planned progress.
 - 5. Review of Submittals Schedule or Status of Submittals.
 - 6. Review of Off-site Fabrication and Delivery Schedules
 - 7. Maintenance of Progress Schedule
 - 8. Corrective Measures to Regain Project Schedules
 - 9. Planned Progress During Succeeding Work Period
 - 10. Coordination of Projected Progress
 - 11. Maintenance of Quality and Work Standards.
 - 12. Effect of Proposed Changes on Progress Schedule and Coordination
 - 13. Other Business Relating to Work
- E. Architect to record minutes and distribute copies within three days after meeting to participants, Architect, and those affected by decisions made.

1.06 PREINSTALLATION MEETING

- A. When required in individual specification sections, convene a preinstallation meeting prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of installation, preparation and installation procedures.
 - 2. Review coordination with related work.
- E. Contractor to record minutes and distribute copies within three days to participants, Architect and those affected by decisions made.

1.07 COORDINATION OF SUBMITTALS

- A. Schedule and coordinate submittals specified in Section 01 33 00.
- B. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate request for substitutions to assure compatibility of space, of operating elements, and effect on work of other sections.

1.08 COORDINATION OF SPACE

- A. Coordinate use of project space and sequence of installation of mechanical and electrical work which is indicated diagrammatically on drawings. Follow routings shown for pipes, ducts, and conduits as closely as practical, with due allowance for available physical space; make runs parallel with lines of building. Utilize space efficiently to maximum accessibility for other installations, for maintenance and for repairs.
- B. In finished areas, except as otherwise shown, conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

1.09 COORDINATION WITH WORK BY COUNTY

- A. Coordinate any work by County.

1.10 COORDINATION OF CONTRACT CLOSE-OUT

- A. Coordinate completion and cleanup of work of separate sections in preparation for Substantial Completion.
- B. After County occupancy of premises, coordinate access to site by various sections for correction of defective work and work not in accordance with Contract Documents to minimize disruption of County's activities.
- C. Assemble and coordinate close-out submittals specified in Section 01 77 00.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

* * * * *

SECTION 01 31 19

PROGRESS MEETINGS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scheduling and administration of progress meetings.

1.02 RELATED REQUIREMENTS

- A. Instructions to bidders.
- B. Project general requirements.
- C. Construction schedules.
- D. Shop drawings, product data and samples.
- E. Quality control.
- F. Temporary Facilities.

1.03 PROGRESS MEETINGS

- A. The County will schedule and administer progress meetings throughout the construction of the work.
- B. The County will make physical arrangements, prepare agenda and distribute notice for the meetings to participants in advance of meeting date.
- C. The Project Manager will preside at meetings. Meeting minutes will be recorded and copies will be distributed to participants prior to next meeting.
- D. Location of meetings: Project's field office or Project Manager's office.
- E. Attendance: Project Manager, Inspector, Contractor, job superintendent, subcontractors, suppliers and others as appropriate to agenda; Architect/Engineer and others shall attend when appropriate.
- F. Minimum Agenda:
 - 1. Approval of minutes of previous meetings.
 - 2. Review of work progress.
 - 3. Field observations, problems and decisions.

4. Identification of problems which impede planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to Work.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

* * *

SECTION 01 32 00

CONSTRUCTION SCHEDULES

Critical Path Method Schedule Integration System

1. GENERAL

DESCRIPTION – The work specified in this section consists of developing and maintaining a Critical Path Method (CPM) schedule integration system for the contract. Planning, scheduling, management, and execution of work in accordance with contract documents are the sole responsibility of the Contractor.

- 1.1 Related General Conditions/General Requirements Articles, and Specifications Sections
 - a. General Conditions Articles 12.A, 12.B, 12.C
 - b. General Conditions Articles 14
 - c. General Conditions Articles 15.B.e.3
 - d. General Requirements Articles 1.02
 - e. General Requirements Articles 1.06
- 1.2 Generate a CPM schedule integration system using commercially available CPM scheduling software program containing direct file interchange capability with the software program used by the Los Angeles County Department of Public Works. Prepare as directed by the County Project Manager.
- 1.3 For scheduling submittals produce Precedence Diagram Method (PDM) and time scaled network diagram submittals on D-Size (22-inch by 34-inch) or E-Size (34-inch by 44-inch) medium suitable for reproduction. Print schedule submittal tabular reports on A-Size (8 ½-inch by 11-inch) paper. For scheduling submittals, the Contractor shall include backup diskettes. The backup diskettes shall be made directly from the CPM scheduling software and shall contain all files of the project that can be restored by the County for its evaluation and analysis.
- 1.4 Contract milestone dates, County furnished goods, availability dates, and real estate availability dates, are unique zero duration activities as a “start no earlier than” or “finish no later than” milestone. Each milestone activity will constrain its dependent work. Assume Notice to Proceed (NTP) is given at day zero for calculation of constraint dates for milestones.

- 1.5 Float is not for exclusive use or benefit of either the County or Contractor but is an expiring resource available to both parties on a nondiscriminatory basis. Float is used by either party, as needed to meet contract milestones and contract completion dates. Contract time extensions for contract performance will be granted only to extent that delays or disruptions to affected work paths exceed total float along those paths of current contract schedule (update schedule) in effect at time of delay or disruption. These delays or disruptions must also cause end date of work to exceed current contract date or milestone date and be beyond control and without fault or negligence of Contractor or any subcontractor at any tier. If delays or disruptions impact an already negative float path, Contractor will not receive a time extension unless and until activity with highest float is driven even further negative.
- 1.6 Use of float suppression techniques such as preferential sequencing or logic, special lead/lag logic restraints, and extended activity times or durations should be submitted with written justification to obtain the County's acceptance. Use of float time disclosed or implied by use of alternate float suppression techniques shall be shared to proportionate benefit of the County and Contractor. Use of any technique solely for purposes of suppressing float will be cause for rejection of schedule submittal.
- 1.7 Planning units – Scheduling software supports schedule Planning Units of hours, days, weeks or months. The standard time unit applied to the schedule integration system is defined as days.
- 1.8 Schedule network – Use Retained Logic CPM Precedence Diagram Method of scheduling.
- 1.9 Analyze in detail, activities included in contract schedule to determine activity time durations in units of working days. Base durations on engineering and design resources, drawing production, submittal review periods, procurement lead time and duration, manufacturing times, labor (crafts), equipment, and materials required to perform each activity on a normal workday basis. No on-site activity shall have a duration over 10 working days except non-construction activities such as submittals, submittal reviews, procurement and delivery of materials or equipment, and concrete curing.

2. PRODUCTS

SUBMITTALS – Submit one original and four copies of schedule unless specified otherwise. Provide submittals specified in this section to the County for review and acceptance.

2.1 Baseline CPM Contract Schedule

Provide the County with a means to monitor and follow progress of all phases of work, with contractually specified interim milestones and completion dates, and with constraints, restraints or sequences included in the contract. Degree of schedule detail required shall include factors to the satisfaction of the County, including but not limited to the following:

- 2.1.1 Master list of submittals and all other requirement as referenced in Section 01 33 00 Submittals.
- 2.1.2 Contract interim milestones and contract completion date, substantial completion dates, constraints, restraints, sequence of work indicated.
- 2.1.3 Type of work to be performed, sequences, and labor trades involved.
- 2.1.4 Purchases, manufacture, tests, delivery, and installation activities for major materials and equipment.
- 2.1.5 Deliveries of County furnished goods and/or materials in accordance with dates or schedule windows of such times set forth in the contract or furnished by the County.
- 2.1.6 Preparation, submittal, and acceptance of shop and/or working drawings and material samples showing a 30-day minimum time specified for the County and third party reviews of normal or routine submittals, so identified in the specifications, and the same time frame shall be allowed for at least one re-submittal or submittals so identified in the contract documents.
- 2.1.7 Approvals and permits required by regulatory agencies or other third parties.
- 2.1.8 Schedules for subcontract work.
- 2.1.9 Assignment of responsibility for performing specific activities.
- 2.1.10 Access and availability to work areas.

- 2.1.11 Identification of interfaces and dependencies with preceding, concurrent and follow-on construction or contractors and utilities.
 - 2.1.12 Actual tests, submissions of test reports, and acceptance of test results.
 - 2.1.13 Start up, testing, training, and assistance required under the contract.
 - 2.1.14 Planning for phased or total takeover by the County.
 - 2.1.15 Punch-list and final clean up.
 - 2.1.16 Identification of construction restrictions as well as any activity requiring unusual shift work, such as two shifts, six day weeks, specified overtime, or work at times other than a standard work day.
- 2.2 The schedule of values shall be prepared and submitted together with the construction schedule.
 - 2.3 Failure to meet these requirements may result in a determination and recommendation that the Board of Supervisors determine that the successful bidder as non-responsible because such failure reflects the bidder's ability to manage the work.
3. Current CPM Contract Schedule Updates
- 3.1 Initially, upon approval of the baseline CPM contract schedule, establish the current CPM contract schedule from the baseline CPM contract schedule. Thereafter, update the current contract schedule monthly with data date designated by the County. Use updated current contract schedule for subsequent planning, scheduling, and execution of work to be accomplished. Obtain County prior acceptance before making deviations in logic and activity durations in the current CPM contract schedule.
 - 3.2 Participate with the County in periodic meetings, at least monthly, on dates directed by the County and seven days prior to monthly status. At meeting held seven days prior to the data date, provide preliminary updated current CPM contract schedule that forecasts project status on the data date and contains actual start and actual finish dates for activities in progress or completed, remaining durations of activities already in progress, percent completed, logic changes, new or deleted activities, and new change order/modifications.

- 3.3 Submit a stand alone portion of the network (fragnet), if current progress reflects negative float of minus 10 days or more for a milestone activity, as indicated by most recent CPM contract schedule, allowed by contract as amended by approved change orders/modifications. Show activities affected, date delay or disruption occurred or how productivity was impacted, and unmitigated impacts to schedule caused delay or disruption. Submit similar fragnet showing Contractor's plan to mitigate delay or disruption and subsequent impacts to schedule at the County's request. Provide written narrative describing circumstances that caused delay or disruption and methodology used to determine extent of delay or disruption. Submission of such fragnets does not constitute permission to proceed with plan. Execute some or all of the following remedial actions, and submit a recovery schedule that may include:
 - 3.3.1 Increase construction manpower in such quantities and crafts as necessary to eliminate the backlog of work.
 - 3.3.2 Increase the number of working hours per shift, shifts per working day, working days per week, the amount of construction equipment, or combination of the foregoing to eliminate the backlog of work.
 - 3.3.3 Reschedule the work in conformance with the specifications requirements.
4. Before implementing any of the above actions, notify and obtain acceptance from the County. If such actions are accepted, incorporate current CPM contract schedule revisions before next update.
5. Addition of equipment or construction forces, increasing working hours or other methods, manner, or procedure to return to contractually required completion date will not be considered justification for a change order/modification, nor be treated as acceleration where the need for a recovery schedule has been caused by the Contractor and/or its subcontractors or suppliers at any tier.
6. When the Contractor experiences change order/modifications or delays and a time extension is requested, submit to the County a written time impact analysis illustrating the influence of each change or delay on current contract schedule completion date utilizing current CPM contract schedule. Include in each time impact analysis a fragnet demonstrating how the Contractor proposes to incorporate the change order/modification or delay into the current CPM contract schedule. The fragnet shall contain a sequence of new and/or activity revisions that are proposed to be added

to the current CPM contract schedule in effect at the time change or delay is encountered to demonstrate influence of delay and method of incorporating the delay and its impact into the schedule as they are encountered.

- 6.1 Each time impact analysis shall demonstrate estimated time impact based on events of delay, date of change order/modifications, proceed order, or unilateral change order/modification given to the Contractor, status of construction at that point in time, and event time computation of activities affected by change or delay. Event times used in analysis shall be those included in latest version of the current CPM contract schedule, in effect at time change or delay was encountered.
- 6.2 Submit each time impact analysis in triplicate, within ten days after a delay occurs. If the Contractor does not submit a time impact analysis for a specific change order/modification or delay within specified period of time, the Contractor will be deemed to have irrevocably waived rights to additional time and cost.
- 6.3 Because float time within current CPM contract schedule is jointly owned, it is acknowledged and agreed by the Contractor that the County caused delays on the project may be offset by County caused time savings (including, but not limited to: critical path submittals returned in less time than allowed for the contract, acceptance of substitution requests which result in a savings of time along the critical path for the Contractor, etc.). In such an event, the Contractor will not be entitled to receive an extension of time or delay damages until the County caused time savings are exceeded and contract completion data also exceeded.
- 6.4 The County will accept or reject each time impact analysis. Upon acceptance, a copy of a time impact analysis signed by the County will be returned to the Contractor for incorporation into the schedule.
- 6.5 Upon mutual agreement by both parties, incorporate fragnets illustrating the influence of change orders/modifications and delays into the current CPM contract schedule during first update after agreement is reached.
- 6.6 In the event the Contractor does not agree with the decision of the County regarding impact of a change or delay, the County's determination shall govern.

7. The Contractor shall resolve out-of-sequence progress, if any, to provide the actual construction sequence to calculate the current critical path(s) and identify any deviations of interim milestones and/or project completion.
8. As-built schedule – Submit as-built schedule covering work performed under the Contract within 30 days after final completion. As-built schedule – Certified by a planner/scheduler and Contractor's project manager as being the manner in which Contract was executed. Submittal and acceptance of the schedule will be a condition precedent to reduction/release of retainage at the end of the contract.
9. Schedule reviews – The County will review and respond to scheduling submittals within 14 days after submittal, unless a different review period is specified in this section. Submit a revised schedule within seven days after receipt of the County's response if the County requires changes or additional information.
10. Early completion schedule – If the schedule duration proposed by the Contractor is less than the completion date in the NTP, the proposed schedule will not nullify the Contractor's right to the NTP duration. The Contractor agrees that in the event a proposed early completion schedule (or any subsequent update) which is found to be acceptable by the County, indicating a duration which is less than time allowed by Contract for completion of work or of interim milestone, Contract completion time shall only be shortened by a change order/modification to equal Contractor's proposed baseline CPM contract schedule duration.

If the schedule duration proposed by the Contractor is less than the completion date in the NTP, the proposed schedule will not nullify the Contractor's right to the NTP duration.

11. Three week rolling bar chart schedule – Once a week, on a day mutually agreed to by the County and the Contractor, a meeting will be held to assess the progress achieved by the Contractor during previous work week. Submit a project schedule listing activities completed and in progress for the previous week and the activities scheduled for the succeeding two weeks based on the current CPM contract schedule. The three week rolling bar chart schedule shall be provided from the current CPM contract schedule and include all activities scheduled including: activity ID, description, early start and early finish, total float, original duration, remaining duration, percent complete, performance of the activity, and pertinent remarks as to activity status. The schedule shall be submitted to the County before the weekly meeting for review. Submit copies of schedule on 11-inch by 17-inch paper.

12. Monthly Updated Current Contract Schedule
 - a. One computer generated backup copy of monthly updated current CPM contract schedule file.
 - b. Written narrative for updated current CPM contract schedule.
13. Fragnets
 - a. One computer generated backup copy of fragnet files.
 - b. Written narrative of fragnet assumptions.
14. Contract Time Scaled Network Diagrams – Submit computer generated time-scaled network diagram entitled “Current Time Scaled Network Diagram” with submittal of items referenced below.
 - a. Submit with initial early work schedule submittal.
 - b. Submit every month with updated current CPM contract schedule.
15. Written Narrative Reports – Include a stand alone narrative of sufficient detail to explain basis of Contractor’s submittal with each schedule submittal.
 - 15.1 CPM Contract Schedule Submittals – Explain determination of activity durations and describe Contractor’s approach for meeting required interim and final completion milestone dates, as specified in the Contract. Include as a minimum basis and assumptions used in preparing the submittal, including crew sizes, equipment requirements, and anticipated delivery dates; restraints; critical path activities; production rates; activities requiring overtime or additional shifts; activities that contain time contingencies for impacts to be expected from normal rainfall; holidays and other non-work days; potential problem areas; permits; coordination required with the County; utilities and other parties; and long lead delivery items requiring more than 30 days from order to delivery. Identify work items that may be expedited by use of overtime or additional shifts. Identify and explain sequencing and other constraints such as manpower, material, and equipment. Include listing of holidays and special non-work days.
 - 15.2 Current CPM Contract Schedule Submittals – State in narrative, work actually completed and reflect progress along critical path in terms of days ahead of or behind allowable dates. Specific requirements of narrative are as follows:

- 15.2.1 If updated current CPM contract schedule indicates an actual or potential delay to contract completion date or interim milestone dates as specified under the contract documents or modified by change order/modification, identify causes of delays, disruptions and interruptions and provide explanation of work affected and proposed corrective action to meet milestone dates involved or to mitigate potential delays or disruptions. Document and log in a matrix format activities with non-mitigated negative float until the negative float is mitigated. Identify deviations from previous month's critical path. The matrix will include applicable activity number, description, planned start and finish dates, current start and finish dates, and float quantity.
- 15.2.2 Identify by activity number and description, activities in progress and which activities are scheduled to complete during the next period.
- 15.2.3 Identify by activity number and description, activities to be started during the month following the report period. Show Contractor's forecast early and late start, and finish dates.
- 15.2.4 Discuss added change order/modification work items.

3. EXECUTION

3.1 Baseline CPM Contract Schedule

- 3.1.1 Provide Contractor's detailed activities and sequencing for work included in the contract. Assign unique activity identification for each detailed activity.
- 3.1.2 Indicate Contractor's best estimate for original durations, early dates, late dates, logic ties, constraint dates, and total float. Schedule activities in the sequence which Contractor intends to perform work.
- 3.1.3 Include following activity sequence for major material and equipment procurement:
 - 3.1.3.1 Submittal preparation; review for acceptance; and fabricate/deliver – Divide procurement items that may contain multiple submittals occurring at different time intervals into separate sequences that can be tracked

on individual basis. Include a maximum original duration of 20 working days for re-review. Resubmittal activities shall contain submittal preparation activities for other material and equipment procurement (non-major) to schedule.

3.1.4 Baseline CPM contract schedule activity requirement are as follows:

- 3.1.4.1 Activity descriptions – Briefly convey scope and location of work indicated.
- 3.1.4.2 Activities – Discrete items of work accomplished under contract that provide measurable and recognizable parts of work.
- 3.1.4.3 Include as contract deliverables, submittal and approval of permit applications and variances, samples of materials, shop drawings, working drawings, inspection and test plans, safety and security plans, and site traffic control plans. Include activities of the County that may affect progress as well as those of affected utility companies and other similarly involved third parties. Include activities in the baseline CPM contract schedule as stipulated in general requirements.
- 3.1.4.4 Work activities – Show duration in work days.
- 3.1.4.5 Work activities – Durations of 10 working days or less except for non-construction activities such as procurement of materials, or fabrication of equipment. Should a work activity require more than 10 working days, subdivide work activity to define appropriate work items.
- 3.1.4.6 Critical path is defined as the sequence(s) of activities with the least amount of float.
- 3.1.4.7 Failure to include any element of work required for performance of the contract in baseline CPM contract schedule will not excuse Contractor from completing work required to achieve milestone completion, notwithstanding acceptance of baseline CPM contract schedule submittals.

Activities that are susceptible to weather delays caused by rain shall contain time contingencies for those potential delays. The time contingencies shall be described in the appropriate activity log windows of scheduling software. In scheduling the work, Contractor shall plan for normal rainfall (including its subsequent effects on days following extremely heavy rain).

3.2 Baseline CPM Contract Schedule Changes

When commencing new work associated with a change order/modification, incorporate work into the current baseline CPM contract schedule submittal as new activities after discussion with the County concerning how changes will be placed into the revised baseline CPM contract schedule. After an official change order/modification has been issued for work, add it to the schedule.

3.3 Fragnets

3.3.1 Submit revised current CPM contract schedule within 14 days of request. If Contractor falls behind in prosecution of work, as indicated by negative critical path, or submittal of current CPM contract schedule no longer appears to represent actual prosecution of work.

3.3.2 Properly connect to and constrain by, previously existing predecessor and successor activities, as applicable, activities of revised portion(s) of schedule. Band impacted activities in separate networks (fragnets); indicating specific delay or impact issues and submit to the County for review. Combine approved fragnets into current CPM contract schedule.

3.3.3 Time extensions will be granted only to the extent that equitable time adjustments for activity or activities affected exceed total or remaining float along critical path of activities at time of actual delay, or at time a change order/modification was issued. Float or slack time is not for the exclusive use or benefit of the Contractor but is an expiring resource available to all parties as needed to meet contract milestones and contract completion date. Time extensions will not be granted nor delay damages paid until delay occurs:

3.3.3.1 Which is beyond the control and without the fault or negligence of the Contractor and its subcontractors or suppliers, at any tier; and

3.3.3.2 Which extends actual performance of work beyond applicable current Contract completion date and most

recent date predicted for completion of project on approved schedule update, current as of time of the delay or as of time of issuance of a change order/modification.

3.4 Submittal of Schedule

- 3.4.1 Contractor shall submit the construction schedule within ten (10) calendar days, per Section 00 01 00, Paragraph 1.14e, after receipt of the Notice to Proceed (NTP) on hard copies and CD that is compatible with P6. The Contractor shall provide to the County for review four (4) copies of the construction schedule indicating the sequence of operations, description of the work, calendar definition and duration showing entire job performed within the specified contract time.
- 3.4.2 If the schedule duration proposed by the Contractor is less than the completion date in the NTP, the proposed schedule will not nullify the Contractor's right to the NTP duration.
- 3.4.3 The County shall review the Contractor's construction schedule. The Contractor shall incorporate all the revisions requested by the County and submit the final schedule within seven (7) calendar days of its receipt from the County.
- 3.4.4 The schedule of values shall be prepared and submitted together with the construction schedule.
- 3.4.5 Failure to meet these requirements may result in a determination and recommendation that the Board of Supervisors determine that the successful bidder as non-responsible because such failure reflects the bidder's ability to manage the work.
- 3.4.6 The schedule shall be revised at no additional cost to the County and resubmitted for review when:
 - 3.4.6.1 Changes to contract affect contract completion time.
 - 3.4.6.2 "Slippage" occurs because of procurement delays, rain, strikes and other delays.
 - 3.4.6.3 Any activities are modified from previous submittal.
 - 3.4.6.4 Delay on initial non-critical items is of such magnitude as to change the critical path.

3.5 Responsibility for Completion

The Contractor shall furnish sufficient forces, offices, facilities and equipment, and shall work such hours including night shift and overtime operations, as necessary to ensue the prosecution of the work in accordance with the current monthly construction schedule update. If, in the opinion of the County, the Contractor falls behind in meeting the construction schedule as presented in the current monthly schedule update, the Contractor shall take such steps as may be necessary to improve its progress, and the County may require it to increase the hours of work, the number of shifts, overtime operations and/or the amount of construction plant and equipment without additional cost to the County.

END OF SECTION

SECTION 01 32 33

PHOTOGRAPHIC DOCUMENTATION

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Periodic construction photographs.
- B. Related Sections include the following:
 - 1. Division 1 Section, Submittal Procedures, for submitting photographic documentation.
 - 2. Division 1 Section, Closeout Procedures, for submitting digital media as Project Record Documents at project closeout.

PART 2 – PRODUCTS

2.01 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in uncompressed TIFF format, produced by a digital camera with minimum sensor size of 4.0 megapixels, and at an image resolution of not less than 1024 by 768 pixels.

PART 3 – EXECUTION

3.01 CONSTRUCTION PHOTOGRAPHS

- A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the work. Photographs with blurry or out-of-focus areas will not be accepted.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
1. Date and Time: Include date and time in file name for each image.
 2. Field Office Images: Maintain one set of images on CD-ROM in the field office at project site, available at all times for reference. Identify images same as for those submitted to Architect and Construction Manager.
- C. Preconstruction Photographs: Before commencement of demolition, or commencement of construction, take digital photographs of project site and surrounding properties, including existing items to remain during construction, from different vantage points.
- D. Periodic Construction Photographs: Take digital photographs weekly, with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.
- E. Architect or Construction Manager Directed Construction Photographs: From time to time, Architect or Construction Manager may instruct photographer about number and frequency of photographs and subject, general directions or vantage points for photographs. Select actual vantage points and take photographs to show the status of construction and progress since last photographs were taken.

END OF SECTION

SECTION 01 33 00

SUBMITTALS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Submittal Procedures
- B. Construction Progress Schedules
- C. Shop Drawings
- D. Product Data
- E. Samples
- F. Manufacturers' Instructions
- G. Manufacturers' Certificates
- H. Coordinated Drawings
- I. Request for Information
- J. Contractor's Photographs

1.02 SUBMITTALS LIST AND SCHEDULE

- A. Submittal: Within 30 days or submission of List of Submittals, whichever is later, after award of contract, and before submitting items for review, submit two copies of submittals list and schedule.
- B. The Contractor will submit and document all submittals as directed by the County Project Manager.
- C. Schedule: Compile complete schedule of submittals anticipated to be made during progress of work.
 - 1. Include list of each type item for which Contractor's drawings, shop drawings, coordination drawings, product data, samples, certificates of compliance, manufacturer's certificates, warranties, and other types of submittals are required. Include number of Contractor's drawings, shop drawings, and coordination drawings anticipated within each submittal.
 - 2. Sequentially number each submittal. Use original submittal number with sequentially numbered suffix for resubmittals.
 - 3. Allow at least 10 working days, average, for Architect's review of submittals following receipt of submittal, including return to Contractor.

4. Indicate date of submittal by Contractor to Architect and date of receipt of reviewed submittals by Contractor from Architect.
 5. Coordinate schedule with subcontractors and materials suppliers.
 6. On acceptance by Architect, adhere to schedule except when specifically otherwise permitted. Accurately maintain submittal log for duration of contract.
- D. Revisions: Revisions to original submittal list and schedule will only be accepted by the County Project Manager when revisions are required by circumstances not reasonably anticipated by Contractor during preparation of original schedule.

1.03 SUBMITTAL PROCEDURES

- A. Transmit each submittal directly to Architect and copy the County Project Manager on the transmittal.
1. Bind submittals sturdily, neatly label covers.
 2. Include job number as it appears on Contract Documents.
 3. Include state agency application or approval number.
 4. When requested by the County, all submittals shall be submitted by pdf. File.
- B. Sequentially number the transmittal forms. Resubmittals to have original number with an alphabetic suffix.
- C. Identify Project, Architect, Contractor, Subcontractor or supplier, manufacturer; pertinent Drawing Sheet and detail number(s) and specification Section number, as appropriate.
1. Provide name and telephone number of individual who may be contacted for further information.
- D. Apply Contractor's stamp with Contractor's original signature or initials affixed thereto, certifying that review, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents. Stamped signatures or initials are acceptable.

- E. Schedule submittals to expedite the project. Coordinate submission of related items.
 - 1. Make all submittals in accordance with the progress schedule and far enough in advance of scheduled dates of installation to provide required time for reviews for securing necessary approvals for possible revision and submittal and for placing orders and securing delivery.
- F. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of the completed work.
 - 1. Requests for deviations from Contract Documents shall be submitted for consideration before submittal of affected items. Submit in accordance with substitution requirements of Section 01 65 00 Transport, Handling and Storage. Only deviations which have been previously accepted in writing shall be included in submittals.
- G. Provide space for Contractor and Architect review stamps.
- H. Revise and resubmit submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.
- I. Determine and verify all field dimensions and conditions, materials, catalog numbers and similar data.
- J. Coordinate as required with all trades and all public agencies involved.
- K. Unless otherwise specifically authorized by Architect, make all submittals in groups containing all associated items. Architect may reject partial submittals as not comply with the provisions of this Section.
- L. Resubmittals:
 - 1. Subject to same terms and conditions as original submittal.
 - 2. The County Project Manager will accept not more than one resubmittal.
 - a. Should additional resubmittals be required, Contractor shall reimburse County for Architect's account for time spent in processing additional resubmittals at rate of

2.5 times rate of Direct Personnel Expense (DPE). Direct Personnel Expense is defined as direct salaries of Architect's personnel engaged or Project and portion of costs of mandatory, and customary contributions and benefits related thereto, including employment taxes and other statutory employee benefits, insurance sick leave, holidays, vacations, pensions, and similar contributions and benefits.

1.04 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit as required in Section 01 32 00.

1.05 SHOP DRAWINGS

- A. Submit a schedule of the shop drawings, listing their required submission and review dates to the County Project Manager for approval. The submission time shall be in accordance with the requirements set forth in Section 1.02, Submittals List and Schedule, Paragraph A. The schedule shall allow sufficient time for checking by the Architect. In addition, the shop drawing submission and review dates shall be incorporated into the progress schedule required in the General Conditions.
 - 1. "Elapsed time due to 'Revise and Resubmit' or 'Not Approved' action, indicated, on submittal review (due to inaccurate data or incomplete definition), shall not adversely affect equipment delivery and/or installation schedules".
 - 2. "Allotted time for review/approval process shall be a minimum of ten (10) working days from the date individual submittals are received by the Architect.
- B. Submit newly prepared information, drawn to accurate scale. Highlight, encircle or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as to the basis of Shop Drawings. Standard information prepared without specific reference to the Project will not be approved as Shop Drawings.
- C. Shop Drawings shall include fabrications and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
 - 1. Dimensions
 - 2. Identification of products and materials included.

3. Compliance with specified standards.
 4. Notation of coordination requirements.
 5. Notation of dimensions established by field measurement.
- D. Sheet Size: Except for templates, patterns and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 inch x 11 inch, but not larger than 30 inch x 42 inch.
- E. The Contractor shall review, stamp with his approval as herein required, and submit with reasonable promptness and in orderly sequences, in accordance with the submittal schedule. All shop drawings required by the Contract Documents or subsequently by the Architect as covered by modifications shall be properly identified. At the time of submission the Contractor shall inform the Architect in writing of any deviation in the shop drawings.
- F. Stamp: Each page of shop drawings shall bear the Contractor's stamp, which shall signify the Contractor's representation that he has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained in the shop drawings, all in accordance with the requirements of Section 01 33 00 Submittals. Each stamp shall be accompanied by a wet signature or initial of an employee of the Contractor who may be contacted for information. Stamped signatures or initials are not acceptable.
- G. Submittals not certified by being stamped and signed will be returned without action as well as those, in the Architect's opinion, that have not been adequately reviewed or coordinated by the Contractor.
- H. Method of Review: Submit shop drawings, electronically as a pdf file as directed by the County Project Manager. Comments or corrections will be noted on the shop drawings and returned to the Contractor, who shall identify all changes made since the previous submittal and resubmit in the same manner. After it is reviewed by the Architect, the shop drawings will be stamped and returned to the Contractor who shall make distribution of copies as required.
- I. The Architect will review and approve shop drawings with reasonable promptness so as not to cause any delay, but only for conformance with the design concept of the project and with the information given in the Contract Documents. The Architect's approval of a separate item shall not indicate approval of an assembly in which the item functions.

1. Contractor shall allow additional time if processing must be delayed to permit coordination with subsequent submittals.
- J. Submittal of shop drawings to the Architect shall be made by the Contractor with a dated transmittal form or letter, and not by subcontractors or suppliers.
- K. The Architect's approval of shop drawings shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents unless the Contractor has informed the Architect in writing of such deviation at the time of submission and the Architect has given written approval to the specific deviation, nor shall the Architect's approval relieve the Contractor from responsibility for errors or omissions in the shop drawings.
1. Notations by the Architect which increase contract or time of completion shall be brought to County Project Manager's attention and authorization by the County shall be obtained before proceeding with work.
- L. No portion of work requiring shop drawings shall be commenced until the shop drawings have been approved by the Architect.
- M. SHOP DRAWING PROCESSING
1. Requirements for Submittal of Shop Drawings
 - a. Shop drawings shall be submitted directly to the Architect and copy of transmittal to the County Project Manager.
 2. Each shop drawing submitted for review shall have the following information:
 - a. Project Name
 - b. Specs. No.
 - c. Contract No.
 - d. Technical Specifications Section No.
 3. Each item of the submittal must be referenced to the proper item of the specification or drawings.
 4. A signed statement from the General Contractor stating that the submittal has been reviewed by him and that it conforms with the drawings and specifications.

5. Provide a copy of each transmittal to the County Project Manager and Inspector.
6. Types of Approvals
 - a. "No Exception Taken" (Approved). This stamp will be used by the Architect for accepted shop drawings and will qualify the submittal for shop drawing number.
 - b. "Exception Noted" (Approved as Noted). This stamp will be used by the Architect when minor correction will make the submittal acceptable. These corrections will be shown in red on each of the submittals or on a correction list. This approval will qualify the submittal for a shop drawing number.
 - c. "Resubmit" (Rejected). Submittals which do not conform to the drawings and specifications will be returned without stamping or issuance of a shop drawing number. The rejection transmittal will state why the submittal was not acceptable and request that it be resubmitted.

N. Assignment of Shop Drawings Numbers

Each accepted submittal shall be stamped by the Architect and assigned a shop drawing number using either of the following systems. The shop drawing number will be shown on each sheet that is stamped by Architect.

1. A simple numerical sequence may be used whereby each submittal is assigned a number in order of approval (SD-1, SD 2...).
2. A numerical sequence by classification may be used such as SD-S-1 for a Structural Submittal; SD-AC-1 for an Air Conditioning Submittal; SD-C-1 for a Civil Submittal, SD-L-1 for a Landscape Submittal; SD-A-1 for an Architectural Submittal; and SD-X-1 for Miscellaneous Submittals.
3. Material submittals and paint color chips should be assigned a shop drawing number for identification purposes.

O. Transmittal of Submittals

The General Contractor shall submit to the Architect a set of shop drawings which comply with this Exhibit. Upon receipt of the submittal, the Architect will review or have his consultants review the submittal for compliance with the drawings and specifications.

P. Processing

1. Procedure

- a. Shop drawings will be stamped or returned as per Section M of this Exhibit. Accepted and numbered shop drawings shall be returned to the General Contractor. The Architect will provide a pdf copy of approved shop drawings to the County Project Manager, Building Inspector, and Contractor.
- b. The County Project Manager is to check shop drawings for any deviation from the drawings or specifications prior to releasing them to the Contractor. If there are discrepancies in the shop drawings, they should be sent back to the Architect for correction.

1.06 PRODUCT DATA

- A. Submit pdf copy of product data as directed by the County Project Manager.
- B. Product data shall identify applicable products, models, options and other available data specific to the project requirements.
- C. After review and approval by the Architect, copies will be distributed to the County Project Manager, Building Inspector, and General Contractor. The approved product data sheets shall be retained at the site by the General Contractor to be used for reference.

1.07 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of the product with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- B. Unless precisely specified, submit samples of finishes from the full range of manufacturers' standard colors, textures and patterns for Architect selection, or in custom colors selected.

- C. Include identification on each sample with full Project information, as required for Shop Drawings, Item, 1.04 above.
- D. Submit a minimum of three (3) samples or as specified in individual sections of the specifications, two of which will be retained by the Architect.
- E. Reviewed samples which may be used in the work are indicated in individual specification sections.
- F. Approval or rejection of samples will be made by the Architect in writing.

1.08 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting and finishing in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

1.09 MANUFACTURER'S CERTIFICATES

- A. When specified in individual specification sections, submit manufacturers' certificate to Architect for review in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

1.10 COORDINATED DRAWINGS

- A. Submit drawings which indicate routing, locations, sizes, types and numbers of components in concealed spaces where potential conflict may occur between structures, mechanical, electrical, fire sprinklers, communications and ceiling suspension systems.

- B. Indicate locations of all ceiling penetrations and surface-mounted items. Provide cross sections at all areas to indicate proper support of ceilings and non-interference with work of other sections of the specifications. Cross sections shall indicate coordination required and proposed solutions for routing of elements where potential conflict exists. A reproduction of Architect's reflected ceiling plan is not acceptable.
- C. Drawings shall be based on field measurements, shop drawings and product data.
- D. Conflicts shall be brought to the County Project Manager's attention immediately.
- E. Submit to the Architect, in writing, requests for clarification or interpretations that will affect the intent of the Contract Documents.
- F. The coordinated drawings shall indicate each class of work in the affected area. The drawing or written submittal shall include Contractor's recommendations for the solution of any potential conflicts as well as recommendations tendered by any work of any section of the specifications which may be affected thereby.
- G. Submit the coordinated drawings in a scale of not less than 1/8" – 1' – 0" with necessary sections and profiles at an appropriate, clearly readable enlarged scale. Submit the coordinated drawings as one reproducible and two blue-line prints as a pdf file as directed by the County Project Manager.
- H. The Architect will review the submittals, make appropriate notations and comments to ensure the solution meets the intent of the Contract Documents and then return to Contractor for implementation.
- I. The Contractor shall be responsible for the proper coordination of the work of all sections of the specifications in the execution of coordinated drawing. Any installation of materials, components or equipment under one section of the specifications without full and complete agreement, knowledge and consent by fabricators of adjacent or otherwise related or affected work will not be approved.
- J. It shall be incumbent upon the Contractor that all fabricators of work involved in the execution of coordinated drawings be informed, consulted and advised in sufficient advance time to arrive at solutions where no extension of contract time or extra cost to the

County will be approved due to Contractor's negligence in the expeditious, timely submittal of coordinated drawings.

1.11 REQUEST FOR INFORMATION

- A. Submit Request for Information (RFI) or interpretation in writing to the County.
- B. Response will be in writing, by the County, either in the construction field meeting notes or on the RFI itself, within 5 working days of receipt of RFI.
 - 1. No change in cost interpretations or clarifications will be accepted as such.
 - 2. Change in cost interpretation or clarifications will institute a Change Order procedure.

1.12 CONSTRUCTION PHOTOGRAPHS

- A. Submit with payment request monthly. See Section 01 32 33.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

* * * * *

SECTION 01 33 23

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Submittals
 - 1. Shop drawings.
 - 2. Product or catalog data.
 - 3. Samples.
- B. The Contractor will prepare and submit shop drawings as directed by the County Project Manager.
- C. Related work specified elsewhere.
 - 1. Operating and maintenance manuals.
 - 2. Spare parts or hardware lists.
 - 3. Tests and certificates.

1.02 DEFINITIONS

- A. Shop Drawings
 - 1. Original drawings prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate some portion of the work; showing fabrication, layout, setting or erection details.
 - 2. Identify details by reference to sheet and detail numbers shown on Contract Drawings.
- B. Product or Catalog Data
 - 1. Manufacturers standard drawings modified to delete nonapplicable data or include applicable data.
 - 2. Manufacturers catalog sheets, brochures, diagrams, schedules, charts, illustrations or other descriptive data. Mark each copy to identify pertinent dimensions, materials, products or models.

C. Samples

1. Physical examples to illustrate materials, equipment or workmanship.
2. Office samples to show functional characteristics of product or material. Submit with full range of colors available.
3. Field samples and mock-up; erect at site in location acceptable to Project Manager.

1.03 CONTRACTOR'S RESPONSIBILITIES

A. Prior to Submittal

1. Review and approve Shop Drawings, Product Data and Samples prior to submission to the Department.
2. Coordinate each submittal with work of the project and Contract Documents so as to cause no delays in the work.
3. By approving and submitting Shop Drawings, Product Data and Samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the work and of the Contract Documents.
4. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Department's acceptance unless the Contractor has specifically informed the Department in writing of such deviation at the time of submission and the Department has given written acceptance to the specific deviation.
5. Contractor's responsibility for errors and omissions in submittals or deviations from Contract Documents is not relieved by the Department's review of submittals.
6. The Contractor shall direct specific attention, in writing or on submitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Department on previous submittals.

B. After Submittal

1. Begin no work which requires submittals until return of such submittals with the Department's stamp and signature indicating review.
2. Distribute copies of submittals to subcontractors, suppliers or manufacturers as their interests appear.

1.04 IDENTIFICATION OF DATA

A. All submittals for review shall have the following identification data, as applicable, contained thereon or permanently adhered to.

1. Project Name and Location
2. Specifications Number
3. Subcontractor's, Vendor's, and/or Manufacturer's Name, Address and Phone Number
4. Product Identification
5. Shop Drawing Title, Contractor's Drawing Number, and Date of Drawing and Revisions
6. Applicable Contract Drawings and Specifications Section Numbers
7. Contractor's Approval, Signature and Date

B. Submittal Format

Submittal No. _____

Project Name _____

Specifications No. _____

Product _____

Section No. _____

Supplier _____

We have reviewed the submitted, and have verified that it meets the criteria required in accordance with the plans and specifications.

Contractor's Name _____

Signature _____

Title _____

C. Catalog Data

1. Each separate catalog, brochure or single page data sheet submitted shall have the identification required and the Contractor's approval.
2. Catalogs or brochures containing multiple items for review need identification only on the cover. Identify page numbers and catalog items.
3. In the event that one or more of the multiple items are not accepted in any submittal, additional copies required will not be required until all items are accepted.
4. Provide a space approximately 4" x 4" for the Department to affix its status stamp.

1.05 COLOR AND FINISH SELECTION

A. Contractor Submittals

1. Submit as soon as practical, subsequent to award of contract, names of manufacturers and pertinent products or materials proposed for use in which a color selection is required.
2. Submit standard color charts or samples as requested by the District. All items for color selection must be submitted prior to issuance of any approvals.
3. Contractor is responsible for submitting products that comply with technical specifications.

1.06 SUBMISSION REQUIREMENTS

- A. Submit all Shop Drawings, Product or Catalog Data and Samples to the District by transmittal containing identification of project, specifications number and identification of items being submitted.

B. Product Data

1. Original Submittal – Six (6) copies of all Shop Drawings and/or Product Data for review in ample time to coordinate necessary features of construction with all fabrication and installation requirements.
2. Resubmittal – When required, copies will be returned to Contractor. After revision submit new copies as stipulated for original submittal. Indicate all changes.

C. Samples

1. Original Submittal – Furnish three (3) samples, unless otherwise specified, of each item for which samples are required for review. Obtain review prior to delivery of material to project site. Such samples shall be representative of actual material proposed for use in project and of sufficient size to demonstrate design, color, texture, and finish.
2. Resubmittal – All rejected samples will be returned upon request. All resubmittals shall consist of three (3) samples.

1.07 REVIEW AND PROCESSING

A. General

1. The Department will review and accept or take other appropriate action upon Contractor's submittals for conformance with the design concept of the work and with the information given in the Contract Documents. Acceptance of a specific item shall not indicate acceptance of an assembly of which the item is component.
2. Submittals not approved by the Contractor will be returned to Contractor. Submittals will not be reviewed or accepted by the Department or Architect without Contractor's prior approval.

B. Review

1. Product Data – After review, two (2) copies bearing the Department's review stamp and signature will be returned to Contractor.

2. Samples – After review one (1) sample will be returned and the remainder will be retained by the Department until completion of the work.

END OF SECTION

SECTION 01 35 46

INDOOR AIR QUALITY PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Example Indoor Air Quality Management Plan

SUBMITTALS [Note to AE: Identify relevant LEED point requirements for the Project. Include requirements for the following:]

- A. Indoor Air Quality Management Plan: Describe in detail measures to be taken to promote adequate indoor air quality; use SMACNA IAQ Guideline for Occupied Buildings Under Construction.
 1. Submit IAQ Plan at pre-construction meeting. See Exhibit 01 35 46-1, Example Indoor Air Quality Management Plan.
 2. Identify construction activities likely to produce odor or dust.
 3. Identify areas of project potentially affected, especially occupied areas.
 4. Evaluate potential problems by severity and describe methods of control.
 5. Describe construction ventilation to be provided, including type and duration of ventilation, use of permanent HVAC systems, types of filters and schedule for replacement of filters.
 6. Describe cleaning and dust control procedures.
 7. Describe commissioning procedure.
- B. Identify interior finishes that generate odors, moisture, or vapors or are susceptible to absorption of odors and vapors, and indicate air handling zone, sequence of application, and curing times.
- C. Provide a LEED Letter Template, signed by the General Contractor declaring that a Construction IAQ Management Plan has been developed and implemented, and including the MERV value of each air filter used during construction and at the end of construction.
- D. Provide 18 photographs – six photographs taken on three different occasions during construction – along with identification of the SMACNA approach featured by each photograph, in order to show consistent adherence to the LEED credit requirements.

1. As an alternative to providing photographs, declare which of the five Design Approaches of SMACNA IAQ Guideline for Occupied Buildings under Construction which were used during building construction. Include adequate description of the design approaches employed.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 IMPLEMENTATION *[Note to AE: Provide Construction Documents to ensure the following:]*

- A. An Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:
 1. Controls, sequences, permanent equipment/systems shall meet the Design Intent / Basis of Design in accordance with the Project's schedule without imposing hardship to the Commissioning requirements and schedule.
 2. Meet the recommended Design Approaches of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, Chapter 3.
 3. Protect stored on-site or installed absorptive materials from moisture damage.
 4. HVAC equipment and supply air ductwork shall not be used for ventilation during construction without meeting the following criteria as specified in the IAQ.
 - a. Meet all requirements of *Section 01 76 00 - Protecting Installed Construction*.
 - b. Coordinate with the Ventilation Contractor to avoid the use of return air ducting.
 - 1) Seal return air inlets or otherwise positively isolate return air system to prevent recirculation of air; provide alternate return air pathways.
 - c. If the Permanent Design does not permit temporary isolation of Return Ducting then filtration media with a Minimum Efficiency Reporting Value (MERV) of 11 shall be used at each return air grill.
 - 1) Within Design parameters, operate HVAC system on 100 percent outside air.
 - d. Ensure that all air filters are correctly installed prior to starting use. Replace all filtration media at a minimum of weekly or sooner as necessary to maintain cleanliness. Replace all filtration immediately prior to occupancy. Provide filtration media having a Minimum Efficiency Reporting Value as

scheduled maintaining LEED compliance.

- B. Prior to permanent use of return air ductwork without intake filters, clean up and remove dust debris generated by construction activities using a HEPA vacuum cleaning system.
- C. Do not perform dusty or dirty work after starting use of return air ducts without intake filters.
- D. Prevent the absorption of moisture by:
 - 1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
 - 2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
 - 3. Provide sufficient TEMPORARY ventilation for drying. Permanent equipment may be allowed to be used once all Contractor-submitted care provisions have been approved by Owner.
- E. Begin construction ventilation only when building envelope is sealed.
When working in a portion of an occupied building, prevent movement of air from construction area to occupied area.

* * *

SECTION 01 45 00

QUALITY CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Tests.
- B. Inspections.
- C. County will employ and pay for the services of an Independent Testing Laboratory or Soils Engineer to perform specified testing and/or inspections.
- D. Related requirements specified elsewhere:
 - 1. Refer to the various trade sections for specific test and inspection requirements.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

- A. Los Angeles County Building Code.
- B. Uniform Building Code Standards, as applicable.
- C. California Code of Regulations.
 - 1. Title 17 and 24.

1.03 QUALITY ASSURANCE

- A. General Test Requirements. Materials to be furnished under the Contract are subject to testing and inspection for compliance with requirements of Drawings and Specifications.
- B. Testing Laboratory or Agency shall be the licensed Testing Laboratory or Agency meeting the requirements of ASTM E-329, designated by the County and referred to hereafter as the Testing Laboratory. Perform all testing under supervision and control of a California registered professional engineer employed by the Testing Laboratory.
- C. Soils or Foundation Engineer will be the registered professional Geotechnical Engineer employed and paid by the County.
- D. Disqualified Material. Any material shipped or delivered to the site by the

Contractor from the source of supply prior to having satisfactorily passed the required testing and inspection, or prior to the receipt of a notice from the County or Architect that such testing and inspection will not be required, shall not be incorporated in the Work.

1.04 QUALITY CONTROL

- A. Earthwork.
 - 1. Approval of fill material.
 - 2. Compaction tests.
 - 3. Inspection of subgrades and excavations.

- B. Concrete.
 - 1. Materials.
 - a. Portland cement tests.
 - b. Concrete aggregates.
 - c. Reinforcing bars.
 - 2. Concrete quality.
 - a. Concrete mix designs.
 - b. Strength tests of concrete.
 - 3. Concrete inspection.
 - a. Job site inspection.
 - b. Batch plant or weighmaster inspection.

- C. Masonry.
 - 1. Materials.
 - a. Tests of brick or block masonry units.
 - b. Tests of mortar and grout materials.

- c. Reinforcing steel bars.
 - 2. Mortar and grout quality.
 - a. Strength tests for mortar and grout
 - 3. Masonry inspection.
 - a. Job site inspection.
- D. Structural steel and metal deck tests and inspections.
 - 1. Materials.
 - a. Material identification and certification.
 - b. Testing of unidentified material.
 - 2. Inspection of structural steel, light gage steel deck and welding.
 - a. Welding inspection (shop and field).

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Materials to be tested and/or inspected as specified in respective sections.

PART 3 - EXECUTION

3.01 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with laboratory personnel, provide access to Work.
 - 1. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the Work of the Contract.
- B. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.
- C. Furnish copies of products test reports as required.
- D. Furnish incidental labor and facilities:
 - 1. To provide access to Work to be tested.

2. To obtain and handle samples at the Project site or at the source of the product to be tested.
 3. To facilitate inspections and tests.
 4. For storage and curing of test samples.
- E. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
1. When tests or inspections cannot be performed after such notice, reimburse County for laboratory personnel and travel expenses incurred due to Contractor's negligence.
- F. Make arrangements with laboratory and pay for additional samples and tests required for Contractor's convenience.

3.02 FIELD QUALITY CONTROL

A. Tests.

1. County will select an independent testing laboratory to conduct tests. Selection of material required to be tested shall be by the laboratory or County's representative and not by Contractor.
2. Contractor shall notify County in sufficient time in advance of manufacture of material to be supplied, which must by terms of the contract be tested, in order that the County may arrange for testing.
3. County will select and pay testing laboratory costs for all tests and inspection, except as provided elsewhere in this section.

B. Test reports.

1. One copy of all test reports shall be forwarded to the County by the testing agency. Such reports shall include all tests made, regardless of whether such tests indicate that the material is satisfactory or unsatisfactory. Sample taken but not tested shall also be reported. Records of special sampling operations as required shall also be reported. The reports shall show that the material or materials were sampled and tested in accordance with the requirements of (Title 24) and with the approved specifications. Test reports shall show the specified design strength. They shall also state definitely whether or

not the material or materials tested comply with requirements.

C. Verification of test reports.

1. Each testing laboratory shall submit to the County a verified report in duplicate covering all of the tests which were required to be by that laboratory during the progress of the project. Such report shall be furnished each time that work on the project is suspended, covering the tests up to that time, and at the completion of the project, covering all tests.

D. Inspection.

1. The County shall at all times have access for the purpose of the inspection to all parts of the work and to the shops wherein the work is in preparation, and the Contractor shall at all times maintain proper facilities and provide safe access for such inspection.
2. The County shall have the right to reject materials and workmanship which are defective, or to require their correction. Rejected workmanship shall be satisfactorily corrected and rejected materials shall be removed from the premises without charge to the County. If the Contractor does not correct such rejected work within a reasonable time, fixed by written notice, the County may correct same and charge the expense to the Contractor.
3. Should it be considered necessary or advisable by the County at any time before final acceptance of the entire work to make an examination of work already completed by removing or tearing out the same, the Contractor shall on request promptly furnish all necessary facilities, labor and materials. If such work is found to be defective in any respect due to fault of the Contractor or his subcontractor, he shall defray all expenses of such examinations and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract, the additional cost of labor and material necessarily involved in the examination and replacement shall be allowed the Contractor.
4. Reimbursement of Inspection Costs. Contractor shall reimburse the County all or any part, of the actual excessive inspection costs incurred by the County due to any or all of the following.
 - a. Contractor's failure to complete the Work within the Contract

Time and any previously authorized extensions thereof.

- b. Claims between separate contractors.
- c. Covering of any of the Work before the required inspections or tests are performed.
- d. Extra inspections required for Contractor's correction of defective Work.

E. Inspector.

- 1. An Inspector employed by the County will be assigned to the Work.
- 2. The work of construction in all stages of progress shall be subject to the personal continuous observation of the Inspector. He shall have free access to any or all parts of the work at any time. The Contractor shall furnish the Inspector reasonable facilities for obtaining such information as may be necessary to keep him fully informed respecting the progress and manner of the work and the character of the materials. Inspection of the work shall not relieve the Contractor from any obligation to fulfill this Contract.

* * *

SECTION 01 50 00

TEMPORARY FACILITIES

1 - GENERAL

1.01 DESCRIPTION

- 1.02 Intentionally Omitted
- 1.03 Storage structure
- 1.04 Intentionally Omitted
- 1.05 Intentionally Omitted
- 1.06 Toilets
- 1.07 Protection From Weather
- 1.08 Utilities
- 1.09 Construction signboards
- 1.10 Temporary chain link fencing
- 1.11 Temporary Walkways and Driveways
- 1.12 Storage of materials
- 1.13 Parking
- 1.14 Staging areas

1.02 Intentionally Omitted

1.03 STORAGE STRUCTURE

Contractor shall provide and maintain on the premises, where directed, watertight storage structure for all materials which might be damaged by weather, including storage facilities for concrete test samples or other material samples required for work.

1.04 Intentionally Omitted

1.05 Intentionally Omitted

1.06 TOILETS

Contractor shall install and maintain in a sanitary condition, suitable chemical toilets for use of workmen. Toilets shall be in a location approved by the Department. There shall be a minimum of one (1) toilet for each multiple of twenty (20) Contractor's employees, or fractional part thereof, working at the job site. The temporary restroom facilities shall be serviced a minimum of three (3) times a week.

1.07 PROTECTION FROM WEATHER

The existing building structure and interior finish and furnishings shall be protected

from rain, dew, wind, and all other elements of the weather during periods when roof areas are unprotected by roofing or when breaches are present in exterior walls. Such areas shall be covered with weathertight tarpaulins or roofing materials firmly secured or by other approved methods. Refer to General Conditions. When, in the opinion of the Department, breaches in roof or wall areas afford access to unauthorized persons, the Contractor shall, at no additional expense to the County, construct at such breaches, substantial barricades of type and material as approved by the Department.

1.08 UTILITIES

The Contractor shall arrange for and provide all utility services necessary to the work, including electrical current for power and light, and water supplies; or at Contractor's option, he may use free of charge, available County utility services as may exist on the site. Motors connected to County electrical circuits shall not exceed 1/3 horsepower. Contractor shall provide, maintain and remove upon completion of work, all temporary connecting lines to sources of supplies, and temporary meters and accessories as needed.

The Contractor shall bear all expenses involved in the provisions of providing and connecting all temporary utility services. The County will assume payment for utility service charge at the time the various permanent meters are set. Refer to Project General Requirements section for permanent utility services.

1.09 CONSTRUCTION SIGNBOARDS

Refer to article entitled "Advertising" of the General Conditions. Prior to any ground breaking operation or in the case ground breaking is not required, within ten (10) days after award of contract, the Contractor shall furnish and erect two (2) identification signboards 4'-0 x 8'-0 in size, constructed of 3/4" exterior grade plywood within a frame, supported on posts, and adequately braced to resist wind stresses. The sign background shall be painted with two (2) coats of exterior type paint over a suitable primer and lettered with block letters professionally applied. The signboard shall set forth, in sequence, the following information with the layout as directed by the Department.

FIRE CAMP 13 RECONSTRUCTION
County of Los Angeles
Board of Supervisors

Lindsey P. Horvath	3rd District
Hilda L. Solis	1st District
Holly J. Mitchell	2nd District
Janice Hahn	4th District
Kathryn Barger	5th District

Fesia Davenport, Chief Executive Officer, Chief Executive Office
Mark Pestrella, Director, Department of Public Works

Anthony Marrone, Fire Chief, Fire Department

Huitt-Zollars, Inc.
Name of Contractor

In addition, individual signs of Contractors, subcontractors and materialmen may be displayed as approved.

Signs shall be promptly removed by the Contractor or by the owner, if individually owned, upon completion of the work. The size, construction, subject matter and location of all signs shall be subject to the approval of the Department.

1.10 TEMPORARY CHAIN LINK FENCING

1. The Contractor shall provide and maintain a 6 ft. high chain link fence around the construction area(s) consisting of 11 gauge (minimum) x 2" mesh chain link fabric attached to substantial steel pipes spaced at 10 feet on center maximum. Provide top and bottom tension wires and corner post bracing. Provide chain link gates with welded steel pipe frames and all hardware required for proper operation. Fencing shall not have any loose or easy to remove tie wires, hog rings, etc.
2. Provide and maintain the County specified chain link fence enclosures around each jobsite with vehicle and man gates as specified by the County.
3. Obtain and pay for all required permits and inspections. Construct in accordance with applicable codes and regulations of public agencies having jurisdiction.

1.11 TEMPORARY WALKWAYS AND DRIVEWAYS

- A. All new temporary walkways shall be properly joined or tied in with existing walkways. All permanent walkways shall consist of concrete.
- B. Areas where temporary walkways or driveways have been installed shall be returned to their condition prior to construction.

1.12 STORAGE OF MATERIALS

Storage of materials shall be only within areas designated by the Department.

1.13 PARKING

The Contractor and subcontractor employee parking is restricted to parking onsite or as approved by the County.

1.14 STAGING AREAS

Contractor shall coordinate with County for location, extent and type of construction staging areas.

* * *

SECTION 01 57 00

STORM WATER POLLUTION PREVENTION

PART 1 - GENERAL

1.01 **Water Pollution Control.**

1.02 **Best Management Practices (BMPs).** Apply BMPs for project that disturbs less than 1 acre of soil.

1.03 **Terms and Definitions.**

1. **Active Areas of Construction** - areas subject to land surface disturbance activities related to the Project including, but not limited to, the Project site, staging areas, immediate access areas, and storage areas. Previously active areas will be considered active areas until temporary or final soil stabilization BMPs are implemented.
2. **Accumulated Precipitation Procedure (APP)** – the methods and procedures for management and discharge of accumulated precipitation on the Project site.
3. **Best Management Practices (BMPs)** - shall be defined as specified in the permits listed in 1.05.
4. **BMP Manager** - an individual who meets the requirements of Los Angeles Regional Water Quality Control Board MS4 Permit Order No. R4-2012-0175-DWQ, Section VI. D. 8. L ii (2).
5. **BMP Manual** - the edition of the Los Angeles County Department of Public Works Construction Site Best Management Practices (BMPs) Manual in effect as of the date of advertisement of the Contract.
6. **Exposed Soil** - native soil left exposed as the result of uncovering, removal of vegetation or pavement, grading, excavation, or any other construction activity. Soil protected with temporary soil stabilization BMPs will not be considered exposed soil.
7. **Inactive Disturbed Soil Areas (DSA)** – areas that have been disturbed and have not or will not be disturbed for at least 14 Days.
8. **Non-Storm Water Discharges** - discharges that do not originate from precipitation events.
9. **Run-On** - storm water discharges that flow onto the Project site.

10. Run-On Control BMPs - BMPs used to divert or direct run-on either around or through the Project site.

1.04 Abbreviations.

<u>Abbreviation</u>	<u>Word or Words</u>
APP	Accumulated Precipitation Procedure
BMP	Best Management Practice
NPDES	National Pollutant Discharge Elimination System
RWQCB	Regional Water Quality Control Board
SWRCB	State Water Resources Control Board

1.05 General. This Project lies within the boundaries of the County of Los Angeles and shall conform to the following requirements:

- a) Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles, and the Incorporated Cities therein, except the City of Long Beach (Order No. R4-2012-0175. NPDES Permit No. CAS004001). Within the City of Long Beach (Order No. 99-060, NPDES Permit No. CAS004003).
- b) Within the unincorporated areas of the County of Los Angeles, Los Angeles County Code, Chapter 12.80.

1.06 Best Management Practices (BMPs).

- a) **General.** The Contractor shall effectuate a year-round program for implementing, inspecting, and maintaining BMPs for wind erosion control, tracking control, erosion and sediment control, non-storm water control, and waste management and materials pollution control.

Best Management Practices conforming to the "Minimum Requirements" specified in Table 1.06 shall be implemented throughout the duration of the Project. The Contractor shall be responsible for the implementation, maintenance, and inspection of BMPs throughout any temporary suspension of the Work or designated construction moratorium.

The National Weather Service weather forecast shall be monitored by the Contractor on a daily basis. Whenever a rain event is predicted, the contractor shall implement all required BMPs according to the BMP Manual and these Special Provisions.

- i. **BMP Manual.** Water pollution control work shall conform to the requirements in the BMP Manual. BMP Manual may be accessed at Public Works' Contracts Opportunities, <https://dpw.lacounty.gov/contracts/opportunities.aspx>, under **County Sites links (scroll to the bottom of the page).**

The Contractor shall have a minimum of one readily accessible copy of the BMP Manual on the Project site at all times.

- b) BMP Manager.** The Contractor shall designate a BMP Manager who meets the requirements of Los Angeles Regional Water Quality Control Board (RWQCB) MS4 Permit Order No. R4-2012-0175-DWQ, Section VI, D. 8.I.ii (2).

MS4 Permit Order No. R4-2012-0175-DWQ, Section VI, D. 8.I.ii (2):

"Each Permittee shall ensure that its inspectors are knowledgeable in inspection procedures consistent with the State Water Board sponsored program QSD or a Qualified SWPPP Practitioner (QSP) or that a designated person on staff who has been trained in the key objectives of the QSD/QSP programs supervises inspection operations. Each Permittee may provide internal training to staff or require staff to obtain QSD/QSP certification. Each inspector must be knowledgeable of the local BMP technical standards and ESCP requirements."

The BMP Manager shall have the responsibility and authority to fully implement, maintain and inspect the required BMP's in accordance with the Contract Documents and as directed by the County Project Manager. The BMP Manager shall be fully knowledgeable of the requirements in the BMP Manual.

The designated BMP Manager's name and qualifications shall be submitted in accordance with MS4 Permit Order No. R4-2012-0175-DWQ, Section VI, D. 8.I.ii (2), prior to issuance of the Construction Contract, Part 2 NTP.

- c) Minimum Requirements.** The Contractor shall implement an effective combination of erosion and sediment controls and maintain the appropriate Construction Site BMPs shown in Table 1.06. The BMPs shown in this table meet or exceed the Waste Discharge Requirements referenced in 1.05.

Table 1.06 Construction Site BMPs		
ID	BMP Name	Minimum Requirement
Temporary Soil Stabilization		
SS-1	Scheduling	X
SS-2	Preservation of Existing Vegetation	X
SS-3	Hydraulic Mulch	
SS-4	Hydro seeding	
SS-5	Soil Binders	
SS-6	Straw Mulch	
SS-7	Geotextiles, Plastic Covers, & Erosion Control Blankets/Mats	X
SS-8	Wood Mulching	
SS-9	Earth Dikes/Drainage Swales & Ditches	
SS-10	Outlet Protection/Velocity Dissipation Devices	
SS-11	Slope Drains	
SS-12	Streambank Stabilization	
Temporary Sediment Control		
SC-1	Silt Fence	X

SC-2	Sediment/Desilting Basin	
SC-3	Sediment Trap	
SC-4	Check Dam	
SC-5	Fiber Rolls	X
SC-6	Gravel Bag Berm	X
SC-7	Street Sweeping and Vacuuming	X
SC-8	Sandbag Barrier	X
SC-10	Storm Drain Protection	X

Wind Erosion Control		
WE-1	Wind Erosion Control	X
Tracking Control		
TC-1	Stabilized Construction Entrance/Exit	X
TC-2	Stabilized Construction Roadway	
TC-3	Entrance/Outlet Tire Wash	
Non-Storm Water Management		
NS-1	Water Conservation Practices	X
NS-2	Dewatering Operations	X
NS-3	Paving and Grinding Operations	X
NS-4	Temporary Stream Crossing	
NS-5	Clear Water Diversion	
NS-6	Illicit Connection/Illegal Discharge Detection and Reporting	X
NS-7	Potable Water/Irrigation	X
NS-8	Vehicle Equipment Cleaning	X
NS-9	Vehicle Equipment Fueling	X
NS-10	Vehicle Equipment Maintenance	X
NS-11	Pile Driving Operations	
NS-12	Concrete Curing	
NS-13	Material and Equipment Use Over Water	
NS-14	Concrete Finishing	
NS-15	Structure Demolition Over or Adjacent to Water	
NS-16	Temporary Batch Plant	
Waste Management and Material Pollution Control		
WM-1	Material Delivery	X
WM-2	Material Use	X
WM-3	Stockpile Management	X
WM-4	Spill Prevention and Control	X
WM-5	Solid Waste Management	X
WM-6	Hazardous Waste Management	X
WM-7	Contaminated Soil Management	
WM-8	Concrete Waste Management	X
WM-9	Sanitary/Septic Waste Management	X
WM-10	Liquid Waste Management	X

Additional BMPs may be required as a result of actual field conditions, Contractor activities, or construction operations.

Year-Round Implementation Requirements. Implementation shall conform to the requirements in the BMP Manual and the following:

Temporary Soil Stabilization

- ii. Active Areas of Construction shall be stabilized and temporary sediment controls implemented prior to a rain event.

Temporary Sediment Control

- iii. Sediment shall not be discharged offsite or to the storm drain system or receiving waters.
- iv. Stockpiles shall be removed from roadways at the end of each work day and shall be covered and bermed with perimeter sediment controls prior to every rain event and when not in use.

Wind Erosion Control

- v. Wind erosion control BMPs shall be implemented in conformance with the requirements of the jurisdictional air quality regulatory agency.

Tracking Control

- vi. Each entrance to, and exit from, the Project site shall be stabilized. Traffic entering/exiting the Project site shall be directed so as to only use such stabilized entrances/exits. Tracking of mud and/or sediment onto paved surfaces shall be removed by the end of each Day.

Non-Storm Water Management

- vii. Accumulated precipitation shall be discharged in accordance with the Accumulated Precipitation Procedure, Section 7.2 of the BMP Manual.
- viii. BMP Manual may be accessed at Public Works' Contracts Opportunities, **County Sites links**, <https://dpw.lacounty.gov/contracts/opportunities.aspx>
- ix. Non-storm water BMPs shall be implemented to prevent un-authorized discharges.
- x. Non-storm water discharges shall be in compliance with Section III of the Waste Discharge Requirements referenced in 1.05.

Waste Management and Material Pollution Control

- xi. Material and waste stockpiles shall be covered prior to all rain events.
 - xii. Stockpiles of temporary asphalt concrete (“cold mix”) shall be covered at all times.
 - xiii. The Contractor shall have a minimum of 3 spill response cleanup on the Project site at all times.
 - xiv. Spills and leaks shall be cleaned up within one hour after spillage and disposed of off the Project site.
 - xv. Concrete waste shall be contained in a concrete washout bin. At grade and below grade washouts are prohibited. There shall be no discharge of concrete washout or waste into the underlying soil or onto the surrounding areas. Concrete waste shall be considered as including, but not be limited to, slurry, cement, wash waters, additives, or grout.
- 1.07 **Accumulated Precipitation Procedure (APP).** The Contractor shall prepare an accumulated precipitation procedure (APP) for review and approval by the County Project Manager before any discharge from the Project site and as required by the County Project Manager. The APP shall describe the location of proposed discharges, the BMPs to be implemented (e.g., NS-2), and the actual equipment to be used. The APP shall be prepared and submitted in accordance with BMP NS-2 and Section 7 of the BMP Manual, <https://dpw.lacounty.gov/contracts/opportunities.aspx>
- 1.08 **BMP Inspections.** The Project site shall be inspected by the BMP Manager and documented on the LACDPW BMP checklist (contained in the BMP Manual) as follows:
- a) Within 24 hours prior to a rain event.
 - b) Within 48 hours after a rain event (0.01 inch or more of accumulated precipitation).
 - c) At 24-hour intervals during extended rain events.
 - d) Once every week.
- 1.09 **Non-Storm Water Discharge Reporting.** If the Contractor identifies any non-storm water discharge(s) as identified in Section III of the Waste Discharge Requirements referenced in 1.05, or if the Project receives a written notice or order from any regulatory agency, the Contractor shall so inform the County Project Manager within 24 hours. The Contractor shall submit a written report to the County Project Manager within 5 Days of the discharge event, notice or order. The report shall include the following information:
- a) The date, time, location, nature of the operation and type of discharge, including the cause or nature of the notice or order.
 - b) The BMPs implemented before the discharge event, or prior to receiving the notice or order.

- c) The date of deployment and type of water pollution control practices deployed after the discharge event, or after receiving the notice or order, including additional measures installed or planned to reduce or prevent recurrence.
- d) The Contractor shall conduct applicable water quality monitoring per the MS4 Permit Order No. R4-2012-0175-DWQ, Section VI, D. 8.1.ii (2) Section III A.4 and Table 8 of the Waste Discharge Requirements referenced in 1.05.

1.10 **Progressive Enforcement.** The Agency, as a permittee, is subject to enforcement action by the State Water Resources Control Board (SWRCB), Environmental Protection Agency, private citizens and citizen groups. The Contractor shall notify the County Manager immediately following receipt of a request from any jurisdictional regulatory agency, to enter, inspect, sample, monitor or otherwise access the Project site or the Contractor's records pertaining to water pollution control.

The Agency will assess the Contractor a penalty of \$1,000 for each Day that the Contractor fails to fully-comply with the specified requirements. The penalty will be deducted from Contract progress payments due the Contractor.

The Contractor shall be responsible for the costs and liabilities imposed by law as a result of its failure to fully-comply. Costs and liabilities include, but are not limited to, fines, penalties and damages whether assessed against the Agency or the Contractor, including those levied under the Federal Clean Water Act and the State Porter Cologne Water Quality Act. In addition the Agency will deduct, from any monies due the Contractor, the total amount of any legal fees, staff costs, and consultant fees.

Payment. Payment for the implementation of BMPs, including the BMP Manager, construction, deployment, inspection, maintenance, removal, and the furnishing of all necessary labor, equipment, materials, and all other related costs shall be considered as included in the lump sum Bid price for "IMPLEMENTATION OF BMPs."

Payment will be prorated on a monthly basis over the duration of the Contract.

SECTION 01 57 19

TEMPORARY AND ENVIRONMENTAL CONTROLS

SECTION 1 - GENERAL

1.1 SUMMARY

This section establishes general control requirements for protection of land and water resources; control of noise, dust, and debris, and other environmental pollution; regulation traffic, and control of other activities of the Contractor and the Contractor's subcontractors in performance of the work of the contract.

1.2 DEFINITIONS

- A. Environmental pollution and damage means the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to human life; affect other species of importance to humanity; or degrade the utility of the environment for aesthetic, cultural, or historical purposes.
- B. Sediment means soil and other debris that has been eroded and transported by storm or well production runoff water.
- C. Inert solids/inert waste means non-liquid solid waste including, but not limited to, soil and concrete, that does not contain hazardous waste or soluble pollutants at concentrations in excess of water-quality objectives established pursuant to Division 7 of the California Water Code and does not contain significant quantities of decomposable solid waste.
- D. Inert fill means a permitted facility that accepts inert waste such as asphalt and concrete exclusively.
- E. Construction and demolition waste includes solid wastes such as building materials, packaging, rubbish, debris, and rubble resulting from construction, remodeling, repair, and demolition operations.

1. Rubbish includes both combustible and noncombustible wastes such as paper, boxes, glass, crockery, metal and lumber scrap, tin cans, and bones.
 2. Debris includes both combustible and noncombustible wastes such as leaves and tree trimmings that result from construction or maintenance and repair work.
- F. Class III landfill means a landfill that accepts nonhazardous waste such as household, commercial, and industrial waste, including construction, remodeling, repair, and demolition operations.
- G. Chemical waste includes petroleum products, bituminous materials, salts, alkalis, herbicides, pesticides, organic chemicals, and inorganic wastes.
- H. Sanitary Wastes:
1. Garbage includes refuse and scraps resulting from preparation, cooking, distribution, or consumption of food;
 2. Sewage means domestic sanitary sewage.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Environmental Protection Program: Prior to commencement of the work of this contract. Compile and submit to the County the written environmental protection program proposed by the Contractor for compliance with requirements of this section, as defined under paragraph 1.4 below. Meet with the County to review the proposed environmental protection program, make changes in the plan, and secure the County's approval of the written environmental protection program, prior to commencement of the work.

1.4 QUALITY CONTROL

- A. Use adequate numbers of skilled workmen thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this section. Comply with all pertinent Federal, State, and local regulations pertaining to water, air, solid waste, and noise pollution. Require the Contractor's subcontractors to comply with the provisions of this section.

B. Environmental Protection Program:

1. After award of the contract, and prior to commencement of the work, schedule and conduct a meeting with the County representatives to discuss solid waste management and environmental protection, recycling, and rebate programs required in connection with the work.
2. Not more than 21 calendar days after the meeting, prepare and submit a written and/or graphic Solid Waste Management and Environmental Protection Plan including, but not necessarily limited to:
 - a. List of Federal, state and local laws, regulations, and permits concerning environmental protection, pollution control, noise abatement, and noise control that are applicable to the Contractor's proposed operations;
 - b. Procedures to be implemented to provide the required environmental protection and to comply with applicable laws and regulations;
 - c. Location or locations of solid waste disposal areas proposed to be used by the Contractor, with statement as to current permits or licenses issued to those disposal areas;
 - d. Contractor's proposed procedures for recycling and re-use of materials;
 - e. Contractor's proposed participation in rebate programs.
 - f. Revise and submit the Solid Waste Management and Environmental Protection Plan as required by the County.
 - g. Approval of the Contractor's Waste Management and Environmental Protection Plan will not relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protective measures.
3. With each application for progress payment, submit a summary of solid waste generated by the construction and demolition operations.

- a. Submit on form copied from the example at the end of this section on a different form acceptable to the County;
 - b. Include copies of all manifests, weight tickets, receipts, and invoices specifically identifying the work and waste materials from recycling centers, class III landfills, and inert fills.
- C. Prepare and maintain a 3-ring binder with rebate information and product identification as required for the County to qualify for rebate programs; submit the binder with final closeout submittals.

SECTION 2 - PRODUCTS

2.1 MATERIALS

Except for materials proposed by the Contractor for compliance with the requirements of this Section, and approved in advance by the County, no materials are needed.

SECTION 3 - EXECUTION

3.1 PROTECTION OF LAND RESOURCES

- A. It is intended that land resources within boundaries of the project, but outside the limits of permanent work performed under this contract, shall be preserved in their present condition or be restored to a condition after completion of construction that will appear to be natural and not detract from the appearance of the project.
- B. Insofar as possible, confine activities of the Contractor to pertinent areas defined on the drawings or elsewhere in the Contract Documents. Maintain natural drainage patterns. Conduct construction activities in such a manner that ponding or stagnant water conducive to mosquito breeding habitat will not occur at any time.
- C. Land Resources: Do not remove, cut, deface, injure, or destroy trees or other vegetation outside the work area limits. Do not remove, cut, deface, injure, or destroy trees or other vegetation inside the work area limits except as permitted by the County and where land resources are damaged by the Contractor, promptly replace or repair to the approval of the County and at the Contractor's expense.

- D. Tree Trimming: In accordance with recognized standards for such work, trim and seal tree limbs overhanging the line of the work and in danger of being damaged by the Contractor's operations. Remove other tree limbs as directed by the County so the tree will present a balanced appearance. Roots: Do not cut any roots unnecessarily during excavating or trenching operations, expose roots 75 mm (3 inches) in diameter or larger, encountered in the course of excavation, and do not sever but wrap them in burlap as a protective measure while exposed, and at the edge of the excavation or trench, neatly trim all roots 25 mm (1 inch) in diameter or larger that are severed in the course of excavation and paint them with a heavy coat of tree seal approved by the County.
- E. When and as directed by the County obliterate all signs of temporary construction such as work areas, structures, foundation of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction; Level all temporary roads, parking areas, and other areas which have become compacted or shaped; At unpaved areas where vehicles are operated, provide a suitable surface treatment or wet down periodically to prevent dust from becoming a nuisance, keep haul roads clear of objects which create unsafe conditions, and promptly remove contaminants and construction materials dropped from construction vehicles.
- F. Do not drop mud and debris from construction vehicles onto public streets; sweep turning areas and pavement entrances as needed.

3.2 NOISE CONTROL: Do not permit noise levels exceeding the following:

- A. Trenchers, pavers, graders, and trucks: 90 dBA at 50 feet as measured under the noisiest operating conditions;
- B. All other equipment: 85 dBA at 50 feet.
- C. Use whisperized type generators as approved by the County.
- D. Jack Hammers: Equip with exhaust mufflers and steel muffling sleeves; Use whisperized type air compressors as approved by the County.
- E. Operations: Keep noise equipment as far as possible from noise-sensitive site boundaries, do not leave machines idling, use electric power in lieu of internal combustion engine power when practicable; Maintain equipment in a manner to reduce noise from excessive vibration, faulty mufflers, and similar

sources, provide mufflers on all engines, and schedule operations to minimize their duration at any given location.

- F. Monitoring: As needed, provide portable sound metering devices meeting requirements of ANSI S1.4 for Type 2 sound level meters. Promptly locate and correct noncomplying noise levels.
- G. Contractor shall take all practical measures to minimize, or eliminate if possible, air borne and structure borne noise generated from construction activities. Contractor shall comply with the ground vibration limits as specified by ANSI S3.29-1983.
- H. The use of explosives and riveting will be prohibited.

3.3 RECYCLING REQUIREMENTS

Implement a recycling program which includes separate collection of waste materials. Refer to technical specifications for recycling of building materials via an on-site crushing operation.

3.4 ARCHAEOLOGICAL FINDINGS DURING CONSTRUCTION

There are no known archaeological remains at the project site. Should skeletons, artifacts, or other archaeological remains be uncovered: Suspend operations of this contract at the site of discovery, continue operations in other areas, and notify the County immediately of the finding. Should the discovery site require archaeological studies resulting in delays and/or additional work, the Contractor will be compensated by an adjustment under pertinent provisions of the contract.

3.5 BURNING RUBBISH AND DEBRIS

Do not permit open burning of rubbish, debris, and/or other combustibles on the site.

3.6 DUST CONTROL/AIR QUALITY

- A. Contractor shall prevent air borne debris and dust generated during construction activities from traveling outside the area of work in accordance with SCAQMD Rule 403. All loose materials being hauled onto or out of the site in open truck beds or trailers shall be covered in accordance with State of California Vehicle code Section 23114. Wheels of all vehicles shall be cleaned prior to leaving the Project site.

- B. County and City of Los Angeles streets shall be kept free of construction dirt and debris at all times by use of street sweeping equipment. The degree of cleanliness to be maintained will be determined by the County.
- C. Contractor shall water down all construction activities, such as excavation that create dust.
- D. The Contractor shall provide temporary dust proof enclosures to ensure that particulate matter does not migrate outside of enclosed work areas to adjacent occupied hospital areas. The Contractor's means and methods shall dictate the exact method used to comply with this requirement.
- E. Maintain and operate construction equipment so as to minimize exhaust emissions. During construction, the site shall be watered and all equipment cleaned once a day to reduce particulate and dust emissions.
- F. The Contractor shall not allow any construction equipment with an internal combustion engine to idle more than five (5) minutes in accordance with California Vehicle Code § 2485 (diesel).

3.7 COMPLIANCE

- A. The County will notify the Contractor in writing of any observed noncompliance with the provisions of this section, and will describe actions to be taken. Such notice, when delivered to the Contractor or his authorized representative at the job site, will be deemed sufficient for the purpose. Immediately upon receipt of such notice, initiate the required action or actions.
- B. Noncompliance: If the Contractor fails or refuses to comply promptly, the County may issue an order stopping all or part of the work of this contract until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it was determined that the Contractor was in compliance.

3.8 TRAFFIC REGULATION

- A. Traffic Maintenance: Determine the routing of construction vehicles before starting work, based on restrictions indicated on the drawings and the safeguards and procedures necessary to carry out the work. In addition be responsible for controlling construction traffic within and adjacent to the site,

provide all entrances, lifts and safeguards required necessary to the progress of the work, and effectively control such traffic to provide minimum hazard to the work and all persons, route all construction equipment, trucks, and similar vehicles via existing public streets to and from the site as approved by the governing authorities and the Construction Access Plan.

- B. Obtain and pay for permits and inspections necessitated by the use of public streets, sidewalks, curbs, and paving. Post guarantees and bonds that may be required, and repair and make good any damages thereto, acceptable to the authorities having jurisdiction, construct and maintain temporary walks and bridges for pedestrians. Keep streets adjacent to the site open to vehicular and traffic.
 - C. Maintain constant access for police, fire, and ambulance service.
 - D. Provide and maintain for proper control of traffic and safety of all concerned. All necessary barricades, suitable and sufficient lights, reflectors, and danger signals, warning and closure signs, directional and detour signs, and whatever additional measures necessary.
 - E. Indicate on a 24-hour basis all restricted and dangerous conditions existing on or adjacent to the site, illuminate barricades, danger signals, warning signs and obstructions and night and keep warning lights burning from one hour before sunset and until one hour after sunrise.
- 3.9 Parking: Do not permit parking on site to interfere with activities related to the performance of the work. The Contractor is responsible for providing offsite parking for all Contractor construction personnel at no additional cost to the County, if the County provided Contractor parking area does not provide enough parking spaces for construction personnel.

END OF SECTION

SECTION 01 60 00

PRODUCT HANDLING

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Work Included: Products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.
- B. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. Additional procedures also may be prescribed in other Sections of these Specifications.

1.2 QUALITY ASSURANCE

- A. Include within the Contractor's written quality assurance program such procedures as are required to assure full protection of work and materials.

1.3 MANUFACTURER'S RECOMMENDATIONS

- A. Except as otherwise approved by the Architect, determine and comply with manufacturer's recommendations on product handling, storage, and protection.

1.4 PACKAGING

- A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.
- B. Maintain packaged materials with seals unbroken and labels intact until time of use.
- C. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the County.

- D. The Architect may reject as non-complying such material and products that do not bear identification satisfactory to the Architect as to manufacturer, grade, quality, and other pertinent information.

1.5 PROTECTION

- A. Protect unfinished surfaces, including jambs and soffits or openings used as passageways, through which equipment and material are handled.
- B. Provide protection for finished floor surfaces in traffic areas prior to allowing equipment or materials to be moved over such surfaces.
- C. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by the County.

1.6 REPAIRS AND REPLACEMENTS

- A. In the event of damage, promptly make replacements and repairs to the approval of the Architect and at no additional cost to the County.
- B. Additional time required to secure replacements and to make repairs will not be considered by the Architect to justify an extension in the Contract Time of Completion.

END OF SECTION

SECTION 01 66 00

TRANSPORT, HANDLING & STORAGE

PART 1 GENERAL

1.01 DESCRIPTION (PREPARATION FOR SHIPMENT)

A. Shop prime:

1. Structural steel surfaces not to be encased in concrete shall be shop primed with specified primer. Refer to Section 05 12 00 Structural Steel for primer.
2. After factory tests and acceptance, machined and/or polished surface to remain unpainted shall be coated with minimum 2 mil thickness of rust preventive compounds, or as recommended by manufacturer.

B. Protection:

1. Protect steel surfaces to ensure that their cleanliness during shipment, storage and erection.
2. Protect structural steel against damage from all sources whether mechanical, chemical or environmental.

1.02 TRANSPORTATION AND HANDLING

- A. Verification of intent to ship, arrival date and cartage company must be made known to County by Contractor.
- B. Immediately on delivery, a complete and thorough inspection of the structural steel by County and Contractor shall be made. Any damages incurred in shipping or handling shall be replaced promptly by Contractor at no cost to the County.

1.03 STORAGE AND PROTECTION

- A. Storage and protection shall be the responsibility of the Contractor.
- B. Provide complete weather protection for stored structural steel. Storage must be in Los Angeles County, and all material must be insured.

- C. Inspection of stored structural steel to assure it will be free from damage or deterioration shall be provided at no additional cost.
- D. All storage, handling and rehandling costs, insurance and responsibility for protection and proper installation of such material is the obligation of the Contractor. No payment, pursuant to this provision for material shall in any way relieve the Contractor of its responsibility to obtain or provide, at its expense, any such material or release the Contractor from any of its obligations under this Contract.
- E. Department may enter upon the premises where the material is stored for inspection, checking, or any other purpose he deems necessary.
- F. The Contractor will be reimbursed for any Los Angeles County taxes levied against such material while so stored, upon presentation of the receipted tax bill for same.
- G. Contractor must furnish with his Request for Payment acceptable evidence showing such material has been paid for in full, together with a verified statement that same is/are free from liens and encumbrances and will be utilized in the work covered by this Contract and a material list sufficient for physical inventory at the storage location.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION AND DEMOLITION DEBRIS RECYCLING
FOR
LOS ANGELES COUNTY PROJECTS

PART 1 GOAL

Consistent with the County's efforts to comply with the California Integrated Waste Management Act of 1989 (Public Resources code, Section 40000 et seq.), one goal of this project is to reduce, reuse, and/or recycle the construction and demolition debris generated by the project in accordance with Los Angeles County Code, Chapter 20.87, Construction and Demolition Debris Recycling and Reuse.

PART 2 GENERAL DEBRIS RECYCLING REQUIREMENTS

- 2.1 Prior to the commencement of construction, the Contractor shall submit to the Los Angeles County Public Works, Environmental Programs Division (EPD), a Construction and Demolition Recycling and Reuse Plan (RRP) via EPIC-LA.
- 2.2 Contractor shall submit a RRP for any work done for or on behalf of the County that generates C&D debris.

PART 3 DEBRIS RECYCLING REQUIREMENTS FOR ANY WORK DONE FOR OR ON BEHALF OF THE COUNTY

- 3.1 The RRP submitted in accordance with Paragraph 2.2 of this Section must demonstrate that the Contractor will reduce, reuse, and/or recycle the C&D debris generated by the project. The RRP must demonstrate that the project will deliver debris to an approved facility for recycling or reuse of at least 70% of the mixed and inert debris and 100% of soil and land clearing debris generated by the project. A list of approved facilities is available on the CND website under reference materials (dpw.lacounty.gov/epd/CD/cd_attachments/Recycling_Facilities.pdf).

The RRP must also identify proper recycling or disposal of 100% of universal waste generated by alteration or renovation projects.

- 3.2 As part of the Contractor's request for final payment, the Contractor shall submit a Final Compliance Report to EPD for review and approval.

The Final Compliance Report shall include information and documentation as set forth in the Section D of the C&D Recycling and Reuse Guidelines.

- 3.3 As part of the approval of the final payment, EPD will review the Final Compliance Report to determine if the Contractor documented the quantity of debris generated, reused, and recycled, and achieved a recycling/reuse rate at least 70% by weight and of mixed and inert debris and 100% of soil debris generated and disposed during the project duration.
- 3.4 If EPD determines that the applicant has not provided sufficient documentation to show that all of the project C&D Debris and universal waste included in the RRP, were properly recycled, reused and/or disposed, within one year of the completion of the project plus any additional time provided by Public Works for the correction of any deficiencies, or if the documentation indicates that the project C&D debris and universal waste were not properly recycled, reused and/or disposed, EPD will calculate the applicable penalty in accordance with the penalty schedule below:

Tons of C&D Not Recycled and Not Reported	Penalty Amount	
For up to the first ton	\$ 100	fixed amount; plus, as applicable, amounts below
From above the first ton up to 15 tons	\$ 60	per ton (or fraction thereof); plus, as applicable, amounts below
From above 15 tons up to 45 tons	\$ 45	per ton (or fraction thereof); plus, as applicable, amounts below
From above 45 tons	\$ 30	per ton (or fraction thereof)

PART 4 COST

Cost of compliance with the C&D Ordinance shall be considered as included in the Contractor’s lump sum base bid.

SECTION 01 74 23

FINAL CLEANING

1.00 GENERAL

1.01 DESCRIPTION

A. Principal work in this Section:

1. Keep premises, adjacent private properties and public properties free from accumulations of waste, debris and rubbish caused by construction operations.
2. At completion of work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all exposed surfaces.

1.02 SAFETY REQUIREMENTS

A. Standards: Maintain Project in accord with State and local safety and insurance standards.

B. Hazard control:

1. Store volatile wastes in covered metal containers, and remove from premises daily.
2. Prevent accumulation of wastes which create hazardous conditions.
3. Provide adequate ventilation during use of volatile or noxious substances.

C. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on Project site.
2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains. Store in containers with tight-fitting lids and remove to legal dump site.
3. Special reference is made to the Los Angeles County Department of Public Works Storm Water Pollution Control Requirements for Construction Sites which require implementation of the NPDES standards. The cost of implementing the NPDES standards and adhering to the Storm Water Pollution Control Requirements must be included in the lump sum bid for the Project.

2.00 PRODUCTS (Not applicable)

3.00 EXECUTION

3.01 DURING CONSTRUCTION

- A. Remove or paint over, as appropriate to the substrate, graffiti on the site or surrounding fence daily.
- B. Wet down materials and rubbish to lay dust and prevent it from blowing.
- C. Provide on-site covered containers for collection of waste materials, debris and rubbish. Provide a collection can at each location used as an eating area. Pick-up all garbage daily.
- D. Remove waste materials, debris and rubbish from site and legally dispose of at legal public or private dumping areas off County's property.
- E. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.
- F. Comply with the County of Los Angeles Department of Health design /construction and maintenance risk assessment: Policies and Procedures Infection Control Policy Guidelines Procedure No.918.01.

3.02 FINAL CLEANING

- A. In preparation for Substantial Completion or Occupancy conduct final inspection of all work.
- B. Repair, patch and touch-up marred surfaces to specified finish to match adjacent surfaces.
- C. Contaminated earth:
 - 1. Final clean-up operation includes the removal and disposal of earth contaminated or unsuitable for support of plant life in planting areas, and filling of resulting excavations with suitable soil.
 - 2. Contaminated areas include those used for disposal of waste concrete, mortar, plaster, masonry, and similar materials, areas in which washing out of concrete and plaster mixers or washing of tools and like cleaning operations have been performed, and areas that have been oiled, paved, or chemically treated.
 - 3. Do not dispose of waste oil, solvents, paints, solutions, or like penetrating material by depositing or burying on County's property. All

material shall be disposed in accordance with all regulatory requirements.

- D. Broom clean paved surfaces; rake clean other surfaces of grounds.
- E. Keep Project clean until Final Acceptance by the County.

END OF SECTION

SECTION 01 75 00

PROJECT ADDED STOCK

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Work in This Section: Principle items include:
 - 1. Providing Added Stock Materials to the Owner.
- B. Related Work Not in This Section:
 - 1. Project Closeout.
 - 2. Documents affecting Work of this Section include, but are not necessarily limited to, sections in all divisions of these Specifications.

1.02 QUALITY ASSURANCE

- A. Delegate the responsibility for maintenance of Added Stock to one person on the Contractor's staff as approved by the County.
- B. All materials shall be delivered to the County in original, unopened containers bearing the manufacturer's original labels.

1.03 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 23.
- B. Prior to submitting request for final payment, transmit the final Project Added Stock to the County and secure County approval.

1.04 ADDED STOCK PROTECTION AND HANDLING

- A. Maintain the Added Stock completely protected from deterioration, loss and damage until completion of the Work and transfer of all recorded data to the final Project Record Documents.

PART 2 – PRODUCTS

2.01 ADDED STOCK

- A. All materials delivered, as Added Stock, shall exactly match the materials used on the project. Materials shall be from the same dye-lots, production runs, and color matching and match the installed materials.

PART 3 - EXECUTION

3.01 SCHEDULE OF MATERIALS

<u>Section/ Drawings</u>	<u>Item</u>	<u>Quantity</u>
09 91 00	Exterior Paint	10 gallons
09 91 00	Interior Paint	10 gallons
09 91 00	Primer Paint	10 gallons

3.02 DELIVERY

- A. Transmit all materials to the County in one submission at the completion of the Project. The Contractor is not to use the Added Stock materials for Punchlist and repairs.

SECTION 01 77 00

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Sections of the Specifications, apply to this section.

1.02 SUMMARY

This section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:

- A. Inspection procedures.
- B. Project record document submittal.
- C. Operation and maintenance manual submittal.
- D. Submittal of warranties.
- E. Final cleaning.

- 1. Closeout requirements for specific construction activities are included in the appropriate sections.

1.03 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request:

- 1. In the application for payment that coincides with, or first follows, the date substantial completion is claimed, show one hundred (100) percent completion for the portion of the Work claimed as substantially complete.
 - a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the contract sum.
 - b. If one hundred (100) percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

2. Prepare and deliver to the County a completion list enumerating all items of work not complete, the work required to complete the items of work, the reason that each item is not complete, the action taken by the Contractor to complete all other work in light of the item at work remaining, and the date that the item of work will be completed.
 3. Advise the County of pending insurance changeover requirements.
 4. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
 5. Obtain and submit releases enabling the County unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 6. Submit record drawings, operation and maintenance manuals, project photographs, damage or settlement surveys, property surveys, and similar final record information.
 7. Deliver tools, spare parts, extra stock, and similar items.
 8. Make final changeover of permanent locks and transmit keys to the County. Advise the County's personnel of changeover in security provisions.
 9. Complete startup testing of systems and instruction of the County's operation and maintenance personnel. Discontinue and remove temporary facilities from the site, along with mock-ups, construction tools, and similar elements.
 10. Complete final cleanup requirements, including touch-up painting.
 11. Touch up and otherwise repair and restore marred, exposed finishes.
- B. Inspection Procedures: On receipt of a request for inspection, the County and the Architect will either proceed with inspection or advise the Contractor of unfilled requirements. The architect will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
1. The County and the Architect will repeat inspection when requested and assured that the Work is substantially complete. If, after making such reinspection, the County determines that the work is not substantially complete, the Contractor shall be responsible for the cost

that the County and the Architect incurred in the performance of additional inspections for the purpose of determining Substantial Completion.

2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.04 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes to the contract sum.
3. Submit a certified copy of the architect's final inspection list of items to be completed or corrected, endorsed, and dated by the architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the architect.
4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion or when the County took possession of and assumed responsibility for corresponding elements of the Work.
5. Submit consent of surety to final payment.
6. Submit a final liquidated damages settlement statement.
7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Reinspection Procedure: The County will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed.

1. Upon completion of reinspection, the County will prepare a certificate of final acceptance. If the Work is incomplete, the architect will advise the

Contractor of Work that is incomplete or of obligations that have not been fulfilled, but are required for final acceptance.

2. If necessary, reinspection will be repeated, and the Contractor shall be responsible for the costs of the County and the Architect incurred in the performance of the reinspection or reinspections.

1.05 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the architect's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
 1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
 2. Mark new information that is important to the County, but was not shown on Contract Drawings or Shop Drawings.
 3. Note related Change-Order numbers where applicable.
 4. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets and print suitable titles, dates, and other identification on the cover of each set.
- C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda. Include with the Project Manual one (1) copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.
 1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.

2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
 3. Note related Record Drawing information and product data.
 4. Upon completion of the Work, submit record Specifications to the architect for the County's records.
- D. Record Product Data: Maintain one (1) copy of each product data submittal. Note related Change Orders and markup of Record Drawings and Specifications.
1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.
 2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
 3. Upon completion of markup, submit complete set of record product data to the architect for the County's records.
- E. Record Sample Submitted: Immediately prior to Substantial Completion, the Contractor shall meet with the architect and the County's personnel at the Project site to determine which samples are to be transmitted to the County for record purposes. Comply with the County's instructions regarding delivery to the County's sample storage area.
- F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to the architect for the County's records.
- G. Maintenance Manuals: Organize operation and maintenance data as described in Section 01 78 23, Operations and Maintenance manuals.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

- A. Operation and Maintenance Instructions: Arrange for each Installer of equipment that requires regular maintenance to meet with the County's personnel to provide instruction in proper operation and maintenance. Provide instruction by manufacturer's representatives if installers are not experienced in operation and maintenance procedures. Include a detailed review of the following items:
1. Maintenance manuals.
 2. Record documents.
 3. Spare parts and materials.
 4. Tools.
 5. Lubricants.
 6. Fuels.
 7. Identification systems.
 8. Control sequences.
 9. Hazards.
 10. Cleaning.
 11. Warranties and bonds.
 12. Maintenance agreements and similar continuing commitments.
- B. As part of instructions for operating equipment, demonstrate the following procedures:
1. Startup.
 2. Shutdown.
 3. Emergency operations.
 4. Noise and vibration adjustments.
 5. Safety procedures.
 6. Economy and efficiency adjustments.
 7. Effective energy utilization.
- C. See additional requirements for training in the specification sections.

3.2 FINAL CLEANING

- A. General: The General Conditions require general cleaning during construction. Regular site cleaning is included in Division 1, Section 01 74 23, " Final Cleaning."
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal,

commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.
 - a. Remove labels that are not permanent labels.
 - b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 - c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
 - d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
 - e. Clean the site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean and remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid the project of rodents, insects, and other pests. Provide six (6) copies of each pest control inspection report to the County.
- D. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.
- E. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the County's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully.

* * *

SECTION 01 78 23

OPERATIONS AND MAINTENANCE

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. To aid the continued instruction of operating and maintenance personnel, and to provide a positive source of information regarding the products incorporated into the Work, furnish and deliver the data described in this Section and in other Sections of Division 1.

1.02 SUBMITTALS

- A. Submit three (3) copies of a preliminary draft of the proposed Manual or Manuals to the Agency for review and comments.
- B. Unless otherwise directed in other Sections, or in writing by the Agency, submit five (5) copies of the final Manual along with (1) copy of Manual on CD latest version of Word to Engineer prior to indoctrination of operation and maintenance personnel.

PART 2 - PRODUCTS

2.01 INSTRUCTION MANUALS

- A. Where Instruction Manuals are required to be submitted under other Sections of these Specifications, prepare in accordance with the provisions of this Section.
- B. Format:
 - 1. Size: 8-1/2" x 11"
 - 2. Paper: White bond, at least 20-lb. Weight
 - 3. Test: Neatly written or printed
 - 4. Drawings: 11" in height preferable; bind in with text; foldout acceptable; larger drawings acceptable but to fit within the Manual and provide a drawing pocket inside rear cover or bind in with test.
 - 5. Sheets: Separate each portion of the Manual with neatly prepared flysheets briefly describing content of the ensuing portion; flysheets may be in color.

6. Measurements: Provide measurements in U.S. standard units such as feet and inches, lbs, and cfm; where items may be expected to be measured within ten years in accordance with metric formula, provide additional measurements in the "International Systems of Units" (SI).
- C. Provide front and back covers for each Manual, using durable material approved by Engineer and clearly identified on or through the cover with at least the following information:

OPERATING AND MAINTENANCE INSTRUCTIONS

- name and address of Work
- name of Contractor
- general subject of this Manual
- space for approval signature of Architect and approval date

- D. Contents: Include at least the following:

1. Neatly typewritten index near the front of the Manual, giving immediate information as to location within the Manual of emergency information regarding the installation.
2. Complete instructions rearing operation and maintenance of equipment.
3. Complete nomenclature of part of equipment.
4. Complete nomenclature and part number of replaceable part, name and address of nearest vendor, and all other data pertinent to procurement procedures.
5. Copy of guarantees and warranties issued.
6. Manufacturers' bulletins, cuts, and descriptive data, where pertinent, clearly indicating the precise items included in this installation and deleting, or others that are not relevant to this installation.
7. Such other data as required in pertinent Section of these Specifications.

PART 3 - EXECUTION

3.01 PREPARATION OF MANUAL

A. General

1. Prepare data in the form of an instructional Manual.
2. When multiple binders are used, correlate data into related, consistent groupings.

B. Include a directory for each product. Provide names, addresses and telephone numbers of Contractor, sub-contractor, suppliers, installers and authorized service and parts suppliers. Format as follows:

1. General Contractor: _____
Address: _____
Telephone No.: _____
Person to Contact: _____
2. Subcontractor:
Address: _____
Telephone No.: _____
Person to Contact: _____
3. Installer: _____
Address: _____
Telephone No.: _____
Person to Contact: _____
4. Manufacturer: _____
Address: _____
Telephone No.: _____
Person to Contact: _____
5. Local Service Representative: _____
Address: _____
Telephone No.: _____
Person to Contact: _____

C. Identify each product by product name and other identifying symbols as set forth in Contract Documents.

1. Product Data: Include only those sheets pertinent to specific product. Clearly identify pertinent data; line out inapplicable test.

2. Drawings: Supplement product data with drawings as necessary. Coordinate drawings with information in Project records Documents to ensure correct illustration of completed installation.
3. Written test, as required to supplement product data for particular installation.
4. Submittal format and content: Provide each of the following items, as applicable, for each required items or system. Requirements will vary, depending on the equipment. Refer also to specific Specification Section requirements.
5. System description: Provide a detailed narrative description of each system, describing function, components, capacities, controls and other data specified and including the following:
 - a. Number of
 - b. Sizes
 - c. Type of operation
 - d. Detailed operating instructions, including start up and shutdown of each system, with indications for position of controls, as applicable.
6. Wiring diagrams: Complete wiring diagrams for internally wired components including controls.
7. Operating sequence: Describe in detail.
8. Manufacturers' data: Provide catalog data sheets, specifications, nameplate data and parts list.
9. Preventative maintenance: Provide manufacturers' detailed maintenance recommendations.
10. Troubleshooting: Provide manufacturers' sequence for troubleshooting procedures foe operational problems.
11. Extra parts: Provide a listing of extra stock parts furnished as part of the Contract.
12. Warranties: Provide specific manufacturer's warranty. List each component and control covered, with day and date warranty begins, date of expiration, name, address and telephone number of person to contact regarding problems during warranty period.

Operations and Maintenance

13. Provide operating and maintenance data on work required by the Scope of Work.

3.03 INSTRUCTION OF COUNTY'S PERSONNEL

- A. Prior to final inspection and acceptance, instruct County's designated and maintenance personnel in operation, adjustment and maintenance of products equipment and systems.
- B. Operation and Maintenance Manual shall constitute the basis of instruction.

* * *

SECTION 01 78 36

GUARANTEES AND WARRANTIES

PART 1 GENERAL

1.01 REQUIREMENTS

A. Section Includes: Requirements for the compilation and submittal of guarantees, warranties, and other documents specified.

1. Compile specified guarantees and warranties.
2. Compile specified service and maintenance contracts.
3. Co-execute submittals when so specified.
4. Review submittals to verify compliance with Contract Documents.
5. Submit to County's Representative for review with transmittal to the County.

B. Related Sections:

1. Section 01 33 00 Submittals.

1.02 SUBMITTAL REQUIREMENTS

A. General: Make submittals in accordance with the relevant requirements of Section 01 33 00.

B. Requirements:

1. Assemble warranties, bonds, and service and maintenance contracts, executed by each of the respective manufacturers, supplies and subcontractors.
2. Submit two original, signed copies, each.
3. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.
 - a. Product or work item.
 - b. Firm, with name of principal, address and telephone number.
 - c. Scope.

- d. Date of beginning of warranty, bond, or service and maintenance contract.
- e. Duration of guarantee, warranty, or services and maintenance contract.
- f. Provide information for County personnel:
 - (1) Proper procedure in case of failure.
 - (2) Instances which might affect the validity of guarantee or warranty.
- g. Contractor, name of responsible principal, address, and telephone number.

1.03 FORM OF SUBMITTALS

- A. Prepare in duplicate packets.
- B. Format:
 - 1. Size 8 1/2-inches by 11-inches, punch sheets for standard 3-ring binder.
 - 2. Fold larger sheets to fit into binders.
 - 3. Cover: Identify each packet with typed or printed title (GUARANTEES AND WARRANTIES).
 - List:
 - a. Title or project.
 - b. Name of Contractor.
- C. Binders: Commercial quality, three-ring, with durable and cleanable plastic covers.

1.04 TIME OF SUBMITTALS

- A. For equipment or component parts of equipment put into services during progress of construction:
 - 1. Submit documents within 10 days after inspection and acceptance.
- B. Otherwise make submittals within 10 days after Date of Substantial Completion, prior to final request for payment.

- C. For items of work, where acceptance is delayed materially beyond Date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of guarantee/warranty period.

1.05 SUBMITTALS REQUIRED

- A. Submit guarantees, warranties, and service and maintenance contracts as specified in pertinent Sections of Specification.

* * * *

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Project Record Documents required include:
 - 1. Marked-up copies of Contract Drawings.
 - 2. Marked-up copies of Shop Drawings.
 - 3. Newly prepared Drawings.
 - 4. Marked-up copies of Specifications, addenda and Change Orders.
 - 5. Marked-up Product Data submittals.
 - 6. Record Samples.
 - 7. Field records for variable and concealed conditions.
 - 8. Record information on Work that is recorded only schematically.

- B. Maintenance of Documents and Samples: Store record documents and Samples in the field office apart from Contract Documents used for construction. Do not permit Project Record Documents to be used for construction purposes. Maintain record documents in good order, and in a clean, dry, legible condition. Make documents and Samples available at all times for inspection by the Architect.

1.2 RECORDING

- A. Record drawings shall include dimensions from not less than two permanent and salient building points.

- B. Post changes and modifications to the Documents as they occur. Do not wait until the end of the Project.
- C. The Architect will periodically review record documents to assure compliance with this requirement.

1.3 PROCEDURES

- A. Promptly following Contract Award, General Contractor shall secure from the County one complete set of Specifications and prints of the Contract Drawings and mark them as "Project Record Documents."
- B. Timing of Entries: Make entries within 24 hours after receipt of information.
- C. Contractor shall be responsible for maintaining and recording changes on "Project Record Document" set.
- D. Do not use "Project Record Documents" set for any purpose except entry of new data and for review by the Architect and County Inspector. Maintain separate job sets for subcontractors and workers daily use.
- E. Maintain "Project Record Documents" set at job site where designated by the Architect.
- F. Use all means necessary to protect "Project Record Documents" set from deterioration, loss or damage until completion of work.
- G. Making Entries On "Project Record Documents" Drawings: Using an erasable color pencil, other than blue, not ink or indelible pencil, clearly describe change by note and by graphic line as required. Date entries. Call attention to entry by a "cloud" around area or areas affected. In even of overlapping changes, different colors may be used for each change.
 - 1. Changes due to approved change orders may be indicated by referencing change order number and scope of change in lieu of revising "Project Record Documents".

2. Location and depth below finish grade or above ceilings and attic spaces of utilities shall be fully dimensioned and indicated on "Project Record Documents". Dimensions shall be taken to building lines of permanent landmarks.
- H. The Architect's approval of current status of "Project Record Documents" will be a prerequisite to the Architect's approval of requests for progress payments and request for final payment.
1. Progress Approvals: Prior to submitting each request for progress payments, secure the County Inspector's approval of status of "Project Record Documents."
 2. Prior to submitting request for final payment and final inspection, General Contractor shall submit "Project Record Documents" set to the County Inspector, with transmittal letter, in duplicate, for approval and further processing.
 3. The General Contractor shall certify that the "Project Record Documents" are complete and accurately reflect all changes or modifications to the original Construction Documents.

Project Manual

Construction Documents

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS FIRE CAMP 13 RECONSTRUCTION PROJECT ID: 00002191

Huitt-Zollars, Inc.
Project No. R311608.14
January 4, 2023



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DOCUMENT 00 01 10 – TABLE OF CONTENTS

General Requirements Subgroup

DIVISION 01 – GENERAL REQUIREMENTS

ISSUED BY OWNER

Facility Construction Subgroup

DIVISION 02 – EXISTING CONDITIONS

02 41 20 SELECTIVE BUILDING DEMOLITION

DIVISION 03 – CONCRETE

03 10 00 CONCRETE FORMING AND ACCESSORIES
03 20 00 CONCRETE REINFORCING
03 30 00 CAST IN PLACE CONCRETE
03 35 10 CONCRETE FLATWORK FINISHING AND CURING
03 54 16 HYDRAULIC CEMENT UNDERLAYMENT

DIVISION 04 – MASONRY (NOT INCLUDED)

DIVISION 05 – METALS

05 05 12 HOT-DIP GALVANIZING
05 12 00 STRUCTURAL STEEL FRAMING
05 40 00 COLD FORMED METAL FRAMING
05 44 00 COLD FORMED METAL TRUSSES
05 50 00 METAL FABRICATIONS

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES

06 05 73 WOOD TREATMENT
06 16 43 GMF GYPSUM SHEATHING
06 41 19 PLASTIC LAMINATE-CLAD WOOD CASEWORK

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

07 21 50 BUILDING ENCLOSURE INSULATION
07 25 13 SHEET WEATHER-RESISTIVE BARRIERS
07 41 13 METAL ROOF PANELS
07 42 13 FORMED METAL WALL PANELS
07 62 00 SHEET METAL FLASHING AND TRIM
07 65 26 SASM FLASHING
07 92 00 JOINT SEALANTS

DIVISION 08 – OPENINGS

08 12 13 STANDARD HOLLOW METAL FRAMES
08 13 13 STANDARD HOLLOW METAL DOORS

08 14 16 FLUSH WOOD DOORS
08 31 16 ACCESS PANELS
08 51 13 ALUMINUM WINDOWS
08 83 13 MIRRORED GLASS

DIVISION 09 – FINISHES

09 05 16 PREPARATION OF CONCRETE SUBSTRATES FOR FINISH FLOORING
09 22 16 LIGHTGAGE METAL FRAMING
09 22 26 METAL SUSPENSION SYSTEMS
09 28 15 GMF GYPSUM TILE BACKING BOARD
09 29 00 GYPSUM BOARD
09 30 00 TILING
09 51 13 ACOUSTICAL PANEL CEILINGS
09 65 13 RESILIENT BASE AND ACCESSORIES
09 65 16 RESILIENT SHEET FLOORING
09 81 33 ACOUSTICAL INSULATION, SEALANTS, AND ACCESSORIES
09 91 00 PAINTING
PAINT PRODUCTS SCHEDULE
09 97 23 PENETRATING CONCRETE FLOOR SEALER

DIVISION 10 – SPECIALTIES

10 14 13 REGULATORY SIGNAGE
10 28 13 COMMERCIAL TOILET ACCESSORIES
10 28 14 COMMERCIAL SHOWER ACCESSORIES
10 44 00 FIRE PROTECTION SPECIALTIES

DIVISION 11 – EQUIPMENT

11 31 00 RESIDENTIAL APPLIANCE
11 34 00 CEILING FANS

DIVISION 12 – FURNISHINGS

12 24 13 ROLLER WINDOWS SHADES
12 36 64 QUARTZ AGGLOMERATE COUNTERTOPS

DIVISION 13 – SPECIAL CONSTRUCTION (NOT INCLUDED)

DIVISION 14 – CONVEYING EQUIPMENT (NOT INCLUDED)

Facility Services Subgroup

DIVISION 21 – FIRE SUPPRESSION (NOT INCLUDED)

DIVISION 22 – PLUMBING

22 05 17 SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING
22 05 18 ESCUTCHEONS FOR PLUMBING PIPING
22 05 19 METERS AND GAGES FOR PLUMBING PIPING

22 05 23	GENERAL DUTY VALVES FOR PLUMBING PIPING
22 05 48	VIBRATIONS AND SEIMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT
22 05 53	IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT
22 07 16	PLUMBING EQUIPMENT INSULATION
22 07 19	PLUMBING PIPING INSULATION
22 08 00	COMMISSIONING OF PLUMBING
22 11 16	DOMESTIC WATER PIPING
22 11 19	DOMESTIC WATER PIPING SPECIALTIES
22 11 23	DOMESTIC WATER PUMPS
22 13 16	SANITARY WASTE AND VENT PIPING
22 13 19	SANITARY WASTE PIPING SPECIALTIES
22 35 00	DOMESTIC-WATER HEATERS
22 40 00	PLUMBING FIXTURES

DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING

23 05 13	COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT
23 05 17	SLEEVES AND SLEVE SEALS FOR HVAC PIPING
23 05 18	ESCUTCHEONS FOR HVAC PIPING
23 05 29	HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT
23 05 48	VIBRATION AND SEISMIC CONTROLS FOR HVAC
23 05 55.3	IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT
23 05 93	TESTING ADJUSTING AND BALANCING FOR HVAC
23 07 13	DUCT INSULATION
23 07 19	HVAC PIPING INSULATION
23 11 23	NATURAL GAS PIPING
23 33 00	AIR DUCT ACCESSORIES
23 34 13	AXIAL HVAC FANS
23 34 16	CENTRIFUGAL HVAC FANS
23 82 19	FAN COIL UNITS

DIVISION 25 – INTEGRATED AUTOMATION (NOT INCLUDED)

DIVISION 26 – ELECTRICAL

26 05 00	COMMON WORK RESULTS FOR ELECTRICAL
26 05 19	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 05 26	GROUNDING AND BONDING
26 05 29	HANGERS AND SUPPORTS
26 05 33	RACEWAYS AND BOXES
26 05 44	MANHOLES AND HANDHOLES
26 05 48	VIBRATION AND SEISMIC CONTROLS
26 05 53	IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 05 72	OVERCURRENT PROTECTIVE DEVICE SHORT-CIRCUIT STUDY
26 05 73	OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY

26 05 74	OVERCURRENT PROTECTIVE DEVICE ARC-FLASH STUDY
26 09 23	LIGHTING CONTROL DEVICES
26 09 43	RELAY-BASED LIGHTING CONTROLS
26 24 13	SWITCHBOARDS
26 24 16	PANELBOARDS
26 27 13	ELECTRICITY METERING
26 27 26	WIRING DEVICES
26 28 13	FUSES
26 28 16	ENCLOSED SWITCHES AND CIRCUIT BREAKERS
26 51 00	INTERIOR LIGHTING
26 56 00	EXTERIOR LIGHTING

DIVISION 27 – COMMUNICATIONS (NOT INCLUDED)

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY (NOT INCLUDED)

Site and Infrastructure Subgroup

DIVISION 31 – EARTHWORK (NOT INCLUDED)

DIVISION 32 – EXTERIOR IMPROVEMENTS (NOT INCLUDED)

DIVISION 33 – UTILITIES (NOT INCLUDED)

END TABLE OF CONTENTS

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DIVISION 02

EXISTING CONDITIONS

SECTION 02 41 20 – SELECTIVE BUILDING DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Systematic removal of portions of buildings and structures.
2. Salvage of existing items for reuse.
3. Salvage of construction materials for recycling.
4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

A. Definitions:

1. Remove: Means to detach from existing construction and legally dispose off-site.
2. Demolish: Means the same as “remove”.
3. Dispose: Means to get rid of by throwing away; or by giving or selling to someone else.
4. Reuse: Means to use again for the same function without re-processing.
5. New-Life Reuse: Means to use again for a different function without re-processing.
6. Remove and Salvage: Means to detach from existing construction, prepare for reuse or storage as applicable, and then deliver to the Owner.
7. Remove and Reinstall: Means to detach from existing construction, prepare for reuse, and reinstall where indicated.
8. Recycle: Means to detach from existing construction, break down into raw materials, and then process the materials to make new items.
9. Existing-to-Remain: Means existing items that are not removed, reused, or recycled.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Demolition drawings are diagrammatic and show existing conditions with information developed from field surveys and to generally show the extent and type of demolition required. The Owner will maintain conditions existing at the time of inspection for bidding purposes as far as practicable.

1. Before beginning demolition, make a detailed survey of existing conditions indicated below in Part 3 of this specification Section, and report discrepancies or conflicts between Drawings and actual conditions in writing to the Architect for clarifications and instructions.

2. Do not proceed, when such conflicts or discrepancies occur, before receipt of the Architect's instructions.

B. Pre-Demolition Meeting:

1. To review methods and procedures related to the work of this specification Section, hold a meeting at the project site after submittal approval and at least 10 business days before beginning installation. At a minimum, the Contractor, demolition subcontractor, and Architect must attend the meeting.
2. During the meeting, review the Contract Documents, submittals, project conditions, and demolition sequence and methods, including special details and conditions that might affect demolition.
 - a. Review and discuss existing conditions survey indicated below in Part 3 of this specification Section.
 - b. Inspect and discuss condition of construction to be selectively demolished.
 - c. Review structural load limitations of existing structure.
 - d. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - e. Review requirements of work that rely on substrates exposed by selective demolition operations.
 - f. Review areas where construction is existing-to-remain and requires protection.
3. Identify and discuss adverse or unfavorable conditions detrimental to protecting or demolishing construction. Resolve each condition.
4. Finalize construction schedule.
5. Record significant discussions and distribute meeting minutes. Do not begin demolition until disagreements are successfully resolved to the satisfaction of all parties.

1.4 SUBMITTALS

A. Informational Submittals:

1. Schedule of Selective Demolition Activities: Indicate the following.
 - a. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
 - b. Interruption of utility services. Indicate how long utility services will be interrupted.
 - c. Coordination for shutoff, capping, and continuation of utility services.
 - d. Use of elevator and stairs.
 - e. Locations of proposed dust- and noise-control temporary partitions and means of egress.
 - f. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed work.
 - g. Means of protecting existing-to-remain items in the path of waste removal.

2. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.
3. Pre-Demolition Photographs or Videos: Submit videos or photographs showing existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations.

1.5 QUALITY ASSURANCE

- A. Quality Standards: Comply with the safety requirements of both American National Standards Institute/ American Society of Safety Engineers publication ANSI/ASSE A10.6. *"Safety Requirements for Demolition Operations"* and National Fire Protection Association publication NFPA 241, *"Standard for Safeguarding Construction, Alteration, and Demolition Operations"*.

1.6 PROJECT CONDITIONS

- A. Hazardous Materials: Hazardous materials may be encountered in the building or at the project site. If materials suspected of containing hazardous materials are encountered, then do not disturb; promptly notify the Architect and Owner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure adequate supervision practices are followed at the project site before demolition work begins and at all times during installation.
- B. Survey: Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.
 1. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
 2. Provide means to have digital molds created to repair ornate items in case of loss (e.g., laser cloud point scan).
 3. Inventory and record the condition of items removed and reinstalled and removed and salvaged.
 4. When unforeseen mechanical, electrical, or structural elements are encountered that conflict with intended function or design, investigate and measure the nature and extent of conflict. Promptly submit written report to Architect.

5. Perform surveys as the work progresses to detect hazards resulting from selective demolition activities.

3.2 PREPARATION

- A. Site Protection: Protect existing-to-remain sitework against damage and soiling during demolition.
 1. Do not begin selective demolition work until temporary partitions, barricades, warning signs, and other forms of protection are installed.
 2. Protect trees, plants, utilities, and existing improvements that are not to be removed from injury or damage. Replace damaged landscaping, improvements, and utilities in kind.
 3. During demolition, provide safeguards for protection of the public, Contractor's employees, and existing improvements existing-to-remain, including warning signs and lights, barricades, and the like.
 4. Provide and maintain shoring, bracing, and structural supports required to preserve stability and prevent movement, settlement, or collapse of existing-to-remain construction and finishes; and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
- B. Building Protection: Protect existing-to-remain building construction against damage and soiling during selective demolition.
 1. Do not begin selective demolition work until temporary building bracing, barricades, and other protection necessary to prevent injury to people and damage to adjacent existing-to-remain facilities.
 2. Do not allow water to enter existing-to-remain wall or roof insulation. Replace insulation when it is wetted.
- C. Utilities, Services, and Building Systems Protection:
 1. Maintain existing-to-remain utility services and mechanical and electrical systems and protect them against damage during selective demolition operations.
 2. Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical and electrical systems serving areas indicated for demolition.
 - a. Arrange with utility companies to shut off indicated utilities.
 - b. If building systems or mechanical and electrical systems are indicated as removed, relocated, or abandoned, provide temporary services and systems that bypass demolition areas and maintain continuity of services and systems to other parts of building before proceeding with selective demolition.
 - c. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

3.3 DEMOLITION

- A. General Demolition Requirements:

1. Coordinate demolition to assure the proper sequence, limits, methods, and time of performance. Schedule demolition to impose minimum of hardship on present facility operations and performance of the work.
2. Conduct selective demolition and debris-removal operations to ensure the least interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
3. Demolish and remove existing construction only as shown and to the extent required by new construction. Use methods necessary to complete the work within indicated or specified limitations.
 - a. Maintain existing building structure (including structural floor and roof decking) and envelope (exterior skin and framing, excluding window assemblies and nonstructural roofing material) not shown as demolished; do not demolish existing construction beyond indicated limits.
 - b. Maintain existing interior nonstructural elements (interior walls, doors, floor coverings, and ceiling systems) not shown as demolished.
 - c. Do not demolish existing construction beyond indicated limits.
4. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage existing-to-remain construction or adjoining construction.
5. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces.
6. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces. Verify condition and contents of hidden space before starting cutting operations.
7. Do not use cutting torches until after work areas are cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
8. Temporarily cover existing-to-remain openings.
9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
10. Do not remove any item in a manner that that results in any warranty or guarantee becoming void.

B. Special Techniques:

1. Removed and Salvaged Items:
 - a. Clean salvaged items.
 - b. Pack or crate items after cleaning. Identify contents of containers.
 - c. Store items in a secure area or location until delivery to the Owner.
2. Removed and Reinstalled Items:
 - a. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 - b. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - c. Protect items from damage during transport and storage.

- d. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
3. Existing-to-Remain Items:
 - a. When permitted by the Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.4 CORRECTION AND REPAIR

- A. Damaged existing-to-remain work must be patched and repaired. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Do not correct, repair, or replace any item in a manner that that results in any warranty or guarantee becoming void.
- D. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 CLEANING

- A. Except for recycled, reused, salvaged, and reinstalled items and other existing-to-remain items on Owner's property, remove demolished materials from the project site and legally dispose off-site. Do not burn demolished materials.
- B. Removed items not indicated for reuse, reinstallation, or salvage are the property of the Contractor and must be cleared from the project site.
 1. Continuously clean up and clear these items; do not allow them to accumulate in the building or at the project site.
 2. Material and equipment may not be viewed by prospective purchasers nor sold on the site.
 3. The Owner is not responsible for the condition, loss, or damage to removed items.
- C. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
FIRE CAMP 13 RECONSTRUCTION
PROJECT ID: 00002191

HUITT-ZOLLARS, INC.
PROJECT NO. R311608.14
CONSTRUCTION DOCUMENT 01/04/2023

END OF SECTION

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DIVISION 03

CONCRETE

SECTION 03 10 00 – CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Design and construction of formwork for concrete.
2. Setting in forms, all anchor bolts, metal inserts, sleeves, etc., embedded in concrete.
3. Miscellaneous concrete work, including but not limited to areaways, cast-in-place valve boxes, pits, splash blocks, equipment bases, and other items as shown or required to complete all work.

B. Related requirements:

1. All Pertinent Provisions of Division 01, "General Requirements."
2. Section 03 20 00 "Concrete Reinforcement"
3. Section 03 30 00 "Cast-In-Place Concrete"

1.2 QUALITY ASSURANCE

- A. Construct forms according to ACI 347R, "Guide to Formwork for Concrete," and conforming to tolerances specified in ACI 301, "Specifications for Structural Concrete," as applicable, unless otherwise indicated or specified.

1.3 DELIVERY AND STORAGE

- A. Deliver materials for forms in timely manner to ensure uninterrupted progress.
- B. Store materials by methods that prevent damage and permit ready access for inspection and identification.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Form lumber: Lumber with adequate strength, stiffness, dimensional accuracy and stability, workability, and durability in conformance with ACI 347R "Guide to Formwork of Concrete."
- B. Form plywood: PS 1 95, Group I, Exterior Grade B-B Plyform or better, minimum 5-ply and 3/4" thick for exposed locations and not less than 5/8" thick for unexposed locations, grade marked, not mill oiled. Plywood having medium or high-density overlay is acceptable.

- C. Coated form plywood: For exposed painted concrete, plastic overlaid plywood of grade specified above, factory coated with a form coating and release agent "NoxCrete", or equal.
- D. Tube forms: Sonoco "Seamless Sonotubes", or approved equal, type leaving no marks in concrete, 1-piece lengths for full required heights.
- E. Form ties: Prefabricated rod, flat band, wire, internally threaded disconnecting type, or equal, not leaving metal within 1 1/2" of concrete surface.
- F. Form coating: Non-staining clear coating free from oil, silicone, wax, not grain-raising, "Cast-Off" by BASF or equal approved equal by the SEOR. Where form liners are used, provide form coatings recommended by form liner manufacturer.
- G. Form liner: Rigid or resilient type by Labrado Forms, Symons, or approved equal, types shown or directed, matching approved sample.

PART 3 - EXECUTION

3.1 MATERIALS

- A. Rigidly construct forms to prevent mortar leakage, sagging, displacement or bulging between studs. Use clean, sound, approved form material, coated with specified materials only, not oil. Provide backing on all plywood joints.
- B. Sides of all footings and grade beams shall be formed or cast against clean vertical cuts in unweathered bedrock, unless the member detail provides at least 3" clear cover to reinforcement and indicates that the member is cast against earth, or permission is obtained to place concrete directly against earth. Where this permission is granted, the footing or grade beam dimension shall be increased 3". Remove formwork prior to backfilling operations.

3.2 FORM ERECTION AND REMOVAL

- A. Conform to ACI 301, ACI 318 and ACI 347R.
- B. Construction: Coat forms with the specified resin coating, not form oil. Construct forms to exact shapes, sizes, lines, and dimensions required to obtain level, plumb, and straight surfaces. Provide openings, offsets, keys, reglets, anchorages, recesses, moldings, chamfers, blocking, screeds, drips, bulkheads, and all other required features. Make forms easily removable without hammering or prying against concrete. Space forms apart with metal spreaders. Construct forms to accurate alignment, location and grades, and provide against sagging, leakage of concrete mortar, or displacement occurring during and after placing of

concrete. Coordinate installation of inserts and anchors in forms according to Shop Drawings and requirements for work of other sections.

- C. Camber: Place suitable jacks, wedges, or similar means to induce camber and to correct settlement in forms before and during concrete placing. Camber shall be as determined in pre-installation meeting specified above. In general, formwork shall be capable of accommodating camber of 1/8" per 10' of span plus 1/4". Provide camber as noted on the Structural Drawings (if required).
- D. Corners and Angles: Provide 3/4" by 3/4" beveled chamfer strips for all exposed concrete corners and angles unless otherwise indicated. Form concealed concrete corners and angles square unless otherwise indicated.
- E. Reglets and Rebates: Form required reglets and rebates to receive frames, flashing, and other equipment. Obtain required dimensions, details, and precise positions for work to be installed under other sections and form concrete accordingly.
- F. Form Joints: Fill joints to produce smooth surfaces, intersections, and arises. Use polymer foam or equivalent fillers at joints and where forms abut or overlap existing concrete to prevent leakage of mortar.
- G. Recesses, Drips, and Profiles: Provide smooth milled wood or pre-formed rubber or plastic shapes of types shown and required.
- H. Cleanouts and Cleaning: Provide temporary openings in all wall forms and other vertical forms for cleaning and inspection. Clean forms and surfaces to receive concrete prior to placing.
- I. Re-Use: Clean and recondition form material before re-use.
- J. Form Removal: Do not remove concrete forms until concrete attains sufficient strength to support its own weight and all superimposed loads as determine by testing field cured

concrete cylinders, but not sooner than specified in ACI 347R, Section 5.7, or ACI 318, Section 26.11.

3.3 FORMWORK TOLERANCES

- A. Deflection: Limit deflection of forming surfaces from concrete pressure to $L/240$.
- B. Finish Lines: Position formwork to maintain hardened concrete finish lines within following permissible deviations.
 - 1. Variation from Plumb:
 - 1. In 10' 0" 1/4 inch
 - 2. In any story or 20' 0" 3/8 inch
 - 3. In 40' 0" or more 3/4 inch
 - 2. Cross-Sectional Dimensions
 - 1. Minus 1/4 inch
 - 2. Plus 1/2 inch

3.4 SURVEY AND ADJUSTMENT

- A. Check forms before and during placement of concrete, using an instrument, and make corrections as work proceeds.

3.5 EMBEDDED PIPING AND ROUGH HARDWARE

- A. Comply with ACI 318, Section 26.11. Where work of other sections require openings for passage of pipes, conduits, ducts, and other inserts in the concrete, obtain all dimensions and other information. All necessary pipe sleeves, anchors, or other required inserts shall be accurately installed as part of the work of other sections, according to following requirements. See specification Section 03 30 00, Section 1.3.B for submittal requirements related to this scope.
- B. Conduits or Pipes: Locate so as not to reduce strength of concrete. Do not place pipes, other than conduits, in a slab 4 1/2" thick or less in any case. Conduit buried in a concrete slab shall not have an outside diameter greater than 1/3 the slab thickness nor be placed below the bottom reinforcing steel or over top reinforcing steel.
- C. Sleeves: Pipe sleeves may pass through slabs or walls if not exposed to rusting or other deterioration and are of uncoated or galvanized iron or steel. Provide sleeves of diameter large enough to pass any hub or coupling on pipe, including any insulation. Refer to

Architectural and MEP drawings and specifications for details of waterproofing seals at wall penetrations.

- D. Conduits: Conduits may be embedded in walls only if the outside diameter does not exceed $1/3$ the wall thickness, are spaced no closer than 3 diameters on centers, and do not impair the strength of the structure.
- E. Clusters of Conduits:
 - 1. Clusters of conduits embedded in a concrete slab shall not exceed 6 conduits per cluster and each conduit per cluster shall be individually spaced as per the above requirements. Conduit clusters exceeding this requirement shall be reviewed and approved by the Structural Engineer of Record and OSHPD prior to the installation of the conduits.
 - 2. If more than one conduit cluster is required in a specific area of the slab, routing and spacing of the clusters shall be reviewed and approved by the structural engineer of record and OSHPD prior to the installation of the conduits.
 - 3. At no time shall the quantity and routing of clusters of conduits impair the strength of the concrete construction.

SECTION 03 20 00 – CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Steel reinforcement bars.
- B. Related requirements:
 - 1. All Pertinent Provisions of Division 01, "General Requirements."
 - 2. Section 03 30 00 "Cast-In-Place Concrete"

1.2 SUBMITTALS

- A. Product Data: For the following:
 - 1. Each type of steel reinforcement.
 - 2. Bar supports.
 - 3. Mechanical splice couplers.
- B. Shop Drawings: Comply with ACI SP-066:
 - 1. Include placing drawings that detail fabrication, bending, and placement.
 - 2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.
- C. Informational Submittals:
 - 1. Material Certificates: For each of the following, signed by manufacturers:
 - a. Epoxy-Coated Reinforcement: CRSI's "Epoxy Coating Plant Certification."
 - 2. Material Test Reports: For the following, from a qualified testing agency:
 - a. Steel Reinforcement.
 - b. Mechanical splice couplers.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel reinforcement: As indicated on structural drawings.

B. Reinforcement accessories:

1. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.
 - a. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - b. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.

2.2 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protection of In-Place Conditions:
1. Do not cut or puncture vapor retarder.
 2. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.2 INSTALLATION OF STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.
- B. Accurately position, support, and secure reinforcement against displacement.
1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
 2. Do not tack weld crossing reinforcing bars.
- C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.
- D. Provide concrete coverage in accordance with ACI 318.
- E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- F. Splices: Lap splices as indicated on Drawings.
1. Bars indicated to be continuous, and all vertical bars to be lapped not less than 36 bar diameters at splices, or 24 inches, whichever is greater.

2. Stagger splices in accordance with ACI 318

3.3 JOINTS

- A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 1. Place joints perpendicular to main reinforcement.
 2. Continue reinforcement across construction joints unless otherwise indicated.
 3. Do not continue reinforcement through sides of strip placements of floors and slabs.

3.4 INSTALLATION TOLERANCES

- A. Comply with ACI 117.

SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

B. Related requirements:

1. All Pertinent Provisions of Division 01, "General Requirements."
2. Section 031000 "Concrete Forming and Accessories"
3. Section 032000 "Concrete Reinforcing"

1.2 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, and other pozzolans materials subject to compliance with requirements.
- B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.3 SUBMITTALS

A. Product Data: For the following:

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Aggregates.
6. Admixtures:
 - a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
7. Vapor retarders.
8. Liquid floor treatments.
9. Curing materials.
10. Joint fillers.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
 2. Minimum 28-day compressive strength.
 3. Durability exposure class.
 4. Maximum w/cm.
 5. Calculated equilibrium unit weight, for lightweight concrete.
 6. Slump limit.
 7. Air content.
 8. Nominal maximum aggregate size.
 9. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
 10. Intended placement method.
 11. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Informational Submittals:
1. Material Certificates: For each of the following, signed by manufacturers:
 - a. Cementitious materials.
 - b. Admixtures.
 - c. Curing compounds.
 - d. Vapor retarders.
 - e. Joint-filler strips.
 2. Material Test Reports: For the following, from a qualified testing agency:
 - a. Portland cement.
 - b. Fly ash.
 - c. Slag cement.
 - d. Blended hydraulic cement.
 - e. Aggregates.
 - f. Admixtures.

1.4 QUALITY ASSURANCE

- A. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with ASTM C94/C94M and ACI 301.

1.6 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1.
- B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cementitious Materials & Aggregates: As indicated on structural drawings.
- B. Air-Entraining Admixture: ASTM C260/C260M.
- C. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride[in steel-reinforced concrete].
 - 1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
 - 2. Retarding Admixture: ASTM C494/C494M, Type B.
 - 3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
 - 5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.

2.2 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301 (ACI 301M).
 - 1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 - 1. Fly Ash or Other Pozzolans: 25 percent by mass.
 - 2. Slag Cement: 50 percent by mass.
 - 3. Total of Fly Ash or Other Pozzolans, Slag Cement: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass.
 - 4. Total of Fly Ash or Other Pozzolans: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass.
- C. Concrete mix design properties shall be as indicated on structural drawings.

PART 3 - EXECUTION

3.1 JOINTS

- A. Construct joints true to line, with faces perpendicular to surface plane of concrete.

- B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.
 - 1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
 - 2. Place joints perpendicular to main reinforcement.
 - a. Continue reinforcement across construction joints unless otherwise indicated.
 - b. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 - 4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

3.2 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.
 - 1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
 - 2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.
- D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Do not place concrete floors and slabs in a checkerboard sequence.
 - 2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 3. Maintain reinforcement in position on chairs during concrete placement.
 - 4. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 5. Level concrete, cut high areas, and fill low areas.
 - 6. Slope surfaces uniformly to drains where required.
 - 7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
 - 8. Do not further disturb slab surfaces before starting finishing operations.

3.5 FINISHING FORMED SURFACES

- A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

3.6 TOLERANCES

- A. Comply with ACI 117.

3.7 FIELD QUALITY CONTROL

- A. Conform with testing and inspection requirements as indicated on structural drawings.

3.8 PROTECTION

- A. Protect concrete surfaces as follows:
 1. Protect from petroleum stains.
 2. Diaper hydraulic equipment used over concrete surfaces.
 3. Prohibit vehicles from interior concrete slabs.
 4. Prohibit use of pipe-cutting machinery over concrete surfaces.
 5. Prohibit placement of steel items on concrete surfaces.
 6. Prohibit use of acids or acidic detergents over concrete surfaces.
 7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

SECTION 03 35 10 – CONCRETE FLATWORK FINISHING AND CURING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Finishing flatwork after strike off, including leveling, floating, troweling; and other concrete finishing methods, including finishing tolerance classifications.
2. Evaporation reducers.
3. Curing compounds.
4. Preventative (day-of-pour) MVECS.
5. Floor hardeners.
6. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 03 54 16 for underlayment; and for definition of the term “underlayment”.
2. Section 09 05 16 for corrective (remedial) MVECS; and for definitions of the terms “substrate”, “penetrant”, “overlay”, “covering”, and “overburden”.
3. Section 09 97 23 for penetrating concrete floor sealer.

1.2 RELATED DOCUMENTS

A. This specification

1. supersedes any leveling, floating, troweling, and other concrete finishing requirements, including finishing tolerances;
2. compliments the requirements of Section 09 05 16 to generally describe concrete slab finishing and surface preparation for finish flooring. Additional slab finish and surface preparation requirements specific to a particular finish flooring are specified within the applicable specification sections.

1.3 ALTERNATES

- ##### A.
- With input from the preventative (day-of-pour) MVECS manufacturer, preventative MVECS specified in this specification section may be considered for certain concrete curing applications in lieu of curing compounds; and possibly in lieu of corrective (remedial) MVECS products specified in Section 09 05 16.

1.4 REFERENCES

A. Abbreviations and Acronyms:

1. ACI: American Concrete Institute.
2. F(f): Floor Flatness.
3. F(l): Floor Levelness.
4. HVFAC: High-Volume Fly Ash Concrete.
5. MLV: Minimum Local Value.
6. MVECS: Moisture Vapor Emission Control System.
7. MVER: Moisture Vapor Emission Rate.
8. pH: Potential of Hydrogen. (measure of acidity or alkalinity)
9. RH: Relative Humidity.
10. SOV: Specified Overall Value.
11. VDR: Vapor Diffusion Retarder.

B. Definitions:

1. Manufacturer: Means the evaporation reducer, curing compound, MVECS, floor hardener, or accessory manufacturer, as the context admits, unless otherwise indicated.
2. Flatwork: Means all concrete work along a horizontal plane, including indoor floors and decks, concrete stairs, and outdoor patios, sidewalks, and driveways. Flatwork excludes vertical structures like walls or bridges.
3. General Concrete Terms:
 - a. Freshly-Mixed Concrete: Means a homogenous mixture of blended hydraulic cement, aggregates, and water, with or without admixtures, fibers, or other cementitious materials.
 - b. Newly-Placed Concrete: Means freshly-mixed concrete that is deposited (placed), distributed (spread), screeded (struck-off), and consolidated (tamped) in the place where it hardens, but not yet floated, troweled, or otherwise finished. (aged up to approximately one hour after placement)
 - c. Newly-Finished Concrete: Means newly-placed concrete, the surface of which has deliberate floating, troweling, and other finishing actions performed during a period promptly after strike off and after bleed water, glaze, or sheen has disappeared and the concrete is hard enough to resist surface damage, but before initial set; and whose surface is damp but not wet. (aged approximately one to 4 hours)
 - d. Cured Concrete: Means newly-finished concrete, the surface of which has had deliberate actions taken between final finishing and the termination of curing to reduce loss of water from the flatwork surface; and control concrete temperature.
 - 1) Initially-Cured Concrete (Beginning Curing): Means newly-finished concrete before initial set when bleed water is evaporating too rapidly to keep the surface wet. (aged approximately one to 4 hours)

- 2) Newly-Cured Concrete (Intermediate Curing): Means newly-finished concrete during a period following initial set, but before final set. (aged approximately 4 to 8 hours)
 - 3) Recently-Cured Concrete (Final Curing): Means newly-finished concrete during a period following final set. (aged approximately 8 hours to 14 days)
 - e. Hardened Concrete: Means recently-cured concrete that has sufficient strength to serve its purpose or resist breaking under stipulated loading (approximately 7 to 28 days or older), and that has not been exposed to weathering or contaminates.
 - f. Newly-Aged Concrete: Means hardened concrete aged more than 28 days whose surfaces have been exposed to weathering, including abrasion, liquid penetration, freeze/thaw cycles, and salts or other contaminates.
 - g. Existing Concrete: Means concrete that was placed, finished, cured, hardened, and weathered prior to the start of the project that is indicated as remaining, and which may also require cleaning, resurfacing, rehabilitation, or strengthening.
4. Concrete Finishing Terms:
- a. Smooth: Means having a continuous even surface free from irregularities, roughness, projections, bumps, points or ridges.
 - b. Surface Defect: Means surface voids, aggregate transparency, color variation, spalling, cracking, offsets, and similar cavities or irregularities.
 - c. Trowel Pattern: Means a flatwork surface feature produced by troweling that is seen but cannot be felt.
 - d. Trowel Mark: Means a flatwork surface defect produced by troweling that is both seen and felt.
5. Concrete Curing Terms:
- a. Water Curing: Means curing flatwork by flooding with water (ponding or immersion), continuously spraying with water, or fog mist-spraying to replace evaporating water. Adding water to the surface does not mean adding water that is worked into the concrete mix, which may increase the surface concrete water-cement ratio and weaken it.
 - b. Wet Covering Curing: Means curing flatwork with coverings, including earth, sand, sawdust, straw, hay, canvas, hessian or jute burlap, or natural cellulose fabric, which are kept continuously wet to replace water evaporating from flatwork.
 - c. Sheet Curing: Means curing flatwork with water retaining coverings, including waterproof paper or plastic film, which prevent water from evaporating from flatwork.
 - d. Curing Compounds: Means curing flatwork with liquid membrane-forming resinous materials that prevent water from evaporating from flatwork. Solutions of silicate salts are chemically reactive in concrete rather than membrane-forming; therefore, they do not meet the definition of a curing compound.

1.5 ADMINISTRATIVE REQUIREMENTS

A. General Coordination:

1. Though certain curing methods may be generally recommended and preferred for curing concrete (to minimize the risk of potential flatwork failures), the Contractor controls the means and methods for flatwork finishing and curing.
 2. Contractor shall perform or arrange and pay costs without reimbursement from the Owner for all remedial work necessary to correct or improve all deficient conditions and all failures directly or indirectly caused by concrete curing means and methods, without limitation, including delays, schedule disruptions, corrections, repairs, and replacement.
 3. Proposed substitution requests and submittals that change the generic chemistry of specified concrete finishing and curing materials are prohibited and returned to the Contractor without review or responsive action, except to record non-conformance with this requirement.
 4. Specified coverage rates are minimum. If manufacturer's recommended coverage rates differ from specified rates, then
 - a. consult the manufacturer's representative and obtain manufacturer-recommended rates printed on manufacturer's letterhead;
 - b. assume the manufacturer-recommended coverage rates govern; and
 - c. promptly submit an RFI to the Architect for resolution; include manufacturer-recommended coverage rates with the RFI.
- B. Concrete Mix Design Coordination: Coordinate concrete finishing methods and curing materials with factors of the approved concrete mix design that affect concrete bleeding, including the presence of water-reducing admixtures, air-entraining agents, and fly ash, especially HVFAC
- C. VDR Coordination:
1. Coordinate finishing methods and curing materials with the selected below-grade VDRs, and with the location of the VDR within each flatwork assembly.
 2. Do not double steel trowel interior flatwork installed over VDRs.
 3. When curing compounds are selected by the Contractor for use in curing concrete, with the assistance of both the VDR and curing compound manufacturers, coordinate the selection of the correct curing compounds to match selected VDRs.
- D. Concrete Finishing Coordination:
1. Coordinate finishing with forecast and actual weather conditions measured at the project site, including factors that affect surface setting such as high wind velocity, low RH, rising air temperature, and exposure to direct sunlight. Where practicable, make arrangements to block wind and shade newly-placed concrete from direct sunlight.
 2. Coordinate concrete finishing with penetrant, overlay, and covering material preparation, application, and installation requirements indicated in other specification sections. Finish concrete in conformance with tolerances and surface finishes required, recommended, or accepted by all penetrant, overlay, and covering material suppliers and manufacturers.
 3. Without limitation, either perform or arrange and pay costs reimbursement from the Owner for performing all remedial work necessary to correct or remove, dispose of,

and replace defective flatwork, the surface finish and tolerances of which do not conform to the penetrant, overlay, and covering manufacturers' surface finish and tolerance requirements.

E. Concrete Curing Coordination:

1. Coordinate flatwork curing to ensure selected curing materials and methods result in flatwork that conforms to the penetrant, overlay, and covering manufacturers' MVER, pH, RH, and warranty requirements.
2. Coordinate finishing with both forecast and actual weather conditions measured at the project site, including factors that affect surface setting such as high wind velocity, low RH, rising air temperature, and exposure to direct sunlight. Block wind and shade newly-placed concrete from direct sunlight.
3. If liquid membrane-forming curing compounds are selected for use in curing concrete flatwork, then with assistance from the VDR, curing compound, and finish flooring manufacturers, coordinate selection of the correct curing compounds with selected VDR and finish flooring materials and flooring installation materials based on current product formulations.
 - a. Verify chemical and adhesive compatibility of selected concrete curing compounds and installed MVECS with selected finish flooring materials and flooring installation materials, including all primers, adhesives, and sealants, based on current product formulations.
 - b. Contractor assumes responsibility for all subsequent flatwork conditions, floor finish issues, and substrate failures brought about or attributable to curing compound use, including MVER failure.
4. Without reimbursement from Owner, perform or arrange and pay costs for performing all remedial work necessary to correct and improve
 - a. defective flatwork, including areas that exceed the MVER, pH, and RH limits required, recommended, or accepted by the penetrant, overlay, and covering manufacturers; and
 - b. penetrant, overlay, and covering failures resulting from selected concrete curing methods; and coordination of, or failure to coordinate, the chemical and adhesive compatibility of selected curing compounds with all subsequent penetrants, overlays, and covering materials, including primers, adhesives, and sealants, and other installation materials.

F. Preinstallation Meeting:

1. Hold a meeting after submittal approval and at least 10 business days before beginning VDR installation.
 - a. VDR manufacturer's representative and installer must attend meeting.
 - b. Concrete finishers and the evaporation reducer, curing compound, and MVECS manufacturer's representatives and MVECS installers must attend the meeting.
 - c. Tiling, flooring, and concrete sealer manufacturers' representatives and installers must attend the meeting.
2. During the meeting, review the Contract Documents, submittals, project conditions, and installation sequence and methods, including special details and conditions that might affect installation.

- a. Review, discuss, and complete the National Ready Mixed Concrete Association and American Society of Concrete Contractors publication NRMC/ASCC, "*Checklist for the Concrete Pre-Construction Conference*" during the course of the pre-installation meeting. (available from www.nrcma.org or www.ascconline.org)
 - b. Discuss the use (or not) of maturity testing for this project, including development of the maturity calibration curve. and equipment requirements and sensor placement for measuring in-place concrete maturity.
 - c. Review and discuss specified tolerance standard document, including concrete construction tolerances, tolerance compatibility at interface between concrete and other building systems, and suggested methods for mitigating tolerance conflicts.
 - d. Review and discuss flatwork finishing tolerances, flatness and levelness, curing methods, and floor protection, including all applications and restrictions for each.
 - e. Review and discuss floor testing, failures, causes, prevention, and remedial measures, including responsibilities for repair and remedial work necessary to correct and improve defective or non-conforming flatwork.
 - f. Review and discuss the difference between floor preparation and floor repair, including responsibilities for each.
3. Identify and discuss adverse or unfavorable conditions detrimental to protecting stored materials or to installation; or to the quality, durability, appearance, or performance of installed flatwork. Resolve each condition.
 4. Finalize construction schedule.
 5. Record significant discussions and distribute meeting minutes. Do not begin installation until disagreements are successfully resolved to the satisfaction of all parties.
- G. Sequencing:
1. When drilling for RH probes specified in Section 09 05 16 is inadvisable (such as when floor heating elements, water tubing, or other items are installed), provide wet concrete RH meter accessories for installation prior to placing concrete.
 2. Begin concrete finishing operations promptly after strike off, though refrain from troweling until after bleed water, glaze, or sheen has disappeared. (if troweling is begun while bleed water is still visible, surface defects are likely, and delamination is possible)
 3. Both wet coverings saturated with water and sheet curing materials may be used only after the concrete has hardened enough to prevent surface damage, including both marks and patterns. Depending upon environmental conditions at the project site, initial curing may be necessary when utilizing wet covering and sheet curing.
- H. Scheduling:
1. Saw Cutting: Newly-cured concrete contraction joints must be cut during a period within the first one or 2 hours of finishing, or as soon as the concrete has hardened sufficiently to prevent aggregates from being dislodged by the saw blade, and before final set. (within approximately 24 hours)

2. Minimum Concrete Curing Period: Allow sufficient time in the construction schedule to permit concrete flatwork to cure undisturbed for at least the following time periods, at ambient temperatures above 40 deg. F.
 - a. ASTM C 150 Type I Cement (used when the special properties specified for any other types are not required): At least 7 consecutive days.
 - b. ASTM C 150 Type II Cement (general use; used when moderate sulfate resistance or moderate heat of hydration is required): At least 10 consecutive days.
 - c. ASTM C 150 Type III Cement (high early-strength): At least 3 consecutive days.
 - d. ASTM C 150 Type IV Cement (low heat of hydration) or Type V Cement (high sulfate resistance): At least 14 consecutive days.

1.6 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
 1. Product Data: Submit manufacturer's product data, specifications, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 2. Test Reports: Submit manufacturer's ASTM Test Method C 156 water retention laboratory test results demonstrating submitted products conform to ASTM C 309 Section 6 requirements water retention properties.
- B. Informational Submittals: Submit the following for information (informal review; responsive action not expected or required, except to record non-conformance with submittal requirements).
 1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished concrete sealers.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.
 3. Manufacturer's Representative Reports:
 - a. At the beginning of work, request and submit reports confirming concrete is prepared in conformance with manufacturer's instructions and other requirements and recommendations; are acceptable and satisfactory to receive curing compounds; and conform to all requirements necessary to issue specified and other warranties.
 - b. During the work, request and submit reports documenting actions taken by the manufacturer's representative to verify conformance with manufacturer's instructions and other requirements and recommendations.

- c. Upon completion, request and submit reports confirming installed waterproofing conforms to all requirements necessary to issue specified and other warranties.

1.7 QUALITY ASSURANCE

- A. Source Limitations: Curing materials must be obtained only from a manufacturer that sends a representative to the project site before beginning work to verify conditions; and during work to perform manufacturer's field services.
- B. Regulatory Requirements:
 1. Portland cement concrete paving must be stable, firm, and slip resistant and must conform to California Building Code Sections 11B-302 and 11B-403.
- C. Quality Standards:
 1. Tolerance Standard: Comply with ACI publication 117 "*Guide for Tolerance Compatibility in Concrete Construction*" requirements and recommendations for concrete construction tolerances, tolerance compatibility at interface between concrete and other building systems, and suggested methods for mitigating tolerance conflicts.
- D. Qualifications:
 1. Manufacturer: Company or individuals must have at least 10 years' experience manufacturing concrete sealers installed on at least 200 previous projects similar to this project in size, material, design, and complexity.
 2. Concrete Finishers: Company or individuals must have at least 5 years' experience finishing and curing concrete for at least 30 previous projects similar to this project in size, material, design, and complexity. Individuals performing flatwork finishing and curing must be ACI-certified Flatwork Technicians and Finishers and current in their certification.
 3. Supervisors: Individuals must have at least 7 years' experience finishing and curing concrete for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading concrete finishers. Supervisors must be ACI-certified Flatwork Technicians and Finishers and current in their certification.
 4. Manufacturer's Representative: Individuals must have at least 5 years' technical field experience performing manufacturer's services for at least 50 previous projects similar to this project in material, design, and complexity.

1.8 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
 3. Unload and store only inspected and accepted items.

- B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
 - 1. Furnish adequate dunnage and bracing during storage.
 - 2. Prevent stored items from contacting the floor and from deterioration and damage.
 - 3. Do not leave items uncovered where they might be exposed to weather or become wet; or exposed to heat or sudden changes in temperature or relative humidity; or other sources of deterioration and damage, including dust and other airborne contaminants.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.
 - 1. Avoid damage to packaging and containers, and contamination of contents.
 - 2. Rotate inventory; do not use items the shelf life of which is expired.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective [coating]s with undamaged new [coating]s that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.9 PROJECT CONDITIONS

- A. Ambient Conditions: Install evaporation reducers and curing compounds only when ambient temperature, RH, and other environmental conditions fall within ranges required, recommended, or accepted by the manufacturer.
 - 1. Do not install evaporation reducers and curing compounds during rain or snow, fog or mist; or when rain or snow is predicted within 24 hours of installation.
 - 2. Proceed only when there is no threat of impending precipitation, and both current and forecasted weather conditions conform to those required, recommended, or accepted by the manufacturer.

1.10 WARRANTY

- A. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 5 years.

PART 2 - PRODUCTS

2.1 EVAPORATION REDUCERS (EVAPORATION RETARDANTS)

- A. Description: VOC-compliant water-based polymer liquid that forms a thin continuous film when applied to fresh concrete, which controls the flatwork surface conditions until finishing operations cause the thin film to completely dissipate.

1. Evaporation reducers are not curing compounds. Concrete treated with evaporation reducers must be cured.
 2. Evaporation reducers are not surface retarders.
- B. Applications: Used on surfaces of newly-placed concrete to temporarily reduce rapid moisture loss from flatwork due to any of the following conditions and applications.
1. High temperature.
 2. Low humidity.
 3. High wind.
 4. Direct sunlight.
 5. Indoor applications heated in winter.
 6. Low water-cement ratio concrete applications.
 7. Concrete mixes indicated as containing either super plasticizers or silica fume.
- C. Restrictions: Do not apply evaporation reducers during final troweling operations. (slab discoloration may occur)
- D. Products: Provide one of the following, or equal.
1. "EUCOBAR" manufactured by The Euclid Chemical Co.
 2. "E-CON" manufactured by L&M Construction Chemicals, Inc.
 3. "Sealtight Evapre" manufactured by W.R. Meadows, Inc.

2.2 CURING COMPOUNDS

- A. Description: Liquids containing film-forming polymers used to seal the surface of newly-finished concrete and prevent rapid moisture loss.
- B. Application: When the permitted use of curing compounds is selected to cure flatwork, temporary (chemically dissipating) curing compounds are recommended and preferred.
- C. Restrictions: Liquid membrane-forming curing compounds are not recommended where moisture-sensitive finish flooring is installed. Concrete curing compounds may not be used to cure flatwork indicated as receiving penetrants, overlays, or coverings without prior written acceptance from the manufacturer based on actual in-service conditions.
1. If temporary curing compounds are used to cure flatwork, then mechanical abrasion, including planing and grinding, must be provided before beginning installation of any penetrant or overlay, including substrate preparation, to achieve complete removal of any film left behind that does not dissipate. If mechanical abrasion methods do not adequately remove temporary curing compounds, then shot blasting, bead blasting, and abrasive blasting down to a level below curing compound penetration must be utilized before beginning application of any penetrant, overlay, or covering, including substrate preparation, to achieve complete curing compound removal.
 2. If permanent curing compounds are used to cure flatwork, then shot blasting, bead blasting, and abrasive blasting down to a level below curing compound penetration

must be utilized before beginning application of any penetrant, overlay, or covering, including substrate preparation, to achieve complete curing compound removal.

- D. Temporary Curing Compounds (Chemically Dissipating Compounds):
1. Description: Resin-based liquid membrane-forming curing compound conforming to ASTM C 309, Type 1-D (clear or translucent with fugitive dye that loses its coloring during proper usage), Class B (resin).
 2. Restrictions: Temporary curing compounds must be completely removed before beginning floor covering installation
 3. Products: "KUREZ DR-100" manufactured by The Euclid Chemical Co., or equal.
- E. Permanent Curing Compounds (Non-Dissipating Compounds):
1. Description: Water-based curing compound conforming to ASTM C 1315, Type 1 (clear or translucent), Class A (non-yellowing) and must be specially formulated and warrantied for proper concrete curing and chemical and adhesive compatibility with all covering adhesives and materials.
 2. Restrictions: Use only where floor coverings are indicated.
 3. Products: "FloorBond 710" manufactured by Floor Seal Technology, Inc., or equal.
- F. Silicate-Based Curing Compounds: Curing compounds that contain silicate salts are prohibited. (these are chemically reactive in concrete, not film-forming)
- G. Combination Curing Compounds: Combination curing compounds are prohibited, including cure & seal; cure & harden; cure, seal, & harden; and cure, seal, harden & dustproofing compounds.
- H. Requisite Properties:
1. Water Retention Rate: Maximum water loss may not exceed 0.40 kilograms per square meter in 72 hours, when tested in conformance with ASTM C 156.
 2. Maximum VOC Content: Not more than 60 grams per liter.

2.3 PREVENTATIVE (DAY-OF-POUR) MVECS

- A. Description: Resin-based compound conforming to ASTM C 1315 and specially formulated for proper concrete curing; reducing moisture vapor emission levels to a specific and measurable rate; reducing shrinkage cracking; and chemical and adhesive compatibility with all floor covering adhesives and materials.
- B. Application: With input from the preventative MVECS manufacturer, day-of-pour preventative MVECS may be considered for certain curing applications in lieu of curing compounds; and possibly in lieu of corrective (remedial) MVECS products specified in Section 09 05 16.
- C. Restrictions: When substrates receiving day-of-pour preventative MVECS subsequently demonstrate during testing MVER and pH exceeding the limits required, recommended, or accepted by the penetrant, overlay, and covering manufacturers' published limits,

preventative MVECS manufacturer must apply to those areas the corrective (remedial) MVECS products specified in Section 09 05 16 at no additional expense to the Contractor or Owner.

D. Products: "VaporSeal 309" manufactured by Floor Seal Technology, Inc., or equal.

E. Requisite Properties:

1. Minimum Water Retention Rate: Maximum water loss of not more than 0.40 kilograms per square meter in 72 hours, when tested in conformance with ASTM C 156.
2. Maximum VOC Material Content: Not more than 100 grams per liter.

2.4 FLOOR HARDENERS

A. Description: Water-based lithium silicate chemical hardening compound that chemically reacts to seal, harden, and densify flatwork surfaces.

B. Products: Provide one of the following, or equal.

1. "Consolideck LS" manufactured by PROSOCO, Inc.
2. "MirrorCrete" manufactured by Floor Seal Technologies.

2.5 ACCESSORIES

A. Screed Stakes: Prohibited; screeding systems must not puncture the below grade VDRs.

B. Wet Concrete RH Meter Accessories:

1. Description: Disposable plastic tubes for measuring humidity in concrete.
2. Manufacturer: Provide accessories manufactured by Vaisala Inc., or equal.
3. Products: Provide all of the following parts for wet concrete installations.
 - a. Plastic Tube Set: Vaisala Part No. 19266HM, or equal.
 - b. Plastic Flange Set: Vaisala Part No. 26529HM, or equal.
 - c. Long Rubber Plug Set: Vaisala Part No. 26530HM, or equal.

C. Saw Blades:

1. Description: Diamond blades for early-entry dry-cut saws.
2. Products: "Soff-Cut" manufactured by Husqvarna Construction Products, or equal.

D. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify formwork, VDRs, and items penetrating flatwork are installed.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from the Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 PREPARATION

- A. Substrate Acceptance:
 - 1. Before starting curing compound application, the manufacturer's representative must examine and certify that flatwork surfaces are properly finished in a manner that does not void specified warranties, and satisfactory and ready to receive curing materials.
 - 2. Request and accommodate the manufacturer's representative's presence as required thereafter to review installation progress, review completed work, and issue specified warranties.

3.3 FINISHING

- A. General:
 - 1. Comply with ACI 302.1R recommendations for screeding, floating, re-straightening, and finishing flatwork, including the proper use of a highway straightedge where applicable.
 - 2. Finish concrete in conformance with the specified quality standard requirements.
 - 3. Protect concrete from rapid moisture loss before and during finishing operations.
 - a. Apply evaporation reducer as needed prior to beginning finishing operations, and periodically during finishing.
 - b. Do not apply water to the slab surface during finishing operations.
 - 4. Finish flatwork to produce uniform surface appearance throughout the area involved and adjacent areas with the same finish.
 - 5. Compacting and Floating:
 - a. Use continuous screeds spaced or located to produce specified substrate tolerances. Bring substrates to proper level and strike-off with a straightedge.
 - b. Remove excess water and laitance.

- c. Compact and consolidate to embed coarse aggregates.
 - d. Float and test surfaces with a 10-foot straightedge and eliminate high and low spots.
 - e. Use methods and tools necessary to produce proper finishes and tolerances.
6. Concrete Placed over Metal Decking:
- a. Use adjustable screeds at all screeded points and adjust to compensate for deck, beam, and girder deflection; and for deflection occurring during concrete placement.
 - b. Do not use steel closures at metal deck edges as screeds.
 - c. Continuously monitor screeds and substrates during concrete placement and finishing and adjust concrete floor thickness as required to obtain level floors conforming to specified tolerances.
- B. Rough Finishes
1. Basic Finishing: Screed and bullfloat flatwork surface.
 2. Scratch Finishing: Beginning with a basic finish, roughen the flatwork surface with stiff brushes, brooms, or rakes to produce a 1/4-inch surface profile in one direction before final set.
 3. Float Finishing:
 - a. Beginning with a basic finish, consolidate flatwork surfaces using power-driven floats; or by hand floating if areas are too small or inaccessible by power-driven floats.
 - b. Re-straighten, cut down high spots, and fill low spots.
 - c. Repeat float passes and re-straightening actions until flatwork is left with a uniform, smooth, granular texture.
- C. Textured Finishes:
1. Broom Finishing:
 - a. Beginning with a float finish, lightly steel trowel to remove irregularities.
 - b. Roughen flatwork by drawing at least a 24-inch-wide fiber bristle broom (for medium broom finish) or steel bristle broom (for heavy broom finish), across the flatwork surface perpendicular to the main direction of traffic.
 - c. Produce even texture from edge to edge; slightly lap adjacent strokes to produce a uniform pattern.
 - d. Obtain the Architect's approval for proposed texture before final application.
 2. Swirl Finishing:
 - a. Beginning with a float finish, continue hand float the flatwork surface using a wood float to produce a continuous swirl patterned surface that is free from porous and rough spots, which are often produced by disturbing particles of coarse aggregate embedded near the surface.
 - b. Obtain the Architect's approval of the proposed texture before final application.
 - c. Finish texture appearance, size, and quality in every area must match approved mockups, as determined by the Architect.
 - d. Due to higher evaporation rates caused by increased porosity of swirl finishes, swirl finishes must be cured in conformance with specified requirements for hot-

weather protection during curing regardless of weather conditions. (this may require increased use of evaporation reducers and curing compounds)

- e. All swirl finished concrete must have specified surface hardener applied after at least 28 days of curing.

D. Smooth Finishes:

1. Light Steel Trowel Finishing (requires at least one pass):
 - a. Beginning with a float finish, consolidate flatwork surface by hand troweling.
 - b. Continue trowel passes and re-straightening actions until flatwork surfaces are free of trowel marks, are uniform in texture and appearance, and fall within specified flatness tolerances.
 - c. Grind smooth all surface defects that might telegraph through applied floor coverings.
 - d. Steel trowel to a hard, dense finish.
2. Normal Steel Trowel Finishing (requires at least 2 passes):
 - a. Beginning with a light trowel finish, continue hand troweling until a ringing sound is produced as the trowel is moved over the surface.
 - b. Continue trowel passes and re-straightening actions until flatwork surfaces are free of trowel marks, are uniform in texture and appearance, and fall within specified surface plane tolerances.
 - c. Grind smooth all surface defects that might telegraph through applied floor coverings.
 - d. Steel trowel to a hard, dense finish.
3. Hard Steel Trowel Finishing (requires at least 3 passes):
 - a. Beginning with a normal trowel finish, continue hand troweling until a ringing sound is produced as the trowel is moved over the surface.
 - b. Continue trowel passes and re-straightening actions until flatwork surfaces are free of trowel marks, are uniform in texture and appearance, and fall within specified surface plane tolerances.
 - c. Grind smooth all surface defects that might telegraph through applied floor coverings.
 - d. Steel trowel to a hard, dense finish.
4. Restrictions:
 - a. Do not hard trowel air entrained concrete.
 - b. Do not hard trowel exterior concrete.
 - c. Do not normal or hard steel trowel interior slabs on grade having an underslab vapor retarder.

3.4 TOLERANCES

- A. General: Finish concrete in conformance with the specified quality tolerance standard requirements. Flatwork must conform to the tolerance classifications indicated below, when measured with 3D laser scanning or Allen Face F-Meter methods.

1. When flatwork tolerance is measured with a straightedge, flatwork must be measured in conformance with ASTM E 1486 between 16 and 72 hours after final troweling using a 10-foot straightedge placed anywhere on the slab in any direction and allowing it to rest on 2 high spots.
 2. When flatwork is not sloped, floor flatness and levelness must be measured in conformance with ASTM E 1155 between 16 and 72 hours after completion of final troweling.
 - a. Specified flatness values apply to both slabs on grade and elevated slabs.
 - b. Specified levelness values apply only to slabs-on-grade and to elevated slabs when the slab remains supported in its as-cast position and there is no camber present.
 - c. Specified levelness values do not apply to inclined or cambered slabs.
 3. Verify actual substrate tolerance, flatness, and levelness requirements with each selected flooring manufacturer.
- B. Conventional Floor Classifications:
1. Float Tolerance: Not used.
 2. Straightedge Tolerance:
 - a. Application: Generally recommended as a substrate for self-leveling overlays, polymer overlays, concrete toppings and repairs, broadloom carpet, medium and thick bed tiles with all edges less than 15 inches, penetrating concrete sealer, floors used for utility spaces, and floors usually left exposed.
 - b. Minimum Tolerance: True plane with not more than 1/4-inch gap under a 10-foot straightedge.
 - c. Minimum Flatness: SOV at least F(f) 25, with MLV at least F(f) 17.
 - d. Minimum Levelness: SOV at least F(l) 15 with MLV at least F(l) 10.
- C. Traditionally Flat Floor Classifications:
1. Moderately Flat Tolerance:
 - a. Application: Generally recommended as a substrate for resilient tile, resilient sheet flooring, tile carpeting, and exposed in service concrete indicated as received a penetrating concrete sealer.
 - b. Minimum Tolerance: True plane with not more than 3/16-inch gap under a 10-foot straightedge.
 - c. Minimum Flatness: SOV at least F(f) 35, with MLV at least F(f) 23.
 - d. Minimum Levelness: SOV at least F(l) 20 with MLV at least F(l) 10.
 2. Flat Tolerance:
 - a. Application: Generally recommended as a substrate for epoxy terrazzo.
 - b. Minimum Tolerance: True plane with not more than 1/8-inch in 10 feet variation.
 - c. Minimum Flatness: SOV at least F(f) 52 with MLV at least F(l) 35.
 - d. Minimum Levelness: SOV at least F(l) 20 with MLV at least F(l) 10.
- D. Exceptionally Flat Tolerance Classifications: Not used.

3.5 CURING

A. General:

1. Protect newly-finished concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 requirements for cold-weather protection, and with ACI 305.1 requirements for hot-weather protection during curing.
 - a. Cold Weather Requirements: When flatwork is subjected to freezing temperatures within 24 hours after placement, or when flatwork is subjected to a period of 3 or more successive days within 7 days after placement where average daily outdoor temperature drops below 40 deg. F, flatwork must be protected from freezing. After placing concrete, maintain air temperature adjacent to flatwork to at least 50 deg. F for at least 7 days; or at least 70 deg. F for at least 3 days, and then at least 40 deg. F for at least 4 more days.
 - b. Hot Weather Requirements: When hot weather conditions may cause an evaporation rate exceeding 0.2 pounds of water per square foot per hour, cure flatwork for at least the first 24 hours by water curing, fogging and sprinkling absorbent coverings, or wet covering curing methods.
2. Comply with ACI 308.1 requirements for concrete curing, utilizing one or more of the methods indicated below that do not mottle, discolor, or stain the concrete.
3. Begin curing concrete promptly after free water has disappeared from flatwork surfaces after finishing.
4. Comply with ACI 308.1 requirements for preventing flatwork from becoming dry during curing.

B. Curing Compounds: Either before or after bleed water has disappeared, at the discretion of the curing compound or MVES manufacturer, keep concrete flatwork surfaces continuously moist during the curing period by one of the following curing methods.

1. Promptly after troweling or finishing, and as soon as it can be accomplished without marring or damaging concrete finish, mist concrete surfaces with water and apply curing compound uniformly in one continuous operation in conformance with its manufacturer instructions.
 - a. When the curing compound manufacturer recommends a coverage range, either use heavier application rate or consult with Architect and manufacturer for appropriate coverage rate based upon intended use.
 - b. Do not exceed manufacturer's recommended coverage rate.
2. Maintain continuity of coating and repair damage during curing period.
 - a. Examine application at regular intervals to verify compound film is intact.
 - b. If damaged, moisten the concrete and apply additional compound.
 - c. Recoat areas subjected to heavy rainfall within three hours after initial application.
3. Special Techniques:
 - a. Uniformly apply 2 coats in a continuous operation with second coat at right angle to first coat. Total coverage for two coats may not exceed 200 square feet per gallon of undiluted compound, unless otherwise recommended by the manufacturer's written instructions.

- b. The compound must form a uniform, continuous film that will not crack or peel. Promptly apply an additional coat of compound to areas where film is defective.
- c. Recoat concrete surfaces subjected to rainfall within 3 hours after the curing compound application.
- d. Maintain compound on the concrete surface throughout the curing period and immediately repair any damage.

3.6 FIELD QUALITY CONTROL

- A. Tests and Inspections:
- B. Manufacturer Services: Installed work is subject to examination by the manufacturer's representative to determine conformance to manufacturer's instructions and other requirements and recommendations.
 - 1. Note all defective items and non-conforming work identified by the manufacturer's representative.
 - 2. Itemize into a punch list all noted items and record the manufacturer's requirements and recommendations for correcting each punch list item.
 - 3. Promptly bring all punch list items into conformance with the manufacturer's requirements and recommendations until accepted in writing by the Architect.
 - 4. Manufacturer's representative withholds issuing warranties until all punch list items are accepted by the Architect.

3.7 CORRECTION AND REPAIR

- A. Non-conforming and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 - 1. written descriptions of non-conforming, damaged, and defective work;
 - 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 - 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from the Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.8 CLEANING

- A. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.9 PROTECTION

- A. Protect flatwork in place from soiling, deterioration, and damage until Substantial Completion, including
 1. heavy construction traffic;
 2. hard-wheeled traffic;
 3. impact and abrasion;
 4. imposed loads (e.g., cranes, concrete trucks);
 5. stains from grease, oil, chemicals, paint, plaster, clay, soil, and other sources;
 6. rubber tire marks;
 7. deicers;
 8. freezing;
 9. fireproofing applications specified in Division 07;
 10. chemicals, fluids, and other items present during testing of fire suppression systems specified in Division 21; and
 11. re-wetting after initial drying, including from rain, wash water, and spillage by other trades and other sources.
- B. Petroleum stains cannot be removed from concrete.
 1. Hydraulic powered equipment must be diapered to avoid concrete staining.
 2. Other vehicle parking on flatwork is prohibited.
- C. Do not store anything on or adjacent to or against installed flatwork unless it is protected from damage. Use of pipe-cutting machines on flatwork is prohibited.
- D. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 03 54 16 – HYDRAULIC CEMENT UNDERLAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hydraulic cement underlayment.
2. Patching material.
3. Surface preparation.
4. Installation materials.
5. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 03 35 10 for concrete flatwork finishing and curing; and for preventative MVER products.
2. Section 09 05 16 for preparation of concrete slabs for finish flooring; and for remedial MVER products.

1.2 REFERENCES

A. Definitions:

1. Manufacturer: Means the cement underlayment manufacturer, unless otherwise indicated.
2. Underlayment: Means a material installed over subfloors to help achieve specified floor flatness values, and to smooth and correct surface irregularities prior to flooring installation

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Verify chemical and adhesive compatibility of selected cement underlayment with installed curing compounds and installed moisture vapor emission control systems, based on current product formulations.
2. Proposed substitution requests and submittals that change the quality (grade) or the generic chemistry of specified cement underlayment are prohibited and returned to the Contractor without review or responsive action, except to record non-conformance with this requirement.
3. Coordinate existing concrete subfloor surface flatness and levelness with ACI 117 requirements, measured in conformance with ASTM E 1155 (3D laser scanning or

Allen Face F-Meter methods), and tolerances required, recommended, or accepted by the cement underlayment manufacturer.

4. Coordinate cement underlayment primers with concrete curing compounds.
 - a. When accepted in writing by the manufacturer's field representative, specified cement underlayment may be applied over concrete slabs treated with either a silicate or acrylic resin curing compound.
 - b. Wax- and petroleum-based emulsions are permanent bond breakers that must be completely removed by mechanical means prior to patching or leveling.
 - c. Dissipating compounds must be completely removed by mechanical means prior to patching or leveling.
 - d. In all cases, acid etching, adhesive removers, solvents, and sweeping compounds are prohibited.
 5. When covering plywood or OSB subfloor sheathing with cement underlayment, additional measures must be taken to avoid concrete topping or concrete mix water leaching into subflooring. (concrete topping and concrete toppings seal the upper surface and moisture must travel through the full depth of subflooring to escape, which may delay ceiling finish installation to avoid trapping moisture within the assembly)
 6. Specified coverage rates and thicknesses are minimum. If manufacturer's recommended coverage rates differ from specified rates, then
 - a. consult the manufacturer's representative and obtain manufacturer-recommended coverage rates printed on manufacturer's letterhead;
 - b. assume the manufacturer-recommended coverage rates govern; and
 - c. promptly submit an RFI to the Architect for resolution; include manufacturer-recommended coverage rates with the RFI.
- B. Sequencing:
1. Install cement underlayment only after concrete is cured to a condition of equilibrium; is sufficiently dry to bond with cement underlayment; and has alkalinity (pH), MVER, and RH within ranges required, recommended, or accepted by the manufacturer. Provide chemically and adhesively compatible surface treatment when required or necessary to reduce pH and MVER to within allowable limits required, recommended, or accepted by the manufacturer.
 2. Install cement underlayment only after penetrating items are installed.
- C. Scheduling:
1. Concrete Substrate Curing: Allow enough time in the construction schedule for concrete to cure for at least 28 days before beginning surface preparation and installation.
 2. Primer Installation: Cement underlayment must be applied within 24 hours of primer installation. Re-prime surfaces exposed for more than 24 hours; follow manufacturer's instructions for re-priming.
 3. Finishing Flooring Installation: Do not install floor coverings until after the minimum time recommended in writing by the manufacturer has passed.

4. Access Restrictions: Close spaces during installation; keep closed to foot traffic after installation for at least 48 hours and to rolling load traffic for at least 72 hours.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
 1. Product Data: Submit manufacturer's product data, specifications, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
 1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished cement underlayment.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.

1.5 QUALITY ASSURANCE

- A. Source Limitations:
 1. Cement underlayment must be obtained through one source from the same manufacturer (to ensure compatibility and a warrantable installation).
 - a. Certain cement underlayments may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
 2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.
- B. Qualifications:
 1. Installer: Company or individuals must have at least 5 years' experience installing cement underlayment for at least 30 previous projects similar to this project in size, material, design, and complexity.
 2. Supervisors: Individuals must have at least 7 years' experience installing cement underlayment for at least 30 previous projects similar to this project in size, material,

design, and complexity, including at least 2 years' supervisory experience directing and leading cement underlayment installers.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 - 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 - 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped and in conformance with manufacturer's instructions and other requirements and recommendations for storage. Furnish adequate dunnage during storage.
 - 1. Prevent stored items from contacting the floor or ground and from deterioration and damage.
 - 2. If items are not stored in an enclosed location, then cover the tops and sides with securely-tied, waterproof, and breathable covers. Unvented polyethylene tarpaulins do not qualify as breathable covers and are prohibited. (due to potential accumulation of moisture beneath tarpaulin during certain environmental conditions)
 - 3. Incline covered items to ensure maximum drainage of accumulated moisture.
 - 4. Do not leave items uncovered where they might be exposed to weather or become wet from rain, mist, relative humidity, condensation, frost, and other sources of moisture; or exposed to other sources of deterioration and damage.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.
 - 1. Avoid damage to packaging and containers, and contamination of contents.
 - 2. Rotate inventory; do not use items the shelf life of which is expired.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective cement underlayment materials with undamaged new cement underlayment materials that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 PROJECT CONDITIONS

- A. Ambient Conditions: Install cement underlayment only when ambient temperature, RH, and other environmental conditions fall within ranges required, recommended, or accepted by the manufacturer.
- B. Existing Conditions:

1. Surface Conditions: Install cement underlayment only when substrate moisture content, vapor emission rate, and surface temperature fall within ranges required, recommended, or accepted by the manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Provide products manufactured by one of the following, or equal.
 1. ARDEX Group.
 2. Custom Building Products.
 3. Floor Seal Technology, Inc.
 4. LATICRETE International, Inc.
 5. Mapei Corp.

2.2 HYDRAULIC CEMENT UNDERLAYMENT

- A. Description: Portland-cement-based, non-structural, engineered cementitious material specifically designed for use as interior flooring cement underlayment. Products with added gypsum are prohibited.
- B. Application: Installed over subfloors to help achieve specified floor flatness values; and to smooth and correct surface irregularities prior to flooring installation.
- C. Self-Leveling Products:
 1. Pourable Grade Cement Underlayment Applications (0 to 1-1/4 inches thick):
"ARDEX V-1200" self-leveling, no-troweling cement underlayment manufactured by ARDEX Americas, or equal. Primer is required.
 2. High-Flow Cement Underlayment Applications (1/16- to 1/2-inch thick):
"ARDEX K 10" reactivatable high-flow, self-leveling cement underlayment manufactured by ARDEX Americas, or equal. Primer is required.
 3. Thicker Cement Underlayment Applications (1/4-inch to 5 inches thick):
"ARDEX K 15" self-leveling polymer-modified cement underlayment manufactured by ARDEX Americas, or equal. Primer is required.
 - a. For application thickness between 1/4-inch and 1-1/2 inches thick, apply neat.
 - b. For application thickness between 1-1/2 and 5 inches thick, apply with aggregate.
 4. Fiber Reinforced Underlayment Applications (1/4-inch to 5 inches thick):
"ARDEX K 22 F" high-flow, fiber-reinforced, self-leveling underlayment manufactured by ARDEX Americas, or equal. Primer is required.
 - a. For application thickness between 1/4-inch and 1-1/4 inches thick, apply neat.
 - b. For application thickness between 1-1/4 and 2 inches thick, apply with aggregate.

D. Trowel Grade Products:

1. Non-Structural Repair, Re-Slope, and Re-Forming Material: "ARDEX CP" Portland cement-based concrete topping for filling and repairing indoor and outdoor concrete flatwork manufactured by ARDEX Americas, or equal.
2. Structural Repair Mortar: "ARDEX ERM" Polymer modified structural repair mortar with integral corrosion inhibitor manufactured by ARDEX Americas, or equal.

2.3 PATCHING MATERIAL

- A. Patching Compound: "ARDEX SD-F Feather Finish" self-drying finishing cement underlayment manufactured by ARDEX Americas, or equal. Primer is typically not required.

2.4 SURFACE PREPARATION

- A. Substrate Testing and Surface Preparation: Perform testing and corrective work and prepare substrates in conformance with the requirements of Section 09 05 16.
- B. Concrete Surface Profiling: Provide ICRI concrete surface profile CSP 3 to CSP 5 (light to medium shotblast between 10 and 40 mils), unless otherwise explicitly required, recommended, or accepted in writing by the covering manufacturer. Conform to the requirements of Section 09 05 16.

2.5 INSTALLATION MATERIALS

- A. Primers:
1. Standard Absorbent Concrete, Gypsum, and Other Porous Substrates (in Specialized Applications): "ARDEX P 51" manufactured by ARDEX Americas, or equal.
 - a. Two applications of primer must be applied over gypsum cement underlayment.
 - b. Two applications of primer may be required over absorbent concrete cement underlayment.
 2. Wood, Cutback Residue, Metal, and Other Non-Porous Substrates: "ARDEX P 82 ULTRA PRIME" manufactured by ARDEX Americas, or equal.
- B. Additive: "ARDEX E 25" resilient emulsion manufactured by ARDEX Americas, or equal, for use over cutback and other adhesive residues on concrete subfloors only; over metal; and as part of mesh-reinforced wood subfloor systems.
- C. Crack Repair Compound: "ARDEX ARDIFIX" 100-percent solids, 2-part polyurethane repair compound manufactured by ARDEX Americas, or equal, for repair of non-moving joints and cracks.
- D. Joint Filler: "ARDEX ARDISEAL Rapid Plus" 2-part, self-leveling, semi-rigid polyurea joint filling compound manufactured by ARDEX Americas, or equal, for repair of all moving joints.

- E. Sand: Washed masonry or plaster sand, 1/8-inch diameter and smaller.
- F. Aggregate: Well-graded washed gravel, 1/8- to 1/4-inch diameter or larger, supplied, required, recommended, or accepted by the manufacturer for proposed thicknesses.
- G. Mix Water: Provide fresh, clean, clear, potable water from a domestic source. Water must conform to ASTM C 1602 and be free of oil, grease, waxy films, curing compounds, release agents, and other deleterious materials, including salts, acids, alkalis, organic materials, detergents, and other matter that might negatively affect cement underlayment quality, durability, or performance.

2.6 ACCESSORIES

- A. Perimeter Isolation Strips: Supplied, required, recommended, or accepted by the manufacturer.
- B. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.7 MIXING

- A. Site Mixing: Batch mix cement underlayment in conformance with manufacturer's instructions and other requirements and recommendations, using manufacturer-recommended techniques and manufacturer-recommended mechanical mixing equipment, which must be clean and free of material from previously mixed batches before charging each subsequent batch.
 - 1. Measure mix materials using only graduated mixing containers and calibrated mixing equipment. Shovels do not qualify as graduated mixing containers or calibrated equipment and are prohibited from measuring or dispensing mix materials.
 - 2. Thoroughly agitate and stir mix materials to a uniform and smooth consistency suitable for proper installation.
 - 3. Do not reduce, alter, or introduce foreign materials into mix materials, , including primers, additives, compounds, and fillers, except in conformance with manufacturer's instructions and other requirements and recommendations.
 - 4. Do not use caked or lumpy materials; or materials that are irregular, too thick or too thin, or that are partially set.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.

B. Verification:

1. Verify in-place construction, project conditions, and the work of other specification sections conform to the manufacturer's instructions and other requirements and recommendations.
2. Verify subfloor surfaces are properly secured, smooth, and flat to minimum floor flatness and levelness tolerances required, recommended, or accepted by the manufacturer for the actual in-service conditions applicable to the project.
3. Verify substrates are dry and free of curing compounds, sealers, hardeners, and deleterious and other substances that might interfere with cement underlayment adhesion or performance.
4. Verify items penetrating cement underlayment are installed.

C. Evaluation and Assessment:

1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 PREPARATION

A. Protection:

1. Adjacent Material Protection: Protect adjacent surfaces against soiling and damage; and from detrimental effects caused by surface profiling operations. Utilize drop cloths, shields, masking, barricades, and other items necessary to protect adjacent surfaces.
2. Opening Protection: Close and protect drains and other openings and penetrations to prevent cement underlayment intrusion or migration.

B. Substrate Preparation: Prepare substrates as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.

1. Remove substrate coatings and other substances that are incompatible with cement underlayment or that may negatively affect the quality of installation, durability, or performance.
2. Perform testing and corrective work and prepare substrates in conformance with the requirements of Section 09 05 16. Provide ICRI concrete surface profile CSP 3 to CSP 5 (light to medium shotblast between 10 and 40 mils), unless otherwise explicitly required, recommended, or accepted in writing by the manufacturer.
3. Repair damaged sub-floor and fill cracks.
4. Vacuum-clean substrate.

3.3 INSTALLATION

A. General Requirements:

1. Install cement underlayment using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
2. Remove and replace cement underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.
3. Installed cement underlayment must be warrantable. Do not install, correct, or replace cement underlayment in a manner that is un-warrantable by the manufacturer; or that results in any warranty or guarantee becoming void.

B. Special Techniques:

1. Thickness: Install screeds as required, recommended, or accepted by the manufacturer.
 - a. Set screeds with a laser level so the minimum cement underlayment thickness is at least 1/8-inch.
 - b. Where cement underlayment covers only a small area, grind, chisel, and undercut floor and deck slabs as necessary to ensure a minimum cement underlayment thickness of at least 1/8-inch.
2. Place cement underlayment in one continuous operation, without cold joints, to produce uniform and level surfaces.
 - a. Screed cement underlayment to levels and tolerances required, recommended, or accepted by the finish flooring manufacturer.
 - b. Feather edges to match adjacent floor elevations.
3. Cure cement underlayment in conformance with the manufacturer's instructions. Protect cement underlayment to prevent contamination during installation and curing.

3.4 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 CLEANING

- A. Cleaning Work: Clean spills, stains, and soiling from adjacent surfaces.
 - 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 - 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 - 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 - 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.

- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

END OF SECTION

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DIVISION 05

METALS

SECTION 05 05 12 – HOT-DIP GALVANIZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hot-dip galvanizing.
2. Surface preparation.
3. Repair materials.
4. Supplementary components and accessories normally furnished or necessary for complete galvanizing, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 05 50 00 for galvanized item design standards.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. AGA: American Galvanizer's Association.
2. DFT: Dry Film Thickness.
3. HDG: Hot-Dip Galvanized.
4. NAAMM: National Association of Architectural Metal Manufacturers.
5. SSPC: The Society for Protective Coatings.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Proposed substitution requests and submittals that change the quality (grade) or the generic chemistry of specified galvanizing or repair materials are prohibited and returned to the Contractor without review or responsive action, except to record non-conformance with this requirement.
2. Specified coverage rates and thicknesses are minimum.

1.4 SUBMITTALS

A. Action Submittals: Submit the following for responsive action (formal review and approval).

1. Galvanizing Schedule: Submit galvanizing schedule indicating material category and thickness, and minimum coating grade mil thickness for each item.

- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
 - 1. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.
 - 2. Certificates: Submit certificates signed by the galvanizer stating coated items are hot-dip galvanized in conformance with the Contract Documents.
 - a. Indicate ASTM standards used for each galvanized coating and certify all coated items meet or exceed that ASTM standard's minimum requirements.
 - b. Provide detailed description of the material processed and quenching, if any.

1.5 QUALITY ASSURANCE

- A. Quality Standards:
 - 1. Galvanizing: Comply with the requirements of NAAMM documents AMP 500, "*Metal Finishes Manual*" and AMP 504, "*Finishes for Carbon Steel and Iron*".
 - 2. Repair: Recondition zinc-coated steel welded joints in conformance with AWS publication WZC (D19.0), "*Welding Zinc-Coated Steel*".
- B. Qualifications:
 - 1. Galvanizer: Company or individuals must have at least 5 years' experience galvanizing items for at least 30 previous projects similar to this project in size, material, design, and complexity.
 - 2. Supervisors: Individuals must have at least 7 years' experience galvanizing items for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading galvanizers.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 - 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 - 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped. Furnish adequate dunnage and bracing during storage.
 - 1. Prevent stored items from contacting the floor or ground, from soiling and staining, and from deterioration and damage.
 - 2. If items are not stored in an enclosed location, then cover the tops and sides with securely-tied, waterproof, and breathable covers. Unvented polyethylene tarpaulins do not qualify as breathable covers and are prohibited. (due to potential accumulation of moisture beneath tarpaulin during certain environmental conditions)
 - 3. Incline covered items to ensure maximum drainage of accumulated moisture.

4. Do not leave items uncovered where they might be exposed to weather or become wet from rain, mist, relative humidity, condensation, frost, and other sources of moisture; or exposed to other sources of deterioration and damage
- C. Handling: Handle items in a manner that that prevents damage.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective galvanized items with undamaged new galvanized items that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 HOT-DIP GALVANIZING

- A. Description: Zinc galvanic coatings applied in the shop or factory.
- B. Application: Applied to iron and steel items
 1. in concrete or masonry installations;
 2. at exterior locations completely or partially exposed to weather, humidity, moisture, precipitation, wetting, or condensation, except where high performance coatings are indicated; and
 3. elsewhere indicated.
- C. Materials:
 1. Zinc: ASTM B 6, HG (High Grade) or better (at least 99.95 percent pure zinc).
 2. Bath Composition: ASTM A 123.
- D. Accessories: Provide accessories and secondary items normally furnished or necessary for complete galvanizing; or supplied, required, recommended, or accepted by the fabricator or galvanizer for actual in-service conditions applicable to the project.

2.2 SURFACE PREPARATION:

- A. Remove oils, organic materials, mill primers, paints, crayon marks, grease- or oil-based marks, and similar materials from metal surfaces prior to starting galvanizing operations. Where permanent identification of a galvanized item is required, provide stamped or seep stencil markings.
- B. Blast-clean and flux (recommended method of processing high strength steels for galvanizing to avoid hydrogen embrittlement); or pre-clean with alkaline cleaner, and then acid pickle and flux.

2.3 FINISHES

- A. Exposed Natural Finish Items: Furnish galvanized items with a bright regular spangle (recognized, faceted, metallic surface appearance) finish.
- B. Painted Finish Items: Furnish galvanized items with a minimized spangle (good surface for paint application when minimal spangle show-through is desired).

2.4 REPAIR MATERIALS

- A. Galvanizing Repair Solder:
 - 1. Description: Lead-free, high zinc content solder formulated specifically for repairs to zinc coatings.
 - 2. Applications: Used for
 - a. shop repair or restoration of small defects in the surfaces of freshly galvanized items directly out of the kettle;
 - b. field repair or restoration of damaged zinc coatings caused by welding, brazing, cutting with an oxy-acetylene torch, and similar activities.
 - c. field repair or restoration of zinc coatings on exposed-in-service HDG surfaces indicated as retaining a natural zinc finish, when accepted in writing by the Architect, and
 - 3. Products: Provide one of the following, or equal.
 - a. "All-State Galvover" manufactured by ESAB.
 - b. "Galvanite" manufactured by Kapp Alloy & Wire, Inc.
 - c. "Zaclon Alloy Repair Rod" manufactured by Zaclon, Inc.
- B. Cold Galvanizing Repair Compound:
 - 1. Description: At least 95-percent pure zinc and epoxy resin-based galvanizing repair material.
 - 2. Applications: Used for the repair or restoration of damaged zinc coatings on exposed-in-service HDG surfaces indicated as retaining a natural zinc finish.
 - 3. Restrictions: May be used to repair damaged zinc coatings on exposed-in-service HDG surfaces only after accepted in writing by the Architect,
 - 4. Products: Provide one of the following, or equal.
 - a. "Devcon Z" manufactured by ITW Devcon.
 - b. "Zinc Clad Cold Galvanizing" manufactured by The Sherwin Williams Co.
 - c. "ZRC Galvilite" manufactured by ZRC Worldwide.
- C. Galvanizing Repair Paint:
 - 1. Description: Zinc-rich organic primer conforming to SSPC-Paint 20 Type II (Organic) zinc-rich primers and AISC requirements for Class B surface slip coefficient rating (minimum mean slip coefficient of at least 0.50).
 - 2. Applications: Used for the repair or restoration of damaged zinc coatings on concealed -in-service HDG surfaces indicated as receiving a painted finish.

3. Product: Provide one of the following, or equal.
 - a. "Carbozinc 859, Color 0300" (green) manufactured by the Carboline Co.
 - b. "Amercoat 68HS" (reddish-gray) manufactured by PPG Industries, Inc.
 - c. "Tneme-Zinc Series 90-97" (reddish-gray) manufactured by the Tnemec Co.
4. Requisite Properties:
 - a. Thickness: Apply to a DFT of at least 3 plus or minus 0.5 mils per coat, when measured in conformance with SSPC-PA 2. Provide at least 2 coats.
 - b. Color: Reddish-gray or other standard color furnished by the primer manufacturer.
5. Performance Requirements:
 - a. Zinc Dust Pigment: ASTM D 520 Type III composition classification (maximum 0.002 percent lead).
 - b. Minimum Dry Film Adhesion: At least 800 pounds per square inch pull, when tested in conformance with ASTM D 4541.
 - c. Minimum Humidity Resistance: No blistering, cracking, rusting, or film delamination after at least 1,000 hours exposure, when tested in conformance with ASTM D 4585.
 - d. Minimum Salt Spray Resistance: No blistering, cracking, rusting, or film delamination nor more than 1/32-inch rust creep at scribe after at least 10,000 hours exposure, when tested in conformance with ASTM B 117.

2.5 SOURCE QUALITY CONTROL

A. Tests and Inspections:

1. Perform thickness testing and inspection of zinc coatings in conformance with the guidelines outlined in AGA publication "*The Inspection of Products Hot-Dip Galvanized after Fabrication*" and ASTM A 123.
2. Determine whether zinc coating thicknesses conform to specified minimum thicknesses by taking measurements using a magnetic, electromagnetic, or eddy-current gauge in conformance with ASTM E 376.
3. Record results on galvanizing schedule.
4. Re-galvanize non-conforming work.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed in the shop before the galvanizer begins work and at all times during galvanizing.
- B. Evaluation and Assessment:
 1. Identify conditions that do not conform to the referenced standard requirements and recommendations.

2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the galvanizer begins work.

3.2 PREPARATION

- A. Protection: Follow procedures outlined in ASTM A 143 both to safeguard against and test for hydrogen embrittlement.
- B. Surface Preparation:
 1. Remove oils, organic materials, mill primers, paints, crayon marks, grease- or oil-based marks, and similar materials from metal surfaces prior to starting galvanizing operations. Where permanent identification of a galvanized item is required, provide stamped or seep stencil markings.
 2. Blast-clean and flux (recommended method of processing high strength steels for galvanizing to avoid hydrogen embrittlement); or pre-clean with alkaline cleaner, and then acid pickle and flux.

3.3 GALVANIZING

- A. General: Galvanize items in conformance with ASTM A 123. Plug vent holes with silicone sealant after galvanizing.
 1. Coating Thickness: Produce a continuous and fully-adhering zinc coating that is reasonably smooth.
 - a. Coating thickness must conform to the minimum thickness requirements indicated in ASTM A 123 Table 2, based on the material category and material thickness indicated in Table 1.
 - b. Galvanized assemblies consisting of varying material category and material thicknesses must receive the minimum coating thickness grade for all members equal to or exceeding the maximum highest material category coating grade.
 - c. Excessive dross, rough surfaces, blisters, lumpiness, runs, edge tears, and spikes are prohibited, and considered defective work.
 2. Coating Appearance: Galvanized items must be smooth and free from uncoated areas, pits, craters, blisters, flux deposits, dross inclusions, and other types of projections and defects that may interfere with the items' intended use.
- B. Special Techniques: Galvanize castings; rolled, pressed and forged items; and bolts, nuts, washers, and similar threaded fasteners, in conformance with ASTM A 153.
 1. Coating Thickness: Zinc coating must have uniform thickness conforming to the minimum thickness requirements indicated in ASTM A 153 Table 1, based on the material category and thickness of material each item belongs.
 2. Coating Appearance: Galvanized items must be smooth and free from uncoated areas, pits, craters, blisters, flux deposits, dross inclusions, and other types of projections and defects that may interfere with the items' intended use.

3.4 QUENCHING

- A. Painted Finish Items:
 - 1. Do not water-quench galvanized items painted after galvanizing. (doing so may leave residue on surfaces that cause paint adhesion problems or require added surface preparation prior to painting)
 - 2. Do not chromate-quench galvanized items painted after galvanizing. (hexavalent chromium is often used as a wet-storage stain inhibitor; chromate interferes with paint adhesion)
 - 3. Do not phosphate-quench galvanized items coated with a zinc-rich paint after galvanizing. (doing so reduces the electrical conductivity of the paint)
- B. Natural Finish Items (zinc finish without added paint or other coatings): If required to prevent wet storage stain, quench freshly-galvanized steel in a passivating solution.

3.5 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 - 1. written descriptions of non-conforming, damaged, and defective work;
 - 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 - 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.6 PROTECTION

- A. Protect galvanized items from wet storage stain, soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything on, adjacent to, or against galvanized items unless they are protected from damage, as accepted in writing by the Architect. Do not use installed galvanized items as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
FIRE CAMP 13 RECONSTRUCTION
PROJECT ID: 00002191

HUITT-ZOLLARS, INC.
PROJECT NO. R311608.14
CONSTRUCTION DOCUMENT 01/04/2023

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SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Structural steel framing
- B. Related requirements:
 - 1. All Pertinent Provisions of Division 01, "General Requirements."
 - 2. Section 055000 "Metal Fabrications" for miscellaneous steel fabrications and other steel items not defined as structural steel.

1.2 REFERENCED STANDARDS

- A. California Building Code (CBC), 2022 Edition.
- B. AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- C. AISC's "Seismic Provisions for Structural Steel Buildings" and "Supplement No. 2."
- D. AISC's "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design as well as Load and Resistance Factor Design Specification for Structural Steel Buildings."
- E. AISC's "Specification for the Design of Steel Hollow Structural Sections."
- F. AISC's "Specification for Allowable Stress Design of Single-Angle Members and Specification for Load and Resistance Factor Design of Single-Angle Members."
- G. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1.3 SUBMITTALS

- A. Product Data: For each type of product specified.
- B. Shop Drawings: Indicate detailing fabrication of structural steel components.
 - 1. Include erection plans, details of cuts, connections, splices, camber, holes and other pertinent data.
 - 2. Indicate welds by standard AWS Symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.

3. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify high-strength bolted slip-critical, direct-tension, or tensioned shear/bearing connections.
 4. Steel detailing shall be phased such that erection drawings are a separate submittal that includes inquiries of all required dimensional clarifications. Detailing of individual pieces ("D" sheets) shall not commence until erection sheets are returned and clarifications are incorporated. Detailing resulting from this process shall be included in the bid.
 5. Indicate on the erection drawings, in addition to the "D" sheets, the type of surface preparation of the individual pieces, such as shop primed, painted, or galvanized.
- C. Welding Procedure Specification (WPS): For each weld type used for the work, in conformance with AWS requirements.
- D. Qualification Data: For qualified fabricator.
- E. Mill Test Reports: Signed by manufacturers certifying that their products, including the following comply with requirements.
1. Structural steel, including chemical and physical properties.
 2. Bolts, nuts, and washers, including mechanical properties and chemical analysis.
 3. Shop primers.
- F. Fabricator Test Reports: Comply with ASTM A1011/A1011M.
- G. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.
- H. Designer's Qualification Statement.
- I. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed structural steel work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Fabricator Qualifications: Engage a firm experienced in fabricating structural steel similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to fabricate structural steel without delaying the Work.
1. Fabricator must participate in the AISC Quality Certification Program and be designated an AISC-Certified Plant as follows:
 - a. Category: STD, Standard for Steel Building Structures.
- C. Comply with applicable provisions of the following specifications and documents.
1. AISC's "Steel Construction Manual", 15th Ed.

2. AISC's "Seismic Provisions for Structural Steel Buildings."
 3. ASTM A6 (ASTM A6M) "Specification for General Requirements for Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use."
 4. Research Council on Structural Connections' (RCSC) "Specification for Structural Joints Using ASTM A325 or A490 Bolts."
- D. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code-Steel."
1. Present evidence that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.
- E. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.
- F. Erector: Company specializing in performing the work of this section with minimum two years of documented experience.
- G. Design connections not detailed on drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in California.
- H. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1, Section 01 3000 - Administrative Requirements.
- 1.5 DELIVERY, STORAGE, AND HANDLING
- A. Deliver structural steel to Project site in such quantities and at such times to ensure continuity of installation.
 - B. Store materials to permit easy access for inspection and identification. Keep steel members off ground by using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration.
 1. Store fasteners in a protected place. Replace bolts and nuts that become dry and rusty before use.
 2. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.
- 1.6 SEQUENCING
- A. Supply anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, templates, instructions, and directions, as required, for installation.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. Structural Steel Shapes (W and WT Shapes): ASTM A992 or A572, Grade 50 (Multi-Cert).
- B. Plates, Angles, and Channels: ASTM A36.UNO.
- C. Standard Steel Pipe Sections: ASTM A53, Grade B
- D. Hollow Structural Sections: ASTM A500, Grade C.
- E. Anchor Rods: ASTM F1554, Grade 36, UNO.
 - 1. Configuration: Straight, UNO.
 - 2. Nuts: ASTM A563 heavy hex carbon steel, UNO.
 - 3. Plate Washers: ASTM A36, UNO.
 - 4. Washers: ASTM F436 hardened carbon steel.
- F. Machine Bolts and Nuts: ASTM A307, Grade A.
- G. Welding Electrodes: Comply with AWS requirements.

2.2 PRIMER

- A. Shop Primer for Ferrous Metal: Organic zinc-rich primer, complying with SSPC-Paint 20 and compatible with topcoat.
 - 1. Primer for steel to receive a high-performance coating system shall be as specified in Division 9, Section 09 9600 - High-Performance Coatings.

2.3 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, complying with ASTM C1107, of consistency suitable for application, and a 30-minute working time.

2.4 FABRICATION

- A. Fabricate and assemble structural steel in shop to greatest extent possible. Fabricate structural steel according to AISC specifications referenced in this Section and in Shop Drawings.
 - 1. Camber structural steel members where indicated.
 - 2. Identify high-strength structural steel according to ASTM A6 and maintain markings until steel has been erected.

3. Mark and match-mark materials for field assembly.
 4. Fabricate for delivery a sequence that will expedite erection and minimize field handling of structural steel.
 5. Complete structural steel assemblies, including welding of units, before starting shop-priming operations.
 6. Comply with fabrication tolerance limits of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for structural steel.
- B. Thermal Cutting: Perform thermal cutting by machine only, unless approved by the Engineer.
1. Plane thermally cut edges to be welded.
- C. Finishing: Accurately mill ends of columns and other members transmitting loads in bearing.
- D. Holes: Provide holes required for securing other work to structural steel framing and for passage of other work through steel framing members, where shown on drawings.
1. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame-cut holes or enlarge holes by burning. Drill holes in bearing plates.
 2. Weld threaded nuts to framing and other specialty items as indicated to receive other work.

2.5 SHOP CONNECTIONS

- A. Where feasible, shop-install and tighten nonhigh-strength bolts, except where high-strength bolts are indicated.
- B. Assemble and weld built-up sections by methods that will maintain true alignment of axes without warp.

2.6 SHOP PRIMING

- A. Shop prime steel surfaces, except the following:
 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
 2. Surfaces to be field welded.
 3. Galvanized surfaces.
 4. Surfaces to receive a high-performance coating system shall be prepared and primed as specified in Division 9, Section 09 9600 - High-Performance Coating System.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust, loose mill scale, and spatter, slag, or flux deposits. Prepare surfaces according to SSPC specifications as follows:
 1. SSPC-SP 3 "Power Tool Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's instructions and at rate recommended by SSPC to provide a dry film thickness of not less than

1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Strip paint corners, crevices, bolts, welds, and sharp edges.
 2. Apply 2 coats of shop paint to inaccessible surfaces after assembly or erection. Change color of second coat to distinguish it from first.
- D. Painting: Apply a 1-coat, non asphaltic primer complying with SSPC's "Painting System Guide No. 7.00" to provide a dry film thickness of not less than 1.5 mils.

2.7 FIELD PRIMING

- A. All existing steel framing remaining installed shall be clean and primed with primer per section 2.02 and section 2.06B, 2.06C and 2.06D.

2.8 GALVANIZING

- A. Hot Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel indicated for galvanized according to ASTM A123.

2.9 SOURCE QUALITY CONTROL

- A. Owner's Representative will engage an independent testing and inspecting agency to perform shop inspections and tests and to prepare reports.
1. Testing agency will conduct and interpret tests and state in each report whether test specimens comply with or deviate from requirements.
 2. Provide testing agency with access to places where structural steel work is being fabricated or produced so required inspection and testing can be accomplished.
- B. Correct deficiencies in or remove and replace structural steel that inspections and test reports indicate do not comply with specified requirements.
- C. Additional testing, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.
- D. In addition to visual inspection, shop-welded connections will be inspected and tested according to AWS D1.1 and the inspection procedures listed below, at Engineer's option.
1. Liquid Penetrant Inspection: ASTM E165.
 2. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 3. Radiographic Inspection: ASTM E94 and ASTM E142; minimum quality level "2-2T."
 4. Ultrasonic Inspection: ASTM E164.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Before erection proceeds, and with the steel erector present, verify elevations of concrete and masonry bearing surfaces and locations of anchorages for compliance with requirements.
- B. Do not proceed with erection until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place, unless otherwise indicated.

3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC specifications referenced in this Section.
- B. Base and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.
 - 1. Set base and bearing plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.
 - 3. Pack grout solidly between bearing surfaces and plates so no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.
 - a. Comply with manufacturer's instructions for proprietary grout materials.
- C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure.
 - 2. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.

- E. Splice members only where indicated.
- F. Thermal Cutting during erection will be subject to Engineer's review and approval.
- G. When thermal cutting in the field is permitted by the Engineer, then all such cut sections shall be finished to a sheared appearance acceptable to the Engineer.
- H. Do not enlarge holes in members by burning or by using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

- A. Install and tighten non high-strength bolts.
- B. Weld Connections: Comply with AWS D1.1 for procedures, appearance and quality of welds, and methods used in correcting welding work.
 - 1. Comply with AISC specifications referenced in this Section for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
 - 2. Assemble and weld up built-up sections by methods that will maintain true alignment of axes without warp.

3.5 FIELD QUALITY CONTROL

- A. Owner's Representative will engage an independent testing and inspecting agency to perform field inspections and tests and to prepare test reports.
 - 1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from requirements.
- B. Correct deficiencies in or remove and replace structural steel that inspections and test reports indicate do not comply with specified requirements.
- C. In addition to visual inspection, field-welded connections will be inspected and tested according to AWS D1.1 and the inspection procedures listed below, at Engineer's option.
 - 1. Liquid Penetrant Inspection: ASTM E165.
 - 2. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - 3. Radiographic Inspection: ASTM E94 and ASTM E142; minimum quality level "2-2T."
 - 4. Full Penetration and Groove Weld Inspection: Testing Laboratory shall inspect complete penetration and groove welds for connections of column to column, column to girder, girder to girder, and similar connections by ultrasonic testing or other approved non-destructive tests.
 - 5. Ultrasonic Testing: Testing Laboratory specially trained and fully qualified technician shall operate ultrasonic testing equipment, examine welds, and maintain a record of

welds examined, defects found, and disposition of each defect. All defective welds shall be repaired and costs for retesting defective welds shall be paid by the Contractor.

3.6 CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting.
 - 1. Apply by brush or spray to provide a minimum dry film thickness of 1.5 mils.
 - 2. For steel to receive a high-performance coating system, field touchup shall be as specified in Division 9, Section 09 96 00 - High-Performance Coating System.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and apply galvanizing repair paint according to ASTM A780.

END OF SECTION

SECTION 05 40 00 – COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Load-bearing cold-formed metal wall framing

B. Related requirements:

1. All Pertinent Provisions of Division 01, "General Requirements."
2. Section 055000 "Metal Fabrications" for miscellaneous steel fabrications and other steel items used with cold-formed metal framing.
3. Section 054400 "Cold-Formed Metal Trusses" for requirements for the BOQ roof trusses.

1.2 REFERENCED STANDARDS

- A. California Building Code (CBC), 2022 Edition.
- B. AISI S100 "North American Specification for the Design of Cold-Formed Steel Structural Members." And "Supplement 2."
- C. AISI S202 "Code of Standard Practice for Cold-Formed Steel Framing."
- D. AISI S240 "North American Standard for Cold-Formed Steel Structuring, Framing."
- E. AISI S400 "North American Standard for Seismic Design of Cold-Formed Steel Structural Systems."

1.3 SUBMITTALS

- A. Product Data: For each type of product specified.
 1. Cold-formed steel framing materials
 2. Post-installed anchors
- B. Delegated Design Submittal: For cold-formed steel framing trusses.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E329 for testing indicated.

- B. Product Tests: Mill Certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic coating thickness.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code – Steel."
 - 2. AWS D1.3/D1.3M, "Structural Welding Code – Sheet Steel."

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide CEMCO; California Expanded Metal Products Co.; Structural Load-Bearing Studs and Tracks or comparable product by one of the following:
 - 1. ClarkDietrich.
 - 2. AllSteel & Gypsum Products, Inc.
 - 3. Formetal Co. Inc.
 - 4. SCAFCO Steel Stud Company.

2.2 COLD-FORMED STEEL FRAMING MATERIALS

- A. Reference structural general notes.

2.3 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from ASTM A1003, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 - 1. Supplementary framing.
 - 2. Bracing, bridging, and solid blocking.
 - 3. Web stiffeners.
 - 4. Anchor, end, and foundation clips.
 - 5. Hole-reinforcing plates.
 - 6. Backer plates.

2.4 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A36, zinc coated by hot-dip process according to ASTM A123.

- B. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC193, ICC-ES AC58, or ICC-ES AC308 as appropriate for the substrate.
- C. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws. Low-profile head beneath sheathing, manufacturer's standard elsewhere.

2.6 SHOP CONNECTIONS

- A. Where feasible, shop-install and tighten nonhigh-strength bolts, except where high-strength bolts are indicated.
- B. Assemble and weld built-up sections by methods that will maintain true alignment of axes without warp.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, conditions, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
 - 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.
- D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
 - 1. Cut framing members by sawing or shearing; do not torch cut.

2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- G. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

3.3 INSTALLATION OF LOAD-BEARING WALL FRAMING

- A. Install continuous top and bottom tracks sized to match studs. Align tracks accurately and securely anchor at corners and ends, and at spacings as shown on structural drawings.
- B. Squarely seat studs against top and bottom tracks, with gap not exceeding 1/8 inch between the end of wall-framing member and the web of track.
 1. Fasten both flanges of studs to top and bottom tracks.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar configurations.
- D. Install headers over wall openings wider than stud spacing. Locate headers above openings. Fabricate headers of compound shapes indicated or required to transfer load to supporting studs, complete with clip-angle connectors, web stiffeners, or gusset plates.
 1. Frame wall openings with not less than a double stud at each jamb of frame. Fasten jamb members together to uniformly distribute loads.
 2. Install tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with clip angles or by welding, and space jack studs same as full-height wall studs.
- E. Install supplementary framing, blocking, and bracing in stud framing indicated to support fixtures, equipment, services, casework, heavy trim, furnishings, and similar work requiring attachment to framing.
 1. If type of supplementary support is not indicated, comply with stud manufacturer's written recommendations and industry standards in each case, considering weight or load resulting from item supported.
- F. Install miscellaneous framing and connections, including supplementary framing, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

SECTION 05 44 00 – COLD-FORMED METAL TRUSSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Cold-formed metal roof trusses

B. Related requirements:

1. All Pertinent Provisions of Division 01, "General Requirements."
2. Section 055000 "Metal Fabrications" for miscellaneous steel fabrications and other steel items used with cold-formed metal framing.
3. Section 054000 "Cold-Formed Metal Framing."

1.2 SUBMITTALS

A. Product Data: For each type of product specified.

1. Cold-formed steel framing materials
2. Power-actuated fasteners
3. Mechanical fasteners.

B. Shop Drawings:

1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel trusses; fabrication; and fastening and anchorage details, including mechanical fasteners.
2. Indicate reinforcing channels, opening framing, supplemental framing, sheathing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

C. Delegated Design Submittal: For cold-formed steel trusses, engage a qualified professional engineer to design the cold-formed steel trusses. Include detailed drawings and engineering calculations.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM E329 for testing indicated.

B. Product Tests: Mill Certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic coating thickness.

C. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code – Steel."
2. AWS D1.3/D1.3M, "Structural Welding Code – Sheet Steel."

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide CEMCO; California Expanded Metal Products Co.; Structural Load-Bearing Studs and Tracks or comparable product by one of the following:
1. ClarkDietrich.
 2. AllSteel & Gypsum Products, Inc.
 3. Formetal Co. Inc.
 4. SCAFCO Steel Stud Company.

2.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: As indicated on structural drawings.
- B. Cold-Formed Steel Truss Standards: Unless more stringent requirements are indicated, trusses comply with the following:
1. Lateral Design: AISI S213.
 2. Roof Trusses: AISI S214.

2.3 TRUSS ACCESSORIES

- A. Fabricate steel-truss accessories from steel sheet, ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for truss members.
- B. Provide accessories of manufacturer's standard thickness and configuration unless otherwise indicated.

2.4 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A36, zinc coated by hot-dip process according to ASTM A123.
- B. Power-Actuated Fasteners: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws. Low-profile head beneath sheathing, manufacturer's standard elsewhere.

2.5 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A780/A780M, MIL-P-21035B, or SSPC-Paint 20.
- B. Shims: Load-bearing, high-density multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as truss members supported by shims

2.6 FABRICATION

- A. Fabricate cold-formed steel trusses and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
 - 1. Fabricate trusses using jigs or templates.
 - 2. Cut truss members by sawing or shearing; do not torch cut.
 - 3. Fasten cold-formed steel truss members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - 4. Fasten other materials to cold-formed steel trusses by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace trusses to withstand handling, delivery, and erection stresses. Lift fabricated trusses by means that prevent damage or permanent distortion.
- C. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable variation of 1/8 inch in 10 feet (1:960) and as follows:
 - 1. Spacing: Space individual truss members no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.
 - 2. Squareness: Fabricate each cold-formed steel truss to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, conditions, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install bridge, and brace cold-formed steel trusses according to AISI S200, AISI S202, AISI S214, and manufacturer's written instructions unless more stringent requirements are indicated.
1. Coordinate with wall framing to align webs of bottom chords and load-bearing studs or continuously reinforce track to transfer loads to structure.
 2. Anchor trusses securely at all bearing points.
 3. Install continuous bridging and permanently brace trusses as indicated on delegated design drawings.
- B. Install cold-formed steel trusses and accessories true to line and location, and with connections securely fastened.
1. Erect trusses with plane of truss webs plumb and parallel to each other. Align and accurately position trusses at required spacings.
 2. Erect trusses without damaging truss members or connections.
 3. Fasten cold-formed steel trusses by welding or mechanical fasteners.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners, install according to Shop Drawings, and comply with requirements for spacing, edge distances, and screw penetration.
- C. Install temporary bracing and supports to secure trusses and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to trusses are secured.
- D. Truss Spacing: As indicated on Drawings.
- E. Do not alter, cut, or remove truss members or connections of trusses.

3.3 ERECTION TOLERANCES

- A. Install cold-formed steel trusses level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:

1. Space individual trusses no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 REPAIR

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel trusses with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.

3.5 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel trusses are without damage or deterioration at time of Substantial Completion.

SECTION 05 50 00 – METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Shop-fabricated non-decorative metal items.
2. Dissimilar metal corrosion protection.
3. Delegated design of metal fabrications.
4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. AWS: American Welding Society.
2. DFT: Dry Film Thickness.
3. HDG: Hot-Dip Galvanized.
4. SSPC: The Society for Protective Coatings.

B. Definitions:

1. Manufacturer: Means the grout or bituminous paint manufacturer, as the context admits, unless otherwise indicated.
2. Fabricator: Means the metal fabricator, unless otherwise indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Delegated Design Requirements:

1. Engineer, fabricate, assemble, and install metal fabrications that conform to the profiles indicated and other Contract Document requirements; meets specified performance criteria; and results in structurally sound and non-corroding assemblies that accommodate, resist, distribute, or transfer in-service loads without incipient or catastrophic failure.
2. Maintain visual design concept indicated, including sizes, profiles, and alignments. Deviation from visual design concept is non-conforming work and prohibited without prior written acceptance by the Architect.

B. Performance Requirements:

1. Design Loads: Indicated on the Drawings.
2. Deflection: Not more than 1/8-inch.

3. Thermal Expansion and Contraction: Accommodate movement resulting from at least 120 deg. F ambient and 180 deg. F material surface temperature differentials (changes).
4. Dissimilar Metal Corrosion Protection: Permanently isolate metal surfaces from direct contact with incompatible materials and other potentially corrosive substrates as specified below.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
 1. Product Data:
 - a. For manufactured items, submit manufacturer's product data, specifications, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 2. Shop Drawings:
 - a. Submit dimensioned plans and elevations drawn to scale and showing metal fabrication layout and types. Show locations, sizes, and extents of all items, accessories, and trim. Label manufactured items by product name.
 - b. Include project-specific dimensioned details drawn to scale showing profiles, shapes, joints, seams, and dimensions, including coves, miters, and corner conditions. Cross-reference details to plans and elevations.
 - c. Indicate method of attaching, fastening, joining, adhering, and anchoring to adjacent construction.
 - d. Show backings, embedments, fasteners, brackets, clips, cleats, straps, mounting devices, and other attachments.
 - e. Label each attachment type; indicate manufacturer's product name for each manufactured item.
 - f. Indicate base material and finish, fastener material and finish, and material and finish of items being fastened or attached.
 - g. Label welds in conformance with the requirements of AWS publication A2.4, "*Standard Symbols for Welding, Brazing, and Nondestructive Examination*".
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
 1. Delegated Design Submittals: Together with shop drawings, submit engineering calculations demonstrating conformance to the Contract Documents and all impacts of delegated design scope of work on other work.
 - a. Calculations must be explicit and legible and must incorporate distinct cross-references to submitted shop drawings in sufficient quantity to render the calculations readily intelligible and reviewable.

- b. At a minimum, calculations must include design loads; analysis of supporting construction, including section-property computations; analysis of fasteners, anchors, attachments, and connectors; and signature and seal of the licensed professional engineer responsible for preparing them.
 - c. Test reports are not an acceptable substitute for calculations and are returned to the Contractor without review or responsive action, except to record non-conformance with this requirement.
2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.

1.5 QUALITY ASSURANCE

A. Quality Standard:

1. Design Standard for Galvanized Items: Items indicated as galvanized must be designed and fabricated in conformance with the requirements of AGA publication, *"The Design of Products to be Hot-Dip Galvanized after Fabrication"*, and ASTM A 385. Limit the use of vent and drain holes and locate where they drain by gravity and are concealed from view in the finish work.
2. Welding Standards: Welding procedures must conform to the requirements of the following American Welding Society publications.
 - a. AWS D1.1, *"Structural Welding Code – Steel"*.
 - b. AWS D1.2, *"Structural Welding Code – Aluminum"*.
 - c. AWS D1.3, *"Structural Welding Code – Sheet Steel"*.
 - d. AWS D1.6, *"Structural Welding Code – Stainless Steel"*.
 - e. AWS D1.8, *"Seismic Supplement"*.
 - f. AWS D9.1, *"Sheet Metal Welding"*.
 - g. AWS D10.10, *"Heating Practices For Pipe And Tube"*.
 - h. AWS D10.11, *"Root Pass Welding For Pipe"*.
 - i. AWS D10.12, *"Pipe Welding – Mild Steel"*.
 - j. AWS D10.18, *"Pipe Welding – Stainless Steel"*.
 - k. AWS D11.2, *"Welding – Cast Iron"*.
 - l. AWS D18.2, *"Stainless Steel Tube Discoloration Guide"*.
 - m. AWS D19.0, *"Welding Zinc Coated Steel"*.

B. Qualifications:

1. Fabricator: Company or individuals must have at least 10 years' experience fabricating metal fabrications installed on at least 100 previous projects similar to this project in size, material, design, and complexity
2. Installer: Company or individuals must have at least 5 years' experience installing metal fabrications for at least 30 previous projects similar to this project in size, material, design, and complexity.
3. Welders: Welding personnel and supervisors must comply with the *"Qualification"* requirements of AWS quality standard publications. Only certified welders current in their certification may perform or supervise any welding work.

4. Supervisors: Individuals must have at least 7 years' experience installing metal fabrications for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading metal fabrication installers.
5. Engineer: Must be a licensed professional structural engineer registered to practice in California having at least 10 years' experience performing the kind of engineering services indicated for at least 20 previous projects similar to this project in size, material, design, and complexity.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped. Furnish adequate dunnage and bracing during storage.
 1. Prevent stored items from contacting the floor or ground, from soiling and staining, and from deterioration and damage.
 2. If items are not stored in an enclosed location, then cover the tops and sides with securely-tied, waterproof, and breathable covers. Unvented polyethylene tarpaulins do not qualify as breathable covers and are prohibited. (due to potential accumulation of moisture beneath tarpaulin during certain environmental conditions)
 3. Incline covered items to ensure maximum drainage of accumulated moisture.
 4. Do not leave items uncovered where they might be exposed to weather or become wet from rain, mist, relative humidity, condensation, frost, and other sources of moisture; or exposed to other sources of deterioration and damage.
- C. Handling: Handle items in a manner that that prevents damage.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective metal fabrications with undamaged new metal fabrications that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 IRON

- A. Ductile Iron Castings: ASTM A 536, Grade 70-50-05 or better.

2.2 STEEL

- A. Steel Plate: ASTM A 36 (mild steel).
- B. Uncoated Steel Coil, Sheet, and Strip: Finished cold-rolled steel coil, sheet, and strip conforming to ASTM A 1008, CS Type B (commercial steel), unexposed (interior items) and exposed, temper rolled (exterior items), regular matte finish (40 to 59 AA), mill phosphatized.
- C. HDG Metallic Coated Steel Coil, Sheet, and Strip: ASTM A 653, CS Type B (commercial steel), with equal coating weight on each surface, coating designation indicated below on both surfaces, minimized spangle, chemically treated, oiled, and mill phosphatized.
 - 1. Natural Finish: At least a G90 minimum coating designation (galvanized), minimized spangle, chemically treated, and oiled.
 - 2. Painted Finish: At least an A60 minimum coating designation (galvannealed), not chemically treated, not oiled, and mill phosphatized.
- D. Hot-Rolled Steel Rods, Bars, and Shapes: ASTM A 36 (mild steel), merchant quality.
- E. Steel Pipe: ASTM A 53, black pipe, Type and Grade as indicated below, size and weight class, schedule number, or outside diameter indicated and wall thickness as required by engineering calculations for type of use indicated.
 - 1. Type: Provide Type S (Seamless) pipe.
 - 2. Grade: Provide Grade A pipe for cold bending; otherwise provide Grade B pipe.
- F. Steel Tubing:
 - 1. Steel Structural Tubing: ASTM A 500, Grade A, black, round or shaped hot-formed tubing as indicated, outside diameter or dimensions as indicated, and calculated wall thickness as required by engineering calculations for type of use indicated. Provide seamless tubing.
 - 2. Mechanical Tubing: ASTM A 513, black, Type 5 M.D. (mandrel drawn or Drawn over a Mandrel).
- G. Steel Castings: ASTM A 27, Grade 65-35, Class 2 (post-weld heat-treatment not required).
- H. Galvanized Carbon Steel Wire: Soft temper zinc-coated wire conforming to ASTM A 641, minimum Class 4 coating weight.

2.3 STAINLESS STEEL

- A. Stainless Steel Bars, Hot-Rolled or Extruded Shapes: ASTM A 276, Condition T (hardened and tempered at a relatively high temperature), Type 304L (for welded applications) or Type 304 (for all other applications), passivated in conformance with ASTM A 967.
- B. Stainless Steel Pipe: ASTM A 312, Grade TP (pipe), Type 304L (for welded applications) or Type 304 (for all other applications), passivated in conformance with ASTM A 967.

- C. Stainless Steel Coil, Sheet, Strip, Plate, and Flat Bar:
 - 1. Exposed Locations: ASTM A 666 (annealed and tempered), Type 304L (for welded applications) or Type 304 (for all other applications), annealed, No. 4 (soft) temper (hardness not more than Rockwell B-65; can be bent flat upon itself in any direction), passivated in conformance with ASTM A 967.
 - a. Uncoated (Bare) or Natural Finish: No. 2B (bright) finish.
 - b. Painted Finish: No. 2D (matte) finish.
 - 2. Concealed Locations: ASTM A 240 (annealed) Type 304L (for welded applications) or Type 304 (for all other applications), No. 2D (matte) finish, annealed, No. 4 (soft) temper (hardness not more than Rockwell B-65; can be bent flat upon itself in any direction), passivated in conformance with ASTM A 967.
- D. Stainless Steel Tubing: ASTM A 554, Grade MT (tubing), Type 304L (for welded applications) or Type 304 (for all other applications), No. 2D (matte) finish, passivated in conformance with ASTM A 967.
- E. Stainless Steel Castings: ASTM A 743, Grade CF8M or CF3M.

2.4 ALUMINUM

- A. General: Unless otherwise indicated, provide aluminum alloy and temper recommended by both the metal producer for the type of use, strength, and welding characteristics; and by the aluminum finisher for color match and compatibility of fabricated items with specified finish.
- B. Cold-Rolled Aluminum Bar and Rod: ASTM B 211.
- C. Extruded Bars, Shapes and Tubes:
 - 1. Standard Structural Profiles: ASTM B 308, Alloy 6061-T6.
 - 2. Extruded Aluminum Bars and Shapes: ASTM B 221.
 - a. Alloy and Temper: 6063-T5 or T6 for primary components; 6063-T5 or T6, 6005-T5, 6105-T5 or 6061-T6 for structural components.
 - b. Minimum Thickness: At least 0.125-inch.
- D. Sheet and Plate: ASTM B 209.
 - 1. Alloy and Temper: 5005-H32 (for anodic finishing), or alloy 3003-H14 (for painted or unfinished sheet).
 - 2. Minimum Thickness: At least 0.060-inch.
- E. Aluminum Pipe:
 - 1. Structural Aluminum Pipe and Round Tube: ASTM B 429.
 - 2. Seamless Aluminum Pipe and Seamless Extruded Tubes: ASTM B 241.
- F. Aluminum Tubing:
 - 1. Seamless Drawn Aluminum Tubes: ASTM B 210.

2. Extruded Aluminum Tubes: ASTM B 221 or ASTM B 483.

G. Aluminum Die and Hand Forgings: ASTM B 247.

H. Aluminum Castings: ASTM B 26.

2.5 ACCESSORIES

A. Flanges and Anchors: Unless otherwise indicated, provide cast or formed metal of the same type, material, and finish as the supported metal fabrications.

B. Grout:

1. Description: Pre-packaged, non-shrink, non-metallic, non-corrosive, non-staining, non-gaseous grout conforming to ASTM C 1107, Grade A (drypack) and Grades B and C (flowable grout) of a consistency suitable for application within a 30-minute working time.
2. Type: Grout specifically recommended by the manufacturer for interior and exterior applications.
3. Minimum 28-day Compressive Strength: At least 7,500 pounds per square inch.

C. Bituminous Paint:

1. Description: Cold-applied asphalt mastic conforming to SSPC publication PS 9.01, "*Cold-Applied Asphalt Mastic Painting System with Extra-Thick Film*" and containing no asbestos fibers; or cold-applied asphalt emulsion conforming to ASTM D 1187.
2. Application: Used for aluminum surfaces in contact with masonry, concrete, or steel.

D. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.6 FABRICATION

A. Shop Fabrication:

1. Fabricate items in largest sections practicable to minimize field jointing.
2. Fabricate exposed work precise, straight, and true to line, size, and shape; plumb, level, and square within allowable tolerances; and with accurate angles and surfaces, and crisp straight edges.
3. Fabricate exposed connections with flush hairline joints, and square and true edges and corners.
4. Form bent metal corners to the smallest radius possible without causing grain separation or otherwise impairing the strength of the material.
5. Bend pipe without collapsing or deforming its walls, to produce a smooth, uniform curved section and to maintain uniform sectional shape.
6. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of

member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

7. Cut, reinforce, drill, punch, thread, and tap metal fabrications as necessary to receive other fabrications, components, accessories, hardware, and similar items, and as required to securely attach to supporting construction
8. Before cleaning, treating, and applying specified finishes, remove blemishes by grinding.
9. Remove sharp or rough areas on exposed traffic surfaces. Ease exposed edges to a nominal 1/32-inch radius.

B. Fabrication Tolerances: Fabricated items must conform to the following; specified tolerances are non-cumulative.

1. Squareness: Not more than 1/8-inch difference in diagonal measurements.
2. Maximum Offset between Components at Joints: 1/16-inch except that at welded joints, offsets are prohibited.
3. Maximum Misalignment of Adjacent Members: 1/16-inch.
4. Maximum Bow: 1/8-inch in 48 inches.
5. Maximum Deviation from Plane: 1/16-inch in 48 inches.

2.7 FINISHES

A. Natural (Uncoated) Steel Finish:

1. Remove visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants from all steel surfaces in conformance with SSPC publication SP1, "*Solvent Cleaning*".
2. After fabrication, remove loose mill scale, rust, paint, and other deleterious material from all steel surfaces in conformance with SSPC publication SP2, "*Hand Tool Cleaning*".

2.8 DISSIMILAR METAL CORROSION PROTECTION

A. Review dissimilar metals for potential galvanic action.

B. Ensure metal surfaces are permanently isolated from direct contact with potentially corrosive substrates by

1. applying the alkali-resistant coating specified above to each metal surface in direct contact with concrete, lime mortar, or other masonry materials, or similar cementitious materials;
2. applying either the bituminous coating specified above or a rubberized-asphalt coating to a total DFT of at least 40 mils to each metal surface in direct contact with incompatible metals, wood, or similar corrosive substrates; or to anodic metal surface when incompatible metals are in direct contact; or
3. providing high impact polystyrene shims to provide cathodic isolation between aluminum plates and steel, and metal plates and concrete

- C. Ensure runoff is directed or diverted so as to prevent water from passing over or across dissimilar metals.
1. Arrange metals along water runoff paths in a series from anodic metals (e.g., aluminum) to cathodic metals (e.g., copper) to prevent runoff from cathodic metals (e.g., copper flashings) from flowing over anodic metals (e.g., aluminum gutters).
 2. Where drainage from cathodic metals (e.g., copper roof panels) might pass over anodic metals (e.g., aluminum gutters), apply a protective coating acceptable to the Architect to the surfaces of the anodic metals.

Metal	Electronegativity	
Lithium	Anodic (Active) End	
Potassium	Less Noble (corrosion occurs this end)	
Sodium		
Zinc		
Aluminum 5052, 3004, 3003, 1100, 6053		
Cadmium		
Iron and Mild Steel		
Chrome Iron		
Stainless Steel (active)		
Tin-lead solder		
Lead		
Tin		
Nickel		
Brass		
Copper		
Bronze		
Stainless Steel (passive)		
Silver		
Titanium		More Noble
Platinum		(no corrosion this end)
Gold	Cathodic (Passive) End	

- D. Ensure small anodic metals items (e.g., aluminum rivets) are not placed in contact with large cathodic metals (e.g., a large piece of steel sheet).
- E. Provide a non-absorbent insulate between dissimilar metal surfaces that contact one another (e.g., polypropylene tape at least 1.7 mils thick with a dielectric strength of 300-400 volts/mil). Before connecting, prime or paint each dissimilar metal contact surface, even if they have protective coatings.
- F. Ensure fasteners are made of the same material being fastened or have a suitable barrier protection coating.
 - 1. Apply corrosion-inhibiting material (e.g., pastes, washers, compounds, etc.) under the heads of screws or bolts inserted into dissimilar metal, even if they already have been treated or have a protective coating.
 - 2. Washers, gaskets, and sleeves must be made of plastic or closed-cell polychloroprene (Neoprene).
- G. Protect aluminum from the following.
 - 1. Dissimilar Materials: Where aluminum surfaces come into contact with dissimilar metals other than active stainless steel, zinc, or zinc coatings, isolate the aluminum from direct contact by painting the dissimilar metal with a prime coat of alkyd-type zinc primer followed by aluminum paint applied to a total DFT of at least 3.0 mils.
 - 2. Cementitious Materials: Where aluminum surfaces come into contact with concrete, plaster, or mortar and other cementitious materials, isolate the aluminum surfaces from direct contact by applying bituminous paint to the aluminum surfaces to a total of at least 25 mils DFT.
 - 3. Wood and Other Absorptive Materials: Where aluminum surfaces come into contact with wood, treated wood, or similar absorptive materials that are subject to repeated wetting, isolate the aluminum surfaces from direct contact by
 - a. applying bituminous paint to the aluminum surfaces to a total of at least 25 mils DFT; or
 - b. applying aluminum paint to the wood, treated wood, or similar absorptive material surfaces to a total DFT of at least 3.0 mils, and then continuously sealing joints with weather sealing joint sealant specified in Section 07 92 00.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify that in-place construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed items.

C. Evaluation and Assessment:

1. Identify project conditions that do not conform to the fabricator's instructions and other requirements and recommendations.
2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

A. General Requirements:

1. Scribe and cope items as necessary for an accurate fit. Perform required cutting, drilling, and fitting for metal fabrication installation.
2. Set metal fabrications true to line, to required levels and lines, plumb, square, and cut and fitted without warp or rack; sloped or level as required; with flush well-fitted joints; and in alignment with adjacent construction.
3. Shim as required with concealed shims.
4. Dry-pack metal fabrications supported on concrete and masonry to provide firm, level bearing surfaces.
5. Provide temporary bracing or anchors for items indicated as built into concrete, masonry, or similar construction.
6. Fit exposed connections accurately to form flush hairline joints

B. Interface with Adjacent Items:

1. Attachment: Provide materials, components, and accessories normally furnished or necessary to securely attach metal fabrications to supporting construction.
2. Field Welding:
 - a. Comply with AWS quality standard publications for manual shielded arc welding procedures, appearance and quality of welds, and methods to correct faulty welds.
 - b. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - c. Before welding, grind to remove zinc coating from one to 4 inches from either side of the intended weld zone and on both sides of the item.
 - d. Obtain fusion without undercut or overlap.
 - e. Promptly remove welding flux.
 - f. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
 - g. Do not weld, cut, or abrade exterior surfaces hot-dip galvanized after fabrication and are for bolted or screwed field connections.
 - h. Field-weld connections indicated as exposed joints but cannot be shop-welded because of shipping size limitations.
 - i. Welds remaining exposed must be ground smooth and flush to match and blend with parent metal surfaces.

- j. Clean field welds, weld spatter, bolted connections, and abraded areas promptly after installation.

- C. Installation Tolerances: Install metal fabrications to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch and from plumb, level, and alignment.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.
- D. Damaged Primer Touchup: Clean and prepare damaged primed surfaces in conformance with manufacturer's published instructions and SSPC surface preparation standard SSPC-SP11 "*Power Tool Cleaning to Bare Metal*".
 1. Sand smooth and re-clean.
 2. Spot-prime bare metal surfaces with specified primer applied to a total spot primer DFT of at least 5 mils.
 3. Overlap undamaged primer areas with spot primer at least 2 inches.
- E. Damaged Galvanizing Touchup: Repair damaged galvanized items or re-galvanize items that cannot be satisfactorily repaired to the Architect's acceptance.
 1. Zinc-Based Solder Repair: Repair damaged galvanizing in conformance with ASTM A 780 Annex A1.
 2. Organic Zinc-Rich Cold Galvanizing Compound Repair:
 - a. Repair damaged galvanizing in conformance with ASTM A 780 Annex A2
 - b. Apply cold galvanizing repair compound to a DFT of 1.5 plus or minus 0.5 mils per coat, when measured in conformance with SSPC publication SSPC-PA 2, "*Determining Compliance to Required DFT*". Provide 2 coats.

3.4 CLEANING

- A. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

END OF SECTION

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DIVISION 06

WOOD, PLASTICS, AND COMPOSITES

SECTION 06 05 73 – WOOD TREATMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Preservative treated wood.
2. Fire-retardant treated wood.
3. Telephone and electrical equipment backing panels.
4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. ACQ: Alkaline Copper Quaternary.
2. APA: Means the Engineered Wood Association.
3. AWWA: American Wood Protection Association.
4. CCA: Chromium Copper Arsenate.
5. FRTW: Fire Retardant Treated Wood.
6. PTW: Preservative Treated.

B. Definitions:

1. Manufacturer: Means the plywood, PTW, FRTW, or accessory manufacturer, as the context admits, unless otherwise indicated.
2. Pressure-Treated Wood: Means either PTW or FRTW.

1.3 SUBMITTALS

A. Action Submittals: Submit the following for responsive action (formal review and approval).

1. Product Data: For manufactured items, submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.

B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).

1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished rough carpentry.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.

1.4 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped. Furnish adequate dunnage and bracing during storage.
 1. Prevent stored items from contacting the floor or ground, from soiling and staining, and from deterioration and damage.
 2. If items are not stored in an enclosed location, then cover the tops and sides with securely-tied, waterproof, and breathable covers. Unvented polyethylene tarpaulins do not qualify as breathable covers and are prohibited. (due to potential accumulation of moisture beneath tarpaulin during certain environmental conditions)
 3. Incline covered items to ensure maximum drainage of accumulated moisture.
 4. Do not leave items uncovered where they might be exposed to weather or become wet from rain, mist, relative humidity, condensation, frost, and other sources of moisture; or exposed to other sources of deterioration and damage, including heat and sudden changes in temperature.
 5. Do not leave items uncovered where they might be exposed to weather or become wet from rain, mist, relative humidity, condensation, frost, and other sources of moisture; or exposed to heat or sudden changes in temperature; or exposed to other sources of deterioration and damage.
- C. Handling: Handle items in a manner that that prevents damage.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective materials with undamaged new materials that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 PRESERVATIVE TREATED WOOD (PTW)

- A. Description: Wood products conforming to the AWPA U1 manufactured with ACQ wood preservative. PTW containing arsenic or CCA are prohibited.
1. Interior wood construction not in contact with the ground must conform to Use Category UC2.
 2. Exterior wood construction not in contact with the ground must conform to Use Category UC3b.
 3. Wood contacting the ground must conform to Use Category UC4a.
- B. Application: Provide PTW at the following locations and where indicated.
1. Concealed rough carpentry items in contact with concrete or masonry.
 2. Miscellaneous wood framing attached directly to the interior of below-grade exterior masonry or concrete walls.
 3. Rough carpentry in contact with roofing, metal flashings, vapor retarders or barriers, air barriers, or waterproofing.
 4. Wood framing members less than 18 inches above the ground in crawl spaces or unexcavated areas.
 5. Wood floor plates installed on concrete slabs-on-grade.
 6. Wood items exposed to weather.
- C. Products: Provide the following manufactured by Sunbelt Forest Products Corp., or equal.
1. Termite Resistant Wood: "Timbersave PT", or equal.
 2. Decay and Termite Resistant Wood: "Preserve", or equal.
 3. Decay, Termite, and Water Resistant Wood: "Preserve Plus", or equal.
- D. Requisite Properties:
1. Minimum Retention: At least 0.25 pounds per cubic foot in conformance with AWPA C2 for lumber and timber and AWPA C9 for plywood.
 2. Maximum Moisture Content: Kiln dry after treatment to a moisture content of not more than 19 percent for lumber, and not more than 15 percent for plywood.

2.2 FIRE-RETARDANT TREATED WOOD (FRTW)

- A. Description: Wood products conforming to AWPA C20 and AWPA C27, manufactured with fire-retardant materials for which the fire-retardant manufacturer publishes physical properties of treated wood after exposure to elevated temperatures, when tested in conformance with ASTM D 5664 and ASTM D 5516.
1. Provide exterior type wood at exterior locations.
 2. Provide Type A High Temperature (HT) wood at interior locations.

- B. Application: Provide FRTW at the following locations and elsewhere where indicated.
 - 1. Framing for raised platforms.
 - 2. Concealed blocking.
 - 3. Roof construction.
 - 4. Plywood backing panels.
 - 5. Other wood items installed within fire-resistive construction.
 - 6. Elsewhere where indicated.
- C. Restrictions: Fire-retardant products must not develop or advance metal fastener corrosion.
- D. Products: Provide the following manufactured by Hoover Treated Wood Products, Inc., or equal
 - 1. Interior Locations: "Pyro-Guard", or equal.
 - 2. Exterior Locations: "Exterior Fire-X", or equal.

2.3 TELEPHONE AND ELECTRICAL EQUIPMENT BACKING PANELS

- A. Manufacturer: Provide lumber and plywood manufactured by one of the following, or equal.
 - 1. Boise Cascade LLC.
 - 2. Georgia-Pacific Wood Products LLC.
 - 3. Louisiana-Pacific Corp.
 - 4. Weyerhaeuser NR Co.
- B. Requisite Properties
 - 1. Minimum Grades: "APA Type A-D" grade sanded plywood. Plywood panels must have a visible APA grade mark.
 - 2. Minimum Thickness: At least 3/4-inch nominal thickness, unless otherwise indicated.
 - 3. Construction: 7-ply veneer core.
 - 4. Panel Edges: Square-edged.
 - 5. Finish: Field-applied intumescent white paint finish. Paint both sides of plywood to prevent warping.

2.4 ACCESSORIES

- A. Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify that in-place construction satisfies all other conditions that might affect the quality of installation or the durability, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify deficient and non-conforming project conditions.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 - 1. Scribe and cope items as necessary for an accurate fit. Perform required cutting, drilling, and fitting for woodwork installation.
 - 2. Set items true to line, to required levels and lines, plumb, square, and cut and fitted without warp or rack; sloped or level as required; with flush well-fitted joints; and in alignment with adjacent construction.
 - 3. Shim as required with concealed shims.
 - 4. Fit exposed connections accurately to form flush hairline joints
- B. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach rough carpentry to supporting construction.
- C. Installation Tolerances: Install items within the following tolerance variations.
 - 1. Maximum Out of Plumb: Not more than 1/4-inch in 10 feet.
 - 2. Maximum Out of Plane: Not more than 1/8-inch.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.

- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.

- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

END OF SECTION

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SECTION 06 16 43 – GMF GYPSUM SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. GMF gypsum sheathing.
 - 2. Installation materials.
 - 3. Joint treatment materials.
 - 4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.
- B. Related Requirements:
 - 1. Section 09 28 15 for GMF gypsum tile backing boards.

1.2 REFERENCES

- A. Abbreviations and Acronyms:
 - 1. GMF: Glass Mat Faced.
- B. Definitions:
 - 1. Manufacturer: Means the sheathing manufacturer, unless otherwise indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Scheduling: Schedule installation to keep sheathing exposure to UV within the manufacturer's recommended limits.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
 - 1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 - 2. Shop Drawings: Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project.

- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
 - 1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished sheathing.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 - 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.

1.5 QUALITY ASSURANCE

- A. Source Limitations:
 - 1. Sheathing must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
 - 2. Sheathing must be manufactured in North America by a domestic company from gypsum mined in North America; synthetic gypsum recovered from coal-fired plants operating in North America (FGD gypsum); or a combination of both.
 - a. Sheathing manufactured outside of North America by a domestic company are prohibited.
 - b. Sheathing manufactured outside of North America by a foreign company and relabeled or rebranded by a domestic company are prohibited.
 - 3. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.
- B. Qualifications:
 - 1. Installer: Company or individuals must have at least 5 years' experience installing sheathing for at least 30 previous projects similar to this project in size, material, design, and complexity.
 - 2. Supervisors: Individuals must have at least 7 years' experience installing sheathing for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading sheathing installers.

1.6 HANDLING

- A. General: Comply with GA publication GA 801 "*Handling Gypsum Board*" and applicable requirements of ASTM C 1264 for the inspection, rejection, certification, packaging, marking, shipping, handling, and storage of gypsum sheathing products.
- B. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 - 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 - 2. Unload and store only inspected and accepted items.
- C. Storage: Store unloaded items as shipped. Furnish adequate dunnage and bracing during storage.
 - 1. Prevent stored items from contacting the floor or ground, from soiling and staining, and from deterioration and damage.
 - 2. Do not leave items uncovered where they might be exposed to weather or become wet from rain, mist, relative humidity, condensation, frost, and other sources of moisture; or exposed to heat, sudden changes in temperature, and UV exposure beyond the manufacturer's limits; or exposed to other sources of deterioration and damage.
 - 3. If items are not stored in an enclosed location, then cover the tops and sides of stored items with securely-tied, waterproof, breathable covers. Unvented polyethylene tarpaulins do not qualify as breathable covers and are prohibited (due to potential accumulation of moisture beneath the tarpaulin during certain environmental conditions).
 - 4. Incline covered items to ensure maximum drainage of accumulated moisture.
- D. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.
- E. Damaged Item Replacement: Promptly remove and replace items that are deteriorated, damaged, or defective with undamaged new items that do not exhibit deterioration, damage, or defects.
- F. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Provide products manufactured by one of the following, or equal.
 - 1. CertainTeed Corp.
 - 2. Georgia Pacific Gypsum LLC.
 - 3. National Gypsum Co.

4. USG Corp.

2.2 GMF GYPSUM SHEATHING

- A. Description: Gypsum-based GMF commercial sheathing conforming to ASTM C 1177
- B. Application: Installed to the outside face of above-grade exterior wall framing members to serve as a substrate for exterior wall finishes.
- C. Restrictions: May not be used
 1. below grade;
 2. within roofing assemblies, including gypsum panels installed vertically within roofing assemblies on the roof side of parapet wall framing members as a substrate for the roofing membrane;
 3. as a backerboard for tile;
 4. as a structural product (may not be used in lieu of plywood where required);
 5. as a base for nailing or mechanical fastening; and
 6. for immersion in water or sustained exposure to water and moisture, including cascading roof or floor water, which must be directed away from the sheathing until appropriate drainage is installed.
- D. Products: Provide one of the following, or equal.
 1. "GlasRoc Sheathing" manufactured by CertainTeed Corp. (ICC-ES Report No. ESR-2460)
 2. "DensGlass Sheathing" manufactured by Georgia Pacific Gypsum LLC. (ICC-ES Report No. ESR-3087)
 3. "Gold Bond e2XP Extended Exposure Sheathing" manufactured by National Gypsum Co. (ICC-ES Report No. ESR-2743)
 4. "SECUROCK Glass-Mat Sheathing Panels" manufactured by USG Corp. (ICC-ES Report No. ESR-3044)
- E. Requisite Properties:
 1. Minimum Size: Provide at least 4-foot by 8-foot sheets.
 2. Minimum Thickness: 1/2-inch regular core panels and 5/8-inch Type X panels.
 3. Edges: Tapered long edges and square ends.
 4. Facers: Heat-cured, acrylic-coated, fiberglass mat wrapped around panel face, back side, and long edges. Water repellent paper facers and backings are prohibited.
 5. UV Exposure Limit: Cover within 270 calendar days.

2.3 INSTALLATION MATERIALS

- A. Fasteners: Provide 0.164-inch shank diameter (#8-32 UNC) by at least 1-1/4-inch-long Philips drive socket, bugle or wafer head, self-drilling stainless steel, bi-metal, duplex anti-corrosive steel, 3-coat anti-corrosive steel, or ceramic-coated anti-corrosive steel

screw fasteners, unless another fastener type is explicitly indicated; or is otherwise supplied, required, recommended, or accepted by the manufacturer.

2.4 JOINT TREATMENT MATERIALS

- A. Sheathing Tape: Polypropylene panel joint tape is prohibited. (provides for short-term joint protection only)
- B. Joint Sealant:
 - 1. Glass Mesh Tape Reinforcing:
 - a. Description: At least 2-inch wide, alkali-resistant, polymer-coated, 10x10 glass-fiber mesh tape. Polypropylene sheathing tape is prohibited.
 - b. Application: Used in combination with joint sealant as a panel joint and penetration treatment for long-term joint protection.
 - c. Product: Supplied, required, recommended, or accepted by the manufacturer.
 - 2. Sealant: Provide fluid-applied low modulus joint sealant specified in Section 07 92 00, unless another type of sealant; or supplied, required, recommended, or accepted by the manufacturer to seal sheathing joints and fastener penetrations.
- C. Seam Seal Tape (Alternate):
 - 1. Description: 40-mil thick, self-adhering, cold-applied, rubberized asphalt/HDPE flexible flashing tape.
 - a. Acrylic-coated polypropylene sheathing tape is prohibited.
 - b. Glass mesh tape applied without sealant is prohibited.
 - 2. Application: Used as an alternate panel joint and penetration treatment for long-term joint protection.
 - 3. Products: Provide the following manufactured by GCP Applied Technologies, or equal, unless another type of seam seal tape is explicitly indicated; or is otherwise supplied, required, recommended, or accepted by the manufacturer.
 - a. Primer: "Perm-A-Barrier Primer Plus", or equal, water-based primer required for cementitious and exterior gypsum sheathing substrates.
 - b. Flashing Tape: "Perm-A-Barrier Wall Flashing", or equal, self-adhesive, rubberized asphalt/polyethylene flashing tape.
 - c. Maximum UV Exposure Limit: Cover within 60 days.

2.5 ACCESSORIES

- A. Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 - 1. Install sheathing using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 - 2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
 - 3. Installed sheathing must be warrantable. Do not install, correct, or replace sheathing in a manner that results in any warranty or guarantee becoming void.
- B. Special Techniques:
 - 1. Furnish units in longest available lengths to minimize end joints.
 - 2. Pre-cut panels and make accurate cutouts for penetrations.
 - 3. Position gypsum sheathing next to framing with coated side away from studs.
 - a. Fit ends closely.
 - b. Cut panel to required size and make cutouts.
 - c. Leave 1/8-inch gap between penetrating items and panel edges.
 - 4. Orient panels with long edge perpendicular to framing and short edges vertically oriented and centered over studs.
 - a. Fit sheathing snugly around openings.
 - b. Install panels with at least a 3/8-inch gap where non-load-bearing construction abuts structural elements.

- c. Install panels with at least a 1/4-inch gap where they abut masonry or similar materials that may retain moisture.
 - d. Do not bridge building expansion or seismic joints. Cut and space edges of panels to match framing spacing.
 5. Accurately fit exposed connections to form flush hairline joints.
 6. Securely fasten sheathing panels to framing.
 - a. Stagger vertical joints at least 16 inches on center, but not less than one framing space between adjacent rows.
 - b. Locate fasteners at least 3/8-inch from perimeter edges, and space fasteners a maximum of 8 inches on center, both along the panel perimeter and over the panel face.
 - c. Drive fasteners to bear tightly against sheathing faces. Do not break or rupture facing, fracture underlying core or countersink fasteners.
 - d. Do not use staples or adhesives to fasten sheathing to framing.
 7. When sheathing panels are installed in sloped wall applications, the sloped portions of the wall must be temporarily protected with a weather-resistive barrier specified in Section 07 25 13 until cladding systems are installed.
 8. Exposed wall ends, including tops of walls (parapets) must be covered to prevent water from infiltrating the wall assembly.
- C. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach sheathing to supporting construction.
- D. Installation Tolerances: Install sheathing to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch from plumb, level, and alignment.

3.3 PANEL AND PENETRATION JOINT TREATMENT

- A. Panel Joint and Penetration Treatment for Long-Term Wind and Water Protection (Partially-Controlled Enclosure):
 1. Promptly after sheathing is installed, apply glass mesh joint tape to panel joints and penetrating items promptly after sheathing is installed.
 2. Center tape over sheathing panel joints and on perimeter openings surrounding penetrating items.
 3. Provide an overlap at intersections at least equal to the tape width.
 4. Apply at least a 3/8-inch continuous bead of sealant over the glass mesh joint tape, centered over sheathing panel joints; and to fasteners and perimeter of openings surrounding penetrating items.
 5. With a trowel, compress and embed the sealant into the entire surface of the tape creating a continuous, flat, and level surface.
 6. Fastener Treatment: Apply sealant or liquid flashing to each exposed fastener; trowel level and smooth.

- B. Alternate Panel Joint and Penetration Treatment: As an alternate to sealant and glass mesh tape, specified seam seal tape may be provided when applied to properly prepared and primed sheathing surfaces in conformance with the seam seal tape manufacturer's published installation instructions.

3.4 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 CLEANING

- A. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.6 PROTECTION

- A. Protect installed sheathing in place from prolonged exposure to UV manufacturer's recommended limits, and other sources of deterioration and damage until covering. If exposed to UV for more than the recommended limit, then sheathing must be removed and replaced in conformance with the manufacturer's instructions.
- B. Do not store anything adjacent to or against installed sheathing unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed sheathing as work surfaces.
- C. Remove protection when it's no longer needed and before covering.

END OF SECTION

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SECTION 06 41 19 – PLASTIC LAMINATE-CLAD WOOD CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Shop-fabricated wood cabinets and casegoods.
2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 12 36 64 for quartz agglomerate countertops.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. 2DL: 2D Laminate.
2. 3DL: 3D Laminate.
3. RTF: Rigid Thermoformable Foils.
4. HPL: High-Pressure Laminate.
5. HPDL: High-Pressure Decorative Laminate.
6. TFL: Thermally-Fused Laminate.
7. CPA: Composite Panel Association.
8. MDF: Medium Density Fiberboard.
9. NEMA: National Electrical Manufacturers Association.
10. WI: Woodwork Institute.

B. Definitions:

1. Manufacturer: Means plastic laminate, finish hardware, or accessory manufacturer, as the context admits, unless otherwise indicated.
2. Fabricator: Means the casework fabricator, unless otherwise indicated.
3. Self-Closing Hinge: Means a type of hinge that has a spring built into it so when a cabinet door starts to close, at some point the spring takes over and pulls the door closed with a tap.
4. Soft Closing Hinge: Means a type of hinge that has hydraulics built into it so when a cabinet door starts to close, at some point the hydraulics take over and ease the door closed silently; the cabinet door appears to glide closed.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate casework finish hardware with adjacent door hardware finishes.
2. Coordinate casework design with countertops. Provide reinforcement as required to support countertops and backing. Countertops must not deflect to the point of cracking when subjected to in-service loads.

B. Shelving Performance Requirements:

1. Design Load: Shelving must support at least 50 pounds per square foot uniformly distributed load; not more than 200 pounds total load per shelf.
2. Deflection: Limit deflection under maximum design load to $L/144$, except that all shelving in the same room, or space must have the same thickness where not concealed by doors. Minimum shelving thickness must be at least 3/4-inch.
3. Permanent Deformation: No permanent deformation at maximum design load after 48 hours continuous loading.

C. Sequencing:

1. Schedule casework deliveries to the project site only after the building is enclosed with a permanent enclosure; "wet work" within storage areas (including concrete, cast underlayment, mortaring, grouting, plastering, and gypsum board finishing) is complete and cured or dried to a condition of equilibrium; storage areas are broom- and vacuum-clean; and the HVAC system is activated, operating, and maintaining ambient conditions at occupancy levels.
2. Install casework only after all other finishing operations are complete, especially overhead finishes.
3. After casework installation, maintain ambient conditions within design range until Final Completion.

D. Scheduling:

1. Acclimation: Allow sufficient time in the construction schedule to acclimate casework to specified ambient conditions for between 72 hours and 6 weeks before installation begins, or until moisture content is not more than 8 percent, when measured with a moisture meter at specified ambient conditions.

1.4 SUBMITTALS

A. Action Submittals: Submit the following for responsive action (formal review and approval).

1. Product Data: For manufactured items, submit manufacturer's product data, specifications, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
2. Shop Drawings:

- a. Submit dimensioned plans and elevations drawn to scale and showing casework layout and types. Show locations, sizes, and extents of all casework, accessories, and trim. Label manufactured items by product name.
 - b. Include project-specific dimensioned details drawn to scale showing profiles, shapes, joints, seams, and dimensions, including coves, miters, and corner conditions specific to the project. Cross-reference details to plans and elevations.
 - c. Indicate method of attaching, fastening, joining, adhering, and anchoring to adjacent construction.
3. Samples: Submit at least one 8-inch square representative fabrication sample for each casework type, color, finish, and variety, including core panels, facings, and edgings.
- B. Informational Submittals: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Operable parts for accessible casework must conform to the requirements of CBC Section 11B-309.
- B. Quality Standards:
1. Woodworking Standard: Provide casework conforming to Architectural Woodwork Institute/Architectural Woodwork Manufacturer's Association of Canada/Woodwork Institute publication "*Architectural Woodwork Standards*" requirements for each specified Grade.
- C. Qualifications:
1. Woodworkers and Finishers: Company or individuals must have at least 10 years' experience fabricating casework installed on at least 100 previous projects similar to this project in size, material, design, and complexity.
 2. Installer: Company or individuals must have at least 5 years' experience installing casework for at least 30 previous projects similar to this project in size, material, design, and complexity.
 3. Supervisors: Individuals must have at least 7 years' experience installing casework for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading casework installers.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Unload and store only inspected and accepted items.

- B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
 - 1. Furnish adequate dunnage and bracing during storage.
 - 2. Prevent stored items from contacting the floor, from soiling and staining, and from deterioration and damage.
 - 3. Do not leave items uncovered where they might become wet; or exposed to heat or sudden changes in temperature or relative humidity; or other sources of deterioration and damage, including dust and other airborne contaminants.
- C. Handling: Handle items in a manner that that prevents damage.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective casework with undamaged casework that does not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL WOOD CASEWORK

- A. Cabinets and Caseworks: Faced panel casework conforming to the referenced woodworking quality standard, Section 10 requirements for Custom Grade, Construction Type A (frameless) single-length cabinet sections with Interface Style 1 (flush overlay) cabinet doors and drawers.

2.2 SOFTWOOD LUMBER

- A. Description: FSC-Certified dressed lumber, surface four sides (S4S) smooth without knife marks, unless otherwise indicated.
- B. Requisite Properties:
 - 1. Species: Douglas fir.
 - 2. Appearance Grade: Grade B & Better.

2.3 FACED PANEL CONSTRUCTION

- A. Plastic Laminate Facing and Edgebanding:
 - 1. Description: High-pressure decorative laminate (HPDL) conforming to NEMA LD-3.
 - a. Exposed Surfaces: General purpose type HPDL Grade HGS. Toe bases are exposed surfaces, unless indicated as receiving an applied base. (e.g., a resilient base)
 - b. Semi-Exposed Surfaces: Cabinet liner type HPDL, Grade CLS.
 - c. Concealed Surfaces: Backer type HPDL, Grade BKV.

2. Standard Laminate Manufacturers: Provide products manufactured by one of the following, or equal.
 - a. Lamin-Art, Inc.
 - b. Formica Corp.
 - c. Panolam Industries International, Inc.
 - d. Wilsonart LLC.
3. Requisite Properties:
 - a. Color: Indicated on the Drawings.
 - b. Pattern: Indicated on the Drawings.
 - c. Finish: Indicated on the Drawings.

B. Other Substrate Panels:

1. Description: Flame retardant composite fiber panels conforming to ANSI A208.2 and made from 100-percent post-industrial recycled wood fiber and having no added urea-formaldehyde resin.
2. Restrictions:
 - a. Plywood is prohibited for doors and drawers.
 - b. When accepted in writing by the Architect, plywood may be used for casework boxes. (accepted by WI, though not recommended)
3. Products: "Meditate FR" manufactured by Roseburg Forest Products Co., or equal.
4. Requisite Properties:
 - a. Minimum Density: At least 50 pounds per cubic foot.
 - b. Nominal Thickness: At least 1/2-inch, unless otherwise indicated.
 - c. Minimum Grade: Grade 150.

2.4 FINISH HARDWARE

A. General:

1. Provide all hardware indicated, specified, and necessary for a complete installation.
2. Hardware finish must match the door hardware specified in Section 08 71 00, unless otherwise noted.

B. Manufacturers: Provide products manufactured by one of the following, or equal.

1. Accuride.
2. Blum, Inc.
3. Doug Mockett & Co., Inc.
4. Häfele America Co.
5. Sugastune Corp.

C. Pulls:

1. Description: Back-mounted pulls conforming to BHMA A156.9 Hardware Type No. A09021.
2. Products: "DP128 Series" pulls manufactured by Doug Mockett & Co., Inc., or equal.

3. Requisite Properties:
 - a. Size: Indicated on the Drawings.
 - b. Finish: Indicated on the Drawings.

- D. Hinges:
 1. Description: Frameless concealed hinges (European cup style) conforming to BHMA A156.9, B01601 with integrated soft-close mechanism in the hinge cup. Spring-type self-closing hinges are prohibited.
 2. Product: "Salice Silentia Series" manufactured by Häfele America Co., or equal.
 3. Requisite Properties:
 - a. Provide hinges with between 95 and 100 degrees of opening for cabinets having retractable doors; and for cabinets next to walls or similar obstructions.
 - b. Provide hinges with between 100 and 120 degrees of opening for cabinets requiring additional cabinet access.
 - c. Provide hinges with between 165 and 175 degrees of opening for cabinets requiring the most cabinet access; and for installations where there are drawer pullouts in the cabinets.
 - d. Provide at least 3 hinges for doors at least 24 inches wide or at least 36 inches high.
 - e. Provide either screw- or rapido-mounted hinges.

- E. Full Extension Drawer Slides:
 1. Description: Heavy Duty full extension slides conforming to BHMA A156.9 Hardware Type No. B05091, with decelerated closing
 2. Products: Provide the following supplied by Häfele America Co., or equal.
 - a. Light Duty Side Mount Slides: "Accuride 2632" slides, or equal.
 - b. Medium Duty Side Mount Slides: "Accuride 3832EC" slides, or equal.
 - c. Heavy Duty Side Mount Slides: "Accuride 3657" slides, or equal.
 - d. Medium Duty Bottom Mount Slides: "Accuride 3132EC Eclipse Easy-Close" slides, or equal.
 - e. Heavy Duty S Bottom Mount Slides: "Accuride 9307" slides, or equal.
 3. Grades:
 - a. Light Duty Slides: Provide BHMA-certified Grade 1, rated to at least 50 pounds per pair, for pencil drawers; and rated to at least 75 pounds per pair for general purpose drawers.
 - b. Medium Duty Slides: Provide BHMA-certified Grade 1HD-100, rated to at least 100-pounds per pair for file drawers up to 24 inches wide.
 - c. Heavy Duty Slides: BHMA-certified Grade 1HD-200, rated to at least 200 pounds per pair for lateral file drawers greater than 24 inches wide.
 4. Mounting Style:
 - a. Provide side-mount slides for cabinet trays and drawers.
 - b. Provide bottom-mount slides for cabinet pullouts and heavy duty storage platforms.
 5. Finish: Indicated on the Drawings or selected by the Architect.

6. Accessories: Provide stops to prevent accidental removal.

F. Shelf Brackets:

1. Description: Spoon-shaped 1/4-inch nickel-plated steel shelf supports.
2. Product: "Item No. 282.04.739" manufactured by Häfele America Co., or equal.

G. Locks:

1. Description: Cylinder locks that separate the lock core from the cylinder housing, allowing any combination of locking systems.
2. Product: "Cylinder Module System" manufactured by Häfele America Co., or equal.
3. Requisite Properties:
 - a. All cabinet doors and drawers must be lockable.
 - b. Certain areas may be keyed separate. Everywhere else must be keyed the same.
 - c. Provide master keying.

H. Grommets:

1. Standard Grommet Liner and Cap: "MM5A" solid brass grommet liner (fits a 2-7/8-inch hole) and "MM5" solid brass grommet cap (fits a 2-3/4-inch hole).
2. No Gap Small Grommets: "BRV1 Brava Grommet – Small", or equal (fits a 2-3/8-inch hole size).
3. No Gap Large Grommets: "BRV2 Brava Grommet – Large", or equal (fits a 3-5/32-inch hole size).
4. Trash Grommet: "TM-1 Steel" stainless steel trash grommet, or equal (fits a 6-inch hole size).
5. Finish: Satin Chrome.

2.5 ACCESSORIES

A. Base Cabinet Levelers:

1. Description: 2-part adjuster and separate panel with steel spring clip screw-mounted to the toe kick panel.
2. Products:
 - a. Adjuster: "Item No. 637.19.228" manufactured by Häfele America Co., or equal. (4-3/4- to 5-1/2-inch toe kick height)
 - b. Panel Clip: "Item No. 637.19.906" manufactured by Häfele America Co., or equal.

B. Fixed Shelf Brackets:

1. Description: Steel shelf supports.
2. Product: "Hebgo Bracket" manufactured by Häfele America Co., or equal.
3. Requisite Properties:
 - a. Minimum Sizes: Indicated on the Drawings.
 - b. Minimum Load Capacity: At least 300 pounds per pair.
 - c. Finished: Factory primed for a field-applied finish.

C. Counter Supports:

1. Description: Manufactured counter support brackets.
2. Product: "Rakks EH Series - Counter Support Brackets" manufactured by Rangine Corp., or equal.
3. Requisite Properties
 - a. Models: Indicated on the Drawings.
 - b. Mounting Configuration: Indicated on the Drawings.
 - c. Minimum Sizes: Indicated on the Drawings.
 - d. Surface Mount Configuration: At least 450 pounds.
 - e. Flush Mount Configuration: At least 300 pounds.
 - f. Standard Finish: Shop primed for a field-applied finish.
 - g. Custom Finish: Custom powder coat finish matching the Architect's design reference (target) sample.

D. PVC Edgebanding:

1. Manufacturer: Provide products manufactured by Canplast, or equal.
2. Product: Indicated on the Drawings, or equal.

E. Wood Glue:

1. Description: Yellow aliphatic resin polyvinyl acetate (PVA) glue.
2. Manufacturers: Provide products manufactured by one of the following, or equal.
 - a. Elmer's Products Inc.
 - b. Franklin International.
 - c. Gorilla Glue, Inc.
3. Products: Provide the following manufactured by Franklin International, or equal.
 - a. Interior Grade Glue: "Titebond Original", or equal.
 - b. Exterior Grade Glue: "Titebond III Ultimate", or equal.
 - c. Moulding and Trim Glue: "Titebond Quick & Thick Mutisurface Glue", or equal.

F. Construction Adhesive:

1. Description: General purpose, indoor or outdoor, drillable, moisture resistant, sandable, heavy duty construction adhesive.
2. Product: "Titebond PROvantage" manufactured by Franklin International, or equal.

G. Finishing Nails:

1. Description: 15-gage finish nails.
2. Manufacturers: Provide products manufactured by one of the following, or equal.
 - a. DEWALT.
 - b. PORTER-CABLE.
 - c. SENCO.
3. Requisite Properties:
 - a. Point Style: Chisel or diamond point.
 - b. Head Style: Brad.

- c. Interior Application Finish: Electro-galvanized.
 - d. Exterior Application Finish: Stainless steel.
 - e. Coating: Sencote.
- H. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the fabricator for actual in-service conditions applicable to the project.
- I. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.6 FABRICATION

- A. Fabricate items to the dimensions, profiles, and details shown, and in conformance with the specified quality standards requirements, unless otherwise noted or indicated.
- 1. Shop-assemble work in as large units as practicable to minimize field cutting and jointing.
 - 2. Where necessary to fit at the project site, allow ample allowance for cutting and fitting. Create sufficient scribe where items intersect walls and partitions.
 - 3. Conceal means of fastening various items together.
 - 4. Assemblies must be free from open joints, hammer and machine marks, structural defects, and surface blemishes.
- B. Finish Hardware:
- 1. Accurately fit hardware and install in conformance with the manufacturer's instructions.
 - 2. Accurately fit doors and drawers with uniform clearance at all edges.
 - 3. Doors and drawers must operate freely, but not loosely, without sticking or binding, with all hardware adjusted and functioning properly.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify that in-place construction satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
- 1. Identify deficient and non-conforming project conditions.

2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

A. General Requirements:

1. Scribe and cope items as necessary for an accurate fit. Perform required cutting, drilling, and fitting for casework installation.
2. Set casework true to line, to required levels and lines, plumb, square, and cut and fitted without warp or rack; sloped or level as required; with flush well-fitted joints; and in alignment with adjacent construction.
3. Shim as required with concealed shims.
4. Fit exposed connections accurately to form flush hairline joints

B. Special Techniques:

1. Install casework in a manner consistent with the specified grade; and plumb, level, true, and straight with no distortions.
2. Shim using concealed shims.
3. Secure to ground, stripping, and blocking with countersunk, concealed fasteners and blind nailing as required for a satisfactory installation.
4. At gypsum board construction, anchor through wall surface to wood blocking or wood studs only.
5. Furnish fillers, closures and trim as required for a complete installation. Scribe in place where required.

C. Interface with Adjacent Items:

1. Provide materials, components, and accessories normally furnished or necessary to securely attach casework to supporting construction.
2. Casework taller than 42 inches must be seismically anchored.

D. Installation Tolerances: Install casework to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch and from plumb, level, and alignment.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include

1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 ADJUSTING

- A. Verify smooth and quiet door, drawer, and finish hardware operation.
- B. Lubricate and adjust operating parts and finish hardware to function properly, free from warp, twist, binding, and distortion. Confirm latches and locks engage securely without forcing or binding.
- C. Rehang or replace doors, drawers, and finish hardware that do not operate freely in a safe and reliable manner.

3.5 CLEANING

- A. Cleaning Work: Remove from exposed casework surfaces anything that might interfere with uniform oxidation or weathering. Clean all visible casework surfaces in a manner that does not result in any warranty or guarantee becoming void.
 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.6 PROTECTION

- A. Protect installed casework in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything in, on, adjacent to, or against installed casework unless it is protected from damage. Do not use installed casework as work surfaces.

- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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DIVISION 07

THERMAL AND MOISTURE PROTECTION

SECTION 07 21 50 – BUILDING ENCLOSURE INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Stud bay concealed insulation.Spray polyurethane foam insulation.
2. Installation materials.
3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 09 81 33 for acoustical insulation.

1.2 REFERENCES

A. Definitions:

1. Manufacturer: Means the insulation or accessory manufacturer, as the context admits, manufacturer, unless otherwise indicated.
2. Thermal Transmittance (U-value): Means the measure of heat flux (flow of energy per unit of area per unit of time) and is expressed in units of BTU per hour square foot degrees Fahrenheit of air to air temperature difference between the two sides of a material (Btu/sq. ft. x h x deg. F).
3. Thermal Resistance (R-value): Means the designation of an insulation material's resistance to heat flux. The R value is numerically equal to the reciprocal of the material's thermal transmittance, and is expressed in units of degrees Fahrenheit hour square foot per BTU inch at 75 degrees Fahrenheit (deg. F x h x sq. ft./Btu x in. at 75 deg. F).
4. Concealed: Means hidden behind other construction when complete; and exposed surfaces in areas designated as shelled spaces.
5. Exposed: Means remaining seen after construction is complete.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Fiberglass and mineral wool insulation may not be installed in direct contact with interior ventilation. Fiberglass and mineral wool insulation used in plenum spaces must be fully encapsulated.
2. Plastic insulation must be separated from the building interior by a thermal/fire barrier that prevents the temperature rise to not more than 250 deg. F in a 15-minute time period.

3. Both board insulation and spray applied foam insulation manufactured with blowing agents known to have ozone depleting potential (ODP) are prohibited.

- B. Performance Requirements: Above grade exterior perimeter walls must include insulation having a minimum R-value of at least R-21 for insulation material only, unless otherwise indicated.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
 1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
- B. Informational Submittals: Submit manufacturer's instructions for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
 1. Submit manufacturer-prepared published instructions for proper installation of furnished insulation.
 2. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 3. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.

1.5 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped in their original packaging, indoors within dry, well-ventilated, broom-cleaned, and partially- or permanently-enclosed storage areas.
- C. Damaged Item Replacement: Promptly remove and replace items that are deteriorated, damaged, or defective with undamaged new items that do not exhibit deterioration, damage, or defects.
- D. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.6 PROJECT CONDITIONS

- A. Existing Conditions: Surfaces receiving insulation must be dry.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Fiberglass Blanket Insulation: Provide products manufactured by one of the following, or equal.
 - 1. CertainTeed Corp.
 - 2. Johns Manville.
 - 3. Knauf Insulation.
 - 4. Owens Corning Fiberglass Corp.
- B. Rock Wool Blanket Insulation: Provide products manufactured by one of the following, or equal.
 - 1. Fibrex Insulations, Inc.
 - 2. ROXUL, Inc.
 - 3. Thermafiber, Inc.

2.2 CONCEALED STUD BAY INSULATION

- A. Description: Asbestos-free mineral fiber blanket insulation conforming to ASTM C 665 requirements for Type I insulation (blankets without membrane coverings), manufactured from slag and naturally occurring rock.
- B. Mineral Wool Blanket Insulation: Provide one of the following, or equal.
 - 1. "COMFORTBATT" manufactured by ROCKWOOL International A/S.
 - 2. "Thermafiber UltraBatt" manufactured by Owens Corning.
- C. Requisite Properties:
 - 1. Minimum Thermal Resistance: Provide material having an R-value of at least R-4.0 per inch of thickness.
 - 2. Minimum Size: Provide sizes required for a self-supporting friction fit.
 - 3. Minimum Thickness: 6 inches.
 - 4. Minimum Density: 2.0 pounds per cubic foot.
 - 5. Facing: None.

2.3 SPRAY POLYURETHANE FOAM INSULATION

- A. Description: High-yield rigid closed-cell polyurethane cellular plastic foam insulation.

- B. Product: "Corbond III" manufactured by Johns Manville, or equal.
- C. Requisite Properties:
 - 1. Minimum Thermal Resistance: Provide material having an R-value of at least R-7 per inch of thickness.
 - 2. Thickness: Indicated on the Drawings.
 - 3. Nominal Density: 2.0 pounds per cubic foot, when measured in conformance with ASTM D 1622.
 - 4. Closed-Cell Content: Greater than 90 percent, when measured in conformance with ASTM D 6226.
 - 5. Minimum Compressive Strength: At least 35 pounds per square inch, when measured in conformance with ASTM D 1621.
- D. Performance Requirements:
 - 1. Maximum Air Permeance: Not more than 0.0006 liters per second per meter at 75 Pascals of pressure change, when measured in conformance with ASTM E 2178.
 - 2. Maximum Water Absorption: Not more than 1 percent in conformance with ASTM C 209.
 - 3. Maximum Water Vapor Transmission: Not more than 0.65 perms at 1.5-inch thickness, when measured in conformance with ASTM E 96.
 - 4. Surface Burning Characteristics: Class I (or A); not more than the following, when tested in compliance with ASTM E 84.
 - a. Maximum FSI Value: Not more than 25.
 - b. Maximum SDI Value: Not more than 450.

2.4 INSTALLATION MATERIALS

- A. Insulation Hangers:
 - 1. Application: Used to attach insulation to clean, dry, smooth, non-porous solid surfaces.
 - 2. Manufacturer: Provide products manufactured by AGM Industries, Inc., or equal.
 - 3. Products: Provide the following, or equal.
 - a. Anchors: "TACTOO Insul-Hangers" adhesively attached spindle-type anchors.
 - b. Adhesive: "BOSS 348 Multi-Purpose Construction Adhesive" manufactured by Accumetric, LLC or other VOC-compliant insulation hanger adhesive.
 - c. Insulation Standoff: One-inch "Clutch Clip".
 - d. Insulation Retaining Washers: "Style RC 200" round or "SC 250" square washers.
 - 4. Requisite Properties:
 - a. Base Plate and Insulation Standoff and Retaining Washers: At least 2-inch square by at least 0.149-inch (MSG 28) base metal thickness galvanized perforated steel sheet.
 - b. Retaining Washers: At least 1-1/2-inch square or diameter by at least 0.149-inch (MSG 28) base metal thickness galvanized perforated steel sheet.

- c. Spindle: At least 0.106-inch diameter (SWG 12), zinc-coated wire, depth to suit depth of insulation indicated.
 - d. Adhesive: Adhesive used with impaling pins must either be manufactured or accepted by the insulation hanger manufacturer. "Peel and press" hangers with self-adhering adhesive backings are prohibited.
- B. Mechanical Fasteners: Tape, staples, and other devices for fastening insulation supplied, required, recommended, or accepted by the insulation manufacturer.
- C. Hanger Wire: At least 0.106-inch diameter (SWG 12) soft temper zinc-coated wire conforming to ASTM A 641, Class 3 or A coating.
- D. Adhesive: Supplied, require, recommended, or accepted by the insulation manufacturer to bond insulation securely to substrates indicated without damaging insulation or substrates.

2.5 ACCESSORIES

- A. Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:

1. Install insulation using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 2. Extend insulation to envelop entire area insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
 3. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.
 4. Installed insulation must be warrantable. Do not install, correct, or replace insulation in a manner that results in any warranty or guarantee becoming void.
- B. Special Techniques:
1. Stud Bay Insulation: Install insulation in cavities formed by framing members.
 - a. Use insulation that fills the cavities. If more than one length is required to fill the cavities, then provide lengths that will produce a snug fit between ends.
 - b. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - c. Maintain 3-inch clearance around recessed lighting fixtures not rated for or protected from contact with insulation.
 - d. Stuff loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to roughly 40 percent of normal maximum volume.
 - e. For metal-framed wall cavities higher than 96 inches, support unfaced blankets mechanically and support faced blankets by taping insulation flanges to metal stud flanges.
 2. Ceiling Insulation:
 - a. Install blanket insulation above ceilings where indicated.
 - b. Maintain 3-inch clearance of insulation around recessed lighting fixtures.
- C. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach insulation to supporting construction.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;

2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.5 PROTECTION

- A. Protect installed insulation in place from becoming wet, deterioration, and damage until covering.
- B. Do not store anything adjacent to or against installed insulation unless it is protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed insulation as work surfaces.
- C. Remove protection when it's no longer needed and before covering.

END OF SECTION

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SECTION 07 25 13 – SHEET WEATHER-RESISTIVE BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Polyethylene sheet weather-resistive barriers.
2. Asphalt-saturated sheet weather-resistive barriers.
3. Self-adhering sheet flashings integral to sheet weather-resistive barriers.
4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 06 16 43 for treatment of sheathing panel joints.
2. Section 07 65 26 for through-wall, opening, penetration, and transition SASM flashings, installation materials, and accessories not integral to WRB installation.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. WRB: Weather-Resistive Barrier.
2. VDR: Vapor Diffusion Retarder.
3. AB: Air Barrier.
4. UV: Ultraviolet Solar Radiation.

B. Definitions:

1. Manufacturer: Means the WRB manufacturer, unless otherwise indicated.
2. Perm: Means a U.S. perm, or unit of permeance (water vapor transmission) at a given differential in partial pressures on either side of a material or membrane. The U.S. perm is defined as one grain of water vapor per hour, per square foot, per inch of mercury. One US perm is equivalent to 0.659045 metric perms.
3. Shiner: Means lath or accessory fasteners that miss framing members.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: A preinstallation meeting is required for specified warranty.

1. Hold a meeting after submittal approval and at least 10 business days before beginning installation.

2. During the meeting, review the Contract Documents, submittals, project conditions, and installation sequence and methods, including special details and conditions that might affect installation
 3. Identify and discuss adverse or unfavorable conditions detrimental to protecting stored materials or to installation; or to the quality, durability, or performance of installed WRBs. Resolve each condition.
 4. Finalize construction schedule.
 5. Record significant discussions and distribute meeting minutes. Do not begin installation until disagreements are successfully resolved to the satisfaction of all parties.
- B. Sequencing:
1. Install WRBs only after penetrating items are installed.
 2. Install WRBs only after openings are framed.
- C. Scheduling:
1. UV Exposure: Schedule installation to keep WRB exposure to UV within the manufacturer's recommended limits.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
1. Product Data:
 - a. Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 - b. Submit sample warranties with warranty periods, terms, conditions, exclusions, and remedies explicitly defined for each warranty, including clear warranty period start dates. (e.g., date of manufacture, purchase, installation, Beneficial Occupancy, Substantial Completion, Final Completion, etc.)
 2. Shop Drawings:
 - a. Submit dimensioned drawings showing joints, seams, tie-ins, and dimensions, including terminations, penetrations, coves, interior and exterior corner conditions, openings, and expansion joints.
 - b. Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project.
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).

1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished WRBs.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.
 3. Manufacturer's Representative Reports:
 - a. Before beginning work, request and submit reports confirming substrates are properly prepared in conformance with manufacturer's instructions and other requirements and recommendations; are acceptable and satisfactory to receive the work of this specification section; and conform to all requirements necessary to issue specified and other warranties.
 - b. During the work, request and submit reports documenting actions taken by the manufacturer's representative to verify conformance with manufacturer's instructions and other requirements and recommendations.
 - c. Upon completion, request and submit reports confirming installed roofing conforms to all requirements necessary to issue specified and other warranties.
- C. Closeout Submittals: Submit the following to the Architect as a condition of project closeout.
1. Warranty Documentation: Submit final warranties signed by the manufacturer's representative with complete terms indicated for all warranties covering items furnished or installed under this specification section.

1.5 QUALITY ASSURANCE

- A. Source Limitations:
1. WRBs must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
 2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.
- B. Qualifications:
1. Manufacturer: Company or individuals must have at least 10 years' experience manufacturing WRBs installed on at least 200 previous projects similar to this project in size, material, design, and complexity.

2. Installer: Company or individuals must have at least 5 years' experience installing WRBs for at least 30 previous projects similar to this project in size, material, design, and complexity.
 3. Supervisors: Individuals must have at least 7 years' experience installing WRBs for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading WRB installers.
 4. Manufacturer's Representative: Individuals must have at least 5 years' technical field experience performing manufacturer's services for at least 50 previous projects similar to this project in size, material, design, and complexity.
- C. Mockups: If an *ex-situ* exterior wall integrated mockup is required for this project, then integrate WRBs into the mockup as part of the work of this specification section.
- D. Field Samples: Include *in-situ* mockups as part of the work of this specification section.
1. Install at least one 100-square-foot field sample of each WRB installation to verify selections made under sample submittal and to set quality standards for installation. Demonstrate surface preparation, crack repair, and joint, and corner preparation.
 2. The Architect reviews field samples for conformance to the Contract Documents and approves or rejects them as the standard by which subsequent work is evaluated.
 3. Revise field samples and repeat reviews, including arranging all revisions and paying all revision costs, until accepted in writing by the Architect. Final acceptance of WRB is made from field samples.
 4. After acceptance, promptly identify and protect field samples for reference until Substantial Completion.
 5. Approved field samples may remain part of the work after being identified for future reference.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped and in conformance with manufacturer's instructions and other requirements and recommendations for storage.
1. Prevent stored items from contacting the floor or ground, from soiling and staining, and from deterioration and damage.
 2. Sheet products must be tightly rolled face out on a sturdy core designed for that purpose and vertically stored unless otherwise required or recommended by the manufacturer. Promptly remove and replace rolled sheet products that are flattened or distorted during shipping, unloading, or storage.
 3. If items are not stored in an enclosed location, then cover the tops and sides of stored items with securely-tied, waterproof, breathable covers. Unvented polyethylene

taraulins do not qualify as breathable covers and are prohibited. (due to potential accumulation of moisture beneath the tarpaulin during certain environmental conditions)

4. Incline covered items to ensure maximum drainage of accumulated moisture.
 5. Do not leave items uncovered where they might be exposed to weather or become wet from rain, mist, relative humidity, condensation, frost, and other sources of moisture; or exposed to heat, sudden changes in temperature, and UV exposure beyond the manufacturer's limits; or exposed to other sources of deterioration and damage.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.
- D. Damaged Item Replacement: Promptly remove and replace items that are deteriorated, damaged, or defective with undamaged new items that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 PROJECT CONDITIONS

- A. Ambient Conditions:
1. Do not install WRBs during rain or snow, fog or mist; or when rain or snow is predicted within 24 hours of installation.
 2. Proceed only when there is no threat of impending precipitation, and both current and forecasted weather conditions conform to those required, recommended, or accepted by the manufacturer.
- B. Existing Conditions: Surfaces over which WRBs are installed must be dry. Install WRBs only when substrate moisture content falls within ranges required, recommended, or accepted by the manufacturer.

1.8 WARRANTY

- A. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 10 years.
- B. Installer Guarantee: Furnish to the Owner a written guarantee for the work of this specification section against all defects in materials and workmanship for 2 years from date of acceptance. Guarantees must be properly prepared and signed on the guarantee form in Division 01.

PART 2 - PRODUCTS

2.1 POLYETHYLENE SHEET WRB

- A. Description: Non-woven, non-perforated, non-absorbing, breathable spunbonded HDPE WRB that that
 - 1. resists air flow, bulk water, and wind driven rain;
 - 2. channels water and moisture to the outside of the building envelope; and
 - 3. has a current evaluation report from the NES or ICC-ES demonstrating code compliance when installed as a WRB.
- B. Application: Installed on the exterior side of exterior building walls directly over the exterior wall sheathing as the base layer primary WRB. Windows, doors, and other openings must be flashed to this layer.
- C. Products: "Tyvek CommercialWrap" (ICC-ES Report No. ESR-2375) manufactured by E.I. DuPont de Nemours & Co. (Dupont), or equal.
- D. Requisite Properties:
 - 1. Minimum Basis Weight: At least 2.7 ounces per square yard, when measured in conformance with TAPPI Test Method T 410.
 - 2. Minimum Roll Width: 10 feet.
 - 3. Maximum UV Exposure Limit: Cover within 365 days.
- E. Performance Requirements:
 - 1. Maximum Water Vapor Permeance: Not more than 23 perms, when measured in conformance with ASTM E 96, Procedure A.
 - 2. Minimum Water Resistance: At least 280, when tested in conformance with AATCC 127.
 - 3. Minimum Tensile Strength: At least 35 lbf per inch, when tested in conformance with ASTM D 882.
 - 4. Surface-Burning Characteristics: wall surfacing having a maximum FSI Value of 10 or less and a maximum SDI Value of less than 10 (Class A), when tested in conformance with ASTM E 84.
- F. Accessories:
 - 1. Prefabricated Penetration Flashings: Provide products manufactured by Quickflash Weatherproofing Products, Inc.
 - 2. Primer: Supplied, recommended, or accepted by the manufacturer for each substrate.
 - 3. Straight Flashing Material:
 - a. Description: 30-mil thick self-adhering flashing material with an elasticized polyethylene laminate face coated with butyl adhesive.
 - b. Application: Applied to rectangular window flanges, sill plates, corners, and joints.
 - c. Product: "StraightFlash", or equal,

- d. UV Exposure Limit: Cover within 120 calendar days.
- 4. Flexible Flashing Material:
 - a. Description: 70-mil thick self-adhering elastic flexible flashing tape with a spunbonded polyethylene laminate face coated with butyl adhesive.
 - b. Application: Applied to recessed and curved window flanges, sill plates, corners, and joints.
 - c. Product: "FlexWrap NF", or equal.
 - d. UV Exposure Limit: Cover within 120 calendar days.
- 5. Seam Tape:
 - a. Description: Oriented polypropylene film coated with acrylic adhesive
 - b. Product: "Tyvek Tape", or equal.
- 6. Transition Flashing Material:
 - a. Description: Used where WRB transitions to another system or parapet.
 - b. Products: Specified in Section 07 65 26.
- 7. Fasteners:
 - a. Metal Stud Construction: "Tyvek Wrap Cap" fastening system, including "Wrap Cap Screws" and 2-inch diameter "Wrap Cap" HDPE washers.
 - b. Wood Stud Construction: "Tyvek Wrap Cap" fastening system, including #4 nails with large one-inch plastic cap fasteners.
- 8. Primer, Adhesive, and Other Accessories: Provide primer, adhesive, and other accessories and similar secondary items supplied, required, recommended, or accepted by the manufacturer and as necessary for a complete installation.

2.2 ASPHALT-SATURATED SHEET WRB

- A. Description: Weather-resistant building paper conforming to Federal Specification FS UU-B-790a Type I (barrier paper), Grade D (water vapor permeable), Style 2 (uncreped, not reinforced, saturated) and having a current evaluation report from the NES or ICC-ES demonstrating code compliance when installed as a WRB.
- B. Application: Installed on the exterior side of exterior building walls directly behind exterior Portland cement plaster to separate the plaster assembly from the base layer WRB.
- C. Products: Provide one of the following, or equal.
 - 1. "Davis Wire 60 Minute" (ICC-ES Report No. ESR-2595) manufactured by Davis Wire Corp.
 - 2. "Super Jumbo Tex 60 Minute" (ICC-ES Report No. ESR-1027) manufactured by Fortifiber Corp.
 - 3. "GMCraft 60 Minute" (ICC-ES Report No. ESR-2376) manufactured by GMC Roofing & Building Paper Products, Inc.
- D. Requisite Properties:

1. Minimum Basis Weight: At least 6 pounds per 100 square feet (approximately 9.0 ounces per square yard).
2. Minimum Roll Width: At least 40 inches.
3. Maximum UV Exposure Limit: Cover within 30 days.

E. Performance Requirements:

1. Minimum Water Vapor Permeance: At least 5 perms, when measured in conformance with ASTM E 96, Procedure B.
2. Minimum Water Resistance: At least 60 minutes, when tested in conformance with ASTM D 779.
3. Minimum Tensile Strength: At least 70 lb^f per inch, when tested in conformance with ASTM D 882.

F. Accessories:

1. Fasteners: At least one-inch-long, 16-gage, pneumatically-applied, coated galvanized steel crown staples
2. Sealing Material, Repair Tape, and Other Accessories: Provide mastic, adhesive, pressure-sensitive adhesive tape, and other items supplied, required, recommended, or accepted by the manufacturer and compatible with base layer WRB where in contact.

2.3 ACCESSORIES

A. Sealant:

1. Description: Silicone sealant conforming to ASTM C 920 requirements for Type S, Grade NS, Class 25.
2. Product: "758" manufactured by Dow Corning Corp., or equal.
3. Color: White.

- B. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification:
1. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect

the quality of installation or the durability, appearance, or performance of installed and adjacent items.

2. Verify substrates are dry and free of deleterious and other substances that might interfere with WRB installation or performance.
3. Verify items penetrating WRBs are installed.

C. Evaluation and Assessment:

1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

A. General Requirements:

1. Install WRBs using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
3. Installed WRBs must be warrantable. Do not install, correct, or replace WRBs in a manner that results in any warranty or guarantee becoming void.

B. Special Techniques:

1. Placing:
 - a. Start weather barrier installation at a building corner, leaving 6-12 inches of weather barrier extended beyond corner.
 - b. Starting at the bottom of the wall, install WRB horizontally over sheathing and securely attach with a minimum of fasteners.
 - c. Lap WRB in shingle fashion at least 3 inches at horizontal seams, and 6 inches at vertical seams. Stagger vertical joints. Shingle horizontal joints. Continuously tape all seams.
 - d. To prevent direct contact between metal lath and accessories, and to ensure water tightness, lap the WRB over flanges of plaster accessories. Continue weather barrier uninterrupted behind plaster control joints.
 - e. At areas to receive plaster provide asphalt saturated sheet WRB over base layer WRB, installed in conformance with the manufacturer's instructions.
 - f. At areas where base layer WRB might be permanently exposed to UV light, provide UV stable sheet installed in conformance with the manufacturer's instructions.
 - g. Integrate base layer WRB with flashing materials at windows, doors, and other penetrations to properly discharge water to the exterior face of the wall. Omitted or improperly installed flashing must be corrected prior to installing the WRB.

- h. Seal all joints and penetrations through the WRB with flashing tape.
 - i. Continuously tape WRB at window and door openings, and to through-wall flashings.
 - 2. Attachment: Fasten WRBs tight to substrates without wrinkles.
 - 3. Penetrations: To create an airtight seal between penetrating items and WRBs, seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating WRBs with vapor-retarder tape.
 - a. Cut WRB to fit closely and neatly.
 - b. Continuously seal edges around penetrations.
 - 4. Cladding Anchors: Apply 4- by 9-inch piece of approved flashing membrane to weather barrier membrane prior to the installation cladding anchors. Seal edges with weather barrier sealant.
 - 5. Follow polyethylene sheet WRB manufacturer's instructions for WRB installations greater than 4 stories for the primary WRB.
- C. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to attach WRB tight and flat with as few fasteners as possible, and only enough to hold the WRB in place until the final wall finish material is installed.

3.3 FIELD QUALITY CONTROL

- A. Manufacturer Services: Installed work is subject to examination by the manufacturer's representative to determine conformance to manufacturer's instructions and other requirements and recommendations. Manufacturer's field representative services are required for specified warranty.
 - 1. Note all defective items and non-conforming work identified by the manufacturer's representative.
 - 2. Itemize into a punch list all noted items and record the manufacturer's requirements and recommendations for correcting each punch list item.
 - 3. Promptly bring all punch list items into conformance with the manufacturer's requirements and recommendations until accepted in writing by the Architect.
 - 4. Manufacturer's representative withholds issuing warranties until all punch list items are accepted by the Architect.

3.4 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
 - 1. WRB Repair: Repair tears, holes and other damage with tape; or if too large, with at least 12-inch wide strips or remnants of WRB material centered over damaged areas and at least 6 inches larger all around, whichever is greater.
 - a. Continuously tape or seal top layer edges of repair material to bottom layer.
 - b. WRB must be free from holes, tears, and punctures at the end of installation.

2. Shiner Repair:

- a. Shiners are discovered by the installer as they miss the framing or observed from the interior if before drywall is installed.
- b. Shiners must be removed, and WRB and sheathing holes filled with compatible sealant prior to patching WRB with compatible self-adhesive flashing.
- c. Do not leave shiners in place and seal over or rely on sealant as the only patching method.

B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include

1. written descriptions of non-conforming, damaged, and defective work;
2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.

C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 CLEANING

A. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.6 PROTECTION

A. Protect installed WRBs in place from prolonged exposure to UV manufacturer's recommended limits, exposure to weather, becoming wet, contact with damp or wet surfaces, and other sources of deterioration, and damage until covering. If exposed to UV for more than the recommended limit, then WRBs must be removed and replaced in conformance with the manufacturer's instructions.

B. Do not store anything adjacent to or against installed WRBs unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed WRBs as work surfaces.

C. Remove protection when it's no longer needed and before covering.

END OF SECTION

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SECTION 07 41 13 – METAL ROOF PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof panels.
2. Delegated design of roof panel system.
3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

A. Definitions:

1. Manufacturer: Means the roof panel manufacturer, unless otherwise indicated.
2. Failure: Includes noise or vibration caused by movement, material deterioration beyond normal weathering, and water leakage through roof panel and framing areas.
3. Water Leakage: Means penetration of water onto the exposed inside surface of the test specimen under specified conditions of air pressure difference across the specimen during a 15-min test period. Water penetration at or around end dams or side rails is not leakage; end dams and side rails are installed to cause and control ponding over the panels and to support the panels. They are not part of the roof.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate building opening tolerances with roof panel manufacturing and erection tolerances. The manufacturer must accommodate building frame tolerances.

B. Delegated Design Requirements:

1. Engineer, fabricate, assemble, and install roof panels that conform to the profiles indicated and other Contract Document requirements; meet specified performance criteria; and result in structurally sound, non-corroding, and weathertight assemblies that accommodate, resist, distribute, or transfer in-service loads without incipient or catastrophic failure.
2. Maintain visual design concept indicated, including sizes, profiles, and alignments. Deviation from visual design concept is non-conforming work and prohibited without prior written acceptance by the Architect.
3. Panel structural properties must be determined in conformance with Aluminum Association publication "*Aluminum Design Manual- Specifications and Guidelines for Aluminum Structures*".

4. Roof panels must be tested to verify load capacity in conformance with ASTM E 72 "*Standard Test Method of Conducting Strength Tests of Panels for Building Construction*" for determination of negative (suction) load capacity.

C. Performance Requirements:

1. Design Pressure: Calculate in conformance with American Society of Civil Engineers/ Structural Engineering Institute publication ASCE/SEI 7, "*Minimum Design Loads and Associated Criteria for Buildings and other Structures*".
2. Design Wind Rating: Roof panel assemblies must conform to UL 580 Class 90 wind uplift requirements.
3. Clip and Panel Performance: Clip and panel components must resist design pressures, when panel bending and clip-to-panel strength are tested in conformance with ASTM E 1592.
4. Panel Deflection: Individual roofing panels may not deflect more than $L/180$ measured normal to the panel plane, when tested in conformance with ASTM E 1592.
5. Permanent Deformation: Individual roofing panels may not deform, buckle, or exhibit side lap separation when subjected to a 300-pound concentrated load applied to a 4-square-inch area located between supports at panel mid-span and center.
6. Air Leakage (AL): Maximum permanent AL rating of not more than 0.006 cubic feet per minute per square foot, when tested in conformance with ASTM E 1680 at 1.57 pounds per square foot minimum differential static air pressure in sequence with or before water leakage testing.
7. Water Leakage: No water leakage through the assembly or joints, when tested in conformance with ASTM E 1646 at the following differential pressures.
 - a. Less than or Equal to 30 Degrees from Horizontal: 2.86 pounds per square foot minimum differential pressure.
 - b. Steeper than 30 Degrees from Horizontal: 20 percent of the positive design wind pressure but not less than 6.24 nor more than 12 pounds per square foot minimum differential pressure.
8. Hydrostatic Head Resistance: No water leakage, when tested in conformance with both ASTM E 2140.
9. Solar Energy Performance Requirements:
 - a. Minimum Solar Reflectance Index (SRI) Value: At least SRI 0.75 for low-slope roofs (less than 2:12 slope) and 0.16 for steep slope roofs (greater than or equal to 2:12 slope), when measured in compliance with ASTM E 1918.
 - b. Minimum Aged Reflectance Value: At least 0.63 for low-slope roofs (less than 2:12 slope) and 0.20 for steep slope roofs (greater than or equal to 2:12 slope), when maintained under normal conditions and measured in conformance with ASTM E 1918.
 - c. Minimum Emittance Value: At least 0.75, when measured in conformance with ASTM C 1371.
10. Thermal Expansion and Contraction: Accommodate movement resulting from at least 120 deg. F ambient and 180 deg. F material surface temperature differentials (changes).

11. Dissimilar Metal Corrosion Protection: Permanently isolate metal surfaces from direct contact with incompatible materials and other potentially corrosive substrates as specified in Section 05 50 00.

D. Preinstallation Meeting:

1. Hold a meeting after submittal approval and at least 10 business days before beginning installation.
2. During the meeting, review the Contract Documents, submittals, project conditions, and installation sequence and methods, including special details and conditions that might affect installation
3. Identify and discuss adverse or unfavorable conditions detrimental to protecting stored materials or to installation; or to the quality, durability, appearance, or performance of installed roof panels. Resolve each condition.
4. Finalize construction schedule.
5. Record significant discussions and distribute meeting minutes. Do not begin installation until disagreements are successfully resolved to the satisfaction of all parties.

1.4 SUBMITTALS

A. Action Submittals: Submit the following for responsive action (formal review and approval).

1. Product Data:
 - a. Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 - b. Submit sample warranties with warranty periods, terms, conditions, exclusions, and remedies explicitly defined for each warranty, including clear warranty period start dates. (e.g., date of manufacture, purchase, installation, Beneficial Occupancy, Substantial Completion, Final Completion, etc.)
2. Shop Drawings:
 - a. Submit dimensioned plans and elevations drawn to scale and showing roof panel layout, materials, construction, and finishes. Show locations, sizes, and extents of all items, accessories, and trim. Label manufactured items by product name.
 - b. Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project. Cross-reference details to plans and elevations.
3. Samples:
 - a. Submit at least 6-inch long by full panel width representative samples of each roof panel type, color, finish, and variety.
 - b. Submit at least 6-inch long representative samples of each accessory and trim type, color, finish, and variety. Include fasteners and exposed accessories.

- c. Submit samples of all supporting framework components (e.g. rails, clips, brackets, subgirts), necessary for a complete installation.
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished roof panels.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 2. Delegated Design Submittals: Together with shop drawings, submit engineering calculations demonstrating conformance to the Contract Documents and all impacts of delegated design scope of work on other work.
 - a. Calculations must be explicit and legible and must incorporate distinct cross-references to submitted shop drawings in sufficient quantity to render the calculations readily intelligible and reviewable.
 - b. At a minimum, calculations must include design loads; section-property computations; analysis of fasteners, anchors, attachments, and connectors; and signature and seal of the licensed professional engineer responsible for preparing them.
 - c. Test reports are not an acceptable substitute for calculations and are returned to the Contractor without review or responsive action, except to record non-conformance with this requirement.
 3. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.
- C. Closeout Submittals: Submit the following to the Architect as a condition of project closeout.
1. Warranty Documentation: Submit final warranties signed by the manufacturer's representative with complete terms indicated for all warranties covering items furnished or installed under this specification section.

1.5 QUALITY ASSURANCE

- A. Source Limitations:
1. Roof panels must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.

2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.

B. Regulatory Requirements:

1. Fire Resistance Rating: Roof coverings must conform to UL 790 fire resistance requirements for Class A rating. (effective against severe fire test exposures)

C. Qualifications:

1. Manufacturer: Company or individuals must have at least 10 years' experience manufacturing roof panels installed on at least 200 previous projects similar to this project in size, material, design, and complexity.
2. Installer: Company or individuals must have at least 5 years' experience installing roof panels for at least 30 previous projects similar to this project in size, material, design, and complexity.
3. Supervisors: Individuals must have at least 7 years' experience installing roof panels for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading roof panel installers.
4. Engineer: Must be a licensed professional structural engineer registered to practice in California having at least 10 years' experience performing the kind of engineering services indicated for at least 20 previous projects similar to this project in size, material, design, and complexity.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped and in conformance with manufacturer's instructions and other requirements and recommendations for storage. Furnish adequate dunnage and bracing during storage.
1. Prevent stored items from contacting the floor or ground, from soiling and staining, and from deterioration and damage.
 2. If items are not stored in an enclosed location, then cover the tops and sides with securely-tied, waterproof, and breathable covers. Unvented polyethylene tarpaulins do not qualify as breathable covers and are prohibited. (due to potential accumulation of moisture beneath tarpaulin during certain environmental conditions)
 3. Incline covered items to ensure maximum drainage of accumulated moisture.
 4. Do not leave items uncovered where they might be exposed to weather or become wet; or exposed to other sources of deterioration and damage.

- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective roof panels with undamaged new roof panels that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 WARRANTY

- A. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 5 years; and for finishes against color fading, chalking, cracking, checking, peeling, and adhesive failure for 20 years.
- B. Installer Guarantee: Furnish to the Owner a written guarantee for the work of this specification section against all defects in materials and workmanship for 2 years from date of acceptance. Guarantees must be properly prepared and signed on the guarantee form in Division 01.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
 - 1. AEP Span.
 - 2. CENTRIA, Inc.
 - 3. Metal Sales Manufacturing Corp.
 - 4. Morin.
 - 5. NorthClad.
 - 6. Steelogic LLC.
- B. Fabricators: Shop-fabricated panels are prohibited.

2.2 ROOF PANELS

- A. Description: Pre-finished, formed metal roofing panels with vertical panel edges, flat panel between panel edges, and standing seam joints between panels.
- B. Restrictions: Minimum slope must be at least 2:12.
- C. Product: "Design Span hp" manufactured by AEP SPAN, or equal.

- D. Requisite Properties:
1. Sizes: Indicated on the Drawings.
 2. Material Thickness: At least 0.032-inch thick pre-painted aluminum sheet.
 3. Coverage: 12 inches.
 4. Depth: 1-3/4 inches.
 5. Exposed Finish: Manufacturer's standard PVDF 3-coat color finish; color selected by the Architect from the manufacturer's standard colors.
 6. Bottom Side Finish: Manufacturer's standard pretreatment and white or light-colored acrylic or polyester backer finish consisting of both prime and wash coats for a total DFT of at least 0.5-mil.
 7. Panel Texture: Smooth.
 8. Protection: Apply strippable film to the top side of the painted coil to protect the finish during fabrication, shipping and field handling. Remove strippable film just before installation.
- E. Metallic Finishes: Panels, components, and accessories having a metallic finish must be finished such that the metallic finish directionality (grain) of all components runs in the same direction when installed. Color variation caused by failure to comply with this requirement is non-conforming work.

2.3 ACCESSORIES

- A. Flashing, Trim, and Closures: Fabricated from same material as panels.
1. Provide flashing, trim, and closures required to seal against weather and to match finished appearance, including bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers.
 2. Flashing, trim, and closure finish must match adjacent panel finish.
- B. Gaskets and Seals used in Panel Assembly: Supplied, required, recommended, or accepted by the manufacturer to conform to specified performance criteria; color selected by the Architect from manufacturer's standard colors.
- C. Edge Members and Perimeter Extrusions: Extruded aluminum at least 0.063-inch thick, with integral weather-stripping and finish matching adjacent panels.
- D. Clips and Fasteners: Concealed, non-corrosive, non-deteriorating clips and fasteners of quantity and type required, recommended, or accepted by manufacturer and that are that are compatible with roof panel faces.
- E. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
1. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
 2. Reinforce framing members as required to receive fastener threads.

3. Exposed fasteners are prohibited on faces exposed to view. Provide concealed fasteners and expansion provisions.

- F. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.4 FABRICATION

- A. Fabricate flashing and trim in conformance with SMACNA publication "*Architectural Sheet Metal Manual*" requirements for design, dimensions, metal, and other characteristics.
 1. Form exposed sheet metal accessories without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 2. Fabricate cleats and attachment devices from the same material as the accessory being anchored, or from compatible, noncorrosive metal required or recommended by metal roof panel manufacturer.
 3. Exposed fasteners are prohibited from faces of accessories exposed to view.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification:
 1. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
 2. Verify items penetrating roof panels are installed.
- C. Evaluation and Assessment:
 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:

1. Install roof panels using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
 3. Completed work must match approved samples and mockups, as accepted by the Architect.
 4. Installed roof panels must be warrantable. Do not install, correct, or replace roof panels in a manner that results in any warranty or guarantee becoming void.
- B. Special Techniques:
1. Provide manufacturer's standard pressure-equalized, rainscreen-principle system with vertical channel that provides support and complete secondary drainage system, draining at base of wall.
 2. Install panels perpendicular to girts and subgirts unless otherwise indicated. Securely fasten panels and other components in place with provisions for thermal and structural movement. Use concealed fasteners and anchorages where possible. Provide washer head fasteners with bonded sealing washers where required to protect metal surfaces and to make a weathertight connection.
 3. Install roof panels to allow individual panels to "free float" and be installed and removed without disturbing adjacent panels. Leave joints uniform-width with open reveals.
 4. Form closely-fitted joints with exposed connections accurately located and secured.
 5. Provide uniform-width perimeter reveals and opening sealants and joint fillers as indicated.
 6. Flash and seal panels with weather closures at perimeter of openings. Install flashing and trim as roof panel work proceeds.
 7. Do not apply sealants to joints unless otherwise indicated on Drawings.
 8. Where weathertight panel joints are required, install concealed gaskets, flashings, joint fillers, and insulation as panel installation progresses. Comply with the requirements of Section 07 92 00 for installing sealants during panel installation.
- C. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach roof panels to supporting construction.
- D. Installation Tolerances: Install roof panels within the following tolerance variations.
1. Squareness: Not more than 1/8-inch difference in diagonal measurements.
 2. Maximum Offset between Components at Joints: 1/16-inch except that offset are not allowed at welded joints.
 3. Maximum Misalignment of Adjacent Members: 1/16-inch.
 4. Maximum Bow: 1/8-inch in 48 inches.
 5. Maximum Deviation from Plane: 1/16-inch in 48 inches.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Cleaning Work: After installation, correction, and repair are complete, remove strippable film or other temporary protection. Promptly remove from exposed metal surfaces anything that might interfere with uniform oxidation or weathering. Clean all visible surfaces in a manner that does not result in any warranty or guarantee becoming void.
 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.5 PROTECTION

- A. Protect installed roof panels in place from soiling, deterioration, and damage until Substantial Completion.

- B. Do not store anything adjacent to or against installed roof panels unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed roof panels as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 07 42 13 – FORMED METAL WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Formed metal wall panels.
2. Supporting framework.
3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

A. Definitions:

1. Manufacturer: Means the wall panel manufacturer, unless otherwise indicated.
2. Failure: Includes noise or vibration caused by movement, material deterioration beyond normal weathering, and water leakage through wall panel and framing areas.
3. Water Leakage: Means no uncontrolled water penetrating assemblies or water appearing on interior surfaces. Water leakage does not include water controlled by flashing and gutters that is drained to the exterior.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate building superstructure and design movement tolerances with wall panel manufacturing and erection tolerances. The manufacturer must accommodate building frame tolerances.

B. Performance Requirements:

1. General: Wall panels must establish and maintain a continuous watertight seal without failure.
2. Design Pressure: Calculate in conformance with American Society of Civil Engineers/ Structural Engineering Institute publication ASCE/SEI 7, "*Minimum Design Loads and Associated Criteria for Buildings and other Structures*".
3. Superstructure Deflection and Story Drift: Accommodate design displacement of adjacent stories indicated on the structural drawings.
4. Seismic Loads: Resist, distribute, or transfer seismic loads indicated on the structural drawings without incipient or catastrophic failure.
5. Cladding Deflection: Individual wall panels may not deflect more than $L/175$ measured normal to the wall plane.

6. Wall Support Deflection: Sub-framing members may not deflect more than $L/175$, or $3/4$ -inch, whichever is less.
7. Permanent Deformation: Individual wall panels may not permanently deform more than $L/100$, when tested in conformance with ASTM E 330.
8. Water Leakage: No water leakage through the assembly or joints, when tested in conformance with both ASTM E 331 (uniform static air pressure test) and AAMA 501 (dynamic pressure test) at 12 pounds per square foot minimum differential pressure.
9. Thermal Expansion and Contraction: Accommodate movement resulting from at least 120 deg. F ambient and 180 deg. F material surface temperature differentials (changes).
10. Dissimilar Metal Corrosion Protection: Permanently isolate metal surfaces from direct contact with incompatible materials and other potentially corrosive substrates as specified in Section 05 50 00.

C. Preinstallation Meeting:

1. Hold a meeting after submittal approval and at least 10 business days before beginning installation.
2. During the meeting, review the Contract Documents, submittals, project conditions, and installation sequence and methods, including special details and conditions that might affect installation
3. Identify and discuss adverse or unfavorable conditions detrimental to protecting stored materials or to installation; or to the quality, durability, appearance, or performance of installed wall panels. Resolve each condition.
4. Finalize construction schedule.
5. Record significant discussions and distribute meeting minutes. Do not begin installation until disagreements are successfully resolved to the satisfaction of all parties.

1.4 SUBMITTALS

A. Action Submittals: Submit the following for responsive action (formal review and approval).

1. Product Data:
 - a. Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 - b. Submit sample warranties with warranty periods, terms, conditions, exclusions, and remedies explicitly defined for each warranty, including clear warranty period start dates. (e.g., date of manufacture, purchase, installation, Beneficial Occupancy, Substantial Completion, Final Completion, etc.)
2. Shop Drawings:

- a. Submit dimensioned plans and elevations drawn to scale and showing wall panel layout, materials, construction, and finishes. Show locations, sizes, and extents of all items, accessories, and trim. Label manufactured items by product name.
 - b. Include project-specific dimensioned details drawn to scale showing wall panel supporting framework and attachments to supporting construction; penetrations, transitions, and terminations, including flashing and sealant installation; provisions for movement and for draining accumulated moisture within the assembly to the exterior; and other conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project. Cross-reference details to plans and elevations.
3. Samples:
- a. Submit at least 12-inch long by full panel width representative samples of each wall panel type, color, finish, and variety.
 - b. Submit samples of all supporting framework components (e.g. rails, clips, brackets, subgirts), necessary for a complete installation.
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished wall panels.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.
- C. Closeout Submittals: Submit the following to the Architect as a condition of project closeout.
1. Warranty Documentation: Submit final warranties signed by the manufacturer's representative with complete terms indicated for all warranties covering items furnished or installed under this specification section.
- 1.5 QUALITY ASSURANCE
- A. Source Limitations:
1. Wall panels must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.

2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.
- B. Regulatory Requirements:
1. Wall panel assemblies must conform to the requirements of California Building Code section 1407 and have a maximum FSI Value of 25 or less and a maximum SDI Value of less than 10 (Class A), when tested in conformance with ASTM E 84.
 2. Wall panels must be tested along with supporting framework and continuous or cavity wall insulation and found in conformance with National Fire Protection Association publication National Fire Protection Association publication NFPA 285, "*Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components*".
- C. Qualifications:
1. Manufacturer: Company or individuals must have at least 10 years' experience manufacturing wall panels installed on at least 200 previous projects similar to this project in size, material, design, and complexity.
 2. Installer: Company or individuals must have at least 5 years' experience installing wall panels for at least 30 previous projects similar to this project in size, material, design, and complexity.
 3. Supervisors: Individuals must have at least 7 years' experience installing wall panels for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading wall panel installers.
 4. Engineer: Must be a licensed professional structural engineer registered to practice in California having at least 10 years' experience performing the kind of engineering services indicated for at least 20 previous projects similar to this project in size, material, design, and complexity.
- D. Mockups: If an *ex-situ* exterior wall integrated mockup is required for this project, then integrate wall panels into the mockup as part of the work of this specification section.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped and in conformance with manufacturer's instructions and other requirements and recommendations for storage. Furnish adequate dunnage and bracing during storage.
1. Prevent stored items from contacting the floor or ground, from soiling and staining, and from deterioration and damage.

2. If items are not stored in an enclosed location, then cover the tops and sides with securely-tied, waterproof, and breathable covers. Unvented polyethylene tarpaulins do not qualify as breathable covers and are prohibited. (due to potential accumulation of moisture beneath tarpaulin during certain environmental conditions)
 3. Incline covered items to ensure maximum drainage of accumulated moisture.
 4. Do not leave items uncovered where they might be exposed to weather or become wet; or exposed to other sources of deterioration and damage.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective wall panels with undamaged new wall panels that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 WARRANTY

- A. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 5 years; and for finishes against color fading, chalking, cracking, checking, peeling, and adhesive failure for 20 years.
- B. Installer Guarantee: Furnish to the Owner a written guarantee for the work of this specification section against all defects in materials and workmanship for 2 years from date of acceptance. Guarantees must be properly prepared and signed on the guarantee form in Division 01.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
1. AEP Span.
 2. CENTRIA, Inc.
 3. Metal Sales Manufacturing Corp.
 4. Morin.
 5. NorthClad.
 6. Steelogic LLC.
- B. Fabricators: Shop-fabricated panels are prohibited.

2.2 FORMED METAL WALL PANELS

- A. Description: Pre-finished exterior wall bent plate metal cladding panels.
- B. Product: Indicated on the Drawings, or equal.
- C. Requisite Properties:
 - 1. Panel Sizes: Indicated on the Drawings.
 - 2. Thickness: At least 0.0359-inch BMT (MSG 20) pre-painted steel sheet.
 - 3. Exposed Finish: Manufacturer's standard PVDF 3-coat color finish; color selected by the Architect from the manufacturer's standard colors.
 - 4. Bottom Side Finish: Manufacturer's standard pretreatment and white or light-colored acrylic or polyester backer finish consisting of both prime and wash coats for a total DFT of at least 0.5-mil.
 - 5. Texture: Smooth.
 - 6. Attachment Method: Back ventilated rainscreen system.
 - 7. Nominal Panel Joint Size: Indicated on the Drawings.
- D. Metallic Finishes: Panels, components, and accessories having a metallic finish must be finished such that the metallic finish directionality (grain) of all components runs in the same direction when installed. Color variation caused by failure to comply with this requirement is non-conforming work.

2.3 SUPPORTING FRAMEWORK

- A. Metal Sub-Framing: Hat channels, C channels, Z girts, and other items indicated on the Drawings, all made from aluminum sheet conforming to ASTM B 209, Alloy 5005-H32 or Alloy 3003-H14.
- B. Plastic Composite Sub-Framing: Z girts, attachment clips, and other items indicated on the Drawings, all designed to prevent metal-thermal bridging
 - 1. Z Girts: "GreenGirt - Simple Z" thermal attachment members manufactured by Advanced Architectural Products, or equal.
 - 2. Attachment Clips: "Cascadia Clip" thermal spacers manufactured by Cascadia Windows Ltd., or equal.
- C. Backing Plates: Provide metal backing plates fabricated from material recommended by manufacturer.
- D. Clips, Pins, and Fasteners: Concealed, non-corrosive, non-deteriorating clips, pins and fasteners of quantity and type required, recommended, or accepted by manufacturer and that are that are compatible with panel faces.
 - 1. Secure clips in the manufacturer's facility as much as is reasonably practicable.
 - 2. Pop rivet attachment of clips and accessories is prohibited.

- E. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
 - 1. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
 - 2. Reinforce framing members as required to receive fastener threads.
 - 3. Exposed fasteners are prohibited on faces exposed to view. Provide concealed fasteners and expansion provisions.

2.4 ACCESSORIES

- A. Flashing: At least 0.0239-inch BMT (MSG 24) pre-painted steel sheet matching panels.
 - 1. Provide flashing and trim required to seal against weather and to match finished appearance. Locations include bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers.
 - 2. Finish flashing and trim with same finish system as adjacent panels.
- B. Gaskets and Seals used in Panel Assembly: Supplied, required, recommended, or accepted by the manufacturer to conform to specified performance criteria; color selected by the Architect from manufacturer's standard colors.
- C. Closures: Fabricated from same material as panels, and with same finish system as adjacent panels.
- D. Edge Members and Perimeter Extrusions: Extruded aluminum at least 0.063-inch thick, with integral weather-stripping and finish matching adjacent panels.
- E. Coped and Mitered Corners: Trimless structurally-bonded corners matching panel profile, shape, material, and finish; and without exposed fasteners.
- F. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.5 FABRICATION

- A. Fabricate flashing and trim in conformance with SMACNA publication "*Architectural Sheet Metal Manual*" requirements for design, dimensions, metal, and other characteristics.
 - 1. Form exposed sheet metal accessories without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 2. Fabricate cleats and attachment devices from the same material as the accessory being anchored, or from compatible, noncorrosive metal required or recommended by metal wall panel manufacturer.
 - 3. Exposed fasteners are prohibited from faces of accessories exposed to view.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification:
 - 1. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
 - 2. Verify items penetrating wall panels are installed.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 - 1. Install wall panels using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 - 2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
 - 3. Completed work must match approved samples and mockups, as accepted by the Architect.
 - 4. Installed wall panels must be warrantable. Do not install, correct, or replace wall panels in a manner that results in any warranty or guarantee becoming void.
- B. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach wall panels to supporting construction.
- C. Installation Tolerances: Install wall panels within the following tolerance variations.
 - 1. Squareness: Not more than 1/8-inch difference in diagonal measurements.
 - 2. Maximum Offset between Components at Joints: 1/16-inch except that offset are not allowed at welded joints.
 - 3. Maximum Misalignment of Adjacent Members: 1/16-inch.
 - 4. Maximum Bow: 1/8-inch in 48 inches.

5. Maximum Deviation from Plane: 1/16-inch in 48 inches.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
 1. Damaged finishes must be restored so that no evidence remains of corrective work.
 2. Return to the factory those items that either cannot be refinished on-site, or that contain components that cannot be refinished on-site.
 3. either refinish the entire item or provide a new item
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Cleaning Work: After installation, correction, and repair are complete, remove strippable film or other temporary protection. Promptly remove from exposed metal surfaces anything that might interfere with uniform oxidation or weathering. Clean all visible surfaces in a manner that does not result in any warranty or guarantee becoming void.
 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.5 PROTECTION

- A. Protect installed wall panels in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything adjacent to or against installed wall panels unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed wall panels as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 07 62 00 – SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Shop- or field-fabricated flashings used for roofing and flashing applications.
2. Delegated design of flashing assemblies.
3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 05 50 00 for dissimilar metal corrosion protection.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. BMT: Base Metal Thickness.msg
2. HDG: Hot-Dip Galvanized.
3. MSG: Manufacturer's Standard Gage for Sheet Steel.
4. USSG: United States Standard Gage for Sheet.
5. NRCA: National Roofing Contractors Association.
6. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association.

B. Definitions:

1. Fabricator: Means the decorative flashing fabricator, unless otherwise indicated.
2. Manufacturers' Standard Gage for Sheet Metal: Means the thickness steel sheet based on a weight of 41.82 pounds per square foot per inch of thickness.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate installation of roof perimeter flashings with installation of roof drainage system.
2. Coordinate installation of counterflashing with installation of base flashings.
3. Coordinate installation of roof-penetration flashings with installation of roofing and other items penetrating roof.
4. Coordinate the installation of equipment support flashings with the installation of roofing and equipment.

5. Coordinate the installation of wall flashings with the installation of wall-opening components, including windows, doors, and louvers.
- B. Delegated Design Requirements:
1. Engineer, fabricate, assemble, and install flashings that conform to the profiles indicated and other Contract Document requirements; meet specified performance criteria; and results in structurally sound, non-corroding, and weathertight assemblies that accommodate, resist, distribute, or transfer in-service loads without incipient or catastrophic failure.
 2. Maintain visual design concept indicated, including sizes, profiles, and alignments. Deviation from visual design concept is non-conforming work and prohibited without prior written acceptance by the Architect.
- C. Performance Requirements:
1. Design Pressure: Calculate in conformance with American Society of Civil Engineers/ Structural Engineering Institute publication ASCE/SEI 7, "*Minimum Design Loads and Associated Criteria for Buildings and other Structures*".
 2. Design Wind Rating:
 - a. Minimum Roof Field Area: 60 pounds per square foot.
 - b. Roof Perimeter Area: 90 pounds per square foot.
 - c. Roof Corner Area: 120 pounds per square foot.
 3. Design Negative Uplift Pressure: Coping system must conform to FMG requirements for at least a Class I-90 wind uplift rating.
 4. Thermal Expansion and Contraction: Accommodate movement resulting from at least 120 deg. F ambient and 180 deg. F material surface temperature differentials (changes).
 5. Dissimilar Metal Corrosion Protection: Permanently isolate metal surfaces from direct contact with incompatible materials and other potentially corrosive substrates.
- D. Preinstallation Meeting:
1. Hold a meeting after submittal approval and at least 10 business days before beginning installation.
 2. During the meeting, review the Contract Documents, submittals, project conditions, and installation sequence and methods, including special details and conditions that might affect installation
 3. Identify and discuss adverse or unfavorable conditions detrimental to protecting stored materials or to installation; or to the quality, durability, appearance, or performance of installed flashings. Resolve each condition.
 4. Finalize construction schedule.
 5. Record significant discussions and distribute meeting minutes. Do not begin installation until disagreements are successfully resolved to the satisfaction of all parties.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
1. Product Data:
 - a. For manufactured items, submit manufacturer's product data, specifications, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 2. Shop Drawings:
 - a. Submit dimensioned plans and elevations drawn to scale and showing flashing layout and types. Show locations, sizes, and extents of all items, accessories, and trim. Label manufactured items by product name.
 - b. Include project-specific dimensioned details drawn to scale showing profiles, shapes, joints, seams, and dimensions, including coves, miters, and corner conditions. Cross-reference details to plans and elevations.
 - c. Indicate method of attaching, fastening, joining, adhering, and anchoring to adjacent construction.
 - d. Show backings, embedments, fasteners, brackets, clips, cleats, straps, mounting devices, and other attachments.
 - e. Label each attachment type; indicate manufacturer's product name for each manufactured item.
 - f. Indicate base material and finish, fastener material and finish, and material and finish of items being fastened or attached.
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
1. Delegated Design Submittals: Together with shop drawings, submit engineering calculations demonstrating conformance to the Contract Documents and all impacts of delegated design scope of work on other work.
 - a. Calculations must be explicit and legible and must incorporate distinct cross-references to submitted shop drawings in sufficient quantity to render the calculations readily intelligible and reviewable.
 - b. At a minimum, calculations must include design loads; analysis of supporting construction, including section-property computations; analysis of fasteners, anchors, attachments, and connectors; and signature and seal of the licensed professional engineer responsible for preparing them.
 - c. Test reports are not an acceptable substitute for calculations and are returned to the Contractor without review or responsive action, except to record non-conformance with this requirement.
 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.

1.5 QUALITY ASSURANCE

A. Quality Standard Requirements:

1. Design Standard: Comply with SMACNA publication "*Architectural Sheet Metal Manual*" requirements for design dimensions, geometry, metal thickness and other characteristics, and installation of flashings.
2. Installation Standard: Comply with NRCA publication "*Roofing and Waterproofing Manual*", Volume 2, "*Architectural Sheet Metal and Metal Roofing*" requirements for the design and installation of sheet metal flashing and trim items installed as part of roofing applications.

B. Qualifications:

1. Fabricator: Company or individuals must have at least 10 years' experience fabricating flashings installed on at least 100 previous projects similar to this project in size, material, design, and complexity
2. Installer: Company or individuals must have at least 5 years' experience installing flashings for at least 30 previous projects similar to this project in size, material, design, and complexity.
3. Supervisors: Individuals must have at least 7 years' experience installing flashings for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading flashing installers.
4. Engineer: Must be a licensed professional structural engineer registered to practice in California having at least 10 years' experience performing the kind of engineering services indicated for at least 20 previous projects similar to this project in size, material, design, and complexity.

C. Mockups: If an *ex-situ* exterior wall integrated mockup is required for this project, then integrate flashing into the mockup as part of the work of this specification section.

1.6 HANDLING

A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.

1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
2. Unload and store only inspected and accepted items.

B. Storage: Store unloaded items as shipped. Furnish adequate dunnage and bracing during storage.

1. Prevent stored items from contacting the floor or ground, from soiling and staining, and from deterioration and damage.
2. If items are not stored in an enclosed location, then cover the tops and sides with securely-tied, waterproof, and breathable covers. Unvented polyethylene tarpaulins do not qualify as breathable covers and are prohibited. (due to potential accumulation of moisture beneath tarpaulin during certain environmental conditions)

3. Incline covered items to ensure maximum drainage of accumulated moisture.
 4. Do not leave items uncovered where they might be exposed to weather or become wet from rain, mist, relative humidity, condensation, frost, and other sources of moisture; or exposed to other sources of deterioration and damage.
- C. Handling: Handle items in a manner that that prevents damage.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective flashings with undamaged new flashings that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Hot-Dip Galvanized and Galvannealed Steel Sheet: ASTM A 653, CS Type B (commercial steel), with equal coating weight on each surface, coating weight designation (mass designation) indicated below on both surfaces.
1. Natural Finish (Galvanized): Provide material with at least a G90 coating weight, regular spangle, chemically treated (desired for humid-storage stain resistance; can still be painted; recommended for sheet that will be used unpainted), and oiled (intended as a corrosion inhibitor; sheet must be thoroughly cleaned to remove the oil prior to painting).
 2. Shop-Painted Finish (Galvanized): Provide material with at least a G90 coating weight, minimized spangle, chemically treated (desired for humid-storage stain resistance; can still be painted; recommended for sheet that will be used unpainted), and oiled (for enhanced formability; sheet must be thoroughly cleaned to remove the oil prior to painting).
 3. Field-Painted Finish (Galvannealed): Provide material with at least an A60 coating weight, not chemically treated, not oiled, and mill phosphatized (paint-grip finish; provides enhanced lubricating characteristics).
- B. Stainless Steel Sheet:
1. Exposed Locations: ASTM A 666 (annealed and tempered), Type 304L (for welded applications) or Type 304 (for all other applications), annealed, No. 2 (half hard) temper (hardness between Rockwell B-65 and B-70; can be bent 90 degrees across the direction of rolling around a radius equal to its thickness), passivated in conformance with ASTM A 967.
 - a. Natural Finish: Furnish materials having a No. 2B (bright) finish.
 - b. Painted Finish: Furnish materials having a No. 2D (matte) finish.
 2. Concealed Locations: ASTM A 240 (annealed) Type 304L (for welded applications) or Type 304 (for all other applications), annealed, No. 2 (half hard) temper (hardness between Rockwell B-65 and B-70; can be bent 90 degrees across the direction of

rolling around a radius equal to its thickness), passivated in conformance with ASTM A 967.

3. Natural Finish: Furnish materials having a No. 4 (bright) finish.
- C. Aluminum Sheet: ASTM B 209, 5005-H32 (for anodic finishing) and 3003-H14 (for painted or unfinished sheet).
- D. Pre-Painted Coated Steel Coil and Sheet: ASTM A 755.
1. Sheet: Hot-dip galvanized and galvanized steel sheet.
 2. Top Side Finish: 70-percent by weight liquid polyvinylidene fluoride (PVDF) coating system conforming to AAMA 2605 and consisting of a prime coat applied to a DFT of at least 0.2-mil and solid color coat applied to a DFT of at least 0.75-mil; or metallic color coat applied to a DFT of at least 0.75-mil and a clear top coat applied to a DFT of at least 0.50-mil.
 3. Reverse Side Finish: 0.25-mil DFT acrylic bottom side primer and polyester wash coat (backercoat).
 4. Painted Metallic Finishes: Panels, components, and accessories having a painted metallic finish must be finished such that the metallic finish directionality (grain) of all components runs in the same direction when installed. Color variation caused by failure to comply with this requirement is rejected as non-conforming work.

2.2 ROOFING AND ROOF EDGE FLASHINGS AND TRIM

A. Description:

1. Copings: Fabricate from at least 0.0359-inch BMT (MSG 20) hot-dip galvanized and galvanized steel sheet.
2. Scuppers and Conductor Heads: Fabricate from at least 0.0359-inch BMT (MSG 20) hot-dip galvanized and galvanized steel sheet.
3. Gutters: Fabricate from at least 0.0359-inch BMT (MSG 20) hot-dip galvanized and galvanized steel sheet.
4. Downspouts: Fabricate from at least 0.0359-inch BMT (MSG 20) hot-dip galvanized and galvanized steel sheet.

B. Requisite Properties:

1. Profiles, Edge Styles, and Attachments: Indicated on the Drawings.
2. Joint Style: J2. (butt and backup plate)
3. Fabrication: Provide standard profiles from the SMACNA quality standard publication, Chapter 1.
 - a. Fabricate in sections between 8-and 10-feet long,
 - b. Fabricate backup plates from the same material and thickness as copings.
 - c. Miter corners, seal, mechanically fasten, and solder or weld watertight.
 - d. All corners and transitions must be shop or factory fabricated. Corner pieces shall extend minimum 12 inches beyond corner in both directions.
 - e. Only linear transitions may be field fabricated.

- f. Finish: Filed-applied duplex coating.

2.3 OTHER SHEET METAL FLASHINGS AND TRIM

A. Description:

1. Interlocking Counterflashing: Provide same material and thickness as reglets.
2. Through-Wall Flashings: Fabricate from at least 0.0250-inch thick (USSG 24) stainless steel sheet.
3. Opening Flashings in Framed Construction: Fabricate from at least 0.0359-inch BMT (MSG 20) hot-dip galvanized and galvanized steel sheet.
4. Equipment Support Flashings: Fabricate from at least 0.0299-inch BMT (MSG 22) hot-dip galvanized and galvanized steel sheet.
5. Overhead-Piping Drip Pans: Fabricate from at least 0.0359-inch BMT (MSG 20) hot-dip galvanized and galvanized steel sheet.
6. Elevator Hoistway Guards: Fabricate from at least 0.0359-inch BMT (MSG 20) hot-dip galvanized and galvanized steel sheet.
7. Backpans: Fabricate from at least 0.0359-inch BMT (MSG 20) hot-dip galvanized and galvanized steel sheet, with equal coating weight on each surface, coating designation G90, not chemically treated, not oiled. Stiffen back pans as necessary to prevent "oil canning" or excessive deflection under load.
8. Flashings and Trim in Contact with Aluminum Components: Fabricate from at least 0.032-inch aluminum sheet.
9. Flashings and Trim in Contact with Concrete, Gravel, or Soil and Elsewhere Indicated: Fabricate from at least 26-ga. stainless steel Type 316 sheet.
10. Other Flashings and Trim: Unless otherwise noted, fabricate from at least 0.0299-inch BMT (MSG 22) hot-dip galvanized and galvanized steel sheet; or from at least 0.0250-inch (USSG 24) Type 316 stainless steel sheet.

2.4 ACCESSORIES

- A. Splash Pans: Standard precast concrete units cast from at least 4,000 pounds per square inch concrete. Precast units must have rounded corners and smooth and dense surfaces free of honeycombs.
- B. Soldering Materials:
 1. HDG Sheet Metal Solder and Flux: 50-percent tin solder conforming to ASTM B 32 Grade Sn50 and used with a non-corrosive flux.
 2. Stainless Steel Sheet Metal Solder and Flux: 60-percent tin solder conforming to ASTM B 32 Grade Sn60 and used with an acid flux.
- C. Fasteners: Provide fasteners and accessory materials suitable to the type of use and conditions of installation and service indicated; and as required for producing secure attachment to supporting construction without staining or deterioration of either the base materials or fastened materials; or deterioration of the fastener itself when in contact with base materials or fastened materials.

1. Pop rivet attachment is prohibited.
 2. Provide fasteners are made of the same material as the fastened material or have a suitable barrier protection coating.
 - a. Apply corrosion-inhibiting material (e.g., pastes, washers, compounds, etc.) under the heads of screws or bolts inserted into dissimilar metal, even if they are already treated or have a protective coating.
 - b. Washers, gaskets, and sleeves must be made of plastic or closed-cell polychloroprene (Neoprene).
 3. Verify fasteners and accessories that are galvanically compatible with fastened materials under conditions of installation and service, as demonstrated by the fastener manufacturer based on testing and field experience. Do not use fasteners that are corrosive or otherwise incompatible with fastened materials.
 4. Where fasteners are subject to loosening or turning out due to thermal and structural movements, wind loads, vibration, and other causes, provide self-locking devices that either maintain tension in the fastener assembly or remain locked even if tension in the assembly is lost. (e.g. washers, locknuts, and similar items)
 5. Exposed fasteners are prohibited on faces exposed to view. Provide concealed fasteners and expansion provisions. Where unavoidable, provide flat head cap screws (type FHCS) with drive slots filled and finished flush and smooth with adjacent surfaces.
- D. Underlayment:
1. Description: Self-adhering cross-laminated high-density polyethylene (HDPE) composite sheet/non-asphaltic butyl adhesive flashing membrane, with release liner on the adhesive side. Asphaltic adhesive flashing membranes are prohibited.
 2. Product: "Grace Ultra" manufactured by GCP Applied Technologies, or equal.
 3. Requisite Properties:
 - a. Minimum Thickness: At least 30 mils.
 - b. Minimum Roll Width: 36 inches.
 - c. Maximum UV Exposure Limit: Not more than 100 days.
 - d. Maximum High Temperature Application: Up to 300 deg F.
- E. Sealant:
1. Exposed Sealant: "756 SMS" neutral-curing silicone sealant manufactured by Dow Corning Corp., or equal conforming to ASTM C 920.
 2. Concealed Sealant: Single-component, solvent-release plasticized polyisobutylene (butyl rubber) conforming to ASTM C 1311; black color.
 3. Sheet Metal Lap Sealant: "Sikaflex 15LM" low-modulus urethane sealant manufactured by Sika Corp., or equal.
 4. Color: Selected by the Architect from the manufacturer's standard colors.
- F. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape 1/2-inch wide and 1/8-inch thick.

- G. Bituminous Coating: Cold-applied asphalt emulsion conforming to ASTM D 1187.
- H. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.5 FABRICATION

A. Shop Fabrication:

1. Before beginning fabrication, apply strippable film or other temporary protection normally furnished or necessary to protect metal from deterioration and damage during fabrication.
2. Fabricate items in largest sections practicable to minimize field jointing.
3. Fabricate flashing in thickness or weight needed to conform to the specified performance requirements, but not less than indicated for each application and metal.
4. Fabricate exposed work precise, straight, and true to line, size, and shape; plumb, level, and square within allowable tolerances; and with accurate angles and surfaces, and crisp straight edges.
5. Fabricate flashing without excessive oil canning, buckling, and tool marks; precise, straight, and true to line, size, shape, and levels indicated; with accurate angles and straight edges; and with exposed edges folded back to form hems.
6. Fabricate exposed connections with flush hairline joints, and square and true edges and corners.
7. Inside and outside corners, and changes in direction, must be fabricated watertight assemblies with mechanically-fastened and continuously welded or soldered joints.
8. Form non-expansion, but movable, joints in metal to accommodate sealant. Where lapped expansion provisions cannot be used, form expansion joints with at least one-inch deep intermeshing hooked flange; fill with butyl sealant concealed within joints.
 - a. Exposed fasteners are prohibited on faces exposed to view.
 - b. Provide concealed fasteners and expansion provisions elsewhere.
9. Fabricate cleats and attachment devices from the same material as the item being anchored, of sizes as recommended by the SMACNA quality standard publication for the application, but not less than thickness of metal being secured
10. Do not use graphite pencils to mark metal surfaces.

B. Fabrication Tolerances: Fabricated items must conform to the following; specified tolerances are non-cumulative.

1. Maximum Offset between Components at Joints: 1/8-inch except that at welded joints, offset are not allowed.
2. Maximum Deviation from Slope and Location Lines: 1/4-inch in 20 feet.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify that in-place construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the fabricator's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 - 1. Scribe and cope items as necessary for an accurate fit. Perform required cutting, drilling, and fitting for flashing installation.
 - 2. Set flashings true to line, to required levels and lines, plumb, square, and cut and fitted without warp or rack; sloped or level as required; with flush well-fitted joints; and in alignment with adjacent construction.
 - 3. Shim as required with concealed shims.
 - 4. Install exposed flashings without excessive oil canning, buckling, and tool marks. Do not use graphite pencils to mark metal surfaces.
 - 5. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 - 6. Fit exposed connections accurately to form flush hairline joints. Trim to fit substrates and to result in watertight performance. Torch cutting is prohibited.
 - 7. Set sheet metal in bed of urethane sealant over concrete surfaces or coat with bituminous coating where compatible with overlying materials to prevent galvanic corrosion.
 - 8. Install sealant tape where indicated.
- B. Expansion Provisions: Provide provisions for thermal expansion.
 - 1. Space movement joints not more than 10 feet on center. Joints may not be located within 24 inches of corners or intersections.
 - 2. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints with intermeshing hooked flanges at least one inch deep, and fill with sealant concealed within the joints.

3. At exposed sheet metal fabrications, provide 8 in. wide splice plates. Set sheet metal laps in low-modulus urethane sealant. At sheet metal backing, provide 8-inch wide splice plates or at least 4-inch laps set in bed of low-modulus urethane sealant between pieces of sheet metal. Do not apply sealant to surface of joints.
- C. Seal joints where indicated on the Drawings and as required for watertight construction.
1. Where sealant-filled joints are used, embed hooked flanges of joint members at least one inch into the sealant. Form joints to completely conceal sealant.
 2. When ambient temperature at the time of installation is between 40 and 70 deg. F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg. F.
 3. Prepare joints and apply sealants in conformance with Section 07 92 00.
- D. Soldered Joints:
1. Soldered joints must also be mechanically fastened
 2. Clean surfaces to be soldered.
 3. Pre-tin sheet edges to at least 1-1/2 inches from the edge; reduce pre-tinning area where the pre-tinned surface might show in the completed work.
 4. Promptly remove acid flux residue from metal after tinning and soldering. Clean and neutralize in conformance with the solder manufacturer's installation instructions.
 5. Do not use torches for soldering.
 6. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
- E. Special Techniques:
1. Roof Drainage System: Install sheet metal roof drainage components as indicated to produce a complete roof drainage system conforming to the referenced standard.
 2. Roof Flashing: Install sheet metal flashing and trim in conformance with specified performance requirements, the SMACNA quality standard publication requirements. Provide concealed fasteners where possible, set units true to line, and level. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
 3. Roof Edge Flashing: Anchor to resist uplift and outward forces in conformance with the SMACNA quality standard publication and recommendations. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.
 4. Copings: Anchor to resist uplift and outward forces in conformance with the SMACNA quality standard publication requirements and recommendations and roofing requirements.
 - a. Interlock exterior bottom edge of coping with continuous cleat anchored to the supporting substrate at not more than 24-inches on center.
 - b. Anchor the interior leg of copings with washers and screw fasteners through slotted holes at not more than 24 inches on center.

5. Pipe and Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.
 6. Counterflashing: Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with sealant. Secure in a waterproof manner by means of snap-in installation and sealant.
 7. Roof-Penetration Flashing: Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof. All penetrations must receive umbrella flashings.
 8. Wall Flashing: Install sheet metal wall flashing as indicated, and to intercept and exclude penetrating moisture in conformance with the referenced standard's recommendations.
 9. Opening Flashing in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend beyond wall openings as indicated on the shop drawings.
 10. Miscellaneous Flashing:
 - a. Equipment Support Flashing: Weld or seal flashing with elastomeric sealant to equipment support members.
 - b. Overhead-Piping Safety Pans: Suspend pans independent from structure above as indicated. Pipe and install drain lines to plumbing waste or drainage system as indicated on the plumbing drawings.
- F. Interface with Adjacent Items:
1. Provide materials, components, and accessories normally furnished or necessary to securely attach flashing to supporting construction.
 2. Provide provisions for thermal and structural movement.
 3. Space cleats not more than 12 inches apart. Anchor each cleat with at least 2 fasteners. Bend tabs over fasteners.
- G. Installation Tolerances: Shim and align flashing within an installed tolerance of 1/4-inch in 20 feet on slope and location lines indicated, and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and

3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.

- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Cleaning Work: After installation, correction, and repair are complete, remove strippable film or other temporary protection. Promptly remove from exposed metal surfaces anything that might interfere with uniform oxidation or weathering.
 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.
- C. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.5 PROTECTION

- A. Protect installed flashing in place from deterioration and damage until Substantial Completion.
- B. Do not store anything on, adjacent to, or against installed flashings unless they are protected from damage. Do not use installed flashings as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 07 65 26 – SASM FLASHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. SASM through-wall, opening, penetration, and transition flashings that are not integral to WRB or AB installation.
2. Roof and façade SASM underlayment.
3. Installation materials.
4. Surface preparation.
5. Site tests and inspections.
6. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 06 16 43 for treatment of sheathing panel joints.
2. Section 07 25 13 for self-adhering sheet flashings, installation materials, and accessories integral to sheet WRB installation.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. WRB: Weather-Resistive Barrier.
2. VDR: Vapor Diffusion Retarder.
3. AB: Air Barrier.
4. SASM: Self-Adhering Sheet Membrane.
5. UV: Ultraviolet Solar Radiation.

B. Definitions:

1. Manufacturer: Means the flashing manufacturer, unless otherwise indicated.
2. Roof: Means the top cover of a building having a slope of 60 degrees or less from the zero-degree horizontal plane.
3. Non-Roof: Means the top cover of a building having slope more than 60 degrees from the zero-degree horizontal plane.
4. Wall: Means one of the sides of a room or building connecting a floor and ceiling or foundation and roof, and having slope less than 30 degrees from the 90-degree vertical plane.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Performance Requirements: SASM flashing membranes installed around the perimeter of exterior opening assemblies and other penetrations must conform to Level 3 (elevated temperature exposure) requirements of American Architectural Manufacturers Association publication AAMA 711, *Voluntary Specification for Self-Adhering Flashing Used for Installation of Exterior Wall Fenestration Products*.
- B. Coordination: Verify chemical and adhesive compatibility of selected flashings with installed waterproofing, WRBs, ABs, VDRs, roofing, sealants, and other items with which the flashings are in direct contact, based on current product formulations.
- C. Preinstallation Meeting:
 - 1. Hold a meeting after submittal approval and at least 10 business days before beginning installation.
 - 2. During the meeting, review the Contract Documents, submittals, project conditions, and installation sequence and methods, including special details and conditions that might affect installation
 - 3. Identify and discuss adverse or unfavorable conditions detrimental to protecting stored materials or to installation; or to the quality, durability, or performance of installed WRBs. Resolve each condition.
 - 4. Finalize construction schedule.
 - 5. Record significant discussions and distribute meeting minutes. Do not begin installation until disagreements are successfully resolved to the satisfaction of all parties.
- D. Sequencing:
 - 1. Install flashings only after penetrating items are installed.
 - 2. Install flashings only after openings are framed.
- E. Scheduling:
 - 1. Installations Requiring Primer: Flashings must be applied within 24 hours of primer installation. Schedule installation to limit exposure of primed surfaces to not more than 24 hours. Re-prime surfaces exposed for more than 24 hours in conformance with manufacturer's instructions for re-priming.
 - 2. UV Exposure: Schedule installation to keep flashing exposure to UV within the manufacturer's recommended limits.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
 - 1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets

(SDSs), both of which are returned to the Contractor without review or responsive action.

2. Shop Drawings:
 - a. Submit dimensioned drawings showing joints, seams, tie-ins, and dimensions, including terminations, penetrations, coves, interior and exterior corner conditions, openings, penetrations, and expansion and drift joints.
 - b. Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project.

- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
 1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished flashings.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.
 3. Manufacturer's Representative Reports:
 - a. Before beginning work, request and submit reports confirming substrates are properly prepared in conformance with manufacturer's instructions and other requirements and recommendations; are acceptable and satisfactory to receive the work of this specification section; and conform to all requirements necessary to issue specified and other warranties.
 - b. During the work, request and submit reports documenting actions taken by the manufacturer's representative to verify conformance with manufacturer's instructions and other requirements and recommendations.
 - c. Upon completion, request and submit reports confirming installed roofing conforms to all requirements necessary to issue specified and other warranties.

1.5 QUALITY ASSURANCE

- A. Source Limitations:
 1. Flashings must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.

2. Flashings must be obtained only from a manufacturer that sends a representative to the project site before beginning work to verify existing conditions; and during work to perform manufacturer's field services.
3. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.

B. Qualifications:

1. Manufacturer: Company or individuals must have at least 10 years' experience manufacturing flashings installed on at least 200 previous projects similar to this project in size, material, design, and complexity.
2. Installer: Company or individuals must have at least 5 years' experience installing flashings for at least 30 previous projects similar to this project in size, material, design, and complexity.
3. Supervisors: Individuals must have at least 7 years' experience installing flashings for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading flashing installers.
4. Manufacturer's Representative: Individuals must have at least 5 years' technical field experience performing manufacturer's services for at least 50 previous projects similar to this project in size, material, design, and complexity.

- C. Mockups: If an *ex-situ* exterior wall integrated mockup is required for this project, then integrate flashings into the mockup as part of the work of this specification section.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped and in conformance with manufacturer's instructions and other requirements and recommendations for storage. Furnish adequate dunnage during storage.
1. Prevent stored items from contacting the floor or ground and from deterioration and damage.
 2. Sheet products must be tightly rolled face out on a sturdy core designed for that purpose and vertically stored unless otherwise required or recommended by the manufacturer. Promptly remove and replace rolled sheet products that are flattened or distorted during shipping, unloading, or storage.
 3. If items are not stored in an enclosed location, then cover the tops and sides with securely-tied, waterproof, and breathable covers. Unvented polyethylene tarpaulins do not qualify as breathable covers and are prohibited. (due to potential accumulation of moisture beneath tarpaulin during certain environmental conditions)

4. Incline covered items to ensure maximum drainage of accumulated moisture.
 5. Do not leave items uncovered where they might be exposed to weather or become wet from rain, mist, relative humidity, condensation, frost, and other sources of moisture; or exposed to other sources of deterioration and damage, including heat and sudden changes in temperature, and UV exposure beyond manufacturer-recommended limits.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.
- D. Damaged Item Replacement: Promptly remove and replace items that are deteriorated, damaged, or defective with undamaged new items that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 PROJECT CONDITIONS

- A. Ambient Conditions: Install flashings only when ambient temperature, RH, and other environmental conditions fall within ranges required, recommended, or accepted by the manufacturer.
1. Do not install flashings during rain or snow, fog or mist; or when rain or snow is predicted within 24 hours of installation.
 2. Proceed only when there is no threat of impending precipitation, and both current and forecasted weather conditions conform to those required, recommended, or accepted by the manufacturer.
- B. Existing Conditions: Surfaces to which flashings are installed must be dry. Install flashings only when substrate moisture content and surface temperature fall within ranges required, recommended, or accepted by the manufacturer.
- C. Other Conditions: Do not apply flashings where dust is generated, or liquids are sprayed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
1. Carlisle Coatings and Waterproofing Inc.
 2. GCP Applied Technologies.
 3. Henry Co.

2.2 THROUGH-WALL SASM FLASHING

A. Standard Through-Wall Flashing:

1. Description: Self-adhering cross-laminated high-density polyethylene (HDPE) composite sheet/rubberized asphalt adhesive flashing membrane, with release liner on the adhesive side, conforming to AAMA 711 requirements for self-adhered flashing materials.
2. Applications: Through-wall flashing for cavity wall applications.
3. Products: "Perm-A-Barrier Wall Flashing" manufactured by GCP Applied Technologies, or equal.
4. Requisite Properties:
 - a. Minimum Thickness: At least 40 mils.
 - b. Minimum Roll Width: At least 12 inches.
 - c. Maximum UV Exposure Limit: Not more than 45 days.
 - d. Color: Green with repeated logo imprint.
5. Performance Requirements:
 - a. Maximum Water Vapor Transmission: Not more than 0.05-perm, when tested in conformance with ASTM E 96 method B.
 - b. Minimum Pull Adhesion to Concrete: At least 60 pounds per foot, when tested in conformance with ASTM D 903 modified.
 - c. Minimum Low Temperature Flexibility: Unaffected at minus 45 deg. F, when tested in conformance with ASTM D 1970.
 - d. Minimum Elongation: At least 200 percent, when tested in conformance with ASTM D 412 die C modified.

B. Aluminum-Faced Detail Membrane:

1. Description: Aluminum-faced self-adhering cross-laminated high-density polyethylene (HDPE) composite sheet/rubberized asphalt adhesive, with release liner on the adhesive side, conforming to AAMA 711 requirements for self-adhered flashing materials.
2. Applications: Detail membrane for air and vapor barrier applications.
3. Restrictions: May not be used when aluminum facing might contact cementitious materials (e.g., Portland cement plaster) or dissimilar metals.
4. Products: "Perm-A-Barrier Aluminum Flashing" manufactured by GCP Applied Technologies, or equal.
5. Requisite Properties:
 - a. Minimum Thickness: At least 40 mils.
 - b. Minimum Roll Width: At least 9 inches.
 - c. Maximum UV Exposure Limit: Not more than 270 days.
 - d. Color: Natural finish aluminum.
6. Performance Requirements:
 - a. Maximum Water Absorption: Not more than 0.1 percent, when tested in conformance with ASTM D 570.

- b. Minimum Puncture Resistance: At least 80 pounds, when tested in conformance with ASTM E 154.
- c. Minimum Elongation: At least 200 percent, when tested in conformance with ASTM D 412 die C modified.

2.3 OPENING AND PENETRATION SASM FLASHING

A. Standard SASM Flashing:

- 1. Description: Self-adhering cross-laminated high-density polyethylene (HDPE) composite sheet/rubberized asphalt adhesive flashing membrane, with release liner on the adhesive side, conforming to AAMA 711 requirements for self-adhered flashing materials.
- 2. Applications: Deck-to-wall intersections, inside and outside corners of sheathing, wall-to-wall tie-ins, foundation sill plates, sheathing panel seams, and other non-roof detail areas.
- 3. Restrictions: May not be used
 - a. in hot desert areas in the southwestern United States;
 - b. in contact with with flexible PVC or vinyl windows; and
 - c. with certain metal windows having integral nail fins.
- 4. Products: "Vycor Plus" manufactured by GCP Applied Technologies, or equal.
- 5. Requisite Properties:
 - a. Minimum Thickness: At least 25 mils.
 - b. Minimum Roll Width: At least 9 inches.
 - c. Maximum UV Exposure Limit: Not more than 21 days.
 - d. Color: Black-gray.
- 6. Performance Requirements:
 - a. Maximum Water Vapor Transmission: Not more than 0.05-perm, when tested in conformance with ASTM E 96 method B.
 - b. Minimum Pull Adhesion to Plywood: At least 3 pounds per inch, when tested in conformance with ASTM D 903 modified.
 - c. Minimum Low Temperature Flexibility: Unaffected at minus 20 deg. F. , when tested in conformance with ASTM D 1970.
 - d. Minimum Elongation: At least 250 percent, when tested in conformance with ASTM D 412 die C modified.

B. Aluminum-Faced SASM Flashing:

- 1. Description: Aluminum surfaced self-adhering cross-laminated high-density polyethylene (HDPE) composite sheet/rubberized asphalt adhesive, with release liner on the adhesive side, conforming to AAMA 711 requirements for self-adhered flashing materials.
- 2. Applications: Deck-to-wall intersections, inside and outside corners of sheathing, wall-to-wall tie-ins, foundation sill plates, sheathing panel seams, and other non-roof detail areas.
- 3. Restrictions: May not be used

- a. in hot desert areas in the southwestern United States;
 - b. in contact with flexible PVC or vinyl windows;
 - c. with certain metal windows having integral nail fins; and
 - d. when aluminum facing may contact cementitious materials (e.g., Portland cement plaster) or dissimilar metals.
4. Products: "Vycor Aluminum Flashing" manufactured by GCP Applied Technologies, or equal.
5. Requisite Properties:
- a. Minimum Thickness: At least 25 mils.
 - b. Minimum Roll Width: At least 6 inches.
 - c. Maximum UV Exposure Limit: Not more than 350 days.
 - d. Color: Natural finish aluminum.
- C. Butyl SASM Flashing:
1. Description: Self-adhering cross-laminated polypropylene sheet/non-asphaltic butyl adhesive flashing membrane, with release liner on the adhesive side, conforming to AAMA 711 Level 3 requirements for elevated exposure self-adhered flashing materials. Asphaltic adhesive flashing membranes are prohibited.
 2. Applications: Used for flashing around window and door headers, sills, jambs, thresholds, and nailing flanges; and under exterior plaster (stucco) trims.
 3. Products: "Vycor PRO" manufactured by GCP Applied Technologies, or equal.
 4. Requisite Properties:
 - a. Minimum Thickness: At least 14 mils.
 - b. Minimum Roll Width: At least 9 inches.
 - c. Maximum UV Exposure Limit: Not more than 100 days.
 - d. Color: White with green paint.
- 2.4 SASM UNDERLAYMENT
- A. Description: Self-adhering cross-laminated high-density polyethylene (HDPE) composite sheet/non-asphaltic butyl adhesive flashing membrane, with release liner on the adhesive side. Asphaltic adhesive flashing membranes are prohibited.
- B. Applications: Roof detail areas, including under equipment flashings, as ice dam protection, at roof valleys and rake edges, and around chimneys and skylights.
- C. Restrictions: May not be used
1. in contact with polysulfides;
 2. in contact with flexible PVC or vinyl windows; and
 3. with high concentrations of resin (pitch) that may be found in some wood plank decks.
- D. Products: "Grace Ultra" manufactured by GCP Applied Technologies, or equal.

E. Requisite Properties:

1. Minimum Thickness: At least 30 mils.
2. Minimum Roll Width: 36 inches.
3. Maximum UV Exposure Limit: Not more than 100 days.
4. Maximum High Temperature Application: Up to 300 deg F.
5. Color: Gray-black.

F. Performance Requirements:

1. Minimum Membrane Tensile Strength: At least 250 pounds per square inch, when tested in conformance with ASTM D 412, Die C modified.
2. Minimum Membrane Elongation: At least 250 percent, when tested in conformance with ASTM D 412, Die C modified.
3. Minimum Low Temperature Flexibility: Unaffected to at least -2 deg. F , when tested in conformance with ASTM D 1970.
4. Minimum Adhesion to Plywood: At least 3.0 pounds per inch of width, when tested in conformance with ASTM D 903.
5. Maximum Permeance: Not more than 0.05-perm, when tested in conformance with ASTM E 96 method B

2.5 INSTALLATION MATERIALS

A. Liquid Flashing:

1. Description: Trowel grade, asphalt modified urethane.
2. Application: Used as repair material for defects on concrete surfaces; as fillet and reinforcement material at inside corners; as flashing material at outside corners and around drains, protrusions, curbs and parapets; and as sealing material at membrane terminations.
3. Product: "Bituthene Liquid Membrane" manufactured by GCP Applied Technologies, or equal.

B. Green Concrete Primer:

1. Description: Low-VOC solvent-based primer.
2. Applications: Used to prime green concrete cured less than 7 days; and to prime damp concrete, masonry, sheathing or wood surfaces to which SASMs are applied.
3. Product: "Bituthene Primer B2 LVC" manufactured by GCP Applied Technologies, or equal.

C. Sheathing Primer:

1. Description: Water-based primer.
2. Application: Used to prime fiber cement and GMF gypsum sheathing.
3. Product: "Perm-A-Barrier WB Primer" manufactured by GCP Applied Technologies, or equal.

2.6 ACCESSORIES

- A. Sealant:
 - 1. Description: Silicone sealant conforming to ASTM C 920 requirements for Type S, Grade NS, Class 25.
 - 2. Product: "758" manufactured by Dow Corning Corp., or equal.
 - 3. Color: White.
- B. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification:
 - 1. Verify in-place construction, project conditions, and the work of other specification sections conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Verify substrates are dry and free of curing compounds, sealers, hardeners, and deleterious and other substances that might interfere with flashing adhesion, appearance, or performance.
 - 3. Verify items penetrating flashings are installed.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 PREPARATION

- A. Substrate Preparation:
 - 1. Prepare substrates as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.
 - 2. Remove substrate coatings and other substances that may negatively affect the quality of the installation, durability, or performance of furnished flashings.

3. Remove substrate ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with leveling and patching compound. Apply, trowel, and float patching compound to achieve smooth, flat, hard surface.

3.3 INSTALLATION

A. General Requirements:

1. Install flashings using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
2. Only install flashings under conditions that ensure they are free from blemishes and defects.
3. Completed work must match approved samples and mockups, as accepted by the Architect.
4. Installed flashings must be warrantable. Do not install, correct, or replace flashings in a manner that results in any warranty or guarantee becoming void.

B. Special Techniques:

1. Accurately align flashing membranes and maintain uniform side and end laps at least 3 inches or as specifically depicted in the project details. Apply flashing membranes with side laps shingled in the direction of bulk water flow.
2. Clean seam areas, overlap flashing membranes, and roll side and end laps in conformance with the flashing manufacturer's installation instructions to ensure a watertight seam installation.
3. Press and form material tightly against the substrate.
 - a. Pressure is essential to eliminate wrinkles and bubbles.
 - b. Ensure complete and continuous adhesion by using a hard neoprene or stainless steel hand roller.
 - c. Apply sealant or liquid membrane at flashing membrane leading edges.
4. Install flashing around windows in the following order.
 - a. Install in conformance with details indicated on Drawings.
 - b. Install in conformance with the flashing membrane manufacturer, and the door and window manufacturers' installation instructions.
 - c. Install in conformance with ASTM E 2112.
5. Install flashing under copings over wall flashing, WRBs, and roof membranes.
 - a. Provide aluminum-faced flashing separation at incompatible materials.
 - b. Lap joints at least 3 inches.
 - c. Hand-roll seams for complete adherence to substrate.

- #### C. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach flashing to supporting construction.

3.4 FIELD QUALITY CONTROL

A. Site Tests and Inspections:

1. General: Include site tests and inspections as part of the work of this specification section. The Owner's testing and inspection agency performs tests and inspections.
 - a. Schedule and arrange all tests and inspections.
 - b. Coordinate all work and the final construction schedule with all tests and inspections.
 - c. Coordinate tests and inspections with the work of other specification sections, and other specified, required, or necessary tests and inspections.
 - d. Furnish all work, equipment, tools, facilities, personnel, and controls necessary for each test and inspection.
 - e. Arrange tests and inspections by notifying the Owner, the testing and inspection agency, the installer, the manufacturer's representative, and the Architect at least 5 business days before work is ready for testing or inspection.
 - f. Witness all site tests and inspections.
 - g. Receive test and inspection reports and distribute to the installer and the manufacturer's representative.
 - h. When tests and inspections reveal defective items, repair defective work to the satisfaction of the manufacturer's representative and Architect, and re-test and re-inspect work without reimbursement from Owner until all work passes tests and inspections.
2. Adhesion Testing: Before beginning work in each area, conduct adhesion tests with manufacturer's representative present at start of installation over each new substrate.

B. Manufacturer Services: Installed work is subject to examination by the manufacturer's representative to determine conformance to manufacturer's instructions and other requirements and recommendations.

1. Note all defective items and non-conforming work identified by the manufacturer's representative.
2. Itemize into a punch list all noted items and record the manufacturer's requirements and recommendations for correcting each punch list item.
3. Promptly bring all punch list items into conformance with the manufacturer's requirements and recommendations until accepted in writing by the Architect.
4. Manufacturer's representative withholds issuing warranties until all punch list items are accepted by the Architect.

3.5 CORRECTION AND REPAIR

- #### A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs, and re-inspection and re-testing costs, without reimbursement from Owner, until accepted in writing by the Architect.

1. Repair punctures, tears, voids, and deficient lapped seams that do not conform to specified requirements. Slit and flatten fishmouths and blisters.
 2. Extend patches 6 inches beyond repaired areas in all directions. Seal edges with sealant or liquid membrane.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.6 CLEANING

- A. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.7 PROTECTION

- A. Protect installed flashings in place from prolonged exposure to UV manufacturer's recommended limits, exposure to weather, becoming wet, contact with damp or wet surfaces, and other sources of deterioration, and damage until covering flashings. If exposed to UV for more than the recommended limit, then flashings must be removed and replaced in conformance with the manufacturer's instructions.
- B. Do not store anything on, adjacent to, or against installed flashings unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed flashings as work surfaces.
- C. Remove protection when it's no longer needed and before covering.

END OF SECTION

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SECTION 07 92 00 – JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Traffic sealants.
2. Exterior façade sealants.
3. Interior joint sealants.
4. Joint sealant backings.
5. Surface preparation.
6. Site tests and inspections.
7. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 08 81 00 for structural silicone sealants for glazing applications.
2. Section 09 81 33 for acoustical sealants.

1.2 REFERENCES

A. Definitions:

1. Manufacturer: Means the sealant manufacturer, unless otherwise indicated.
2. Ultra-Low Modulus: Means having a joint movement extension/compression capability of at least a 100-percent increase and at least a 50-percent decrease, when tested in conformance with ASTM C 719.
3. Low Modulus: Means having a joint movement extension/compression capability of at least a 50-percent increase and at least a 50-percent decrease, when tested in conformance with ASTM C 719.
4. Medium Modulus: Means having a joint movement extension/compression capability of at least a 35-percent increase and at least a 35-percent decrease, when tested in conformance with ASTM C 719.
5. High Modulus: Means having a joint movement extension/compression capability of at least a 25-percent increase and at least a 25-percent decrease, when tested in conformance with ASTM C 719.
6. Very High Modulus: Means having a joint movement extension/compression capability of at least a 12.5-percent increase and at least a 12.5-percent decrease, when tested in conformance with ASTM C 719.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Proposed substitution requests and submittals that change the quality (grade) or generic chemistry of specified sealants are prohibited and returned to the Contractor without review or responsive action, except to record non-conformance with this requirement.

B. Performance Requirements:

1. Joint sealants must establish and maintain a continuous watertight seal without staining substrates or deterioration.
2. Sealants installed in contact with porous substrates must demonstrate testing in conformance with ASTM C 1248 resulting in no staining to porous materials identical to those indicated for this project.

C. Preinstallation Meeting:

1. Hold a meeting after preliminary preparation of specified submittals and before issuing submittals to the Architect for review and approval.
 - a. Sealant manufacturer's representative and distributor must attend meeting.
 - b. Sealant installer and the same installer's personnel designated to perform the work of this specification section must attend meeting.
 - c. Architect and waterproofing consultant must attend meeting.
2. During the meeting, review the Contract Documents, preliminary submittals, in-service project conditions, and installation sequence and methods, including special details and conditions that might affect installation.
 - a. Review, discuss, and schedule preconstruction testing to determine chemical and adhesive compatibility of all materials, joint substrates, shims, setting blocks, joint sealant backings, secondary seals, and other materials that will contact or affect joint sealants. Obtain joint-sealant manufacturer's instructions for corrective measures for items failing tests.
 - b. Review and discuss sealant backings, including backing types, materials, configurations, sizes, installed depths relative to joint widths, and other criteria.
 - c. Review and discuss substrate preparation, including whether priming and other specific joint preparation techniques are necessary or required to obtain optimum adhesion of joint sealants to joint substrates.
 - d. Review and discuss sealant mixing, installation, and tooling, including joint configurations relative to ASTM C 1193 and those indicated on the Drawings.
 - e. Review and discuss field testing, including both non-destructive and destructive testing procedures, subsequent evaluation and corrective measures for items failing tests, and repair of damaged sealants.
3. Identify and discuss adverse or unfavorable conditions detrimental to protecting stored materials or to installation; or to the quality, durability, appearance, or performance of installed sealants. Resolve each condition.
4. Finalize construction schedule.

5. Record significant discussions and distribute meeting minutes. Do not make submittal to the Architect for review and approval until disagreements are successfully resolved to the satisfaction of all parties.

- D. Scheduling: Schedule cleaning to prevent dust and other contaminants from falling on freshly-applied sealants.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).

1. Product Data:

- a. Submit manufacturer's product data, specifications, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
- b. Submit sample warranties with warranty periods, terms, conditions, exclusions, and remedies explicitly defined for each warranty, including clear warranty period start dates. (e.g., date of manufacture, purchase, installation, Beneficial Occupancy, Substantial Completion, Final Completion, etc.)

2. Samples: Submit at least 6-inch long representative samples of each sealant variety in each selected color.

- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).

1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished joint sealants.

- a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
- b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.

2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.

- C. Closeout Submittals: Submit the following to the Architect as a condition of project closeout.

1. Warranty Documentation: Submit final warranties signed by the manufacturer's representative with complete terms indicated for all warranties covering items furnished or installed under this specification section.

1.5 QUALITY ASSURANCE

- A. Source Limitations:

1. Joint sealants must be obtained through one source from the same manufacturer (to ensure compatibility and a uniform appearance).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.

B. Qualifications:

1. Manufacturer: Company or individuals must have at least 10 years' experience manufacturing sealants installed on at least 200 previous projects similar to this project in size, material, design, and complexity.
2. Installer: Company or individuals must have at least 5 years' experience installing joint sealants for at least 30 previous projects similar to this project in size, material, design, and complexity. Installers and supervisors must be
3. Supervisors: Individuals must have at least 7 years' experience installing joint sealants for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading joint sealant installers.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped and in conformance with manufacturer's instructions and other requirements and recommendations for storage. Furnish adequate dunnage during storage.
 1. Prevent stored items from contacting the floor or ground and from deterioration and damage.
 2. If items are not stored in an enclosed location, then cover the tops and sides with securely-tied, waterproof, and breathable covers. Unvented polyethylene tarpaulins do not qualify as breathable covers and are prohibited. (due to potential accumulation of moisture beneath tarpaulin during certain environmental conditions)
 3. Incline covered items to ensure maximum drainage of accumulated moisture.
 4. Do not leave items uncovered where they might be exposed to weather or become wet from rain, mist, relative humidity, condensation, frost, and other sources of moisture; or exposed to other sources of deterioration and damage, including heat and sudden changes in temperature, and UV exposure beyond manufacturer-recommended limits.

- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.
 - 1. Avoid damage to packaging and containers, and contamination of contents.
 - 2. Rotate inventory; do not use items the shelf life of which is expired.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective sealant materials with undamaged new sealants materials that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 PROJECT CONDITIONS

- A. Ambient Conditions: Install joint sealants only when ambient temperature, RH, and other environmental conditions fall within ranges required, recommended, or accepted by the manufacturer.
 - 1. Do not install joint sealants during rain or snow, fog or mist; or when rain or snow is predicted within 24 hours of installation.
 - 2. Proceed only when there is no threat of impending precipitation, and both current and forecasted weather conditions conform to those required, recommended, or accepted by the manufacturer.
 - 3. Do not apply joint sealants when
 - a. ambient temperature is below 45 deg. F or more than 90 deg. F during application, and for at least 8 hours after;
 - b. surface temperatures are less than 40 deg. F or greater than 120 deg. F; and
 - c. surface temperatures are 5 deg. F or less above the dew point.
- B. Existing Conditions:
 - 1. Surface Conditions: Surfaces receiving joint sealants must be dry. Install joint sealants only when substrate moisture content and surface temperature fall within ranges required, recommended, or accepted by the manufacturer.
 - 2. Illumination: Provide permanent lighting or illuminate work spaces to at least the same level occurring in the room or space after Final Completion.
- C. Other Conditions: Do not apply sealants where dust is generated, or liquids are sprayed.

1.8 WARRANTY

- A. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 5 years (urethane sealants) and 20 years (silicone sealants).
- B. Installer Guarantee: Furnish to the Owner a written guarantee for the work of this specification section against all defects in materials and workmanship for 2 years from

date of acceptance. Guarantees must be properly prepared and signed on the guarantee form in Division 01.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Silicone Sealant Manufacturers: Provide products manufactured by one of the following, or equal. Private label and third-party-manufactured sealants are prohibited.
 - 1. Dow Corning Corp.
 - 2. Momentive Performance Materials, Inc.
- B. Polyurethane Sealant Manufacturers: Provide products manufactured by one of the following, or equal.
 - 1. BASF Building Systems.
 - 2. Pecora Corp.
 - 3. Sika Corp.
- C. Acrylic Latex Sealant Manufacturers:
 - 1. LATICRETE International, Inc.
 - 2. Pecora Corp.
 - 3. Tremco, Inc.

2.2 TRAFFIC JOINT SEALANTS

- A. Self-Leveling Polyurethane Traffic Sealant:
 - 1. Application: Used to weather seal interior and exterior flat walkways, plazas, decks, parking garages, and similar horizontal installation joints subject to pedestrian or vehicular traffic.
 - 2. Description: Single-component polyurethane sealant conforming to ASTM C 920 requirements for Type S, Grade P, Class 25, Use T, M or O sealant, as applicable.
 - 3. Product: Provide one of the following, or equal.
 - a. "Sonneborn Sonolastic SL 1" manufactured by BASF Building Systems.
 - b. "Urexpan NR-201" manufactured by Pecora Corp.
 - c. "Sikaflex-1c SL" manufactured by Sika Corp.
 - 4. Colors: Selected by the Architect from the manufacturer's standard colors.
- B. Non-Sag Polyurethane Traffic Sealant:
 - 1. Application: Used to weather seal interior and exterior sloped walkways, plazas, decks, parking garages, and similar sloped installation joints subject to pedestrian or vehicular traffic.

2. Description: 2-component polyurethane sealant conforming to ASTM C 920 requirements for Type M, Grade NS, Class 25, Use T, NT, M, G, A, O, or I sealant, as applicable.
3. Product: "Sikaflex-2c NS" manufactured by Sika Corp., or equal.
4. Colors: Selected by the Architect.

2.3 EXTERIOR FACADE SEALANTS

A. Ultra-Low Modulus Silicone Sealant:

1. Description: Neutral-curing silicone sealant conforming to ASTM C 920 requirements for Type S, Grade NS, Class 100/50, Use NT, A or O sealant, as applicable.
2. Application: Used for sealing expansion and control joints, precast concrete panel joints, EIFS joints, curtainwall joints, mullion joints, stone pavers, and other exterior building joints subject to extreme or dynamic movement.
3. Products: Provide one of the following, or equal.
 - a. "DOWSIL 790" manufactured by Dow Corning Corp.
 - b. "GE SCS 2700 SilPruf LM" manufactured by Momentive Performance Materials, Inc.
4. Colors: Selected by the Architect from the manufacturer's standard colors.

B. Low Modulus Silicone Sealant:

1. Description: Neutral-curing silicone sealant conforming to ASTM C 920 requirements for Type S, Grade NS, Class 50, Use NT, M, G, A or O sealant, as applicable.
2. Application: Used for weatherproofing building facade materials, including glass, aluminum, steel, painted metal, EIFS, granite and other stone, concrete, brick and plastics.
3. Products: Provide one of the following, or equal.
 - a. "DOWSIL 795" manufactured by Dow Corning Corp.
 - b. "GE SCS 2000 SilPruf LM" manufactured by Momentive Performance Materials, Inc.
4. Colors: Selected by the Architect from the manufacturer's standard colors.

C. Butyl Sealant:

1. Description: Single-component, solvent-release plasticized polyisobutylene (butyl rubber) conforming to ASTM C 1311.
2. Application: Applied to weather seal joints between sheet metal flashings and substrates.
3. Color: Black.

2.4 SPECIALTY JOINT SEALANTS

A. Low Modulus Porous Surface Sealant:

1. Description: Neutral-curing silicone sealant conforming to ASTM C 920 for Type S, Grade NS, Class 50, Use NT, M, G, A or O sealant, as applicable.

2. Application: Used for weatherproofing exterior building joints in sensitive porous stone requiring reduced substrate staining; and with metal panel substrates requiring reduced residue rundown.
3. Products: Provide one of the following, or equal.
 - a. "756 SMS" manufactured by Dow Corning Corp.
 - b. "GE SCS 9000 SilPruf NB" manufactured by Momentive Performance Materials, Inc.
4. Colors: Selected by the Architect from the manufacturer's standard colors.

2.5 INTERIOR JOINT SEALANTS

A. Single-Component Damp Location Sealant:

1. Description: Medium or high modulus mildew-resistant silicone sealant conforming to ASTM C 920 requirements for Type S, Grade NS, Class 25, Use NT, A or O sealant, as applicable.
2. Products: Provide one of the following, or equal.
 - a. "786" manufactured by Dow Corning Corp.
 - b. "Sanitary SCS 1700" manufactured by Momentive Performance Materials, Inc.
3. Colors: White or clear, as selected by the Architect.

B. General Purpose Interior Sealant:

1. Description: Siliconized acrylic-latex sealant conforming to ASTM C 834 requirements for Type OP, Grade NF classification, as required.
2. Products: Provide one of the following, or equal.
 - a. "Sonneborn Sonolac" manufactured by BASF Building Systems.
 - b. "AC-20+Silicone" manufactured by Pecora Corp.
 - c. "Tremflex 834" manufactured by Tremco, Inc.
3. Colors: Selected by the Architect from the manufacturer's standard colors.

2.6 JOINT SEALANT BACKINGS

A. Closed Cell Foam Joint Backing:

1. Description: Extruded polyethylene foam cylindrical sealant backings conforming to ASTM C 1330, Type C.
2. Application: Provide closed-cell backer rod at all exterior applications unless otherwise indicated on the Drawings.
3. Products: Provide one of the following, or equal.
 - a. "Mile High Foam" manufactured by Backer Rod Mfg. Inc.
 - b. "HBR" or "Green Rod" manufactured by Nomaco, Inc.
 - c. "NuFlex 870" manufactured by TVM Building Products.
4. Performance Requirements:
 - a. Maximum Water Absorption: Not more than 0.10 grams per cubic centiliter when tested in conformance with conformance with ASTM C 1016, Procedure B.

- b. Minimum Density: At least 24 per cubic meter when tested in conformance with conformance with ASTM D 1622.
 - c. Maximum Outgassing: Less than 1 bubble when tested in conformance with conformance with ASTM D 1253.
 - d. Minimum Compression Recovery: At least 90 percent, when tested in conformance with conformance with ASTM D 5249.
 - e. Minimum Compression Deflection: At least 20.5 percent, when tested in conformance with conformance with ASTM D 5249.
 - f. Minimum Tensile Strength: At least 200 kPa, when tested in conformance with conformance with ASTM D 1623.
- B. Open Cell Foam Joint Backing:
1. Restrictions: Permitted only for interior use, and as the second (interior) line of a double-line sealant application.
- C. Bi-Cellular (Dual-Cell) Foam Joint Backings:
1. Description: Extruded polyethylene foam cylindrical sealant backings conforming to ASTM C 1330, Type B.
 2. Restrictions: Permitted only for interior use. Only bi-cellular (dual-cell) foam may be used as a backing for single-component (air-cure) materials.
 3. Products: "Sof Rod" or "Dual Rod" manufactured by Nomaco, Inc., or equal.
 4. Performance Requirements:
 - a. Maximum Water Absorption: Not more than 0.10 grams per cubic centiliter when tested in conformance with conformance with ASTM C 1016, Procedure B.
 - b. Density: At least 24 kilograms per cubic meter when tested in conformance with conformance with ASTM D 1622.
 - c. Maximum Outgassing: Less than 1 bubble when tested in conformance with conformance with ASTM D 1253.
 - d. Minimum Compression Recovery: At least 90 percent, when tested in conformance with conformance with ASTM D 5249.
 - e. Minimum Compression Deflection: At least 20.5 percent, when tested in conformance with conformance with ASTM D 5249.
 - f. Minimum Tensile Strength: At least 200 kPa, when tested in conformance with conformance with ASTM D 1623.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.
- E. Prefabricated Backer Seal: "BackerSeal" manufactured by Emseal Joint Systems, Ltd., or equal.

2.7 TAPE SEALANTS

- A. Foam Tape:

1. Description: Closed-cell, compressible PVC foam with pressure-sensitive adhesive.
2. Product: "NORSEAL" foam tape manufactured by Saint-Gobain Performance Plastics, or equal.

B. Pre-Formed Silicone Sheet:

1. Applications: Used at barrier transitions to rough openings.
2. Product: "Dow Corning 123 Silicone Seal" manufactured by Dow Corning Corp., or equal.
3. Colors: Selected by the Architect from the manufacturer's standard colors.

2.8 ACCESSORIES

A. Primer and Surface Cleaners:

1. Application: Applied to enhance and strengthen sealant adhesion to porous and nonporous substrates; and help ensure proper joint preparation
2. Porous and Cementitious Surfaces: "1200 OS Primer" manufactured by Dow Corning Corp., or equal.
3. Other Surfaces: "Construction Primer P" manufactured by Dow Corning Corp., or equal.

B. Masking Tape: Provide paper masking tape manufactured by 3M, or equal, unless another kind is supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project

C. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.9 MIXING

A. Open sealants containers only as required for use and mix only in designated areas.

B. Do not reduce, alter, or introduce foreign materials into sealants, except in conformance with manufacturer's instructions and other requirements and recommendations.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.

B. Verification:

1. Verify in-place construction, project conditions, and the work of other specification sections conform to the manufacturer's instructions and other requirements and recommendations.
2. Verify joint dimensions and joint backer sizes conform to width-to-depth ratios, neck dimensions, and surface bond areas required, recommended, or accepted by the manufacturer.
3. Verify substrates are dry and free of deleterious and other substances that might interfere with joint sealant adhesion, appearance, or performance.

C. Evaluation and Assessment:

1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 PREPARATION

A. Protection:

1. Work Area Protection: Protect work areas from dust and other airborne contaminants during surface preparation and joint sealant installation.
2. Adjacent Material Protection: Protect adjacent surfaces against soiling and damage. Utilize drop cloths, shields, masking, barricades, and other items necessary to protect adjacent surfaces.

B. Substrate Preparation:

1. Prepare substrates in conformance with ASTM C 1193 and as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.
2. Remove loose materials and foreign matter that may impair sealant adhesion.
3. Clean and prime substrates as required, recommended, or accepted by the manufacturer, using the manufacturer's recommended products and methods.
 - a. Confine primers to bond areas.
 - b. Do not allow spillage and migration onto exposed surfaces

3.3 INSTALLATION

A. General Requirements:

1. Install joint sealants in conformance with ASTM C 1193 using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
2. Only install joint sealants under conditions that ensure finishes are free from blemishes and defects.

3. Provide smooth surfaces of uniform finish, color, appearance, and coverage. Joint sealant surfaces with cloudiness, spotting, holidays, runs, or other imperfections are prohibited and are rejected as non-conforming work. Produce sharp and even lines and color breaks.
4. Completed work must match approved samples and mockups, as accepted by the Architect.
5. Installed joint sealants must be warrantable. Do not install, correct, or replace joint sealants in a manner that results in any warranty or guarantee becoming void.

B. Special Techniques:

1. Install sealant backings to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - a. Install sealants free of air pockets, foreign embedded matter, ridges, and sags.
 - b. Do not leave gaps between ends of sealant backings.
 - c. Do not stretch, twist, puncture, or tear sealant backings.
 - d. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
2. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
3. Size materials to achieve required width/depth ratio.
4. Install sealants using proven techniques that conform to the following and at the same time backings are installed:
 - a. Place sealants so they directly contact and fully wet joint substrates.
 - b. Completely fill recesses in each joint configuration.
 - c. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
 - d. Employ installation techniques that ensure joint sealers are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of bond surfaces equally on opposite sides.
 - e. Joint configuration: Fill sealant joint to a slightly concave surface, slightly below adjoining surfaces, unless otherwise indicated.
 - f. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture or dirt.
5. Promptly after sealant application, and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - a. Remove excess sealant from surfaces adjacent to joints.
 - b. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - c. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
 - d. Provide flush joint configuration where indicated per Figure 5B in ASTM C 1193.

- e. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.
6. Preformed Silicone-Sealant System:
 - a. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
 - b. Apply silicone sealant to each side of joint to produce a bead of size conforming to the preformed silicone-sealant system manufacturer's instructions and covering a bonding area of not less than 3/8 inch. Hold edge of sealant bead 1/4 inch inside masking tape.
 - c. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
 - d. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.
7. Preformed Foam Sealant Special Techniques:
 - a. Install each length of sealant immediately after removing protective wrapping. Do not pull or stretch material.
 - b. Produce seal continuity at ends, turns, and intersections of joints.
 - c. For applications at low ambient temperatures, apply heat to sealant in conformance with sealant manufacturer's instructions.

3.4 FIELD QUALITY CONTROL

A. Site Tests and Inspections:

1. General: Include site inspections as part of the work of this specification section. The Owner's testing and inspection agency performs inspections.
 - a. Schedule and arrange all inspections.
 - b. Coordinate all work and the final construction schedule with all inspections.
 - c. Coordinate inspections with the work of other specification sections, and other specified, required, or necessary tests and inspections.
 - d. Furnish all work, equipment, tools, facilities, personnel, and controls necessary for each test and inspection.
 - e. Arrange inspections by notifying the Owner, the testing and inspection agency, the installer, the manufacturer's representative, and the Architect at least 5 business days before work is ready for testing or inspection.
 - f. Witness all site inspections.
 - g. Receive test and inspection reports and distribute to the installer and the manufacturer's representative.
 - h. When tests and inspections reveal defective items, repair defective work to the satisfaction of the manufacturer's representative and Architect, and re-test and re-inspect work without reimbursement from Owner until all work passes tests and inspections.
2. Porous Substrate Stain Testing: Procedures must conform to ASTM C 510.

3. Non-Destructive Spot Testing: Procedures must conform to ASTM C 1521.
 - a. The center of sealant beads is depressed with a blunt dowel-shaped probing tool to depth of 50 percent of the bead width.
 - b. If sealant fails, then the failure is recorded along with whether the failure was an adhesive or cohesive failure, and the maximum surface depression as a percentage of joint width.
 - c. Tests are performed every 12 inches for first 10 linear feet of each joint; if test failure is not observed, then tests are performed every 24 inches thereafter.
4. Non-Destructive Continuous Inspection: Procedures must conform to ASTM C 1521.
 - a. Certain sealant quantities, locations, and lengths up to 100-percent inspection of an entire assembly sealant may be chosen by the Architect for general sealant assessment, including joint configurations known to be difficult to install, changes in sealant and substrate types, or other quantities and locations.
5. Destructive Testing: Procedures must conform to ASTM C 1521.
 - a. A 3-inch-long tab is cut into the sealant bead.
 - b. The tab is marked one inch from the beginning of the adhesive bond away from the cut tail.
 - c. The tab is grasped one inch from the beginning of the adhesive bond and pulled until it extends to 2 times the published movement capability of the sealant. If sealant does not fail, it is then pulled to failure.
 - d. Elongation at the point of failure is recorded along with whether the failure was an adhesive or cohesive failure.
 - e. Sealant is then observed during the complete filling of the joint for the presence of voids, for joint configuration, and for conformance with specified requirements. Observations and sealant dimensions are recorded.
 - f. 10 tests are performed for the first 1,000 linear feet of joint for each type of sealant and substrate; if failure at two times the movement capability is not observed, then one test is performed for either every 1,000 linear feet thereafter or at a rate of one test per floor per building elevation, whichever is more frequent.
6. After testing is complete, promptly replace failed sealants in test areas.
 - a. Neatly cut out and remove failed sealant, prepare and prime surfaces, and install new sealant.
 - b. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

3.5 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs, and re-inspection and re-testing costs, without reimbursement from Owner, until accepted in writing by the Architect.

- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 - 1. written descriptions of non-conforming, damaged, and defective work;
 - 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 - 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.

- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.6 CLEANING

- A. Cleaning Work: Clean sealant from adjacent surfaces.
 - 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 - 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 - 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 - 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.

- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

END OF SECTION

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DIVISION 08

OPENINGS

SECTION 08 12 13 – STANDARD HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Standard hollow metal door frames.
 2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.
- B. Related Requirements:
1. Section 08 71 00 for door hardware.

1.2 REFERENCES

- A. Abbreviations and Acronyms:
1. BMT: Base Metal Thickness.
 2. DHI: Door Hardware Institute.
 3. HM: Hollow Metal.
 4. MSG: Manufacturer's Standard Gage.
 5. DI: Steel Door Institute.
- B. Definitions:
1. Manufacturer: Means the door frame manufacturer, unless otherwise indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
1. Coordinate building opening tolerances with door frame manufacturing and erection tolerances.
 2. Coordinate hardware preparations, handing, and reinforcement requirements and locations with the Drawings, door schedule, and selected hardware sets.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets

- (SDSs), both of which are returned to the Contractor without review or responsive action.
2. Door Schedule: Submit schedule showing opening identification symbols and door and frame types and sizes, including thickness, swing, fire-resistance rating label requirements, undercuts, and finishes. Use the same reference numbers for openings and details as the Drawings.
 3. Shop Drawings: Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project. Cross-reference details to door schedule.
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished door frames.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.

1.5 QUALITY ASSURANCE

- A. Source Limitations:
1. Door frames must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
 2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.
- B. Quality Standard Requirements:
1. Manufacturing Tolerances: Comply with the requirements of ANSI/SDI publication ANSI/SDI A250.8, *"Recommended Specifications for Standard Steel Doors and Frames"*.
 2. Door Frame Installation Standards:
 - a. Install fire-resistance rated frames in conformance with NFPA 80, *"Standard for Fire Doors and Other Opening Protectives"*.
 - b. Install other frames in conformance with of ANSI A250.11, *"Recommended Erection Instructions for Steel Frames"*.

3. Hardware Preparations and Reinforcement: Comply with the requirements of ANSI/SDI A250.6, "*Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames*" with reinforcing plates fabricated from the same material as door face sheets.
4. Door Hardware Installation Standards: Install door frame hardware in conformance with ANSI/DHI A115-IG, "*Installation Guide for Doors and Hardware*".

C. Qualifications:

1. Manufacturer: Company or individuals must have at least 10 years' experience manufacturing door frames installed on at least 200 previous projects similar to this project in size, material, design, and complexity. Manufacturer must be a current member of SDI.
2. Installer: Company or individuals must have at least 5 years' experience installing door frames for at least 30 previous projects similar to this project in size, material, design, and complexity. Installer must be a current member of SDI.
3. Supervisors: Individuals must have at least 7 years' experience installing door frames for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading door frame installers.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Unload and store only inspected and accepted items.
 3. Across the bottom of welded frames, at least 2 removable spreader bars must be tack welded to jambs and mullions.
 4. Frames must be palletized, wrapped, or crated to provide protection during transit and site storage.
- B. Storage: Store unloaded items as shipped, upright, and indoors within dry, well-ventilated, broom-cleaned, and partially- or permanently-enclosed storage areas.
- C. Damaged Item Replacement: Promptly remove and replace items that are deteriorated, damaged, or defective with undamaged new items that do not exhibit deterioration, damage, or defects.
- D. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
1. Allegion PLC.
 2. ASSA ABLOY.
 3. Door Components, Inc.
 4. MPI Custom Steel Doors and Frames.
 5. Republic Doors and Frames.

2.2 STANDARD HOLLOW METAL FRAMES

- A. Description: 3-sided (open), fully welded masonry (universal) and flush drywall standard HM frames conforming to the requirements of Steel Door Institute publication SDI-100, *Recommended Specifications for Standard Steel Doors and Frames*.
- B. Products: "Steelcraft" frames manufactured by Allegion, or equal.
1. Single Egress Door HM Frames: "F-Series" frames, or equal.
 2. Double Egress Door HM Frames: "FE-Series" frames, or equal.
 3. Cross-Corridor Door HM Frames: "DE-Series" frames, or equal.
 4. Stainless Steel HM Frames: "FS-Series" frames, or equal.

2.3 COMPONENTS

- A. Materials:
1. Frames with an Uncoated Finish (Bare or Natural Finish): Fabricate from zinc coated (HDG) steel sheet or from stainless steel sheet, as indicated.
 2. Exterior Frames with a Painted Finish and Interior Frames Installed in Wet or High Humidity Locations (including shower rooms and toilet rooms): May be fabricated from either zinc-iron alloy coated (galvannealed) steel sheet or stainless steel sheet.
 3. Interior Frames Installed Elsewhere: Fabricate from uncoated CRS sheet.
 4. Sidelight and Transom Frames: Fabricate from the same material, thickness, and finish as the adjacent door frame.
- B. Material Thickness:
1. HM Frames for Level 1 and Physical Performance Level C (Standard Duty) Doors: Fabricate from at least 0.0478-inch BMT (MSG 18) uncoated and zinc-coated steel sheet; or from at least 0.0500-inch (USSG 18) stainless steel sheet.
 2. HM Frames for Level 2 (Heavy Duty) and Physical Performance Level B, and for Level 3 and Physical Performance Level B (Extra Heavy Duty) Doors: Fabricate from at least 0.0598-inch BMT (MSG 16) uncoated steel and zinc-coated steel BMT; or from at least 0.0625-inch BMT (USSG 16) stainless steel sheet.

3. HM Frames for Level 3 and Physical Performance Level B (Extra Heavy Duty) Doors: Fabricate from at least 0.0598-inch BMT (MSG 16) uncoated steel and zinc-coated steel BMT; or from at least 0.0625-inch BMT (USSG 16) stainless steel sheet.
4. HM Frames for Level 4 and Physical Performance Level A (Maximum Duty) Doors: Fabricate from at least 0.0747-inch BMT (MSG 14) uncoated and zinc-coated steel sheet, or at least 0.0781-inch (USSG 14) stainless steel sheet.
5. Other HM Frames: Fabricate from at least 0.0598-inch BMT (MSG 16) uncoated steel and zinc-coated steel BMT; or from at least 0.0625-inch BMT (USSG 16) stainless steel sheet.

C. Profiles:

1. Types: Indicated on the Drawings.
2. Throat Openings:
 - a. Butted Frames: Equal to the wall or partition type thickness minus twice the frame return dimension, unless otherwise indicated.
 - b. Wrap-Around Frames: Equal to the wall or partition thickness, unless otherwise indicated.
3. Frame Depth:
 - a. Butted Frames: Equal to the wall or partition thickness.
 - b. Wrap-Around Frames: Equal to the throat opening plus twice the frame return dimension.
4. Frame Return Dimension: 1/2-inch.
5. Backbend Dimension (Second, Double, or Drywall Return Dimension): At least 3/8-inch.
6. Backbend Type: Indicated on the Drawings.
7. Face Dimension: Provide 4-inch face dimension at heads in CMU construction where required to maintain a masonry module; provide 2-inch face dimension at jambs. Provide 2-inch face dimension elsewhere, unless otherwise indicated.
8. Stop Dimension: 5/8-inch.
9. Rabbet Depth Dimension: Equal to 3/16-inch greater than the door thickness.
10. Opposite Door Rabbet Depth Dimension: 1-9/16 inches.
11. Soffit Dimension: Equal to the frame depth minus the sum of the rabbet dimensions.

D. Corners:

1. Welded HM Door Frames: Provide square-cut mitered or coped and mitered, set-up arc welded (SUA) and ground smooth, full profile welded frames (fully welded or continuously welded frames) for installation of frames as a complete unit. All corners must be watertight.
2. HM Frame Glazing Beads: Provide butted corners.

- E. Hardware Preparations and Reinforcement: Provide HM frame hardware reinforcing and preparations in conformance with ANSI/SDI publications A250.6, *“Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames”* and A250.8, *“Recommended Specifications for Standard Steel Doors and Frames”*.

2.4 ACCESSORIES

- A. Head Reinforcement: For opening widths greater than 48 inches wide, provide channel or angle stiffeners fabricated from at least 0.0747-inch BMT (MSG 14) zinc coated (HDG) steel sheet or at least 0.0781-inch BMT (USSG 14) stainless steel sheet, as applicable.
- B. Anchors:
1. Masonry Anchors: Provide either 3/16-inch minimum diameter (SWG 7) galvanized carbon steel masonry wire anchors or at least 0.0598-inch BMT (MSG 16) zinc coated (HDG) steel sheet masonry tee anchors, as applicable.
 2. Existing Opening Anchors: Provide at least 16-gage welded pipe sleeve anchors with 0.0598-inch BMT (MSG 16) zinc coated (HDG) steel sheet straps designed specifically to add support for bolting frames into rough openings of an existing walls.
 3. Wood Stud Anchors: Provide either at least 0.0598-inch BMT (MSG 16) zinc coated (HDG) steel sheet anchors designed specifically for attachment to the wood studs of a rough opening.
 4. Metal Stud Anchors: Provide either at least 0.0598-inch BMT (MSG 16) zinc coated (HDG) steel sheet anchors designed specifically for attachment to the webbing of the closed steel studs built around the frame.
 5. Universal Stud Wall Anchors: Provide either at least 0.0598-inch BMT (MSG 16) zinc coated (HDG) steel sheet universal lock-in jamb anchors designed specifically for use in either wood or steel stud wall applications, as applicable.
 6. Base Anchors: Provide either at least 0.0598-inch (MSG 16) BMT zinc coated (HDG) steel sheet or at least 0.0625-inch BMT (USSG 16) stainless steel sheet base anchors, as applicable. Provide adjustable base anchors that allow for installation adjustment when the floor is not level.
- C. Electrical Device Requirements: Make provisions for installation of electrified hardware and door electrical devices, and arrange so that wiring is readily installed, removed, and replaced.
1. Provide cutouts and reinforcement required for installation of devices.
 2. Provide metal conduits or raceways to accommodate wiring between devices. (e.g., from electric hinge to other electric door hardware)
- D. Glazing Stops:
1. Fire-Rated Conditions: Provide 3/4-inch square channel glazing beads.
 2. Elsewhere: Provide 5/8-inch square channel glazing beads.
 3. Material Thickness: Fabricate from at least 0.0478-inch BMT (MSG 18) uncoated and zinc-coated steel sheet.
- E. Silencers: Provide loose, 1/8-inch thick by 1/2-inch wide pressure-sensitive-adhesive-backed polychloroprene (Neoprene) or ethylene propylene diene monomer (EPDM) rubber silencers for field installation. Furnish at least 3 for each strike jamb and at least 2 for double door head. Do not provide silencers where they may interfere with other seals, including smoke & draft seals.

- F. Filler: Provide material conforming to the requirements of ANSI/SDI publication A250.8, "Recommended Specifications for Standard Steel Doors and Frames". Use UL-listed materials in frames scheduled as having a fire-resistance rating.
- G. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.5 MATERIALS

- A. Uncoated Carbon Steel Sheet:
 - 1. Frame Material: Finished CRS coil, sheet, and strip conforming to ASTM A 1008, CS Type B (commercial steel), exposed, temper rolled, regular matte surface finish (40 to 59 AA), and oiled (sheet must be thoroughly cleaned to remove the oil prior to painting).
 - 2. Hardware Reinforcements: HRS coil, sheet, and strip conforming to ASTM A 1011, CS Type B (commercial steel), as-rolled surface finish, with cut edges.
- B. Zinc-Iron Alloy Coated (Galvannealed) Steel Sheet: ASTM A 653, CS Type B (commercial steel), with equal coating weight on each surface.
 - 1. Coating Weight (Mass) Designation: Provide at least a A60 (galvannealed) minimum coating weight (mass) designation.
 - 2. Surface Finish: Non-spangled matte finish.
 - 3. Surface Treatment: Provide mill phosphate surface treatment (paint-grip finish - provides enhanced lubricating characteristics).
- C. Zinc Coated (HDG) Steel Sheet: ASTM A 653, CS Type B (commercial steel), with equal coating weight on each surface.
 - 1. Coating Weight (Mass) Designation: Provide at least a G90 (galvanized) minimum coating weight (mass) designation.
 - 2. Surface Finish: Provide regular spangle surface finish.
 - 3. Surface Treatment:
 - a. Exterior Frames: Provide oil over chemical surface treatment (chemical treatment desired for humid-storage stain resistance and oil treatment needed for enhanced formability).
 - b. Interior Frames: Provide oiled surface treatment (needed for enhanced formability).

2.6 FINISHES

- A. Uncoated Steel HM Frames: Provide shop-applied phosphate (paint-grip) pre-treatment and baked on rust inhibitive primer. Primer must be compatible with either field-applied paint or field-applied coating systems specified in Division 09, as applicable.

- B. Zinc Coated and Zinc-Iron Alloy Coated Steel and Stainless Steel HM Frames: Provide shop-applied bonderized pre-treatment. (not prime painted)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 - 1. Install door frames in conformance with the quality standards publications using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 - 2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
 - 3. Perform drilling and fitting as required or necessary for an accurate fit and complete installation.
 - 4. Installed door frames must be warrantable. Do not install, correct, or replace door frames in a manner that results in any warranty or guarantee becoming void.
- B. Special Techniques:
 - 1. Frames: Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. Install frames with removable glazing stops located on secure side of opening.
 - b. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - c. Install door silencers in frames before grouting.

- d. Provide setting spreaders, supplied by the installer, and leave intact until frames are set square and plumb within specified tolerances, and all anchors are securely attached and grouted where required.
 - e. Remove frame spreader bars only after frames re properly set and secured. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
 4. Concrete Walls: Solidly fill space between frames and concrete with grout. Take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
 5. Ceiling Struts: Except where anchored to masonry or to other structural support at each jamb, extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame.
 - a. Bend top of struts to provide flush contact for securing to supporting construction.
 - b. Provide adjustable wedged or bolted anchorage to frame jamb members.
 6. Glazing: Comply with installation requirements and with the manufacturer's instructions. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches O.C. and not more than 2 inches on center from each corner.
- C. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach door frames to supporting construction.
- D. Installation Tolerances: Install frames within the following tolerance variations.
1. Maximum Out of Square: Not more than 1/16-inch, measured at rabbet on 90 degrees from jamb perpendicular to frame head.
 2. Maximum Out of Alignment: Not more than 1/16-inch, measured at jambs on a horizontal line parallel to plane of wall.
 3. Maximum Twist: Not more than 1/16-inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 4. Maximum Out of Plumb: Not more than 1/16-inch, measured on floor at jambs.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include

1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Cleaning Work: Clean all visible door frame surfaces in a manner that does not result in any warranty or guarantee becoming void.
1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.5 PROTECTION

- A. Protect installed door frames in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything adjacent to or against installed door frames unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed door frames as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 08 13 13 – STANDARD HOLLOW METAL DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Standard hollow metal doors.
2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 08 71 00 for door hardware.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. BMT: Base Metal Thickness.
2. DHI: Door Hardware Institute.
3. HM: Hollow Metal.
4. MSG: Manufacturer's Standard Gage.
5. SDI: Steel Door Institute.

B. Definitions:

1. Manufacturer: Means the door manufacturer, unless otherwise indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate building opening tolerances with door manufacturing and erection tolerances.
2. Coordinate hardware preparations, handing, and reinforcement requirements and locations with the Drawings, door schedule, and selected hardware sets.
3. Coordinate door hardware finishes with other door hardware finishes.

1.4 SUBMITTALS

A. Action Submittals: Submit the following for responsive action (formal review and approval).

1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract

- Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
2. Door Schedule: Submit schedule showing opening identification symbols and door and frame types and sizes, including thickness, swing, fire-resistance rating label requirements, undercuts, and finishes. Use the same reference numbers for openings and details as the Drawings.
 3. Shop Drawings: Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project. Cross-reference details to door schedule.
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished doors.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.

1.5 QUALITY ASSURANCE

- A. Source Limitations:
1. Doors must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
 2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.
- B. Regulatory Requirements:
1. Fire-Protection Rating: Within fire-resistance rated assemblies, provide fire-protection-rated doors conforming to NFPA 80, "*Standard for Fire Doors and Other Opening Protectives*" and tested in conformance with NFPA 252, "*Standard Methods of Fire Tests of Door Assemblies*" and UL 10B, "*Standard for Fire Tests of Door Assemblies*"; or UL 10C, "*Standard for Positive Pressure Fire Tests of Door Assemblies*" for doors at atmospheric (neutral) pressure. A label or listing mark indicating the fire-protection rating must be permanently affixed at the factory in a location such

that the label remains visible after the door is installed and must include UL "S" and "Positive Pressure Test" listings.

2. Temperature Rise Rating: At vertical exit enclosures and exit passageways, provide doors with a maximum transmitted temperature end point of not more than 450 deg F above ambient after 30 minutes of standard fire-test exposure.
3. Smoke-Control Door Assemblies: Provide doors conforming to the requirements of with NFPA 80, *"Standard for Fire Doors and Other Opening Protectives"* and tested in conformance with NFPA 105, *"Standard for Smoke Door Assemblies and Other Opening Protectives"* or UL 1784, *"Standard for Air Leakage Tests of Door Assemblies"*.

C. Quality Standard Requirements:

1. Manufacturing Tolerances: Comply with the requirements of ANSI/SDI publication ANSI/SDI A250.8, *"Recommended Specifications for Standard Steel Doors and Frames"*.
2. Hardware Preparations and Reinforcement: Comply with the requirements of ANSI/SDI A250.6, *"Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames"* with reinforcing plates fabricated from the same material as door face sheets.
3. Door Hardware Installation Standards: Install door hardware in conformance with ANSI/DHI A115-IG, *"Installation Guide for Doors and Hardware"*.

D. Qualifications:

1. Manufacturer: Company or individuals must have at least 10 years' experience manufacturing doors installed on at least 200 previous projects similar to this project in size, material, design, and complexity. Manufacturer must be a current member of SDI.
2. Installer: Company or individuals must have at least 5 years' experience installing doors for at least 30 previous projects similar to this project in size, material, design, and complexity. Installer must be a current member of SDI.
3. Supervisors: Individuals must have at least 7 years' experience installing doors for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading door installers.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped, upright, and indoors within dry, well-ventilated, broom-cleaned, and partially- or permanently-enclosed storage areas.
- C. Damaged Item Replacement: Promptly remove and replace items that are deteriorated, damaged, or defective with undamaged new items that do not exhibit deterioration, damage, or defects.

- D. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
1. Allegion PLC.
 2. ASSA ABLOY.
 3. Door Components, Inc.
 4. MPI Custom Steel Doors and Frames.
 5. Republic Doors and Frames.

2.2 STANDARD HOLLOW METAL DOORS

- A. Description: Commercial full flush and seamless steel-stiffened doors.
- B. Products: "Steelcraft" doors manufactured by Allegion, or equal.
1. Standard Duty Doors: "SL20" doors, or equal.
 2. Heavy Duty Doors: "BW18" doors, or equal.
 3. Extra Heavy Duty Doors: "BW16" doors, or equal.
 4. Maximum Duty Doors: "BW14" doors, or equal.
 5. Temperature Rise Rated Doors: "T-14" doors, or equal.
- C. Requisite Properties:
1. Construction: SDI 108 Level 3 (extra heavy-duty) or Level 4 (maximum-duty), Model 2 (seamless with welded edge construction).
 2. Type: SDI 106, Type F (seamless).
 3. Thickness: 1-3/4 inches.
 4. Face Sheets:
 - a. Exterior Doors: Fabricate from at least 0.0747-inch BMT (MSG 14) galvanized steel sheet.
 - b. Interior Doors at Wet Locations, such as Shower Rooms and Toilet Rooms: Fabricate from at least 0.0747-inch BMT (MSG 14) galvanized steel sheet.
 - c. Interior Doors Located Elsewhere: Fabricate from at least 0.0598-inch BMT (MSG 16) CRS.
 5. Core Construction:
 - a. Exterior Insulated Doors: Maximum thermal transmittance (U-factor) value of not more than 0.50 BTU per hour per square foot per deg. F, when tested in conformance with ASTM C 1363.

- b. Fire-Resistance Rated and Other Doors: Manufacturer's standard core necessary to meet indicated fire-resistance and temperature-rise ratings.
- 6. Vertical Edges: Manufacturer's standard edge with mechanical edge seam welded and finished before priming.
- 7. Top and Bottom Edges: Close edges with flush or inverted channels or end closures fabricated from same material as face sheets, but not less than at least 0.0747-inch BMT (MSG 14). Provide screw-on caps at exterior doors.
- 8. Minimum Hardware Reinforcement: Fabricate reinforcing from the same material as door in conformance with the following. Reinforcement must be offset to allow faces of mortised hardware devices to be installed flush with door surfaces.
 - a. Hinges: At least 0.1094-inch BMT (MSG 12) continuous stile extruded and tapped to at least 0.1875-inch BMT (MSG 07) reinforcement, unless another thickness and size are required by the by the hardware manufacturer based on actual in-service conditions applicable to the project.
 - b. Lock Front, Strike, and Flushbolt Reinforcement: At least 0.1094-inch BMT (MSG 12) by sizes required by the hardware manufacturer, unless another thickness is required by the by the hardware manufacturer based on actual in-service conditions applicable to the project.
 - c. Lock Reinforcement: At least 0.0625-inch BMT (MSG 16) by size as required by lock manufacturer, unless another thickness is required by the by the hardware manufacturer based on actual in-service conditions applicable to the project.
 - d. Closer Reinforcement: At least 0.0625-inch BMT (MSG 16) one-piece channel by size as required by the closer manufacturer, unless another thickness is required by the by the hardware manufacturer based on actual in-service conditions applicable to the project.
 - e. Exit Device Reinforcement: 0.0781-inch BMT (MSG 14) by 18 inches high by 3-3/16 inches wide, unless another thickness and size are required by the by the hardware manufacturer based on actual in-service conditions applicable to the project.
 - f. Other Hardware Reinforcement: Supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
 - g. Hardware manufacturers' recommended reinforcement units may be used in lieu of specified reinforcement.
- 9. Electrical Device Requirements: Make provisions for installation of electrified hardware and door electrical devices, and arrange so that wiring is readily installed, removed, and replaced.
 - a. Provide cutouts and reinforcement required for installation of devices.
 - b. Provide metal conduits or raceways to accommodate wiring between devices. (e.g., from electric hinge to other electric door hardware)

2.3 ACCESSORIES

- A. Filler: Material conforming to the requirements of SDI publication SDI 100, *"Specifications for Standard Steel Doors and Frames"*. Use UL-listed materials in doors scheduled to have a fire-resistance rating.

- B. Vision Lights: "Vision Lite Kits" manufactured by TRUDOOR, LLC, or equal.
 - 1. Frames: At least at least 0.0359-inch BMT (MSG 20) uncoated steel sheet, with mitered and welded corners and countersunk mounting holes.
 - 2. Finish: Manufacturer's standard powder coat finish.
 - 3. Frame Color: Selected by the Architect.
 - 4. Safety-Rated Glass: Fully-tempered or laminated clear glass specified in Section 08 81 00.

- C. Door Louvers:
 - 1. Products: Provide the following manufactured by USA Fire Door LLC, or equal.
 - a. Standard Door Louvers: "800 Series", or equal, 0.0478-inch BMT (MSG 18) uncoated steel louver door inserts.
 - b. Fire-Rated Door Louvers: "1900 Series", or equal, 0.0478-inch BMT (MSG 18) uncoated steel louver door inserts.
 - 2. Requisite Properties:
 - a. Blades: Inverted Y or Z blades.
 - b. Minimum Free Area: Between 40 and 50 percent.
 - c. Finish: Manufacturer's standard powder coat finish; custom colors selected by the Architect.

- D. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

- E. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.4 MATERIALS

- A. Uncoated Carbon Steel Sheet:
 - 1. Door Material: Finished CRS coil, sheet, and strip conforming to ASTM A 1008, CS Type B (commercial steel), exposed, temper rolled, regular matte surface finish (40 to 59 AA), and oiled (sheet must be thoroughly cleaned to remove the oil prior to painting).
 - 2. Hardware Reinforcements: HRS coil, sheet, and strip conforming to ASTM A 1011, CS Type B (commercial steel), as-rolled surface finish, with cut edges.

- B. Zinc-Iron Alloy Coated (Galvannealed) Steel Sheet: ASTM A 653, CS Type B (commercial steel), with equal coating weight on each surface.
 - 1. Coating Designation: Provide at least a A60 (galvannealed) minimum coating designation.
 - 2. Surface Finish: Non-spangled matte finish.
 - 3. Surface Treatment: Provide mill phosphate surface treatment. (provides enhanced lubricating characteristics)

2.5 FINISHES

- A. Uncoated Steel HM Frames: Provide shop-applied phosphate (paint-grip) pre-treatment and baked on rust inhibitive primer to all 6 door surfaces. Primer must be compatible with either field-applied paint or field-applied coating systems specified in Division 09, as applicable.
- B. Zinc Coated and Zinc-Iron Alloy Coated Steel and Stainless Steel HM Frames: Provide shop-applied bonderized pre-treatment. (not prime painted)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 - 1. Install doors in conformance with the quality standards publications using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 - 2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
 - 3. Perform drilling and fitting as required or necessary for an accurate fit and complete installation.
 - 4. Installed doors must be warrantable. Do not install, correct, or replace doors in a manner that results in any warranty or guarantee becoming void.

- B. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach doors to supporting construction.
- C. Installation Tolerances:
 - 1. Fire-Rated Doors: Install doors with clearances in conforming to NFPA 80.
 - 2. Smoke- Control Doors: Install doors with clearances in conforming to NFPA 105.
 - 3. Other Doors: Install doors within the following clearance variations.
 - a. Jambs and Head: 1/8-inch plus or minus 1/16 inch.
 - b. Between Edges of Pairs of Doors: 1/8-inch plus or minus 1/16-inch.
 - c. Between Bottom of Door and Top of Threshold: Maximum 1/4-inch.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 1/4-inch.

3.3 ADJUSTING

- A. Verify smooth and quiet door and hardware operation.
- B. Lubricate and adjust operating parts and hardware to function properly, free from warp, twist, binding, and distortion. Confirm latches and locks engage securely without forcing or binding.
- C. Replace items that do not operate freely in a safe and reliable manner.

3.4 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 - 1. written descriptions of non-conforming, damaged, and defective work;
 - 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 - 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 CLEANING

- A. Cleaning Work: Clean all visible door surfaces in a manner that does not result in any warranty or guarantee becoming void.
 - 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 - 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 - 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 - 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.6 PROTECTION

- A. Protect installed doors in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything adjacent to or against installed doors unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed doors as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 08 14 16 – FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood veneer-faced flush wood doors.
2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 08 71 00 for door hardware.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. DHI: Door Hardware Institute.
2. WDMA: Wood Door Manufacturers Association.

B. Definitions:

1. Manufacturer: Means the door manufacturer, unless otherwise indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate building opening tolerances with door manufacturing and erection tolerances.
2. Coordinate hardware preparations, handing, and reinforcement requirements and locations with the Drawings, door schedule, and selected hardware sets.
3. Coordinate door hardware finishes with other door hardware finishes.

1.4 SUBMITTALS

A. Action Submittals: Submit the following for responsive action (formal review and approval).

1. Product Data:

- a. Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets

- (SDSs), both of which are returned to the Contractor without review or responsive action.
- b. Submit sample warranties with warranty periods, terms, conditions, exclusions, and remedies explicitly defined for each warranty, including clear warranty period start dates. (e.g., date of manufacture, purchase, installation, Beneficial Occupancy, Substantial Completion, Final Completion, etc.)
2. Door Schedule: Submit schedule showing opening identification symbols and door and frame types and sizes, including thickness, swing, fire-resistance rating label requirements, undercuts, and finishes. Use the same reference numbers for openings and details as the Drawings.
 3. Shop Drawings: Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project. Cross-reference details to door schedule.
 4. Samples: Submit at least 8-inch square representative samples of each door color, finish, and variety.
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished doors.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.
- C. Closeout Submittals:
1. Maintenance Data: Submit copies of manufacturer's instructions and other requirements and recommendations for door maintenance, cleaning, and repair to the Architect as a condition of project closeout.
 2. Warranty Documentation: Submit final warranties signed by the manufacturer's representative with complete terms indicated for all warranties covering items furnished or installed under this specification section.

1.5 QUALITY ASSURANCE

- A. Source Limitations:
1. Doors must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.

- b. Items provided for each different installation must be obtained from the same source and manufacturer.
 2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.
- B. Regulatory Requirements:
 1. Fire-Protection Rating: Within fire-resistance rated assemblies, provide fire-protection-rated doors conforming to NFPA 80, "*Standard for Fire Doors and Other Opening Protectives*" and tested in conformance with NFPA 252, "*Standard Methods of Fire Tests of Door Assemblies*" and UL 10B, "*Standard for Fire Tests of Door Assemblies*"; or UL 10C, "*Standard for Positive Pressure Fire Tests of Door Assemblies*" for doors at atmospheric (neutral) pressure. A label or listing mark indicating the fire-protection rating must be permanently affixed at the factory in a location such that the label remains visible after the door is installed and must include UL "S" and "Positive Pressure Test" listings.
 2. Smoke-Control Door Assemblies: Provide doors conforming to the requirements of with NFPA 80, "*Standard for Fire Doors and Other Opening Protectives*" and tested in conformance with NFPA 105, "*Standard for Smoke Door Assemblies and Other Opening Protectives*" or UL 1784, "*Standard for Air Leakage Tests of Door Assemblies*".
- C. Quality Standard Requirements:
 1. Product Standard: Comply with the requirements Window & Door Manufacturers Association publication ANSI/WDMA I.S.1-A, "*Industry Standard for Interior Architectural Wood Flush Doors*".
 2. Door Hardware Installation Standards: Install door hardware in conformance with ANSI/DHI A115-IG, "*Installation Guide for Doors and Hardware*".
- D. Qualifications:
 1. Manufacturer: Company or individuals must have at least 10 years' experience manufacturing doors installed on at least 200 previous projects similar to this project in size, material, design, and complexity. Manufacturer must be a current member of WDMA.
 2. Installer: Company or individuals must have at least 5 years' experience installing doors for at least 30 previous projects similar to this project in size, material, design, and complexity.
 3. Supervisors: Individuals must have at least 7 years' experience installing doors for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading door installers.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.

2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
 3. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
1. Furnish adequate dunnage and bracing during storage.
 2. Prevent stored items from contacting the floor, from soiling and staining, and from deterioration and damage.
 3. Do not leave items uncovered where they might be exposed to weather or become wet; or exposed to heat or sudden changes in temperature or relative humidity; or other sources of deterioration and damage, including dust and other airborne contaminants.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage. Avoid damage to packaging and containers.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective doors with undamaged new doors that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 WARRANTY

- A. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 5 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
1. Algoma Hardwoods, Inc.
 2. Eggers Industries.
 3. Marshfield DoorSystems, Inc.
 4. Oshkosh Architectural Door Co.

2.2 WOOD VENEER-FACED DOORS

- A. Description: Flush wood doors conforming to WDMA I.S.1-A Performance Grade Heavy Duty.
- B. Application: Transparent finish wood doors.
- C. Restrictions: Doors manufactured with adhesives and composite wood products containing urea formaldehyde are prohibited.
- D. Product: "Signature Series" doors manufactured by Marshfield DoorSystems, Inc., or equal.
- E. Requisite Properties:
 - 1. Type: Solid Core.
 - 2. Grade: Premium.
 - 3. Thickness: 1-3/4 inches.
 - 4. Construction: 5-ply.
 - 5. Core: Manufacturer's standard wood-based particleboard, structural composite lumber, or fire-resistant composite or mineral core, or specialty core.
 - 6. Edge Construction: Structural composite lumber or hardwood lumber stiles and rails securely bonded to core components and machine calibrated before veneering, with edge banding veneer matching face veneer species and grade.
 - 7. Meeting Edge: Beveled at lock stile, square edged at strike stiles.
 - 8. Hardware Blocking: As required by hardware manufacturer to eliminate through-bolting hardware.
 - a. 5-by-18-inch lock blocks at both stiles.
 - b. 5-inch top rail blocking for closers and 5-inch bottom rail blocking where automatic door bottoms are indicated.
 - c. 2-1/2-inch mid-rail blocking.
 - 9. Exposed Vertical Surfaces: Wood veneer.
 - a. Veneer Grade:
 - b. Face Cut and Veneer Species:
 - c. Grain Direction:
 - d. Veneer Match:
 - 10. Transparent Finish:
 - a. Grade: Premium.
 - b. Surface Finish: Clear conversion varnish.
 - c. Stain: Indicated on the Drawings or selected by the Architect.
 - d. Sheen: Indicated on the Drawings or selected by the Architect.
 - 11. Horizontal Surfaces: Structural composite lumber.
 - 12. Openings: Cut and trim openings through doors in factory.
 - a. Light Openings: Trim openings with materials and profiles indicated.
 - b. Glazing: Field install glazing.

- c. Louvers: Factory install louvers in prepared openings.

2.3 ACCESSORIES

- A. Vision Lights: "Vision Lite Kits" manufactured by TRUDOOR, LLC, or equal.
 - 1. Frames: At least at least 0.0359-inch BMT (MSG 20) uncoated steel sheet, with mitered and welded corners and countersunk mounting holes.
 - 2. Finish: Manufacturer's standard powder coat finish.
 - 3. Frame Color: Indicated on the Drawings or selected by the Architect.
 - 4. Safety-Rated Glass: Fully-tempered or laminated clear glass specified in Section 08 81 00.
- B. Door Louvers:
 - 1. Products: Provide the following manufactured by USA Fire Door LLC, or equal.
 - a. Standard Door Louvers: "800 Series", or equal, 0.0478-inch BMT (MSG 18) uncoated steel louver door inserts.
 - b. Fire-Rated Door Louvers: "1900 Series", or equal, 0.0478-inch BMT (MSG 18) uncoated steel louver door inserts.
 - 2. Requisite Properties:
 - a. Blades: Inverted Y or Z blades.
 - b. Minimum Free Area: Between 40 and 50 percent.
 - c. Finish: Manufacturer's standard powder coat finish; custom colors selected by the Architect.
- C. Electrical Device Requirements: Make provisions for installation of electrified hardware and door electrical devices, and arrange so that wiring is readily installed, removed, and replaced.
 - 1. Provide cutouts and reinforcement required for installation of devices.
 - 2. Provide metal conduits or raceways to accommodate wiring between devices. (e.g., from electric hinge to other electric door hardware)
- D. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
- E. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 - 1. Install doors in conformance with the quality standards publications using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 - 2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
 - 3. Perform drilling and fitting as required or necessary for an accurate fit and complete installation.
 - 4. Installed doors must be warrantable. Do not install, correct, or replace doors in a manner that results in any warranty or guarantee becoming void.
- B. Special Techniques:
 - 1. Factory-Fitted Doors: Align in frames for uniform clearance at each edge. Hang doors to operate freely for their entire travel, but not loosely, without sticking or hinge binding, with hardware adjusted and functioning properly.
 - 2. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.
- C. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach doors to supporting construction.
- D. Installation Tolerances:
 - 1. Fire-Rated Doors: Install doors with clearances in conforming to NFPA 80.

2. Smoke- Control Doors: Install doors with clearances in conforming to NFPA 105.
3. Other Doors: Install doors within the following clearance variations.
 - a. Jambs and Head: 1/8-inch plus or minus 1/16 inch.
 - b. Between Edges of Pairs of Doors: 1/8-inch plus or minus 1/16-inch.
 - c. Between Bottom of Door and Top of Threshold: Maximum 1/4-inch.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 1/4-inch.

3.3 ADJUSTING

- A. Verify smooth and quiet door and hardware operation.
- B. Lubricate and adjust operating parts and hardware to function properly, free from warp, twist, binding, and distortion. Confirm latches and locks engage securely without forcing or binding.
- C. Rehang or replace doors that do not operate freely in a safe and reliable manner.

3.4 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 CLEANING

- A. Cleaning Work: Clean all visible door surfaces in a manner that does not result in any warranty or guarantee becoming void.
 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.

2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.6 PROTECTION

- A. Protect installed doors in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything adjacent to or against installed doors unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed doors as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 08 31 16 – ACCESS PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal access panel assemblies.
2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. BMT: Base Metal Thickness.

B. Definitions:

1. Manufacturer: Means the access panel manufacturer, unless otherwise indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate locations of items and equipment being accessed with access panel sizes and locations indicated on the Drawings.
2. Coordinate hardware preparations, handing, reinforcement requirements, and locations with the Drawings, access panel manufacturer, and selected hardware sets.

B. Acoustical Requirements:

1. Provide fire-rated access doors with continuous piano-style hinges at sound-rated construction.
2. Seal door flange perimeter with "S88" adhesive-backed fire and smoke gasketing manufactured by Pemko Manufacturing Co., Inc., or equal.
3. Seal entire assembly to gypsum board with acoustical sealant.
4. Include 1-1/2-inch-thick minimum insulation laminated with at least 2 pound per square foot density material such as gypsum board.

1.4 SUBMITTALS

- ##### A. Action Submittals: Submit the following for responsive action (formal review and approval).

1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs) both of which are returned to the Contractor without review or responsive action.
 2. Shop Drawings:
 - a. Submit dimensioned plans and elevations drawn to scale and showing access panel locations, sizes, and extents of all items, accessories, and trim. Label manufactured items by product name.
 - b. Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project. Cross-reference details to plans and elevations.
- B. Informational Submittals: Submit manufacturer's instructions for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
1. Submit manufacturer-prepared published instructions for proper installation of furnished access panels.
 2. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 3. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.

1.5 QUALITY ASSURANCE

- A. Source Limitations:
1. Access panels must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
 2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
 3. Unload and store only inspected and accepted items.

- B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage. Avoid damage to packaging and containers, and contamination of contents.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective access panels with undamaged new access panels that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 METAL ACCESS PANEL AND FRAMES

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
 - 1. Activar Construction Products Group, Inc.
 - 2. Acudor Products, Inc.
 - 3. Karp Associates, Inc.
 - 4. Nystrom Building Products.
- B. Non-Rated Access Panels at Ceramic Tile Wall Finishes:
 - 1. Description: Flush stainless steel access panels and frames.
 - 2. Product: "JL Industries Model TMS" manufactured by Activar Construction Products Group, Inc., or equal.
 - 3. Material: Type 304, 0.0625-inch BMT (USSG 16) stainless steel frame with at least 0.0625-inch BMT (USSG 16) stainless steel door.
 - 4. Trim: At least 0.0312-inch BMT (USSG 22) stainless steel flange.
 - 5. Hinge: Concealed continuous piano hinge.
- C. Non-Rated Access Panels Elsewhere:
 - 1. Description: Flush concealed frame access panels with wallboard bead.
 - 2. Product: "JL Industries Model TMW" manufactured by Activar Construction Products Group, Inc., or equal.
 - 3. Material: At least 0.0598-inch BMT (MSG 16) cold-rolled uncoated steel sheet frame and 0.0598-inch BMT (MSG 16) cold-rolled uncoated steel sheet door.
 - 4. Trim: At least 0.0299-inch BMT (MSG 22) HDG steel sheet gypsum board tape-in bead flange.
 - 5. Hinge: Concealed continuous piano hinge.
 - 6. Finish: Manufacturer's standard shop-applied phosphate pre-treatment and baked on rust inhibitive primer for field-applied finish.

D. Fire-Resistance Rated Access Panels:

1. Description: Fire-rated and insulated concealed frame access panel with wallboard bead.
2. Product: "JL Industries Model FDW" manufactured by Activar Construction Products Group, Inc., or equal.
3. Material: At least 0.0598-inch BMT (MSG 16) cold-rolled uncoated steel sheet frame with At least 0.0359-inch BMT (MSG 20) cold-rolled uncoated steel sheet door.
4. Trim: At least 0.0299-inch BMT (MSG 22) HDG steel sheet gypsum board tape-in bead flange.
5. Insulation: At least 2-inch thick fire-resistive mineral wool insulation sandwiched between access panel faces.
6. Hinge: Concealed continuous piano hinge.
7. Finish: Manufacturer's standard shop-applied phosphate pre-treatment and baked on rust inhibitive primer for field-applied finish.

E. Requisite Properties:

1. Provide at least 24-inch square or larger panel assemblies where servicemen must access spaces through panels.
2. Elsewhere, provide at least 12-inch square panel assemblies.

F. Accessories:

1. Locking Devices:
 - a. Public Areas: Provide one mortise cylinder lock per access door. Key all locks alike, unless otherwise noted.
 - b. Other Areas: Provide flush, key-operated cam lock. Key all locks alike, unless otherwise noted.
 - c. Panels 24 inches or More in Any Dimension: Provide interior latch to permit access panel opening from inside without a key.
2. Gaskets: Apply manufacturer's optional gasketing to frames of units that do not come standard with gaskets.
3. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
4. Other Accessories: Provide other accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 - 1. Install access panels using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 - 2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
 - 3. Installed access panels must be warrantable. Do not install, correct, or replace access panels in a manner that results in any warranty or guarantee becoming void.
- B. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach access panels to supporting construction.
- C. Installation Tolerances: Install access panels to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch from plumb, level, and alignment.

3.3 ADJUSTING

- A. Verify smooth and quiet access panel door and hardware operation.
- B. Lubricate and adjust operating parts and hardware to function properly, free from warp, twist, binding, and distortion. Confirm latches and locks engage securely without forcing or binding.

- C. Replace items that do not operate freely in a safe and reliable manner.

3.4 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 CLEANING

- A. Cleaning Work: Clean all visible access panel surfaces in a manner that does not result in any warranty or guarantee becoming void.
 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.6 PROTECTION

- A. Protect installed access panels in place from soiling, deterioration, and damage until Substantial Completion.

- B. Do not store anything on or adjacent to or against installed access panels unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed access panels as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 08 51 13 – ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Aluminum windows.
 2. Site tests and inspections.
 3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

- A. Abbreviations and Acronyms:
1. AAMA: American Architectural Manufacturers Association.
 2. WDMA: Window & Door Manufacturers Association.
 3. CSA: Canadian Standards Association.
- B. Definitions:
1. Manufacturer: Means the window manufacturer, unless otherwise indicated.
 2. Failure: Includes noise or vibration caused by movement, material deterioration beyond normal weathering, water leakage through fixed glazing and framing areas, and failure of operating components.
 3. Water Leakage: Means no uncontrolled water penetrating assemblies or water appearing on assemblies' normally-exposed interior surfaces from sources other than condensation. Water leakage does not include water controlled by flashing and gutters that is drained to the exterior.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
1. Coordinate building opening tolerances with window manufacturing and erection tolerances.
 2. Coordinate window hardware finishes with door hardware finishes.
- B. Performance Requirements:
1. General: Windows must establish and maintain a continuous watertight seal without failure.
 2. Thermal Transmittance (U-Factor): Maximum assembly thermal transmittance value may not exceed the following.

- a. Maximum Winter Nighttime Transmittance (U-value): Not more than 0.36 for fixed assemblies; and 0.46 BTU per hour per square foot per deg. F. for operable assemblies.
 - b. Maximum Summer Daytime Transmittance (U-value): Not more than 0.42 BTU per hour per square foot per deg. F.
 3. Condensation Resistance Factor (CRF): Minimum CRF value of at least the following, when tested in conformance with NFRC 500.
 - a. Combined Framing Members and Glazing: At least 56.
 - b. Framing Members Only: At least 70.
 4. Sound Transmission Class (STC): Provide complete assemblies (both frame and glazing) having a minimum laboratory-tested STC value of at least that indicated on the Drawings for glass and frame together, as determined in conformance with ASTM E 413, based on testing in conformance with ASTM E 90.
 5. Outdoor-Indoor Transmission Class (OITC): Provide complete assemblies (both frame and glazing) having a minimum laboratory-tested OITC value of at least that indicated on the Drawings for glass and frame together, as determined in conformance with ASTM E 413, based on testing in conformance with ASTM E 90.
 6. Operating Force for Sliding Window Assemblies: Not more than 30 pounds-force required to open the window, nor more than 20 pounds-force to keep the window in motion, when tested in conformance with ASTM E 2068.
 7. Operable Window De-Glazing Test: Operable sash or panel member must not move from the original position, relative to glazing, by more than the glass bite depth, when tested in conformance with ASTM E 987 at a 70 pounds-force concentrated load on vertical rails and a 50 pounds-force concentrated load on other rails.
 8. Forced-Entry Resistance: Operable window assemblies within 15 feet of grade or accessible platform must be rated at least Performance Grade 30, when tested in conformance with ASTM F 588 according to window assembly type classification.
 9. Thermal Expansion and Contraction: Accommodate movement resulting from at least 120 deg. F ambient and 180 deg. F material surface temperature differentials (changes).
 10. Dissimilar Metal Corrosion Protection: Permanently isolate metal surfaces from direct contact with incompatible materials and other potentially corrosive substrates as specified in Section 05 50 00.
- C. Preinstallation Meeting:
1. Hold a meeting after submittal approval and at least 10 business days before beginning installation.
 2. During the meeting, review the Contract Documents, submittals, project conditions, and installation sequence and methods, including special details and conditions that might affect installation
 3. Identify and discuss adverse or unfavorable conditions detrimental to protecting stored materials or to installation; or to the quality, durability, appearance, or performance of installed windows. Resolve each condition.
 4. Finalize construction schedule.

5. Record significant discussions and distribute meeting minutes. Do not begin installation until disagreements are successfully resolved to the satisfaction of all parties.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
 1. Product Data:
 - a. Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs), and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 - b. Submit sample warranties with warranty periods, terms, conditions, exclusions, and remedies explicitly defined for each warranty, including clear warranty period start dates. (e.g., date of manufacture, purchase, installation, Beneficial Occupancy, Substantial Completion, Final Completion, etc.)
 2. Shop Drawings:
 - a. Submit dimensioned plans and elevations drawn to scale and showing window layout, materials, construction, and finishes. Show locations, sizes, and extents of all items, accessories, and trim. Label manufactured items by product name.
 - b. Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project. Cross-reference details to plans and elevations.
 3. Samples:
 - a. Submit at least 6-inch square representative samples of each window frame and sash color and finish.
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
 1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished windows.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.
- C. Closeout Submittals: Submit the following to the Architect as a condition of project closeout.

1. Warranty Documentation: Submit final warranties signed by the manufacturer's representative with complete terms indicated for all warranties covering items furnished or installed under this specification section.

1.5 QUALITY ASSURANCE

A. Source Limitations:

1. Windows must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.

A. Regulatory Requirements:

1. Windows must conform to the requirements of California Building Code 11B-229.1. Where glazed openings are provided in accessible rooms or spaces for operation by occupants, at least one must conform to the requirements of California Building Code Section 11B-309.

B. Quality Standard Requirements:

1. Product Standard: Windows must conform to the requirements of ANSI/AAMA/WDMA publication ANSI/AAMA/WDMA 101/I.S.2/NAFS-02, "*Windows, Skylights and Glass Doors*".
2. Performance Standard: Comply with the requirements of AAMA/WDMA/CSA publication AAMA/WDMA/CSA 101/I.S.2/A440, "*NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*".

C. Qualifications:

1. Manufacturer: Company or individuals must have at least 10 years' experience manufacturing windows installed on at least 200 previous projects similar to this project in size, material, design, and complexity.
2. Installer: Company or individuals must have at least 5 years' experience installing windows for at least 30 previous projects similar to this project in size, material, design, and complexity.
3. Supervisors: Individuals must have at least 7 years' experience installing windows for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading window installers.

- D. Mockups: If an *ex-situ* exterior wall integrated mockup is required for this project, then integrate windows into the mockup as part of the work of this specification section.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 - 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 - 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped and in conformance with manufacturer's instructions and other requirements and recommendations for storage. Furnish adequate dunnage and bracing during storage.
 - 1. Prevent stored items from contacting the floor or ground, from soiling and staining, and from deterioration and damage.
 - 2. If items are not stored in an enclosed location, then cover the tops and sides with securely-tied, waterproof, and breathable covers. Unvented polyethylene tarpaulins do not qualify as breathable covers and are prohibited. (due to potential accumulation of moisture beneath tarpaulin during certain environmental conditions)
 - 3. Incline covered items to ensure maximum drainage of accumulated moisture.
 - 4. Do not leave items uncovered where they might be exposed to weather or become wet; or exposed to other sources of deterioration and damage.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective windows with undamaged new windows that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 WARRANTY

- A. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 5 years; and for finishes against color fading, chalking, cracking, checking, peeling, and adhesive failure for 20 years.
- B. Installer Guarantee: Furnish to the Owner a written guarantee for the work of this specification section against all defects in materials and workmanship for 2 years from date of acceptance. Guarantees must be properly prepared and signed on the guarantee form in Division 01.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
1. Arcadia.
 2. EFCO Corp.
 3. Kawneer Co., Inc.
 4. Wausau Window and Wall Systems.

2.2 FRAMED ALUMINUM WINDOWS

- A. Description: Thermally-broken aluminum-framed window units tested and labeled for conformance to AAMA/WDMA/CSA 101/I.S.2/A440 requirements for at least Class AW 50 and having mitered and fusion-welded corners.
- B. Product: "GLASSvent Windows" manufactured by Kawneer Co., Inc., or equal.
- C. Requisite Properties:
1. Style: Indicated on the Drawings.
 2. Sizes: Indicated on the Drawings.
 3. Nominal Glazing Thickness: One-inch.
 4. Exposed Finishes: Match curtain wall framing.
 5. Concealed Steel Finishes: Prepare surfaces and apply shop primer specified in Section 05 05 13.
 6. Concealed Aluminum Finishes: Prepare surfaces and coat aluminum surfaces in contact with masonry, concrete, or steel with bituminous paint specified Section 05 50 00.

2.3 ACCESSORIES

- A. Window Sills and Stools: Selected by the Architect, or equal.
- B. Fiberglass Insect Screens:
1. Description: Vinyl-coated fiberglass mesh insect screening fabric.
 2. Product: "Phiferglass" manufactured by Phifer Wire Products, Inc., or equal.
 3. Requisite Properties:
 - a. Window and Door Screens: 18x16 nominal mesh count, woven from 0.010-inch diameter permanent glass yarn; 59 percent minimum free area (openness).
 - b. Pool, Patio and Porch Screen: 18x14 nominal mesh count, woven from 0.013-inch diameter permanent glass yarn; 58 percent minimum free area (openness).
 - c. No-See-Um Mesh Screen: 20x20 nominal mesh count, woven from 0.013-inch diameter permanent glass yarn; 45 percent minimum free area (openness).

- d. Color: Match Phifer color "Black".
- e. Frame: Rolled aluminum frame; match window finish.
- C. Hardware: Manufacturer's standard factory-installed operating hardware; finish must match adjacent door hardware.
- D. Glazing Gaskets: Manufacturer's standard ethylene propylene diene monomer (EPDM) conforming to ASTM C 864 and having a Shore A hardness value of at least 70, unless another type of gasket is supplied, required, recommended, or accepted by the manufacturer.
- E. Brackets: Provide high-strength aluminum or non-magnetic austenitic stainless steel brackets and reinforcements.
- F. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
 - 1. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
 - 2. Reinforce framing members as required to receive fastener threads.
 - 3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.
- G. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

A. General Requirements:

1. Install windows using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
3. Installed windows must be warrantable. Do not install, correct, or replace windows in a manner that results in any warranty or guarantee becoming void.

B. Special Techniques:

1. Use concealed fasteners and anchorages. Provide washer head fasteners with bonded sealing washers where required to protect metal surfaces and to make weathertight connections.
2. Form closely-fitted joints with exposed connections accurately located and secured.
3. Provide uniform-width perimeter reveals and opening sealants and joint fillers as indicated.
4. Install concealed gaskets, flashings, and joint fillers as the window installation progresses.

C. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach windows to supporting construction.

D. Installation Tolerances: Install windows to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch from plumb, level, and alignment.

3.3 ADJUSTING

A. Verify smooth and quiet window and hardware operation.

B. Lubricate and adjust operating parts and hardware to function properly, free from warp, twist, binding, and distortion. Confirm latches and locks engage securely without forcing or binding.

C. Replace items that do not operate freely in a safe and reliable manner.

3.4 FIELD QUALITY CONTROL

A. Site Tests and Inspections:

1. General: Include site tests and inspections as part of the work of this specification section. The Owner's testing and inspection agency performs tests and inspections.
 - a. Schedule and arrange all tests and inspections.

- b. Coordinate all work and the final construction schedule with all tests and inspections.
 - c. Coordinate tests and inspections with the work of other specification sections, and other specified, required, or necessary tests and inspections.
 - d. Furnish all work, equipment, tools, facilities, personnel, and controls necessary for each test and inspection.
 - e. Arrange tests and inspections by notifying the Owner, the testing and inspection agency, the installer, the manufacturer's representative, and the Architect at least 5 business days before work is ready for testing or inspection.
 - f. Witness all site tests and inspections.
 - g. Receive test and inspection reports and distribute to the installer and the manufacturer's representative.
 - h. When tests and inspections reveal defective items, repair defective work to the satisfaction of the manufacturer's representative and Architect, and re-test and re-inspect work without reimbursement from Owner until all work passes tests and inspections.
2. Required Tests:
- a. Water Leakage Hose Tests: Perform water leakage hose tests in conformance with ASTM AAMA 501.2 (fixed glazing assemblies) and AAMA 502 (operable window units).

3.5 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs, and re-inspection and re-testing costs, without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.6 CLEANING

- A. Cleaning Work: Clean all visible window surfaces in a manner that does not result in any warranty or guarantee becoming void.

1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.7 PROTECTION

- A. Protect installed windows in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything adjacent to or against installed windows unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed windows as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 08 83 13 – MIRRORED GLASS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Mirrored glass.
 2. Mirror hardware.
 3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

- A. Definitions:
1. Manufacturer: Means the mirrored glass manufacturer, unless otherwise indicated.

1.3 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
1. Product Data:
 - a. Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 - b. Submit sample warranties with warranty periods, terms, conditions, exclusions, and remedies explicitly defined for each warranty, including clear warranty period start dates. (e.g., date of manufacture, purchase, installation, Beneficial Occupancy, Substantial Completion, Final Completion, etc.)
 2. Shop Drawings: Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project.
 3. Samples: Submit at least 8-inch long representative samples of each mirrored glass hardware type, color, finish, and variety.
- B. Informational Submittals: Submit manufacturer's instructions for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
1. Submit manufacturer-prepared published instructions for proper installation of furnished mirrored glass.

2. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 3. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
- C. Closeout Submittals: Submit the following to the Architect as a condition of project closeout.
1. Warranty Documentation: Submit final warranties signed by the manufacturer's representative with complete terms indicated for all warranties covering items furnished or installed under this specification section.
- 1.4 HANDLING
- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped, upright in their original packaging or containers, indoors within dry, well-ventilated, broom-cleaned, and partially- or permanently-enclosed storage areas. Prevent stored items from contacting the floor or ground and from deterioration and damage.
- C. Damaged Item Replacement: Promptly remove and replace items that are deteriorated, damaged, or defective with undamaged new items that do not exhibit deterioration, damage, or defects.
- D. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.5 WARRANTY

- A. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 10 years.

PART 2 - PRODUCTS

2.1 MIRRORED GLASS

- A. Clear Annealed Mirrored Glass:
1. Description: 6.0mm thick (nominal 1/4-inch) silvered annealed monolithic clear glass mirrors conforming to ASTM C 1503, Mirror Stock Sheet (mirrors intended for

architectural use and where trimming is required), Quality Q-1 (Mirror Select Quality), Clear Glass Mirrors.

2. Manufacturers: Provide products manufactured by one of the following, or equal.
 - a. Guardian Industries.
 - b. National Glass Industries.

B. Mirror Backing:

1. Protective Copper Coating: "Paint Mirror Backing Copper" manufactured by Sommer & Maca, or equal.
2. Backing Sealer: "Mirro-Bac" flat black, lead-free, industrial quality mirror backing paint manufactured by Palmer Products, or equal.

2.2 MIRROR HARDWARE

- A. Bottom Supporting Angles: "Catalog No. D636A" 1/4-inch standard extruded satin anodized aluminum "J" channels manufactured by C.R. Lawrence Co., or equal.
- B. Top Supporting Angles: "Catalog No. D645A" 1/4-inch deep nose extruded satin anodized aluminum "J" channels manufactured by C.R. Lawrence Co., or equal.

2.3 ACCESSORIES

- A. Cut Edge Sealer: "CRL Gunther Seal-Kwik" manufactured by C.R. Lawrence Co., or equal.
- B. Setting Blocks: "Catalog No. PSB040" clear plastic setting blocks manufactured by C.R. Lawrence Co., or equal.
- C. Fasteners: Provide countersunk or flat head duplex anti-corrosive steel screw fasteners.
- D. Mounting Adhesive Primer: "CRL Gunther Prime-N-Seal Primer" manufactured by C.R. Lawrence Co., or equal.
- E. Mounting Adhesive: "CRL Gunther Ultra/Bond Mastic" manufactured by C.R. Lawrence Co., or equal.
- F. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.

- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 - 1. Install mirrored glass using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 - 2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
 - 3. Installed mirrored glass must be warrantable. Do not install, correct, or replace mirrored glass in a manner that results in any warranty or guarantee becoming void.
- B. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach mirrored glass to supporting construction.
- C. Installation Tolerances: Install mirrored glass to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch from plumb, level, and alignment.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 - 1. written descriptions of non-conforming, damaged, and defective work;
 - 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 - 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.

- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Cleaning Work: Clean all visible mirrored glass surfaces in a manner that does not result in any warranty or guarantee becoming void.
 - 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 - 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 - 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 - 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.5 PROTECTION

- A. Protect installed mirrored glass in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything on or adjacent to or against installed mirrored glass unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed mirrored glass as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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DIVISION 09

FINISHES

SECTION 09 05 16- PREPARATION OF CONCRETE SUBSTRATES FOR FINISH FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete substrate testing equipment.
2. Corrective (remedial) MVECS.
3. Surface preparation.
4. Site tests and inspections.
5. Supplementary components, accessories, and detail work normally furnished or otherwise necessary for complete testing and preparation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 03 35 10 for preventative (day-of-pour) MVECS; for definitions of the term "recently-cured", "hardened", "newly-aged", and "existing" concrete; and for wet concrete RH meter accessories.
2. Section 03 54 16 for definition of the term "underlayment".
3. Section 09 29 00 for definition of "permanent enclosure".

1.2 RELATED DOCUMENTS

A. This specification section

1. supplements the requirements of specification sections that identify penetrants, overlays, and coverings required for the project; and
2. is used with other specification sections to produce correct and complete substrates for all actual in-service flooring conditions applicable to the project; and sound substrates for the proper and warrantable installation of all specified or selected penetrants, overlays, and coverings, including underlayment specified in Section 03 54 16.

1.3 PRICE AND PAYMENT PROCEDURES

A. Slab Remediation:

1. Without reimbursement from Owner, perform or arrange and pay costs for performing all remedial work necessary to correct and improve
 - a. defective flatwork, including areas that exceed the MVER, pH, and RH limits required, recommended, or accepted by the penetrant, overlay, and covering manufacturers; and

- b. penetrant, overlay, and covering failures resulting from selected concrete curing methods; and coordination of, or failure to coordinate, the chemical and adhesive compatibility of selected curing compounds with all subsequent penetrants, overlays, and covering materials, including primers, adhesives, and sealants, and other installation materials.
 2. For other applications, specified MVECS is excluded from the Contract and used only as a topical remediation where necessary to conform to the penetrant, overlay, and covering manufacturers' MVER, pH, and RH requirements.
- B. Unit Prices:
 1. Administrative Requirements:
 - a. Supply unit prices in terms of dollars per square foot for complete MVECS surface preparation and installation.
 - b. Specified MVECS becomes part of the Contract upon acceptance in writing by the Owner via properly-executed Change Order.
 2. Measurement Procedures: Contract adjustments are made based on the net installed verifiable quantities of conforming work compared to quantities indicated on the Drawings.
 3. Payment Procedures:
 - a. The Owner provides payment based on actual quantities and measurements that are both placed in the work and verified by the Architect.
 - b. The Owner is not required to provide additional compensation for extraneous, non-conforming, or rejected work.
- C. Alternates: With input from the preventative (day-of-pour) MVECS manufacturer, preventative MVECS specified in Section 03 35 10 may be considered for certain concrete curing applications in lieu of curing compounds; and possibly in lieu of corrective MVECS products specified in this specification section.

1.4 REFERENCES

- A. Abbreviations and Acronyms:
 1. CC: Anhydrous Calcium Chloride.
 2. ICRI: International Concrete Repair Institute.
 3. MVECS: Moisture Vapor Emission Control System.
 4. MVER: Moisture Vapor Emission Rate.
 5. pH: Potential of Hydrogen.
 6. RH: Relative Humidity.
- B. Definitions:
 1. Floor Preparation: Means to make flatwork surfaces ready to receive finish flooring and suitable for proper bonding of flooring and installation materials, including patching minor holes and saw cuts, sanding, sweeping, and cleaning of conforming substrates.

2. Floor Repair: Means to fix or mend non-conforming substrates suffering from damage or fault, including grinding, filling, topping, and leveling activities.
3. Moisture Vapor Emission Rate (MVER): Means the amount of moisture emitted from a substrate, expressed as the weight of condensed gas (liquid) in theoretical pounds emitted over 1,000 square feet of floor area during a 24-hour period. MVER is commonly referred to as “pounds” (i.e., “3 pounds” or “3 lb”). Rates range from 0 to 30 pounds per 1,000 square feet per 24 hours.
4. Substrate: Means a recently-cured, hardened, newly-aged, or existing concrete substrate, including cast-in-place, sitecast, and precast concrete floor and deck assemblies, cast underlayment, toppings, repair materials, and similar items.
 - a. Floor: Means a slab-on-grade floor assembly.
 - b. Deck: Means a suspended floor or roof slab assembly.
5. Penetrant: Means any direct-applied material, product, component, accessory, or other item that can pass into or through substrate surfaces, or enter and diffuse through substrate surface cracks, pores, and other surface defects. Penetrants include water, hardeners, curing compounds, stains, penetrating repellents and sealers, non-sacrificial graffiti-resistant materials, and dry penetrants.
6. Overlay: Means any direct-applied film-forming or high-build material that covers a substrate surface, including cast decks, underlayment, and toppings; dampproofing, waterproofing, and roofing; liquid flashings and sealants; fluid-applied and flooring treatment; terrazzo flooring; and paints, coatings, and film-forming sealers; and sacrificial graffiti-resistant materials.
7. Covering: Means any direct-applied material, product, component, accessory, or other item that is adhered or bonded to a substrate surface, including tile and adhered veneer assemblies; specialty, masonry, wood, resilient and precast terrazzo flooring; carpeting; and unit paving.
8. Cladding: Means any material, product, component, accessory, or other item supported by a framework, which is attached to a sporting construction, including anchored veneer, wall and soffit panels, and exterior plaster assemblies; suspended ceiling assemblies; and free-standing elevated accessible floor and roof paver assemblies.
9. Overburden: Means all materials, components, accessories, and other items installed or placed over a cured substrate, including overlays, coverings, cladding, and vegetated plaza deck and roof assemblies.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting:

1. MVECS manufacturer’s representative and MVECS installer must attend the preinstallation meeting specified in specification section 03 35 10.
2. Schedule a separate additional preinstallation meeting between the Contractor, the Architect, penetrant, overlay and covering manufacturers’ representatives and installers, the MVECS manufacturer’s representative and installer, and the entities and individuals responsible for conducting concrete substrate testing.

3. Hold the meeting after submittal approval and at least 10 business days before beginning installation.
 4. During the meeting, review
 - a. substrate design and installation, including concrete mix design, water-cement ratio, slab thickness at each test location, below grade VDRs and concrete placement and pour dates;
 - b. curing, sealing, or bond breaking compounds used on substrates, along with requirements and techniques used for complete removal of compounds prior to testing and floor covering installation;
 - c. trenching, including mix design, water-cement ratio, thickness, and pour dates of concrete or slurry backfill;
 - d. bonding agents selected for overlay installation or application;
 - e. primers and adhesives selected for covering installation;
 - f. qualifications of the testing agency and testing agency personnel that are scheduled to complete testing, and that interpret test results;
 - g. calibration and verification of test equipment prior to beginning each round of testing;
 - h. HVAC system operation and requirements during testing, including temperature and RH limits;
 - i. preparation of testing sites, including procedures to assure slab surfaces are free from any material or substance that may hinder the free release of moisture from the slab;
 - j. testing procedures and sequence for each test, including sequence, frequency, and location of test sites;
 - k. requirements for testing and inspection reports;
 - l. the construction schedule;
 - m. temporary procedures required to protect concrete surfaces from re-wetting after initial testing; and
 - n. redistribution of moisture within the substrate after floor coverings are applied;
 5. Identify and discuss adverse or unfavorable conditions detrimental to testing and floor preparation.
 6. Finalize construction schedule.
 7. Record significant discussions and distribute meeting minutes. Do not begin installation until disagreements are successfully resolved to the satisfaction of all parties.
- B. Quality Standards:
1. Quality Guideline: Selected concrete surface profiling, preparation, cleaning, and repair must conform to the requirements of International Concrete Repair Institute (ICRI) Guideline No. 310.2R, *"Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair"*.
 2. Installation Standard: Concrete surface preparation must conform to the requirements of Journal of Protective Coatings and Linings (JPCL) publication, *"Surface Preparation of Concrete Substrates"*.

C. Qualifications:

1. Substrate Testing: Individuals performing substrate testing must be certified as ICRI Concrete Slab Moisture Testing Technicians, Grade 1 and current in their certification.
2. Substrate Repair: Individuals performing substrate repair must be certified as ICRI Concrete Surface Repair Technicians, Grade 1 and current in their certification.

D. Sequencing: Begin substrate testing only after

1. the building is enclosed with a permanent enclosure, including permanently-installed doors, windows, storefronts, curtain walls and similar opening protectives;
2. "wet work" such as concrete work, plastering, tile installation, and gypsum board finishing are complete and cured and dried to a condition of equilibrium;
3. testing areas are properly prepared for testing; and
4. the HVAC system is activated, operating, and maintaining temperatures and RH at anticipated occupancy levels for at least 48 hours prior to and during testing.
 - a. If HVAC activation and operation prior to testing cannot be provided within the proposed construction schedule, then close a number of rooms or spaces where conditions can either be brought to anticipated normal conditions or into conformance with the minimum environmental parameters of the specified test standards using commercial equipment and building climate control services.
 - b. Provide a recording hygrometer to monitor and record ambient temperature and RH levels for comparison to design occupancy conditions.

E. Scheduling:

1. Allow sufficient time in the construction schedule to permit concrete to cure and dry, without being re-wetted, for at least 90 days before beginning testing. Substrates re-wetted after initial curing must be permitted to cure and dry for at least 180 days before beginning testing.
 - a. If minimum concrete curing and drying time cannot be provided in the construction schedule, assume the specified MVECS must be incorporated into the project as a topical remediation for concrete substrates, and reflect this assumption in the project cost until otherwise directed by the Owner.
 - b. Forced drying substrates is prohibited.
2. Allow sufficient time in the construction schedule to permit RH test sites to equalize for at least 72 hours prior to reading equilibrium RH levels.
3. Testing must be complete and reports submitted at least one week, but not more than 3 weeks, before beginning penetrant, overlay, or covering installation or application.

1.6 SUBMITTALS

A. Action Submittals: Before beginning the work of this specification section, including bulk purchase and delivery of products, submit to the Architect the following for responsive action (formal review and approval).

1. Product Data:

- a. Submit a comprehensive and complete list of proposed and other items specified, required, or otherwise necessary to complete the work of this specification section, including all accessories and similar secondary items normally furnished, required, or otherwise necessary for complete repair, surface preparation, testing, and remediation.
 - b. For each item listed, submit manufacturer's product data, specifications, typical installation details for all actual in-service conditions applicable to this project, and any other information necessary to demonstrate conformance with the Contract Documents, excluding Material Safety Data Sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review.
- B. Informational Submittals: Submit to the Architect the following for information (for informal review: responsive action by the Architect, including formal review and approval, is not expected or required, except to record non-conformance with specified requirements).
1. Installation Instructions: Before beginning the work of this specification section, submit the following.
 - a. Submit manufacturer-prepared published instructions for the proper installation of each furnished manufactured item and accessory, including packaging, delivery, storage, handling, surface preparation, installation, adjusting, cleaning, and protection instructions and requirements.
 - b. If manufacturer-prepared published installation instructions are either unavailable or do not specifically apply to actual project conditions, then consult with the manufacturer's representative and obtain manufacturer-prepared, project-specific supplemental instructions printed on the manufacturer's company letterhead. Promptly distribute copies to the Architect for examination before beginning the work of this specification section; the Architect may have comments that lead to contract modifications, or to minor changes in the work.
 2. Test Reports: Submit facility floor plan diagrams showing area calculations and locations of each test along with measured test results for each test location.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
1. American Moisture Test, Inc.
 2. Vaisala
 3. Wagner Electronics.

2.2 CONCRETE SUBSTRATE TESTING EQUIPMENT

- A. Description: Commercially-produced and -packaged test kits and equipment delivered to testing sites in factory-sealed wrappings.

- B. MVER Testing Kits (CC Moisture Test Kits):
1. Description: ASTM F 1869-compliant anhydrous calcium chloride moisture vapor testing kits consisting of a sealed dish of anhydrous calcium chloride, a metering dome with gasket, and instructions.
 2. Product: "AMT Calcium Chloride Moisture Test Kit" manufactured by American Moisture Test, Inc., or equal.
 3. Components:
 - a. Non-pre-weighed, non-recycled, 94-percent pure anhydrous calcium chloride sealed in air-tight dishes.
 - b. Virgin resin non-recycled plastic dome having a maximum U.S. perm rating of 0.10-perm or less.
 - c. Butyl adhesive sealant system.
 - d. Dish container size of 69mm plus or minus one millimeter; calcium chloride weight of 16 grams plus or minus one gram.
- C. pH Testing Kits:
1. Description: ASTM F 710-compliant digital alkalinity-pH meter.
 2. Product: "AMT Concrete Digital Alkalinity-pH Meter" manufactured by American Moisture Test, Inc., or equal.
 3. Components:
 - a. Meter must return wide range (1-14) pH readings.
 - b. Provide clean distilled or deionized water.
- D. RH Testing Equipment:
1. Description: ASTM F 2170-compliant temperature and RH meter, cable, RH probes, and concrete sleeves.
 2. Product: "AMT RH System" manufactured by American Moisture Test, Inc., or equal.
- 2.3 CORRECTIVE (REMEDIAL) MVECS
- A. Description: Corrective MVER remediation system consisting of concrete mechanical surface profiling, sealer, and cementitious covering.
- B. Application: MVER remediation system are applied when test results indicate slab MVER, pH, or RH exceed selected coating or covering manufacturer's required, recommended, or accepted limits.
- C. Concrete Surface Profiling: ICRI concrete surface profile CSP 2 to CSP 3 (grind to light blast between 4 and 10 mils), unless otherwise explicitly required, recommended, accepted in writing by the sealer manufacturer.
- D. Sealer:
1. Description: Moisture seal applied to substrates as a topical remediation.
 2. Products: "MES 100" manufactured by Floor Seal Technology, Inc., or equal.
 3. Requisite Properties:

- a. Composition: Products may not contain latex, organic additives or chemistries that have a potential to either re-emulsify or support micro-organism growth.
 - b. Growth Resistance: Product must not support the growth of mold, mildew or biological growth.
 - c. Safety: Non-corrosive, non-toxic, and non-hazardous to installers.
 - d. Water Pollution: Product must be a non-marine pollutant, and safe for natural water sources.
 - e. Maximum VOC Material Content: Less than 100 grams per liter.
4. Performance Requirements:
- a. Water Vapor Transmission: Products must bring emission rates of up to 20 pounds to within a range conforming to the flooring manufactures' requirements, when measured in conformance with ASTM F 1869.
 - b. Alkali Resistance: Tolerant to 14pH alkali exposure, when tested in conformance with ASTM D 1308 and ASTM F 710.
 - c. Minimum Adhesion Strength: Between 370 and 500 pounds per square inch, when tested in conformance with ASTM D 4541.
 - d. Adhesive Compatibility: Complete compatibility with all covering primers, adhesive, and materials.
 - e. Minimum RH Tolerance: Tolerant to at least 95 percent RH exposure, when determined in conformance with ASTM F 2170.

E. Covering:

1. Description: Cementitious topping applied directly over sealer to provide smooth substrate for finish flooring.
2. Products: Hydraulic cement underlayment specified in Section 03 35 16.
3. Minimum Thickness: Install underlayment to thickness required by either the sealer manufacturer or the finish flooring manufacturer (whichever is thicker), but not less than 1/8-inch.

2.4 ACCESSORIES

- A. Trowelable Patch and Fill Materials: Specified in Section 03 54 16 unless other products are supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
- B. Other Accessories: Provide accessories and other similar secondary items supplied, required, recommended, or accepted by the MVECS manufacturer.

2.5 SURFACE PREPARATION

- A. Penetrants:
 1. Remove all dirt, dust, debris, and other foreign matter from concrete surfaces
- B. Marker Removal:
 1. Remove all slab markings by sanding or bead blasting surface clean.

2. Completely remove all marker markings (i.e. Sharpie markers), marker paint, spray paint, and other markings.
- C. Floor Coatings and Fluid-Applied Flooring:
1. Provide one or more of the following ICRI concrete surface profiles, as applicable, unless otherwise explicitly required, recommended, or accepted in writing by the flooring manufacturer.
 - a. Sealers: CSP 1 to CSP 2. (grind to between 0 and 3 mils)
 - b. Thin-Film Coatings: CSP 2 to CSP 3. (grind to light blast between 4 and 10 mils)
 - c. High-Build Coatings and Resurfacing Applications: CSP 3 to CSP 5. (light to medium shotblast between 10 and 40 mils)
 - d. Self-Leveling Overlays: CSP 4 to CSP 6. (medium to heavy shotblast between 50 mils and 1/8-inch)
 - e. Polymer Overlays: CSP 5 to CSP 9. (medium shotblast to coarse planing between 1/8- and 1/4- inch)
 - f. Concrete Overlays, Toppings, and Repairs: CSP 5 to CSP 10. (medium shotblast to coarse planing greater than 1/4- inch)
 2. To reduce the risk of introducing microcracking into the substrate, all concrete surface profiling must be achieved through abrasive blasting, grinding, or shot blasting; or through the use of surface retarders specified in Section 03 35 10.
 - a. Handheld concrete breakers, rotomilling, needle scaling, scabbling, and scarifying are prohibited, unless explicitly required or recommended in writing by the covering manufacturer (scarifying grooves/lines may become visible through a newly laid coverings).
 - b. Ultra-high- and high-pressure water jetting, and low-pressure water jetting surface preparation methods are also prohibited.
 - c. Chemical cleaning and acid etching are also prohibited. (residual chemicals not removed may adversely affect the flooring performance and adhesion – ASTM D 4262 covers procedures for determining the acidity or alkalinity of concrete surfaces prepared by chemical cleaning or etching prior to coating)
 3. Repair damaged sub-floor. Produce a uniform and smooth substrate. Fill cracks, holes, depressions, and similar substrate defects with trowelable leveling and patching compound; remove bumps and ridges.
 4. Sweep and vacuum-clean substrates just prior to beginning floor covering installation.
 5. Move floor coverings and installation materials into spaces at least 48 before installation.
- D. Floor Coverings: Prepare substrates in conformance with the requirements of ASTM F 710 and as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.
1. Verify substrates are dry and free of curing compounds, sealers, and hardeners.
 2. Remove substrate coatings and other substances that are incompatible with adhesives or that contain soap, wax, oil, or silicone; or that may negatively affect the

quality of installation, durability, appearance, or performance of furnished flooring. Comply with the flooring manufacturers' instructions using manufacturer-recommended techniques and equipment. Do not use solvents.

3. Remove subfloor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with leveling and patching compound. Apply, trowel, and float patching compound to achieve smooth, flat, hard surface. Prohibit traffic until patching compound is cured.
4. Repair damaged sub-floor. Produce a uniform and smooth substrate. Fill cracks, holes, depressions, and similar substrate defects with trowelable leveling and patching compound; remove bumps and ridges.
5. Sweep and vacuum-clean substrates just prior to beginning floor covering installation.
6. Do not install floor coverings until both they and the installation materials are acclimated to the same temperatures as the spaces into which they are installed. Move floor coverings and installation materials into spaces at least 48 before installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Before beginning testing, examine project conditions and field-verify measurements affecting the work of this specification section.
 1. Examine substrates scheduled for testing, and other conditions under which such items are tested, including HVAC operation and building enclosure.
 2. Verify that work performed as part of the work of other specification sections conforms to the testing equipment or testing kit manufacturer's requirements; and satisfies all other conditions relating to the quality of testing.

3.2 FIELD QUALITY CONTROL

- A. Site Tests and Inspections:
 1. General: Include site tests and inspections as part of the work of this specification section. The Owner's testing and inspection agency performs tests and inspections.
 - a. Schedule and arrange all tests and inspections.
 - b. Coordinate all work and the final construction schedule with all tests and inspections.
 - c. Coordinate tests and inspections with the work of other specification sections, and other specified, required, or necessary tests and inspections.
 - d. Furnish all work, equipment, tools, facilities, personnel, and controls necessary for each test and inspection.
 - e. Arrange tests and inspections by notifying the Owner, the testing and inspection agency, the installer, the manufacturer's representative, and the Architect at least 5 business days before work is ready for testing or inspection.

- f. Witness all site tests and inspections.
 - g. Receive test and inspection reports and distribute to the installer and the manufacturer's representative.
 - h. When tests and inspections reveal defective items, repair defective work to the satisfaction of the manufacturer's representative and Architect, and re-test and re-inspect work without reimbursement from Owner until all work passes tests and inspections.
2. Required Tests: Conduct the following tests on all concrete substrates prior to the installation of any flooring material or component regardless of substrate grade level or age.
- a. MVER Testing (Anhydrous Calcium Chloride Test): Conduct CC tests in conformance with ASTM F 1869.
 - 1) Test area environmental conditions must match that of the finished floor covering.
 - 2) Doors, windows, and roofing must be installed and the building temperature controlled to a finished building atmosphere.
 - 3) Do not perform tests when the interior building temperature is below 65 deg. F for 72 hours prior to and throughout the duration of testing.
 - 4) The minim required number of test kits is determined by the square footage of areas scheduled to receive finish flooring. Provide at least 3 test kits for the first 1,000 square feet, and at least one additional test kit for each additional 1,000 square feet or fraction thereof, with consideration given to separation of test areas.
 - 5) Time of exposure must be between 60 hours 72 hours.
 - 6) Clean substrate in area to be tested by removing dust solvent, paint, wax, oil, grease, residual adhesive, adhesive removers, curing, sealing, hardening, or parting compounds, alkaline salts, excessive carbonation, or laitance, mold mildew and other foreign materials.
 - 7) Weigh the tape sealed dish on a gram scale with 1/10th gram gradation. Record start weight, date and time on dish's label and instruction document.
 - 8) Unseal dish and expose test according to preprinted test kit instructions.
 - 9) After exposure time has elapsed, retrieve test dish re-seal and re-weigh according to the manufacturer's instructions.
 - 10) Moisture emission rates exceeding 3 pounds may affect coating or covering. Verify permissible RH levels with individual flooring manufacturers.
 - b. Alkalinity (pH) Testing: Conduct pH test in conformance with ASTM F 710.
 - 1) Perform tests after abrasive removal of concrete surfaces.
 - 2) Place several drops of water on a clean portion of the substrate surface; form a puddle approximately one-inch in diameter. Allow the puddle to set for at least 60 seconds, and then insert the digital alkalinity-pH meter probe into the puddle. Allow the meter to calculate results for 15 seconds and record the meter readings.
 - 3) Concrete substrates must test between pH 8.0 and 10.0 before flooring materials are installed; slabs may not exceed pH 10.0.

- 4) Readings exceeding pH 10.0 may affect coating or covering. Verify permissible pH levels with individual flooring manufacturers.
- c. RH Probe Test: Conduct *in situ* RH probe testing in conformance with ASTM F 2170
 - 1) Concrete floor slabs must be at the in-service temperature and the occupied air space above the slab must be at the in-service temperature and RH for at least 48 hours before taking RH measurements in the substrate.
 - 2) Perform at least 3 tests for the first 1,000 square feet and at least one test for every additional 1,000 square feet or fraction thereof.
 - 3) At below-grade substrates, choose testing locations within 3 feet of each exterior wall.
 - 4) Drill probe holes 40 percent down into the slab for slabs drying from the top only; 20 percent into the slab for slabs drying from top and bottom.
 - 5) Use a vacuum cleaner to remove dust from drilled holes, and allow at least 72 hours for holes to achieve moisture equilibrium within each hole before taking RH measurements.
 - 6) After the 72-hour equilibrium period, insert probes and allow a 30-minute period for each probe to reach temperature equilibrium before measuring RH.
 - 7) Use the RH probe to measure the ambient air temperature and RH above the slab in the vicinity of the hole.
 - 8) RH readings exceeding 75 percent may affect coating or covering. Verify permissible RH levels with individual flooring manufacturers.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs, and re-inspection and re-testing costs, without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

END OF SECTION

SECTION 09 22 16 – LIGHTGAGE METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal furring for supporting interior finish materials.
2. Metal framing for supporting interior partition and ceiling assemblies.
3. Delegated design of metal framing assemblies.
4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 09 22 26 for metal suspension systems.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. BMT: Base Metal Thickness.msg
2. MSG: Manufacturer's Standard Gage for Sheet Steel.
3. HDG: Hot Dip Galvanized.

B. Definitions:

1. Manufacturer: Means the metal framing manufacturer, unless otherwise indicated.
2. Metal Framing: Means lightgage metal framing.
3. Gage: Means the thickness of sheet metal based on weight measured in pounds per square foot per inch of thickness. For the purposes of this specification, gages are classified the Table below. Minimum thickness indicated in the first column is equivalent to 95 percent of the design thickness and is the minimum acceptable thickness of base metal delivered to the project site.
4. Manufacturers' Standard Gage for Sheet Metal: Means the steel sheet thickness based on a weight of 41.82 pounds per square foot per inch of thickness.
5. Base Metal Thickness: Means the thickness of sheet steel material without any coatings.
6. Lightgage Metal Framing: Means metal framing members having a BMT of 30 mils BMT (MSG 20) or less and installed in non-load bearing interior construction assemblies typically supporting plaster or gypsum board.
7. Cold-Formed Metal Framing: Means metal framing members having a BMT range of between 118 mils BMT (MSG 10) and 33 mils BMT (MSG 20) and installed in transverse or axial load-bearing applications, or in non-load bearing interior

construction assemblies typically supporting plaster or gypsum board.

Reference Gage	Minimum Thickness (mils)	Design Thickness (inch)
Lightgage Metal Framing specified in this specification Section		
25	18	0.0188
22	27	0.0283
20	30	0.0312
Cold-Formed Metal Framing		
20	33	0.0346
18	43	0.0451
16	54	0.0566
14	68	0.0713
12	97	0.1017
10	118	0.1242

1.3 ADMINISTRATIVE REQUIREMENTS

A. Delegated Design Requirements:

1. Where engineering is required, including when manufacturer's loading tables are exceeded, engineer, fabricate, assemble, and install framing that conforms to the profiles indicated and other Contract Document requirements; meets specified performance criteria; and results in structurally sound, and non-corroding assemblies that accommodate, resist, distribute, or transfer in-service loads without incipient or catastrophic failure.
2. Maintain visual design concept indicated, including sizes, profiles, and alignments. Deviation from visual design concept is non-conforming work and prohibited without prior written acceptance by the Architect.

B. Performance Requirements:

1. Interior Partition Uniformly Distributed Lateral Live Load: At least 7.5 pounds per square foot.
2. Design Loads: Interior partitions must also accommodate, resist, distribute, or transfer, as applicable, other loads to which they are subjected, including attachment of any architectural components, non-structural components, equipment, and similar items.
3. Superstructure Displacement:
 - a. Vertical Displacement of Adjacent Stories (Live Load Deflection): Allow for at least 3/4-inch vertical live load structure deflection, unless otherwise indicated on the structural drawings and general notes.

- b. Horizontal Displacement of Adjacent Stories (Interstory Drift): Accommodate design displacement of adjacent stories indicated on the structural drawings and general notes.
 4. Seismic Loads: Resist, distribute, or transfer seismic loads indicated on the structural drawings without incipient or catastrophic failure.
 5. Perpendicular Deflection (Convexity and Concavity): Framing members may not deflect more than shown in California Building Code Table 1604A.3 or the following, whichever is less, measured normal to the assembly plane. Limit asymmetric wall construction deflection to the most stringent requirement that applies to the assembly.
 - a. Construction Supporting Masonry: Not more than $L/360$.
 - b. Construction Supporting Stone: Not more than $L/960$.
 - c. Construction Supporting Plaster: Not more than $L/360$.
 - d. Construction Supporting Gypsum Board: Not more than $L/240$.
 - e. Construction Supporting Tile: Not more than $L/360$.
- C. Acoustic Requirements: Where materials are part of an STC-rated assembly, provide items within the assembly that are identical to or better than those products indicated as listed and tested in conformance with ASTM E 90 and ATM E 413.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
 1. Product Data: Submit manufacturer's product data, specifications, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 2. Shop Drawings: Include project-specific dimensioned details drawn to scale showing framing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project.
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
 1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished framing.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 2. Delegated Design Submittals: Together with shop drawings, submit engineering calculations demonstrating conformance to the Contract Documents and all impacts of delegated design scope of work on other work.

- a. Calculations must be explicit and legible and must incorporate distinct cross-references to submitted shop drawings in sufficient quantity to render the calculations readily intelligible and reviewable.
 - b. At a minimum, calculations must include design loads; analysis of supporting construction, including section-property computations; analysis of fasteners, anchors, attachments, and connectors; and signature and seal of the licensed professional engineer responsible for preparing them.
 - c. Test reports are not an acceptable substitute for calculations and are returned to the Contractor without review or responsive action, except to record non-conformance with this requirement.
3. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.

1.5 QUALITY ASSURANCE

A. Source Limitations:

1. Framing must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.

B. Quality Standards:

1. Comply with all requirements of the California Building Code (CBC).
2. Comply with ASTM C 754 requirements for installation of lightgauge metal framing, except conform to the framing sizes and spacing indicated.
3. Comply with the requirements of ASTM C 840 that apply to framing installation

C. Qualifications:

1. Installer: Company or individuals must have at least 5 years' experience installing framing for at least 30 previous projects similar to this project in size, material, design, and complexity.
2. Supervisors: Individuals must have at least 7 years' experience installing framing for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading framing installers.
3. Engineer: Must be a licensed professional structural engineer registered to practice in California having at least 10 years' experience performing the kind of engineering services indicated for at least 20 previous projects similar to this project in size, material, design, and complexity.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 - 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 - 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped and in conformance with manufacturer's instructions and other requirements and recommendations for storage. Furnish adequate dunnage and bracing during storage.
 - 1. Prevent stored items from contacting the floor or ground, from soiling and staining, and from deterioration and damage.
 - 2. If items are not stored in an enclosed location, then cover the tops and sides with securely-tied, waterproof, and breathable covers. Unvented polyethylene tarpaulins do not qualify as breathable covers and are prohibited. (due to potential accumulation of moisture beneath tarpaulin during certain environmental conditions)
 - 3. Incline covered items to ensure maximum drainage of accumulated moisture.
 - 4. Do not leave items uncovered where they might be exposed to weather or become wet; or exposed to other sources of deterioration and damage.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective framing with undamaged new framing that does not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
 - 1. California Expanded Metal Products Co. (CEMCO)
 - 2. Clarkwestern Dietrich Building Systems LLC.
 - 3. Olmar Supply Inc.
 - 4. SCAFCO Corp.

2.2 MATERIALS

- A. Cold-Formed Metal Framing: ASTM A 1003, ST50 (Structural Grade 50), with at least a G60 coating weight designation (mass designation) on both surfaces with equal coating weight on each surface.
- B. Lightgauge Metal Framing: ASTM C 645 manufactured from HDG metallic-coated steel sheet conforming to ASTM A 1003, NS33 (Non-Structural Grade 33), with at least a G40 coating weight designation (mass designation) on both surfaces with equal coating weight on each surface.

2.3 COLD-FORMED METAL FURRING

- A. Hat Furring Channels:
 - 1. Products: "FC Series Furring Channel" manufactured by Clarkwestern Dietrich Building Systems LLC, or equal.
 - 2. Requisite Properties:
 - a. Depth: 7/8- or 1-1/2-inch deep channels, as indicated.
 - b. Minimum Thickness: At least 43 mils BMT (MSG 18).
 - c. Web: 1-1/4 inches wide.
 - d. Screw Flanges: 3/4-inch wide.
- B. Z-shaped Furring Channels:
 - 1. Products: "Z-Furring (ZF-Series)" manufactured by Clarkwestern Dietrich Building Systems LLC, or equal.
 - 2. Requisite Properties:
 - a. Depth: One to 3 inches deep, as indicated.
 - b. Minimum Thickness: At least 43 mils BMT (MSG 18).
 - c. Screw Flanges: 1-1/4 inches wide.

2.4 LIGHTGAGE METAL FURRING

- A. Hat Furring Channels:
 - 1. Products: "Hat" or "F" furring channel manufactured by CEMCO, or equal.
 - 2. Requisite Properties:
 - a. Depth: 7/8- or 1-1/2-inch deep, as indicated.
 - b. Minimum Thickness: At least 30 mils BMT (MSG 20).
 - c. Web: 1-1/4 inches wide or 2-1/2 inches.
 - d. Screw Flanges: 1/2-inch wide.
- B. Z-shaped Furring Channels:
 - 1. Products: "CEMCO Z - Furring Channel" manufactured by CEMCO, or equal.
 - 2. Requisite Properties:
 - a. Depth: 7/8-inch.

- b. Minimum Thickness: At least 30 mils BMT (MSG 20).
 - c. Screw Flanges: 1-1/4 inches wide.
- C. Standard Resilient Channels:
 - 1. Products: "RC1-X" manufactured by CEMCO, or equal.
 - 2. Requisite Properties:
 - a. Depth: 1/2-inch deep.
 - b. Minimum Thickness: At least 30 mils BMT (MSG 20).
 - c. Screw Flanges: 1-1/4 inches wide.
- D. Resilient Channels for Acoustical Applications:
 - 1. Product: "RC Deluxe Resilient Channel (RCSD)" manufactured by Clarkwestern Dietrich Building Systems LLC, or equal.
 - 2. Requisite Properties:
 - a. Depth: 1/2-inch deep.
 - b. Minimum Thickness: At least 27 mils BMT (MSG 22).
 - c. Screw Flanges: 1-1/2 inches wide.
- E. Resilient Sound Isolation Clips:
 - 1. Description: Molded rubber and steel resilient sound isolation wall and ceiling clips.
 - 2. Products: Provide one of the following, or equal.
 - a. "IsoMax" manufactured by Kinetics Noise Control, Inc.
 - b. "RSIC-1" manufactured by PAC International, Inc.
 - c. "GenieClip Resilient Sound Isolation Clip" manufactured by Pliteq, Inc.

2.5 LIGHTGAGE STUD FRAMING

- A. Studs:
 - 1. Description: Pre-punched C-shaped framing members with manufacturer's standard knockout sizing and spacing.
 - 2. Product: "Viper Stud" manufactured by CEMCO, or equal.
 - 3. Requisite Properties:
 - a. Depth: Indicated on the Drawings.
 - b. Minimum Thickness: At least 30 mils BMT (MSG 20).
 - c. Flanges: 1-1/4-inch wide stiffened flanges with at least 1/4-inch returns (lip).
- B. Tracks (Top and Bottom Runners):
 - 1. Description: Un-punched U-shaped runners manufactured from the same material to corresponding stud sizes and gages.
 - 2. Product: "Viper Track" manufactured by CEMCO, or equal.
 - 3. Requisite Properties:
 - a. Depth: Indicated on the Drawings.
 - b. Minimum Thickness: At least 30 mils BMT (MSG 20).

- c. Flanges: At least 1-1/4-inch wide unstiffened flanges.
- C. High-Performance Studs:
- 1. Description: Pre-punched C-shaped framing members with manufacturer's standard knockout sizing and spacing.
 - 2. Product: "Viper-X Stud" manufactured by CEMCO, or equal.
 - 3. Requisite Properties:
 - a. Depth: Indicated on the Drawings.
 - b. Minimum Thickness: At least 28 mils BMT.
 - c. Flanges: 1-7/16-inch wide flanges with at least 3/8-inch returns (lip).
- D. High-Performance Tracks (Top and Bottom Runners):
- 1. Description: Un-punched U-shaped runners manufactured from the same material to corresponding stud sizes and gages.
 - 2. Product: "Viper-X Track" manufactured by CEMCO, or equal.
 - 3. Requisite Properties:
 - a. Depth: Indicated on the Drawings.
 - b. Minimum Thickness: At least 28 mils BMT.
 - c. Flanges: At least 1-1/4-inch wide unstiffened flanges.
- E. Deflection Tracks:
- 1. Description: Slotted roll- or brake-formed track installed in head-of-wall deflection conditions to accommodate vertical movement caused by normal head-of-wall and floor extension or compression.
 - 2. Products: "CEMCO Slotted Track (CST)" or "SLP-TRK" manufactured by CEMCO, or equal.
- F. Cold Rolled Channel (CRC) Bridging:
- 1. Description: Un-punched U-shape stiffeners installed in both load-bearing and non-load bearing walls to help resist stud twisting.
 - 2. Requisite Properties:
 - a. Size: 1-1/2-inch wide by 1/2-inch deep.
 - b. Minimum Thickness: At least 54 mils BMT (MSG 16).
 - c. Flanges: 1-1/2 inches wide unstiffened flanges.
 - 3. Manufactured Bridging Clips: "SUBH Wall Stud Bridging Connectors" manufactured by CEMCO, or equal.
- G. Flat Strap Bridging (Strapping):
- 1. Application: Flat sheet installed to provide resistance to stud rotation and minor axis buckling under loads for studs deeper than 6 inches.
 - 2. Requisite Properties:
 - a. Width: Between 2 and 20 inches, as indicated or necessary.
 - b. Minimum Thickness: At least 54 mils BMT (MSG 16).

2.6 SPECIALTY FRAMING

A. Corner Angles:

1. Description: Utility angles installed as a connection strut or angle, as corner reinforcement, or other various framing applications.
2. Requisite Properties:
 - a. Minimum Thickness: At least 30 mils BMT (MSG 20).
 - b. Legs: 2- or 3-inch wide legs, as indicated, unless a wider or uneven leg size is explicitly indicated; or is otherwise supplied, required, recommended, authorized, or accepted by the manufacturer.

2.7 ACCESSORIES

- A. Steel Beam and Column Wallboard Clips: "The Claw" beam clips manufactured by Claw International, or equal.
- B. Shims: Load bearing, non-leaching, high-density multimonomer plastic.
- C. Screw Fasteners: Provide #8-32 UNC 2B (0.164-inch shank diameter, 32 threads per inch) by at least one-inch long, pan head, coarse thread, self-piercing or self-drilling as applicable, chromate finish zinc-plated steel screw fasteners, unless another fastener type is explicitly indicated; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
- D. Power-Actuated Fasteners:
 1. Description: ICC-ES-approved anchors conforming to California Building Code Occupancy Category III, Seismic Design Category E, unless a more stringent Occupancy Category or Seismic Design Category is indicated on the Structural Drawings.
 2. Manufacturer: Provide products manufactured by Hilti, Inc., or equal.
- E. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
- F. Other Accessories: Provide other accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.

- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 - 1. Install framing using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 - 2. Installed framing must be warrantable. Do not install, correct, or replace framing in a manner that results in any warranty or guarantee becoming void.
- B. Metal Furring Special Techniques:
 - 1. Direct Furring: Attach to concrete or to masonry with stub nails, screws designed for masonry attachment, or power-actuated fasteners spaced 24 inches on center.
 - 2. Z-Furring:
 - a. Except at outside corners, securely attach narrow flanges of furring members to walls with concrete stub nails, screws designed for masonry attachment, or power-actuated fasteners spaced 24 inches on center.
 - b. At outside corners, attach wide flange of furring members to walls with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.
- C. Metal Framing Special Techniques:
 - 1. Align and securely attach floor and ceiling tracks to superstructure.
 - 2. Install studs in single lengths extending from floor to underside of floor or roof structure above without joints, except where indicated on the Drawings as stopping at or above ceilings. Stud splicing is prohibited without prior written authorization from the Architect.
 - a. Install studs so that flanges within framing systems point in same direction.
 - b. Continue framing around ducts that penetrate partitions above ceilings.
 - c. Where framing extends to overhead structural supports, install vertical deflection connectors to produce joints at tops of framing assemblies that prevent axial loading of finished assemblies.

- d. Where studs stop at or above ceilings, brace not more than every fourth stud with opposite-side bracing installed at 45-degree angles and securely fastened to the underside of the floor or roof structure above.
 - e. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.
 - f. Assemble corners using at least 3 studs.
3. Unless otherwise indicated, provide screw attachment to tracks for
 - a. studs with gypsum board on only one side;
 - b. studs on each side of doors and windows;
 - c. studs supporting wall hung plumbing fixtures; and
 - d. studs supporting wall hung urinal screens, toilet compartments, cabinets, equipment, and similar items.
 4. Attach all other studs to tracks either by friction fit for single stud gypsum board partitions or by attaching with screws in conformance with the manufacturer's published installation instructions.
 - a. Space anchors within 6 inches of ends of each track segment ends, and not more than 24 inches on center.
 - b. Do not install fasteners within 3 inches of slab or curb edges.
 5. Where required by engineering calculations, install horizontal bridging spaced not more than 54 inches on center. Unless otherwise indicated, provide bridging in partitions supporting wall supported cabinets.
 - a. Provide an additional 3/4 inch channel 6 inches above door headers, and extend at least 3 studs beyond the jamb studs.
 - b. Install channels in longest possible lengths. At end joints, lap at least 12 inches and wire-tie. Do not tie together channels on opposite sides of staggered or double stud partitions.
- D. Door and Window Opening Special Techniques:
1. Provide double studs (installed face to face to form a tube) at locations adjacent to doors and openings.
 2. Extend studs at door openings to slab or deck above and securely anchor both to bottom track and to top slab or deck.
 3. Locate additional studs not more than 2 inches from door and window frames, abutting partitions, partition corners, and other construction.
 4. Install sections of track over door and window frames with clip angles securely attached at each end to adjacent vertical studs. Install cut-to-length studs at vertical joint locations; and at standard spacing over the door frame header extending to the ceiling track.
 5. Install cripple studs at opening heads adjacent to each jamb stud, with at least a 1/2 inch clearance from the jamb stud to allow for installation of control joint in the finished assembly.
- E. Other Opening Special Techniques: Unless otherwise indicated, frame other openings and recesses in stud walls the same as that required for door openings.
1. Install framing below sills matching framing required above door heads.

2. Provide additional framing as required for the secure attachment of electrical boxes, fire extinguisher cabinets, and similar items located in stud walls.
- F. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach framing to supporting construction.
- G. Installation Tolerances: Install framing within the following tolerance variations.
1. Maximum Out of Plumb: Not more than $L/960$ of span, or 1/8-inch in 10 feet.
 2. Maximum Out of Level: Not more than $L/960$ of span, or 1/8-inch in 10 feet,
 3. Maximum Out of Plane: Fastening surfaces of adjacent framing members may not vary by more than 1/8-inch.
 4. Maximum Stud Spacing Variance: Not more than 1/8-inch. Cumulative error may not exceed minimum fastening requirements of sheathing or other finishing materials.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

END OF SECTION

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SECTION 09 22 26 – METAL SUSPENSION SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal furring and framing systems for supporting suspended gypsum board ceilings.
2. Delegated design of metal furring and framing assemblies.
3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. BMT: Base Metal Thickness.msg
2. MSG: Manufacturer's Standard Gage for Sheet Steel.
3. HDG: Hot Dip Galvanized.

B. Definitions:

1. Manufacturer: Means the metal suspension system manufacturer, unless otherwise indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Delegated Design Requirements:

1. Where engineering is required, including when manufacturer's loading tables are exceeded, engineer, fabricate, assemble, and install suspension systems that conform to the profiles indicated and other Contract Document requirements; meet specified performance criteria; and result in structurally sound, and non-corroding assemblies that accommodate, resist, distribute, or transfer in-service loads without incipient or catastrophic failure.
2. Maintain visual design concept indicated, including sizes, profiles, and alignments. Deviation from visual design concept is non-conforming work and prohibited without prior written acceptance by the Architect.

B. Performance Requirements:

1. Superstructure Deflection and Story Drift: Accommodate design displacement of adjacent stories indicated on the structural drawings.
2. Seismic Loads: Resist, distribute, or transfer seismic loads indicated on the structural drawings without incipient or catastrophic failure.

3. Perpendicular Deflection (Convexity and Concavity): Drywall support system may not deflect more than $L/240$, measured normal to the assembly plane.

C. Acoustic Requirements: Where materials are part of an STC-rated assembly, provide items within the assembly that are identical to or better than those products indicated as listed and tested in conformance with ASTM E 90 and ATM E 413.

1.4 SUBMITTALS

A. Action Submittals: Submit the following for responsive action (formal review and approval).

1. Product Data: Submit manufacturer's product data, specifications, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
2. Shop Drawings: Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project.

B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).

1. Delegated Design Submittals: Together with shop drawings, submit engineering calculations demonstrating conformance to the Contract Documents and all impacts of delegated design scope of work on other work.
 - a. Calculations must be explicit and legible and must incorporate distinct cross-references to submitted shop drawings in sufficient quantity to render the calculations readily intelligible and reviewable.
 - b. At a minimum, calculations must include design loads; analysis of supporting construction, including section-property computations; analysis of fasteners, anchors, attachments, and connectors; and signature and seal of the licensed professional engineer responsible for preparing them.
 - c. Test reports are not an acceptable substitute for calculations and are returned to the Contractor without review or responsive action, except to record non-conformance with this requirement.
2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.

1.5 QUALITY ASSURANCE

A. Source Limitations:

1. Suspension system components must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.

- b. Items provided for each different installation must be obtained from the same source and manufacturer.
 - 2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.
- B. Quality Standards:
- 1. Comply with all requirements of the California Building Code (CBC).
- C. Qualifications:
- 1. Installer: Company or individuals must have at least 5 years' experience installing suspension systems for at least 30 previous projects similar to this project in size, material, design, and complexity.
 - 2. Supervisors: Individuals must have at least 7 years' experience installing suspension systems for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading suspension system installers.
 - 3. Engineer: Must be a licensed professional structural engineer registered to practice in California having at least 10 years' experience performing the kind of engineering services indicated for at least 20 previous projects similar to this project in size, material, design, and complexity.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
- 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 - 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped and in conformance with manufacturer's instructions and other requirements and recommendations for storage. Furnish adequate dunnage and bracing during storage.
- 1. Prevent stored items from contacting the floor or ground, from soiling and staining, and from deterioration and damage.
 - 2. If items are not stored in an enclosed location, then cover the tops and sides with securely-tied, waterproof, and breathable covers. Unvented polyethylene tarpaulins do not qualify as breathable covers and are prohibited. (due to potential accumulation of moisture beneath tarpaulin during certain environmental conditions)
 - 3. Incline covered items to ensure maximum drainage of accumulated moisture.
 - 4. Do not leave items uncovered where they might be exposed to weather or become wet; or exposed to other sources of deterioration and damage.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.

- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective suspension system components with undamaged new suspension system components that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
 1. California Expanded Metal Products Co. (CEMCO)
 2. ClarkDietrich Building Systems.
 3. Olmar Supply Inc.
 4. SCAFCO Corp.

2.2 MATERIALS

- A. Cold-Formed Metal Framing: ASTM A 1003, ST50 (Structural Grade 50), with at least a G60 coating weight designation (mass designation) on both surfaces with equal coating weight on each surface.
- B. Lightgage Metal Framing: ASTM C 645 manufactured from HDG metallic-coated steel sheet conforming to ASTM A 1003, NS33 (Non-Structural Grade 33), with at least a G40 coating weight designation (mass designation) on both surfaces with equal coating weight on each surface.

2.3 COMPONENTS

- A. Galvanized Carbon Steel Wire:
 1. Hanger Wire: At least 0.162-inch diameter (SWG 8).
 2. Diagonal Bracing Wire: At least 0.106-inch diameter (SWG 12).
 3. Tie Wire: At least 0.050-inch diameter (SWG 18).
- B. Standard Furring Clips:
 1. Application: Used in lieu of tie wire to attach metal furring channels to 1-1/2-inch U-channels in drop ceiling assemblies.
 2. Restrictions:
 - a. Clips must be installed on alternating sides of carrying channels. Use tie wire when clips cannot be alternated.
 - b. Clips must only be used when single-layer gypsum or single-layer veneer plaster base is used. Otherwise use tie wire.

3. Product: "Metal Furring Channel Clips (MFCC)" manufactured by Clarkwestern Dietrich Building Systems LLC, or equal.
- C. Resilient Sound Isolation Furring Clips:
1. Application: Used in lieu of tie wire to attach metal furring channels to 1-1/2-inch U-channels in drop ceiling assemblies.
 2. Restrictions:
 - a. Clips must be installed on alternating sides of the 1-1/2-inch channels. Use tie wire when clips cannot be alternated.
 - b. Clips must only be used when single-layer gypsum or single-layer veneer plaster base is used. Otherwise use tie wire.
 - c. Carrying channels (U-channels) may not exceed 48-inch on center spacing.
 - d. Furring channels (hat channel) may not exceed 24-inch on center spacing.
 3. Product: "GenieClip C3" manufactured by Pliteq Inc., or equal.
- D. Flat Hangers (Straps):
1. Width: At least 2 inches.
 2. Minimum Thickness: At least 97 mils BMT (MSG 12).
- E. U-Channel or Cold Rolled Channel (CRC) Carrying Channels:
1. Deep: 3/4- or 1-1/2-inches.
 2. Minimum Thickness: At least 97 mils BMT (MSG 12).
 3. Flanges: 1/2 inch wide.
- F. Hat Furring Channels:
1. Products: "Hat" or "F" furring channel manufactured by CEMCO, or equal.
 2. Depth: 7/8- or 1-1/2-inch deep, as indicated.
 3. Minimum Thickness: At least 30 mils BMT (MSG 20).
 4. Web: 1-1/4 inches wide or 2-1/2 inches.
 5. Screw Flanges: 1/2-inch wide.

2.4 ACCESSORIES

- A. Attachment Devices: Sized for 5 times the design load indicated in ASTM C 635, Table 1, Direct Hung, unless otherwise indicated. Comply with seismic design requirements.
- B. Seismic Separation Joints: Provide seismic separation joints at ceiling locations where the contiguous area of non-broken ceiling is 2,500 square feet or greater.
- C. Compression Struts:
1. Cold or hot rolled angles, loadbearing or non-loadbearing studs, EMT or rigid conduit, or black iron.
 2. Cold-rolled steel section with maximum L/R ratio of 200.

- D. Screw Fasteners: Provide #8-32 UNC 2B (0.164-inch shank diameter, 32 threads per inch) by at least one-inch long, pan head, coarse thread, self-piercing or self-drilling as applicable, chromate finish zinc-plated steel screw fasteners, unless another fastener type is explicitly indicated; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
- E. Power-Actuated Fasteners:
 - 1. Description: ICC-ES-approved anchors conforming to California Building Code Occupancy Category III, Seismic Design Category E, unless a more stringent Occupancy Category or Seismic Design Category is indicated on the Structural Drawings.
 - A. Manufacturer: Provide products manufactured by Hilti, Inc., or equal.
- F. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
- G. Other Accessories: Provide other accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:

1. Install suspension systems using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 2. Installed suspension systems must be warrantable. Do not install, correct, or replace suspension systems in a manner that results in any warranty or guarantee becoming void.
- B. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach suspension systems to supporting construction.
- C. Installation Tolerances: Install suspension systems within the following tolerance variations.
1. Maximum Out of Plane: Surfaces may not vary by more than 1/8-inch in 10 feet.
 2. Carrying Channel Maximum Out of Level: Not more than 1/8-inch in 12 feet,
 3. Main Runner Maximum Out of Level: Not more than 1/4-inch in 10 feet,
 4. Main Runner Maximum Deflection: Not more than L/360 of span,
 5. Maximum Misalignment of Main Runners: 0.015-inch.
 6. Maximum Misalignment of Intersection Members: 0.020-inch.
 7. Main Runner Bow, Camber, and Twist: Not more than 1/32-inch in 2 feet bow or camber; not more than one degree twist.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
FIRE CAMP 13 RECONSTRUCTION
PROJECT ID: 00002191

HUITT-ZOLLARS, INC.
PROJECT NO. R311608.14
CONSTRUCTION DOCUMENT 01/04/2023

END OF SECTION

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SECTION 09 28 15 – GMF GYPSUM TILE BACKING BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. GMF gypsum backing board.
2. Installation materials.
3. Joint treatment materials.
4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 06 16 43 for GMF gypsum sheathing.
2. Section 09 29 00 for requirements for marking and identification of wall and partition construction required to have protected openings or penetrations.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. GMF: Glass Mat Faced.

B. Definitions:

1. Manufacturer: Means the backing board manufacturer, unless otherwise indicated.

1.3 SUBMITTALS

A. Action Submittals: Submit the following for responsive action (formal review and approval).

1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
2. Shop Drawings: Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project.

B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).

1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished backing boards.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.

1.4 QUALITY ASSURANCE

A. Source Limitations:

1. Backing boards must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
2. Backing board must be manufactured in North America by a domestic company from gypsum mined in North America; synthetic gypsum recovered from coal-fired plants operating in North America (FGD gypsum); or a combination of both.
 - a. Backing board manufactured outside of North America by a domestic company are prohibited.
 - b. Backing board manufactured outside of North America by a foreign company and relabeled or rebranded by a domestic company are prohibited.
3. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.

1.5 HANDLING

- A. General: Comply with GA publication GA 801 "*Handling Gypsum Board*" and applicable requirements of ASTM C 1264 for the inspection, rejection, certification, packaging, marking, shipping, handling, and storage of gypsum panel products.
- B. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Unload and store only inspected and accepted items.
- C. Storage: Store unloaded items as shipped, indoors within dry, well-ventilated, broom-cleaned, and partially- or permanently-enclosed storage areas.
 1. Store items indoors within dry, well-ventilated, broom-cleaned, and partially- or permanently-enclosed storage areas; where "wet work" within storage areas (e.g.,

- concrete, cast underlayment, mortaring, grouting, plastering, gypsum board finishing, etc.) is complete and cured or dried to a condition of equilibrium.
2. Prevent stored items from contacting the floor or ground, from soiling and staining, and from deterioration and damage.
- D. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.
- E. Damaged Item Replacement: Promptly remove and replace items that are deteriorated, damaged, or defective with undamaged new items that do not exhibit deterioration, damage, or defects.
- F. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Provide products manufactured by one of the following, or equal.
1. CertainTeed Corp.
 2. GP Building Products.
 3. National Gypsum Co.
 4. USG Corp.

2.2 GMF GYPSUM BACKING BOARD

- A. Description: Gypsum-based GMF water-resistant gypsum backing panel conforming to ASTM C 1178 installed as a base for the application of ceramic tile.
- B. Applications: Installed as a base for the application of ceramic tile and behind fiberglass bathtub surround walls.
- C. Restrictions: May not be used
1. as a base for nailing or mechanical fastening;
 2. as a radiant barrier behind fireplaces;
 3. in exterior applications; and
 4. In direct contact with concrete or concrete masonry units.
- D. Products: Provide one of the following, or equal.
1. "DensShield Tile Backer" manufactured by GP Building Products.
 2. "GlasRoc Tile Backer" manufactured by CertainTeed Corp.
 3. "Gold Bond eXP Tile Backer" manufactured by National Gypsum Co.

E. Requisite Properties:

1. Minimum Size: At least 4-foot by 8-foot sheets.
2. Minimum Thickness: 1/2-inch regular core panels and 5/8-inch Type X panels.
3. Minimum Mass: At least 2.2 pounds per square foot.
4. Edges: Tapered long edges and square ends.
5. Facers: Heat-cured, acrylic-coated, fiberglass mat wrapped around panel face, back side, and long edges. Water repellent paper facers and backings are prohibited.

F. Performance Requirements:

1. Resistance to the Propagation of Mold and Mildew: Minimum score of 10 (no visual defacement), when tested in conformance with ASTM D 3273.

2.3 INSTALLATION MATERIALS

- A. Fasteners: Provide 0.164-inch shank diameter (#8-32 UNC) by at least 1-1/4-inch-long Philips drive socket, bugle or wafer head, self-drilling stainless steel, bi-metal, duplex anti-corrosive steel, 3-coat anti-corrosive steel, or ceramic-coated anti-corrosive steel screw fasteners, unless another fastener type is explicitly indicated; or is otherwise supplied, required, recommended, or accepted by the manufacturer.

2.4 JOINT TREATMENT MATERIALS

A. Glass Mesh Tape:

1. Description: 2-inch wide, alkali-resistant, polymer-coated, 10x10 glass-fiber mesh tape.
2. Application: Used in combination with joint sealant as a panel joint and penetration treatment for long-term joint protection.
3. Product: Supplied, required, recommended, or accepted by the manufacturer.

B. Polymer-Modified Cementitious Mortar:

1. Description: Premium-grade (best quality grade), single-component, ultra-high-performance, polymer-modified Portland cement mortar conforming to A118.15 shear bond strength requirements.
2. Application: Used for embedding joint tape and finishing backing board in wet locations (e.g., toilet rooms, shower rooms, saunas, steam rooms, kitchens, swimming pool enclosures, etc.). Do not use drying-type joint compound, setting-type joint compound, or paper tape in wet locations.
3. Products: Provide one of the following, or equal.
 - a. "MegaFlex Crack Prevention Mortar" manufactured by Custom Building Products.
 - b. "254 Platinum" manufactured by LATICRETE International, Inc.
 - c. "Ultraflex 3" manufactured by Mapei Corp.

C. Setting-Type Joint Compound:

1. Description: Lightweight, sandable, chemically setting powder compound conforming to ASTM C 475 and
2. Application: Used for embedding joint tape and finishing backing board in locations other than wet locations. All-purpose and drying type joint compounds are prohibited.
3. Product: "ToughRock Sandable Setting Compound" manufactured by GP Building Products, or equal.

2.5 ACCESSORIES

- A. Sealant: Provide fluid-applied low modulus joint sealant specified in Section 07 92 00, unless another type of sealant; or supplied, required, recommended, or accepted by the manufacturer to seal sheathing joints and fastener penetrations.
- B. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 1. Install backing boards using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.

2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
 3. Installed backing boards must be warrantable. Do not install, correct, or replace backing boards in a manner that results in any warranty or guarantee becoming void.
- B. Interface with Adjacent Items:
1. Provide materials, components, and accessories normally furnished or necessary to securely attach backing boards to supporting construction.
 2. Do not install vapor retarders directly behind backing board.
- C. Installation Tolerances: Install backing boards to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch from plumb, level, and alignment.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

END OF SECTION

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SECTION 09 29 00 – GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Gypsum board panels.
2. Metal trim.
3. Installation materials.
4. Joint treatment materials.
5. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 06 16 43 for GMF gypsum sheathing.
2. Section 09 28 15 for GMF gypsum tile backing board.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. GMF: Glass Mat Faced.

B. Definitions:

1. Manufacturer: Means the gypsum board manufacturer, unless otherwise indicated.
2. Enclosure: Means a level of protective resistance to weather provided for interior spaces during the construction phase by either permanent construction or substantial temporary construction. Other terms, including “enclosed” and similar terms, have the same meaning as “enclosure”.
 - a. Uncontrolled Enclosure: Means short-term, limited, temporary protection against wind for up to 6 months before completion of the permanent enclosure, as determined by the Architect, whose decision is final.
 - b. Partially-Controlled Enclosure: Means medium-term, limited, temporary protection against both wind and rain for up to 12 months before completion of the permanent enclosure, as determined by the Architect, whose decision is final.
 - c. Permanent Enclosure: Means complete permanent protection against wind, temperature, humidity, atmospheric pressure, and precipitation; provided by a permanent insulated and weathertight roofing system, permanent insulated and weathertight exterior wall construction, and openings closed with permanent protectives or substantial temporary closures equivalent in protection to permanent protectives, as determined by the Architect, whose decision is final.

3. Dry-In: Means that the building shell is sufficiently complete to keep out wind, rain, and other weather. Other terms, including “box-in” and similar terms, have the same meaning as “dry-in”. At a minimum, dry-in includes
 - a. all exterior walls are constructed with weather-resistive barrier or air barrier applied;
 - b. roof deck is installed with an appropriate waterproof covering; and
 - c. windows and doors are installed.
4. Locations:
 - a. Wet Locations: Means interior locations subject to moisture during normal activities for which the space was designed (e.g., toilet rooms, shower rooms, saunas, steam rooms, kitchens, swimming pool enclosures, etc.)
 - b. Dry Locations: Means normally-dry interiors.
5. Pre-Rock Construction: Means installation in locations exposed to ambient moisture during the normal construction cycle before the structure is either partially controlled or permanently enclosed. Pre-rock construction is not limited to top-down construction. Other terms, including “pre-dry-in” and similar terms, have the same meaning as “pre-rock”.
6. Top-Down Construction: Means the limited installation of gypsum board panels only in plenums above the finished ceiling plane after the installation of metal framing is complete and before the installation of ducts, conduits, pipes, or other items that penetrate the gypsum board assemblies begins.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate locations of control joints to ensure the recommended spacings of control joints for gypsum wall and ceiling panels are accommodated.
 - a. If control joints are not indicated on the construction drawings, do not anticipate the quantity is zero.
 - b. Propose locations on shop drawings or submit an RFI to the Architect before submitting bid proposal.
2. Final locations of control joints are subject to Architect approval.

B. Preinstallation Meeting:

1. Hold the meeting after submittal approval and at least 10 business days before beginning installation.
2. During the meeting, review the Contract Documents, submittals, project conditions, and installation sequence and methods, including special details and conditions that might affect installation.
3. Discuss and finalize locations and extents of all control joints.
4. Identify and discuss adverse or unfavorable conditions detrimental to protecting stored materials or to installation; or to the quality, durability, appearance, or performance of installed underlayment. Resolve each condition.
5. Finalize construction schedule.

6. Record significant discussions and distribute meeting minutes. Do not begin installation until disagreements are successfully resolved to the satisfaction of all parties.
- C. Sequencing: Deliver paper-faced gypsum board to the project site only after building dry-in.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
 1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 2. Shop Drawings:
 - a. Submit dimensioned plans and elevations drawn to scale and showing locations, sizes, and extents of all control joints. Label manufactured items by product name.
 - b. Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project.
- B. Informational Submittals: Submit the following for information (informal review; responsive action not expected or required, except to record non-conformance with submittal requirements).
 1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished gypsum board.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.

1.5 QUALITY ASSURANCE

- A. Source Limitations:
 1. Gypsum board must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.

- b. Items provided for each different installation must be obtained from the same source and manufacturer.
 2. Gypsum board must be manufactured in North America by a domestic company from gypsum mined in North America; synthetic gypsum recovered from coal-fired plants operating in North America (FGD gypsum); or a combination of both.
 - a. Gypsum board manufactured outside of North America by a domestic company are prohibited.
 - b. Gypsum board manufactured outside of North America by a foreign company and relabeled or rebranded by a domestic company are prohibited.
 3. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.
- B. Qualifications:
 1. Installer: Company or individuals must have at least 5 years' experience installing gypsum board for at least 30 previous projects similar to this project in size, material, design, and complexity.
 2. Supervisors: Individuals must have at least 7 years' experience installing gypsum board for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading gypsum board installers.

1.6 HANDLING

- A. General: Comply with GA publication GA 801, "*Handling Gypsum Board*" and applicable requirements of ASTM C 1264 for the inspection, rejection, certification, packaging, marking, shipping, handling, and storage of gypsum panel products.
- B. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
 3. Unload and store only inspected and accepted items.
- C. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
 1. Furnish adequate dunnage and bracing during storage.
 2. Prevent stored items from contacting the floor, from soiling and staining, and from deterioration and damage.
 3. Do not leave items uncovered where they might be exposed to weather or become wet; or exposed to heat or sudden changes in temperature or relative humidity; or other sources of deterioration and damage, including dust and other airborne contaminants.

- D. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage. Avoid damage to packaging and containers.
- E. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective gypsum board with undamaged new gypsum board that does not exhibit deterioration, damage, or defects.
- F. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Provide products manufactured by one of the following, or equal.
 - 1. CertainTeed Corp.
 - 2. GP Building Products.
 - 3. National Gypsum Co.
 - 4. USG Corp.

2.2 PRE-ROCK GYPSUM BOARD

- A. Description: GMF interior gypsum panels conforming to ASTM C 1658.
- B. Application: Pre-rock panels must be used when gypsum board is installed prior to dry-in.
- C. Products: Provide one of the following, or equal.
 - 1. "DensArmor Plus Interior Panels" manufactured by GP Building Products.
 - 2. "e²XP Interior Extreme" manufactured by National Gypsum Co.
 - 3. "SHEETROCK Glass-Mat Panels Mold Tough" manufactured by USG Corp.
- D. Requisite Properties:
 - 1. Minimum Size: Provide at least 4-foot by 8-foot sheets.
 - 2. Minimum Thickness: 1/2-inch regular core panels and 5/8-inch Type X panels.
 - 3. Edges: Tapered long edges and square ends.
 - 4. Facers: Heat-cured, acrylic-coated, fiberglass mat on the face side, back side, and around long edges. Water repellent paper facers and backings are prohibited.

2.3 FIRE-RESISTANCE RATED GYPSUM BOARD

- A. Fire-Resistance-Rated Gypsum Wall and Ceiling Board:
 - 1. Description: Gypsum board conforming to ASTM C 1396.

2. Applications: Installed in fire-resistance-rated and non-rated interior partition assemblies constructed in dry locations.
 3. Products: Provide one of the following, or equal.
 - a. "ProRoc Type X" and "ProRoc Type C" manufactured by CertainTeed Corp.
 - b. "ToughRock Fireguard" and "ToughRock Fireguard C" manufactured by GP Building Products.
 - c. "Gold Bond Fire-Shield" and "Gold Bond Fire-Shield C" manufactured by National Gypsum Co.
 - d. "SHEETROCK "Firecode Core"" and "SHEETROCK "Firecode C Core""
 4. Requisite Properties:
 - a. Minimum Size: At least 4-foot by 8-foot sheets.
 - b. Minimum Thickness: At least 5/8-inch.
 - c. Core: Provide Type X panels in walls and Type C panels in ceilings, unless otherwise indicated on the Drawings.
 - d. Minimum Mass: At least 2.2 pounds per square foot.
 - e. Edges: Tapered long edges and square ends.
 - f. Facers: Paper face, back, and long edges.
- B. Mold- and Moisture-Resistant Fire-Resistance-Rated Gypsum Wall and Ceiling Board:
1. Description: Mold- and moisture-resistant and fire-resistance-rated gypsum board conforming to ASTM C 1396.
 2. Applications: Installed as the inside face of exterior wall assemblies; and in fire-resistance-rated and non-rated interior partition assemblies constructed in wet locations.
 3. Products: Provide one of the following, or equal.
 - a. "ProRoc Moisture and Mold Resistant Gypsum board with M2Tech" manufactured by CertainTeed Corp.
 - b. "ToughRock Mold-Guard" manufactured by GP Building Products.
 - c. "Gold Bond XP Gypsum Board" manufactured by National Gypsum Co.
 - d. "SHEETROCK Mold Tough" manufactured by USG Corp.
 4. Requisite Properties:
 - a. Minimum Size: At least 4-foot by 8-foot sheets.
 - b. Minimum Thickness: At least 5/8-inch.
 - c. Core: Provide Type X panels in walls and Type C panels in ceilings, unless otherwise indicated on the Drawings.
 - d. Minimum Mass: At least 2.2 pounds per square foot.
 - e. Edges: Tapered long edges and square ends.
 - f. Facers: Heavy-duty mold- and moisture-resistant paper face, back, and long edges.
 5. Performance Requirements:
 - a. Mold Resistance: Must earn a score of at least 10, when tested in conformance with ASTM D 3273.

2.4 METAL TRIM

A. Steel Trim:

1. Description: Paper-faced galvanized steel sheet trim pieces conforming to ASTM C 1047.
2. Manufacturers: Provide products manufactured by one of the following, or equal.
 - a. CEMCO.
 - b. Clinch-On Cornerbead Co.
 - c. Stockton Products.
 - d. Western Metal Lath.
 - e. USG Corp.
3. Products: "BEADEX" paper-faced metal bead and trim manufactured by USG Corp., or equal.
 - a. Corner Beads: Provide to protect exterior corners. Provide corner beads with notched or flexible flanges at curved edges.
 - 1) 90-degree Outside Corner Bead: "Micro Bead Style", or equal.
 - 2) 90-degree Inside Corner Bead: "B2 Style", or equal.
 - b. Casing Beads: Provide long-flanged L- or LC-beads at exposed panel edges indicated as receiving joint compound; provide short-flanged U-beads at exposed panel edges that do not receive joint compound.
 - 1) J Trims (J-shaped with exposed long flange): "B9J Style", or equal.
 - 2) L Trims (L-shaped with exposed long flange): "B4 Style", or equal.

B. Metal Control Joints:

1. Description: One-piece solid zinc control joint supplied with factory-applied removable tape to ensure a clean joint.
2. Products: Provide one of the following, or equal.
 - a. "NO93 Control Joint" manufactured by Alabama Metal Industries Corp. Building Products (AMICO).
 - b. "Niles-093 Zinc Control Joint" manufactured by Niles Building Products Co.
 - c. "SHEETROCK Zinc Control Joint No. 093" manufactured by USG Corp.
3. Requisite Properties:
 - a. Minimum Length: At least 10 feet long; provide longest possible lengths to minimize or avoid joints.

2.5 INSTALLATION MATERIALS

- ### A. Fasteners: Provide #6-32 UNC 2B (0.138-inch shank diameter, 32 threads per inch) by at least 1-1/4-inch long, Philips bugle head, coarse thread, self-piercing or self-drilling (as applicable) phosphate coated steel screw fasteners, unless another fastener type is explicitly indicated; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

- ### B. Laminating Adhesive:

1. Description: Lightweight, sandable, chemically-setting powder compound conforming to ASTM C 475.
2. Application: Used for bonding gypsum board to studs, laminating gypsum board to gypsum board, and bonding gypsum board to concrete or CMU walls.
3. Product: "SHEETROCK Easy Sand Joint Compound" manufactured by USG Corp., or equal.

2.6 JOINT TREATMENT MATERIALS

A. Joint Tape:

1. Description: Nominal 2-inch wide gypsum panel joint and corner reinforcement conforming to ASTM C 475.
2. Products:
 - a. Fiberglass Joint Tape: "SHEETROCK Fiberglass Drywall Tape" manufactured by USG Corp., or equal.
 - b. Paper Joint Tape: "BEADDEX Drywall Joint Tape" manufactured by USG Corp., or equal.
 - c. Fiberglass Mesh Tape: Prohibited.

B. Setting-Type Joint Compound:

1. Description: Lightweight, sandable, chemically setting powder compound conforming to ASTM C 475, and used for embedding joint tape and finishing interior gypsum panels.
2. Applications:
 - a. Pre-Filling Gypsum Panel Joints throughout the Project: Use setting-type compound for open joints, beveled panel edges, and at damaged surface areas at all locations.
 - b. All Other Coats: Use setting-type compound for embedding and first coat, fill coat, finish coat, and skim coat at wet locations; and at locations where panels are subject to moisture and high humidity.
3. Product: "SHEETROCK DURABOND" manufactured by USG Corp., or equal.

C. Drying-Type Joint Compound:

1. Description: Vinyl-type compound conforming to ASTM C 475, and used for embedding joint tape, finishing interior gypsum panels, and hand-applying simple texturing.
2. Application: Use for embedding and first coat, fill coat, finish coat, and skim coat at dry locations, and at locations where joint is subject to moisture and high humidity.
3. Product: "SHEETROCK All Purpose Joint Compound – SELECT" and "SHEETROCK Brand Plus 3 Lightweight All-Purpose Joint Compound" manufactured by USG Corp., or equal.

2.7 ACCESSORIES

- A. Texture Finish:
 - 1. Description: Unaggregated texture coating wall and ceiling texture.
 - 2. Restrictions: New concrete and new plaster must age at least 60 days before texturing.
 - 3. Concrete Crack Repair and Surface Preparation: Setting-type compound specified above.
 - 4. Primer: "SHEETROCK FIRST COAT Primer" manufactured by USG Corp., or equal.
 - 5. Texture Product: "SHEETROCK TUF-TEX" manufactured by USG Corp., or equal.
 - 6. Finish: Fine orange peel.
- B. Applied Level 5 Wallboard Finish Products: Prohibited.
- C. Repair Clips: "SHEETROCK Drywall Repair Clips" manufactured by USG Corp., or equal.
- D. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.8 MARKING AND IDENTIFICATION

- A. Description: Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions, and other walls required by the California Building Code to have protected openings or penetrations must be effectively and permanently identified with stenciling located in accessible concealed floors, floor-ceiling assemblies, plenums, and attic spaces
- B. Paint Products: Specified in Section 09 91 00.
- C. Fire Walls, Fire Barriers, and Fire Partitions: Paint 6-inch high stripes not more than 15 feet from the end of each fire wall, fire barrier, or fire partition; and at intervals of not more than 30 feet, when measured horizontally along the wall, barrier, or partition. Paint stenciled letters over the 6-inch high stripes, leaving at least a one-inch border around the stenciled letter copy.
 - 1. Stripe Color: Match Federal Standard 595B color FS 31350 (red).
 - 2. Stenciled Letter Color: Match Federal Standard 595B color FS 37925 (insignia white).
 - 3. Stenciled Letter Font: 288-Point Linotype Neue Helvetica Regular Bold.
 - 4. Stenciled Letter Copy:
 - a. Fire Walls: "FIRE WALL - PROTECT ALL OPENINGS".
 - b. Fire Barriers: "FIRE BARRIER - PROTECT ALL OPENINGS".
 - c. Fire Partitions: "FIRE PARTITIONS - PROTECT ALL OPENINGS".
- D. Smoke Barriers and Smoke Partitions: Paint 6-inch high stripes not more than 15 feet from the end of each smoke barrier or smoke partition; and at intervals of not more than 30 feet, when measured horizontally along the wall, barrier, or partition. Paint stenciled

letters over the 6-inch high stripes, leaving at least a one-inch border around the stenciled letter copy.

1. Stripe Color: Match Federal Standard 595B color FS 36492 (gray).
2. Stenciled Letter Color: Match Federal Standard 595B color FS 37038 (black).
3. Stenciled Letter Font: 288-Point Linotype Neue Helvetica Regular Bold.
4. Stenciled Letter Copy:
 - a. Smoke Barriers: "SMOKE BARRIER – PROTECT ALL OPENINGS".
 - b. Smoke Partitions: "SMOKE PARTITIONS – PROTECT ALL OPENINGS".

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 1. Install gypsum board using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
 3. Installed gypsum board must be warrantable. Do not install, correct, or replace gypsum board in a manner that results in any warranty or guarantee becoming void.
- B. Special Techniques:
 1. Single-Layer Application:

- a. On ceilings, apply gypsum panels before wall or partition board application to greatest extent possible, and at right angles to framing, unless otherwise indicated.
 - b. On partitions and walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assemblies; minimize end joints.
 - c. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assemblies.
 - d. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 - e. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - f. Securely attach gypsum panels to supports with steel drill screws.
2. Multilayer Application:
- a. On partitions and wall assemblies, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
 - b. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
 - c. Securely attach base layers and face layers separately to supports with screws. Do not glue multiple layers of gypsum board together.
3. Trim:
- a. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim in conformance with manufacturer's instructions.
 - b. Control Joints: Install control joints in conformance with ASTM C 840 and in specific locations indicated or accepted by the Architect.
 - c. Trim: Install cornerbead at outside corners; install LC-Bead or U-Bead at exposed panel edges.
4. Finishing Gypsum Board:
- a. Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and other items and conditions as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
 - b. Prefill open joints, beveled edges, and damaged surface areas.
 - c. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

C. Acoustical Installation Requirements:

1. Comply with ASTM C 840.

2. Install panels with face side out. Butt panels together with light contact at edges and ends and not more than 1/16-inch of open space between panels. Do not force into place.
3. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided.
4. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
5. All joints must be staggered at least 24 inches apart and taped and sealed. Where multi-layer construction is indicated, each layer must be complete, including tape, fillers, and seals, before further layers are added
6. Joints between uncut sheet that lie in the same plane must be tight butt joints. The gap between sheets may not exceed 1/8-inch.
7. Tolerances: Install partitions with the following maximum gaps between gypsum board and abutting construction.
 - a. Floor: 1/4-inch.
 - b. Masonry and Concrete Walls: 1/4-inch.
 - c. Underside of Slab or Decking: 1/4-inch.
8. Damaged sheets may not be used. Joints between cut sheets that lie in the same plane or between any sheets that lie in different planes (i.e., at any angle or corner joint) must be cut back to produce a neat gap not more than 1/16-inch wide and the joint filled and sealed with specified non-hardening acoustic sealant. Subsequent layers must cover the joint and the opposite sheet must be cut short and filled and sealed.
9. In the first layer, all joints between boards must be backed by a continuous stud, noggin, bearer, or angle.
10. Specified batt insulation must be placed in the wall cavity and be suitably retained so that it is in contact with only one face of the partition and does not sag.
11. Wall ties between adjacent independent partitions must be of a resilient type and accepted by the Architect. The minimum number compatible with safe construction should be used.
12. The walls must be constructed from slab to slab (full height) unless otherwise indicated.
13. Where door frames are built into the wall, the vertical and horizontal sections of the frame shall be fully filled with plaster. The plaster joint shall be to the full depth of the wall.
14. Top and bottom of stud walls must be Isolated with resilient partition isolation pad (e.g., "Wallmat and Anchor Isolator" manufactured by Kinetics Noise Control, Inc., or equal)
15. Lateral support at the head of vibration isolated gypsum walls must be a continuous steel angle with a resilient pad to avoid rigid contact between the wall and the lateral support construction and accepted by the Architect. (e.g., wall mount type AB by Mason Industries, or equal)
16. All joints between gypsum and other constructions must be dense packed with fiberglass to the full depth of the wall and fully sealed with a sealant bonding to the gypsum and the other construction.

17. Where gypsum walls abut a profiled metal decking, the gypsum wall should seal to a minimum 16-gage steel plate attached to the deck, with the profile void above the plate filled with fiberglass and acoustically sealed on both sides with a fire barrier putty having a minimum density of 40 pounds per square foot. (e.g., 3M Moldable Putty or equal)
18. For top of walls that are perpendicular with the metal decking maximum of ½ inch gap from the flute and seal the openings with acoustical sealant.
19. Penetrations of building services (e.g., ducts, conduits, pipes) through full height and acoustic rated partitions must be sealed airtight in conformance with the following.
 - a. Seal all annular openings less than 1/2-inch with acoustical sealant and backer rod as required to hold sealant in place.
 - b. When the annular opening is larger than 1/2-inch, provide gypsum board patch to reduce the opening to less than 1/2-inch, and seal as above.
 - c. Prior to sealing penetrations, verify penetrating elements such as piping and ductwork are free and clear of the opening being sealed.
20. Cut-outs must be regular and may not fracture gypsum board core or tear covering and must conform to the following.
 - a. Minimize penetrations of insulated wall and ceiling construction. Penetrate only where necessary and fully seal airtight at the perimeter using acoustical sealant.
 - b. Where ducts and piping greater than 3-inches in diameter penetrate insulated wall or ceiling construction, provide a clearance of one-inch plus 1/4-inch at the perimeter of the penetration
 - c. Where conduit piping 3-inches diameter and less (including mechanical, hydraulic, plumbing, etc.) pass through insulated wall or ceiling construction, provide a clearance of 1/4-inch plus 1/8-inch between the conduit or piping and the structure, unless otherwise shown.
 - d. After the ductwork, conduit, or piping is installed, repair the gypsum board perimeter clearance to the specified tolerance as required. Where the clearance exceeds 3/4-inch, provide a sheet metal sleeve within the partition packed with safing insulation and seal both sides airtight with acoustical sealant.
 - e. Where penetration clearances are 3/8-inch or less, seal airtight with acoustical sealant at gypsum board. Where the perimeter clearance exceeds 3/8-inch, use a flexible backing rod to seal against.
 - f. All gypsum board penetrations (including those resulting from wiring, cables, and electrical junction boxes) must be sealed airtight with acoustical sealant.
 - g. The back and sides of junction boxes in sound-rated construction must be sealed airtight with sheet caulking. Seal perimeter face at gypsum board with acoustical sealant.
 - h. Recessed panel boards, equipment, boxes, and other items having a penetration area greater than 25 square inches at sound-rated partitions are fully enclosed and sealed with 5/8-inch thick gypsum board or 2 pound per square foot sheet metal.
 - i. Seal multiple conduit penetrations airtight with expanding fire foam sealant.

D. Interface with Adjacent Items:

1. Provide materials, components, and accessories normally furnished or necessary to securely attach gypsum board to supporting construction.
 2. Do not install vapor retarders directly behind gypsum board.
- E. Installation Tolerances: Install gypsum board to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch from plumb, level, and alignment.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.5 PROTECTION

- A. Protect installed gypsum board in place from deterioration, and damage until Substantial Completion. Remove and replace wet, moisture-, or mold-damaged panels.
1. Indications panels are wet or moisture damaged include discoloration, sagging, or irregular shape.
 2. Indications that panels are mold damaged include fuzzy or splotchy surface contamination and discoloration.
- B. Do not store anything adjacent to or against installed gypsum board unless it is protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed gypsum board as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

3.6 GYPSUM BOARD FINISH SCHEDULE

- A. General: Finish gypsum board surfaces with exposed joints, corners and edges reinforced or trimmed in conformance with ASTM C 840, Gypsum Association publication GA-214, *“Recommended Levels of Gypsum Board Finish”*, and the following.
- B. Levels of Gypsum Board Finish:
1. Level 0: Use for first layer of multiple layer construction and gypsum board ledge guards in elevator shafts.
 2. Level 1: Use in plenum areas above ceilings, interior faces of shafts, in attics, and in areas where the assembly will generally be concealed.
 3. Level 2: Use where moisture-resistant gypsum backing board is used as a substrate for tile; and in storage and similar areas where surface appearance is not of primary concern.
 4. Level 3: Use in areas where heavy grade wall coverings are to be applied as the final decoration.
 5. Level 4: Use in areas where light texture or backed lightweight wall covering is applied; and all areas indicated as receiving a paint finish, except where Level 5 finish is indicated.
 6. Level 5 (spray and roller-applied products are prohibited): Use where indicated on the Drawings.

END OF SECTION

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SECTION 09 30 00 – TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Tile surfacing units.
2. Thresholds.
3. Tile waterproofing.
4. Installation materials.
5. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 03 35 10 for concrete flatwork finishing and curing; and for preventative MVER products.
2. Section 09 05 16 for preparation of concrete slabs for finish flooring; and for remedial MVER products.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. TCNA: Tile Council of North America.

B. Definitions:

1. Manufacturer: Means the tile, installation material, or accessory manufacturer, as the context admits, unless otherwise indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Verify chemical and adhesive compatibility of selected waterproofing and crack isolation membranes and mortar with installed curing compounds and moisture vapor emission control systems, based on current product formulations.
2. Proposed substitution requests and submittals that change the quality (grade) or generic chemistry of specified mortar and grout are prohibited and returned to the Contractor without review or responsive action, except to record non-conformance with this requirement.

B. Preinstallation Meeting:

1. Hold a meeting after submittal approval and at least 10 business days before beginning installation.
2. During the meeting, review the Contract Documents, submittals, project conditions, and installation sequence and methods, including special details and conditions that might affect installation.
3. Identify and discuss adverse or unfavorable conditions detrimental to protecting stored materials or to installation; or to the quality, durability, appearance, or performance of installed tile. Resolve each condition.
4. Finalize construction schedule.
5. Record significant discussions and distribute meeting minutes. Do not begin installation until disagreements are successfully resolved to the satisfaction of all parties.

C. Sequencing:

1. Schedule tile deliveries to the project site only after the building is enclosed with a permanent enclosure; "wet work" within storage areas (including concrete, cast underlayment, mortaring, grouting, plastering, and gypsum board finishing) is complete and cured or dried to a condition of equilibrium; storage areas are broom- and vacuum-clean; and the HVAC system is activated, operating, and maintaining ambient conditions at occupancy levels.
2. Install tile only after substrate is cured to a condition of equilibrium; is sufficiently dry to bond with tile; and has alkalinity (pH), MVER, and RH within ranges required, recommended, or accepted by the manufacturer. Provide chemically and adhesively compatible surface treatment when required or necessary to reduce pH and MVER to within allowable limits required, recommended, or accepted by the manufacturer.
3. Final light fixtures must be completely installed and energized before beginning installation.
4. Install tile only after penetrating items are installed and after overhead finishing operations are complete.

D. Scheduling:

1. Concrete Curing: Allow enough time in the construction schedule for concrete to cure for at least 28 days before beginning surface preparation and installation.
2. Access Restrictions: Close spaces during installation. Keep closed to foot traffic after installation for at least 48 hours and to rolling load traffic for at least 72 hours.

1.4 SUBMITTALS

A. Action Submittals: Submit the following for responsive action (formal review and approval).

1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.

2. Shop Drawings:
 - a. Submit dimensioned plans and elevations drawn to scale and showing floor and wall design patterns and layouts.
 - b. Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project. Cross-reference details to plans and elevations.
 3. Samples: Submit at least 8-inch square representative samples of each tile variety for each specified color and finish, glued to hardboard backing. Grout all joints with specified grout.
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished tile, installation materials, and accessories.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.
- C. Maintenance Material Submittals: Before Final Completion, deliver to the Owner tile cleaning materials, equipment, accessories, and instructions; and extra stock materials to replace those worn or damaged as a result of normal occupancy.
1. Furnish at least 2 percent of the total installed for each tile type, color, composition, grade, finish, and variety.
 2. Furnish at least 2 percent of the total amount installed for each grout type, color, and composition. but not less than one unopened container.

1.5 QUALITY ASSURANCE

- A. Source Limitations:
1. Tile must be obtained through one source from the same supplier (to ensure compatibility and appearance).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
 2. Installation Materials (Setting Materials): Installation materials, including waterproofing membranes, crack isolation membranes, mortar, adhesive, grout, sealers, and other installation materials and accessories must be obtained through one source from the same manufacturer (to ensure compatibility and a warrantable installation).

3. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.
- B. Tile Floor Finish Regulatory Requirements:
1. Floor surfaces must be stable, firm, and slip resistant, conforming to the requirements of California Building Code Section 11B-302.1.
 2. Allowable Static Coefficient of Friction Value (SCOF): At least 0.6 for level surfaces and at least 0.8 for sloped surfaces, when measured in conformance with ASTM D 2047.
 3. Allowable Dynamic Coefficient of Friction Value (DCOF): Between 0.35 and 0.45, when measured in conformance with ANSI B101.3 under wet conditions.
 4. Radiant Flux Classification: Provide flooring having an average critical radiant flux value of at least 0.45 (Class I), when tested in conformance with ASTM E 648.
- C. Tile Wall Finish Regulatory Requirements:
1. Surface-Burning Characteristics: Provide walls and ceilings having a maximum FSI Value of 25 or less and a maximum SDI Value of less than 450 (Class A), when tested in conformance with ASTM E 84.
- D. Quality Standards:
1. Installation Standards: Comply with parts of ANSI A108 Series publication requirements that apply to types of setting and grouting materials and to installation methods indicated.
 2. Installation Guidelines: Comply with TCNA publication "*Handbook for Ceramic, Glass, and Stone Installation*" requirements for installation methods indicated.
- E. Qualifications:
1. Installer: Company or individuals must have at least 5 years' experience installing tile for at least 30 previous projects similar to this project in size, material, design, and complexity.
 - a. Individuals must be Ceramic Tile Education Foundation (CTEF) Certified Tile Installers and current in their certification.
 - b. Individuals installing large format tile, mudwork for walls or floors, or waterproofing membranes must be certified through Advanced Certifications for Tile Installers (ACT) for installation and current in their certification.
 2. Supervisors: Individuals must have at least 7 years' experience installing tile for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading tile installers.
 - a. Supervisors must be Ceramic Tile Education Foundation (CTEF) Certified Tile Installers and current in their certification.
 - b. Supervisors of individuals installing large format tile, mudwork for walls or floors, or waterproofing membranes must be certified through Advanced Certifications for Tile Installers (ACT) for installation and current in their certification.

- F. Field Samples: Include *in-situ* mockups as part of the work of this specification section.
1. The Architect reviews field samples for conformance to the Contract Documents and approves or rejects them as the standard by which subsequent work is evaluated.
 2. Revise field samples and repeat reviews, including arranging all revisions and paying all revision costs, until accepted in writing by the Architect. Final acceptance of tile is made from field samples.
 3. After acceptance, promptly identify and protect field samples for reference until Substantial Completion.
 4. Approved field samples may remain part of the work after being identified for future reference.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
 3. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
1. Furnish adequate dunnage and bracing during storage.
 2. Prevent stored items from contacting the floor, from soiling and staining, and from deterioration and damage.
 3. Do not leave items uncovered where they might be exposed to weather or become wet; or exposed to heat or sudden changes in temperature or relative humidity; or other sources of deterioration and damage, including dust and other airborne contaminants.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.
1. Avoid damage to packaging and containers, and contamination of contents.
 2. Rotate inventory; do not use items the shelf life of which is expired.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective materials with undamaged new materials that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 PROJECT CONDITIONS

- A. Ambient Conditions: Install tile only when ambient temperature, RH, and other environmental conditions fall within ranges required, recommended, or accepted by the manufacturer.
- B. Existing Conditions:
 - 1. Substrate Dimensional Tolerances: Surfaces receiving tile must be flat with 1/4-inch within any 10-foot radius.
 - 2. Deflection: Maximum deflection of substrate system under positive or negative design loads must not exceed $L/360$ of span.
 - 3. Illumination: Provide permanent lighting or illuminate work spaces to at least the same type, illumination level, and color temperature maintained in the room or space after the building is occupied.

1.8 WARRANTY

- A. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for waterproofing products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 10 years.
- B. Installer Guarantee: Furnish to the Owner a written guarantee for waterproofing work of this specification section against all defects in materials and workmanship for 2 years from date of acceptance. Guarantees must be properly prepared and signed on the guarantee form in Division 01.

PART 2 - PRODUCTS

2.1 TILE SURFACING UNITS

- A. Products: Indicated on the Drawings, or equal.

2.2 THRESHOLDS

- A. Marble Thresholds:
 - 1. Description: Marble conforming to ASTM C 503, Classification I (calcite), Soundness Group A (sound marbles with uniform and favorable working qualities; containing no geological flaws, voids, spalls, cracks, open seams, pits or other defects).
 - 2. Product: Bianco Carrara (Carrera) marble thresholds.
 - 3. Requisite Properties:
 - a. Size and Thickness: Indicated on the Drawings.
 - b. Color: White, with wispy grey bands through the stone.
 - c. Finish: Honed.

2.3 INSTALLATION MATERIALS

- A. Trowelable Patch and Fill Materials: Specified in Section 03 54 16, unless other products are supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
- B. Moisture Vapor Transmission Reduction Coating: Specified in Section 03 35 10 (preventative) or Section 09 05 16 (remedial), unless another coating is supplied, required, recommended, accepted by the by manufacturer for actual in-service conditions applicable to the project.
- C. Fluid-Applied Waterproofing / Crack Isolation Membrane:
1. Products: Provide one of the following, or equal.
 - a. "RedGard" elastomeric membrane manufactured by Custom Building Products.
 - b. "Laticrete HydroBan" manufactured by LATICRETE International, Inc.
 - c. "Mapelastic AquaDefense" manufactured by Mapei Corp.
 2. Accessories:
 - a. Primer: One-part waterproofing / crack isolation membrane diluted with 4 parts water and applied at a rate of 300 square feet per gallon of reduced material; or other substrate sealer or primer supplied, required, recommended, approved or accepted manufactured by the waterproofing/crack isolation membrane manufacturer.
 - b. Fiberglass Mesh: Provide manufacturer's standard alkali-resistant reinforcing mesh for changes of plane and for gaps 1/8-inch wide or greater.
 - c. Other Accessories: Provide other accessories and secondary items supplied, required, recommended, approved, or accepted manufactured by the waterproofing/crack isolation membrane manufacturer.
- D. Thin Bed Mortar (Thinset) Installations (horizontal applications between 3/32- and 3/16-inch thick after beat-in):
1. Description: Premium-grade (best quality grade), single-component, ultra-high-performance, polymer-modified Portland cement mortar conforming to A118.15 shear bond strength requirements.
 2. Application: Used for the installation of interior and exterior floor and wall vitreous, semi-vitreous or non-vitreous tile (ceramic, mosaic, quarry, and cement body tile); impervious porcelain tile; and natural stone veneer and stone tile.
 3. Products: Provide one of the following, or equal.
 - a. "MegaFlex Crack Prevention Mortar" manufactured by Custom Building Products.
 - b. "254 Platinum" manufactured by LATICRETE International, Inc.
 - c. "Ultraflex 3" manufactured by Mapei Corp.
- E. Medium Bed Mortar Installations (horizontal applications between 3/8- and 3/4-inch thick after beat-in):
1. Description: Regular-setting, polymer-modified mortar conforming to A118.15 shear bond strength requirements.
 2. Application: Used for the installation of the installation of

- a. large-format dimensional tile (greater than 12 by 12 inches);
 - b. inconsistent thickness natural stone; and
 - c. tiles and pavers having slight substrate irregularity.
3. Products: Provide one of the following, or equal.
- a. "Marble, Granite & Travertine Premium Medium Bed Mortar" manufactured by Custom Building Products.
 - b. "LATICRETE 4-XLT" manufactured by LATICRETE International, Inc.
 - c. "Ultraflex LFT" manufactured by Mapei Corp.
- F. Polymer-Modified Cementitious Sanded Grout:
1. Description: Premium-grade, pre-mixed, Portland cement sanded grout conforming to ANSI A118.7, and having a specifically-tailored, integrally-mixed antimicrobial agent.
 2. Application: Used for typical joints between 1/8- and 1/2-inch wide.
 3. Products: Provide one of the following, or equal.
 - a. "Prism Ultimate Performance Grout" manufactured by Custom Building Products.
 - b. "LATICRETE PermaColor" manufactured by LATICRETE International, Inc.
 - c. "Ultracolor Plus FA" manufactured by Mapei Corp.
 4. Colors: Indicated on the Drawings.
- G. Mix Water: Provide fresh, clean, clear, potable water from a domestic source. Water must conform to ASTM C 1602 and be free of oil, grease, waxy films, curing compounds, release agents, and other deleterious materials, including salts, acids, alkalis, organic materials, detergents, and other matter that might negatively affect tile quality, durability, appearance, or performance.

2.4 ACCESSORIES

- A. Trim Units: Coordinate with sizes and coursing of adjoining tile. Provide shapes indicated on the Drawings.
- B. Grout Release:
1. Description: Temporary, water soluble, pre-grout coating.
 2. Application: Used to provide protection against grout & mortar staining.
 3. Products: Provide one of the following, or equal.
 - a. "Aqua Mix Grout Release" manufactured by Custom Building Products.
 - b. "STONETECH Grout Release" manufactured by LATICRETE International, Inc.
 - c. "UltraCare Grout Release" manufactured by Mapei Corp.
- C. Cleaner: Supplied, required, recommended, or accepted by the manufacturer for use on the installed tile and actual in-service conditions applicable to the project. Cleaners must remove stains, dirt, and residue without damaging or altering tile and grout surfaces.
- D. Grout Sealer: Manufacturer's standard product for sealing grout joints, which does not change either the color or appearance of installed grouts.

- E. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.5 MIXING

- A. Site Mixing: Batch mix installation materials in conformance with manufacturer's instructions and other requirements and recommendations, using manufacturer-recommended techniques and manufacturer-recommended mechanical mixing equipment, which must be clean and free of material from previously mixed batches before charging each subsequent batch.
 - 1. Measure mix materials using only graduated mixing containers and calibrated mixing equipment. Shovels do not qualify as graduated mixing containers or calibrated equipment and are prohibited from measuring or dispensing mix materials.
 - 2. Thoroughly agitate and stir mix materials to a uniform and smooth consistency suitable for proper installation.
 - 3. Do not reduce, alter, or introduce foreign materials into mix materials, except in conformance with manufacturer's instructions and other requirements and recommendations.
 - 4. Do not use caked or lumpy materials; or materials that are irregular, too thick or too thin, or that are partially set.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification:
 - 1. Verify in-place construction, project conditions, and the work of other specification sections conform to the manufacturer's instructions and other requirements and recommendations, including dimensional tolerances and deflection criteria.
 - 2. Verify subfloor surfaces are properly secured, smooth, and flat to minimum floor flatness and levelness tolerances required, recommended, or accepted by the manufacturer for the actual in-service conditions applicable to the project.
 - 3. Verify items penetrating tile are installed.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 PREPARATION

- A. Adjacent Material Protection: Protect adjacent surfaces against soiling and damage; and from detrimental effects caused by surface profiling operations. Utilize drop cloths, shields, masking, barricades, and other items necessary to protect adjacent surfaces.
- B. Substrate Preparation: Prepare substrates as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.
 - 1. Remove substrate coatings and other substances that are incompatible with adhesives or that may negatively affect the quality of installation, durability, appearance, or performance of furnished tiling.
 - 2. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with leveling and patching compound. Apply, trowel, and float patching compound to achieve smooth, flat, hard surface. Prohibit traffic until patching compound is cured.
 - 3. Perform testing and corrective work and prepare substrates in conformance with the requirements of Section 09 05 16. Provide ICRI concrete surface profile CSP 3 to CSP 5 (light to medium shotblast between 10 and 40 mils), unless otherwise explicitly required, recommended, or accepted in writing by the waterproofing manufacturer.
 - 4. Vacuum-clean substrate.

3.3 INSTALLATION

- A. General Requirements:
 - 1. Install tile in conformance with the specified quality standards requirements using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 - 2. Set tile to line; plumb, level, and square without warp or lipping; with uniform, well-fitted joints and in alignment with adjacent construction
 - 3. Completed work must match approved samples and mockups, as accepted by the Architect.
 - 4. Installed tile must be warrantable. Do not install, correct, or replace tile in a manner that results in any warranty or guarantee becoming void.
- B. Special Techniques:
 - 1. Install waterproofing/crack prevention membrane in conformance with ANSI A108.13 and the waterproofing/crack prevention manufacturer's written instructions to produce membrane of uniform thickness bonded securely to substrate.
 - 2. Do not install tile over waterproofing/crack prevention membrane until membrane has cured and been tested to determine that it is watertight.
 - 3. Install tile in conformance with the ANSI and TCNA quality standard publication requirements for wall installations.

4. Accurately form intersections and returns. Perform cutting and drilling without marring visible surfaces. Carefully grind cut edges abutting trim, finishes, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
 5. Jointing Pattern: Lay tile in patterns as indicated on the Drawings.
 - a. Ensure tile are the same size and joints align when tile are installed against stone on floors, bases, walls, and trim.
 - b. Lay out and center tile in both directions in each space or on each wall area. Adjust to minimize cutting.
 - c. Provide uniform joint widths, unless otherwise indicated.
 6. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, during installation..
 - a. Locate joints in tile surfaces directly above joints in concrete substrates.
 - b. Prepare joints and apply sealants in conformance with the requirements in Section 07 92 00.
 - c. Do not saw-cut joints after installing stones
 7. Thresholds: Install thresholds at locations indicated; set in same type of setting bed as abutting field tile, unless otherwise indicated.
 8. Grout tile in conformance with the ANSI and TCNA quality standard publication requirements.
 9. Grout Sealer: Apply grout sealer to cementitious grout joints in conformance with the grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer that has gotten on tile by wiping with soft cloth.
- C. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely adhere tile to supporting construction.

3.4 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.

- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 CLEANING

- A. Cleaning Work: Clean all visible tile surfaces in a manner that does not result in any warranty or guarantee becoming void.
 - 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 - 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 - 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 - 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.6 PROTECTION

- A. Protect installed tile in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything on, adjacent to or against installed tile unless they are protected from damage, as accepted in writing by the Architect. Do not use installed tile as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 09 51 13 – ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Suspended acoustical ceiling panels.
2. Suspension system.
3. Installation materials.
4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. CISCA: Ceilings & Interior Systems Construction Association.
2. ASW: American Steel and Wire Co.
3. SWG: Steel Wire Gauge.

B. Definitions:

1. Manufacturer: Means the acoustical ceiling manufacturer, unless otherwise indicated.
2. Ceiling: Means the ceiling finish and associated suspension systems.
3. Wire Gage (Steel Wire Gage): Means the diameter of steel wire, in inches, according to dimensions established by Washburn & Moen, Roebling, or American Steel and Wire Co.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate ceiling layout and installation with adjacent construction elements that penetrate ceilings, or is supported by them, including

1. light fixtures;
2. HVAC equipment;
3. fire-suppression system components;
4. partition assemblies; and
5. perimeter conditions.

B. Sequencing:

1. Schedule acoustical ceiling deliveries to the project site only after the building is enclosed with a permanent enclosure; “wet work” within storage areas (including

- concrete, cast underlayment, mortaring, grouting, plastering, and gypsum board finishing) is complete and cured or dried to a condition of equilibrium; and storage areas are broom- and vacuum-clean.
2. Before beginning installation, final light fixtures must be completely installed, energized, and fully illuminated to at least the same type and level of illumination, and color temperature, maintained in the room or space after the building is occupied.
 3. Install acoustical ceilings only after penetrating items are installed.
 4. After acoustical ceiling installation, maintain ambient conditions within a range required, recommended, approved, or accepted by the manufacturer until Final Completion.
- C. Scheduling: Allow sufficient time in the construction schedule to acclimate acoustical ceilings to specified ambient conditions for at least 48 hours before installation begins.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
1. Product Data:
 - a. Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 2. Shop Drawings:
 - a. Submit dimensioned plans drawn to scale and showing acoustical ceiling layout, materials, joints, edge conditions, and finishes. Show locations, sizes, and extents of all items, accessories, and trim. Label manufactured items by product name.
 - b. Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project. Cross-reference details to plans.
 3. Samples:
 - a. Submit at least 8-inch square representative samples of each acoustical ceiling variety for each specified color and finish.
 - b. Submit at least 8-inch long representative samples of each suspension system exposed tee, molding, and trim variety in each specified color and finish.
 - B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
 1. Coordination Drawings: Submit at least 1/4-inch scale dimensioned reflected ceiling plans showing the following items coordinated with each other, based on input from installers of each item involved.
 - a. Ceiling suspension system members.

- b. Method of attaching hangers to building structure. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
 - c. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
2. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished acoustical ceilings.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 3. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.

C. Maintenance Material Submittals:

1. Before Final Completion, deliver to the Owner acoustical ceiling cleaning materials, equipment, accessories, and instructions; and extra stock materials to replace those worn or damaged as a result of normal occupancy.
2. Furnish at least 2 percent of the total installed for each acoustical ceiling type, color, composition, grade, finish, and variety, but not less than one box or open container.

1.5 QUALITY ASSURANCE

A. Source Limitations:

1. Acoustical ceilings must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.

B. Regulatory Requirements:

1. Surface-Burning Characteristics: Provide acoustical ceilings having a maximum FSI Value of 25 or less and a maximum SDI Value of less than 450 (Class A), when tested in conformance with ASTM E 84.
2. Ceiling panels, other than acoustical panels, weighing more than 1/2-pound per square foot must be positively attached to ceiling suspension runners in conformance with California Building Code Section 1616A.1.21.

C. Quality Standards

1. Seismic Standard: Provide acoustical ceilings designed and installed to withstand the effects of earthquake motions in conformance with ASCE/SEI 7, "*Minimum Design Loads For Buildings and Other Structures*"; CISCA publication, "*Seismic Construction Handbook*"; and California Building Code Sections 803.9.1.1, 1614, 1616A.1.20, and 2506.2.1.
2. Installation Standard: Comply with CISCA publication "*Ceiling Systems Handbook*" requirements for installation.

D. Qualifications:

1. Installer: Company or individuals must have at least 5 years' experience installing acoustical ceilings for at least 30 previous projects similar to this project in size, material, design, and complexity.
2. Supervisors: Individuals must have at least 7 years' experience installing acoustical ceilings for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading acoustical ceiling installers.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
 3. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
 1. Furnish adequate dunnage and bracing during storage.
 2. Prevent stored items from contacting the floor, from soiling and staining, and from deterioration and damage.
 3. Do not leave items uncovered where they might be exposed to weather or become wet; or exposed to heat or sudden changes in temperature or relative humidity; or other sources of deterioration and damage, including dust and other airborne contaminants.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage. Avoid damage to packaging and containers.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective ceiling materials with undamaged new ceiling materials that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 PROJECT CONDITIONS

- A. Ambient Conditions: Install acoustical ceilings only when ambient temperature, RH, and other environmental conditions fall within ranges required, recommended, or accepted by the manufacturer.
- B. Existing Conditions: Provide permanent lighting or illuminate work spaces to at least the same level occurring in the room or space after Final Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
 - 1. Armstrong World Industries.
 - 2. CertainTeed Corp.
 - 3. USG Interiors, Inc.

2.2 ACOUSTICAL CEILING PANELS

- A. Description: Mineral fiber ceiling panels conforming to ASTM E 1264 Type XII (glass fiber base with membrane-faced overlay), Form 2 (cloth), Pattern E (lightly textured).
- B. Product: "OPTIMA" or "ULTIMA" manufactured by Armstrong World Industries, or equal.
- C. Requisite Properties:
 - 1. Style: Product Options indicated on the Drawings or selected by the Architect.
 - 2. Size: 24 inches by 24 inches by 7/8-inch.
 - 3. Color: Match Armstrong color WH, "White".
 - 4. Surface Finish: Factory-applied latex paint.
 - 5. Edge Detail: Square lay in.
- D. Performance Requirements:
 - 1. Minimum Noise Reduction Coefficient (NRC): At least NRC 0.80, when tested in conformance with ASTM E 492 and ASTM E 989.
 - 2. Minimum Ceiling Attenuation Class (CAC): At least CAC 35, when tested in conformance with ASTM E 492 and ASTM E 1414.
 - 3. Minimum Light Reflectance (LR): Provide LR value of at least 0.87, when tested in conformance with ASTM E 1477.

2.3 SUSPENSION SYSTEMS

- A. Description: Non-rated direct hung ceiling suspension system conforming to ASTM C 635 requirements for Heavy Duty structural classification.

- B. Product: "Prelude XL" manufactured by Armstrong World Industries, or equal.
- C. Requisite Properties:
 - 1. Size: 15/16-inch bottom flange face dimension by 1-11/16-inch web height.
 - 2. Profile Type: Exposed tee.
 - 3. Material: Hot dip galvanized steel sheet.
 - 4. Finish: Manufacturer's standard shop-applied pre-treatment and baked enamel finish.
 - 5. Color: Match Armstrong color WH, "White".

2.4 INSTALLATION MATERIALS

- A. Attachment Devices: Sized for 5 times the design load indicated in ASTM C 635, Table 1, Direct Hung, unless otherwise indicated. Comply with seismic design requirements.
- B. Wire: Soft temper, zinc-coated, pre-stretched, galvanized carbon steel wire conforming to ASTM A 641 Class 3 or A coating and having a minimum yield-stress load of 3 times the design load.
 - 1. Hanger Wire: Minimum 0.106-inch diameter. (12-gage ASW)
 - 2. Diagonal Bracing Wire: Minimum 0.106-inch diameter. (12-gage ASW)
 - 3. Provide heavier gage hanger wire for ceiling systems heavier than 4 pounds per square foot.
- C. Compression Struts: Provide one of the following.
 - 1. Cold or hot rolled angles, loadbearing or non-loadbearing studs, EMT or rigid conduit, or black iron.
 - 2. Cold-rolled steel section with maximum L/R ratio of 200.
- D. Engineered Compression Struts:
 - 1. Description: Pre-engineered telescoping seismic compression posts manufactured from heavy-wall galvanized tubing.
 - 2. Application: Manufactured compression struts may be provided in lieu of compression struts indicated above when installed in conformance with its manufacturer's instructions.
 - 3. Products: "ARMSTRONG 5594 Ceiling Tile Compression Strut" manufactured by Armstrong World Industries or "Donn Brand Compression Post VSA" manufactured by USG Interiors, Inc. (ICC ES Report No. ESR-1222), or equal.
- E. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.5 ACCESSORIES

- A. Seismic Clips:

1. Description: 2-inch beam end retaining clip that joins main beam or cross tee to wall molding and web of grid with no visible pop rivets.
 2. Restrictions: Use of seismic clips is permitted only when specifically detailed on the Drawings. Alternative method of construction plan-review approval is required for use of seismic clips.
 3. Products: "BERC 2" clips manufactured by Armstrong World Industries or "ACM7" clips by USG Interiors, Inc., or equal.
- B. Seismic Separation Joints: Provide ceiling system manufacturer's standard at seismic separation joints at ceiling locations where the contiguous area of non-broken ceiling is 2,500 square feet or greater.
- C. Wall Molding: Provide the following, with prefinished exposed flanges matching suspension system.
1. Perimeter Molding: "No. 7808" 2- by 2-inch hemmed-edge perimeter wall angle molding manufactured by Armstrong World Industries, or equal.
 2. Shadow Molding: "No. 7823" 2-inch flange by 1-1/4-inch high by 3/4-inch reveal hemmed-edge shadow molding manufactured by Armstrong World Industries, or equal.
 3. Shadow Molding Installed with Seismic Clips: "No. 7897" 15/16-inch flange by 15/16-inch high by 1/2-inch shadow molding manufactured by Armstrong World Industries, or equal.
- D. Perimeter Trim: "Axiom Building Perimeter System" manufactured by Armstrong World Industries, or equal, for ACT ceiling tiles flush with adjacent gypsum board soffits; and for light pockets in corridors and roller window pockets – both with slots for linear return diffusers.
- E. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification:
1. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
 2. Verify items penetrating acoustical ceilings are installed.

C. Evaluation and Assessment:

1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

A. General Requirements:

1. Install acoustical ceilings using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
3. Installed acoustical ceilings must be warrantable. Do not install, correct, or replace acoustical ceilings in a manner that results in any warranty or guarantee becoming void.

B. Special Techniques:

1. Suspend ceiling hangers from building's structural members.
 - a. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, post installed mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
 - b. Do not attach hangers to steel deck tabs. Do not attach hangers to steel roof deck. Attach hangers to structural members.
2. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of the supporting structure or ceiling suspension system.
3. Space hangers not more than 48 inches on center along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
 - a. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 - b. Where width of ducts and other construction within ceiling plenums produce hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
 - c. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by the quality standard publications.
4. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, counter-splaying, or other equally effective means.

- a. Secure wire hangers to ceiling suspension members and to supports above with at least 3 tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 5. Secure bracing wires to ceiling suspension members and to supports with at least 4 tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or post installed anchors.
 6. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
 7. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
 - a. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 - b. Mechanically-fasten moldings to substrates at intervals not more than 16 inches on center and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
 - c. Do not use exposed fasteners, including pop rivets, on moldings and trim.
 8. Install ceiling panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
 - a. Arrange directionally patterned ceiling panels as indicated on reflected ceiling plans. Install panels with pattern running in one direction parallel to short axis of space.
 - b. For square-edged panels, install with edges fully hidden from view by flanges of suspension system runners and moldings.
 - c. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by ceiling panel manufacturer.
 - d. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.
- C. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach acoustical ceilings to supporting construction.
- D. Installation Tolerances: Ceilings must conform to the following tolerances, which are non-cumulative.
1. Maximum Out of Plane: Surfaces may not vary by more than 1/8-inch in 10 feet.
 2. Carrying Channel Maximum Out of Level: Not more than 1/8-inch in 12 feet,
 3. Main Runner Maximum Out of Level: Not more than 1/4-inch in 10 feet,
 4. Main Runner Maximum Deflection: Not more than L/360 of span,
 5. Maximum Misalignment of Main Runners: 0.015-inch.
 6. Maximum Misalignment of Intersection Members: 0.020-inch.

7. Main Runner Bow, Camber, and Twist: Not more than 1/32-inch in 2 feet bow or camber; not more than one degree twist.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Cleaning Work: Clean all visible surfaces in a manner that does not result any warranty or guarantee becoming void.
 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.5 PROTECTION

- A. Protect installed acoustical ceilings in place from deterioration, and damage until Substantial Completion.
- B. Remove protection when it's no longer needed and before Substantial Completion.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
FIRE CAMP 13 RECONSTRUCTION
PROJECT ID: 00002191

HUITT-ZOLLARS, INC.
PROJECT NO. R311608.14
CONSTRUCTION DOCUMENT 01/04/2023

END OF SECTION

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SECTION 09 65 13 – RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Resilient wall base.
2. Resilient floor transitions.
3. Installation materials.
4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 09 29 00 for definition of “permanent enclosure”.

1.2 REFERENCES

A. Definitions:

1. Manufacturer: Means the resilient base or accessory manufacturer, as the context admits, unless otherwise indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Sequencing:

1. Schedule resilient base and accessory deliveries to the project site only after the building is enclosed with a permanent enclosure; “wet work” within storage areas (including concrete, cast underlayment, mortaring, grouting, plastering, and gypsum board finishing) is complete and cured or dried to a condition of equilibrium; storage areas are broom- and vacuum-clean; and the HVAC system is activated, operating, and maintaining ambient conditions at occupancy levels.
2. Final light fixtures must be completely installed and energized before beginning installation.
3. Install resilient base and accessories only after all other finishing operations are complete, especially overhead finishes.
4. After resilient base and accessory installation, maintain ambient conditions within a range required, recommended, approved, or accepted by the manufacturer until Final Completion.

B. Scheduling:

1. Acclimation: Allow sufficient time in the construction schedule to acclimate resilient base and accessories and installation materials to specified ambient conditions for at least 48 hours before installation begins.
2. Primer Installation: Resilient base and accessories must be applied within 24 hours of primer installation. Re-prime surfaces exposed for more than 24 hours; follow manufacturer's instructions for re-priming.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
 1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs), and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
 1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished resilient base and accessories.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.
- C. Maintenance Material Submittals:
 1. Before Final Completion, deliver to the Owner resilient base and accessory cleaning materials, equipment, accessories, and instructions; and extra stock materials to replace those worn or damaged as a result of normal occupancy.
 2. Furnish at least 2 percent of the total installed for each resilient base and accessory type, color, composition, grade, finish, and variety, but not less than one unopened box or container.

1.5 QUALITY ASSURANCE

- A. Source Limitations:
 1. Resilient base and accessories must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).

- a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.
- B. Regulatory Requirements:
1. Surface-Burning Characteristics: base having a maximum FSI Value of 25 or less and a maximum SDI Value of less than 450 (Class A), when tested in conformance with ASTM E 84.
 2. Radiant Flux Classification: resilient accessories having an average critical radiant flux value of at least 0.45 (Class I), when tested in conformance with ASTM E 648.
- C. Qualifications:
1. Installer: Company or individuals must have at least 5 years' experience installing resilient base and accessories for at least 30 previous projects similar to this project in size, material, design, and complexity.
 2. Supervisors: Individuals must have at least 7 years' experience installing resilient base and accessories for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading resilient base and accessory installers.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped, upright in their original containers, indoors within dry, well-ventilated, broom-cleaned, and partially- or permanently-enclosed storage areas.
1. Sheet products must be tightly rolled face out on a sturdy core designed for that purpose and vertically stored unless otherwise required or recommended by the manufacturer
 2. Promptly remove and replace rolled sheet products that are flattened or distorted during shipping, unloading, or storage.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations.
1. Avoid damage to containers and contamination of contents.
 2. Rotate inventory; do not use items the shelf life of which is expired.

- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective resilient base and accessories with undamaged new resilient base and accessories that do not exhibit deterioration, damage, or defects, including rolled sheet products that are flattened or distorted during shipping, unloading, or storage.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 PROJECT CONDITIONS

- A. Ambient Conditions: Install resilient base and accessories only when ambient temperature, RH, and other environmental conditions fall within ranges required, recommended, or accepted by the manufacturer.
- B. Existing Conditions:
 - 1. Surface Conditions: Surfaces receiving resilient base and accessories must be dry. Install resilient base and accessories only when substrate moisture content, vapor emission rate, and surface temperature fall within ranges required, recommended, or accepted by the manufacturer.
 - 2. Ventilation: Maintain adequate ventilation during and after installation and curing, setting, or drying. Where natural ventilation is inadequate, use forced-air circulation or mechanical ventilation as necessary for the installations indicated.
 - 3. Illumination: Provide permanent lighting or illuminate work spaces to at least the same type, illumination level, and color temperature maintained in the room or space after the building is occupied.
- C. Other Conditions: Do not apply resilient base and accessories where dust is generated, or liquids are sprayed.

PART 2 - PRODUCTS

2.1 RESILIENT WALL BASE

- A. Description: Solid thermoset vulcanized SBR rubber base conforming to ASTM F 1861 requirements for Type TS (vulcanized thermoset rubber), Group 1-solid (homogenous), Styles A (straight base) and B (cove base).
- B. Manufacturers: Provide products manufactured by one of the following, or equal.
 - 1. Burke Flooring.
 - 2. Flexco Inc.
 - 3. Johnsonite.
- C. Product: "BaseWorks Thermoset Rubber Wall Base" manufactured by Johnsonite, or equal.
- D. Requisite Properties:

1. Size: 4 inches high.
2. Minimum Thickness: At least 0.125-inch thick.
3. Profiles: Style A (straight base) at carpeting; provide Style B (cove base) at all other flooring, unless otherwise indicated.
4. Colors: Indicated on the Drawings.
5. Lengths: at least 120-foot coiled lengths. Provide at least 4-foot straight lengths.
6. Corners: job-formed inside and outside corners.

2.2 RESILIENT FLOOR TRANSITION MOLDINGS

- A. Description: PVC transitional molding profiles designed to finish edge of floor covering material to base and accessory surface and to transition between floor covering materials.
- B. Products: "Finishing Accessories" manufactured by Johnsonite, or equal.
 1. Material to Floor Reducers: Model No. "CRS-XX" and "RRS-XX" reducers, or equal.
 2. Material to Material Reducers: Model No. "SSR-XX" reducers, or equal.
 3. Slim Line Transitions: Model No. "SLTC-XX" transitions, or equal.
 4. Edge Guards: Model No. "EG-XX" guards, or equal.
 5. Wheeled Traffic Transitions: Model No. "CTA-XX" transitions, or equal.
- C. Requisite Properties:
 1. Minimum Sizes: Indicated on the Drawings.
 2. Colors: Indicated on the Drawings.

2.3 INSTALLATION MATERIALS

- A. Primer: Water-based, low- or zero-VOC, solvent-free primer supplied, required, recommended, or accepted by the manufacturer for in-service installation conditions, including temperature, relative humidity, and substrate porosity; and expected foot traffic, rolling traffic, and fire-resistance ratings.
- B. Adhesive:
 1. Water-based, low- or zero-VOC adhesive supplied, required, recommended, or accepted by the manufacturer for ease of installation; and for adequate bonding of resilient base and accessories to substrates for all in-service installation conditions, including temperature, relative humidity, and substrate porosity; and expected foot traffic, rolling traffic, and fire-resistance ratings.
 2. Wet-tack, percent solids, open-time, stripability, and ease of application must be explicitly formulated for each resilient base and accessory type and application.
 3. Provide hard-set adhesive supplied, required, recommended, or accepted by the manufacturer under resilient base and accessories subject to concentrated static or dynamic rolling loads.

2.4 ACCESSORIES

- A. Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification:
 - 1. Verify in-place construction, project conditions, and the work of other specification sections conform to the manufacturer's instructions and other requirements and recommendations. Verify subfloor surfaces are properly secured, smooth, and flat to minimum floor flatness and levelness tolerances required, recommended, or accepted by the manufacturer for the actual in-service conditions applicable to the project.
 - 2. Verify substrates are dry and free of curing compounds, sealers, hardeners, and deleterious and other substances that might interfere with resilient base and accessory adhesion, appearance, or performance.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 PREPARATION

- A. Substrate Preparation: Prepare substrates as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.

3.3 INSTALLATION

- A. General Requirements:
 - 1. Install resilient base and accessories using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.

2. Only install resilient base and accessories under conditions that ensure finishes are free from blemishes and defects.
3. Completed work must match approved samples and mockups, as accepted by the Architect.
4. Installed resilient base and accessories must be warrantable. Do not install, correct, or replace resilient base and accessories in a manner that results in any warranty or guarantee becoming void.

B. Resilient Base Special Techniques:

1. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
2. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
3. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
4. Do not stretch resilient base during installation.
5. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
6. Use straight pieces of maximum lengths possible to form corners; form without producing discoloration (whitening) at bends.

C. Transitional Moldings Special Techniques: Butt resilient transitional moldings to adjacent materials, and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of resilient base and accessory that would otherwise be exposed.

D. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely adhere resilient base and accessories to supporting construction.

3.4 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.

- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 CLEANING

- A. Cleaning Work: Clean all visible resilient base and accessory surfaces in a manner that does not result in any warranty or guarantee becoming void.
 - 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 - 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 - 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 - 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.6 PROTECTION

- A. Protect installed resilient base and accessories in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything on, adjacent to, or against installed resilient base and accessories unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed resilient base and accessories as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 09 65 16 – RESILIENT SHEET FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Resilient sheet flooring.
2. Surface preparation.
3. Installation materials.
4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 03 35 10 for concrete flatwork finishing and curing; and for preventative MVER products.
2. Section 09 05 16 for preparation of concrete slabs for finish flooring; and for remedial MVER products.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. ICRI: International Concrete Repair Institute, Inc.
2. MVER: Moisture Vapor Emission Rate.
3. RFCI: Resilient Floor Covering Institute.

B. Definitions:

1. Manufacturer: Means the resilient sheet flooring manufacturer, unless otherwise indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Concrete Substrates:
 - a. Verify chemical and adhesive compatibility of selected flooring adhesives with installed curing compounds and installed moisture vapor emission control systems, based on current product formulations.
 - b. Coordinate existing concrete subfloor surface flatness and levelness with ACI 117 requirements, measured in conformance with ASTM E 1155 (3D laser scanning or Allen Face F-Meter methods), and tolerances required, recommended, or accepted by the flooring manufacturer.

2. Wood Substrates: Verify all wood sub floors are double-layer construction, are suspended at least 18 inches above grade, and have adequate cross-ventilation.
- B. Preinstallation Meeting:
1. Resilient sheet flooring manufacturer's representative and installer must attend the preinstallation meeting specified in specification section 03 35 10.
 2. Schedule a separate additional preinstallation meeting between the Contractor, the Architect, resilient sheet flooring manufacturer's representatives and installers, and the entities and individuals responsible for conducting concrete substrate testing.
 3. Hold the meeting after submittal approval and at least 10 business days before beginning installation.
 4. During the meeting, review the Contract Documents, submittals, project conditions, and installation sequence and methods, including subfloor surface flatness and levelness, and special details and conditions that might affect installation.
 5. Identify and discuss adverse or unfavorable conditions detrimental to protecting stored materials or to installation; or to the quality, durability, appearance, or performance of installed resilient sheet flooring. Resolve each condition.
 6. Finalize construction schedule.
 7. Record significant discussions and distribute meeting minutes. Do not begin installation until disagreements are successfully resolved to the satisfaction of all parties.
- C. Sequencing:
1. Schedule resilient sheet flooring deliveries to the project site only after the building is enclosed with a permanent enclosure; "wet work" within storage areas (including concrete, cast underlayment, mortaring, grouting, plastering, and gypsum board finishing) is complete and cured or dried to a condition of equilibrium; storage areas are broom- and vacuum-clean; and the HVAC system is activated, operating, and maintaining ambient conditions at occupancy levels.
 2. Install resilient sheet flooring only after substrate is cured to a condition of equilibrium; is sufficiently dry to bond with resilient sheet flooring adhesives; and has alkalinity (pH), MVER, and RH within ranges required, recommended, or accepted by the manufacturer. Provide chemically and adhesively compatible treatment when required or necessary to reduce pH and MVER to within allowable limits required, recommended, or accepted by the manufacturer.
 3. Final light fixtures must be completely installed and energized before beginning installation.
 4. Install resilient sheet flooring only after penetrating items are installed.
 5. Install resilient sheet flooring only after all other finishing operations are complete, especially overhead finishes.
 6. After resilient sheet flooring installation, maintain ambient conditions within a range required, recommended, approved, or accepted by the manufacturer until Final Completion.
- D. Scheduling:

1. Concrete Curing: Allow enough time in the construction schedule for concrete to cure for at least 28 days before beginning surface preparation and installation.
2. Acclimation: Allow sufficient time in the construction schedule to acclimate resilient sheet flooring and installation materials to specified ambient conditions for at least 48 hours before installation begins.
3. Primer Installation: Resilient sheet flooring must be applied within 24 hours of primer installation. Re-prime surfaces exposed for more than 24 hours; follow manufacturer's instructions for re-priming.
4. Access Restrictions: Close spaces during installation; keep closed to foot traffic after installation for at least 48 hours and to rolling traffic for at least 72 hours.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
 1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs), and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 2. Shop Drawings:
 - a. Submit dimensioned plans drawn to scale and showing resilient sheet flooring custom patterns and inlays, and seam layouts.
 - b. Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project. Cross-reference details to plans.
 3. Material Samples:
 - a. Submit at least 8-inch square representative samples of each resilient sheet flooring color, finish, and variety.
 - b. Submit at least 8-inch long representative samples of each welding rod selected or required for each resilient sheet flooring color, finish, and variety.
 4. Seam Samples:
 - a. Submit at least 8- by 10-inch samples of each seam required for each resilient sheet flooring color, finish, and variety, with seam in center of each sample.
 - b. Samples are representative samples of actual finishes, and must be prepared by the same installer's personnel designated to perform the work of this specification section.
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
 1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished resilient sheet flooring.

- a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.
- C. Closeout Submittals: Submit copies of manufacturer's instructions and other requirements and recommendations for resilient sheet flooring maintenance, cleaning, and repair to the Architect as a condition of project closeout.
- D. Maintenance Material Submittals:
 1. Before Final Completion, deliver to the Owner resilient sheet flooring cleaning materials, equipment, accessories, and instructions; and extra stock materials to replace those worn or damaged as a result of normal occupancy.
 2. Furnish at least 2 percent of the total installed for each resilient sheet flooring type, color, composition, grade, finish, and variety, but not less than one unopened box or container.

1.5 QUALITY ASSURANCE

- A. Source Limitations:
 1. Resilient sheet flooring must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
 2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.
- B. Regulatory Requirements:
 1. Resilient sheet flooring must be stable, firm, and slip resistant, conforming to the requirements of California Building Code Section 11B-302.1
 2. Radiant Flux Classification: Provide resilient sheet flooring having an average critical radiant flux value of at least 0.45 (Class I), when tested in conformance with ASTM E 648.
 3. Allowable Static Coefficient of Friction Value (SCOF): At least 0.6 for level surfaces and at least 0.8 for sloped surfaces, when measured in conformance with ASTM D 2047.
 4. Allowable Dynamic Coefficient of Friction Value (DCOF): Between 0.35 and 0.45, when measured in conformance with ANSI B101.3 under wet conditions.

C. Quality Standards:

1. Resilient Sheet Flooring Installation Standard: Comply with Resilient Floor Covering Institute publication RFCI IP #1, "*Recommended Installation Practice for Homogeneous Sheet Flooring, Fully-Adhered*" requirements that apply to each in-service condition indicated.
2. Material Standard: Resilient sheet flooring must be independently tested and certified by Scientific Certification Systems (SCS) in conformance with FloorScore requirements for indoor air quality emissions.

D. Qualifications:

1. Installer: Company or individuals must have at least 5 years' experience installing resilient sheet flooring for at least 30 previous projects similar to this project in size, material, design, and complexity.
2. Supervisors: Individuals must have at least 7 years' experience installing resilient sheet flooring for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading resilient sheet flooring installers.

E. Custom Patterns and Inlays: Resilient sheet flooring must be laser-cut. Field cutting is prohibited.

1.6 HANDLING

A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.

1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
3. Unload and store only inspected and accepted items.

B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.

1. Furnish adequate dunnage and bracing during storage.
2. Prevent stored items from contacting the floor, from soiling and staining, and from deterioration and damage.
3. Sheet products must be tightly rolled face out on a sturdy core designed for that purpose and vertically stored unless otherwise required or recommended by the manufacturer. Promptly remove and replace rolled sheet products that are flattened or distorted during shipping, unloading, or storage.
4. Do not leave items uncovered where they might be exposed to weather or become wet; or exposed to heat or sudden changes in temperature or relative humidity; or other sources of deterioration and damage, including dust and other airborne contaminants.

C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.

1. Avoid damage to packaging and containers, and contamination of contents.
 2. Rotate inventory; do not use items the shelf life of which is expired.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective resilient sheet flooring materials with undamaged new resilient sheet flooring materials that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 PROJECT CONDITIONS

- A. Ambient Conditions: Install resilient sheet flooring only when ambient temperature, RH, and other environmental conditions fall within ranges required, recommended, or accepted by the manufacturer.
- B. Existing Conditions:
1. Surface Conditions: Surfaces receiving resilient sheet flooring must be dry. Install resilient sheet flooring only when substrate moisture content, vapor emission rate, and surface temperature fall within ranges required, recommended, or accepted by the manufacturer.
 2. Ventilation: Maintain adequate ventilation during and after installation and curing, setting, or drying. Where natural ventilation is inadequate, use forced-air circulation or mechanical ventilation as necessary for the installations indicated.
 3. Illumination: Provide permanent lighting or illuminate work spaces to at least the same type, illumination level, and color temperature maintained in the room or space after the building is occupied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
1. Armstrong World Industries.
 2. Burke Flooring.
 3. Gerflor.
 4. Johnsonite.

2.2 VINYL SHEET FLOORING

- A. Description: Un-backed vinyl sheet floor covering conforming to ASTM F 1913.
- B. Products: Selected by the Architect, or equal.
- C. Requisite Properties:

1. Sheet Width: At least 78 inches wide
2. Thickness: 0.08-inch (2.0mm) and 0.12-inch (3.0mm) as indicated on the Drawings.
3. Shore A Hardness: At least 85, when measured in conformance with ASTM D 2240.
4. Color: Indicated on the Drawings.
5. Surface Texture: Smooth.
6. Seaming Method: Heat welded.
7. Weld Rods: Manufacturer's standard solidified adhesive welding rod. Indicated on the Drawings.
8. Base: Integral flash cove.

2.3 RUBBER SHEET FLOORING

- A. Description: Un-backed rubber sheet floor covering conforming to ASTM F 1859.
- B. Manufacturers: Provide products manufactured by one of the following, or equal.
 1. nora systems, Inc.
 2. Johnsonite.
 3. Mondo USA.
- C. Products: Design Selections indicated on the Drawings or selected by the Architect, or equal.
- D. Requisite Properties:
 1. Sheet Width: At least 78 inches wide
 2. Thickness: 0.08-inch (2.0mm) and 0.12-inch (3.0mm) as indicated on the Drawings.
 3. Shore A Hardness: At least 85, when measured in conformance with ASTM D 2240.
 4. Color: Product Options indicated on the Drawings or selected by the Architect.
 5. Surface Texture: Smooth.
 6. Seaming Method: Heat welded.
 7. Weld Rods: Manufacturer's standard solidified adhesive welding rod.
Product Options indicated on the Drawings or selected by the Architect.
 8. Base: Integral flash cove.

2.4 SURFACE PREPARATION

- A. Substrate Testing and Surface Preparation: Perform testing and corrective work and prepare substrates in conformance with the requirements of Section 09 05 16.

2.5 INSTALLATION MATERIALS

- A. Trowelable Patch and Fill Materials: Specified in Section 03 54 16, unless other products are supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

- B. Moisture Vapor Transmission Reduction Coating: Specified in Section 03 35 10 (preventative) or Section 09 05 16 (remedial), unless another coating is supplied, required, recommended, accepted by the by manufacturer for actual in-service conditions applicable to the project.
- C. Primer: Water-based, low- or zero-VOC, solvent-free primer supplied, required, recommended, or accepted by the manufacturer for in-service installation conditions, including temperature, relative humidity, and substrate porosity; and expected foot traffic, rolling traffic, and fire-resistance ratings.
- D. Adhesive:
 - 1. Water-based, low- or zero-VOC adhesive supplied, required, recommended, or accepted by the manufacturer for ease of resilient sheet flooring installation; and for adequate bonding of resilient sheet flooring to substrates for all in-service installation conditions, including temperature, relative humidity, and substrate porosity; and expected foot traffic, rolling traffic, and fire-resistance ratings.
 - 2. Wet-tack, percent solids, open-time, stripability, and ease of application must be explicitly formulated for each resilient sheet flooring type and application.
 - 3. Provide hard-set adhesive supplied, required, recommended, or accepted by the manufacturer under resilient sheet flooring subject to concentrated static or dynamic rolling loads.
- E. Integral Flash Cove Base Accessories: Provide the following manufactured by Johnsonite, or equal.
 - 1. Cove Filler Strips:
 - a. 1-3/4-inch Radius: "Model No. CFS-00", or equal.
 - b. 1-1/4-inch Radius: "Model No. CFS-00-A", or equal.
 - c. One-inch Radius: "Model No. CFS-00-M", or equal.
 - 2. Cove Caps: "Model No. SCC-55-A", or equal.
- F. Welding Rods:
 - 1. Description: Manufacturer's standard solid-strand, solidified adhesive, through-color welding rods. Match flooring color, pattern, and appearance.
 - 2. Colors: Selected by the Architect.
 - 3. Requisite Properties:
 - a. Provide matching solid colors for solid color flooring.
 - b. Provide pattern-matching non-solid colors for patterned flooring.

2.6 ACCESSORIES

- A. Subfloor Leveler System:
 - 1. Products: Provide the following manufactured by Johnsonite, or equal.
 - a. Reduces 1/8-inch to Zero: "Model No. LS-40-F", or equal.
 - b. Reduces 1/4-inch to Zero (can be cut at score line to reduce height as indicated): "Model No. LS-40", or equal.

- c. Reduces 1/4-inch to Zero (leveled edge for tack strip installation): "Model No. LS-40-K", or equal.
 - d. Reduces 3/8-inch to Zero (can be cut at score line to reduce height as indicated): "Model No. LS-40-D", or equal.
 - e. Reduces 1/2-inch to Zero (can be cut at score line to reduce height as indicated): "Model No. LS-40-E", or equal.
 - f. Reduces 3/4-inch to Zero: "Model No. LS-40-G", or equal.
 - g. Reduces 3/8-inch to 1/4-inch (can be used alone or with LS-40 to extend transition): "Model No. LS-40-B", or equal.
 - h. Reduces 1/2-inch to 3/8-inch (can be used alone or with Model Nos. "LS-40-D" or "LS-40-D" to extend transition): "Model No. LS-40-C", or equal.
- B. Leveling Paper:
- 1. Application: Used to align finish surfaces of 2.0mm and 3.0mm flooring.
 - 2. Description: Kraft or felt paper supplied, required, recommended, or accepted by the manufacturer.
- C. Cleaner: Supplied, required, recommended, or accepted by the manufacturer for use on the installed resilient sheet flooring and actual in-service conditions applicable to the project. Cleaners must remove stains, dirt, and residue without damaging or altering resilient sheet flooring surfaces.
- D. Floor Polish: Protective liquid polish products supplied, required, recommended, or accepted by the manufacturer for the actual in-service conditions applicable to the project.
- E. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification:
- 1. Verify in-place construction, project conditions, and the work of other specification sections conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Verify subfloor surfaces are properly secured, smooth, and flat to minimum floor flatness and levelness tolerances required, recommended, or accepted by the manufacturer for the actual in-service conditions applicable to the project.

3. Verify substrates are dry and free of curing compounds, sealers, hardeners, and deleterious and other substances that might interfere with resilient sheet flooring adhesion, appearance, or performance.
4. Verify items penetrating resilient sheet flooring are installed.

C. Evaluation and Assessment:

1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 PREPARATION

A. Protection:

1. Work Area Protection: Protect work areas from dust and other airborne contaminants during surface preparation and resilient sheet flooring installation. Control and collect dust produced by grinding operations.
2. Adjacent Material Protection: Protect adjacent surfaces against soiling and damage, and from detrimental effects caused by surface profiling operations. Utilize drop cloths, shields, masking, barricades, and other items necessary to protect adjacent surfaces.

B. Substrate Preparation: Prepare substrates as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.

1. Remove substrate coatings and other substances that are incompatible with adhesives or that may negatively affect the quality of the installation, durability, appearance, or performance of either the furnished resilient sheet flooring or adhesives.
2. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with patch and fill materials. Apply, trowel, and float patch material to achieve smooth, flat, hard surface. Prohibit traffic until patch material is cured.
3. Perform testing, corrective work, and substrate preparation specified in Section 09 05 16.
4. Vacuum-clean substrate.

C. Bond Test: Perform and document bond tests as required, recommended, or accepted by the manufacturer, must be performed and documented before beginning installation.

3.3 INSTALLATION

A. General Requirements:

1. Install resilient sheet flooring using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
2. Only install resilient sheet flooring under conditions that ensure finishes are free from blemishes and defects.
3. Completed work must match approved samples and mockups, as accepted by the Architect.
4. Installed resilient sheet flooring must be warrantable. Do not install, correct, or replace resilient sheet flooring in a manner that results in any warranty or guarantee becoming void.

B. Special Techniques:

1. Scribe, cut, and fit resilient sheet flooring to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
2. Extend resilient sheet flooring into toe spaces, door reveals, closets, and similar openings. Extend resilient sheet flooring to centerline of doors in the closed position.
3. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on resilient sheet flooring as marked on substrates. Use pencil, chalk, or other nonpermanent, non-staining marking device. The use of markers is prohibited.
4. Adhere resilient sheet flooring to substrate using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
5. For seamless resilient sheet flooring installation, rout seams and weld together with coordinated color heat welding rod in conformance with the manufacturer's instructions.

C. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely adhere resilient sheet flooring to supporting construction.

3.4 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and

3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.

- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 CLEANING

- A. Cleaning Work: Clean all visible resilient sheet flooring surfaces in a manner that does not result in any warranty or guarantee becoming void.
 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.6 PROTECTION

- A. Protect installed resilient sheet flooring in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything on, adjacent to, or against installed resilient sheet flooring unless it is protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed resilient sheet flooring as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 09 81 33 – ACOUSTICAL INSULATION, SEALANTS, AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concealed acoustical insulation.
2. Acoustical sealants.
3. Acoustical spray.
4. Firestop and acoustical putty pads.
5. Installation materials.
6. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

A. Definitions:

1. Manufacturer: Means the acoustical insulation or accessory manufacturer, as the context admits, manufacturer, unless otherwise indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

A. CPVC Coordination: Not all CPVC products are identical. Different CPVC products from different manufacturers may vary in molecular weight, chlorine content and compound additives.

1. Verify selected CPVC product compatibility with all products that may come into contact with selected CPVC, even if contact is inadvertent.
2. Determine chemical composition of CPVC materials and compatibility of selected paints and sealants with selected CPVC materials.
3. Only apply ancillary products that are specifically approved for use on the specific brand of CPVC selected for the project.
4. If an ancillary product is not on a compatibility list, contact the CPVC manufacturer before use. Never assume the absence of a prohibition indicates suitability.
5. Natural oil (vegetable oil or animal fat) and synthetic ester oils, or items containing natural or synthetic oil are prohibited from contacting CPVC.
6. Plasticizers found in certain materials, including incompatible sealants, are prohibited from contacting CPVC.
7. Surfactants found in certain materials, including soaps and detergents, are prohibited from contacting CPVC.

8. Fungicides sprayed on surrounding drywall and wood framing to prevent growth of mold and mildew, are prohibited from contacting CPVC.
9. Scented products, including cologne, perfume, or essential oils (e.g., peppermint oil, orange oil, spearmint oil, etc.), are prohibited from contacting CPVC. (Sometimes used for the purpose of being able to detect leaks by odor)
10. Jacketing on signal-carrying wiring systems often contains plasticizers that are prohibited from contacting CPVC.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
 1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs), and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
- B. Informational Submittals: Submit manufacturer's instructions for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
 1. Submit manufacturer-prepared published instructions for proper installation of furnished insulation.
 2. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 3. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.

1.5 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items as shipped, upright in their original containers, indoors within dry, well-ventilated, broom-cleaned, and partially- or permanently-enclosed storage areas.
- C. Damaged Item Replacement: Promptly remove and replace items that are deteriorated, damaged, or defective with undamaged new items that do not exhibit deterioration, damage, or defects.
- D. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.6 PROJECT CONDITIONS

- A. Existing Conditions: Surfaces receiving acoustical insulation must be dry.

PART 2 - PRODUCTS

2.1 CONCEALED ACOUSTICAL INSULATION

A. Acoustical Blanket Insulation:

1. Description: Unfaced inorganic glass-fiber blanket acoustical insulation conforming to ASTM C 665 Type I acoustical insulation (blankets without membrane coverings).
2. Manufacturers: Provide one of the following, or equal.
 - a. "CertaPro AcoustaTherm" manufactured by CertainTeed Corp.
 - b. "Sound Control Batts" manufactured by Johns Manville.
 - c. "Sound Attenuation Batts/MW" manufactured by Owens Corning Fiberglass Corp.

B. Sound Attenuating Fire Blanket Insulation:

1. Description: Asbestos-free mineral fiber blanket acoustical insulation conforming to ASTM C 665 requirements for Type I acoustical insulation (blankets without membrane coverings), manufactured from slag and naturally occurring rock.
2. Products: Provide one of the following, or equal.
 - a. "FIBREX Sound Attenuation Fire Batt Acoustical insulation (SAFB)" manufactured by Fibrex Insulations Inc.
 - b. "Thermafiber Sound Attenuating Fire Blankets (SAFB)" manufactured by Owens Corning.
 - c. "ROCKWOOL AFB" manufactured by Roxul Inc.

2.2 ACOUSTICAL SEALANTS

A. Latex Sealants:

1. Description: Non-sag, paintable, non-staining siliconized acrylic-latex sealant conforming to ASTM C 834 requirements for Type OP (opaque sealant), Grade NF (does not meet the requirements for low temperature flexibility of Grade 0°C classification). Verify material compatibility with adjacent materials such as chlorinated polyvinyl chloride (CPVC) pipe.
2. Application: Used where indicated at exposed and concealed joints and annular spaces around through-penetrations.
3. Products: Unless another type is required, recommended, or accepted by the CPVC item manufacturer, provide one of the following, or equal.
 - a. "CP 506 Smoke and Acoustic Sealant" manufactured by Hilti, Inc.
 - b. "QuietZone Acoustic Sealant" manufactured by Owens Corning.
 - c. "AC-20 FTR" manufactured by Pecora Corp.

- d. "Tremflex 834" manufactured by Tremco, Inc.
- e. "Sheetrock Acoustical Sealant" manufactured by USG Corp.
4. Requisite Properties:
 - a. Color: White.
- B. Non-Drying, Non-Hardening, Non-Skinning Sealants:
 1. Description: Single-component butyl rubber sound dampening elastomeric sealant conforming to ASTM Standard D 217. Verify material compatibility with adjacent materials such as chlorinated polyvinyl chloride (CPVC) pipe.
 2. Application: Installed at concealed joints where indicated.
 3. Products: Unless another type is required, recommended, or accepted by the CPVC item manufacturer, provide one of the following, or equal.
 - a. "BA-98" manufactured by Pecora Corp.
 - b. "QuietSeal Acoustical Sealant QS-350" manufactured by Serious Materials, Inc.
 - c. "Acoustical Sealant" manufactured by Tremco, Inc.
- C. Fire Rated, Non-Hardening,, Sealant:
 1. Description: Verify material compatibility with adjacent materials such as chlorinated polyvinyl chloride (CPVC) pipe.
 2. Products: Unless another type is required, recommended, or accepted by the CPVC item manufacturer, provide one of the following, or equal.
 - a. "Fire Barrier 2001 Silicone RTV Foam" manufactured by 3M.
 - b. "CP 601S Elastomeric Firestop Sealant" manufactured by HILTI.
 - c. "Firetemp CI Caulk" manufactured by Johns Manville.
 - d. "Spec Seal ES100" manufactured by Specified Technologies, Inc.
- D. Expanding Foam Sealant:
 1. Description: Gun-applied, expanding spray foam sealant. Verify material compatibility with adjacent materials such as chlorinated polyvinyl chloride (CPVC) pipe
 2. Application: Used to seal and insulate around common areas of energy loss, including foundation/sill plates, outdoor fixtures, pipe penetrations, etc.
 3. Products: Unless another type is required, recommended, or accepted by the CPVC item manufacturer, provide one of the following, or equal.
 - a. "GREAT STUFF PRO Gaps & Cracks" manufactured by The Dow Chemical Co.
 - b. "Polycell" manufactured by M-D Building Products, Inc.
 - c. "Expanding Foam Polyfilla" manufactured by Polyfilla.
- E. Cementitious Sealant: "Monokote Z-146" manufactured by GCP Applied Technologies, Inc., or equal.
- F. Preformed Tape Sealants:
 1. Fire-Resistance Rated Conditions:

- a. Description: Compressible, self-extinguishing, UL-listed closed cell polyvinyl chloride foam tape with pressure sensitive adhesive.
 - b. Application: Installed at concealed joints in fire-resistance rated construction, where indicated.
 - c. Product: "Norseal V740FR" manufactured by Norton Performance Plastics Corp., or equal.
 - d. Requisite Properties:
 - 1) Size: One-inch minimum roll width, unless another width is indicated on the Drawings.
 - 2) Thickness: At least 1/8-inch, unless another thickness is indicated on the Drawings.
 - 3) Density: At least 9 pounds per cubic foot.
 - 4) Facing: Furnish tape in rolls with protective release liner on non-adhesive face.
2. Elsewhere:
- a. Description: Compressible, closed cell polyvinyl chloride foam tape with pressure sensitive adhesive.
 - b. Application: Installed at concealed joints, where indicated.
 - c. Product: "Norseal V730" manufactured by Norton Performance Plastics Corp., or equal.
 - d. Requisite Properties:
 - 1) Size: One-inch minimum roll width.
 - 2) Thickness: At least 3/8-inch.
 - 3) Density: At least 6 pounds per cubic foot.
 - 4) Facing: Furnish tape in rolls with protective release liner on non-adhesive face.

2.3 ACOUSTICAL SPRAY

- A. Description: Sprayable acrylic latex material.
- B. Application: Used where indicated at exposed and concealed static or minimally dynamic joints or gaps in wall construction.
- C. Products: Provide one of the following, or equal.
 1. "CP 572 Smoke and Acoustic Spray" or "CFS-SP WB Firestop Joint Spray" manufactured by Hilti, Inc.
 2. "Spec Seal Smoke 'N' Sound Sealant" manufactured by Specified Technologies, Inc.
 3. "TREMstop Smoke & Sound Sealant" or "TREMstop Acrylic" manufactured by Tremco, Inc.
- D. Requisite Properties:
 1. Spray must be mold and mildew resistant in conformance with ASTM G21.
 2. Spray must have a minimum movement capability of at least 12.5 percent.

2.4 FIRESTOP AND ACOUSTICAL PUTTY PADS

- A. Description: Sound deadening pads.
- B. Application: Used to seal the external surfaces (back side) of metallic and nonmetallic switch and receptacle boxes to reduce airborne sound transmission in interior partitions.
- C. Fire-Resistance Rated Construction (Firestop Putty Pads): Provide one of the following, or equal.
 - 1. "CP 617 Firestop Putty Pads" manufactured by Hilti, Inc.
 - 2. "Putty Pads" manufactured by International Protective Coatings
 - 3. "Type FSP Firestop Putty" pads by Nelson Electric.
 - 4. "Putty Pads" manufactured by Specified Technologies, Inc.
 - 5. "TREMstop MP" manufactured by Tremco, Inc.
- D. Elsewhere (Acoustical Putty Pads): Provide one of the following, or equal.
 - 1. "Lowry Box Pads" manufactured by Henry A. Lowry Co.
 - 2. "Sound Pad #68" manufactured by LH Dottie Co.

2.5 INSTALLATION MATERIALS

- A. Acoustical Insulation Hangers:
 - 1. Application: Used to attach acoustical insulation to clean, dry, smooth, non-porous solid surfaces.
 - 2. Manufacturer: Provide products manufactured by AGM Industries, Inc., or equal.
 - 3. Products: Provide the following, or equal.
 - a. Anchors: "TACTOO Insul-Hangers" adhesively attached spindle-type anchors.
 - b. Adhesive: "BOSS 348 Multi-Purpose Construction Adhesive" manufactured by Accumetric, LLC or other VOC-compliant acoustical insulation hanger adhesive.
 - c. Acoustical insulation Standoff: One-inch "Clutch Clip".
 - d. Acoustical insulation Retaining Washers: "Style RC 200" round or "SC 250" square washers.
 - 4. Requisite Properties:
 - a. Base Plate and Acoustical insulation Standoff and Retaining Washers: At least 2-inch square by at least 0.149-inch (MSG 28) base metal thickness galvanized perforated steel sheet.
 - b. Retaining Washers: At least 1-1/2-inch square or diameter by at least 0.149-inch (MSG 28) base metal thickness galvanized perforated steel sheet.
 - c. Spindle: At least 0.106-inch diameter (SWG 12), zinc-coated wire, depth to suit depth of acoustical insulation indicated.
 - d. Adhesive: Adhesive used with impaling pins must either be manufactured or accepted by the acoustical insulation hanger manufacturer. "Peel and press" hangers with self-adhering adhesive backings are prohibited.

- B. Mechanical Fasteners: Tape, staples, and other devices for fastening acoustical insulation supplied, required, recommended, or accepted by the acoustical insulation manufacturer.
- C. Hanger Wire: At least 0.106-inch diameter (SWG 12) soft temper zinc-coated wire conforming to ASTM A 641, Class 3 or A coating.
- D. Adhesive: Supplied, require, recommended, or accepted by the acoustical insulation manufacturer to bond acoustical insulation securely to substrates indicated without damaging acoustical insulation or substrates.

2.6 ACCESSORIES

- A. Joint Backing:
 - 1. Description: Extruded closed-cell polyethylene foam cylindrical sealant backings conforming to ASTM C 1330, Type C.
 - 2. Products: Provide one of the following, or equal.
 - a. "Mile High Foam" manufactured by Backer Rod Mfg. Inc.
 - b. "HBR" or "Green Rod" manufactured by Nomaco, Inc.
 - c. "NuFlex 870" manufactured by TVM Building Products.
 - 3. Performance Requirements:
 - a. Maximum Water Absorption: Not more than 0.10 grams per cubic centiliter when tested in conformance with conformance with ASTM C 1016, Procedure B.
 - b. Minimum Density: At least 24 per cubic meter when tested in conformance with conformance with ASTM D 1622.
 - c. Maximum Outgassing: Less than 1 bubble when tested in conformance with conformance with ASTM D 1253.
 - d. Minimum Compression Recovery: At least 90 percent, when tested in conformance with conformance with ASTM D 5249.
 - e. Minimum Compression Deflection: At least 20.5 percent, when tested in conformance with conformance with ASTM D 5249.
 - f. Minimum Tensile Strength: At least 200 kPa, when tested in conformance with conformance with ASTM D 1623.
- B. Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.

- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 - 1. Install acoustical insulation using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 - 2. Extend acoustical insulation to envelop entire area insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
 - 3. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of acoustical insulation to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.
 - 4. Installed acoustical insulation must be warrantable. Do not install, correct, or replace acoustical insulation in a manner that results in any warranty or guarantee becoming void.
- B. Special Techniques:
 - 1. Wall Insulation:
 - a. Install acoustical insulation in cavities formed by framing members.
 - b. Use acoustical insulation that fills the cavities. If more than one length is required to fill the cavities, then provide lengths that will produce a snug fit between ends.
 - c. Place acoustical insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - d. Maintain 3-inch clearance around recessed lighting fixtures not rated for or protected from contact with acoustical insulation.
 - e. Stuff loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to roughly 40 percent of normal maximum volume.
 - f. For metal-framed wall cavities higher than 96 inches, support unfaced blankets mechanically and support faced blankets by taping insulation flanges to metal stud flanges.
 - 2. Ceiling Insulation:
 - a. Install blanket acoustical insulation above ceilings where indicated.

- b. Maintain 3-inch clearance of acoustical insulation around recessed lighting fixtures.
 - 3. Acoustical Sealant Installation:
 - a. At sound-rated assemblies and elsewhere indicated, seal construction in conformance with ASTM C 919 with a continuous bead of acoustical sealant at perimeter, behind control joints, and at openings and penetrations.
 - b. Install acoustical sealant to both faces of partitions at perimeters and through penetrations.
- C. Acoustical Installation Requirements:
 - 1. Application: Apply acoustical sealant where shown on drawings and the following.
 - a. Both sides and perimeter of door and window frames.
 - b. Penetrations of partitions, floors, and ceilings by piping, ventilation ducts, conduits, cables, and cable trays.
 - c. Perimeter and between joints of all sound isolating partitions, floors, and ceilings.
 - 2. Acoustical Sealant:
 - a. Use continuous beads of acoustical sealant along gypsum board face layer to seal assemblies at head, sill, perimeter, and penetrations, and joints between layers of sound isolating gypsum board construction and around the perimeter of resilient ceilings.
 - b. Comply with ASTM C 919 requirements for use of joint sealants in acoustical applications as applicable to materials and conditions indicated.
 - 3. Sheet Sealant:
 - a. In full full height, sound rated, and sound sensitive walls, over back and sides of all electrical, telephone, and communication boxes with specified acoustical pads.
 - b. Verify unused knockouts are plugged before installing the pads. Mold pads tightly to the boxes and to the adjacent surfaces.
 - 4. Installation:
 - a. To seal gaps 3/8-inch in dimension and larger, pack with glass/mineral fiber batt prior to installing sealant materials.
 - b. Use compressible closed-cell foam backer rod as required. Uncompressed backer rod width should be 30 to 50 percent greater than joint width.
- D. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach acoustical insulation to supporting construction.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.

- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.5 PROTECTION

- A. Protect installed acoustical insulation in place from becoming wet, deterioration, and damage until covering.
- B. Do not store anything adjacent to or against installed acoustical insulation unless it is protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed acoustical insulation as work surfaces.
- C. Remove protection when it's no longer needed and before covering.

END OF SECTION

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SECTION 09 91 00 – PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Field-applied finish paint.
2. Surface preparation.
3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:

1. Section 05 05 13 for shop-applied steel primers and surface preparation; and for SSPC Environmental Zone definitions.
2. Section 09 97 13 for high performance steel coatings applied to steel surfaces installed in SSPC Environmental Zones 1B, 2A, and 2B.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. DFT: Dry Film Thickness.
2. GU: Gloss Unit.
3. SSPC: The Society for Protective Coatings.

B. Definitions:

1. Manufacturer: Means the paint manufacturer, unless otherwise indicated.
2. Paint: Means all applied materials, including fillers, primers, emulsions, enamels, varnishes, stains, lacquers, and sealers, whether used as a prime, intermediate, or finish coat.
3. Coating: Means the same as paint.
4. Coat: Means a layer of paint that is applied and then permitted to dry. Both back-rolling and applying wet-on-wet are one coat.
5. Finish: Means an entire coating system, including all surface preparation methods, primers, coats, textures, colors, and sheens.
6. Thickness: Means the total finish DFT, measured in conformance with SSPC paint application standard SSPC-PA2, *"Measurement of Dry Coating Thickness with Magnetic Gages"*.
7. Touchup: Means to correct or repair non-conforming or deficient areas to bring into conformance with the Contract Documents.
8. Refinish: Means to apply a new finish to a previously-finished item or surface.

9. Sheen: Means the following gloss ranges, when tested in conformance with ASTM D 523.

Sheen	Reference Description	Gloss Range	Test Method
Gloss Level 1 (Low Sheen)	Matte/Flat	1 to 5 GUs 1 to 10 GUs	60-degree meter 85-degree meter
Gloss Level 2 (Low Sheen)	Velvet	6 to 10 GUs 11 to 24 GUs	60-degree meter 85-degree meter
Gloss Level 3 (Medium Sheen)	Eggshell	11 to 20 GUs 25 to 35 GUs	60-degree meter 85-degree meter
Gloss Level 4 (Medium Sheen)	Satin	21 to 35 GUs >35 GUs	60-degree meter 85-degree meter
Gloss Level 5 (Medium Sheen)	Low sheen	36 to 49 GUs	60-degree meter
Gloss Level 6 (Medium Sheen)	Semi-gloss	50 to 70 GUs	60-degree meter
Gloss Level 7 (High Sheen)	Gloss	71 to 85 GUs Up to 60 GUs	60-degree meter 20-degree meter
Gloss Level 8 (High Sheen)	High-Gloss	>85 GUs >60 GUs	60-degree meter 20-degree meter

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Unless otherwise indicated, paint all surfaces throughout the Project, except the following.
 - a. Concrete.
 - b. Steel decking.
 - c. Roofing.
 - d. Insulation and its facing.
 - e. Finish hardware, except items specified with a USP finish.
 - f. Prefinished metal surfaces, including anodized aluminum, chrome plating, powder coatings, and similar pre-finished materials.
 - g. Natural finish metal surfaces, including mill finish aluminum, stainless steel, copper, bronze, brass and similar finished materials.
 - h. Walls or ceilings in concealed and inaccessible areas, including furred areas, chases, and shafts.

- i. Moving, mechanical, or electrical parts of operating units, including valve and damper operator linkages, sensing devices, motor and fan shafts..
 - j. Nameplates and required labels, including UL, FM, and other equipment identification, performance rating, or name plates.
 2. Paint all visible surfaces, including surfaces visible through registers, screens and grilles whether or not colors are designated, except where a material's natural finish is obviously intended or explicitly indicated as a surface not painted.
 3. Where surfaces are not specifically indicated, paint them to match adjacent similar materials or areas.
 4. Specified surface preparation, priming, and paint coats are in addition to surface preparation and shop priming indicated in other specification sections.
 5. Coordinate selected paint for compatibility with primers indicated in other specification sections.
 - a. Provide prime coats that are compatible with subsequent coats or provide compatible barrier coats over incompatible primers; or completely remove primer and re-prime.
 - b. Verify chemical and adhesive compatibility of all coats within each paint finish.
 6. Coordinate selected paint for compatibility with chemicals used near or on painted surfaces, including cleaning materials, accessories, and methods.
 7. Proposed substitution requests and submittals that change the quality (grade) or generic chemistry of specified paint are prohibited and returned to the Contractor without review or responsive action, except to record non-conformance with this requirement.
 8. Specified coverage rates and thicknesses are minimum. If manufacturer's recommended coverage rates differ from specified rates, then
 - a. consult the manufacturer's representative and obtain manufacturer-recommended coverage rates printed on manufacturer's letterhead;
 - b. assume the manufacturer-recommended coverage rates govern; and
 - c. promptly submit an RFI to the Architect for resolution; include manufacturer-recommended coverage rates with the RFI.
 9. Master Painters Institute standards are insufficient for and not applicable to this project.

B. Sequencing:

1. Schedule paint deliveries to the project site only after the building is enclosed with a permanent enclosure; "wet work" within storage areas (including concrete, cast underlayment, mortaring, grouting, plastering, and gypsum board finishing) is complete and cured or dried to a condition of equilibrium; storage areas are broom- and vacuum-clean; and the HVAC system is activated, operating, and maintaining ambient conditions at occupancy levels.
2. Before beginning installation, final light fixtures must be completely installed, energized, and fully illuminated to at least the same type and level of illumination, and color temperature, maintained in the room or space after the building is occupied.
3. Install paint only after penetrating items are installed.

4. After paint installation, maintain ambient conditions within a range required, recommended, approved, or accepted by the manufacturer until Final Completion.

C. Scheduling:

1. Concrete Curing: Allow enough time in the construction schedule for concrete to cure for at least 28 days and dry before beginning surface preparation and installation.
2. Concrete Masonry Units: CMU walls must be painted within 30 days after building close-in.
3. Cleaning: Schedule cleaning to prevent dust and other contaminants from falling on freshly-applied paint.

1.4 SUBMITTALS

A. Action Submittals: Submit the following for responsive action (formal review and approval).

1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs), and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
2. Paint Schedule:
 - a. Prepare a list of specified finishes and their project locations, with selected products identified for each coat of every finish.
 - b. Identify substrates to which each specified finish is applied, including surface preparation methods and primers for each substrate.
3. Samples: Submit 8-1/2-inch by 11-inch drawdown cards of each specified color and sheen. Label each card with project location.

B. Maintenance Material Submittals:

1. Before Final Completion, deliver to the Owner extra stock materials to replace those worn or damaged as a result of normal occupancy.
2. Furnish one unopened gallon or container for each paint type, color, composition, grade, finish, and variety.
3. Submit manufacturer-recommended cleaning materials, accessories, and manufacturer's instructions and other requirements and recommendations for maintenance and cleaning of painted surfaces, including a comprehensive list of known chemicals that should not come into contact with painted surfaces.

1.5 QUALITY ASSURANCE

A. Source Limitations:

1. Paint must be obtained through one source from the same manufacturer (to ensure compatibility and a uniform appearance).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.

- b. Items provided for each different installation must be obtained from the same source and manufacturer.
 2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.
- B. Field Samples: Include *in-situ* mockups as part of the work of this specification section.
 1. The Architect reviews field samples for conformance to the Contract Documents and approves or rejects them as the standard by which subsequent work is evaluated.
 2. Revise field samples and repeat reviews, including arranging all revisions and paying all revision costs, until accepted in writing by the Architect. Final acceptance of paint is made from field samples.
 3. After acceptance, promptly identify and protect field samples for reference until Substantial Completion.
 4. Approved field samples may remain part of the work after being identified for future reference.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
 3. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
 1. Furnish adequate dunnage and bracing during storage.
 2. Prevent stored items from contacting the floor and from deterioration and damage.
 3. Do not leave items uncovered where they might be exposed to weather or become wet; or exposed to heat or sudden changes in temperature or relative humidity; or other sources of deterioration and damage, including dust and other airborne contaminants.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.
 1. Avoid damage to packaging and containers, and contamination of contents.
 2. Rotate inventory; do not use items the shelf life of which is expired.
- D. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 PROJECT CONDITIONS

- A. Ambient Conditions: Install paint only when ambient temperature, RH, and other environmental conditions fall within ranges required, recommended, or accepted by the manufacturer.
- B. Existing Conditions:
 - 1. Surface Conditions: Surfaces receiving paint must be dry. Install paint only when substrate moisture content and surface temperature fall within ranges required, recommended, or accepted by the manufacturer.
 - 2. Ventilation: Maintain adequate ventilation during and after installation and curing, setting, or drying. Where natural ventilation is inadequate, use forced-air circulation or mechanical ventilation as necessary for the installations indicated.
 - 3. Illumination: Provide permanent lighting or illuminate work spaces to at least the same level occurring in the room or space after Final Completion.
- C. Other Conditions: Do not apply paint where dust is generated, or liquids are sprayed; or when windy conditions exist that may cause paint to be blown onto vegetation or other unintended surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
 - 1. Vista Paint.
 - 2. Dunn Edwards.
 - 3. Benjamin Moore.

2.2 PAINT

- A. Description: 100-percent premium grade (best grade) low- and no-VOC paints, unless otherwise indicated.
- B. Products: Indicated in the Paint Products Schedule at the end of this specification section.
- C. Requisite Properties:
 - 1. Colors: Indicated on the Drawings.
 - 2. Sheens: Provide the following, unless otherwise indicated.
 - a. Ceilings: Not more than Gloss Level 3. (Eggshell)
 - b. Trim: At least Gloss Level 6. (Gloss)
 - c. Bathroom Walls: At least Gloss Level 5. (Semi-Gloss)
 - d. Other Walls: At least Gloss Level 3. (Eggshell)

2.3 ACCESSORIES

- A. Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.4 MIXING

- A. Factory-mix paint to match approved samples and mockups accepted by the Architect.
- B. Box paint at the project site or factory-batch to ensure uniform and consistent color. This requirement includes specified maintenance materials.
- C. Open paint containers only as required for use and mix only in designated areas.
- D. Thoroughly agitate and stir materials to a uniform and smooth consistency suitable for proper installation.
- E. Do not reduce, alter, or introduce foreign materials into paint, except in conformance with manufacturer's instructions and other requirements and recommendations.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification:
 - 1. Verify in-place construction, project conditions, and the work of other specification sections conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Verify substrates are dry and free of curing compounds, sealers, hardeners, and deleterious and other substances that might interfere with paint adhesion, appearance, or performance.
 - 3. Verify items penetrating paint are installed.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 PREPARATION

A. Protection:

1. Work Area Protection: Protect work areas from dust and other airborne contaminants during surface preparation and paint installation.
2. Adjacent Material Protection: Protect adjacent surfaces against soiling and damage. Utilize drop cloths, shields, masking, barricades, and other items necessary to protect adjacent surfaces.
3. Opening Protection: Close and protect drains and other openings and penetrations to prevent paint intrusion or migration of liquids.

- #### B. Substrate Preparation: Prepare substrates as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.

3.3 INSTALLATION

A. General Requirements:

1. Install paint using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
2. Only install paint under conditions that ensure finishes are free from blemishes and defects.
3. Provide smooth surfaces of uniform finish, color, appearance, and coverage. Painted surfaces with cloudiness, spotting, holidays, runs, or other imperfections are prohibited and are rejected as non-conforming work.
4. Do not exceed the application rates recommended by the manufacturer.
5. Completed work must match approved samples and mockups, as accepted by the Architect.
6. Installed paint must be warrantable. Do not install, correct, or replace paint in a manner that results in any warranty or guarantee becoming void.

B. Special Techniques:

1. Produce uniform finished surfaces without substrates, undercoats, marks, or stains showing through. Produce sharp and even lines and color breaks.
2. Paint surfaces behind movable equipment and furniture the same as adjacent exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint back sides of access panels, removable or hinged covers, and similar hinged items the same as exposed surfaces.

3.4 CORRECTION AND REPAIR

- #### A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including

arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.

- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 - 1. written descriptions of non-conforming, damaged, and defective work;
 - 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 - 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 CLEANING

- A. Cleaning Work: Clean spills, stains, soiling, overspray, and fallout from adjacent surfaces.
 - 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 - 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 - 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 - 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.6 PROTECTION

- A. Protect installed paint in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything on, adjacent to, or against painted surfaces unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use painted surfaces as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

3.7 SCHEDULE

- A. Paint products schedule begins on the next page.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
FIRE CAMP 13 RECONSTRUCTION
PROJECT ID: 00002191

HUITT-ZOLLARS, INC.
PROJECT NO. R311608.14
CONSTRUCTION DOCUMENT 01/04/2023

END OF SECTION

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SUBSTRATE	NO. OF COATS	VISTA PAINT	DUNN-EDWARDS	BENJAMIN MOORE
EXTERIOR SURFACES - LOW VOC				
Concrete & CMU Substrates: As specified in Section 09 96 13 - Elastomeric Coatings				
Concrete & Brick Substrates: 100% Acrylic FLAT				
	1 st Coat	4600 Uniprime II	ESPR00 Eff-Stop	023 Fresh Start Primer
	2 nd Coat	2000 Duratone	EVSH10 Evershield Flat	400 Regal Select Flat
	3 rd Coat	2000 Duratone	EVSH10 Evershield Flat	400 Regal Select Flat
CMU Substrates: 100% Acrylic FLAT				
	1 st Coat	018 Acrylic Block Filler	SBPR00 Blockfill	M88 Latex Block Filler
	2 nd Coat	2000 Duratone	EVSH10 Evershield Flat	400 Regal Select Flat
	3 rd Coat	2000 Duratone	EVSH10 Evershield Flat	400 Regal Select Flat
CMU Substrates: 100% Acrylic ELASTOMERIC				
	1 st Coat	4600 Uniprime II	ESPR00 Eff-Stop	023 Fresh Start Primer
	2 nd Coat	500 Solotex	W370 Endurawall	056 Moorlastic
	3 rd Coat	500 Solotex	W370 Endurawall	056 Moorlastic
Finished Wood Surfaces: 100% Acrylic FLAT				
	1 st Coat	4200 Terminator II	EZPR00 EZ Prime Premium	0046 Hi-Hide All Purpose Primer
	2 nd Coat	2000 Duratone	EVSH10 Evershield Flat	W105 Regal Select Flat
	3 rd Coat	2000 Duratone	EVSH10 Evershield Flat	W105 Regal Select Flat
Finished Wood Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	4200 Terminator II	EZPR00 EZ Prime Premium	0046 Hi-Hide All Purpose Primer
	2 nd Coat	7000 Acriglo Semi-Gloss	EVSH50 Evershield Semi Gloss	W096Regal Soft Gloss
	3 rd Coat	7000 Acriglo Semi-Gloss	EVSH50 Evershield Semi Gloss	W096Regal Soft Gloss
Finished Wood Surfaces: 100% Acrylic GLOSS				
	1 st Coat	4200 Terminator II	EZPR00 EZ Prime Premium	0046 Hi-Hide All Purpose Primer
	2 nd Coat	8500 Carefree Gloss	EVSH60 Evershield Gloss	NA
	3 rd Coat	8500 Carefree Gloss	EVSH60 Evershield Gloss	NA

SUBSTRATE	NO. OF COATS	VISTA PAINT	DUNN-EDWARDS	BENJAMIN MOORE
Finished Wood Surfaces: Semi-Transparent Stain				
	1 st Coat	Olympic Maximum ST Stain	Okon WPT-3	0638 Arborcoat S/T Stain
	2 nd Coat	Olympic Maximum ST Stain	Okon WPT-3	0638 Arborcoat S/T Stain
Iron, Steel, and Galvanized Steel Surfaces: Specified in Section 09 97 13 - High Performance Steel Coatings				
Iron & Steel Substrates: 100% Acrylic GLOSS				
	1 st Coat	9600 Protec	BRPR00-1 Block Rust	M04 Acrylic Metal Primer
	2 nd Coat	8500 Carefree Gloss	EVSH60 Evershield Gloss	N/A
	3 rd Coat	8500 Carefree Gloss	EVSH60 Evershield Gloss	N/A
Iron & Steel Substrates: 100% Acrylic SEMI-GLOSS				
	1 st Coat	9600 Protec	BRPR00-1 Block Rust	M04 Acrylic Metal Primer
	2 nd Coat	7000 Acriglo Semi-Gloss	EVSH50 Evershield Semi Gloss	402 Regal Soft Gloss
	3 rd Coat	7000 Acriglo Semi-Gloss	EVSH50 Evershield Semi Gloss	402 Regal Soft Gloss
Galvanized Steel & Aluminum Substrates: 100% Acrylic GLOSS				
Aluminum Surfaces: 100% Acrylic GLOSS				
	Pretreatment	Krud Kutter Metal Etch	ME01 Etch	Jasco Prep N Prime
	1 st Coat	4800 Metal Pro Primer	GAPR00 Galv-Alum Premium	P04 Acrylic Metal Primer
	2 nd Coat	8500 Carefree Gloss	EVSH60 Evershield Gloss	N/A
	3 rd Coat	8500 Carefree Gloss	EVSH60 Evershield Gloss	N/A
Galvanized Steel & Aluminum Substrates: 100% Acrylic SEMI-GLOSS				
Aluminum Surfaces: 100% Acrylic SEMI-GLOSS				
	Pretreatment	Krud Kutter Metal Etch	ME01 Etch	Jasco Prep N Prime
	1 st Coat	4800 Metal Pro Primer	GAPR00 Galv-Alum Premium	P04 Acrylic Metal Primer
	2 nd Coat	7000 Acriglo Semi-Gloss	EVSH50 Evershield Semi Gloss	W096 Regal Soft Gloss
	3 rd Coat	7000 Acriglo Semi-Gloss	EVSH50 Evershield Semi Gloss	W096 Regal Soft Gloss

SUBSTRATE	NO. OF COATS	VISTA PAINT	DUNN-EDWARDS	BENJAMIN MOORE
Zinc Alloy Surfaces: 100% Acrylic SEMI-GLOSS				
	Pretreatment	Krud Kutter Metal Etch	ME01 Etch	Jasco Prep N Prime
	1 st Coat	4800 Metal Pro Primer	GAPR00 Galv-Alum Premium	P04 Acrylic Metal Primer
	2 nd Coat	7000 Acriglo Semi-Gloss	EVSH50 Evershield Semi Gloss	W096 Regal Soft Gloss
	3 rd Coat	7000 Acriglo Semi-Gloss	EVSH50 Evershield Semi Gloss	W096 Regal Soft Gloss
Fiber Cement Board Surfaces: 100% Acrylic FLAT				
	1 st Coat	4600 Uniprime II	ESPR00 Eff-Stop	N023 Fresh Start Primer
	2 nd Coat	2000 Duratone	EVSH10 Evershield Flat	W105 Regal Select Flat
	3 rd Coat	2000 Duratone	EVSH10 Evershield Flat	W105 Regal Select Flat
Portland Cement Plaster (Stucco) Surfaces (Does not apply to Polymer-Modified Plaster Surfaces): Specified in Section 09 96 13 - Elastomeric Coatings				
Portland Cement Plaster (Stucco) Substrates (Does not apply to Polymer-Modified Plaster Surfaces): 100% Acrylic FLAT				
	1 st Coat	4600 Uniprime II	ESPR00 Eff-Stop	023 Fresh Start Primer
	2 nd Coat	2000 Duratone	EVSH10 Evershield Flat	400 Regal Select Flat
	3 rd Coat	2000 Duratone	EVSH10 Evershield Flat	400 Regal Select Flat
Gypsum Soffit Board Surfaces: 100% Acrylic FLAT				
	1 st Coat	4600 Uniprime II	Inter-Kote Premium	N023 Fresh Start Primer
	2 nd Coat	2000 Duratone	EVSH10 Evershield Flat	W105 Regal Select Flat
	3 rd Coat	2000 Duratone	EVSH10 Evershield Flat	W105 Regal Select Flat
INTERIOR SURFACES - LOW VOC				
Concrete Surfaces: 100% Acrylic FLAT				
	1 st Coat	4600 Uniprime II	ESPR00 Eff-Stop	N023 Fresh Start Primer
	2 nd Coat	7100 Acriglo Flat	SSHL10 Spartashield Flat	547 Regal Select Flat
	3 rd Coat	7100 Acriglo Flat	SSHL10 Spartashield Flat	547 Regal Select Flat

SUBSTRATE	NO. OF COATS	VISTA PAINT	DUNN-EDWARDS	BENJAMIN MOORE
Concrete Surfaces: 100% Acrylic EGGSHELL				
	1 st Coat	4600 Uniprime II	ESPR00 Eff-Stop Premium	N023 Fresh Start Primer
	2 nd Coat	7500 Acriglo Eggshell	SSHL30 Spartashield Eggshell	550 Regal Select Pearl
	3 rd Coat	7500 Acriglo Eggshell	SSHL30 Spartashield Eggshell	550 Regal Select Pearl
Concrete Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	4600 Uniprime II	ESPR00 Eff-Stop Premium	N023 Fresh Start Primer
	2 nd Coat	7000 Acriglo Semi-Gloss	SSHL50 Spartashield Semi-Gloss	551 Regal Select Semi Gloss
	3 rd Coat	7000 Acriglo Semi-Gloss	SSHL50 Spartashield Semi-Gloss	551 Regal Select Semi Gloss
Concrete Surfaces: 100% Acrylic GLOSS				
	1 st Coat	4600 Uniprime II	ESPR00 Eff-Stop Premium	N023 Fresh Start Primer
	2 nd Coat	8500 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss
	3 rd Coat	8500 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss
Concrete Surfaces: 100% Epoxy GLOSS				
	1 st Coat	4600 Uniprime II	Rust Oleum Sierra S70/S71 WB	N023 Fresh Start Primer
	2 nd Coat	Rust-Oleum Sierra S60 Gloss WB Epoxy	Rust-Oleum Sierra S60 Gloss WB Epoxy	P43 Super Spec HP Gloss Epoxy
CMU Surfaces: 100% Acrylic Flat				
	1 st Coat	018 Acrylic Block Filler	SBPR00 Blockfill	160 Latex Block Filler
	2 nd Coat	7100 Acriglo Flat	SSHL10 Spartashield Flat	547 Regal Select Flat
	3 rd Coat	7100 Acriglo Flat	SSHL10 Spartashield Flat	547 Regal Select Flat
CMU Surfaces: 100% Acrylic EGGSHELL				
	1 st Coat	018 Acrylic Block Filler	SBPR00 Blockfill	160 Latex Block Filler
	2 nd Coat	7500 Acriglo Eggshell	SSHL30 Spartashield Eggshell	550 Regal Select Pearl
	3 rd Coat	7500 Acriglo Eggshell	SSHL30 Spartashield Eggshell	550 Regal Select Pearl

SUBSTRATE	NO. OF COATS	VISTA PAINT	DUNN-EDWARDS	BENJAMIN MOORE
CMU Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	018 Acrylic Block Filler	SBPR00 Blockfill	160 Latex Block Filler
	2 nd Coat	7000 Acriglo Semi-Gloss	SSHL50 Spartashield Semi-Gloss	551 Regal Select Semi Gloss
	3 rd Coat	7000 Acriglo Semi-Gloss	SSHL50 Spartashield Semi-Gloss	551 Regal Select Semi Gloss
CMU Surfaces: 100% Acrylic GLOSS				
	1 st Coat	040 Block Kote	SBPR00 Blockfill	160 Latex Block Filler
	2 nd Coat	8500 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss
	3 rd Coat	8500 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss
CMU Surfaces: 100% Epoxy GLOSS				
	1 st Coat	040 Block Kote	SBPR00 Blockfill	160 Latex Block Filler
	2 nd Coat	Rust-Oleum Sierra S60 Gloss WB Epoxy	Rust-Oleum Sierra S60 Gloss WB Epoxy	P43 Super Spec HP Gloss Epoxy
Ferrous Metal Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	9600 Protec	BRPR00 Bloc-Rust	P04 Acrylic Metal Primer
	2 nd Coat	7000 Acriglo Semi-Gloss	SSHL50 Spartashield Semi-Gloss	551 Regal Select Semi Gloss
	3 rd Coat	7000 Acriglo Semi-Gloss	SSHL50 Spartashield Semi-Gloss	551 Regal Select Semi Gloss
Ferrous Metal Surfaces: 100% Acrylic GLOSS				
	1 st Coat	9600 Protec	UGPR00 Ultra-Grip	P04 Acrylic Metal Primer
	2 nd Coat	8500 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss
	3 rd Coat	8500 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss
Aluminum Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	9600 Protec	BRPR00 Bloc-Rust	P04 Acrylic Metal Primer
	2 nd Coat	7000 Acriglo Semi-Gloss	SSHL50 Spartashield Semi-Gloss	551 Regal Select Semi Gloss
	3 rd Coat	7000 Acriglo Semi-Gloss	SSHL50 Spartashield Semi-Gloss	551 Regal Select Semi Gloss

SUBSTRATE	NO. OF COATS	VISTA PAINT	DUNN-EDWARDS	BENJAMIN MOORE
Aluminum Surfaces: 100% Acrylic GLOSS				
	1 st Coat	9600 Protec	UGPR00 Ultra-Grip	P04 Acrylic Metal Primer
	2 nd Coat	8500 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss
	3 rd Coat	8500 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss
Stainless Steel, Copper, and Brass Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	9600 Protec	BRPR00 Bloc-Rust	P04 Acrylic Metal Primer
	2 nd Coat	7000 Acriglo Semi-Gloss	SSHL50 Spartashield Semi-Gloss	551 Regal Select Semi Gloss
	3 rd Coat	7000 Acriglo Semi-Gloss	SSHL50 Spartashield Semi-Gloss	551 Regal Select Semi Gloss
Stainless Steel, Copper, and Brass Surfaces: 100% Acrylic GLOSS				
	1 st Coat	9600 Protec	UGPR00 Ultra-Grip	P04 Acrylic Metal Primer
	2 nd Coat	8500 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss
	3 rd Coat	8500 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss
Rough Sawn Wood Surfaces: Semi-Transparent Stain				
	1 st Coat	Olympic S/T Stain	Okon WPT-3	0638 Arborcoat S/T Stain
	2 nd Coat	Olympic S/T Stain	Okon WPT-3	0638 Arborcoat S/T Stain
Finished Wood Surfaces: Semi-Transparent Stain				
	1 st Coat	VWS0250 Series ST Stain	Old Masters Wood Stain	Moore's S/T WB Stain
Finished Wood Surfaces: Clear Lacquer Finish				
	1 st Coat	NRS 1620 Sanding Sealer	LQX 101-0 Sanding Sealer	NRS 1620 Sanding Sealer
	2 nd Coat	NRF 1626 Satin Lacquer	LQX 104-0 Satin Lacquer	NRF 1626 Satin Lacquer
	3 rd Coat	NRF 1626 Satin Lacquer	LQX 103-0 Satin Lacquer	NRF 1626 Satin Lacquer
Finished Wood Surfaces: Water White Finish (for light-colored stains)				
	1 st Coat	NAF 1420 Satin Sealer	LQX 131-0 Sanding Sealer	NAF 1420 Satin Sealer
	2 nd Coat	NAF 1422 Satin Lacquer	LQX 132-0 Satin Lacquer	NAF 1426 Satin Lacquer
	3 rd Coat	NAF 1422 Satin Lacquer	LQX 132-0 Satin Lacquer	NAF 1426 Satin Lacquer

SUBSTRATE	NO. OF COATS	VISTA PAINT	DUNN-EDWARDS	BENJAMIN MOORE
Finished Wood Surfaces: Clear Varnish Finish FLAT				
	1 st Coat	Zenith PKF7501 Flat	Zenith PKF7501 Flat	Zenith PKF7501 Flat
	2 nd Coat	Zenith PKF7501 Flat	Zenith PKF7501 Flat	Zenith PKF7501 Flat
	3 rd Coat	Zenith PKF7501 Flat	Zenith PKF7501 Flat	Zenith PKF7501 Flat
Finished Wood Surfaces: Clear Varnish Finish SEMI-GLOSS				
	1 st Coat	Zenith PKF7501 Flat	Zenith PKF7502 Satin	Zenith PKF7502 Satin
	2 nd Coat	Zenith PKF7501 Flat	Zenith PKF7502 Satin	Zenith PKF7502 Satin
	3 rd Coat	Zenith PKF7501 Flat	Zenith PKF7502 Satin	Zenith PKF7502 Satin
Finished Wood Surfaces: Clear Varnish Finish GLOSS				
	1 st Coat	Zenith PKC7509 Gloss	Zenith PKC7509 Gloss	Zenith PKC7509 Gloss
	2 nd Coat	Zenith PKC7509 Gloss	Zenith PKC7509 Gloss	Zenith PKC7509 Gloss
	3 rd Coat	Zenith PKC7509 Gloss	Zenith PKC7509 Gloss	Zenith PKC7509 Gloss
Finished Wood Surfaces: 100% Acrylic LOW SHEEN				
	1 st Coat	4200 Terminator II	UGPR00 Ultra-Grip	0046 Hi-Hide All Purpose Primer
	2 nd Coat	1750 Acriglo Low Sheen	SPMA20 Suprema VS	549 Regal Select Eggshell
	3 rd Coat	1750 Acriglo Low Sheen	SPMA20 Suprema VS	549 Regal Select Eggshell
Finished Wood Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	4200 Terminator II	UGPR00 Ultra-Grip	0046 Hi-Hide All Purpose Primer
	2 nd Coat	7000 Acriglo Semi-Gloss	SPMA50 Suprema Semi Gloss	551 Regal Select Semi Gloss
	3 rd Coat	7000 Acriglo Semi-Gloss	SPMA50 Suprema Semi Gloss	551 Regal Select Semi Gloss
Finished Wood Surfaces: 100% Acrylic Dryfall FLAT				
	1 st Coat	DF 12 Dryfall Flat	W 6079 Aquafall Flat	M53 Dryfall Flat
	2 nd Coat	DF 12 Dryfall Flat	W 6079 Aquafall Flat	M53 Dryfall Flat
Particle Board, MDF, and Hardboard Surfaces: 100% Acrylic FLAT				
	1 st Coat	4000 Uniprime II	UGPR00 Ultra-Grip	N023 Fresh Start Primer
	2 nd Coat	7100 Acriglo Flat	SPMA10 Suprema Flat	547 Regal Select Flat
	3 rd Coat	7100 Acriglo Flat	SPMA10 Suprema Flat	547 Regal Select Flat

SUBSTRATE	NO. OF COATS	VISTA PAINT	DUNN-EDWARDS	BENJAMIN MOORE
Particle Board, MDF, and Hardboard Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	4000 Uniprime II	UGPR00 Ultra-Grip	N023 Fresh Start Primer
	2 nd Coat	7000 Acriglo Semi-Gloss	SPMA50 Suprema Semi Gloss	551 Regal Select Semi Gloss
	3 rd Coat	7000 Acriglo Semi-Gloss	SPMA50 Suprema Semi Gloss	551 Regal Select Semi Gloss
Particle Board, MDF, and Hardboard Surfaces: 100% Acrylic GLOSS				
	1 st Coat	4000 Uniprime II	UGPR00 Ultra-Grip	N023 Fresh Start Primer
	2 nd Coat	8500 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss
	3 rd Coat	8500 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss
Portland Cement Plaster Surfaces: 100% Acrylic FLAT				
	1 st Coat	4600 Uniprime II	ESPR00 Eff-Stop Premium	N023 Fresh Start Primer
	2 nd Coat	7100 Acriglo Flat	SPMA10 Suprema Flat	547 Regal Select Flat
	3 rd Coat	7100 Acriglo Flat	SPMA10 Suprema Flat	547 Regal Select Flat
Portland Cement Plaster Surfaces: 100% Acrylic EGGSHELL				
	1 st Coat	4600 Uniprime II	ESPR00 Eff-Stop Premium	N023 Fresh Start Primer
	2 nd Coat	7500 Acriglo Eggshell	SPMA30 Suprema LS	550 Regal Select Pearl
	3 rd Coat	7500 Acriglo Eggshell	SPMA30 Suprema LS	550 Regal Select Pearl

SUBSTRATE	NO. OF COATS	VISTA PAINT	DUNN-EDWARDS	BENJAMIN MOORE
Portland Cement Plaster Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	4600 Uniprime II	ESPR00 Eff-Stop Premium	N023 Fresh Start Primer
	2 nd Coat	7000 Acriglo Semi-Gloss	SPMA50 Suprema Semi Gloss	551 Regal Select Semi Gloss
	3 rd Coat	7000 Acriglo Semi-Gloss	SPMA50 Suprema Semi Gloss	551 Regal Select Semi Gloss
Portland Cement Plaster Surfaces: 100% Acrylic GLOSS				
	1 st Coat	4600 Uniprime II	ESPR00 Eff-Stop Premium	N023 Fresh Start Primer
	2 nd Coat	8500 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss
	3 rd Coat	8500 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss
Portland Cement Plaster Surfaces: 100% Epoxy GLOSS				
	1 st Coat	4600 Uniprime II	Rust-Oleum S70/S71 WB	N023 Fresh Start Primer
	2 nd Coat	Rust-Oleum Sierra S60 Gloss WB Epoxy	Rust-Oleum Sierra S60 Gloss WB Epoxy	P43 Super Spec HP Gloss Epoxy
Gypsum Board Surfaces: 100% Acrylic FLAT				
	1 st Coat	N/A	VNPR00 Vinylastic Premium	NA
	2 nd Coat	7100 Acriglo Flat	SPMA10 Suprema Flat	547 Regal Select Flat
	3 rd Coat	7100 Acriglo Flat	SPMA10 Suprema Flat	547 Regal Select Flat
Gypsum Board Surfaces: 100% Acrylic LOW SHEEN				
	1 st Coat	5001 Vpro Primer	VNPR00 Vinylastic Premium	N023 Fresh Start Primer
	2 nd Coat	5200 Vpro Low Sheen	SPMA20 Suprema VS	549 Regal Select Eggshell
	3 rd Coat	5200 Vpro Low Sheen	SPMA20 Suprema VS	549 Regal Select Eggshell
Gypsum Board Surfaces: 100% Acrylic EGGSHELL				
	1 st Coat	5001 Vpro Primer	VNPR00 Vinylastic Premium	N023 Fresh Start Primer
	2 nd Coat	5300 Vpro Eggshell	SPMA30 Suprema LS	550 Regal Select Pearl
	3 rd Coat	5300 Vpro Eggshell	SPMA30 Suprema LS	550 Regal Select Pearl

SUBSTRATE	NO. OF COATS	VISTA PAINT	DUNN-EDWARDS	BENJAMIN MOORE
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Gypsum Board Surfaces: 100% Acrylic SEMI-GLOSS

1 st Coat	5001 Vpro Primer	VNPR00 Vinylastic Premium	N023 Fresh Start Primer
2 nd Coat	5400 Vpro Semi-Gloss	SPMA50 Suprema Semi Gloss	551 Regal Select Semi Gloss
3 rd Coat	5400 Vpro Semi-Gloss	SPMA50 Suprema Semi Gloss	551 Regal Select Semi Gloss

Gypsum Board Surfaces: 100% Acrylic GLOSS

1 st Coat	5001 Vpro Primer	VNPR00 Vinylastic Premium	N023 Fresh Start Primer
2 nd Coat	8500 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss
3 rd Coat	8501 Carefree Gloss	EVSH 60 Evershield Gloss	794 Advance High Gloss

Gypsum Board Surfaces: 100% Epoxy GLOSS

1 st Coat	5001 Vpro Primer	Rust-Oleum Sierra S70/S71 WB Epoxy Acrylic Primer	N/A
2 nd Coat	Rust-Oleum Sierra S60 Gloss WB Epoxy	Rust-Oleum Sierra S60 Gloss WB Epoxy	N/A

Acoustical Tile Surfaces: 100% Acrylic FLAT

1 st Coat	013 Acoustic Kote	W 615 Acoustikote	258 Moore's Ceiling White
2 nd Coat	013 Acoustic Kote	W 615 Acoustikote	258 Moore's Ceiling White

INTERIOR SURFACES - ZERO VOC

Concrete Surfaces: Acrylic FLAT

1 st Coat	5001 Vpro Primer	VNSL00 Vinylastic Select Primer	511 Natura Primer
2 nd Coat	5100 Vpro Flat	EVER 10 Everest Flat	512 Natura Flat
3 rd Coat	5100 Vpro Flat	EVER 10 Everest Flat	512 Natura Flat

Concrete Surfaces: 100% Acrylic EGGSHELL

1 st Coat	5001 Vpro Primer	VNSL00 Vinylastic Select Primer	511 Natura Primer
2 nd Coat	5300 Vpro Eggshell	EVER 30 Everest Eggshell	513 Natura Eggshell
3 rd Coat	5300 Vpro Eggshell	EVER 30 Everest Eggshell	513 Natura Eggshell

SUBSTRATE	NO. OF COATS	VISTA PAINT	DUNN-EDWARDS	BENJAMIN MOORE
Concrete Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	5001 Vpro Primer	VNSL00 Vinylastic Select Primer	511 Natura Primer
	2 nd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
	3 rd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
CMU Surfaces: Acrylic FLAT				
	1 st Coat	040 Block Kote	SBPR00 Blockfill	160 Latex Block Filler
	2 nd Coat	5100 Vpro Flat	EVER 10 Everest Flat	512 Natura Flat
	3 rd Coat	5100 Vpro Flat	EVER 10 Everest Flat	512 Natura Flat
CMU Surfaces: 100% Acrylic EGGSHELL				
	1 st Coat	040 Block Kote	SBPR00 Blockfill	160 Latex Block Filler
	2 nd Coat	5300 Vpro Eggshell	EVER 30 Everest Eggshell	513 Natura Eggshell
	3 rd Coat	5300 Vpro Eggshell	EVER 30 Everest Eggshell	513 Natura Eggshell
CMU Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	040 Block Kote	SBPR00 Blockfill	160 Latex Block Filler
	2 nd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
	3 rd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
Iron & Steel Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	9600 Protec	UGPR00 Ultra-Grip	P04 Acrylic Metal Primer
	2 nd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
	3 rd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss

SUBSTRATE	NO. OF COATS	VISTA PAINT	DUNN-EDWARDS	BENJAMIN MOORE
Aluminum Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	4800 Metal Pro Primer	UGPR00 Ultra-Grip	P04 Acrylic Metal Primer
	2 nd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
	3 rd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
Stainless Steel, Copper, and Brass Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	4800 Metal Pro Primer	UGPR00 Ultra-Grip	P04 Acrylic Metal Primer
	2 nd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
	3 rd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
Finished Wood Surfaces: 100% Acrylic EGGSHELL				
	1 st Coat	5001 Vpro Primer	UGPR00 Ultra-Grip	511 Natura Primer
	2 nd Coat	5300 Vpro Eggshell	EVER 30 Everest Eggshell	513 Natura Eggshell
	3 rd Coat	5300 Vpro Eggshell	EVER 30 Everest Eggshell	513 Natura Eggshell
Finished Wood Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	5001 Vpro Primer	UGPR00 Ultra-Grip	511 Natura Primer
	2 nd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
	3 rd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
Particle Board, MDF, and Hardboard Surfaces: Acrylic FLAT				
	1 st Coat	5001 Vpro Primer	UGPR00 Ultra-Grip	511 Natura Primer
	2 nd Coat	5100 Vpro Flat	EVER 10 Everest Flat	512 Natura Flat
	3 rd Coat	5100 Vpro Flat	EVER 10 Everest Flat	512 Natura Flat

SUBSTRATE	NO. OF COATS	VISTA PAINT	DUNN-EDWARDS	BENJAMIN MOORE
Particle Board, MDF, and Hardboard Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	5001 Vpro Primer	UGPR00 Ultra-Grip	511 Natura Primer
	2 nd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
	3 rd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
Portland Cement Plaster Surfaces: Acrylic FLAT				
	1 st Coat	5001 Vpro Primer	VNSL00 Vinylastic Select Primer	511 Natura Primer
	2 nd Coat	5100 Vpro Flat	EVER 10 Everest Flat	512 Natura Flat
	3 rd Coat	5100 Vpro Flat	EVER 10 Everest Flat	512 Natura Flat
Portland Cement Plaster Surfaces: 100% Acrylic EGGSHELL				
	1 st Coat	5001 Vpro Primer	VNSL00 Vinylastic Select Primer	511 Natura Primer
	2 nd Coat	5300 Vpro Eggshell	EVER 30 Everest Eggshell	513 Natura Eggshell
	3 rd Coat	5300 Vpro Eggshell	EVER 30 Everest Eggshell	513 Natura Eggshell
Portland Cement Plaster Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	5001 Vpro Primer	VNSL00 Vinylastic Select Primer	511 Natura Primer
	2 nd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
	3 rd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss

SUBSTRATE	NO. OF COATS	VISTA PAINT	DUNN-EDWARDS	BENJAMIN MOORE
Gypsum Board Surfaces: Acrylic FLAT				
	1 st Coat	Not Required	VNSL00 Vinylastic Select Primer	511 Natura Primer
	2 nd Coat	5100 Vpro Flat	EVER 10 Everest Flat	512 Natura Flat
	3 rd Coat	5100 Vpro Flat	EVER 10 Everest Flat	512 Natura Flat
Gypsum Board Surfaces: 100% Acrylic EGGSHELL				
	1 st Coat	5001 Vpro Primer	VNSL00 Vinylastic Select Primer	511 Natura Primer
	2 nd Coat	5300 Vpro Eggshell	EVER 30 Everest Eggshell	513 Natura Eggshell
	3 rd Coat	5300 Vpro Eggshell	EVER 30 Everest Eggshell	513 Natura Eggshell
Gypsum Board Surfaces: 100% Acrylic SEMI-GLOSS				
	1 st Coat	5001 Vpro Primer	VNSL00 Vinylastic Select Primer	511 Natura Primer
	2 nd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
	3 rd Coat	5400 Vpro Semi-Gloss	EVER 50 Everest Semi Gloss	514 Natura Semi Gloss
Acoustical Tile Surfaces: Acrylic FLAT				
	1 st Coat	5100 Vpro Flat	EVER 10 Everest Flat	512 Natura Flat
	2 nd Coat	5100 Vpro Flat	EVER 10 Everest Flat	512 Natura Flat

SECTION 09 97 23 – PENETRATING CONCRETE FLOOR SEALER

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Penetrating concrete floor sealer.
2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

A. Definitions:

1. Manufacturer: Means the concrete sealer manufacturer, unless otherwise indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Verify chemical and adhesive compatibility of selected concrete sealer with installed curing compounds and installed moisture vapor emission control systems, based on current product formulations.
2. Coordinate selected sealer for compatibility with chemicals used near or on coated surfaces, including cleaning materials, accessories, and methods.
3. Proposed substitution requests and submittals that change the quality (grade) or generic chemistry of specified concrete sealers are prohibited and returned to the Contractor without review or responsive action, except to record non-conformance with this requirement.
4. Specified coverage rates and thicknesses are minimum. If manufacturer's recommended coverage rates differ from specified rates, then
 - a. consult the manufacturer's representative and obtain manufacturer-recommended coverage rates printed on manufacturer's letterhead;
 - b. assume the manufacturer-recommended coverage rates govern; and
 - c. promptly submit an RFI to the Architect for resolution; include manufacturer-recommended coverage rates with the RFI.

B. Sequencing:

1. Install concrete sealers only after concrete is cured to a condition of equilibrium; is sufficiently dry to bond with concrete sealers; and has alkalinity (pH), MVER, and RH within ranges required, recommended, or accepted by the manufacturer.
2. Either delay concrete sealer installation until after joint sealant installation is complete, or protect sealant bond surfaces to prevent concrete sealer migration onto

joint surfaces. concrete sealer application may only precede sealant application after sealant adhesion and compatibility are tested and verified using substrates, concrete sealers, and sealant materials identical to those used in the work.

- C. Scheduling: Allow enough time in the construction schedule for concrete to cure for at least 28 days before beginning surface preparation and installation.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
 - 1. Product Data: Submit manufacturer's product data, specifications, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs), and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
 - 1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished concrete sealers.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.
 - 2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.
- C. Maintenance Material Submittals:
 - 1. Before Final Completion, deliver to the Owner extra stock materials to replace those worn or damaged as a result of normal occupancy.
 - 2. Furnish one unopened gallon or container for each concrete sealer type, color, composition, grade, finish, and variety.
 - 3. Submit manufacturer-recommended cleaning materials, accessories, and manufacturer's instructions and other requirements and recommendations for maintenance and cleaning of sealed surfaces, including a comprehensive list of known chemicals that should not come into contact with sealed surfaces.

1.5 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Installer: Company or individuals must have at least 5 years' experience installing concrete sealers for at least 30 previous projects similar to this project in size, material, design, and complexity.

2. Supervisors: Individuals must have at least 7 years' experience installing concrete sealers for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading concrete sealer installers.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
 3. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
 1. Furnish adequate dunnage and bracing during storage.
 2. Prevent stored items from contacting the floor and from deterioration and damage.
 3. Do not leave items uncovered where they might be exposed to weather or become wet; or exposed to heat or sudden changes in temperature or relative humidity; or other sources of deterioration and damage, including dust and other airborne contaminants.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage.
 1. Avoid damage to packaging and containers, and contamination of contents.
 2. Rotate inventory; do not use items the shelf life of which is expired.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective concrete sealers with undamaged new concrete sealers that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 PROJECT CONDITIONS

- A. Ambient Conditions: Install concrete sealers only when ambient temperature, RH, and other environmental conditions fall within ranges required, recommended, or accepted by the manufacturer.
 1. Do not install concrete sealers during rain or snow, fog or mist; or when rain or snow is predicted within 24 hours of installation.
 2. Proceed only when there is no threat of impending precipitation, and both current and forecasted weather conditions conform to those required, recommended, or accepted by the manufacturer.

3. Do not apply concrete sealers when
 - a. ambient temperature is below 45 deg. F or more than 90 deg. F during application, and for at least 8 hours after;
 - b. surface temperatures are less than 40 deg. F or greater than 120 deg. F; and
 - c. surface temperatures are 5 deg. F or less above the dew point.
- B. Existing Conditions:
 1. Surface Conditions: Surfaces receiving concrete sealers must be dry. Install concrete sealers only when substrate moisture content and surface temperature fall within ranges required, recommended, or accepted by the manufacturer.
 2. Other Conditions: Do not apply concrete sealers where dust is generated, or liquids are sprayed; or when windy conditions exist that may cause concrete sealers to be blown onto vegetation or other unintended surfaces.

PART 2 - PRODUCTS

2.1 PENETRATING CONCRETE FLOOR SEALER

- A. Description: Clear-drying, water-based silane or siloxane water repellent sealer for interior exposed concrete slabs.
- B. Product: "Sure Klean Weather Seal Siloxane WB Concentrate" manufactured by PROSOCO, Inc., or equal.
 1. Porous Surfaces (e.g., Concrete Brick, Concrete Pavers, and Concrete Tile): Dilute to 1 part concentrate to not more than 7 parts water.
 2. Semi-Porous Surfaces (e.g., Cast-in-Place Concrete, Precast Concrete, Clay Brick, Terra Cotta, and Unpolished Sandstone): Dilute to 1 part concentrate to not more than 9 parts water.
 3. Dense Surfaces: Dilute to 1 part concentrate to not more than 14 parts water.
- C. Requisite Properties: When compared visually to an untreated sample under the same lighting conditions, concrete sealers may not alter the color or sheen of the coated substrate and must be invisible after application and over the life of the substrate. Confirm visual appearance by mockups and adjust products and applications as required.

2.2 ACCESSORIES

- A. Mix Water: Provide fresh, clean, clear, potable water from a domestic source. Water must conform to ASTM C 1602 and be free of oil, grease, waxy films, curing compounds, release agents, and other deleterious materials, including salts, acids, alkalis, organic materials, detergents, and other matter that might negatively affect tile quality, durability, or performance.

- B. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.3 MIXING

- A. Open concrete sealer containers only as required for use and mix only in designated areas.
- B. Thoroughly agitate and stir materials to a uniform and smooth consistency suitable for proper installation.
- C. Do not reduce, alter, or introduce foreign materials into concrete sealers, except in conformance with manufacturer's instructions and other requirements and recommendations.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification:
 - 1. Verify in-place construction, project conditions, and the work of other specification sections conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Verify substrates are dry and free of curing compounds, sealers, hardeners, and deleterious and other substances that might interfere with concrete sealer adhesion, appearance, or performance.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 PREPARATION

- A. Protection:
 - 1. Work Area Protection: Protect work areas from dust and other airborne contaminants during surface preparation and concrete sealer installation.

2. Adjacent Material Protection: Protect adjacent surfaces against soiling and damage. Utilize drop cloths, shields, masking, barricades, and other items necessary to protect adjacent surfaces.
 3. Opening Protection: Close and protect drains and other openings and penetrations to prevent concrete sealer intrusion or migration of liquids.
- B. Substrate Preparation: Prepare substrates as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.

3.3 INSTALLATION

A. General Requirements:

1. Install concrete sealers using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
2. Only install concrete sealers under conditions that ensure finishes are free from blemishes and defects.
3. Provide smooth surfaces of uniform finish, color, appearance, and coverage. concrete sealer surfaces with cloudiness, spotting, holidays, runs, or other imperfections are prohibited and are rejected as non-conforming work.
4. Do not exceed the application rates recommended by the manufacturer.
5. Installed concrete sealers must be warrantable. Do not install, correct, or replace concrete sealers in a manner that results in any warranty or guarantee becoming void.

3.4 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 CLEANING

- A. Cleaning Work: Clean spills, stains, soiling, overspray, and fallout from adjacent surfaces.
 - 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 - 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 - 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 - 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.6 PROTECTION

- A. Protect sealed concrete in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything on, adjacent to, or against sealed concrete unless it is protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed sealed concrete surfaces as work surfaces.

END OF SECTION

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DIVISION 10

SPECIALTIES

SECTION 10 14 13 – REGULATORY SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Restroom doors signs.
 2. Egress stairway door signs.
 3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

- A. Definitions:
1. Manufacturer: Means the sign material manufacturer, unless otherwise indicated.
 2. Fabricator: Means the sign fabricator, unless otherwise indicated.

1.3 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs), and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 2. Shop Drawings: Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project.
 3. Samples: Submit at least 8-inch square representative samples of each sign color, finish, and variety.
- B. Informational Submittals: Submit manufacturer's instructions for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
1. Submit manufacturer-prepared published instructions for proper installation of furnished signs.
 2. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.

3. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.

1.4 QUALITY ASSURANCE

A. Source Limitations:

1. Signs must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.

A. Regulatory Requirements:

1. Chemical Signs and Labels: Provide Proposition 65 signage in conformance with California Code of Regulations (CCR), Title 27.
2. Raised Characters: Raised characters must conform to the requirements of California Building Code Section 11B-703.2:
3. Depth: It must be 1/32-inch (0.8 mm) minimum above their background and must be sans serif uppercase and be duplicated in Braille.
4. Height: It must be 5/8-inch (15.9 mm) minimum and 2 inches (51 mm) maximum based on the height of the uppercase letter "I". California Building Code Section 11B-703.2.5
5. Finish and Contrast: Characters and their background must have a non-glare finish. Character must contrast with their background with either light characters on a dark background or dark characters on a light background. California Building Code Section 11B-703.5.1
6. Proportions: It must be selected from fonts where the width of the uppercase letter "O" is 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I". Stroke thickness of the uppercase letter "I" must be 15 percent maximum of the height of the character. California Building Code Sections 11B-703.2.4 and 11B-703.2.6
7. Character Spacing: Spacing between individual raised characters must conform to the requirements of California Building Code Section 11B-703.2.7 and 11B-703.2.8
8. Format: Text must be in a horizontal format. California Building Code Section 11B-703.2.9
9. Braille: It must be contracted (Grade 2) and must conform to the requirements of California Building Code Sections 11B-703.3 and 11B-703.4. Braille dots must have a domed or rounded shape and must conform to the requirements of California Building Code Table and Figure 11B-703.3.1.
10. Mounting Height: Tactile characters on signs must be located 48 inches minimum to the baseline of the lowest Braille cells and 60 inches maximum to the baseline of the

highest line of raised characters above the finish floor or ground surface. California Building Code Section and Figure 11B-703.4.1

11. Mounting Location: A tactile sign must be located per California Building Code Section and Figure 11B -703.4.2 as follows:
 - a. alongside a single door at the latch side.
 - b. on the inactive leaf at double doors with one active leaf.
 - c. to the right of the right hand door at double doors with two active leaves.
 - d. on the nearest adjacent wall where there is no wall space at the latch side of a single door or at the right side of double doors with two active leaves.
 - e. so that a clear floor space of 18 inches by 18 inches minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position.
12. Visual characters must conform to the requirements of California Building Code Section 11B-703.5 and must be 40 inches minimum above finish floor or ground.
13. Pictograms must conform to the requirements of California Building Code Section 11B-703.6.
14. Symbols of accessibility must conform to the requirements of California Building Code Section 11B-703.7.
15. Variable message signs must conform to the requirements of California Building Code Section 11B-703.8.

1.5 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
 3. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage. Avoid damage to packaging and containers, and contamination of contents.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective signs with undamaged new signs that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 PHOTOPOLYMER PANEL SIGNS

- A. Description: Single-piece photopolymer panel permanent identification signs consisting of moisture resistant non-glare photopolymer bonded to sign base material.
- B. Manufacturer: Provide photopolymer products manufactured by Nova Polymers, Inc., or equal.
- C. Fabricators: Provide signs fabricated by one of the following, or equal.
 - 1. Neiman & Co.
 - 2. Signtech Inc.
- D. Materials:
 - 1. Photopolymer Layer: 0.040-inch acrylic photopolymer.
 - 2. Base Material:
 - a. Interior Locations: 0.120-inch phenolic base.
 - b. Exterior Locations: Exterior grade photopolymer applied to a 0.120-inch phenolic base.
- E. Requisite Properties:
 - 1. Overall Panel Thickness: Between 1/8- and 1/4-inch.
 - 2. Colors: Indicated on the Drawings.
 - 3. Finish: Furnish non-glare finish.
 - 4. Edge Condition: Square cut.
 - 5. Corner Condition: Square.
 - 6. Mounting: Indicated on the Drawings.
 - 7. Copy: Indicated on the Drawings.
 - a. Letter spacing must conform to standards shown and kerned optically to the acceptance of the Architect.
 - b. Lines of copy must be straight and parallel to the sign format, unless otherwise indicated.
 - c. Edges of letters, numbers, and symbols must be smooth and continuous, with straight and curved portions reproducing the original forms exactly, with corners sharp and true.
 - d. All forms must be free from ticks, line waiver, discontinuous curves, and other imperfections.
 - 8. Font: Indicated on the Drawings.

2.2 INSTALLATION MATERIALS

- A. Fasteners: Non-removable mechanical fasteners and anchors suitable for secure attachment to substrate and placed through predrilled holes as recommended in writing by the sign manufacturer.
 - 1. Exposed Fasteners: Exposed fasteners are permitted only where specifically stated in the drawings and must be stainless steel painted or finished to match adjacent surfaces, unless otherwise indicated.
 - 2. Concealed Fasteners: Fabricate from metals that are not corrosive to the sign material and mounting surface.
- B. Tape: "VHB Tape" manufactured by 3M, or equal.
- C. Adhesive: "732 Multi-Purpose Sealant Clear" manufactured by Dow Corning Corp., or equal.

2.3 ACCESSORIES

- A. Plastic Cement: "WELD-ON 4" manufactured by IPC Corp., or equal.
- B. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

A. General Requirements:

1. Install signs using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
3. Installed signs must be warrantable. Do not install, correct, or replace signs in a manner that results in any warranty or guarantee becoming void.

B. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach signs to supporting construction.

C. Installation Tolerances: Install signs to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch from plumb, level, and alignment.

3.3 CORRECTION AND REPAIR

A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.

B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include

1. written descriptions of non-conforming, damaged, and defective work;
2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.

C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

A. Cleaning Work: Clean all visible sign surfaces in a manner that does not result in any warranty or guarantee becoming void.

1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.

2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.

- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.5 PROTECTION

- A. Protect installed signs in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything on or adjacent to or against installed signs unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed signs as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 10 28 13 – COMMERCIAL TOILET ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Commercial toilet accessories.
 2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

- A. Definitions:
1. Manufacturer: Means the toilet accessory manufacturer, unless otherwise indicated.

1.3 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs), and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 2. Shop Drawings: Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project.
- B. Informational Submittals: Submit manufacturer's instructions for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
1. Submit manufacturer-prepared published instructions for proper installation of furnished toilet accessories.
 2. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 3. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.

1.4 QUALITY ASSURANCE

A. Source Limitations:

1. Toilet accessories must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.

B. Regulatory Requirements:

1. Elements of sanitary facilities must be mounted at locations in conformance with California Building Code Sections 11B-602 through 11B-612.
2. Grab bars in toilet facilities and bathing facilities must conform to the requirements of California Building Code Section 11B-609. Grab bars and any wall or other surfaces adjacent to grab bars must be free of sharp or abrasive elements and must have rounded edges. The space around the grab bars must be as follows:
 - a. 1-1/2-inch between the grab bar and the wall.
 - b. 1-1/2-inch minimum between the grab bar and projecting objects below and at the ends.
 - c. 12 inches minimum between the grab bar and projecting objects above.

1.5 HANDLING

A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.

1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
3. Unload and store only inspected and accepted items.

B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.

C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage. Avoid damage to packaging and containers, and contamination of contents.

D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective toilet accessories with undamaged new toilet accessories that do not exhibit deterioration, damage, or defects.

- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
 - 1. Bobrick Washroom Equipment, Inc.
 - 2. Bradley Corp.

2.2 COMMERCIAL TOILET ACCESSORIES

- A. Products: Indicated on the Drawings, or equal.
- B. Materials:
 - 1. Stainless-Steel Sheet: ASTM A 666 (annealed and tempered) Type 304 tension leveled to a flatness of 5 I-units or less.
 - 2. Mirrored Glass: ASTM C 1503, Q-1 Mirror Select Quality.

2.3 ACCESSORIES

- A. Pipe Guards:
 - 1. Description: Insulating antimicrobial, molded plastic, white pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping; allow service access without removing coverings.
 - 2. Manufacturers: Provide products manufactured by one of the following, or equal.
 - a. Plumberex Specialty Products, Inc.
 - b. IPS Corp.
- B. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
- C. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 - 1. Install toilet accessories using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 - 2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
 - 3. Installed toilet accessories must be warrantable. Do not install, correct, or replace toilet accessories in a manner that results in any warranty or guarantee becoming void.
- B. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach toilet accessories to supporting construction.
- C. Installation Tolerances: Install toilet accessories to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch from plumb, level, and alignment.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.

- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Cleaning Work: Clean all visible toilet accessory surfaces in a manner that does not result in any warranty or guarantee becoming void.
 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.5 PROTECTION

- A. Protect installed toilet accessories in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything on or adjacent to or against installed toilet accessories unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed toilet accessories as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 10 28 14 – COMMERCIAL SHOWER ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Shower curtains.
 2. Shower curtain rods.
 3. Shower curtain hooks.
 4. Shower seats.
 5. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

- A. Definitions:
1. Manufacturer: Means the shower accessory manufacturer, unless otherwise indicated.

1.3 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs), and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 2. Shop Drawings: Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project.
- B. Informational Submittals: Submit manufacturer's instructions for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
1. Submit manufacturer-prepared published instructions for proper installation of furnished shower accessories.
 2. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.

3. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.

1.4 QUALITY ASSURANCE

A. Source Limitations:

1. Shower accessories must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.

1.5 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
 3. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage. Avoid damage to packaging and containers, and contamination of contents.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective shower accessories with undamaged new shower accessories that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.

1. Bobrick Washroom Equipment, Inc.
2. Bradley Corp.

2.2 SHOWER CURTAINS

- A. Product: "Model B-204" manufactured by Bobrick Washroom Equipment, Inc., or equal.
- B. Requisite Properties:
 1. Overall Curtain Width: Equal to the curtain rod length plus either 10 percent or at least 12 inches, whichever is greater, for added fullness.
 2. Overall Curtain Length: 72 inches.
 3. Material: Matte white vinyl with antibacterial and flame-retardant agents.
 4. Minimum Fabric Thickness: At least 0.008-inch thick.
 5. Hems: Bottom and sides must be hemmed.
 6. Grommets: Nickel-plated brass grommets spaced every 6 inches on center along the top of curtain.

2.3 SHOWER CURTAIN RODS

- A. Product: "Model B-6047" manufactured by Bobrick Washroom Equipment, Inc., or equal.
- B. Requisite Properties:
 1. Curtain Rod: 18-8 S, Type 304, stainless steel with satin finish.
 2. Flanges: Same material and finish as curtain rod; drawn, one-piece seamless construction (heavy- and extra-heavy-duty rods).
 3. Curtain Rod and Flange Thickness: At least 0.050-inch BMT (USSG 18).
 4. Curtain Rod Outside Diameter: 1-1/4 inches.
 5. Mounting: Concealed aluminum brackets.
 6. Backing:

2.4 SHOWER CURTAIN HOOKS

- A. Product: "Part No. 204-1" shower curtain hooks manufactured by Bobrick Washroom Equipment, Inc., or equal.
- B. Material: 0.09-inch diameter stainless steel Type 304.

2.5 STANDARD SHOWER SEATS

- A. Reversible Folding Shower Seat:
 1. Product: "Model B-5181" manufactured by Bobrick Washroom Equipment, Inc., or equal.
 2. Requisite Properties:

- a. Seat: One-piece, 1/2-inch thick solid phenolic core seat with matte-finish melamine surfaces and black phenolic resin core.
- b. Support: Stainless steel with self-locking mechanism.

2.6 ACCESSORIES

- A. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
- B. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 1. Install shower accessories using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction

3. Installed shower accessories must be warrantable. Do not install, correct, or replace shower accessories in a manner that results in any warranty or guarantee becoming void.
- B. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach shower accessories to supporting construction.
- C. Installation Tolerances: Install shower accessories to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch from plumb, level, and alignment.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.5 PROTECTION

- A. Protect installed shower accessories in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything on or adjacent to or against installed shower accessories unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed shower accessories as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
FIRE CAMP 13 RECONSTRUCTION
PROJECT ID: 00002191

HUITT-ZOLLARS, INC.
PROJECT NO. R311608.14
CONSTRUCTION DOCUMENT 01/04/2023

END OF SECTION

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SECTION 10 44 00 – FIRE PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire extinguishers.
2. Fire extinguisher cabinets.
3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

A. Definitions:

1. Manufacturer: Means the fire protection specialty manufacturer, unless otherwise indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate size of fire extinguisher cabinets to ensure specified fire extinguishers and capacities are accommodated.
2. Coordinate sizes and locations of fire extinguisher cabinets with wall depths.
3. Final location of fire extinguisher cabinets is subject to fire marshal approval.
 - a. Verify cabinet locations with both the fire marshal and the Architect during the framing stage of the project.
 - b. Positioning of cabinets at locations other than where indicated are at no additional cost to the Owner.
4. Where extinguishers are not indicated, assume cabinets and extinguishers are located within 75 feet of any point in the building, or at a rate of one for each 3,000 square feet of building area, or portion thereof, whichever yields the greater number of fire extinguishers.

1.4 SUBMITTALS

A. Action Submittals: Submit the following for responsive action (formal review and approval).

1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs), and safety data sheets

(SDSs), both of which are returned to the Contractor without review or responsive action.

2. Shop Drawings:
 - a. Submit dimensioned plans and elevations drawn to scale and showing fire extinguisher cabinet locations, sizes, and extents of all items, accessories, and trim. Label manufactured items by product name.
 - b. Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project. Cross-reference details to plans and elevations.
- B. Informational Submittals: Submit manufacturer's instructions for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
 1. Submit manufacturer-prepared published instructions for proper installation of furnished fire protection specialties.
 2. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 3. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.

1.5 QUALITY ASSURANCE

- A. Source Limitations:
 1. Fire protection specialties must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
 2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.
- B. Regulatory Requirements:
 1. Mounting Height: When installed within the cabinet, bracket-mounted extinguisher handles height must conform to the prescribed limits for an ADA-accessible front-approach reach.
 2. UL Listing:
 - a. Provide UL-listed fire extinguishers bearing the UL listing mark for type, fire classification, and rating specified.
 - b. Provide cabinets with the same fire rating as wall in which they are installed.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 - 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 - 2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
 - 3. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage. Avoid damage to packaging and containers, and contamination of contents.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective fire protection specialties with undamaged new fire protection specialties that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
 - 1. Activar Construction Products Group, Inc.
 - 2. Larsen's Manufacturing Co.
 - 3. Potter Roemer Fire Protection Equipment.

2.2 FIRE EXTINGUISHERS

- A. Description: UL-listed, heavy duty, enameled steel cylinder, multi-purpose dry chemical fire extinguishers conforming to NFPA 10 requirements for portable extinguishers, and bearing the UL listing mark for type, fire classification, and rating specified.
- B. Products: "JL Industries Cosmic 10E" manufactured by Activar Construction Products Group, Inc., or equal.
- C. Requisite Properties:
 - 1. Capacity: 10 pounds.
 - 2. UL Rating: 4-A:80-B:C.
 - 3. Cylinder Diameter: Not more than 5-1/4 inches.

4. Overall Height: Not more than 22 inches.

2.3 FIRE EXTINGUISHER CABINETS

- A. Description: Fire extinguisher cabinets conforming to ASTM E 814 when installed within fire-resistance rated wall assemblies. Cabinets must have the same fire-resistance rating as the wall in which they are installed.
- B. Stainless Steel Cabinets:
 1. Products: "JL Industries Cosmopolitan Series" manufactured by Activar Construction Products Group, Inc., or equal.
 - a. Flat Trim Recessed Cabinets: "Model No. 1035V17" (non-locking) or "Model No. 1035W17" (locking).
 - b. Square Trim Semi-Recessed Cabinets: "Model No. 1036V17" (non-locking) or "Model No. 8136W17" (locking).
 - c. Surface-Mounted Square Cabinets: "Model No. 1033V17" (non-locking) or "Model No. 1033W17" (locking).
 - d. Fire-Rated Cabinets: Provide model numbers with the "-FX2" suffix for fire rated tub option at fire-resistance rated construction.
 2. Requisite Properties:
 - a. Door Style: "Vertical Duo" with tempered safety glass.
 - b. Tub Size: 10-1/2 inches wide by 24 inches high by 6 inches deep.
 - c. Frame Size: 13-5/8 inches wide by 27-1/8 inches.
 - d. Non-Rated Cabinet Rough Opening Size: 11-1/2 inches wide by 25 inches high by 6-1/8 inches deep.
 - e. Fire-Rated Cabinet Rough Opening Size: 12-13/16 inches wide by 26-5/16 inches high by 6-11/16 inches deep.
 - f. Finish: Stainless steel No. 6 (satin) finish.
 - g. Door Hardware: Standard pull handle with "Saf-T-Lok", or equal where indicated as locked.
- C. Accessories:
 1. Mounting Brackets:
 - a. Provide manufacturer's standard brackets sized as required for specified extinguishers; manufacturer's standard finish.
 - b. Provide brackets for all extinguishers, including those mounted in cabinets. Provide manufacturer's standard J-hook wall brackets for extinguishers installed within fire extinguisher cabinets.
 2. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 - 1. Install fire protection specialties using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 - 2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
 - 3. Installed fire protection specialties must be warrantable. Do not install, correct, or replace fire protection specialties in a manner that results in any warranty or guarantee becoming void.
- B. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach fire protection specialties to supporting construction.
- C. Installation Tolerances: Install fire protection specialties to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch from plumb, level, and alignment.

3.3 ADJUSTING

- A. Verify smooth and quiet fire extinguisher cabinet door and hardware operation.

- B. Lubricate and adjust operating parts and hardware to function properly, free from warp, twist, binding, and distortion. Confirm latches and locks engage securely without forcing or binding.
- C. Replace items that do not operate freely in a safe and reliable manner.

3.4 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 CLEANING

- A. Cleaning Work: Clean all visible fire extinguisher cabinetsurfaces in a manner that does not result in any warranty or guarantee becoming void.
 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.
- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.6 PROTECTION

- A. Protect installed fire protection specialties in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything on or adjacent to or against installed fire protection specialties unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed fire protection specialties as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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DIVISION 11

EQUIPMENT

SECTION 11 31 00 – RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Residential kitchen appliances.
 2. Residential laundry appliances.
 3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

- A. Definitions:
1. Manufacturer: Means the appliance manufacturer, unless otherwise indicated.

1.3 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs), and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 2. Submit sample warranties with warranty periods, terms, conditions, exclusions, and remedies explicitly defined for each warranty, including clear warranty period start dates. (e.g., date of manufacture, purchase, installation, Beneficial Occupancy, Substantial Completion, Final Completion, etc.)
- B. Informational Submittals: Submit manufacturer's instructions for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
1. Submit manufacturer-prepared published instructions for proper installation of furnished appliances.
 2. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 3. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.

- C. Closeout Submittals: Submit the following to the Architect as a condition of project closeout.
 - 1. Warranty Documentation: Submit final warranties signed by the manufacturer's representative with complete terms indicated for all warranties covering items furnished or installed under this specification section.

1.4 QUALITY ASSURANCE

- A. Source Limitations:
 - 1. Appliances must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
 - 2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.

1.5 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 - 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 - 2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
 - 3. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage. Avoid damage to packaging and containers, and contamination of contents.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective appliances with undamaged new appliances that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.6 WARRANTY

- A. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 5 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
 - 1. Frigidaire.
 - 2. GE Appliances.
 - 3. KitchenAid.

2.2 RESIDENTIAL KITCHEN APPLIANCES

- A. Refrigerator:
 - 1. Products: "GTS22KYNRFS" manufactured by GE Appliances, or equal.
 - 2. Requisite Properties:
 - a. Height: 66-3/8 inches.
 - b. Width: 32-3/4 inches.
 - c. Depth: 34-1/2 inches.
 - d. Capacity: 21.9 cubic feet.
 - e. Finish: Fingerprint Resistant stainless steel.
- B. Gas Range:
 - 1. Products: "JGBS66REKSS" manufactured by GE Appliance, or equal.
 - 2. Requisite Properties:
 - a. Height: 47-1/4 inches.
 - b. Top: 30 inches.
 - c. Width: 30 inches.
 - d. Depth: 29-3/4 inches.
 - e. Finish: Stainless steel.
- C. Range Hood:
 - 1. Products: "JVX3300SJSS" manufactured by GE Appliances, or equal.
 - 2. Requisite Properties:
 - a. Size: 29-7/8 inches wide.
 - b. Height: 5-1/2 inches
 - c. Overall Bottom Projection: 17-1/2 inches.
 - d. Finish: Stainless steel.

2.3 RESIDENTIAL LAUNDRY APPLIANCES

- A. Products: "GUD27GESNWW" manufactured by GE Appliances, or equal.
- B. Requisite Properties:
 - 1. Width: 26-3/4 inches.
 - 2. Depth: 30-7/8 inches.
 - 3. Height: 75-7/8 inches.
 - 4. Washer Capacity: 3.9 cubic feet.
 - 5. Dryer Capacity: 5.9 cubic feet.
 - 6. Color: White.

2.4 ACCESSORIES

- A. Vibration Isolators:
 - 1. Description: Neoprene cup mount vibration isolators.
 - 2. Application: Used for vibration isolation of washing machines, dryers, laundry centers, and dishwashers.
 - 3. Product: "Type BM-Green" manufactured by Mason Industries, Inc., or equal.
 - 4. Static Deflection: 0.20 inches.
- B. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
- C. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:

1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

A. General Requirements:

1. Install appliances using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
2. Set items true to line, to required levels and lines, and plumb, level, and square, and in alignment with adjacent construction
3. Installed appliances must be warrantable. Do not install, correct, or replace appliances in a manner that results in any warranty or guarantee becoming void.

B. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach appliances to supporting construction and to safely connect facility services. Washing machines, dryers, laundry centers, and dishwashers must be vibration isolated using specified vibration isolators.

C. Installation Tolerances: Install appliances to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch from plumb, level, and alignment.

3.3 CORRECTION AND REPAIR

A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.

B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include

1. written descriptions of non-conforming, damaged, and defective work;
2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.

C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Cleaning Work: Clean all visible appliance surfaces in a manner that does not result in any warranty or guarantee becoming void.
 - 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 - 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 - 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 - 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.

3.5 PROTECTION

- A. Protect installed appliances in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything on or adjacent to or against installed appliances unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed appliances as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 11 34 00 – CEILING FANS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Residential ceiling fans.
 2. Commercial ceiling fans.
 3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

- A. Definitions:
1. Manufacturer: Means the ceiling fan manufacturer, unless otherwise indicated.

1.3 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs), and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 2. Submit sample warranties with warranty periods, terms, conditions, exclusions, and remedies explicitly defined for each warranty, including clear warranty period start dates. (e.g., date of manufacture, purchase, installation, Beneficial Occupancy, Substantial Completion, Final Completion, etc.)
- B. Informational Submittals: Submit manufacturer's instructions for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
1. Submit manufacturer-prepared published instructions for proper installation of furnished ceiling fans.
 2. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 3. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.

- C. Closeout Submittals: Submit the following to the Architect as a condition of project closeout.
 - 1. Warranty Documentation: Submit final warranties signed by the manufacturer's representative with complete terms indicated for all warranties covering items furnished or installed under this specification section.

1.4 QUALITY ASSURANCE

- A. Source Limitations:
 - 1. Ceiling fans must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
 - 2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.

1.5 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
 - 1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 - 2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
 - 3. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage. Avoid damage to packaging and containers, and contamination of contents.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective ceiling fans with undamaged new ceiling fans that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.6 WARRANTY

- A. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 5 years.

PART 2 - PRODUCTS

2.1 COMMERCIAL CEILING FANS

- A. Product: Provide "Basic 6" manufactured by Delta T Corporation (Big Ass Solutions), or equal.
- B. Requisite Properties:
 - 1. Diameter: 14 feet.
 - 2. Depth 45 inches.
 - 3. Weight: 192 pounds.
 - 4. Maximum Speed: 110 RPM.
 - 5. Airfoils: Six patented aluminum airfoils (mill finish).
 - 6. Winglets: Powerfoil winglets eliminate wind noise (BAS Dark Gray).
 - 7. Motor and Gearbox: Industrial-grade motor and gearbox feature inline helical-cut gears for efficient, durable, and reliable operation; lubricated for life with synthetic oil.
 - 8. Hub System: Machine-cut precision components for uniform load distribution.
 - 9. Controller: Onboard NEMA 4X VFD eliminates RFI and EMI noise; wall-mounted keypad allows floor level control of all fan functions.
 - 10. Mounting Options: Standard upper mount.
 - 11. Safety Features: Airfoil retainers, hub retainer clips, safety cables, Grade 8 bolts, fire relay (must be wired if required by local code).
 - 12. Colors: Classic color upgrades selected by the Architect.
 - 13. Accessories: SmartSense accessory that automatically adjusts fan speed.

2.2 ACCESSORIES

- A. Controls: Provide wall-mount light switch. Provide weather resistant box enclosure.
- B. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
- C. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 - 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 - 1. Install ceiling fans using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 - 2. Set items true to line, to required levels and lines, and plumb, level, and square, and in alignment with adjacent construction
 - 3. Installed ceiling fans must be warrantable. Do not install, correct, or replace ceiling fans in a manner that results in any warranty or guarantee becoming void.
- B. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach ceiling fans to supporting construction and to safely connect facility services.
- C. Installation Tolerances: Install ceiling fans to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch from plumb, level, and alignment.

3.3 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.

- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.

- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

- A. Cleaning Work: Clean all visible ceiling fan surfaces in a manner that does not result in any warranty or guarantee becoming void.
 1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
 2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
 3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
 4. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.

3.5 PROTECTION

- A. Protect installed ceiling fans in place from soiling, deterioration, and damage until Substantial Completion.

- B. Do not store anything adjacent to or against installed ceiling fans unless they are protected from damage, as accepted in writing by the manufacturer's representative.

- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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DIVISION 12

FURNISHINGS

SECTION 12 24 13 – ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Roller window shades.
 2. Shade operation.
 3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

- A. Definitions:
1. Manufacturer: Means the window shade manufacturer, unless otherwise indicated.

1.3 SUBMITTALS

- A. Action Submittals: Submit the following for responsive action (formal review and approval).
1. Product Data: Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs), and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 2. Shop Drawings: Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project.
 3. Samples: Submit at least 8-inch square representative samples of each window shade shadecloth color, finish, and variety.
- B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished window shades.
 - a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project-specific supplemental instructions printed on manufacturer's letterhead.
 - b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.

2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.

1.4 QUALITY ASSURANCE

A. Source Limitations:

1. Window shades must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.

1.5 HANDLING

- A. Receiving and Inspection: Inspect all deliveries for deteriorated, damaged, and defective items. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
- B. Unloading: With minimum handling, unload and store only inspected and accepted items.
- C. Storage: Store unloaded items as shipped, upright in their original packaging or containers, indoors within dry, well-ventilated, broom-cleaned, and partially- or permanently-enclosed storage areas.
- D. Damaged Item Replacement: Promptly remove and replace items that are deteriorated, damaged, or defective with undamaged new items that do not exhibit deterioration, damage, or defects.
- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.6 WARRANTY

- A. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 5 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
1. Draper, Inc.
 2. Lutron Electronics Co., Inc
 3. MechoShade Systems, Inc.

2.2 ROLLER WINDOW SHADES

- A. Products: Provide products manufactured by MechoShade Systems, Inc., or equal.
- B. Requisite Properties:
1. Model: Indicated on the Drawings, or equal.
 2. Sunscreen Shadecloth: "ThermoVeil 1300 Series", or equal.
 - a. Material: 75 percent PVC (coating), 25 percent polyester (yarn).
 - b. Size: Fabric width to match window mullion spacing.
 - c. Minimum Thickness: At least 30 mils.
 - d. Total Weight: 13.5 ounces per square yard.
 - e. Openness Factor: 3 percent open.
 - f. Color: Indicated on the Drawings.
 - g. Pattern: Basket weave.
 - h. Bottom Hem: Straight.
 - i. Maximum Total Solar Energy Transmitted: (Ts) not more than 4.
 - j. Minimum Total Solar Energy Reflected: (Rs) at least 5.
 - k. Minimum Total Solar Energy Absorbed: (As) at least 91.
 - l. Minimum Visible Light Transmitted: (Tv) at least 4.
 3. Blackout Shadecloth: "Classic Blackout 0700 Series", or equal
 - a. Material: 75 percent PVC (coating), 25 percent polyester (yarn).
 - b. Size: Fabric width to match window mullion spacing.
 - c. Minimum Thickness: At least 32 mils.
 - d. Total Weight: 17.6 ounces per square yard.
 - e. Openness Factor: 0 percent open.
 - f. Color: Indicated on the Drawings.
 - g. Pattern: Tightly-woven linear weave.
 - h. Bottom Hem: Straight.
 4. Mounting: Ceiling mounting permitting easy removal and replacement without damaging roller shade or adjacent surfaces and finishes.
 5. Direction of Roll: Regular.
 6. Operation: Manual operation.

C. Performance Requirements:

1. Fire Resistance: Provide shade fabrics tested in conformance with NFPA 701, small scale Vertical Burn Test, and rated "PASS".
2. Toxicity: Provide shade fabrics tested in accordance with University of Pittsburgh Toxicity Protocol including LC50 analysis and toxicity characteristics.
3. Anti-Microbial: ASTM G 21 results indicating "No Growth"; ASTM G 22 results indicating minimum 0.197-inch "No Growth Contact Area".

2.3 COMPONENTS

- A. Rollers: Either electro-galvanized or epoxy-primed steel, or extruded-aluminum tube of diameter and wall thickness required to support and fit internal components of operating system and the weight and width of shade band material without sagging; designed to be easily removable from support brackets; with removable spline fitting integral channel in tube for attaching shade material. Provide capacity for one roller shade band(s) per roller, unless otherwise indicated.
- B. Mounting Brackets: Fascia end caps, fabricated from steel finished to match fascia or headbox.
- C. Fascia: L-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; continuous panel concealing front and bottom of shade roller, brackets, and operating hardware and operators; length as indicated; removable design for access.
- D. Top/Back Cover: L-shaped; material and finish to match fascia; combining with fascia and end caps to form a six-sided headbox enclosure sized to fit shade roller and operating hardware inside.
- E. Pocket-Style Headbox: U-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; with a bottom cover consisting of slot opening of minimum dimension to allow lowering and raising of shade and a removable or an openable, continuous metal access panel concealing shade roller, brackets, and operating hardware and operators within.
- F. Bottom Bar: Steel or extruded aluminum. Provide concealed, by pocket of shade material, internal-type bottom bar with concealed weight bar as required for smooth, properly balanced shade operation.
- G. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard for anchoring roller shade bottom in place and keeping shade band material taut.

2.4 SHADE OPERATION

A. Manual Shade Operation:

1. Lift-Assist Mechanism: Manufacturer's standard spring assist for balancing roller shade weight and lifting heavy roller shades.

2. Loop Length: Continuous-loop bead-chain with loop length equal to full length of roller shade.
3. Bead Chain: Stainless steel.

2.5 ACCESSORIES

- A. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.
- B. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
 2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

- A. General Requirements:
 1. Install window shades using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
 2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction

3. Installed window shades must be warrantable. Do not install, correct, or replace window shades in a manner that results in any warranty or guarantee becoming void.
- B. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach window shades to supporting construction.
- C. Installation Tolerances: Install window shades to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch from plumb, level, and alignment.

3.3 ADJUSTING

- A. Verify smooth and quiet window shade operation.
- B. Lubricate and adjust operating parts and hardware to function properly, free from warp, twist, binding, and distortion. Confirm latches and locks engage securely without forcing or binding.
- C. Replace items that do not operate freely in a safe and reliable manner.

3.4 CORRECTION AND REPAIR

- A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.
- B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
 1. written descriptions of non-conforming, damaged, and defective work;
 2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
 3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.
- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 PROTECTION

- A. Protect installed window shades in place from soiling, deterioration, and damage until Substantial Completion.
- B. Do not store anything on or adjacent to or against installed window shades unless they are protected from damage, as accepted in writing by the manufacturer's representative.

- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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SECTION 12 36 64 – QUARTZ AGGLOMERATE COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Quartz agglomerate countertops.
2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

A. Definitions:

1. Manufacturer: Means the countertop manufacturer, unless otherwise indicated.
2. Fabricator: Means the countertop fabricator, unless otherwise indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Sequencing:

1. Schedule countertop deliveries to the project site only after the building is enclosed with a permanent enclosure; “wet work” within storage areas (including concrete, cast underlayment, mortaring, grouting, plastering, and gypsum board finishing) is complete and cured or dried to a condition of equilibrium; storage areas are broom- and vacuum-clean; and the HVAC system is activated, operating, and maintaining ambient conditions at occupancy levels.
2. Install countertops only after all other finishing operations are complete, especially overhead finishes.
3. After countertop installation, maintain ambient conditions within design range until Final Completion.

B. Scheduling:

1. Acclimation: Allow sufficient time in the construction schedule to acclimate countertops to specified ambient conditions for between 72 hours and 6 weeks before installation begins, or until moisture content is not more than 8 percent, when measured with a moisture meter at specified ambient conditions.

1.4 SUBMITTALS

A. Action Submittals: Submit the following for responsive action (formal review and approval).

1. Product Data:

- a. Submit manufacturer's product data, specifications, typical installation details, and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs), and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.
 - b. Submit sample warranties with warranty periods, terms, conditions, exclusions, and remedies explicitly defined for each warranty, including clear warranty period start dates. (e.g., date of manufacture, purchase, installation, Beneficial Occupancy, Substantial Completion, Final Completion, etc.)
2. Shop Drawings:
- a. Submit dimensioned plans drawn to scale and showing countertop layout and types. Show locations, sizes, and extents of all items, accessories, and trim. Label manufactured items by product name.
 - b. Include project-specific dimensioned details drawn to scale showing profiles, shapes, joints, seams, and dimensions, including coves, miters, and corner conditions. Cross-reference details to plans.
 - c. Indicate method of attaching, fastening, joining, adhering, and anchoring to adjacent construction.
- B. Informational Submittals: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).
- C. Closeout Submittals:
1. Maintenance Data: Submit copies of manufacturer's instructions and other requirements and recommendations for countertop maintenance, cleaning, and repair to the Architect as a condition of project closeout.
 2. Warranty Documentation: Submit final warranties signed by the manufacturer's representative with complete terms indicated for all warranties covering items furnished or installed under this specification section.

1.5 QUALITY ASSURANCE

- A. Source Limitations:
1. Countertops must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
 - a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
 - b. Items provided for each different installation must be obtained from the same source and manufacturer.
 2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.
- B. Quality Standards:

1. Fabrication Standard: Provide countertops conforming to Architectural Woodwork Institute/ Architectural Woodwork Manufacturer's Association of Canada/ Woodwork Institute publication "*Architectural Woodwork Standards*" requirements for each specified Grade.

C. Qualifications:

1. Manufacturer: Company or individuals must have at least 10 years' experience manufacturing countertop material installed on at least 200 previous projects similar to this project in size, material, design, and complexity.
2. Fabricator: Company or individuals must have at least 10 years' experience fabricating countertops installed on at least 100 previous projects similar to this project in size, material, design, and complexity
3. Installer: Company or individuals must have at least 5 years' experience installing countertops for at least 30 previous projects similar to this project in size, material, design, and complexity.
4. Supervisors: Individuals must have at least 7 years' experience installing countertops for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading countertop installers.

1.6 HANDLING

- A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
 2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
 3. Unload and store only inspected and accepted items.
- B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
1. Furnish adequate dunnage and bracing during storage.
 2. Prevent stored items from contacting the floor, from soiling and staining, and from deterioration and damage.
 3. Do not leave items uncovered where they might be exposed to weather or become wet; or exposed to heat or sudden changes in temperature or relative humidity; or other sources of deterioration and damage, including dust and other airborne contaminants.
- C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage. Avoid damage to packaging and containers.
- D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective countertops with undamaged new countertops that do not exhibit deterioration, damage, or defects.

- E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 WARRANTY

- A. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products and accessories against all patent and latent defects, and incipient and catastrophic failure for 5 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Provide products manufactured by one of the following, or equal.
 1. Caesarstone.
 2. E. I. du Pont de Nemours and Company (DuPont).

2.2 QUARTZ AGGLOMERATE COUNTERTOPS

- A. Products: "Classico" manufactured by Caesarstone, or equal.
- B. Requisite Properties:
 1. Thickness: Indicated on the Drawings.
 2. Edge Profile: Indicated on the Drawings.
 3. Color and Finish: Indicated on the Drawings.

2.3 ACCESSORIES

- A. Construction Adhesive:
 1. Description: General purpose, indoor or outdoor, drillable, moisture resistant, sandable, heavy duty construction adhesive.
 2. Product: "Titebond PROvantage" manufactured by Franklin International, or equal.
- B. Mounting Spacers: Supplied, required, recommended, or accepted by the adhesive manufacturer, if required.
- C. Sealant:
 1. Description: Clear, medium or high modulus, mildew-resistant silicone sealant conforming to ASTM C 920 requirements for Type S, Grade NS, Class 25, Use NT, A or O sealant, as applicable.
 2. Products: Provide "786" manufactured by Dow Corning Corp., or "Sanitary SCS 1700" manufactured by Momentive Performance Materials, Inc., or equal.

- D. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the fabricator for actual in-service conditions applicable to the project.
- E. Cleaner: Supplied, required, recommended, or accepted by the manufacturer for use on installed countertops and actual in-service conditions applicable to the project. Cleaners must remove stains, dirt, and residue without damaging or altering countertop surfaces.
- F. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.4 FABRICATION

- A. Shop-fabricate countertops to sizes and shapes indicated on the Drawings and in largest sections practicable to minimize field jointing.
- B. Fabricate exposed work precise, straight, and true to line, size, and shape; square and within allowable tolerances; and with accurate angles and surfaces, and crisp straight edges.
- C. Cut, drill, and punch countertops as required to receive other components, accessories, hardware, and similar items, and as required to securely attach to supporting construction. Provide openings and similar features as needed to accommodate adjacent work.
- D. Carefully inspect finished units at the shop for conformance to specified requirements for appearance, material, and fabrication. Replace defective units.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
- B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
- C. Evaluation and Assessment:
 - 1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.

2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

A. General Requirements:

1. Install countertops using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
3. Perform drilling and fitting as required or necessary for an accurate fit and complete installation.
4. Installed countertops must be warrantable. Do not install, correct, or replace countertops in a manner that results in any warranty or guarantee becoming void.

B. Special Techniques:

1. Shim as required using concealed shims.
2. Scribe and fit accurately against adjacent surfaces for a close fit.
3. Attach countertops securely to supports with concealed screws as required for a rigid and secure installation.
4. Seal interface of countertops with contiguous surfaces with sealant.

C. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach countertops to supporting construction.

D. Installation Tolerances: Install countertops to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch from plumb, level, and alignment.

3.3 CORRECTION AND REPAIR

A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.

B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include

1. written descriptions of non-conforming, damaged, and defective work;
2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and

3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.

- C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.4 CLEANING

1. Cleaning Work: Clean all visible surfaces in a manner that does not result any warranty or guarantee becoming void.
2. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
3. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
4. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.
5. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be cleaned to the Architect's acceptance.

- B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.5 PROTECTION

- A. Protect installed countertops in place from deterioration, and damage until Substantial Completion.
- B. Do not store anything on, adjacent to, or against installed countertops unless they are protected from damage, as accepted in writing by the manufacturer's representative. Do not use installed countertops as work surfaces.
- C. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

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DIVISION 22

PLUMBING

SECTION 220517 - SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sleeves.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- C. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

2.2 SLEEVE-SEAL SYSTEMS

- A. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
 1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 2. Pressure Plates: Carbon steel or Plastic .
 3. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

- A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for imbedding in concrete slab or wall. Unit has plastic or rubber waterstop collar with center opening to match piping OD.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION

- A. Install sleeves for piping passing through penetrations in rated or waterproofed floors, roofs, and concrete or masonry walls.
- B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide annular clear space between piping and concrete slabs and walls.
 - 1. Sleeves are not required for core-drilled holes.
- C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
- D. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078400 "Firestopping."

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls at service piping entries into building.
- B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.

3.4 SLEEVE AND SLEEVE-SEAL SCHEDULE

A. Use sleeves and sleeve seals for the following piping-penetration applications:

1. Exterior Concrete Walls above Grade: Cast-iron wall sleeves or Sleeve-seal fittings.
2. Exterior Concrete Walls below Grade: Cast-iron wall sleeves with sleeve-seal system, or Sleeve-seal fittings.
3. Concrete Slabs and Floors above Grade: PVC-pipe sleeves, Sleeve-seal fittings, or Molded-PVC sleeves.

END OF SECTION

SECTION 220518 - ESCUTCHEONS FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Escutcheons.

PART 2 - PRODUCTS

2.1 ESCUTCHEONS

- A. One-Piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.
- B. Split-Plate, Stamped-Steel Type: With chrome-plated finish, concealed and exposed-rivet hinge, and spring-clip fasteners.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install escutcheons for piping penetrations of finished walls, below ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of insulated piping and with OD that completely covers opening.

3.2 FIELD QUALITY CONTROL

- A. Replace broken and damaged escutcheons using new materials.

END OF SECTION

SECTION 220519 - METERS AND GAGES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Approved Design / Build Plumbing Methods and Materials Construction Standards Matrix.

1.2 SUMMARY

- A. Section Includes:

1. Liquid-in-glass thermometers.
2. Thermowells.
3. Dial-type pressure gages.
4. Gage attachments.
5. Test plugs.

- B. Related Sections:

1. Section 221116 "Domestic Water Piping" for water meters inside the building.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For meters and gages to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Meters and Gages that make contact with potable water shall conform with "Section 116875 of the California Health and Safety Code" also known as the "California Lead Plumbing Law".

2.2 LIQUID-IN-GLASS THERMOMETERS

- A. Metal-Case, Compact-Style, Liquid-in-Glass Thermometers:
 1. Standard: ASME B40.200.

2. Case: Cast aluminum; 6-inch nominal size.
3. Case Form: Back angle or Straight unless otherwise indicated.
4. Tube: Glass with magnifying lens and blue or red organic liquid.
5. Tube Background: Non-reflective aluminum with permanently etched scale markings graduated in deg F.
6. Window: Glass or plastic.
7. Stem: Aluminum or brass and of length to suit installation.
 - a. Design for Thermowell Installation: Bare stem.
8. Connector: 3/4 inch, with ASME B1.1 screw threads.
9. Accuracy: Plus or minus 1 percent of scale range or one scale division, to a maximum of 1.5 percent of scale range.

2.3 THERMOWELLS

A. Thermowells:

1. Standard: ASME B40.200.
2. Description: Pressure-tight, socket-type fitting made for insertion into piping tee fitting.
3. Material for Use with Copper Tubing: Brass, CNR or CUNI.
4. Material for Use with Steel Piping: Brass, CRES or CSA.
5. Type: Stepped shank unless straight or tapered shank is indicated.
6. External Threads: NPS 1/2, NPS 3/4, or NPS 1, ASME B1.20.1 pipe threads.
7. Internal Threads: 1/2, 3/4, and 1 inch, with ASME B1.1 screw threads.
8. Bore: Diameter required to match thermometer bulb or stem.
9. Insertion Length: Length required to match thermometer bulb or stem.
10. Lagging Extension: Include on thermowells for insulated piping and tubing.
11. Bushings: For converting size of thermowell's internal screw thread to size of thermometer connection.

B. Heat-Transfer Medium: Mixture of graphite and glycerin.

2.4 PRESSURE GAGES

A. Direct-Mounted, Metal-Case, Dial-Type Pressure Gages:

1. Standard: ASME B40.100.
2. Case: Liquid-filled or Sealed type(s); cast aluminum or drawn steel; 4-1/2-inch nominal diameter.
3. Pressure-Element Assembly: Bourdon tube unless otherwise indicated.
4. Pressure Connection: Brass, with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads and bottom-outlet type unless back-outlet type is indicated.
5. Movement: Mechanical, with link to pressure element and connection to pointer.
6. Dial: Non-reflective aluminum with permanently etched scale markings graduated in psi.

7. Pointer: Dark-colored metal.
8. Window: Glass.
9. Ring: Stainless steel.
10. Accuracy: Grade A, plus or minus 1 percent of middle half of scale range.

2.5 GAGE ATTACHMENTS

- A. Snubbers: ASME B40.100, brass; with NPS 1/4 or NPS 1/2 , ASME B1.20.1 pipe threads and piston or porous-metal-type surge-dampening device. Include extension for use on insulated piping.
- B. Valves: Brass ball, with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads.

2.6 TEST PLUGS

- A. Description: Test-station fitting made for insertion into piping tee fitting.
- B. Body: Brass with core inserts and gasketed and threaded cap. Include extended stem on units to be installed in insulated piping.
- C. Thread Size: NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe thread.
- D. Minimum Pressure and Temperature Rating: 500 psig at 200 deg F.
- E. Core Inserts: Chlorosulfonated polyethylene synthetic and EPDM self-sealing rubber.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install thermowells with socket extending one-third of pipe diameter to center of pipe and in vertical position in piping tees.
- B. Install thermowells of sizes required to match thermometer connectors. Include bushings if required to match sizes.
- C. Install thermowells with extension on insulated piping as required.
- D. Install direct-mounted thermometers in thermowells and adjust vertical and tilted positions.
- E. Install direct-mounted pressure gages in piping tees with pressure gage located on pipe at the most readable position.
- F. Install test plugs in piping tees per plumbing details.
- G. Install thermometers in the following locations:
 1. Inlets and outlets of each domestic water heat exchanger.

- H. Install pressure gages in the following locations:
 - 1. Inlet and outlet of each pressure-reducing valve.
 - 2. Suction and discharge of each domestic water pump.
- I. All thermometers and pressure gage values shall be visible from the floor.

3.2 CONNECTIONS

- A. Install meters and gages adjacent to machines and equipment to allow service and maintenance of meters, gages, machines, and equipment.

3.3 ADJUSTING

- A. Adjust faces of meters and gages to proper angle for best visibility.

3.4 THERMOMETER SCHEDULE

- A. Thermometers at inlets and outlets of each domestic water heat exchanger shall be the following:
 - 1. Compact, liquid-in-glass type.
- B. Thermometer stems shall be of length to match thermowell insertion length.

3.5 THERMOMETER SCALE-RANGE SCHEDULE

- A. Scale Range for Domestic Cold-Water Piping: 0 to 100 deg F.
- B. Scale Range for Domestic Hot-Water Piping: 30 to 180 deg F.

3.6 PRESSURE-GAGE SCHEDULE

- A. Pressure gages at locations indicated on drawings:
 - 1. Liquid-filled or Sealed, direct-mounted, metal case.
 - 2. Test plug with chlorosulfonated polyethylene synthetic EPDM self-sealing rubber inserts.

3.7 PRESSURE-GAGE SCALE-RANGE SCHEDULE

- A. Scale Range for Domestic Water Piping: 0 to 160 psi.

END OF SECTION

SECTION 22023 – GENERAL DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Approved Design / Build Plumbing Methods and Materials Construction Standards Matrix.

1.2 SUMMARY

- A. Section Includes:

1. Bronze ball valves.
2. Stainless Steel ball valves.
3. Iron, single-flange butterfly valves.
4. Iron, grooved-end butterfly valves.
5. Bronze, grooved-end butterfly valves.
6. Bronze swing check valves.
7. Chainwheels.

- B. Related Sections:

1. Section 220553 "Identification for Plumbing Piping and Equipment" for valve tags and schedules.
2. Section 221116 "Domestic Water Piping" for valves applicable only to this piping.
3. Section 221319 "Sanitary Waste Piping Specialties" for valves applicable only to this piping.

1.3 DEFINITIONS

- A. CWP: Cold working pressure.
- B. EPDM: Ethylene propylene copolymer rubber.
- C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
- D. NRS: Nonrising stem.
- E. OS&Y: Outside screw and yoke.
- F. RS: Rising stem.
- G. SWP: Steam working pressure.
- H. WOG: Water, Oil, Gas

1.4 QUALITY ASSURANCE

- A. ASME Compliance:
 - 1. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - 2. ASME B31.9 for building services piping valves.
- B. NSF Compliance: NSF 61 for valve materials for potable-water service.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Refer to valve schedule articles for applications of valves.
- B. All plumbing valves that make contact with potable water shall conform with "Public Law 111-380" also known as the "Reduction of Lead in Drinking Water Act".
- C. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- D. Valve Sizes: Same as upstream piping unless otherwise indicated.
- E. Valve Actuator Types:
 - 1. Handlever: For quarter-turn valves NPS 6 and smaller except plug valves.
- F. Valve-End Connections:
 - 1. Flanged: With flanges according to ASME B16.1 for iron valves.
 - 2. Grooved: With grooves according to AWWA C606.
 - 3. Threaded: With threads according to ASME B1.20.1.
 - 4. Mechanical Press Fit: In accordance with manufacturer's instructions.
- G. Valve Bypass and Drain Connections: MSS SP-45.

2.2 BRONZE BALL VALVES

- A. Three-Piece, Full-Port, Bronze Ball Valves with Stainless-Steel Trim:
 - 1. Description:
 - a. Standard: MSS SP-110.
 - b. SWP Rating: 150 psig.
 - c. CWP Rating: 600 psig.
 - d. Body Design: Three piece.
 - e. Body Material: Bronze.
 - f. Ends: Threaded.

- g. Seats: PTFE
- h. Stem: Stainless steel.
- i. Ball: Stainless steel, vented.
- j. Port: Full.
- k. Manufacturer: NIBCO T-595-Y-66-LF or equal

2.3 CARBON STEEL BALL VALVES

A. Split Body, Carbon Steel Ball Valves with Stainless-Steel Trim:

1. Description:

- a. Standard: MSS SP-72.
- b. SWP Rating: 150 psig.
- c. CWP Rating: 600 psig.
- d. Body Design: Split Body.
- e. Body Material: Coated carbon steel or stainless.
- f. Ends: Flanged.
- g. Seats: PTFE
- h. Stem: Stainless steel.
- i. Ball: Stainless steel, vented.
- j. Port: Full.
- k. Manufacturer: NIBCO F-515-CS-F-66-FS or equal

2.4 IRON, BUTTERFLY VALVES

A. 200 CWP, Iron, Butterfly Valves with EPDM Seat and Stainless-Steel Disc:

1. Description:

- a. Standard: MSS SP-67, Type I.
- b. CWP Rating: 200 psig.
- c. Body Design: Lug or wafer type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
- d. Body Material: Coated ductile iron.
- e. Seat: EPDM.
- f. Stem: One- or two-piece stainless steel.
- g. Disc: Stainless steel.

B. 200 CWP, Iron, Butterfly Valves with NBR Seat and Stainless-Steel Disc:

1. Description:

- a. Standard: MSS SP-67, Type I.
- b. CWP Rating: 200 psig.

- c. Body Design: Lug or wafer type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
- d. Body Material: Coated ductile iron.
- e. Seat: NBR.
- f. Stem: One- or two-piece stainless steel.
- g. Disc: Stainless steel.

2.5 IRON, GROOVED-END BUTTERFLY VALVES

A. 175 CWP, Iron, Grooved-End Butterfly Valves:

- 1. Description:
 - a. Standard: MSS SP-67, Type I.
 - b. CWP Rating: 175 psig.
 - c. Body Material: Coated, ductile iron.
 - d. Stem: Two-piece stainless steel.
 - e. Disc: Coated, ductile iron.
 - f. Seal: EPDM.

2.6 BRONZE, GROOVED-END BUTTERFLY VALVES

A. 300 CWP, Bronze, Grooved-End Butterfly Valves:

- 1. Description:
 - a. Standard: MSS SP-67, Type I.
 - b. CWP Rating: 300 psig.
 - c. Body Material: Bronze per CDA-836.
 - d. Stem: Two-piece stainless steel.
 - e. Disc: Coated, ductile iron.
 - f. Seal: EPDM.

2.7 BRONZE SWING CHECK VALVES

A. Class 125, Bronze Swing Check Valves with Bronze Disc:

- 1. Description:
 - a. Standard: MSS SP-80, Type 3.
 - b. CWP Rating: 200 psig.
 - c. Body Design: Horizontal flow.
 - d. Body Material: ASTM B 62, bronze.
 - e. Ends: Threaded.
 - f. Disc: Bronze.

B. Class 125, Bronze Swing Check Valves with Nonmetallic Disc:

1. Description:
 - a. Standard: MSS SP-80, Type 4.
 - b. CWP Rating: 200 psig.
 - c. Body Design: Horizontal flow.
 - d. Body Material: ASTM B 62, bronze.
 - e. Ends: Threaded.
 - f. Disc: PTFE or TFE.

2.8 CHAINWHEELS

- A. Description: Valve actuation assembly with sprocket rim, brackets, and chain.
1. Brackets: Type, number, size, and fasteners required to mount actuator on valve.
 2. Attachment: For connection to ball butterfly and plug valve stems.
 3. Sprocket Rim with Chain Guides: Ductile or cast iron , of type and size required for valve. Include zinc coating.
 4. Chain: Hot-dip, galvanized steel, of size required to fit sprocket rim.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.

3.2 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves in accessible locations.
- C. Position valves installed in horizontal piping with stem at or above center of pipe.

- D. Install valves in position to allow full stem movement.
- E. Install chainwheels on operators for exposed valves NPS 8 and larger and more than 96 inches above floor. Extend chains to 60 inches above finished floor.
- F. Install check valves for proper direction of flow and as follows:
 - 1. Swing Check Valves: In horizontal position with hinge pin level.

3.3 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. If valve applications are not indicated, use the following:
 - 1. Shutoff Service: Ball or butterfly valves.
 - 2. Butterfly Valve Dead-End Service: Lug type.
 - 3. Throttling Service: Ball or butterfly valves.
- B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP classes or CWP ratings may be substituted.
- C. Select valves, except wafer types, with the following end connections:
 - 1. For Copper Tubing, NPS 2-1/2 and Smaller: threaded ends.
 - 2. For Copper Tubing, NPS 3 & NPS 4: Flanged.
 - 3. For Steel Piping, NPS 2-1/2 and Smaller: Threaded ends.
 - 4. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged.
 - 5. For Grooved-End Copper Tubing and Steel Piping: Valve ends may be grooved.

3.4 DOMESTIC, HOT- AND COLD-WATER VALVE SCHEDULE (200 PSI MAX)

- A. Pipe NPS 2-1/2 and Smaller:
 - 1. Ball Valves: Three piece, full port, bronze with Stainless Steel trim
 - 2. Bronze Swing Check Valves: Class 150, bronze nonmetallic disc.
- B. Pipe NPS 3 & NPS 4:
 - 1. Copper, flanged or Grooved-End Butterfly Valves: 300 CWP.
 - 2. Bronze Grooved-End Swing Check Valves: Class 150, bronze nonmetallic disc,
 - 3.

3.5 SANITARY-WASTE AND STORM-DRAINAGE VALVE SCHEDULE

- A. Pipe NPS 2-1/2 and Smaller:
 - 1. Ball Valves: Two piece, full port, bronze with bronze trim.
 - 2. Bronze Swing Check Valves: Class 150, nonmetallic disc.
- B. Pipe NPS 3 and Larger:

1. Carbon steel ball valve: Class 125.

END OF SECTION

SECTION 220548 - VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Isolation pads.
 - 2. Spring hangers.
 - 3. Spring hangers with vertical-limit stops.
 - 4. Seismic snubbers.
 - 5. Restraining braces and cables.

1.2 DEFINITIONS

- A. CBC: California Building Code.
- B. ICC-ES: ICC-Evaluation Service.

1.3 PERFORMANCE REQUIREMENTS

- A. Seismic-Restraint Loading:
 - 1. Site Class as Defined in the CBC: See Structural Drawings.
 - 2. Assigned Seismic Use Group or Building Category as Defined in the CBC: See Structural Drawings.
 - a. Component Importance Factor: See Structural Drawings.
 - b. Component Response Modification Factor: See Structural Drawings.
 - c. Component Amplification Factor: See Structural Drawings.
 - 3. Design Spectral Response Acceleration at Short Periods (0.2 Second): See Structural Drawings.
 - 4. Design Spectral Response Acceleration at 1-Second Period: See Structural Drawings.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Include rated load, rated deflection, and overload capacity for each vibration isolation device as scheduled or indicated in the Drawings.
 - 2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.

- a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by service members of ICC-ES, registered structural engineer or pre-approved systems.
 - b. Annotate to indicate application of each product submitted and compliance with requirements.
3. Interlocking Snubbers: Include ratings for horizontal, vertical, and combined loads.
- B. Delegated-Design Submittal: For vibration isolation and seismic-restraint details indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
1. Design Calculations: Calculate static and dynamic loading due to equipment weight and operation, seismic forces required to select vibration isolators, seismic restraints, and for designing vibration isolation bases.
 2. Seismic-Restraint Details:
 - a. Design Analysis: To indicate calculated dead loads, static seismic loads and capacity of materials utilized for connections to equipment and structure. Analysis must detail anchoring methods, bolt diameter, embedment and/or welded length. All seismic restraint devices shall be designed to accept, without failure, the forces acting through the equipment center of gravity. Overturning moments may exceed forces at ground level.
 - b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.
 - c. Preapproval and Evaluation Documentation showing maximum ratings of restraint items and the basis for approval (tests or calculations). Where pre-approved devices are not available, submittals based on independent testing or calculations submitted and approved. Calculations to support seismic restraint designs must be stamped by a registered professional engineer licensed in the State of the California. Testing and calculations must including combined shear and tensile loads as well as one test or analysis at 45E to the weakest mode.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Show coordination of seismic bracing for plumbing piping and equipment with other systems and equipment in the vicinity, including other supports and seismic restraints.
- B. Qualification Data: For professional engineer shall be certified in State of California.

1.6 QUALITY ASSURANCE

- A. Comply with seismic-restraint requirements in the CBC.

- B. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproved by ICC-ES, or preapproved by another agency acceptable to University, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

PART 2 - PRODUCTS

2.1 VIBRATION ISOLATORS

- A. Pads: Arranged in single or multiple layers of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.
1. Resilient Material: Oil- and water-resistant neoprene.
- B. Spring Hangers: Combination coil-spring and elastomeric-insert hanger with spring and insert in compression.
1. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.
 2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
 3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
 4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
 5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
 6. Elastomeric Element: Molded, oil-resistant rubber or neoprene. Steel-washer-reinforced cup to support spring and bushing projecting through bottom of frame.
 7. Self-centering hanger rod cap to ensure concentricity between hanger rod and support spring coil.
- C. Spring Hangers with Vertical-Limit Stop: Combination coil-spring and elastomeric-insert hanger with spring and insert in compression and with a vertical-limit stop.
1. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.
 2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
 3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
 4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.

5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
6. Elastomeric Element: Molded, oil-resistant rubber or neoprene.
7. Adjustable Vertical Stop: Steel washer with neoprene washer "up-stop" on lower threaded rod.
8. Self-centering hanger rod cap to ensure concentricity between hanger rod and support spring coil.

2.2 VIBRATION ISOLATION EQUIPMENT BASES

- A. Steel Base: Factory-fabricated, welded, structural-steel bases and rails.
 1. Design Requirements: Lowest possible mounting height with not less than 1-inch clearance above the floor. Include equipment anchor bolts and auxiliary motor slide bases or rails.
 - a. Include supports for suction and discharge elbows for pumps.
 2. Structural Steel: Steel shapes, plates, and bars complying with ASTM A 36/A 36M. Bases shall have shape to accommodate supported equipment.
 3. Support Brackets: Factory-welded steel brackets on frame for outrigger isolation mountings and to provide for anchor bolts and equipment support.

2.3 SEISMIC-RESTRAINT DEVICES

- A. Manufacturers:
 1. ISAT or equal.
 - 2.
- B. General Requirements for Restraint Components: Rated strengths, features, and applications shall be as defined in reports by an evaluation service member of ICC-ES.
 1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least two times the maximum seismic forces to which they will be subjected.
- C. Snubbers: Factory fabricated using welded structural-steel shapes and plates, anchor bolts, and replaceable resilient isolation washers and bushings.
 1. Anchor bolts for attaching to concrete shall be seismic-rated, drill-in, and stud-wedge or female-wedge type.
 2. Resilient Isolation Washers and Bushings: Oil- and water-resistant neoprene.
 3. Maximum 1/4-inch air gap, and minimum 1/4-inch- thick resilient cushion.
- D. Channel Support System: MFMA-3, shop- or field-fabricated support assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; and rated in tension, compression, and torsion forces.
- E. Restraint Cables: ASTM A 603 galvanized steel cables with end connections made of steel assemblies with thimbles, brackets, swivel, and bolts designed for restraining cable service; and with a minimum of two clamping bolts for cable engagement.

- F. Hanger Rod Stiffener: Steel slotted-support-system sleeve with internally bolted connections to hanger rod.
- G. Bushings for Floor-Mounted Equipment Anchor Bolts: Neoprene bushings designed for rigid equipment mountings, and matched to type and size of anchor bolts and studs.
- H. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings, and matched to type and size of attachment devices used.
- I. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.
- J. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488. Minimum length of eight times diameter.
- K. Adhesive Anchor Bolts: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

2.4 FACTORY FINISHES

- A. Finish: Manufacturer's standard prime-coat finish ready for field painting.
- B. Finish: Manufacturer's standard paint applied to factory-assembled and -tested equipment before shipping.
 - 1. Powder coating on springs.
 - 2. All hardware shall be galvanized. Hot-dip galvanized metal components for exterior use.
 - 3. Zinc plated for metal components on isolators for interior use.
 - 4. Color-code or otherwise mark vibration isolation and seismic-control devices to indicate capacity range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and equipment to receive vibration isolation and seismic-control devices for compliance with requirements for installation tolerances and other conditions affecting performance.

- B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

- A. Multiple Pipe Supports: Secure pipes to trapeze member with clamps approved for application.
- B. Hanger Rod Stiffeners: Install hanger rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.
- C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

3.3 VIBRATION-CONTROL AND SEISMIC-RESTRAINT DEVICE INSTALLATION

- A. Equipment Restraints:
 - 1. Install seismic snubbers on plumbing equipment mounted on vibration isolators. Locate snubbers as close as possible to vibration isolators and bolt to equipment base and supporting structure.
 - 2. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inches
- B. Piping Restraints:
 - 1. Comply with requirements in MSS SP-127.
 - 2. Space lateral supports a maximum of 20 feet o.c., and longitudinal supports a maximum of 40 feet o.c.
 - 3. Brace a change of direction longer than 12 feet
- C. Install cables so they do not bend across edges of adjacent equipment or building structure.
- D. Install bushing assemblies for anchor bolts for floor-mounted equipment.
- E. Install bushing assemblies for mounting bolts for wall-mounted equipment.
- F. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- G. Drilled-in Anchors:
 - 1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.

2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
4. Set anchors to manufacturer's recommended torque, using a torque wrench.
5. Install zinc-coated steel anchors for interior and stainless steel anchors for exterior applications.

3.4 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

- A. Install flexible connections in piping where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where the connections terminate with connection to equipment that is anchored to a different structural element from the one supporting the connections as they approach equipment. Comply with requirements in Section 221116 "Domestic Water Piping" for piping flexible connections.

3.5 FIELD QUALITY CONTROL

- A. Tests and Inspections:
 1. Schedule test with inspector before connecting anchorage device to restrained component (unless post connection testing has been approved), and with at least seven days' advance notice.
 2. Obtain approval before transmitting test loads to structure. Provide temporary load-spreading members.
 3. Test to 90 percent of rated proof load of device.
 4. Measure isolator restraint clearance.
 5. Measure isolator deflection.
 6. Verify snubber minimum clearances.
 7. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.
- B. Remove and replace malfunctioning units and retest as specified above.
- C. Prepare test and inspection reports.

3.6 ADJUSTING

- A. Adjust isolators after piping system is at operating weight.
- B. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

- C. Adjust active height of sprint isolators.
- D. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION

SECTION 220553 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Equipment labels.
 2. Warning signs and labels.
 3. Pipe labels.
 4. Valve tags.
 5. Warning tags.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Valve numbering scheme.
- C. Valve Schedules: For each piping system to include in maintenance manuals.

1.3 COORDINATION

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

- A. Plastic Labels for Equipment:
1. Material and Thickness: Multilayer, multicolor, phenolic labels for mechanical engraving, and having predrilled holes for attachment hardware.
 2. Letter Color: White.
 3. Background Color: Black.
 4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
 6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
 7. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Label Content: Include equipment's drawing designation or unique equipment number.
- C. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number. Equipment schedule shall be included in operation and maintenance data.

2.2 WARNING SIGNS AND LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving and having predrilled holes for attachment hardware.
- B. Color
1. Caution Label: Yellow background with Black lettering.
 2. Warning Label: Orange background with Black lettering.
 3. Danger Label: Red background with White lettering.
- C. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- D. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- E. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- F. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- G. Label Content: Include caution and warning information, plus emergency notification instructions.

2.3 PIPE LABELS

- A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.
- B. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing or Snap-on / Strap-on pipe markers per ANSI A13.1 using manufacturer recommended

fastener where self-adhesive pipe labels cannot be applied properly. Labels should be securely fastened to the pipe. Labels should be installed every 8 feet.

- C. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on drawings, and an arrow indicating flow direction.
 - 1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.

2.4 VALVE TAGS

- A. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.
 - 1. Tag Material: Brass, 16 Gauge minimum thickness, and having predrilled or stamped holes for attachment hardware.
 - 2. Fasteners: Brass wire-link, stainless steel wire or beaded chain; or S-hook .
- B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating). Mark valves for emergency shutoff and similar special uses.
 - 1. Valve-tag schedule shall be included in operation and maintenance data.

2.5 WARNING TAGS

- A. Warning Tags: Preprinted or partially preprinted, accident-prevention tags, of plasticized card stock with matte finish suitable for writing.
 - 1. Size: 3 by 5-1/4 inches minimum.
 - 2. Fasteners: Brass grommet and wire.
 - 3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."
 - 4. Color:
 - a. Caution Label: Yellow background with Black lettering.
 - b. Warning Label: Orange background with Black lettering.
 - c. Danger Label: Red background with White lettering.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

3.3 PIPE LABEL INSTALLATION

- A. Stenciled Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels , complying with ASME A13.1, on each piping system.
 - 1. Identification Paint: Use for contrasting background.
 - 2. Stencil Paint: Use for pipe marking.
- B. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 - 1. Near each valve and control device.
 - 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 - 3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
 - 4. At access doors, manholes, and similar access points that permit view of concealed piping.
 - 5. Near major equipment items and other points of origination and termination.
 - 6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
 - 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- C. Pipe Label Color Schedule:
 - 1. Natural Gas Piping:
 - a. Background Color: Yellow .
 - b. Letter Color: Black.
 - 2. Domestic Water Piping:
 - a. Background Color: Green.
 - b. Letter Color: White.
 - 3. Sanitary / Lab Waste and Storm Drainage Piping:
 - a. Background Color: Green.
 - b. Letter Color: White.

3.4 VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; shutoff valves; faucets; convenience and lawn-

watering hose connections; and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.

- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:
1. Valve-Tag Size and Shape:
 - a. Cold Water: 1-1/2 inches, round.
 - b. Hot Water: 1-1/2 inches, round.
 - c. Compressed Air: 1-1/2 inches, round.
 2. Valve-Tag Color:
 - a. Cold Water: Natural.
 - b. Hot Water: Natural.
 - c. Compressed Air: Natural.
 3. Letter Color:
 - a. Cold Water: Black.
 - b. Hot Water: Black.
 - c. Compressed Air: Black.

3.5 WARNING-TAG INSTALLATION

- A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION

SECTION 220716 - PLUMBING EQUIPMENT INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section applies to the following plumbing equipment:
 - 1. Domestic water storage tank.
 - 2. Domestic hot water pump, if required per manufacturer
- B. Related Sections:
 - 1. Section 220719 "Plumbing Piping Insulation."

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied, if any).
- B. Qualification Data: For qualified Installer.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84 by a testing agency acceptable to Owner. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.5 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
- B. Coordinate clearance requirements with equipment Installer for equipment insulation application.

1.6 SCHEDULING

- A. Schedule insulation application after pressure testing systems. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Comply with requirements in "Equipment Insulation Schedule" articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- F. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials and Type II for sheet materials.
- G. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type I. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
- H. High-Temperature, Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type V, without factory-applied jacket.
- I. Mineral-Fiber Board Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type IA or Type IB. For equipment applications, provide insulation with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

- J. High-Temperature, Mineral-Fiber Board Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type III, without factory-applied jacket.
- K. Mineral-Fiber, Preformed Pipe Insulation:
 - 1. Type I, 850 Deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ-SSL. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
- L. Mineral-Fiber, Pipe and Tank Insulation: Mineral or glass fibers bonded with a thermosetting resin. Semirigid board material with factory-applied ASJ complying with ASTM C 1393, Type II or Type IIIA Category 2, or with properties similar to ASTM C 612, Type IB. Nominal density is 2.5 lb/cu. ft. or more. Thermal conductivity (k-value) at 100 deg F is 0.29 Btu x in./h x sq. ft. x deg F or less. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

2.2 INSULATING CEMENTS

- A. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.

2.3 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
- B. Flexible Elastomeric Adhesive: Comply with MIL-A-24179A, Type II, Class I.
 - 1. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
 - 1. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. ASJ Adhesive, and FSK and PVDC Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
 - 1. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- E. PVC Jacket Adhesive: Compatible with PVC jacket.

1. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.4 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.
 1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below ambient services.
 1. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
 2. Service Temperature Range: Minus 20 to plus 180 deg F.
 3. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
 4. Color: White.
- C. Vapor-Barrier Mastic: Solvent based; suitable for indoor use on below ambient services.
 1. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 35-mil dry film thickness.
 2. Service Temperature Range: 0 to 180 deg F.
 3. Solids Content: ASTM D 1644, 44 percent by volume and 62 percent by weight.
 4. Color: White.
- D. Vapor-Barrier Mastic: Solvent based; suitable for outdoor use on below ambient services.
 1. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 30-mil dry film thickness.
 2. Service Temperature Range: Minus 50 to plus 220 deg F.
 3. Solids Content: ASTM D 1644, 33 percent by volume and 46 percent by weight.
 4. Color: White.
- E. Breather Mastic: Water based; suitable for indoor and outdoor use on above ambient services.
 1. Water-Vapor Permeance: ASTM F 1249, 1.8 perms at 0.0625-inch dry film thickness.
 2. Service Temperature Range: Minus 20 to plus 180 deg F.
 3. Solids Content: 60 percent by volume and 66 percent by weight.
 4. Color: White.

2.5 LAGGING ADHESIVES

- A. Description: Comply with MIL-A-3316C, Class I, Grade A, and shall be compatible with insulation materials, jackets, and substrates.

1. For indoor applications, use lagging adhesives that have a VOC content of compliant with LEED Credit IEQ 4.1 or 4.2, g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over insulation.
3. Service Temperature Range: 0 to plus 180 deg F.
4. Color: White.

2.6 SEALANTS

A. Joint Sealants:

1. Materials shall be compatible with insulation materials, jackets, and substrates.
2. Permanently flexible, elastomeric sealant.
3. Service Temperature Range: Minus 100 to plus 300 deg F.
4. Color: White or gray.
5. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
6. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. FSK and Metal Jacket Flashing Sealants:

1. Materials shall be compatible with insulation materials, jackets, and substrates.
2. Fire- and water-resistant, flexible, elastomeric sealant.
3. Service Temperature Range: Minus 40 to plus 250 deg F.
4. Color: Aluminum.
5. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
6. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. Materials shall be compatible with insulation materials, jackets, and substrates.
2. Fire- and water-resistant, flexible, elastomeric sealant.
3. Service Temperature Range: Minus 40 to plus 250 deg F.
4. Color: White.
5. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
6. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.7 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
 2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
 3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.
 4. PVDC Jacket for Indoor Applications: 4-mil- thick, white PVDC biaxially oriented barrier film with a permeance at 0.02 perm when tested according to ASTM E 96/E 96M and with a flame-spread index of 5 and a smoke-developed index of 20 when tested according to ASTM E 84.
 5. PVDC Jacket for Outdoor Applications: 6-mil- thick, white PVDC biaxially oriented barrier film with a permeance at 0.01 perm when tested according to ASTM E 96/E 96M and with a flame-spread index of 5 and a smoke-developed index of 25 when tested according to ASTM E 84.
 6. PVDC-SSL Jacket: PVDC jacket with a self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip.

2.8 FIELD-APPLIED JACKETS

- A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.
- B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.
1. Adhesive: As recommended by jacket material manufacturer.
 2. Color: White .
 3. Factory-fabricated tank heads and tank side panels.
- C. Metal Jacket:
1. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.
 - a. Factory cut and rolled to size.
 - b. Finish and thickness are indicated in field-applied jacket schedules.
 - c. Moisture Barrier for Outdoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper .
 2. Stainless-Steel Jacket: ASTM A 167 or ASTM A 240/A 240M.
 - a. Sheet and roll stock ready for shop or field sizing .
 - b. Material, finish, and thickness are indicated in field-applied jacket schedules.
 - c. Moisture Barrier for Outdoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper.

2.9 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
 - 1. Width: 3 inches.
 - 2. Thickness: 11.5 mils.
 - 3. Adhesion: 90 ounces force/inch in width.
 - 4. Elongation: 2 percent.
 - 5. Tensile Strength: 40 lbf/inch in width.
 - 6. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

- B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.
 - 1. Width: 3 inches.
 - 2. Thickness: 6.5 mils.
 - 3. Adhesion: 90 ounces force/inch in width.
 - 4. Elongation: 2 percent.
 - 5. Tensile Strength: 40 lbf/inch in width.
 - 6. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

- C. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
 - 1. Width: 2 inches.
 - 2. Thickness: 6 mils.
 - 3. Adhesion: 64 ounces force/inch in width.
 - 4. Elongation: 500 percent.
 - 5. Tensile Strength: 18 lbf/inch in width.

- D. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.
 - 1. Width: 2 inches.
 - 2. Thickness: 3.7 mils.
 - 3. Adhesion: 100 ounces force/inch in width.
 - 4. Elongation: 5 percent.
 - 5. Tensile Strength: 34 lbf/inch in width.

- E. PVDC Tape: White vapor-retarder PVDC tape with acrylic adhesive.
 - 1. Width: 3 inches.
 - 2. Film Thickness: 4 mils .
 - 3. Adhesive Thickness: 1.5 mils.
 - 4. Elongation at Break: 145 percent.
 - 5. Tensile Strength: 55 lbf/inch in width.

2.10 SECUREMENTS

A. Bands:

1. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, ; 0.015 inch thick, 3/4 inch wide with wing seal or closed seal.
2. Aluminum: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 3/4 inch wide with wing seal or closed seal.
3. Springs: Twin spring set constructed of stainless steel with ends flat and slotted to accept metal bands. Spring size determined by manufacturer for application.

B. Insulation Pins and Hangers:

1. Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.135-inch- diameter shank, length to suit depth of insulation indicated.
2. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.135-inch- diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.
3. Metal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place.
 - a. Baseplate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
 - b. Spindle: Copper- or zinc-coated, low-carbon steel , fully annealed, 0.106-inch- diameter shank, length to suit depth of insulation indicated.
 - c. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.
4. Nonmetal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate fastened to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place.
 - a. Baseplate: Perforated, nylon sheet, 0.030 inch thick by 1-1/2 inches in diameter.
 - b. Spindle: Nylon, 0.106-inch- diameter shank, length to suit depth of insulation indicated, up to 2-1/2 inches.
 - c. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.
5. Self-Sticking-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place.
 - a. Baseplate: Galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
 - b. Spindle: Copper- or zinc-coated, low-carbon steel , fully annealed, 0.106-inch- diameter shank, length to suit depth of insulation indicated.
 - c. Adhesive-backed base with a peel-off protective cover.
6. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick, galvanized-steel sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

- a. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in exposed locations.
- 7. Nonmetal Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick nylon sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.
- C. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.
- D. Wire: 0.062-inch soft-annealed, galvanized steel.

2.11 CORNER ANGLES

- A. PVC Corner Angles: 30 mils thick, minimum 1 by 1 inch, PVC according to ASTM D 1784, Class 16354-C. White or color-coded to match adjacent surface.
- B. Aluminum Corner Angles: 0.040 inch thick, minimum 1 by 1 inch, aluminum according to ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14.
- C. Stainless-Steel Corner Angles: 0.024 inch thick, minimum 1 by 1 inch, stainless steel according to ASTM A 167 or ASTM A 240/A 240M, Type 304 or Type 316.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
 - 1. Verify that systems and equipment to be insulated have been tested and are free of defects.
 - 2. Verify that surfaces to be insulated are clean and dry.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Surface Preparation: Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:
 - 1. Stainless Steel: Coat 300 series stainless steel with epoxy primer 5 mils thick and an epoxy finish 5 mils thick if operating in a temperature range between 140 and 300 deg F. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
 - 2. Carbon Steel: Coat carbon steel operating at a service temperature between 32 and 300 deg F with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

- C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that applies to insulation.
- D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Keep insulation materials dry during application and finishing.
- G. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- H. Install insulation with least number of joints practical.
- I. Install insulation with factory-applied jackets as follows:
 - 1. Draw jacket tight and smooth.
 - 2. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
 - 3. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints when an integral self-seal lap is not utilized.
- J. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- K. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- L. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere patches similar to butt joints.
- M. For above ambient services, do not install insulation to the following:
 - 1. Vibration-control devices.
 - 2. Testing agency labels and stamps.

3. Nameplates and data plates.
4. Manholes.
5. Handholes.
6. Cleanouts.

3.4 INSTALLATION OF EQUIPMENT, TANK, AND VESSEL INSULATION

- A. Mineral-Fiber, Pipe, and Tank Insulation Installation for Tanks and Vessels: Secure insulation with adhesive and anchor pins and speed washers.
 1. Groove and score insulation materials to fit as closely as possible to equipment, including contours. Bevel insulation edges for cylindrical surfaces for tight joints. Stagger end joints.
 2. Protect exposed corners with secured corner angles.
 3. Install adhesively attached or self-sticking insulation hangers and speed washers on sides of tanks and vessels as follows:
 - a. Do not weld anchor pins to ASME-labeled pressure vessels.
 - b. Select insulation hangers and adhesive that are compatible with service temperature and with substrate.
 - c. On tanks and vessels, maximum anchor-pin spacing is 3 inches from insulation end joints, and 16 inches o.c. in both directions.
 - d. Do not overcompress insulation during installation.
 - e. Cut and miter insulation segments to fit curved sides and domed heads of tanks and vessels.
 - f. Impale insulation over anchor pins and attach speed washers.
 - g. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
 4. Secure each layer of insulation with stainless-steel or aluminum bands. Select band material compatible with insulation materials.
 5. Where insulation hangers on equipment and vessels are not permitted or practical and where insulation support rings are not provided, install a girdle network for securing insulation. Stretch pre-stressed aircraft cable around the diameter of vessel and make taut with clamps, turnbuckles, or breather springs. Place one circumferential girdle around equipment approximately 6 inches from each end. Install wire or cable between two circumferential girdles 12 inches o.c. Install a wire ring around each end and around outer periphery of center openings, and stretch prestressed aircraft cable radially from the wire ring to nearest circumferential girdle. Install additional circumferential girdles along the body of equipment or tank at a minimum spacing of 48 inches o.c. Use this network for securing insulation with tie wire or bands.
 6. Stagger joints between insulation layers at least 3 inches.
 7. Install insulation in removable segments on equipment access doors, manholes, handholes, and other elements that require frequent removal for service and inspection.
 8. Bevel and seal insulation ends around manholes, handholes, ASME stamps, and nameplates.
 9. For equipment with surface temperatures below ambient, apply mastic to open ends, joints, seams, breaks, and punctures in insulation.

- B. Flexible Elastomeric Thermal Insulation Installation for Tanks and Vessels: Install insulation over entire surface of tanks and vessels.
 - 1. Seal longitudinal seams and end joints.

- C. Insulation Installation on Pumps:

- 1. Fabricate metal boxes lined with insulation. Fit boxes around pumps and coincide box joints with splits in pump casings. Fabricate joints with outward bolted flanges. Bolt flanges on 6-inch centers, starting at corners. Install 3/8-inch- diameter fasteners with wing nuts. Alternatively, secure the box sections together using a latching mechanism.
 - 2. Fabricate boxes from galvanized steel , at least 0.050 inch thick.

3.5 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

- A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.6 FIELD-APPLIED JACKET INSTALLATION

- A. Where FSK jackets are indicated, install as follows:

- 1. Draw jacket material smooth and tight.
 - 2. Install lap or joint strips with same material as jacket.
 - 3. Secure jacket to insulation with manufacturer's recommended adhesive.
 - 4. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch- wide joint strips at end joints.
 - 5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.

- B. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints; for horizontal applications, install with longitudinal seams along top and bottom of tanks and vessels. Seal with manufacturer's recommended adhesive.

- 1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

- C. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

- D. Where PVDC jackets are indicated, install as follows:

- 1. Jacket can be wrapped in cigarette fashion along length of roll for insulation systems with an outer circumference of 33-1/2 inches or less. 33-1/2-inch- circumference limit allows for 2-inch- overlap seal. Using the length of roll allows for longer sections of jacket to be installed at one time. Use adhesive on the lap seal. Visually inspect lap seal for "fishmouthing," and use PVDC tape along lap seal to secure joint.

2. Repair holes or tears in PVDC jacket by placing PVDC tape over the hole or tear and wrapping a minimum of 1-1/4 circumferences to avoid damage to tape edges.

3.7 FINISHES

- A. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.
- B. Do not field paint aluminum or stainless-steel jackets.

3.8 FIELD QUALITY CONTROL

- A. Inspections.: Perform the following field quality-control inspections, after installing insulation materials, jackets and finishes to determine compliance with these Specifications
 1. Throughout the installation process of piping insulation, verify that all insulation materials, jackets, adhesives, sealants and jacketing have been installed in accordance with the manufacturer's requirements and the requirements of this section.
 2. If requested by Owner's Representative, be prepared to remove sample segments of insulation and covers from piping for compliance inspection.
- B. Insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.
- C. Re-install insulation and covers and equipment covers for inspection according to these Specifications.

3.9 EQUIPMENT INSULATION SCHEDULE

- A. Insulation materials and thicknesses are identified below. If more than one material is listed for a type of equipment, selection from materials listed is Contractor's option.
- B. Insulate indoor and outdoor equipment that is not factory insulated.
- C. Domestic hot-water pump insulation shall be one of the following:
 1. Mineral-Fiber Board: 1 inch.
- D. Domestic hot-water storage tank insulation shall be one of the following, of thickness to provide an R-value of 12.5
 1. Mineral-Fiber Blanket: 3-lb/cu. ft. nominal density.
 2. Mineral-Fiber Board: 3-lb/cu. ft. nominal density.
 3. Mineral-fiber pipe and tank.

3.10 INDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

- B. If more than one material is listed, selection from materials listed is Contractor's option.
- C. Equipment, Concealed: None.
- D. Equipment, Exposed: None.

3.11 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. If more than one material is listed, selection from materials listed is Contractor's option.
- C. Equipment, Concealed: None.
- D. Equipment, Exposed: Aluminum, Stucco Embossed with Z-Shaped Locking Seam: 0.016 inch thick.

END OF SECTION

SECTION 220719 - PLUMBING PIPING INSULATION

GENERAL

1.1 SUMMARY

- A. Section applies to the following plumbing piping services:
 - 1. Domestic hot-water piping.
 - 2. Domestic recirculating hot-water piping.
 - 3. Supplies and drains for handicap-accessible lavatories and sinks.
- B. Related Sections:
 - 1. Section 220716 "Plumbing Equipment Insulation."

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied, if any).

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Material Test Reports: From a qualified testing agency acceptable to Owner indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.
- C. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84 by a testing agency acceptable to Owner. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

- C. Comply with the following applicable standards and other requirements specified for miscellaneous components:
 - 1. Supply and Drain Protective Shielding Guards: ICC A117.1.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.6 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
- B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.
- C. Coordinate installation and testing of heat tracing.

1.7 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PRODUCTS

1.8 INSULATION MATERIALS

- A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

- F. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.
- G. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type I. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
- H. Mineral-Fiber, Preformed Pipe Insulation:
 - 1. Type I, 850 Deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ-SSL. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1.9 INSULATING CEMENTS

- A. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.

1.10 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.
- B. Flexible Elastomeric and Adhesive: Comply with MIL-A-24179A, Type II, Class I.
 - 1. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
 - 1. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
 - 1. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- E. PVC Jacket Adhesive: Compatible with PVC jacket.
 - 1. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

1.11 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.
 1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.
 1. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
 2. Service Temperature Range: Minus 20 to plus 180 deg F.
 3. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
 4. Color: White.
- C. Vapor-Barrier Mastic: Solvent based; suitable for indoor use on below-ambient services.
 1. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 35-mil dry film thickness.
 2. Service Temperature Range: 0 to 180 deg F.
 3. Solids Content: ASTM D 1644, 44 percent by volume and 62 percent by weight.
 4. Color: White.
- D. Vapor-Barrier Mastic: Solvent based; suitable for outdoor use on below-ambient services.
 1. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 30-mil dry film thickness.
 2. Service Temperature Range: Minus 50 to plus 220 deg F.
 3. Solids Content: ASTM D 1644, 33 percent by volume and 46 percent by weight.
 4. Color: White.
- E. Breather Mastic: Water based; suitable for indoor and outdoor use on above-ambient services.
 1. Water-Vapor Permeance: ASTM F 1249, 1.8 perms at 0.0625-inch dry film thickness.
 2. Service Temperature Range: Minus 20 to plus 180 deg F.
 3. Solids Content: 60 percent by volume and 66 percent by weight.
 4. Color: White.

1.12 LAGGING ADHESIVES

- A. Description: Comply with MIL-A-3316C, Class I, Grade A, and shall be compatible with insulation materials, jackets, and substrates.
 1. For indoor applications, use lagging adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 2. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over pipe insulation.

3. Service Temperature Range: 0 to plus 180 deg F.
4. Color: White.

1.13 SEALANTS

A. Joint Sealants:

1. Materials shall be compatible with insulation materials, jackets, and substrates.
2. Permanently flexible, elastomeric sealant.
3. Service Temperature Range: Minus 100 to plus 300 deg F.
4. Color: White or gray.
5. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
6. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. FSK and Metal Jacket Flashing Sealants:

1. Materials shall be compatible with insulation materials, jackets, and substrates.
2. Fire- and water-resistant, flexible, elastomeric sealant.
3. Service Temperature Range: Minus 40 to plus 250 deg F.
4. Color: Aluminum.
5. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
6. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. Materials shall be compatible with insulation materials, jackets, and substrates.
2. Fire- and water-resistant, flexible, elastomeric sealant.
3. Service Temperature Range: Minus 40 to plus 250 deg F.
4. Color: White.
5. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
6. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

1.14 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

1.15 FIELD-APPLIED JACKETS

- A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.
- B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.
 1. Adhesive: As recommended by jacket material manufacturer.
 2. Color: White.
 3. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
 - a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.
- C. Metal Jacket:
 1. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.
 - a. Factory cut and rolled to size.
 - b. Finish and thickness are indicated in field-applied jacket schedules.
 - c. Moisture Barrier for Outdoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper.
 - d. Factory-Fabricated Fitting Covers:
 - 1) Same material, finish, and thickness as jacket.
 - 2) Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.
 - 3) Tee covers.
 - 4) Flange and union covers.
 - 5) End caps.
 - 6) Beveled collars.
 - 7) Valve covers.
 - 8) Field fabricate fitting covers only if factory-fabricated fitting covers are not available.
 2. Stainless-Steel Jacket: ASTM A 167 or ASTM A 240/A 240M.
 - a. Factory cut and rolled to size.
 - b. Material, finish, and thickness are indicated in field-applied jacket schedules.
 - c. Moisture Barrier for Outdoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper.
 - d. Factory-Fabricated Fitting Covers:
 - 1) Same material, finish, and thickness as jacket.

- 2) Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.
 - 3) Tee covers.
 - 4) Flange and union covers.
 - 5) End caps.
 - 6) Beveled collars.
 - 7) Valve covers.
 - 8) Field fabricate fitting covers only if factory-fabricated fitting covers are not available.
- D. Underground Direct-Buried Jacket: 125-mil- thick vapor barrier and waterproofing membrane consisting of a rubberized bituminous resin reinforced with a woven-glass fiber or polyester scrim and laminated aluminum foil.

1.16 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
1. Width: 3 inches.
 2. Thickness: 11.5 mils.
 3. Adhesion: 90 ounces force/inch in width.
 4. Elongation: 2 percent.
 5. Tensile Strength: 40 lbf/inch in width.
 6. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.
- B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.
1. Width: 3 inches.
 2. Thickness: 6.5 mils.
 3. Adhesion: 90 ounces force/inch in width.
 4. Elongation: 2 percent.
 5. Tensile Strength: 40 lbf/inch in width.
 6. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.
- C. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
1. Width: 2 inches.
 2. Thickness: 6 mils.
 3. Adhesion: 64 ounces force/inch in width.
 4. Elongation: 500 percent.
 5. Tensile Strength: 18 lbf/inch in width.
- D. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.
1. Width: 2 inches.
 2. Thickness: 3.7 mils.

3. Adhesion: 100 ounces force/inch in width.
4. Elongation: 5 percent.
5. Tensile Strength: 34 lbf/inch in width.

1.17 SECUREMENTS

A. Bands:

1. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304 or Type 316; 0.015 inch thick, 3/4 inch wide with wing seal or closed seal.
2. Aluminum: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 3/4 inch wide with wing seal or closed seal.

B. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.

C. Wire: 0.062-inch soft-annealed, stainless steel or 0.062-inch soft-annealed, galvanized steel.

1.18 PROTECTIVE SHIELDING GUARDS

A. Protective Shielding Pipe Covers,:

1. Description: Manufactured plastic wraps for covering plumbing fixture hot water supplies and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.

B. Protective Shielding Piping Enclosures,:

1. Description: Manufactured plastic enclosure for covering plumbing fixture hot water supplies and trap and drain piping. Comply with ADA requirements.

EXECUTION

1.19 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.

1. Verify that systems to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1.20 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

- C. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

1.21 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Install insulation to engulf hangers on all systems.
- G. Keep insulation materials dry during application and finishing.
- H. Install insulation with tight longitudinal seams and end joints.
- I. Install insulation with least number of joints practical.
- J. Install insulation with factory-applied jackets as follows:
 - 1. Draw jacket tight and smooth.
- K. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- L. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- M. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere patches similar to butt joints.
- N. For above-ambient services, do not install insulation to the following:
 - 1. Vibration-control devices.
 - 2. Testing agency labels and stamps.
 - 3. Nameplates and data plates.
 - 4. Cleanouts.

1.22 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
 - 1. Seal penetrations with flashing sealant.
 - 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 - 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
 - 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.
- C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
 - 1. Seal penetrations with flashing sealant.
 - 2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 - 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
 - 4. Seal jacket to wall flashing with flashing sealant.
- D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
 - 1. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping and fire-resistive joint sealers.
- F. Insulation Installation at Floor Penetrations:
 - 1. Pipe: Install insulation continuously through floor penetrations.
 - 2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

1.23 GENERAL PIPE INSULATION INSTALLATION

- A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:

1. Insulate valves, strainers, flanges, and unions only when specified in the Drawings or the insulation schedule.
2. Insulate pipe elbows using preformed PVC fitting covers with fiberglass inserts.
3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit.
4. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
5. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

1.24 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

- A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated if flexible elastomeric insulation is not provided with self-sealing lap.
- B. Insulation Installation on Pipe Flanges:
 1. Install pipe insulation to outer diameter of pipe flange.
 2. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
 3. Secure insulation to flanges and seal seams using the integral self-sealing lap.
- C. Insulation Installation on Pipe Fittings and Elbows:
 1. Install mitered sections of pipe insulation.
 2. Secure insulation to flanges and seal seams using the integral self-sealing lap.
- D. Insulation Installation on Valves and Pipe Specialties:
 1. Install preformed valve covers manufactured of same material as pipe insulation when available.
 2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
 3. Install insulation to flanges as specified for flange insulation application.
 4. Secure insulation to flanges and seal seams using the integral self-sealing lap.

1.25 INSTALLATION OF MINERAL-FIBER INSULATION

- A. Insulation Installation on Straight Pipes and Tubes:
 1. Secure each layer of preformed pipe insulation to pipe.

2. For insulation with factory-applied jackets with self-sealing laps, surfaces, secure laps using the integral jacket adhesive tape.
- B. Insulation Installation on Pipe Flanges:
1. Install preformed pipe insulation to outer diameter of pipe flange.
 2. Fill voids with mineral-fiber blanket insulation.
 3. For insulation on below-ambient surfaces tape joints as recommended by insulation material manufacturer and seal raw ends and joints with vapor-barrier mastic.
- C. Insulation Installation on Pipe Fittings and Elbows:
1. Install preformed sections of insulation when available and cover with preformed covers.
 2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.
- D. Insulation Installation on Valves and Pipe Specialties:
1. Install preformed sections of same material as straight segments of pipe insulation when available.
 2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
 3. Fill voids between within the preformed insulation section with mineral-fiber blanket insulation.
 4. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
 5. Install insulation to flanges as specified for flange insulation application.

1.26 FIELD-APPLIED JACKET INSTALLATION

- A. Where FSK jackets are indicated, install as follows:
1. Draw jacket material smooth and tight.
 2. Install lap or joint strips with same material as jacket.
 3. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch- wide joint strips at end joints.
 4. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.
- B. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints. Seal with manufacturer's recommended adhesive.
1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.
- C. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

1.27 FINISHES

- A. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.
- B. Do not field paint aluminum or stainless-steel jackets.

1.28 FIELD QUALITY CONTROL

- A. Inspections: Perform the following field quality-control inspections, after installing insulation materials, jackets and finishes to determine compliance with these Specifications.
 - 1. Throughout the installation process of piping insulation, verify that all insulation materials, jackets, adhesives, sealants and jacketing have been installed in accordance with the manufacturer's requirements and the requirements of this section.
 - 2. If requested by Owner's Representative, be prepared to remove sample segments of insulation and covers from piping for compliance inspection.
- B. Insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.
- C. Re-install insulation and covers and equipment covers for inspection according to these Specifications.

1.29 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. Unless otherwise indicated, Insulation thickness indicated is based on Mineral Fiber. Where Flexible Elastomeric insulation is also indicated as an option, provide equivalent thickness establishing minimum thermal resistance provided from Mineral Fiber thickness value.

1.30 INDOOR PIPING INSULATION SCHEDULE

- A. Recirculating Domestic Hot Water:
 - 1. NPS 3/4 and Smaller: Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
 - 2. NPS 1 to NPS 1-1/2: Mineral-Fiber, Preformed Pipe Insulation, Type I: 1-1/2 inch thick.
 - 3. NPS 2 and Larger: Mineral-Fiber, Preformed Pipe Insulation, Type I: 2 inch thick.
- B. Exposed Sanitary Drains, Domestic Water, Domestic Hot Water, and Stops for Plumbing Fixtures for People with Disabilities:
 - 1. All Pipe Sizes: Insulation shall be one of the following:
 - a. Flexible Elastomeric: 1 inch thick.
 - b. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
 - c. Pre-fabricated assembly of equal thermal insulating capacity.

- C. Floor Drains, Traps, and Sanitary Drain Piping within 10 Feet of Drain Receiving Condensate and Equipment Drain Water below 60 Deg F:
 - 1. All Pipe Sizes: Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
- D. Condensate Drain Piping from mechanical equipment with drainage Water below 60 Deg F:
 - 1. All Pipe Sizes: Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.

1.31 OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE

- A. Domestic Water Piping:
 - 1. All Pipe Sizes: Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
- B. Recirculating Domestic Hot Water:
 - 1. NPS 3/4 and Smaller: Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
 - 2. NPS 1 to NPS 1-1/2: Mineral-Fiber, Preformed Pipe Insulation, Type I: 1-1/2 inch thick.
 - 3. NPS 2 and Larger: Mineral-Fiber, Preformed Pipe Insulation, Type I: 2 inch thick.
- C. Hot Service Drains:
 - 1. All Pipe Sizes: Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
- D. Hot Service Vents:
 - 1. All Pipe Sizes: Mineral-Fiber, Preformed Pipe Insulation, Type II: 1 inch thick.

1.32 INDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. If more than one material is listed, selection from materials listed is Contractor's option.
- C. Piping, Concealed: None.
- D. Piping, Exposed: None.

1.33 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. If more than one material is listed, selection from materials listed is Contractor's option.
- C. Piping, Concealed: None.
- D. Piping, Exposed: Stucco Embossed 0.016 inch thick.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
FIRE CAMP 13 RECONSTRUCTION
PROJECT ID: 00002191

HUITT-ZOLLARS, INC.
PROJECT NO. R311608.14
CONSTRUCTION DOCUMENT 01/04/2023

END OF SECTION

SECTION 220800 - COMMISSIONING OF PLUMBING

PART 1 -

PART 2 - GENERAL

2.1 SUMMARY

A. Related Documents:

1. Drawings and general provisions of the Subcontract apply to this Section.
2. Review these documents for coordination with additional requirements and information that apply to work under this Section.

B. Section Includes:

1. General requirements that apply to implementation of commissioning of plumbing systems, assemblies and components.

C. Related Sections:

1. Division 01 Section "General Requirements."
2. Division 01 Section "Special Procedures."
3. Division 22 Plumbing Sections.

2.2 REFERENCES

A. General:

1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.
3. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.
4. Refer to Division 22 Section "Common Results for Plumbing" for codes and standards, and other general requirements.

2.3 DESCRIPTION

- A. The purpose of commission is to ensure the Owner that work has been completed as specified and that systems are functioning in the manner as described in Division 22 Section "Common Results for Plumbing" and specified system operating criteria. It will assist operating staff training and familiarization with new systems. It will serve as a tool to reduce post-occupancy critical systems operational difficulty or failure. It will, also, be used to develop test protocol and record the associated test data in an effort to advance the building systems from a state of substantial completion to a full dynamic operation.

- B. Commission will commence after preliminary punch list items are completed by Subcontractors.

- C. The steps associated with commissioning are outlined below:
 - 1. Step One - Installation Verification
 - 2. Step Two - System Start-Up.
 - 3. Step Three – Functional Performance Testing.
- D. Operational staff training is essential to the commission process and will run concurrently with steps one through three.
- E. The Commissioning Team will include representatives of the Owner, Construction and Installing Subcontractors, Test and Balance Subcontractor, FMCS Subcontractor and Construction Subcontractor's Commissioning Agent. Equipment manufacturer's representatives will be present for start-up as specified in the equipment specification sections and for equipment training.

2.4 SYSTEMS TO BE COMMISSIONED

- A. Commissioning will be performed on the following systems:
 - 1. Domestic Water Heating System

2.5 SUBMITTALS

- A. Submit under provisions of Division 22 Section "Common Results for Plumbing - Review of Materials" and Division 01 Section "General Requirements."
- B. Commissioning Plan as prepared by the prime Subcontractor or his Commissioning Agent.
- C. Prime subcontractors or his Commissioning Agent shall provide Functional Performance Tests (FPT) procedures for the above listed systems. Prime subcontractors or his Commissioning Agent shall provide system narrative descriptions as part of the FPT procedures.

PART 3 - PRODUCTS

3.1 COMMISSIONING PLAN

- A. The commissioning plan shall outline the organization, scheduling, team members, and documentation pertaining to the overall commissioning process.

3.2 NARRATIVE DESCRIPTIONS

- A. A narrative description of the design intents of the systems and their intended modes of sequences of operation.

3.3 FUNCTIONAL PERFORMANCE TESTS (FPT) PROCEDURES

- A. The FPT procedures at the minimum shall consist of the following sections:

1. Narrative Description:
 - a. This section provides a narrative description of the design intents of the systems and their intended modes of sequences of operation.
2. Testing Prerequisites:
 - a. This section contains verification that primary mechanical, electrical, and controls systems that support or interact with the system that the FPT is prepared against are completed, tested and operational.
3. Installation Verification:
 - a. This section contains verification that the system installation is completed and is ready for commissioning.
4. Commencement of Functional Performance Testing:
 - a. This section records the date and time of the start of system commissioning.
5. System Condition Prior to Starting Performance Testing:
 - a. This section records the current set points and parameters of the system at the start of commissioning.
6. Functional Performance Test:
 - a. This section shall provide the following:
 - 1) Sequential steps required to set parameters and conditions required to test component and functions throughout intended ranges of operation.
 - 2) Full range of checks and tests carried out to determine if electric and pneumatic connections, components, subsystems, systems and interfaces between systems function in accordance with the contract documents and design intents.
 - 3) All modes and sequences of control operations, interlocks and conditional control responses and specified responses to abnormal emergency conditions.
7. End of Functional Performance Test:
 - a. This section records the date and time of the end of system commissioning.
8. Field Notes:
 - a. This section records notes or remarks during system commissioning.
9. List systems modifications, not required by the Contract Documents, but provided by the Subcontractor. List other questions regarding such system modifications.
10. List problems discovered during Commissioning that were corrected.
11. List problems discovered during Commissioning that were not corrected.
12. List recommended party that should take action on these problems.

PART 4 - EXECUTION

4.1 GENERAL

- A. The Subcontractors shall be responsible for performing procedures presented in specification and contract drawings as detailed in the Functional Performance Tests (FPT). Members of the designated Commissioning Team shall witness various portions of the commissioning process. Responsibilities for these activities are listed in the following paragraphs. Commissioning Team members shall sign-off on appropriate sections after verifying installation, operation, or documentation. Final sign-off shall be by the Owner and Commissioning Agent.

- B. Any test ports, gauges, test equipment, etc., needed to accomplish the functional performance tests shall be provided by Subcontractors.
- C. Subcontractors shall provide to the Commissioning Team documentation of calibration of controls. Documentation shall include dates, setpoints, calibration coefficients, control loop verification, and other data required to verify system check-out. Documentation shall be dated and initialed by field engineer or technician performing the work.

4.2 OPERATIONAL STAFF TRAINING

- A. System narrative descriptions will be prepared by the Commission Agent and supported by flow diagrams, one line diagrams, and appropriate specification sections for major systems to be commissioned. The Commission Agent will coordinate "system description" meetings with members of facility management and maintenance department groups to review system description documentation. The meetings will provide an overview of major system features, components, and arrangements.
- B. The Subcontractor and associated manufacturer's representatives shall provide required training to operational staff after the system description meetings have occurred. The Subcontractor training sessions shall provide a more detailed analogy of systems operation and maintenance.

4.3 INSTRUMENTATION

- A. Instrumentation will be provided by the Subcontractor. Instruments used for measurements shall be accurate. Calibration histories for each instrument shall be available for examination. Calibration and maintenance of instruments shall be in accordance with the requirements of NEBB or AABC Standards.
- B. Application of instruments and accuracy of measurements shall be in accordance with NEBB or AABC Standards.

4.4 DOCUMENTATION

- A. The installing Subcontractor shall be responsible for collection of pertinent data during system start-up and functional performance testing. The Subcontractor shall submit to the Commissioning Agent documentation of tests performed prior to and after system start-up. Documentation shall also include start-up procedures as approved by Commissioning Team.
- B. Documentation is to be typewritten on 8-1/2 by 11 inches (200 by 280 mm) paper and inserted in a 2 inches (50 mm) to 3 inches (75 mm) thick three ring binder. Indicate the project name, number, volume number, and volume title on the end panel of each binder.
- C. Provide a title sheet for each volume and list the following:
 - 1. Volume Title and Section Name and Number requiring this submittal.
 - 2. Project name, project number, and address.
 - 3. Subcontractor name, address, and phone number.
 - 4. Name, title, signature, and date of person making the submittal.

5. Name of Owner, a blank line for signature, and the date of person accepting the submittal.
 6. Name, address, and phone number of Commission Agent; a blank line for signature; and date of person accepting the submittal.
- D. Provide a Table of Contents for multiple submittals. List each submittal and page number. Number each page, centered on the bottom in sequential numerical order. Provide tabs for multiple submittals in a single binder.

4.5 STEP ONE - INSTALLATION VERIFICATION

A. General Commissioning responsibilities:

1. Before system start-up begins, the Commission Team shall conduct a final installation verification audit. The Subcontractor shall be responsible for completion of work including change orders and punch list items to the Owner's satisfaction. The audit shall include, but not be limited to, checking of:
 - a. Piping specialties including balance, control, and isolation valves.
 - b. Ductwork specialty items including turning devices, balance, fire, smoke, control dampers, and access doors.
 - c. Control sensor types and location.
 - d. Identification of piping, valves, equipment, controls, etc.
 - e. Major equipment, pumps, valves, starters, gauges, thermometers, etc.
 - f. Documentation of prestart-up tests performed, including manufacturer's factory tests.
2. If work is found to be incomplete, incorrect, or non-functional, the Subcontractor shall correct the deficiency before system start-up work proceeds.

4.6 STEP TWO - SYSTEM START-UP

A. General Commissioning Responsibilities:

1. A start-up plan shall be developed and submitted by the installing Subcontractor. Start-up plan to include the following:
 - a. Flushing and cleaning of pipe.
 - b. Filters, strainers, and screens.
 - c. Valve/damper positions.
 - d. Electrical tests.
 - e. Pressure tests.
 - f. Safeties.
 - g. Chemical treatment.
 - h. Manufacturer's tests.
2. The start-up plan will be reviewed and a prestart-up inspection performed by designated members of the Commissioning Team. The installing Subcontractor shall commence with system start-up after approval has been given to start-up plan and the prestart-up inspection is completed. Designated members of the Commissioning Team shall witness system start-up and list system and equipment deficiencies noted during start-up. The Subcontractor shall take

corrective action on system deficiencies noted and demonstrate to the Commissioning Team members suitable system operation.

3. Designated systems requiring test and balance work shall have this activity commence after systems have successfully completed start-up. System and equipment deficiencies observed during this activity is to be noted and corrected.

4.7 STEP THREE - FUNCTIONAL PERFORMANCE TESTING

A. General Commissioning Responsibilities:

1. Functional Performance Testing begins after operational testing, adjusting, and balancing of the systems have been completed by the Subcontractors; and the System Description and Hands-on Training sessions have been completed.
2. The objective of the Functional Performance Testing is to advance the building systems from a state of substantial completion to full dynamic operation in accordance with the specified design requirements and design intent.
3. Attaining this object will be accomplished by developing individual systems testing protocols which, when implemented by the Subcontractor, will allow the Commissioning Team to observe, evaluate, identify deficiencies, recommend modifications, tune, and document the systems and systems equipment performance over a range of load and functional levels.
4. Functional Performance tests for the systems to be commissioned are defined in the Commissioning Plan. These tests are intended to be conclusive but may require minor modifications as system operation dictates.

END OF SECTION

SECTION 221116 - DOMESTIC WATER PIPING

GENERAL

1.1 RELATED DOCUMENTS

- A. Approved Design / Build Plumbing Methods and Materials Construction Standards and Submittals.

1.2 SUMMARY

- A. Section Includes:

- 1. Under-building-slab and aboveground domestic water pipes, tubes, and fittings inside buildings.
- 2. Encasement for piping.

1.3 INFORMATIONAL SUBMITTALS

- A. System purging and disinfecting activities report.
- B. Field quality-control reports.

PRODUCTS

1.4 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.
- B. Potable-water piping and components shall comply with NSF 14 and NSF 61. Plastic piping components shall be marked with "NSF-pw."

1.5 COPPER TUBE AND FITTINGS

- A. Hard Copper Tube: ASTM B 88, Type K water tube, drawn temper.
- B. Cast-Copper, Solder-Joint Fittings: ASME B16.18, pressure fittings.
- C. Wrought-Copper, Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.
- D. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.
- E. Copper Unions:
 - 1. MSS SP-123.
 - 2. Cast-copper-alloy, hexagonal-stock body.

3. Ball-and-socket, metal-to-metal seating surfaces.
4. Solder-joint or threaded ends.

F. Copper Press Fittings:

1. Description: : Copper and copper alloy press fittings shall conform to material requirements of ASME B16.18 or ASME B16.22 and performance criteria of IAPMO PS117.

G. Appurtenances for Grooved-End Copper Tubing:

1. Bronze Fittings for Grooved-End, Copper Tubing: ASTM B 75 copper tube or ASTM B 584 bronze castings.
2. Mechanical Couplings for Grooved-End Copper Tubing:
 - a. Copper-tube dimensions and design similar to AWWA C606.
 - b. Ferrous housing sections.
 - c. EPDM-rubber gaskets suitable for hot and cold water.
 - d. Bolts and nuts.
 - e. Minimum Pressure Rating: 300 psig.
 - f. 3" and larger pipe

1.6 PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials:

1. AWWA C110/A21.10, rubber, flat face, ASME B16.21, nonmetallic and asbestos free unless otherwise indicated.
2. Full-face or ring type unless otherwise indicated.

B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

C. Solder Filler Metals: Lead-free alloys, 95-5 Tin-Antimony

D. Flux: ASTM B 813, water flushable.

E. Plastic, Pipe-Flange Gaskets, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

1.7 ENCASUREMENT FOR PIPING

A. Standard: ASTM A 674 or AWWA C105/A21.5.

B. Form: Sheet or tube.

C. Color: Black or natural .

1.8 DIELECTRIC FITTINGS

- A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
- B. Dielectric Nipples:
 - 1. Standard: IAPMO PS 66.
 - 2. Electroplated steel nipple complying with ASTM F 1545.
 - 3. Pressure Rating and Temperature: 300 psig at 230 deg F .
 - 4. End Connections: Male threaded or grooved.
 - 5. Lining: Inert and noncorrosive, propylene.
 - 6. 6" long brass nipple.

EXECUTION

1.9 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as close as practical to the design drawings. Major deviations from the design drawings must be approved by Owner's Representative.
- B. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve inside the building at each domestic water-service entrance. Comply with requirements for pressure gages in Section 220519 "Meters and Gages for Plumbing Piping" and with requirements for drain valves and strainers in Section 221119 "Domestic Water Piping Specialties."
- C. Install water-pressure-reducing valves downstream from shutoff valves. Comply with requirements for pressure-reducing valves in Section 221119 "Domestic Water Piping Specialties."
- D. Install domestic water piping level without pitch and plumb.
- E. Rough-in domestic water piping for water-meter installation according to utility company's requirements.
- F. Install seismic restraints on piping. Comply with requirements for seismic-restraint devices in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- G. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.
- H. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.
- I. Install piping to permit valve servicing.

- J. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.
- K. Install piping free of sags and bends.
- L. Install fittings for changes in direction and branch connections.
- M. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.
- N. Install pressure gages on suction and discharge piping for each plumbing pump and packaged booster pump. Comply with requirements for pressure gages in Section 220519 "Meters and Gages for Plumbing Piping."
- O. Install sleeves for piping penetrations of rated walls, and floors with waterproofing. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- P. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- Q. Install escutcheons for piping penetrations of walls, below ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

1.10 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- D. Soldered Joints for Copper Tubing: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."
- E. Joint Construction for Grooved-End Copper Tubing: Make joints according to AWWA C606. Roll groove ends of tubes. Lubricate and install gasket over ends of tubes or tube and fitting. Install coupling housing sections over gasket with keys seated in tubing grooves. Install and tighten housing bolts.
- F. Joints for Dissimilar-Material Piping: Make joints using adapters compatible with materials of both piping systems.

1.11 TRANSITION FITTING INSTALLATION

- A. Install transition couplings at joints of dissimilar piping.
- B. Transition Fittings in Underground Domestic Water Piping:
 - 1. Fittings for NPS 1-1/2 and Smaller: Fitting-type coupling.
 - 2. Fittings for NPS 2 and Larger: Sleeve-type coupling.
- C. Transition Fittings in Aboveground Domestic Water Piping NPS 2 and Smaller: Plastic-to-metal transition fittings or unions.

1.12 DIELECTRIC FITTING INSTALLATION

- A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
- B. Dielectric Fittings for NPS 2 and Smaller: Use dielectric nipples or 6" long Brass nipples
- C. Dielectric Fittings for NPS 2-1/2 to NPS 4 : Use dielectric nipples or 6" long Brass nipples
- D. Dielectric Fittings for NPS 5 and Larger: Use dielectric nipples or 6" long Brass nipples

1.13 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for seismic-restraint devices in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- B. Comply with requirements for pipe hanger, support products, and installation in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
 - 1. Vertical Piping: MSS Type 8 or 42, clamps.
 - 2. Individual, Straight, Horizontal Piping Runs:
 - a. MSS Type 1, adjustable, steel clevis hangers.
 - 3. Utilize copper clad or epoxy coated galvanized hangers when hanging copper pipe and tubing.
- C. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.
- D. The hanger spacing and rod diameter listed within this specification is the maximum spacing and minimum rod diameter allowable. Refer to design drawings and standard details for project specific hanger spacing.
- E. Install hangers for copper tubing as specified on plumbing drawings.
- F. Install supports for vertical copper tubing every 10 feet or at each floor.
- G. Install hangers for steel piping as specified on plumbing drawings.

- H. Install supports for vertical steel piping every 25 feet or every other floor.

1.14 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. When installing piping adjacent to equipment and machines, allow space for service and maintenance.
- C. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.
- D. Connect domestic water piping to water-service piping with shutoff valve; extend and connect to the following:
 - 1. Domestic Water Booster Pumps: Cold-water suction and discharge piping.
 - 2. Water Heaters: Cold-water inlet and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
 - 3. Plumbing Fixtures: Cold- and hot-water-supply piping in sizes indicated, but not smaller than that required by plumbing code.
 - 4. Equipment: Cold- and hot-water-supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 and larger.

1.15 IDENTIFICATION

- A. Identify system components. Comply with requirements for identification materials and installation in Section 220553 "Identification for Plumbing Piping and Equipment."
- B. Label pressure piping with system operating pressure when two or more pressure zones are utilized.

1.16 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Piping Inspections:
 - a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by Owner's Representative.
 - b. During installation, notify Owner's Representative at least 24 hours before inspection must be made. Perform tests specified below in presence of Owner's Representative:
 - 1) Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.

- 2) Final Inspection: Arrange for Owner's Representative to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.
 - c. Reinspection: If Owner's Representative find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.
 - d. Reports: Prepare inspection reports and have them signed by Owner's Representative.
2. Piping Tests:
- a. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
 - b. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
 - c. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 - d. Cap and subject piping to static water pressure of 150% of the design pressure, but not less than 50 psig above operating pressure (150 psig max), without exceeding pressure rating of piping system materials. Isolate test source and allow it to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
 - e. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.
 - f. Prepare reports for tests and for corrective action required.
- B. Prepare test and inspection reports.

1.17 ADJUSTING

- A. Perform the following adjustments before operation:
1. Close drain valves, hydrants, and hose bibbs.
 2. Open shutoff valves to fully open position.
 3. Open throttling valves to proper setting.
 4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.
 - a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide hot-water flow in each branch.
 - b. Adjust calibrated balancing valves to flows indicated.
 5. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
 6. Remove and clean strainer screens. Close drain valves and replace drain plugs.
 7. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.

8. Check plumbing specialties and verify proper settings, adjustments, and operation.

1.18 CLEANING

- A. Clean and disinfect potable domestic water piping as follows:
 1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
 2. Use purging and disinfecting procedures prescribed by Owner's Representative; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Fill and isolate system according to either of the following:
 - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
 - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
 - c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
 - d. Repeat procedures if biological examination shows contamination.
 - e. Submit water samples in sterile bottles to Owner.
- B. Prepare and submit reports of purging and disinfecting activities. Include copies of water-sample approvals from Owner.
- C. Remove dirt and debris and clean domestic water piping system as work progresses.

1.19 PIPING SCHEDULE

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
- B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.
- C. Under-building-slab, domestic water, building-service piping, NPS 4 and larger, shall be the following:
 1. Hard copper tube, ASTM B 88, Type K, wrought-copper, solder-joint fittings; and brazed joints..
- D. Aboveground domestic water piping, NPS 4 and smaller shall be the following:
 1. Hard copper tube, ASTM B 88, Type K; wrought-copper, solder-joint fittings; mechanical groove fittings and brazed, soldered or mechanical joints.

2. Hard copper tube, ASTM B 88, Type K; copper pressure-seal-joint fittings; and pressure-sealed joints.

1.20 VALVE SCHEDULE

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
 1. Shutoff Duty: Use ball or gate valves for piping NPS 2 and smaller. Use butterfly, ball, or gate valves with flanged ends for piping NPS 2-1/2 and larger.
 2. Throttling Duty: Use ball valves for piping NPS 2 and smaller. Use butterfly or ball valves with flanged ends for piping NPS 2-1/2 and larger.
 3. Hot-Water Circulation Piping, Balancing Duty: Calibrated or Memory-stop balancing valves.
 4. Drain Duty: Hose-end drain valves.
- B. Use check valves to maintain correct direction of domestic water flow to and from equipment.
- C. Iron grooved-end valves may be used with grooved-end piping with dielectric connections.

END OF SECTION

SECTION 221119 - DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Approved Design / Build Plumbing Methods and Materials Construction Standards and Submittals.

1.2 SUMMARY

- A. Section Includes:

1. Vacuum breakers.
2. Backflow preventers.
3. Balancing valves.
4. Temperature-actuated, water mixing valves.
5. Strainers.
6. Outlet boxes.
7. Hose bibbs.
8. Drain valves.
9. Water-hammer arresters.
10. Air vents.
11. Trap-seal primer valves.
12. Trap-seal primer systems.
13. Flexible connectors.

- B. Related Requirements:

1. Section 220519 "Meters and Gages for Plumbing Piping" for thermometers, pressure gages, and flow meters in domestic water piping.
2. Section 221116 "Domestic Water Piping" for water meters.
3. Section 224000 "Plumbing Fixtures" for thermostatic mixing valves for sitz baths, thermostatic mixing-valve assemblies for hydrotherapy equipment, and outlet boxes for dialysis equipment.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For domestic water piping specialties.
 1. Include diagrams for power, signal, and control wiring.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Include operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PIPING SPECIALTIES

- A. Potable-water piping and components shall comply with NSF 61 and NSF 14.
- B. Potable water specialties shall conform with "Section 116875 of the California Health and Safety Code" also known as the California Lead Plumbing Law".

2.2 PERFORMANCE REQUIREMENTS

- A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig unless otherwise indicated.

2.3 VACUUM BREAKERS

- A. Pipe-Applied, Atmospheric-Type Vacuum Breakers :
 - 1. Standard: ASSE 1001.
 - 2. Size: NPS 1/4 to NPS 3, as required to match connected piping.
 - 3. Body: Bronze.
 - 4. Inlet and Outlet Connections: Threaded.
 - 5. Finish: Rough bronze or natural.
- B. Hose-Connection Vacuum Breakers :
 - 1. Standard: ASSE 1011.
 - 2. Body: Bronze, non-removable, with manual drain.
 - 3. Outlet Connection: Garden-hose threaded complying with ASME B1.20.7.
 - 4. Finish: Rough bronze or natural.
- C. Pressure Vacuum Breakers :
 - 1. Standard: ASSE 1020.
 - 2. Operation: Continuous-pressure applications.
 - 3. Pressure Loss: 5 psig maximum, through middle third of flow range.
 - 4. Size: Per equipment schedule.
 - 5. Design Flow Rate: Per equipment schedule
 - 6. Selected Unit Flow Range Limits: Per equipment schedule.
 - 7. Pressure Loss at Design Flow Rate: Per equipment schedule.
 - 8. Accessories:

- a. Valves: Ball type, on inlet and outlet.
- D. Laboratory-Faucet Vacuum Breakers :
- 1. Standard: ASSE 1035.
 - 2. Size: NPS 1/4 or NPS 3/8 matching faucet size.
 - 3. Body: Bronze.
 - 4. End Connections: Threaded.
 - 5. Finish: Chrome plated.

- E. Spill-Resistant Vacuum Breakers :
- 1. Standard: ASSE 1056.
 - 2. Operation: Continuous-pressure applications.
 - 3. Size: Per equipment schedule.
 - 4. Accessories:

- a. Valves: Ball type, on inlet and outlet.

2.4 BACKFLOW PREVENTERS

- A. Intermediate Atmospheric-Vent Backflow Preventers :
- 1. Standard: ASSE 1012.
 - 2. Operation: Continuous-pressure applications.
 - 3. Size: Per equipment schedule.
 - 4. Body: Bronze.
 - 5. End Connections: Union, solder joint.
 - 6. Finish: Rough bronze.
- B. Reduced-Pressure-Principle Backflow Preventers :
- 1. Standard: ASSE 1013.
 - 2. Operation: Continuous-pressure applications.
 - 3. Pressure Loss: 15 psig maximum, through middle third of flow range.
 - 4. Size: Per equipment schedule.
 - 5. Design Flow Rate: Per equipment schedule.
 - 6. Selected Unit Flow Range Limits: Per equipment schedule.
 - 7. Pressure Loss at Design Flow Rate: Per equipment schedule.
 - 8. Body: Bronze for NPS 2 and smaller; cast iron with interior lining that complies with AWWA C550 or that is FDA approved or stainless steel for NPS 2-1/2 and larger.
 - 9. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
 - 10. Configuration: Designed for horizontal, straight-through flow.
 - 11. Accessories:

- a. Valves NPS 2 and Smaller: Ball type with threaded ends on inlet and outlet.

- b. Valves NPS 2-1/2 and Larger: Outside-screw and yoke-gate type with flanged ends on inlet and outlet.
 - c. Air-Gap Fitting: ASME A112.1.2, matching backflow-preventer connection.
- C. Double-Check, Backflow-Prevention Assemblies :
 - 1. Standard: ASSE 1015.
 - 2. Operation: Continuous-pressure applications unless otherwise indicated.
 - 3. Pressure Loss: 5 psig maximum, through middle third of flow range.
 - 4. Size: Per equipment schedule.
 - 5. Design Flow Rate: Per equipment schedule.
 - 6. Selected Unit Flow Range Limits: Per equipment schedule.
 - 7. Pressure Loss at Design Flow Rate: Per equipment schedule.
 - 8. Body: Bronze for NPS 2 and smaller; cast iron with interior lining that complies with AWWA C550 or that is FDA approved for NPS 2-1/2 and larger.
 - 9. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
 - 10. Configuration: Designed for horizontal, straight-through flow.
 - 11. Accessories:
 - a. Valves NPS 2 and Smaller: Ball type with threaded ends on inlet and outlet.
 - b. Valves NPS 2-1/2 and Larger: Outside-screw and yoke-gate type with flanged ends on inlet and outlet.
- D. Beverage-Dispensing-Equipment Backflow Preventers :
 - 1. Standard: ASSE 1022.
 - 2. Operation: Continuous-pressure applications.
 - 3. Size: NPS 1/4 or NPS 3/8.
 - 4. Body: Stainless steel.
 - 5. End Connections: Threaded.
- E. Dual-Check-Valve Backflow Preventers :
 - 1. Standard: ASSE 1024.
 - 2. Operation: Continuous-pressure applications.
 - 3. Size: Per equipment schedule
 - 4. Body: Bronze with union inlet.
- F. Carbonated-Beverage-Dispenser, Dual-Check-Valve Backflow Preventers :
 - 1. Standard: ASSE 1032.
 - 2. Operation: Continuous-pressure applications.
 - 3. Size: NPS 1/4 or NPS 3/8.
 - 4. Body: Stainless steel.
 - 5. End Connections: Threaded.
- G. Double-Check, Detector-Assembly Backflow Preventers :

1. Standard: ASSE 1048 and is FM Global approved or UL listed.
2. Operation: Continuous-pressure applications.
3. Pressure Loss: 5 psig maximum, through middle third of flow range.
4. Size: Per equipment schedule.
5. Design Flow Rate: Per equipment schedule.
6. Selected Unit Flow Range Limits: Per equipment schedule.
7. Pressure Loss at Design Flow Rate: Per equipment schedule.
8. Body: Cast iron with interior lining that complies with AWWA C550 or that is FDA approved .
9. End Connections: See schedule.
10. Configuration: Designed for horizontal, straight-through flow.
11. Accessories:
 - a. Valves: Outside-screw and yoke-gate type with flanged ends on inlet and outlet.
 - b. Bypass: With displacement-type water meter, shutoff valves, and reduced-pressure backflow preventer.

H. Hose-Connection Backflow Preventers :

1. Standard: ASSE 1052.
2. Operation: Up to 10-foot head of water back pressure.
3. Inlet Size: NPS 1/2 or NPS 3/4.
4. Outlet Size: Garden-hose thread complying with ASME B1.20.7.
5. Capacity: At least 3-gpm flow.

I. Backflow-Preventer Test Kits :

1. Description: Factory calibrated, with gages, fittings, hoses, and carrying case with test-procedure instructions.

2.5 WATER PRESSURE-REDUCING VALVES

A. Water Regulators :

1. Standard: ASSE 1003.
2. Pressure Rating: Initial working pressure of 150 psig.
3. Size: Per equipment schedule.
4. Design Flow Rate: Per equipment schedule.
5. Design Inlet Pressure: Per equipment schedule.
6. Design Outlet Pressure Setting: Per equipment schedule.
7. Body: Bronze for NPS 2 and smaller; cast iron with interior lining that complies with AWWA C550 or that is FDA approved for NPS 2-1/2 and NPS 3.
8. Valves for Booster Heater Water Supply: Include integral bypass.
9. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and NPS 3.

B. Water-Control Valves :

1. Description: Pilot-operated, diaphragm-type, single-seated, main water-control valve.
2. Pressure Rating: Initial working pressure of 150 psig minimum with AWWA C550 or FDA-approved, interior epoxy coating. Include small pilot-control valve, restrictor device, specialty fittings, and sensor piping.
3. Main Valve Body: Cast- or ductile-iron body with AWWA C550 or FDA-approved, interior epoxy coating; or stainless-steel body.
 - a. Size: Per equipment schedule.
 - b. Pattern: Globe-valve design.
 - c. Trim: Stainless steel.
4. Design Flow: Per equipment schedule.
5. Design Inlet Pressure: Per equipment schedule.
6. Design Outlet Pressure Setting: Per equipment schedule.
7. End Connections: Threaded for NPS 2 and smaller; Insert type for NPS 2-1/2 and larger.

2.6 BALANCING VALVES

A. Copper-Alloy Calibrated Balancing Valves :

1. Type: Ball or Y-pattern globe valve with two readout ports and memory-setting indicator.
2. Body: Brass or bronze.
3. Size: Same as connected piping, but not larger than NPS 2.
4. Accessories: Meter hoses, fittings, valves, differential pressure meter, and carrying case.

B. Accessories: Meter hoses, fittings, valves, differential pressure meter, and carrying case.

C. Memory-Stop Balancing Valves :

1. Standard: MSS SP-110 for two-piece, copper-alloy ball valves.
2. Pressure Rating: 400-psig minimum CWP.
3. Size: NPS 2 or smaller.
4. Body: Copper alloy.
5. Port: full port.
6. Ball: Chrome-plated brass or stainless steel.
7. Seats and Seals: Replaceable.
8. End Connections: threaded.
9. Handle: Vinyl-covered steel with memory-setting device.

2.7 TEMPERATURE-ACTUATED, WATER MIXING VALVES

A. Water-Temperature Limiting Devices :

1. Standard: ASSE 1017.
2. Pressure Rating: 125 psig.
3. Type: Thermostatically controlled, water mixing valve.

4. Material: Bronze body with corrosion-resistant interior components.
 5. Connections: Sweat inlets and outlet.
 6. Accessories: Check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.
 7. Tempered-Water Setting: Per equipment schedule in Drawings.
 8. Tempered-Water Design Flow Rate: Per equipment schedule in Drawings.
 9. Valve Finish: Rough bronze.
- B. Manifold, Thermostatic, Water Mixing-Valve Assemblies :
1. Description: Factory-fabricated, exposed-mounted, thermostatically controlled, water mixing-valve assembly in two or three-valve parallel arrangement.
 2. Large-Flow Parallel: Thermostatic, water mixing valve and downstream-pressure regulator with pressure gages on inlet and outlet.
 3. Small-Flow Parallel: Thermostatic, water mixing valve.
 4. Thermostatic Mixing Valves: Comply with ASSE 1017. Include check stops on hot- and cold-water inlets and shutoff valve on outlet.
 5. Water Regulator(s): Comply with ASSE 1003. Include pressure gage on inlet and outlet.
 6. Pressure Rating: 125 psig minimum unless otherwise indicated.
 7. Selected Large-Flow, Tempered-Water Valve Size: Per equipment schedule.
 8. Tempered-Water Setting: Per equipment schedule.
 9. Unit Tempered-Water Design Flow Rate: Per equipment schedule.
 10. Unit Minimum Tempered-Water Design Flow Rate: Per equipment schedule.
 11. Selected Unit Flow Rate at 45-psig Pressure Drop: Per equipment schedule.
 12. Unit Pressure Drop at Design Flow Rate: Per equipment schedule
 13. Unit Tempered-Water Outlet Size: Per equipment schedule end connection.
 14. Unit Hot- and Cold-Water Inlet Size: Per equipment schedule end connections.
 15. Thermostatic Mixing Valve and Water Regulator Finish: Rough bronze.
 16. Piping Finish: Copper.
- C. Individual-Fixture, Water Tempering Valves :
1. Standard: ASSE 1016, thermostatically controlled, water tempering valve.
 2. Pressure Rating: 125 psig minimum unless otherwise indicated.
 3. Body: Bronze body with corrosion-resistant interior components.
 4. Temperature Control: Adjustable.
 5. Inlets and Outlet: Threaded.
 6. Finish: Rough or chrome-plated bronze.
 7. Tempered-Water Setting: Per equipment schedule.
 8. Tempered-Water Design Flow Rate: Per equipment schedule.
- D. Primary Water Tempering Valves :
1. Standard: ASSE 1017, thermostatically controlled, water tempering valve, listed as tempering valve.

2. Pressure Rating: 125 psig minimum unless otherwise indicated.
3. Body: Bronze.
4. Temperature Control: Manual.
5. Inlets and Outlet: Threaded.
6. Selected Primary Water Tempering Valve Size: Per equipment schedule.
7. Tempered-Water Setting: Per equipment schedule.
8. Tempered-Water Design Flow Rate: Per equipment schedule.
9. Pressure Drop at Design Flow Rate: Per equipment schedule.
10. Tempered-Water Outlet Size: End connection per equipment schedule.
11. Cold-Water Inlet Size: end connection per equipment schedule.
12. Hot-Water Inlet Size: end connection per equipment schedule.
13. Valve Finish: Rough bronze .

2.8 STRAINERS FOR DOMESTIC WATER PIPING

A. Y-Pattern Strainers :

1. Pressure Rating: 125 psig minimum unless otherwise indicated.
2. Body: Bronze for NPS 2 and smaller; cast iron with interior lining that complies with AWWA C550 or that is FDA approved, epoxy coated and for NPS 2-1/2 and larger.
3. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
4. Screen: Stainless steel with round perforations unless otherwise indicated.
5. Perforation Size:
 - a. Strainers NPS 2 and Smaller: 0.033 inch .
 - b. Strainers NPS 2-1/2 to NPS 4: 0.062 inch .
 - c. Strainers NPS 5 and Larger: 0.125 inch .
6. Drain: NPS 2-1/2 and smaller Pipe plug, NPS 3 and larger , hose-end drain valve.

2.9 OUTLET BOXES

A. Clothes Washer Outlet Boxes :

1. Mounting: Recessed.
2. Material and Finish: Enameled-steel, epoxy-painted-steel, or plastic box and faceplate.
3. Faucet: Combination valved fitting or separate hot- and cold-water valved fittings complying with ASME A112.18.1. Include garden-hose thread complying with ASME B1.20.7 on outlets.
4. Supply Shutoff Fittings: NPS 1/2 gate, globe, or ball valves and NPS 1/2 copper, water tubing.
5. Drain: NPS 1-1/2 NPS 2 standpipe and P-trap for direct waste connection to drainage piping.
6. Inlet Hoses: Two 60-inch- long, rubber household clothes washer inlet hoses with female, garden-hose-thread couplings. Include rubber washers.
7. Drain Hose: One 48-inch- long, rubber household clothes washer drain hose with hooked end.

B. Icemaker Outlet Boxes :

1. Mounting: Recessed.
2. Material and Finish: Enameled-steel, epoxy-painted-steel, or plastic box and faceplate.
3. Faucet: Valved fitting complying with ASME A112.18.1. Include NPS 1/2 or smaller copper tube outlet.
4. Supply Shutoff Fitting: NPS 1/2 gate, globe, or ball valve and NPS 1/2 copper, water tubing.

2.10 HOSE BIBBS

A. Hose Bibbs :

1. Standard: ASME A112.18.1 for sediment faucets.
2. Body Material: Bronze.
3. Seat: Bronze, replaceable.
4. Supply Connections: NPS 1/2 or NPS 3/4 threaded inlet.
5. Outlet Connection: Garden-hose thread complying with ASME B1.20.7.
6. Pressure Rating: 125 psig.
7. Vacuum Breaker: Integral non-removable, drainable, hose-connection vacuum breaker complying with ASSE 1011.
8. Finish for Equipment Rooms: Rough bronze, or chrome or nickel plated.
9. Finish for Service Areas: Rough bronze .
10. Finish for Finished Rooms: Chrome or nickel plated.
11. Operation for Equipment Rooms: Wheel handle or operating key.
12. Operation for Service Areas: Wheel handle or Operating key.
13. Operation for Finished Rooms: Wheel handle or Operating key.
14. Include operating key with each operating-key hose bibb.
15. Include integral wall flange with each chrome- or nickel-plated hose bibb.

2.11 DRAIN VALVES

A. Ball-Valve-Type, Hose-End Drain Valves :

1. Standard: MSS SP-110 for standard-port, two-piece ball valves.
2. Pressure Rating: 400-psig minimum CWP.
3. Size: NPS 3/4.
4. Body: Copper alloy.
5. Ball: Chrome-plated brass.
6. Seats and Seals: Replaceable.
7. Handle: Vinyl-covered steel.
8. Inlet: Threaded.
9. Outlet: Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap.

B. Gate-Valve-Type, Hose-End Drain Valves :

1. Standard: MSS SP-80 for gate valves.

2. Pressure Rating: Class 125.
3. Size: NPS 3/4.
4. Body: ASTM B 62 bronze.
5. Inlet: NPS 3/4 threaded.
6. Outlet: Garden-hose thread complying with ASME B1.20.7 and cap.

C. Stop-and-Waste Drain Valves :

1. Standard: MSS SP-110 for ball valves or MSS SP-80 for gate valves.
2. Pressure Rating: 200-psig minimum CWP or Class 125.
3. Size: NPS 3/4.
4. Body: Copper alloy or ASTM B 62 bronze.
5. Drain: NPS 1/8 side outlet with cap.

2.12 WATER-HAMMER ARRESTERS

A. Water-Hammer Arresters :

1. Standard: ASSE 1010 or PDI-WH 201.
2. Type: Copper tube with piston.
3. Size: ASSE 1010, Sizes AA and A through F, or PDI-WH 201, Sizes A through F.

2.13 AIR VENTS

A. Bolted-Construction Automatic Air Vents :

1. Body: Bronze.
2. Pressure Rating and Temperature: 125-psig minimum pressure rating at 140 deg F.
3. Float: Replaceable, corrosion-resistant metal.
4. Mechanism and Seat: Stainless steel.
5. Size: NPS 3/8 or NPS 1/2 minimum inlet.
6. Inlet and Vent Outlet End Connections: Threaded.

B. Welded-Construction Automatic Air Vents :

1. Body: Stainless steel.
2. Pressure Rating: 150-psig minimum pressure rating.
3. Float: Replaceable, corrosion-resistant metal.
4. Mechanism and Seat: Stainless steel.
5. Size: NPS 3/8 minimum inlet.
6. Inlet and Vent Outlet End Connections: Threaded.

2.14 TRAP-SEAL PRIMER DEVICE

A. Supply-Type, Trap-Seal Primer Device :

1. Standard: ASSE 1018.

2. Pressure Rating: 125 psig minimum.
3. Body: Bronze.
4. Inlet and Outlet Connections: NPS 1/2 threaded, union, or solder joint.
5. Gravity Drain Outlet Connection: NPS 1/2 threaded or solder joint.
6. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.

B. Drainage-Type, Trap-Seal Primer Device :

1. Standard: ASSE 1044, lavatory P-trap with NPS 3/8 minimum, trap makeup connection.
2. Size: NPS 1-1/4 minimum.
3. Material: Chrome-plated, cast brass.

2.15 TRAP-SEAL PRIMER SYSTEMS

A. Trap-Seal Primer Systems :

1. Standard: ASSE 1044.
2. Piping: NPS 3/4, ASTM B 88, Type L; copper, water tubing.
3. Cabinet: Recessed or Surface-mounted steel box with stainless-steel cover.
4. Electric Controls: 24-hour timer, solenoid valve, and manual switch for 120-V ac power.
 - a. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
5. Vacuum Breaker: ASSE 1001.
6. Number Outlets: See schedule in Drawings.
7. Size Outlets: NPS 1/2 or NPS 5/8.

2.16 FLEXIBLE CONNECTORS

A. Bronze-Hose Flexible Connectors: Corrugated-bronze tubing with bronze wire-braid covering and ends brazed to inner tubing.

1. Working-Pressure Rating: Minimum 200 psig .
2. End Connections NPS 2 and Smaller: Threaded copper pipe or plain-end copper tube.
3. End Connections NPS 2-1/2 and Larger: Flanged copper alloy.

B. Stainless-Steel-Hose Flexible Connectors: Corrugated-stainless-steel tubing with stainless-steel wire-braid covering and ends welded to inner tubing.

1. Working-Pressure Rating: Minimum 200 psig .
2. End Connections NPS 2 and Smaller: Threaded steel-pipe nipple.
3. End Connections NPS 2-1/2 and Larger: Flanged steel nipple.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install backflow preventers in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with Owner's installation standard. If standard is not available, install per AWWA backflow prevention or IAPMO backflow installation standard.
 - 1. Locate backflow preventers in same room as connected equipment or system.
 - 2. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe-to-floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are unacceptable for this application.
 - 3. Do not install bypass piping around backflow preventers.
- B. Install water regulators with inlet and outlet shutoff valves. Install pressure gages on inlet and outlet.
- C. Install water-control valves with inlet and outlet shutoff valves. Install pressure gages on inlet and outlet.
- D. Install balancing valves in locations where they can easily be adjusted.
- E. Install temperature-actuated, water mixing valves with check stops or shutoff valves on inlets and with shutoff valve on outlet.
 - 1. Install type as specified on plans.
- F. Install Y-pattern strainers for water on supply side of each control valve, water pressure-reducing valve, solenoid valve and pump.
- G. Install outlet boxes recessed in wall or surface mounted on wall.
- H. Install water-hammer arresters in water piping according to PDI-WH 201.
- I. Install air vents at high points of water piping. Install drain piping and discharge onto floor drain.
- J. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.
- K. Install drainage-type, trap-seal primer valves as lavatory trap with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting.
- L. Install trap-seal primer systems with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust system for proper flow.

3.2 CONNECTIONS

- A. Comply with requirements for ground equipment in Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Fire-retardant-treated-wood blocking is specified in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for electrical connections.

3.3 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Test each pressure vacuum breaker reduced-pressure-principle backflow preventer double-check, backflow-prevention assembly and double-check, detector-assembly backflow preventer according to Owner's representative and the device's reference standard.
- B. Domestic water piping specialties will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

3.4 ADJUSTING

- A. Set field-adjustable pressure set points of water pressure-reducing valves.
- B. Set field-adjustable flow set points of balancing valves.
- C. Set field-adjustable temperature set points of temperature-actuated, water mixing valves.

END OF SECTION

SECTION 221123 - DOMESTIC WATER PUMPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Horizontally mounted, in-line, close-coupled centrifugal pumps.
2. Vertically mounted, in-line, close-coupled centrifugal pumps.

1.2 DEFINITIONS

- ##### A. Low Voltage:
- As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

1.3 ACTION SUBMITTALS

- ##### A. Product Data:
- For each type of product indicated. Include materials of construction, rated capacities, certified performance curves with operating points plotted on curves, operating characteristics, electrical characteristics, and furnished specialties and accessories.

1.4 CLOSEOUT SUBMITTALS

- ##### A. Operation and Maintenance Data:
- For domestic water pumps to include in operation and maintenance manuals.

1.5 QUALITY ASSURANCE

- ##### A. Electrical Components, Devices, and Accessories:
- Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- ##### B. UL Compliance:
- Comply with UL 778 for motor-operated water pumps.

1.6 DELIVERY, STORAGE, AND HANDLING

- ##### A.
- Retain shipping flange protective covers and protective coatings during storage.
- ##### B.
- Protect bearings and couplings against damage.
- ##### C.
- Comply with pump manufacturer's written rigging instructions for handling.

1.7 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided.

PART 2 - PRODUCTS

2.1 HORIZONTALLY MOUNTED, IN-LINE, CLOSE-COUPLED CENTRIFUGAL PUMPS

- A. Manufacturers: Provide products by one of the following:
 - 1. Grundfos Pumps Corp.
 - 2. or equal
- B. Description: Factory-assembled and -tested, in-line, single-stage, close-coupled, overhung-impeller centrifugal pumps designed for installation with pump and motor shaft mounted horizontal.
- C. Pump Construction:
 - 1. Casing: Radially split with threaded companion-flange connections for pumps with NPS 2 pipe connections and flanged connections for pumps with NPS 2-1/2 pipe connections.
 - 2. Impeller: Statically and dynamically balanced, closed, and keyed to shaft.
 - 3. Shaft and Shaft Sleeve: Steel shaft with deflector, with copper-alloy shaft sleeve. Include water slinger on shaft between motor and seal.
 - 4. Seal: Mechanical, with carbon-steel rotating ring, stainless-steel spring, ceramic seat, and rubber bellows and gasket.
 - 5. Bearings: Oil-lubricated; bronze-journal or ball type.
 - 6. Shaft Coupling: Flexible, capable of absorbing torsional vibration and shaft misalignment.
- D. Motor: Single speed, with grease-lubricated ball bearings; and resiliently or rigidly mounted to pump casing.

2.2 VERTICALLY MOUNTED, IN-LINE, CLOSE-COUPLED CENTRIFUGAL PUMPS

- A. Manufacturers: Provide products by one of the following:
 - 1. Grundfos Pumps Corp.
 - 2. or equal
- B. Description: Factory-assembled and -tested, in-line, single-stage, close-coupled, overhung-impeller centrifugal pumps designed for installation with pump and motor shaft mounted vertical.
- C. Pump Construction:
 - 1. Casing: Radially split, cast iron, with wear rings and threaded companion-flange connections for pumps with NPS 2 pipe connections and flanged connections for pumps with NPS 2-1/2 pipe connections. Include pump manufacturer's base attachment for mounting pump on concrete base.
 - 2. Impeller: Statically and dynamically balanced, closed, and keyed to shaft.

3. Shaft and Shaft Sleeve: Stainless-steel shaft, with copper-alloy shaft sleeve.
 4. Seal: Mechanical, with carbon-steel rotating ring, stainless-steel spring, ceramic seat, and rubber bellows and gasket. Include water slinger on shaft between motor and seal.
 5. Bearings: Oil-lubricated; bronze-journal or ball type.
 6. Shaft Coupling: Flexible or rigid type if pump is provided with coupling.
- D. Motor: Single speed, with grease-lubricated ball bearings; and rigidly mounted to pump casing.

2.3 MOTORS

- A. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Section 220513 "Common Motor Requirements for Plumbing Equipment."
1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

2.4 CONTROLS

- A. Thermostats: Electric; adjustable for control of hot-water circulation pump.
1. Type: Water-immersion temperature sensor, for installation in piping.
 2. Range: 50 to 125 deg F.
 3. Enclosure: NEMA 250, Type 4X.
 4. Operation of Pump: On or off.
 5. Transformer: Provide if required.
 6. Power Requirement: 24 V, or 120 V, ac.
 7. Settings: Start pump at 110 deg F and stop pump at 125 deg F.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of domestic-water-piping system to verify actual locations of connections before pump installation.

3.2 PUMP INSTALLATION

- A. Comply with ANSI/HI 1.4.
- B. Install horizontally mounted, in-line, close-coupled centrifugal pumps with shaft(s) horizontal.
- C. Install vertically mounted, in-line, close-coupled centrifugal pumps with shaft vertical.
- D. Pump Mounting: Install vertically mounted, in-line, mounted on pipe and supported by manufacturer recommendation.

- E. Install thermostats in hot-water return piping.

3.3 CONNECTIONS

- A. Comply with requirements for piping specified in Section 221116 "Domestic Water Piping." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to pumps to allow service and maintenance.
- C. Connect domestic water piping to pumps. Install suction and discharge piping equal to or greater than size of pump nozzles.
 - 1. Install flexible connectors adjacent to pumps in suction and discharge piping of the following pumps:
 - a. Vertically mounted, in-line, close-coupled centrifugal pumps.
 - b. Comply with requirements for flexible connectors specified in Section 221119 "Domestic Water Piping Specialties."
 - 2. Install shutoff valve and strainer on suction side of each pump, and check, shutoff, and throttling valves on discharge side of each pump. Install valves same size as connected piping. Comply with requirements for valves specified in Section 220523 "General-Duty Valves for Plumbing Piping" and comply with requirements for strainers specified in Section 221119 "Domestic Water Piping Specialties."
- D. Connect thermostats to pumps that they control.

3.4 IDENTIFICATION

- A. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment" for identification of pumps.

3.5 STARTUP SERVICE

- A. Perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Check piping connections for tightness.
 - 3. Clean strainers on suction piping.
 - 4. Set thermostats for automatic starting and stopping operation of pumps.
 - 5. Perform the following startup checks for each pump before starting:
 - a. Verify bearing lubrication.
 - b. Verify that pump is free to rotate by hand and that pump for handling hot liquid is free to rotate with pump hot and cold. If pump is bound or drags, do not operate until cause of trouble is determined and corrected.
 - c. Verify that pump is rotating in the correct direction.
 - 6. Prime pump by opening suction valves and closing drains, and prepare pump for operation.
 - 7. Start motor.

8. Open discharge valve slowly.
9. Adjust temperature settings on thermostats.
10. Adjust timer settings.

3.6 ADJUSTING

- A. Adjust domestic water pumps to function smoothly, and lubricate as recommended by manufacturer.
- B. Adjust initial temperature set points.
- C. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

END OF SECTION

SECTION 221316 - SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Approved Design / Build Plumbing Methods and Materials Construction Standards and Submittals.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipe, tube, and fittings.
 - 2. Specialty pipe fittings.
- B. Related Sections:
 - 1. Section 221319 "Sanitary Waste Piping Specialties" for effluent and sewage pumps.

1.3 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:
 - 1. Soil, Waste, and Vent Piping: 10-foot head of water or 5 psig air.
 - 2. Waste, Force-Main Piping: 50 psig .
- B. Seismic Performance: Soil, waste, and vent piping and support and installation shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1.4 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF/ANSI 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping and "NSF-sewer" for plastic sewer piping.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 74, Service class(es).
- B. Gaskets: ASTM C 564, rubber.

2.3 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. CISPI, Hubless-Piping Couplings:
 - 1. Standards: ASTM C 1277 and CISPI 310.
 - 2. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.
- C. Heavy-Duty, Hubless-Piping Couplings:
 - 1. Standards: ASTM C 1277 and ASTM C 1540.
 - 2. Description: Stainless-steel shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.
- D. Cast-Iron, Hubless-Piping Couplings:
 - 1. Standard: ASTM C 1277.
 - 2. Description: Two-piece ASTM A 48/A 48M, cast-iron housing; stainless-steel bolts and nuts; and ASTM C 564, rubber sleeve with integral, center pipe stop.

2.4 GALVANIZED-STEEL PIPE AND FITTINGS

- A. Galvanized-Steel Pipe: ASTM A 53/A 53M, Type E, Standard Weight class. Include square-cut-grooved or threaded ends matching joining method.
- B. Galvanized-Cast-Iron Drainage Fittings: ASME B16.12, threaded.
- C. Steel Pipe Pressure Fittings:
 - 1. Galvanized-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106/A 106M, Schedule 40, seamless steel pipe. Include ends matching joining method.
 - 2. Malleable-Iron Unions: ASME B16.39; Class 150; hexagonal-stock body with ball-and-socket, metal-to-metal, bronze seating surface; and female threaded ends.
 - 3. Galvanized-Gray-Iron, Threaded Fittings: ASME B16.4, Class 125, standard pattern.
- D. Cast-Iron Flanges: ASME B16.1, Class 125.
 - 1. Flange Gasket Materials: ASME B16.21, full-face, flat, nonmetallic, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
 - 2. Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
- E. Grooved-Joint, Galvanized-Steel-Pipe Appurtenances:

1. Galvanized, Grooved-End Fittings for Galvanized-Steel Piping: ASTM A 536 ductile-iron castings, ASTM A 47/A 47M malleable-iron castings, ASTM A 234/A 234M forged steel fittings, or ASTM A 106/A 106M steel pipes with dimensions matching ASTM A 53/A 53M steel pipe, and complying with AWWA C606 for grooved ends.
2. Grooved Mechanical Couplings for Galvanized-Steel Piping: ASTM F 1476, Type I. Include ferrous housing sections with continuous curved keys; EPDM-rubber gasket suitable for hot and cold water; and bolts and nuts.

2.5 COPPER TUBE AND FITTINGS

- A. Copper DWV Tube: ASTM B 306, drainage tube, drawn temper.
- B. Copper Drainage Fittings: ASME B16.23, cast copper or ASME B16.29, wrought copper, solder-joint fittings.
- C. Hard Copper Tube: ASTM B 88, Type DWV, water tube, drawn temper.
- D. Copper Pressure Fittings:
 1. Copper Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint fittings. Furnish wrought-copper fittings if indicated.
 2. Copper Unions: MSS SP-123, copper-alloy, hexagonal-stock body with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.
- E. Copper Flanges: ASME B16.24, Class 150, cast copper with solder-joint end.
 1. Flange Gasket Materials: ASME B16.21, full-face, flat, nonmetallic, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
 2. Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
- F. Solder: ASTM B 32, lead-free with ASTM B 813, water-flushable flux.

2.6 SPECIALTY PIPE FITTINGS

- A. Transition Couplings:
 1. General Requirements: Fitting or device for joining piping with small differences in OD's or of different materials. Include end connections same size as and compatible with pipes to be joined.
 2. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
 3. Unshielded, Nonpressure Transition Couplings:
 - a. Standard: ASTM C 1173.
 - b. Description: Elastomeric, sleeve-type, reducing or transition pattern. Include shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.
 - c. Sleeve Materials:
 - 1) For Cast-Iron Soil Pipes: ASTM C 564, rubber.
 - 2) For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.

- 3) For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
 4. Shielded, Nonpressure Transition Couplings:
 - a. Standard: ASTM C 1460.
 - b. Description: Elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.
 5. Pressure Transition Couplings:
 - a. Standard: AWWA C219.
 - b. Description: Metal, sleeve-type same size as, with pressure rating at least equal to, and ends compatible with, pipes to be joined.
 - c. Center-Sleeve Material: Manufacturer's standard .
 - d. Gasket Material: Natural or synthetic rubber.
 - e. Metal Component Finish: Corrosion-resistant coating or material.
- B. Dielectric Fittings:
1. General Requirements: Include end connections compatible with pipes to be joined.
 2. Dielectric Nipples:
 - a. Description:
 - 1) Standard: IAPMO PS 66
 - 2) Electroplated steel nipple.
 - 3) Pressure Rating: 300 psig at 230 deg F .
 - 4) End Connections: Male threaded or grooved.
 - 5) Lining: Inert and noncorrosive, propylene.
 - 6) 6" long brass nipple.
 3. Mechanical Press Fittings: Copper and copper alloy press fitting shall conform to material requirements of ASME B16.18 or B16.22. Press fitting sealing element shall be EPDM, with leakage path design for joint verification.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as close as practical to plans. Major deviations to layout require approval of Owner's Representative.
- B. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- C. Install piping to permit valve servicing.
- D. Install piping at indicated slopes.
- E. Install piping free of sags and bends.

- F. Install fittings for changes in direction and branch connections.
- G. Install piping to allow application of insulation.
- H. Install seismic restraints on piping. Comply with requirements for seismic-restraint devices specified in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- I. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if two fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- J. Lay buried building drainage piping of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Install soil and waste drainage and vent piping at the following minimum slopes unless otherwise indicated:
 - 1. Building Sanitary Drain: 2 percent downward in direction of flow for piping.; Slope of piping NPS 4 and larger may be reduced to 1 percent downward in direction of flow when approved by the Authority Having Jurisdiction..
 - 2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
 - 3. Vent Piping: Run level toward vertical fixture vent or toward vent stack.
- K. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
- L. Install steel piping according to applicable plumbing code.
- M. Install aboveground copper tubing according to CDA's "Copper Tube Handbook."
- N. Install engineered soil and waste drainage and vent piping systems as follows:
 - 1. Combination Waste and Vent: Comply with standards conform to Owner's standard and CPC, 2013.
 - 2. Reduced-Size Venting: Comply with standards conform to Owner's standard and CPC, 2013.
- O. Install underground, force-main piping according to AWWA C600. Install buried piping inside building between wall and floor penetrations and connection to sanitary sewer piping outside building with restrained joints. Anchor pipe to wall or floor.
 - 1. Install piping according to ASTM A 674 or AWWA C105/A 21.5.
- P. Install underground, copper, force-main tubing according to CDA's "Copper Tube Handbook."
 - 1. Install piping according to ASTM A 674 or AWWA C105/A 21.5.
- Q. Install force mains at elevations indicated.

R. Plumbing Specialties:

1. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers in sanitary drainage gravity-flow piping. Install cleanout fitting with closure plug inside the building in sanitary drainage force-main piping. Comply with requirements for cleanouts specified in Section 221319 "Sanitary Waste Piping Specialties."
2. Install drains in sanitary drainage gravity-flow piping. Comply with requirements for drains specified in Section 221319 "Sanitary Waste Piping Specialties."

S. Do not enclose, cover, or put piping into operation until it is inspected and approved by Owner's representative.

T. Install sleeves for piping penetrations of floors. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."

U. Install sleeve seals for piping penetrations of underground concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."

V. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

3.2 JOINT CONSTRUCTION

A. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.

B. Join hubless, cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. Join copper tube and fittings with soldered joints according to ASTM B 828. Use ASTM B 813, water-flushable, lead-free flux and ASTM B 32, lead-free-alloy solder.

E. Grooved Joints: Cut groove ends of pipe according to AWWA C606. Lubricate and install gasket over ends of pipes or pipe and fitting. Install coupling housing sections, over gasket, with keys seated in piping grooves. Install and tighten housing bolts.

F. Flanged Joints: Align bolt holes. Select appropriate gasket material, size, type, and thickness. Install gasket concentrically positioned. Use suitable lubricants on bolt threads. Torque bolts in cross pattern.

3.3 SPECIALTY PIPE FITTING INSTALLATION

A. Transition Couplings:

1. Install transition couplings at joints of piping with small differences in OD's.
2. In Drainage Piping: Shielded, nonpressure transition couplings.
3. In Aboveground Force Main Piping: Fitting-type transition couplings.
4. In Underground Force Main Piping:
 - a. NPS 1-1/2 and Smaller: Fitting-type transition couplings.
 - b. NPS 2 and Larger: Pressure transition couplings.

B. Dielectric Fittings:

1. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
2. Dielectric Fittings for NPS 2 and Smaller: Use dielectric nipples, 6" long brass nipples.
3. Dielectric Fittings for NPS 2-1/2 to NPS 4 : Use dielectric flanges, flange kits or nipples.
4. Dielectric Fittings for NPS 5 and Larger: Use dielectric flange kits.

3.4 VALVE INSTALLATION

A. General valve installation requirements are specified in Section 220523 "General-Duty Valves for Plumbing Piping."

B. Shutoff Valves:

1. Install shutoff valve on each sewage pump discharge.
2. Install gate or full-port ball valve for piping NPS 2 and smaller.
3. Install gate valve for piping NPS 2-1/2 and larger.

C. Check Valves: Install swing check valve, between pump and shutoff valve, on each sewage pump discharge.

D. Backwater Valves: Install backwater valves in piping subject to backflow.

1. Horizontal Piping: Horizontal backwater valves. Use normally closed type unless otherwise indicated.
2. Floor Drains: Drain outlet backwater valves unless drain has integral backwater valve.
3. Install backwater valves in accessible locations.
4. Comply with requirements for backwater valve specified in Section 221319 "Sanitary Waste Piping Specialties."

3.5 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements for seismic-restraint devices specified in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."

B. Comply with requirements for pipe hanger and support devices and installation specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

1. Install carbon-steel pipe hangers for horizontal piping in noncorrosive environments.
 2. Install stainless-steel pipe hangers for horizontal piping in corrosive environments.
 3. Install carbon-steel pipe support clamps for vertical piping in noncorrosive environments.
 4. Install stainless-steel pipe support clamps for vertical piping in corrosive environments.
 5. Vertical Piping: MSS Type 8 or Type 42, clamps.
 6. Install individual, straight, horizontal piping runs using MSS Type 1, adjustable, steel clevis hangers.
 7. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 8. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Support horizontal piping and tubing within 12 inches of each fitting, valve, and coupling.
- D. Support vertical piping and tubing at base and at each floor.
- E. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.
- F. The hanger spacing and rod diameter listed within this specification is the maximum spacing and minimum rod diameter allowable. Refer to design drawings and standard details for project specific hanger spacing.
- G. Install hangers for hubless cast-iron soil piping as specified on plumbing drawings.
- H. Install supports for vertical hubless cast-iron soil piping at the base and each floor with a maximum of every 15 feet.
- I. Install hangers for steel piping as specified on plumbing drawings.
- J. Install supports for vertical steel piping every 15 feet.
- K. Install hangers for copper tubing as specified on plumbing drawings.
- L. Install supports for vertical copper tubing at each floor.
- M. Support piping and tubing not listed above according to the California Plumbing Code and manufacturer's written instructions.

3.6 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect drainage and vent piping to the following:
 1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.

2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required conform to Owner's standard and CPC, 2013.
 3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
 4. Install test tees (wall cleanouts) in conductors near floor and floor cleanouts with cover flush with floor.
 5. Install horizontal backwater valves with cleanout cover flush with floor or in pit with pit cover flush with floor Insert description.
 6. Comply with requirements for backwater valves, cleanouts and drains specified in Section 221319 "Sanitary Waste Piping Specialties."
 7. Equipment: Connect drainage piping as indicated. Provide shutoff valve if indicated and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 and larger.
- D. Connect force-main piping to the following:
1. Sanitary Sewer: To exterior force main.
 2. Sewage Pump: To sewage pump discharge.
- E. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.
- F. Make connections according to the following unless otherwise indicated:
1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
 2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.

3.7 IDENTIFICATION

- A. Identify exposed sanitary waste and vent piping. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.8 FIELD QUALITY CONTROL

- A. During installation, notify Owner's representative at least 24 hours before inspection must be made. Perform tests specified below in presence of Owner's representative.
1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 2. Final Inspection: Arrange for final inspection by Owner's representative to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If Owner's representative find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by Owner's representative.

- D. Test sanitary drainage and vent piping according to procedures of Owner's standard or, in absence of published procedures, as follows:
1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping except outside leaders on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
 4. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 5. Prepare reports for tests and required corrective action.
- E. Test force-main piping according to procedures conform to ANSI/NFPA 70 or per CBC or, in absence of published procedures, as follows:
1. Leave uncovered and unconcealed new, altered, extended, or replaced force-main piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 2. Cap and subject piping to static-water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
 3. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 4. Prepare reports for tests and required corrective action.

3.9 CLEANING AND PROTECTION

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Exposed ABS and PVC Piping: Protect plumbing vents exposed to sunlight with two coats of water-based latex paint.

3.10 PIPING SCHEDULE

- A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.
- B. Aboveground, soil and waste piping shall be the following:
1. Hubless, cast-iron soil pipe and fittings and solvent stack fittings; CISPI hubless-piping couplings; and coupled joints.
 2. Copper DWV tube, copper drainage fittings, and soldered joints.

3. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.
- C. Aboveground, vent piping shall be the following:
1. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.
 2. Copper DWV tube, copper drainage fittings, and soldered joints.
 - a. Option for Vent Piping, NPS 2-1/2 and NPS 3-1/2: Hard copper tube, Type M; copper pressure fittings; and soldered joints.
 3. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.
- D. Underground, soil, waste, and vent piping NPS 12 and smaller shall be the following:
1. Hub and Spigot, cast-iron soil pipe and fittings; hub and spigot with neoprene gasket per ASTM A888 and A74.
 2. Dissimilar Pipe-Material Couplings: Unshielded, nonpressure transition couplings.
- E. Aboveground sanitary-sewage force mains NPS 2 and smaller shall be any of the following:
1. Hard copper tube, Type L; copper pressure fittings; and soldered joints.
 2. Galvanized-steel pipe, pressure fittings, and threaded joints.
- F. Aboveground sanitary-sewage force mains NPS 2-1/2 and larger shall be the following:
1. Grooved-end, galvanized-steel pipe; grooved-joint, galvanized-steel-pipe appurtenances; and grooved joints or cast-iron drainage pattern screwed.
- G. Underground sanitary-sewage force mains NPS 4 and smaller shall be any of the following:
1. Hard copper tube, Type DWV; wrought-copper pressure fittings; and soldered joints.
 2. Fitting-type transition coupling for piping smaller than NPS 1-1/2 and pressure transition coupling for NPS 1-1/2 and larger if dissimilar pipe materials.
- H. Underground sanitary-sewage force mains NPS 5 and larger shall be the following:
1. Ductile-iron, push-on-joint piping and push-on joints.
 2. Pressure transition couplings if dissimilar pipe materials.

END OF SECTION

SECTION 221319 - SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cleanouts.
2. Floor drains.
3. Miscellaneous sanitary drainage piping specialties.
4. Flashing materials.

B. Related Requirements:

- 1.
2. Section 224000 "Plumbing Fixtures" for plaster sink interceptors.

1.2 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. FOG: Fats, oils, and greases.
- C. FRP: Fiberglass-reinforced plastic.
- D. HDPE: High-density polyethylene plastic.
- E. PE: Polyethylene plastic.
- F. PP: Polypropylene plastic.
- G. PVC: Polyvinyl chloride plastic.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

- A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to Owner, and marked for intended use.

- C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic sanitary piping specialty components.

1.5 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Section 033000 "Cast-in-Place Concrete."
- B. Coordinate size and location of roof penetrations.

PART 2 - PRODUCTS

2.1 CLEANOUTS

- A. Exposed Metal Cleanouts:
 - 1. Standard: ASME A112.36.2M for cast iron for cleanout test tee.
 - 2. Size: Same as connected drainage piping
 - 3. Body Material: Hubless, cast-iron soil pipe test tee as required to match connected piping.
 - 4. Closure: cast-iron plug.
 - 5. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
 - 6. Closure: Stainless-steel plug with seal.
- B. Metal Floor Cleanouts:
 - 1. Standard: ASME A112.36.2M for adjustable housing cleanout.
 - 2. Size: Same as connected branch.
 - 3. Type: Adjustable housing
 - 4. Body or Ferrule: Cast iron
 - 5. Outlet Connection: Threaded.
 - 6. Closure: Brass plug with straight threads and gasket
 - 7. Adjustable Housing Material: Cast iron
 - 8. Frame and Cover Material and Finish: Nickel-bronze, copper alloy
 - 9. Frame and Cover Shape: Round
 - 10. Top Loading Classification: Heavy Duty.
 - 11. Riser: ASTM A 74, Service class, cast-iron drainage pipe fitting and riser to cleanout.
- C. Cast-Iron Wall Cleanouts:
 - 1. Standard: ASME A112.36.2M. Include wall access.
 - 2. Size: Same as connected drainage piping.
 - 3. Body: Hubless, cast-iron soil pipe test tee as required to match connected piping.
 - 4. Closure: Cast-iron plug.

5. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
6. Wall Access: Round, flat, chrome-plated stamped-steel or stainless-steel cover plate with screw.

2.2 FLOOR DRAINS

A. Cast-Iron Floor Drains:

1. Standard: ASME A112.6.3
2. Pattern: Floor drain.
3. Body Material: Gray iron
4. Seepage Flange: See Drawings
5. Anchor Flange: See Drawings
6. Clamping Device: See Drawings
7. Outlet: Bottom
8. Sediment Bucket: See Drawings
9. Top or Strainer Material: Nickel bronze.
10. Top of Body and Strainer Finish: Nickel bronze
11. Top Shape: Round
12. Dimensions of Top or Strainer: See Drawings.
13. Top Loading Classification: Heavy Duty.
14. Inlet Fitting: See Drawings
15. Trap Material: Cast iron
16. Trap Pattern: Standard P-trap.

2.3 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

A. Open Drains:

1. Description: Shop or field fabricate from ASTM A 74, Service class, hub-and-spigot, cast-iron, soil-pipe fittings. Include P-trap, hub-and-spigot riser section; and where required, increaser fitting joined with ASTM C 564, rubber gaskets.
2. Size: Same as connected waste piping with increaser fitting of size indicated.

B. Floor-Drain, Trap-Seal Primer Fittings:

1. Description: Cast iron, with threaded inlet and threaded or spigot outlet, and trap-seal primer valve connection.

C. Air-Gap Fittings:

1. Standard: ASME A112.1.2, for fitting designed to ensure fixed, positive air gap between installed inlet and outlet piping.
2. Body: Bronze or cast iron.
3. Inlet: Opening in top of body.
4. Outlet: Larger than inlet.

5. Size: Same as connected waste piping and with inlet large enough for associated indirect waste piping.

2.4 FLASHING MATERIALS

- A. Elastic Membrane Sheet: ASTM D 4068, flexible, chlorinated polyethylene, 40-mil minimum thickness.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install cleanouts in belowground piping and building drain piping according to the following, unless otherwise indicated:
 1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
 2. Locate at each change in direction of piping greater than 135 degrees.
 3. Locate at minimum intervals of 100 feet.
 4. Locate at base of each vertical soil and waste stack.
- B. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.
- C. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.
- D. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
 1. Position floor drains for easy access and maintenance.
 2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:
 - a. Radius, 30 Inches or Less: Equivalent to 1 percent slope, but not less than 1/4-inch total depression.
 - b. Radius, 30 to 60 Inches: Equivalent to 1 percent slope.
 - c. Radius, 60 Inches or Larger: Equivalent to 1 percent slope, but not greater than 1-inch total depression.
 3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
 4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
- E. Install trench drains at low points of surface areas to be drained. Set grates of drains flush with finished surface, unless otherwise indicated.

- F. Assemble plastic channel drainage system components according to manufacturer's written instructions. Install on support devices so that top will be flush with adjacent surface.
- G. Assemble open drain fittings and install with top of hub per Drawings.
- H. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.

3.2 CONNECTIONS

- A. Comply with requirements in Section 221316 "Sanitary Waste and Vent Piping" for piping installation requirements. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment to allow service and maintenance.
- C. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."

3.3 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

END OF SECTION

SECTION 223500 – DOMESTIC WATER HEATERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Commercial, electric, storage, domestic-water heaters
2. Flow-control, electric, tankless, domestic-water heaters

1.2 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Domestic-water heat exchangers shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

1.3 ACTION SUBMITTALS

A. Product Data: For each type and size of domestic-water heat exchanger indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Shop Drawings:

1. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Domestic-Water, Heater Labeling: Certified and labeled by testing agency acceptable to Owner.

B. Source quality-control reports.

C. Field quality-control reports.

D. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For domestic-water heat exchangers to include in emergency, operation, and maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ASHRAE/IESNA 90.1 Compliance: Applicable requirements in ASHRAE/IESNA 90.1.
- C. ASME Compliance: Where ASME-code construction is indicated, fabricate and label heat-exchanger storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
- D. NSF Compliance: Fabricate and label equipment components that will be in contact with potable water to comply with NSF 61, "Drinking Water System Components - Health Effects."

1.7 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of domestic-water heater that fails in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including heat exchanger, storage tank, and supports.
 - b. Faulty operation of controls.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal use.
 - 2. Warranty Periods: the following warranty shall be furnished to Owner a written guarantee for the following equipment against all defects in materials for the number of years as described below and workmanship for the one year from date of acceptance. Refer to Section 01 78 00, close-out submittals, for submittal form.
 - a. Commercial, Electric, Storage, Domestic-Water Heaters:
 - 1) Storage Tank: Three years.
 - 2) Controls and Other Components: One year.

PART 2 - PRODUCTS

- A. Commercial, Electric, Storage, Domestic-Water Heaters:
 - 1. Standard: UL 1453.
 - 2. Storage-Tank Construction: ASME-code, steel vertical arrangement.
 - a. Tappings: Factory fabricated of materials compatible with tank and piping connections. Attach tappings to tank before testing.
 - 1) NPS 2 and Smaller: Threaded ends according to ASME B1.20.1.

- 2) NPS 2-1/2 and Larger: Flanged ends according to ASME B16.5 for steel and stainless-steel flanges, and according to ASME B16.24 for copper and copper-alloy flanges.
 - b. Pressure Rating: 150 psig.
 - c. Interior Finish: Comply with NSF 61 Annex G barrier materials for potable-water tank linings, including extending lining material into tappings.
 3. Factory-Installed Storage-Tank Appurtenances:
 - a. Anode Rod: Replaceable magnesium.
 - b. Drain Valve: Corrosion-resistant metal complying with ASSE 1005.
 - c. Insulation: Comply with ASHRAE/IESNA 90.1.
 - d. Jacket: Steel with enameled finish.
 - e. Heating Elements: Electric, screw-in or bolt-on immersion type arranged in multiples of three.
 - f. Temperature Control: Adjustable thermostat.
 - g. Safety Controls: High-temperature-limit and low-water cutoff devices or systems.
 - h. Relief Valves: ASME rated and stamped for combination temperature-and-pressure relief valves. Include one or more relief valves with total relieving capacity at least as great as heat input, and include pressure setting less than domestic-water heater working-pressure rating. Select one relief valve with sensing element that extends into storage tank.
 4. Special Requirements: NSF 5 construction.
- B. Flow-Control, Electric, Tankless, Domestic-Water Heaters:
1. Standard: UL 499 for electric, tankless, (domestic-water heater) heating appliance.
 2. Construction: Copper piping or tubing complying with NSF 61 Annex G barrier materials for potable water, without storage capacity.
 - a. Connections: ASME B1.20.1 pipe thread.
 - b. Pressure Rating: 150 psig.
 - c. Heating Element: Resistance heating system.
 - d. Temperature Control: Flow-control fitting.
 - e. Safety Control: High-temperature-limit cutoff device or system.
 - f. Jacket: Aluminum or steel with enameled finish or plastic.
 3. Support: Bracket for wall mounting.
 4. Capacity and Characteristics:
 - a. Flow Rate: see schedule on plan.
 - b. Maximum Temperature Setting: see schedule on plan.
 - c. Power Demand: see schedule on plan.
 - d. Electrical Characteristics:
 - 1) Volts: see schedule on plan.
 - 2) Phases: see schedule on plan.
 - 3) Hertz: see schedule on plan.

- 4) Full-Load Amperes: see schedule on plan.
- 5) Minimum Circuit Ampacity: see schedule on plan.
- 6) Maximum Overcurrent Protection: see schedule on plan.

2.2 SOURCE QUALITY CONTROL

- A. Factory Tests: Test and inspect domestic-water heat exchangers specified to be ASME-code construction, according to ASME Boiler and Pressure Vessel Code.
- B. Hydrostatically test domestic-water heat exchangers to minimum of one and one-half times pressure rating before shipment.
- C. Domestic-water heat exchangers will be considered defective if they do not pass tests and inspections. Comply with requirements in Section "Quality Requirements" for retesting and re-inspecting requirements and Section "Execution" for requirements for correcting the Work.
- D. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 DOMESTIC-WATER HEATER INSTALLATION

- A. Commercial, Domestic-Water Heater Mounting: Install commercial domestic-water heaters on concrete base.
 1. Exception: Omit concrete bases for commercial domestic-water heaters if installation on stand, bracket, suspended platform, or directly on floor is indicated.
 2. Maintain manufacturer's recommended clearances.
 3. Arrange units so controls and devices that require servicing are accessible.
 4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
 5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
 6. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 7. Install anchor bolts to elevations required for proper attachment to supported equipment.
 8. Anchor domestic-water heaters to substrate.

- B. Install domestic-water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.
 - 1. Install shutoff valves on domestic-water-supply piping to domestic-water heaters and on domestic-hot-water outlet piping. Comply with requirements for shutoff valves specified in Section 220523.12 "Ball Valves for Plumbing Piping," Section 220523.13 "Butterfly Valves for Plumbing Piping," and Section 220523.15 "Gate Valves for Plumbing Piping."
- C. Install gas-fired, domestic-water heaters according to NFPA 54.
 - 1. Install gas shutoff valves on gas supply piping to gas-fired, domestic-water heaters without shutoff valves.
 - 2. Install gas pressure regulators on gas supplies to gas-fired, domestic-water heaters without gas pressure regulators if gas pressure regulators are required to reduce gas pressure at burner.
 - 3. Install automatic gas valves on gas supplies to gas-fired, domestic-water heaters if required for operation of safety control.
 - 4. Comply with requirements for gas shutoff valves, gas pressure regulators, and automatic gas valves specified in Section 231123 "Facility Natural-Gas Piping."
- D. Install commercial domestic-water heaters with seismic-restraint devices. Comply with requirements for seismic-restraint devices specified in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- E. Install combination temperature-and-pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.
- F. Install combination temperature and pressure relief valves in water piping for domestic-water heaters without storage. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.
- G. Install water-heater drain piping as indirect waste to spill by positive air gap into open drains or over floor drains. Install hose-end drain valves at low points in water piping for domestic-water heaters that do not have tank drains. Comply with requirements for hose-end drain valves specified in Section 221119 "Domestic Water Piping Specialties."
- H. Install thermometer on outlet piping of domestic-water heaters. Comply with requirements for thermometers specified in Section 220519 "Meters and Gages for Plumbing Piping."
- I. Assemble and install inlet and outlet piping manifold kits for multiple domestic-water heaters. Fabricate, modify, or arrange manifolds for balanced water flow through each domestic-water heater. Include shutoff valve and thermometer in each domestic-water heater inlet and outlet, and throttling valve in each domestic-water heater outlet. Comply with requirements for valves

specified in Section 220523.12 "Ball Valves for Plumbing Piping," Section 220523.13 "Butterfly Valves for Plumbing Piping," and Section 220523.15 "Gate Valves for Plumbing Piping," and comply with requirements for thermometers specified in Section 220519 "Meters and Gages for Plumbing Piping."

- J. Install piping-type heat traps on inlet and outlet piping of domestic-water heater storage tanks without integral or fitting-type heat traps.
- K. Fill domestic-water heaters with water.
- L. Charge domestic-water compression tanks with air.

3.2 CONNECTIONS

- A. Comply with requirements for domestic-water piping specified in Section 221116 "Domestic Water Piping."
- B. Comply with requirements for fuel-oil piping specified in Section 231113 "Facility Fuel-Oil Piping."
- C. Comply with requirements for gas piping specified in Section 231123 "Facility Natural-Gas Piping."
- D. Drawings indicate general arrangement of piping, fittings, and specialties.
- E. Where installing piping adjacent to fuel-fired, domestic-water heaters, allow space for service and maintenance of water heaters. Arrange piping for easy removal of domestic-water heaters.

3.3 IDENTIFICATION

- A. Identify system components. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
 - 2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After electrical circuitry has been energized, start units to confirm proper operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

- B. Domestic-water heaters will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

3.5 DEMONSTRATION

- A. Train Owner maintenance personnel to adjust, operate, and maintain commercial, gas-fired, storage, domestic-water heaters.

END OF SECTION

SECTION 224000 - PLUMBING FIXTURES

GENERAL

1.1 SUMMARY

A. Section includes the following fixtures and specialties:

1. Water closets.
2. Lavatories.
3. Sinks.
4. Service Sinks.
5. Outlet boxes.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fixtures.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For plumbing fixtures and faucets to include in operation and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - a. Servicing and adjustments of flushometer valves, electronic sensors.

PRODUCTS

1.4 WATER CLOSETS

A. Water Closets: Wall mounted, top spud.

1. Manufacturers: Provide product indicated on Drawings:
 - a. American Standard America.
 - b. Kohler Co.
 - c. Sloan Valve Company.
 - d. Zurn Industries, LLC; Commercial Brass and Fixtures.
2. Bowl:
 - a. Standards: ASME A112.19.2/CSA B45.1 and ASME A112.19.5.
 - b. Material: Vitreous china.

- c. Type: Siphon jet.
- d. Style: Flushometer valve.
- e. Height: See Drawings for mounting heights.
- f. Water Consumption: 1.1 gal. per flush.
- g. Spud Size: NPS 1-1/2.
3. Flushometer Valve: Comply with requirements in "Flushometer Valves" Article.
4. Toilet Seat: Comply with requirements in "Toilet Seats" Article.
5. Support:
 - a. Standard: ASME A112.6.1M.
 - b. Description: Waste-fitting assembly as required to match drainage piping material and arrangement with faceplates, couplings gaskets, and feet; bolts and hardware matching fixture.
 - c. Water-Closet Mounting Height: See Drawings.

1.5 FLUSHOMETER VALVES

- A. Sensor, Diaphragm Flushometer Valves.
 1. Manufacturers: Provide product indicated on Drawings:
 - a. Delany Flush Valves.
 - b. Delta Faucet Company.
 - c. Sloan Valve Company.
 - d. Zurn Industries, LLC; Commercial Brass and Fixtures.
 2. Standard: ASSE 1037.
 3. Minimum Pressure Rating: 125 psig.
 4. Features: Integral check stop, backflow-prevention device.
 5. Sensor: Infra-red with range adjustment.
 6. Sensor Power: Battery or hard-wired as indicated on Drawings.
 7. Material: Brass body with corrosion-resistant components.
 8. Exposed Flushometer-Valve Finish: Chrome plated.
 9. Style: Exposed.
 10. Consumption: 1.1 gal. per flush.
 11. Minimum Inlet: NPS 1.
 12. Minimum Outlet: NPS 1-1/4, extended length.

1.6 TOILET SEATS

- A. Toilet Seats.
 1. Manufacturers: Provide product indicated on Drawings:
 - a. Centoco Manufacturing Corporation.
 - b. Church Seats.
 - c. Kohler Co.
 - d. Olsonite Seat Co.

- e. Zurn Industries, LLC; Commercial Brass and Fixtures.
- 2. Standard: IAPMO Z124.5.
- 3. Material: Plastic with antimicrobial agent.
- 4. Type: Commercial.
- 5. Shape: Elongated rim, open front.
- 6. Hinge Material: Non-corroding metal.
- 7. Color: White.

1.7 LAVATORIES

A. Lavatories: Vitreous china, counter mounted.

- 1. Vitreous-China Lavatories:
 - a. Manufacturers: Provide product indicated on Drawings:
 - 1) American Standard America.
 - 2) Kohler Co.
 - 3) Sloan Valve Company.
 - 4) TOTO USA, INC.
 - 5) Zurn Industries, LLC; Commercial Brass and Fixtures.
 - 2. Fixture:
 - a. Standard: ASME A112.19.2/CSA B45.1 for vitreous-china lavatories.
 - b. Type: See Drawings.
 - c. Faucet-Hole Punching: Three holes, 4-inch centers unless indicated otherwise on Drawings.
 - d. Faucet-Hole Location: See Drawings.
 - e. Color: White.
 - 3. Faucet: Comply with requirements in "Lavatory Faucets" Article.
 - 4. Supply Fittings: Comply with requirements in "Supply Fittings" Article.
 - 5. Waste Fittings: Comply with requirements in "Waste Fittings" Article.

B. Lavatories: Vitreous china, wall mounted.

- 1. Vitreous-China Lavatories:
 - a. Manufacturers: Provide product indicated on Drawings:
 - 1) American Standard America.
 - 2) Kohler Co.
 - 3) Sloan Valve Company.
 - 4) TOTO USA, INC.
 - 5) Zurn Industries, LLC; Commercial Brass and Fixtures.
 - 2. Fixture:
 - a. Standard: ASME A112.19.2/CSA B45.1 for vitreous-china lavatories.
 - b. Type: See Drawings.
 - c. Faucet-Hole Punching: Three holes, 4-inch centers unless indicated otherwise on Drawings.
 - d. Faucet-Hole Location: See Drawings.

- e. Color: White.
- 3. Support:
 - a. Standard: ASME A112.6.1M.
 - b. Description: Floor mounted support with adjustable fixture arms.
 - c. Lavatory Mounting Height: See Drawings.
- 4. Faucet: Comply with requirements in "Lavatory Faucets" Article.
- 5. Supply Fittings: Comply with requirements in "Supply Fittings" Article.
- 6. Waste Fittings: Comply with requirements in "Waste Fittings" Article.

1.8 LAVATORY FAUCETS

- A. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components - Health Effects," for faucet materials that will be in contact with potable water.
- B. Lavatory Faucets: Single-control valve.
 - 1. General-Duty, Solid-Brass Faucets:
 - a. Manufacturers: Provide product indicated on Drawings:
 - 1) American Standard America.
 - 2) Chicago Faucets.
 - 3) Delta Faucet Company.
 - 4) Kohler Co.
 - 5) Moen Incorporated.
 - 6) Speakman Company.
 - 7) T & S Brass and Bronze Works, Inc.
 - 8) Zurn Plumbing Products Group.
 - 2. Standard: ASME A112.18.1/CSA B125.1.
 - 3. General: Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture holes; coordinate outlet with spout and fixture receptor.
 - 4. Body Material: General-duty, solid brass.
 - 5. Finish: Polished chrome plate.
 - 6. Maximum Flow Rate: 2.2 gpm maximum unless indicated otherwise on Drawings.
 - 7. Centers: 4 inches center or Single hole unless indicated otherwise on Drawings.
 - 8. Mounting: Deck mounted unless indicated otherwise on Drawings.
 - 9. Valve Handle(s): Lever.
 - 10. Spout: Rigid.
 - 11. Spout Outlet: See Drawings.
 - 12. Drain: Grid.
- C. Lavatory Faucets: Automatically Operated.
 - 1. General-Duty, Solid-Brass Faucets:
 - a. Manufacturers: Provide product indicated on Drawings:
 - 1) American Standard America.

- 2) Chicago Faucets.
 - 3) Delta Faucet Company.
 - 4) Kohler Co.
 - 5) Moen Incorporated.
 - 6) Sloan Valve Company.
 - 7) Speakman Company.
 - 8) T & S Brass and Bronze Works, Inc.
 - 9) Zurn Plumbing Products Group.
2. Standards: ASME A112.18.1/CSA B125.1 and UL 1951.
 3. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 4. General: Coordinate faucet inlets with supplies and fixture holes; coordinate outlet with spout and fixture receptor.
 5. Body Material: General-duty, solid brass.
 6. Finish: Polished chrome plate.
 7. Maximum Flow Rate: 2.2 gpm maximum unless indicated otherwise on Drawings.
 8. Centers: Single hole.
 9. Mounting: Deck mounted unless indicated otherwise on Drawings.
 10. Operation: Sensor operated.
 - a. Sensor: Infra-red with range adjustment.
 - b. Sensor Power: Battery or hard-wired as indicated on Drawings.
 11. Spout: Rigid.
 12. Spout Outlet: See Drawings.
 13. Drain: Grid.

1.9 SINKS

- A. Single Compartment Sinks: Single bowl, counter mounted, stainless steel.
 1. Manufacturers: Provide product indicated on Drawings:
 - a. Elkay Manufacturing Co.
 - b. Iust Manufacturing.
 2. Fixture:
 - a. Standard: ASME A112.19.3/CSA B45.4 for stainless-steel lavatories.
 - b. Type: See Drawings.
 - c. Overall Dimensions: 19 inches by 21 inches unless otherwise indicated in Drawings.
 - d. Metal Thickness: 18-gauge.
 3. Faucet: Comply with requirements in "Sink Faucets" Article.
 4. Supply Fittings: Comply with requirements in "Supply Fittings" Article.
 5. Waste Fittings: Comply with requirements in "Waste Fittings" Article.
 6. Disposer: Optional, see Drawings. Comply with requirements in "Disposers" Article.

- B. Double Compartment Sinks: two bowls, counter mounted, stainless steel.
 - 1. Manufacturers: Provide product indicated on Drawings:
 - a. American Standard America.
 - b. Elkay Manufacturing Co.
 - c. Just Manufacturing.
 - d. Kohler Co.
 - 2. Fixture:
 - a. Standard: ASME A112.19.3/CSA B45.4 for stainless-steel lavatories.
 - b. Type: See Drawings.
 - c. Overall Dimensions: See Drawings.
 - d. Metal Thickness: 18-gauge.
 - 3. Faucet: Comply with requirements in "Sink Faucets" Article.
 - 4. Supply Fittings: Comply with requirements in "Supply Fittings" Article.
 - 5. Waste Fittings: Comply with requirements in "Waste Fittings" Article.
 - 6. Disposer: Optional, see Drawings. Comply with requirements in "Disposers" Article.

1.10 SERVICE SINKS

- A. Service Sinks: Enameled, cast iron, floor mounted.
 - 1. Manufacturers: Provide product indicated on Drawings:
 - a. American Standard America.
 - b. Commercial Enameling Company (CECO).
 - c. Kohler Co.
 - d. Zurn Industries, LLC; Commercial Brass and Fixtures.
 - 2. Fixture:
 - a. Standard: ASME A112.19.1/CSA B45.2.
 - b. Style: With front apron and raised back.
 - c. Nominal Size: 28 by 28 inches.
 - d. Color: White.
 - e. Drain: Grid with NPS 3 outlet.
 - f. Rim Guard: Coated wire optional unless otherwise indicated on Drawings.
 - 3. Faucet: Manual-operation mixing valve, wall mounted.
 - a. Manufacturers: Provide product indicated on Drawings:
 - 1) American Standard America.
 - 2) Chicago Faucets.
 - 3) Delta Faucet Company.
 - 4) Kohler Co.
 - 5) Moen Incorporation.
 - 6) Speakman Company.
 - 7) T & S Brass and Bronze Works, Inc.
 - 8) Zurn Industries, LLC; Commercial Brass and Fixtures.

- b. Standard: ASME A112.18.1/CSA B125.1.
- c. Configuration: Hot- and cold-water indicators; coordinate faucet inlets with supplies; coordinate outlet with spout and sink receptor.
- d. Body Type: Integral check and service stop.
- e. Body Material: Solid brass.
- f. Finish: Polished chrome plate.
- g. Control: Dual lever handles.
- h. Mounting Type: Wall mounted.
- i. Spout Type: Rigid with pail hook.
- j. Vacuum Breaker: Integral.
- k. Spout Outlet: Hose thread.

1.11 SINK FAUCETS

- A. NSF Standard: Comply with NSF 61, "Drinking Water System Components - Health Effects," for faucet-spout materials that will be in contact with potable water.
- B. Sink Faucets: Manual-operation mixing valve.
 - 1. Manufacturers: Provide product indicated on Drawings:
 - a. American Standard America.
 - b. Chicago Faucets.
 - c. Delta Faucet Company.
 - d. Kohler Co.
 - e. Moen Incorporation.
 - f. Speakman Company.
 - g. T & S Brass and Bronze Works, Inc.
 - h. Zurn Industries, LLC; Commercial Brass and Fixtures.
 - 2. Standard: ASME A112.18.1/CSA B125.1.
 - 3. Configuration: Hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture hole punchings; coordinate outlet with spout and sink receptor.
 - 4. Body Type: Centerset.
 - 5. Body Material: Solid brass.
 - 6. Finish: Polished chrome plate.
 - 7. Maximum Flow Rate: 2.2 gpm unless otherwise indicated on Drawings.
 - 8. Control: Wrist-blade handles.
 - 9. Mounting Type: Deck or wall mounted as indicated on Drawings.
 - 10. Spout Type: See Drawings.
 - 11. Vacuum Breaker: Required for hose outlet applications only.
 - 12. Spout Outlet: See Drawings.

1.12 DISPOSERS

- A. Disposers: Batch-feed household, food waste.
 - 1. Continuous-Feed Disposers:
 - a. Manufacturers: Subject to compliance with requirements provide product indicated on Drawings, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) American Standard America.
 - 2) InSinkErator.
 - 3) KitchenAid.
 - 4) Maytag.
 - 2. Standards: ASSE 1008 and UL 430, and listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 3. General: Include reset button; wall switch; corrosion-resistant chamber with jam-resistant, cutlery- or stainless-steel grinder or shredder; NPS 1-1/2 outlet; quick-mounting, stainless-steel sink flange; antisplash guard; and combination cover/stopper.
 - 4. Motor: 115-V ac, 1725 rpm, 1/2 hp with overload protection unless otherwise indicated on Drawings.

1.13 SUPPLY FITTINGS

- A. NSF Standard: Comply with NSF 61, "Drinking Water System Components - Health Effects," for supply-fitting materials that will be in contact with potable water.
- B. Standard: ASME A112.18.1/CSA B125.1.
- C. Escutcheon: Chrome plated steel and polished brass, standard and split ring.
- D. Supply Stops: Chrome-plated brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.
- E. Operation: Loose key.
- F. Supplies: Chrome-plated, soft-copper flexible tube, or ASME A112.18.6 braided flexible hose.

1.14 WASTE FITTINGS

- A. Standard: ASME A112.18.2/CSA B125.2.
- B. Drain: Grid strainer with tailpiece as indicated on Drawings.
- C. Trap:
 - 1. Size: NPS 1-1/2.
 - 2. Material: Chrome-plated, two-piece, cast-brass trap and ground-joint swivel elbow with 17 gauge thick brass tube to wall; and chrome-plated brass or steel wall flange.

EXECUTION

1.15 EXAMINATION

- A. Examine roughing-in of water-supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before fixture installation.
- B. Examine walls, floors, cabinets, and counters for suitable conditions where fixtures will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

1.16 INSTALLATION

- A. Install plumbing fixtures level and plumb according to roughing-in drawings.
- B. Install supports, affixed to building substrate, for wall-mounted fixtures.
 - 1. Use carrier supports with waste fitting and seal for back-outlet fixtures.
 - 2. Use carrier supports without waste fitting for fixtures with tubular waste piping.
 - 3. Use chair-type carrier supports with rectangular steel uprights for accessible fixtures.
- C. Install floor-mounted water closets on bowl-to-drain, connecting fitting attachments to piping or building substrate.
- D. Install counter-mounted fixtures in and attached to casework.
- E. Install water-supply piping with stop on each supply to each fixture to be connected to water-distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.
 - 1. Exception: Use ball valve if supply stops are not specified with fixture. Comply with valve requirements specified in Section 220523 "General-Duty Valves for Plumbing Piping."
- F. Install flushometer valves on water closets.
- G. Install flushometer valves for accessible water closets, with lever handle mounted on wide side of compartment.
- H. Install toilet seats on water closets.
- I. Install faucet flow-control fittings with specified flow rates and patterns in faucet spouts, if faucets are not available with required rates and patterns. Include adapters if required.
- J. Install laminar-flow, faucet-spout fittings in faucet spouts where laminar-flow fittings are specified.
- K. Install shower flow-control fittings with specified maximum flow rates in shower arms.
- L. Install traps on fixture outlets.
 - 1. Exception: Omit trap on fixtures with integral traps.

- M. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible sinks. Comply with requirements in Section 220719 "Plumbing Piping Insulation."
- N. Seal joints between plumbing fixtures, counters, floors, and walls using sanitary-type, one-part, mildew-resistant adhesive caulk. Comply with sealant requirements specified in Section 079200 "Joint Sealants."
- O. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220518 "Escutcheons for Plumbing Piping."

1.17 CONNECTIONS

- A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- B. Comply with requirements for water piping specified in Section 221116 "Domestic Water Piping."
- C. Comply with requirements for waste drainage piping and vent piping specified in Section 221316 "Sanitary Waste and Vent Piping."
- D. Comply with requirements for atmospheric vent piping specified in Section 221316 "Sanitary Waste and Vent Piping."
- E. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible sinks. Comply with requirements in Section 220719 "Plumbing Piping Insulation."

1.18 ADJUSTING

- A. Operate and adjust faucets and controls. Replace damaged and malfunctioning plumbing fixtures, fittings, and controls.
- B. Adjust water supply at faucets and flushometer valves to produce proper flow.
- C. Install fresh batteries in battery-powered, electronic-sensor mechanisms.

1.19 CLEANING AND PROTECTION

- A. After installing plumbing fixtures, inspect and repair damaged finishes.
- B. Clean plumbing fixtures, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.
- C. Provide protective covering for installed fixtures and fittings.
- D. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Owner.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
FIRE CAMP 13 RECONSTRUCTION
PROJECT ID: 00002191

HUITT-ZOLLARS, INC.
PROJECT NO. R311608.14
CONSTRUCTION DOCUMENT 01/04/2023

END OF SECTION

DIVISION 23

HEATING, VENTILATING, AND AIR CONDITIONING

SECTION 230513 - COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 MATERIALS

- A. Polyphase Motors: Design B, medium induction motors.
 - 1. Efficiency: Energy efficient.
 - 2. Service Factor: 1.15.
 - 3. Multispeed Motors: Separate Windings for each Speed.
 - 4. Rotor: Random-wound, squirrel cage.
 - 5. Bearings: Re-greaseable, shielded, antifriction ball bearings suitable for radial and thrust loading.
 - 6. Temperature Rise: Match insulation rating.
 - 7. Code Letter Designation:
 - a. Motors 15 HP and Larger: NEMA starting Code F or Code G.
 - b. Motors Smaller than 15 HP: Manufacturer's standard starting characteristic.
 - 8. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T .
- B. Polyphase Motors with Additional Requirements:
 - 1. Motors used with reduced-voltage and multispeed controllers.
 - 2. Energy- and premium-efficient motors used with variable frequency controllers.
 - 3. Severe-duty motors.
- C. Single-Phase Motors:
 - 1. Motors 1HP and smaller: Motors shall be an electronic commutation (EC) motor specifically designed for applications. Permanent split capacitor (PSC), split Phase I capacitor start are not acceptable..
 - 2. Motors shall be controllable down to 20% of fan speed.
 - 3. Bearings: Pre-lubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.
 - 4. Motors 1/20 HP and Smaller: Shaded-pole type.
- D. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

END OF SECTION

SECTION 230517 – SLEEVES AND SLEEVE SEALS FOR HVAC PIPING

PART 1 - GENERAL

1.1 SLEEVE-SEAL SYSTEMS

- A. Field-assembled, modular sealing-element unit for filling annular space between piping and sleeve.
 - 1. Sealing Elements: EPDM rubber.
 - 2. Pressure Plates: Carbon steel.
 - 3. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating.

1.2 SLEEVE-SEAL FITTINGS (To Match and Be Consistent with Phase I)

- A. Manufactured plastic, sleeve-type, plastic or rubber water stop assembly made for imbedding in concrete slab or wall.

1.3 GROUT

- A. Non-shrink, factory packaged.

1.4 SLEEVE AND SLEEVE-SEAL SCHEDULE (To Match And Be Consistent With Phase I)

- A. Exterior Concrete Walls above Grade:
 - 1. Piping Smaller Than NPS 6: Galvanized-steel wall sleeves.
 - 2. Piping NPS 6 and Larger: Galvanized-steel wall sleeves.
- B. Exterior Concrete Walls below Grade:
 - 1. Piping Smaller Than NPS 6: Galvanized-steel wall sleeves with sleeve-seal system.
 - 2. Piping NPS 6 and Larger: Galvanized-steel wall sleeves with sleeve-seal system.
- C. Concrete Slabs-on-Grade:
 - 1. Piping Smaller Than: Galvanized-steel wall sleeves with sleeve-seal system.
 - 2. Piping NPS 6 and Larger: Galvanized-steel wall sleeves with sleeve-seal system.
- D. Concrete Slabs above Grade:
 - 1. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
 - 2. Piping NPS 6 and Larger: Galvanized-steel-pipe sleeves
- E. Sleeve-Seal-Fitting Installation

1. Sleeve-seal fittings in this article are used, above and below grade in concrete slabs and in concrete walls, for a watertight seal around piping. These fittings do not require a sleeve.
2. Install sleeve-seal fittings in new walls and slabs as they are constructed.
3. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position water stop flange to be centered in concrete slab or wall.
4. Secure nailing flanges to concrete forms.
5. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION

SECTION 230518 – ESCUTCHEONS FOR HVAC PIPING

PART 1 - GENERAL

1.1 Products (To Match and Be Consistent with Phase I)

A. Escutcheons for New Piping

1. Piping with Fitting or Sleeve Protruding from Exposed Wall: One-piece, deep-pattern type.
2. Insulated Piping: One-piece, stamped-steel type; chrome plated.
3. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass type; chrome plated.
4. Bare Piping in Equipment Rooms: One-piece, cast-brass type; chrome plated.

1.2 Installation

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening

END OF SECTION

SECTION 230529 – HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 PERFORMANCE REQUIREMENTS

- A. Pipe hangers and equipment supports designed by Contractor.
- B. Seismic-restraint hangers and supports designed by Contractor and approval obtained from authorities having jurisdiction.

1.2 SUBMITTALS

- A. Shop Drawings: Signed and sealed by a professional engineer.

1.3 QUALITY ASSURANCE

- A. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. ASME Boiler and Pressure Vessel Code.

1.4 COMPONENTS

- A. Metal Pipe Hangers and Supports: Carbon steel, stainless steel or copper.
- B. Trapeze pipe hangers.
- C. Metal Framing Systems: MFMA manufacturer or Non-MFMA manufacturer.
- D. Thermal-hanger shield inserts.
- E. Fastener Systems: Powder-actuated fasteners and mechanical-expansion anchors.
- F. Pipe Stands: Curb-mounted type.
- G. Equipment supports.

END OF SECTION

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
FIRE CAMP 13 RECONSTRUCTION
PROJECT ID: 00002191

HUITT-ZOLLARS, INC.
PROJECT NO. R311608.14
CONSTRUCTION DOCUMENT 01/04/2023

SECTION 230548 – VIBRATION AND SEISMIC CONTROLS FOR HVAC

PART 1 - GENERAL

1.1 PERFORMANCE REQUIREMENTS

- A. Wind-Restraint Loading:
 - 1. Basic Wind Speed: 85.
 - 2. Building Classification Category: III.
 - 3. Minimum 10 lb/sq. ft. multiplied by the maximum area of the HVAC component projected on a vertical plane that is normal to the wind direction, and 45 degrees either side of normal.
- B. Seismic-Restraint Loading:
 - 1. Site Class as Defined in the IBC: D.
 - 2. Assigned Seismic Use Group or Building Category as Defined in the IBC: III.
 - a. Component Importance Factor: $I_p = 1.5$ for components required to function for life safety purposes after an earthquake. $I_p = 1.0$ for all other components.
 - b. Component Response Modification Factor: See ASCE 7 – 05, Table 15.4 – 1.
 - c. Component Amplification Factor: See ASCE Chapter 15, Table 15.4 – 1.
 - 3. Design Spectral Response Acceleration at Short Periods (0.2 Second): 1.557g.
 - 4. Design Spectral Response Acceleration at 1-Second Period: 0.786g.

1.2 COMPONENTS (To Match and Be Consistent with Phase I)

- A. Vibration Isolators:
 - 1. Elastomeric Isolation Pads: Single or multiple layers of sufficient durometer stiffness for uniform loading over pad area. Material to be oil and water resistant with elastomeric properties.
 - a. Surface Pattern: Smooth pattern.
 - b. Infused nonwoven cotton or synthetic fibers.
 - 2. Load-bearing metal plates adhered to pads.
 - 3. Double-Deflection, Elastomeric Isolation Mounts: Molded, oil-resistant rubber, neoprene, or other elastomeric material.
 - 4. Restrained Elastomeric Isolation Mounts: All-directional isolator with seismic restraints;
 - 5. molded, oil-resistant elastomeric material with cast-ductile-iron or welded-steel housing.
 - 6. Open-Spring Isolators: Freestanding, laterally stable.
 - 7. Housed-Spring Isolators: Freestanding, laterally stable, open-spring isolators in two-part telescoping housing.

8. Restrained-Spring Isolators: Freestanding, laterally stable, open-spring isolators with vertical-limit stop restraint.
 9. Housed-Restrained-Spring Isolators: Freestanding, steel, open-spring isolators with vertical-limit stop restraint in two-part telescoping housing.
 10. Pipe-Riser Resilient Support: All-directional, acoustical pipe anchor.
 11. Resilient pipe guides.
 12. Air-Spring Isolators: Freestanding, single or multiple, compressed-air bellows.
 13. Restrained-Air-Spring Isolators: Freestanding, single or multiple, compressed-air bellows with vertical-limit stop restraint.
 14. Elastomeric hangers.
 15. Spring Hangers: Combination coil-spring and elastomeric-insert hangers with spring and insert in compression and with vertical-limit stop.
- B. Seismic Restraint Devices:
1. Snubbers: Welded structural-steel shapes and replaceable resilient isolation washers and bushings.
 2. Restraint Channel Bracings: MFMA-4, shop- or field-fabricated bracing assemblies.
 3. Restraint Cables: ASTM A 603 galvanized-steel cables.
 4. Hanger-Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod.
 5. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.
 6. Anchor Bolts: Adhesive type, seismic rated.
- C. Vibration Isolation Equipment Bases:
1. Steel Base: Factory-fabricated, welded, structural-steel bases and rails.
 2. Inertia Base: Factory-fabricated, welded, structural-steel bases and rails ready for field- applied, cast-in-place concrete.

1.3 FIELD QUALITY CONTROL

- A. Testing: By Contractor-engaged agency.

END OF SECTION

SECTION 230555.3 – IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 QUALITY ASSURANCE

- A. Quality Standard for Piping Identification: ASME A13.1.

1.2 PRODUCTS (To Match and Be Consistent with Phase I)

- A. Equipment Labels: Metal.
- B. Warning Signs and Labels: 1/8 inch thick with fasteners.
- C. Pipe Labels: Pretensioned.
- D. Duct Labels: 1/8 inch thick with fasteners.
- E. Stencils: Aluminum.
- F. Valve Tags: Brass, 0.032-inch minimum thickness.
- G. Warning Tags: Approximately 4 by 7 inches; brass grommet and wire fasteners.

1.3 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

1.4 GENERAL INSTALLATION REQUIREMENTS

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

1.5 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
FIRE CAMP 13 RECONSTRUCTION
PROJECT ID: 00002191

HUITT-ZOLLARS, INC.
PROJECT NO. R311608.14
CONSTRUCTION DOCUMENT 01/04/2023

END OF SECTION

SECTION 230593 – TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

- A. TAB for the following:
 - 1. Balancing Air Systems:
 - a. Constant-volume air systems.
 - 2. Duct leakage tests.
 - 3. Control system verification.
 - 4. Testing plan and balancing procedure to be provided with submittal.

1.2 QUALITY ASSURANCE

- A. TAB Agent Qualifications: AABC/ NEBB certified.

1.3 EXECUTION

- A. Tolerances: Plus or minus 10 percent of design values.
- B. Inspections: Random checks by TAB firm to verify final TAB report.
- C. Additional Tests: Random tests within 90 days of completing TAB to verify balance conditions and seasonal tests.

END OF SECTION

SECTION 230713 – DUCT INSULATION

PART 1 - GENERAL

1.1 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: Flame-spread index of 25, and smoke-developed index of 50 for insulation installed indoors; according to ASTM E 84.
- B. Mockup of each type of duct insulation and finish.

1.2 FIELD QUALITY CONTROL

- A. Field Inspections: By Contractor-engaged agency.

1.3 DUCT INSULATION SCHEDULE, GENERAL

- A. Plenums and Ducts Requiring Insulation:
 - 1. Indoor, concealed supply .
 - 2. Indoor, exposed supply .
 - 3. Indoor, concealed return located in unconditioned space.
 - 4. Indoor, exposed return located in unconditioned space.
- B. Items Not Insulated:
 - 1. Fibrous-glass ducts.
 - 2. Metal ducts with duct liner of sufficient thickness to comply with energy code and ASHRAE/IESNA 90.1.
 - 3. Factory-insulated flexible ducts.
 - 4. Factory-insulated plenums and casings.
 - 5. Flexible connectors.
 - 6. Vibration-control devices.
 - 7. Factory-insulated access panels and doors.

1.4 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

- A. Concealed, round and flat-oval, supply-air duct insulation shall be insulated with Mineral-Fiber Blanket, 1-1/2 inches thick and 0.75-lb/cu. ft. nominal density. Installation to meet or exceed Title 24 CEC standards for thermal connectivity.

1.5 ABOVEGROUND, OUTDOOR DUCT AND PLENUM INSULATION SCHEDULE

- A. Mineral-Fiber Board: 2 inches thick and 3-lb/cu. ft. nominal density.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
FIRE CAMP 13 RECONSTRUCTION
PROJECT ID: 00002191

HUITT-ZOLLARS, INC.
PROJECT NO. R311608.14
CONSTRUCTION DOCUMENT 01/04/2023

END OF SECTION

SECTION 230719 – HVAC PIPING INSULATION

PART 1 - GENERAL

1.1 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: Flame-spread index of 25, and smoke-developed index of 50 for insulation installed indoors; according to ASTM E 84.
- B. Mockup of each type of pipe insulation and finish.
- C. All insulation products to meet or exceed thermal connectivity values required by Title 24 (CEC).

1.2 FIELD QUALITY CONTROL

- A. Field Inspections: By Contractor-engaged agency.

1.3 PIPING INSULATION SCHEDULE, GENERAL

- A. Items Not Insulated: Unless otherwise indicated, do not install insulation on Underground piping.

1.4 INDOOR PIPING INSULATION SCHEDULE

- A. Condensate and Equipment Drain Water below 60 Deg F:
 - 1. All Pipe Sizes: Insulation shall be: Mineral-Fiber, Preformed Pipe Insulation, Type I: 1/2 inch thick.
- B. Chilled Water and Brine, 40 Deg F and above: Mineral-Fiber, Preformed Pipe, Type I: 1 inches thick.
- C. Heating-Hot-Water Supply and Return, 200 Deg F and Below: Mineral-Fiber, Preformed Pipe, Type I: 1-1/2 inches thick.

1.5 INDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field applied jacket over the factory-applied jacket.
 - 1. Piping, Exposed:
 - a. Aluminum, Smooth: 0.016 inch thick.
 - b. 2B Finish: 0.010 inch thick.

1.6 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. Piping Exposed: Aluminum Stucco Embossed .016 inch thick

END OF SECTION

SECTION 231123 — NATURAL GAS PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Approved design / build methods and materials construction standards matrix.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipes, tubes, and fittings.
 - 2. Piping specialties.
 - 3. Piping and tubing joining materials.
 - 4. Valves.

1.3 DEFINITIONS

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

1.4 PERFORMANCE REQUIREMENTS

- A. Minimum Operating-Pressure Ratings:
 - 1. Piping and Valves: 100 psig minimum unless otherwise indicated.
 - 2. Service Regulators: 100 psig minimum unless otherwise indicated.
- B. Natural-Gas System Pressures within Buildings: Two pressure ranges. Primary pressure is more than 2 psig but not more than 5 psig, and is reduced to secondary pressure of more than 0.5 psig but not more than 2 psig.
- C. Delegated Design: Design restraints and anchors for natural-gas piping and equipment, including comprehensive engineering analysis by a qualified California registered professional engineer, using performance requirements and design criteria indicated.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of the following:
 - 1. Piping specialties.
 - 2. Corrugated, stainless-steel tubing with associated components.
 - 3. Valves. Include pressure rating, capacity, settings, and electrical connection data of selected models.
 - 4. Pressure regulators. Indicate pressure ratings and capacities.

5. Dielectric fittings.

B. Shop Drawings: For facility natural-gas piping layout. Include plans, piping layout and elevations, sections, and details for fabrication of pipe anchors, hangers, supports for multiple pipes, alignment guides, expansion joints and loops, and attachments of the same to building structure. Detail location of anchors, alignment guides, and expansion joints and loops.

1. Shop Drawing Scale: 1/4 inch per foot .

C. Delegated-Design Submittal: For natural-gas piping and equipment indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Detail fabrication and assembly of seismic restraints.
2. Design Calculations: Calculate requirements for selecting seismic restraints.

1.6 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans and details, drawn to scale, on which natural-gas piping is shown and coordinated with other installations, using input from installers of the items involved.

B. Site Survey: Plans, drawn to scale, on which natural-gas piping is shown and coordinated with other services and utilities.

C. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For motorized gas valves and pressure regulators and service meters to include in emergency, operation, and maintenance manuals.

1.8 QUALITY ASSURANCE

A. Steel Support Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Handling Flammable Liquids: Remove and dispose of liquids from existing natural-gas piping according to requirements of Owner's Representative.

B. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

C. Store and handle pipes and tubes having factory-applied protective coatings to avoid damaging coating, and protect from direct sunlight.

D. Protect stored PE pipes and valves from direct sunlight.

1.10 COORDINATION

A. Coordinate requirements for access panels and doors for valves installed concealed behind finished surfaces. Comply with requirements in Section 083113 "Access Doors and Frames."

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.
 - 1. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.
 - 2. Wrought-Steel Welding Fittings: ASTM A 234/A 234M for butt welding and socket welding of containment conduit and containment conduit vent piping.
 - 3. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.
 - 4. Forged-Steel Flanges and Flanged Fittings: ASME B16.5, minimum Class 150, including bolts, nuts, and gaskets of the following material group, end connections, and facings:
 - a. Material Group: 1.1.
 - b. End Connections: Threaded to match pipe.
 - c. Lapped Face: Not permitted underground.
 - d. Gasket Materials: ASME B16.20, metallic, flat, asbestos free, aluminum o-rings, and spiral-wound metal gaskets.
 - e. Bolts and Nuts: ASME B18.2.1, carbon steel aboveground and stainless steel underground.
 - 5. Protective Coating for Underground Piping: Factory-applied, three-layer coating of epoxy, adhesive, and PE.
 - a. Joint Cover Kits: Epoxy paint, adhesive, and heat-shrink PE sleeves.
 - 6. Mechanical Couplings:
 - a. Steel flanges and tube with epoxy finish.
 - b. Buna-nitrile seals.
 - c. Steel bolts, washers, and nuts.
 - d. Coupling shall be capable of joining PE pipe to PE pipe, steel pipe to PE pipe, or steel pipe to steel pipe.
 - e. Steel body couplings installed underground on plastic pipe shall be factory equipped with anode.
- B. PE Pipe: ASTM D 2513, SDR 11.
 - 1. For use in underground gas piping only.
 - 2. PE Fittings: ASTM D 2683, socket-fusion type or ASTM D 3261, butt-fusion type with dimensions matching PE pipe.
 - 3. PE Transition Fittings: Factory-fabricated fittings with PE pipe complying with ASTM D 2513, SDR 11; and steel pipe complying with ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.
 - 4. Anodeless Service-Line Risers: Factory fabricated and leak tested.
 - a. Underground Portion: PE pipe complying with ASTM D 2513, SDR 11 inlet.
 - b. Casing: Steel pipe complying with ASTM A 53/A 53M, Schedule 40, black steel, Type E or S, Grade B, with corrosion-protective coating covering. Vent casing aboveground.
 - c. Aboveground Portion: PE transition fitting.
 - d. Outlet shall be threaded or flanged.
 - e. Tracer wire connection.
 - f. Ultraviolet shield.
 - g. Stake supports with factory finish to match steel pipe casing or carrier pipe.
 - 5. Transition Service-Line Risers: Factory fabricated and leak tested.

- a. Underground Portion: PE pipe complying with ASTM D 2513, SDR 11 inlet connected to steel pipe complying with ASTM A 53/A 53M, Schedule 40, Type E or S, Grade B, with corrosion-protective coating for aboveground outlet.
 - b. Outlet shall be threaded or flanged.
 - c. Bridging sleeve over mechanical coupling.
 - d. Factory-connected anode.
 - e. Tracer wire connection.
 - f. Ultraviolet shield.
 - g. Stake supports with factory finish to match steel pipe casing or carrier pipe.
6. Plastic Mechanical Couplings, NPS 1-1/2 and Smaller: Capable of joining PE pipe to PE pipe.
- a. PE body with molded-in, stainless-steel support ring.
 - b. Buna-nitrile seals.
 - c. Acetal collets.
 - d. Electro-zinc-plated steel stiffener.
7. Steel Mechanical Couplings: Capable of joining plain-end PE pipe to PE pipe, steel pipe to PE pipe, or steel pipe to steel pipe.
- a. Steel flanges and tube with epoxy finish.
 - b. Buna-nitrile seals.
 - c. Steel bolts, washers, and nuts.
 - d. Factory-installed anode for steel-body couplings installed underground.

2.2 PIPING SPECIALTIES

A. Appliance Flexible Connectors:

1. Indoor, Fixed-Appliance Flexible Connectors: Comply with ANSI Z21.24.
2. Indoor, Movable-Appliance Flexible Connectors: Comply with ANSI Z21.69.
3. Corrugated stainless-steel tubing with polymer coating.
4. Operating-Pressure Rating: 0.5 psig.
5. End Fittings: Zinc-coated steel.
6. Threaded Ends: Comply with ASME B1.20.1.
7. Maximum Length: 72 inches

B. Quick-Disconnect Devices: Comply with ANSI Z21.41.

1. Copper-alloy convenience outlet and matching plug connector.
2. Nitrile seals.
3. Hand operated with automatic shutoff when disconnected.
4. For indoor or outdoor applications.
5. Adjustable, retractable restraining cable.

C. Y-Pattern Strainers:

1. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.
2. End Connections: Threaded ends for NPS 2 and smaller.
3. Strainer Screen: 40 -mesh startup strainer, and perforated stainless-steel basket with 50 percent free area.
4. CWP Rating: 125 psig.

D. Weatherproof Vent Cap: Cast- or malleable-iron increaser fitting with corrosion-resistant wire screen, with free area at least equal to cross-sectional area of connecting pipe and threaded-end connection.

2.3 JOINING MATERIALS

A. Joint Compound and Tape: Suitable for natural gas.

2.4 MANUAL GAS SHUTOFF VALVES

- A. See Plumbing Plans for where each valve is applied in various services.
- B. General Requirements for Metallic Valves, NPS 2 and Smaller: Comply with ASME B16.33.
1. CWP Rating: 125 psig .
 2. Threaded Ends: Comply with ASME B1.20.1.
 3. Dryseal Threads on Flare Ends: Comply with ASME B1.20.3.
 4. Tamperproof Feature: Locking feature for valves indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
 5. Listing: Listed and labeled by an NRTL acceptable to Owner's Representative for valves 1 inch and smaller.
 6. Service Mark: Valves 1-1/4 inches to NPS 2 shall have initials "WOG" permanently marked on valve body.
- C. One-Piece, Bronze Ball Valve with Bronze Trim: MSS SP-110.
1. Body: Bronze, complying with ASTM B 584.
 2. Ball: Chrome-plated brass.
 3. Stem: Bronze; blowout proof.
 4. Seats: Reinforced TFE; blowout proof.
 5. Packing: Separate packnut with adjustable-stem packing threaded ends.
 6. Ends: Threaded, flared, or socket as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
 7. CWP Rating: 600 psig.
 8. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to Owner's Representative.
 9. Service: Suitable for natural-gas service with "WOG" indicated on valve body..
- D. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim: MSS SP-110.
1. Body: Bronze, complying with ASTM B 584.
 2. Ball: Chrome-plated bronze.
 3. Stem: Bronze; blowout proof.
 4. Seats: Reinforced TFE; blowout proof.
 5. Packing: Threaded-body packnut design with adjustable-stem packing.
 6. Ends: Threaded, flared, or socket as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
 7. CWP Rating: 600 psig.
 8. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to Owner's Representative.
 9. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

- E. Two-Piece, Regular-Port Bronze Ball Valves with Bronze Trim: MSS SP-110.
 - 1. Body: Bronze, complying with ASTM B 584.
 - 2. Ball: Chrome-plated bronze.
 - 3. Stem: Bronze; blowout proof.
 - 4. Seats: Reinforced TFE.
 - 5. Packing: Threaded-body packnut design with adjustable-stem packing.
 - 6. Ends: Threaded, flared, or socket as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
 - 7. CWP Rating: 600 psig.
 - 8. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to Owner's Representative.
 - 9. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

- F. Bronze Plug Valves: MSS SP-78.
 - 1. Body: Bronze, complying with ASTM B 584.
 - 2. Plug: Bronze.
 - 3. Ends: Threaded, socket, or flanged as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
 - 4. Operator: Square head or lug type with tamperproof feature where indicated.
 - 5. Pressure Class: 125 psig.
 - 6. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to Owner's Representative.
 - 7. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

2.5 LABELING AND IDENTIFYING

- A. Detectable Warning Tape: Acid- and alkali-resistant, PE film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored yellow.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for natural-gas piping system to verify actual locations of piping connections before equipment installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Close equipment shutoff valves before turning off natural gas to premises or piping section.
- B. Inspect natural-gas piping according to NFPA 54 to determine that natural-gas utilization devices are turned off in piping section affected.
- C. Comply with NFPA 54 requirements for prevention of accidental ignition.

3.3 OUTDOOR PIPING INSTALLATION

- A. Comply with NFPA 54 for installation and purging of natural-gas piping.
- B. Install underground, natural-gas piping buried at least 36 inches below finished grade. Comply with requirements in Section 312000 "Earth Moving" for excavating, trenching, and backfilling.
 - 1. If natural-gas piping is installed less than 36 inches below finished grade, install it in containment conduit.
- C. Install underground, PE, natural-gas piping according to ASTM D 2774.
- D. Steel Piping with Protective Coating:
 - 1. Apply joint cover kits to pipe after joining to cover, seal, and protect joints.
 - 2. Repair damage to PE coating on pipe as recommended in writing by protective coating manufacturer.
- E. Install fittings for changes in direction and branch connections.
- F. Install pressure gauge upstream and downstream from each service regulator.
- G. Drips and Sediment Traps: Install drips at points where condensate may collect, including service-meter outlets. Locate where accessible to permit cleaning and emptying. Do not install where condensate is subject to freezing.
 - 1. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 3 inches long and same size as connected pipe. Install with space below bottom of drip to remove plug or cap

3.4 INDOOR PIPING INSTALLATION

- A. Comply with NFPA 54 for installation and purging of natural-gas piping.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Arrange for pipe spaces, chases, slots, sleeves, and openings in building structure during progress of construction, to allow for mechanical installations.
- D. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- E. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- F. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- G. Locate valves for easy access.
- H. Install piping free of sags and bends.
- I. Install fittings for changes in direction and branch connections.
- J. Verify final equipment locations for roughing-in.
- K. Comply with requirements in Sections specifying gas-fired appliances and equipment for roughing-in requirements.
- L. Drips and Sediment Traps: Install drips at points where condensate may collect, including service-meter outlets. Locate where accessible to permit cleaning and emptying. Do not install where condensate is subject to freezing.

1. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 3 inches long and same size as connected pipe. Install with space below bottom of drip to remove plug or cap.

M. Extend relief vent connections for service regulators, line regulators, and overpressure protection devices to outdoors and terminate with weatherproof vent cap.

N. Conceal pipe installations in walls, pipe spaces, utility spaces, above ceilings, below grade or floors, and in floor channels unless indicated to be exposed to view.

O. Concealed Location Installations: Except as specified below, install concealed natural-gas piping and piping installed under the building in containment conduit. Install a vent pipe from containment conduit to outdoors and terminate with weatherproof vent cap.

1. Above Accessible Ceilings: Natural-gas piping, fittings, valves, and regulators may be installed in accessible spaces without containment conduit.
2. In Floors: Install natural-gas piping with brazed joints and protective coating in cast-in-place concrete floors. Cover piping to be cast in concrete slabs with minimum of 1-1/2 inches of concrete. Piping may not be in physical contact with other metallic structures such as reinforcing rods or electrically neutral conductors. Do not embed piping in concrete slabs containing quick-set additives or cinder aggregate.
3. In Floor Channels: Install natural-gas piping in floor channels. Channels must have cover and be open to space above cover for ventilation.
4. In Walls or Partitions: Protect tubing installed inside partitions or hollow walls from physical damage using steel striker barriers at rigid supports.
 - a. Exception: Tubing passing through partitions or walls does not require striker barriers.
5. Prohibited Locations:
 - a. Do not install natural-gas piping in or through circulating air ducts, clothes or trash chutes, chimneys or gas vents (flues), ventilating ducts, or dumbwaiter or elevator shafts.
 - b. Do not install natural-gas piping in solid walls or partitions.

P. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.

Q. Connect branch piping from top or side of horizontal piping.

R. Install unions in pipes NPS 2 and smaller, adjacent to each valve, at final connection to each piece of equipment. Unions are not required at flanged connections.

S. Do not use natural-gas piping as grounding electrode.

T. Install strainer on inlet of each line-pressure regulator and automatic or electrically operated valve.

U. Install pressure gage upstream and downstream from each line regulator. Pressure gages are specified in Section 230519 "Meters and Gages for HVAC Piping." Pressure gauges are not required on small regulators supplying appliances unless required by the appliance manufacturer.

V. Install sleeves for piping penetrations of floors. Comply with requirements for sleeves specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."

W. Install sleeve seals for piping penetrations of concrete slabs. Comply with requirements for sleeve seals specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."

X. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 230518 "Escutcheons for HVAC Piping."

3.5 VALVE INSTALLATION

- A. Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless-steel tubing, aluminum, or copper connector.
- B. Install underground valves with valve boxes.
- C. Install regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.
- D. Install earthquake valves aboveground outside buildings according to listing.
- E. Install anode for metallic valves in underground PE piping.

3.6 PIPING JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Threaded Joints:
 - 1. Thread pipe with tapered pipe threads complying with ASME B1.20.1.
 - 2. Cut threads full and clean using sharp dies.
 - 3. Ream threaded pipe ends to remove burrs and restore full inside diameter of pipe.
 - 4. Apply appropriate tape or thread compound to external pipe threads unless dryseal threading is specified.
 - 5. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- D. Flanged Joints: Install gasket material, size, type, and thickness appropriate for natural-gas service. Install gasket concentrically positioned.
- E. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
 - 1. Plain-End Pipe and Fittings: Use butt fusion.
 - 2. Plain-End Pipe and Socket Fittings: Use socket fusion.

3.7 HANGER AND SUPPORT INSTALLATION

- A. Install seismic restraints on piping. Comply with requirements for seismic-restraint devices specified in Section 230548 "Vibration and Seismic Controls for HVAC Piping and Equipment."
- B. Comply with requirements for pipe hangers and supports specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- C. The hanger spacing and rod diameter listed within this specification is the maximum spacing and minimum rod diameter allowable. Refer to design drawings and standard details for project specific hanger spacing.
- D. Install hangers for horizontal steel piping with the following maximum spacing and minimum rod sizes:
 - 1. NPS 1/2 and Smaller: Maximum span, 72 inches; minimum rod size, 3/8 inch.
 - 2. NPS 3/4 through NPS 1: Maximum span, 96 inches; minimum rod size, 3/8 inch
 - 3. NPS 1-1/4 through NPS 4: Maximum span, 10 feet; minimum rod size, 3/8 inch.
 - 4. NPS 6 and NPS 8: Maximum span, 10 feet; minimum rod size, 1/2 inch.
 - 5. NPS 10 and NPS 12: Maximum span, 10 feet; minimum rod size, 5/8.
- E. Install hangers for horizontal, corrugated stainless-steel tubing with the following maximum spacing and minimum rod sizes, or per manufacturers written instructions:
 - 1. NPS 3/8: Maximum span, 48 inches; minimum rod size, 3/8 inch.
 - 2. NPS 1/2: Maximum span, 72 inches; minimum rod size, 3/8 inch.

3. NPS 3/4 and Larger: Maximum span, 96 inches; minimum rod size, 3/8 inch.

F. Support Vertical and Steel piping at the same intervals as horizontal piping and at every floor.

3.8 CONNECTIONS

A. Connect to utility's gas main according to utility's procedures and requirements.

B. Install natural-gas piping electrically continuous, and bonded to gas appliance equipment grounding conductor of the circuit powering the appliance according to NFPA 70.

C. Install piping adjacent to appliances to allow service and maintenance of appliances.

D. Do not use natural gas piping as electrical grounding electrode.

E. Connect piping to appliances using manual gas shutoff valves and unions. Install valve within 72 inches of each gas-fired appliance and equipment. Install union between valve and appliances or equipment.

F. Sediment Traps: Install tee fitting with capped nipple in bottom to form drip, as close as practical to inlet of each appliance.

3.9 LABELING AND IDENTIFYING

A. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for piping and valve identification.

B. Install detectable warning tape directly above gas piping, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.10 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Test, inspect, and purge natural gas according to NFPA 54 and Owner's Representative.

C. Prepare test and inspection reports.

3.11 OUTDOOR PIPING SCHEDULE.

A. Underground natural-gas piping shall be one of the following:

1. PE pipe is available in NPS 1/2 to NPS 16 (DN 15 to DN 400), maximum NPS 2 (DN 50) in 100-foot (305-m) rolls.

2. PE pipe and fittings joined by heat fusion, or mechanical couplings; service-line risers with tracer wire terminated in an accessible location.

3. Steel pipe with mechanical couplings. Coat pipe and fittings with protective coating for steel piping.

B. Aboveground natural-gas piping shall be one of the following:

1. Steel pipe with malleable-iron fittings and threaded joints.

3.12 INDOOR PIPING SCHEDULE FOR SYSTEM PRESSURES MORE THAN 0.25 PSIG AND LESS THAN 5 PSIG

A. Aboveground, piping NPS 2 and smaller shall be one of the following:

1. Verify acceptability of corrugated stainless-steel tubing with Owner's Representative before retaining first subparagraph below.
2. Steel pipe with malleable-iron fittings and threaded joints.

B. Underground, below building, piping shall be one of the following:

1. Steel pipe with malleable-iron fittings and threaded joints.

C. Containment Conduit: Steel pipe with wrought-steel fittings and welded joints. Coat underground pipe and fittings with protective coating for steel piping.

D. Containment Conduit Vent Piping: Steel pipe with malleable-iron fittings and threaded or wrought-steel fittings with welded joints. Coat underground pipe and fittings with protective coating for steel piping.

3.13 ABOVEGROUND MANUAL GAS SHUTOFF VALVE SCHEDULE

A. Valves for pipe sizes NPS 2 and smaller at service meter shall be the following:

1. Bronze or steel plug valve.

B. Valves for pipe sizes NPS 2 and smaller shall be one of the following:

1. Two-piece, full-port, bronze ball valves with bronze trim rated for gas duty.
2. Bronze or steel plug valve.

END OF SECTION

SECTION 233300 – AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 QUALITY ASSURANCE

- A. Installation Standards: NFPA 90A, NVPA 90B, and SMACNA’s “HVAC Duct Construction Standards – Metal and Flexible.”

1.2 PRODUCTS

- A. Section includes:
 - 1. Backdraft and pressure relief dampers.
 - 2. Barometric relief dampers.
 - 3. Manual volume dampers.
 - 4. Control dampers.
 - 5. Fire dampers.
 - 6. Ceiling dampers.
 - 7. Smoke dampers.
 - 8. Combination fire and smoke dampers.
 - 9. Corridor dampers.
 - 10. Flange connectors.
 - 11. Turning vanes.
 - 12. Duct-mounted access doors.
 - 13. Flexible connectors.
 - 14. Flexible ducts.
 - 15. Duct accessory hardware

1.3 SUBMITTALS

- A. Shop Drawings: For duct accessories. Include plans, details.
 - 1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, and required clearances; Include the following:
 - a. Special fittings.
 - b. Manual volume damper installations.
 - c. Control damper installations.

- d. Fire-damper, smoke-damper, combination fire- and smoke-damper, ceiling, and corridor damper installations, including sleeves; and duct-mounted access doors and remote damper operators.
 - e. Wiring Diagrams: For power, signal, and control wiring
- B. Operation and Maintenance Data: For air duct accessories to include in operation and maintenance manuals.

1.4 MATERIALS

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A 653.
 - 1. Galvanized Coating Designation: G90.
- C. Stainless-Steel Sheets: Comply with ASTM A 480, Type 304, and having a No. 2 finish for concealed and exposed ducts.
- D. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.
- E. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

1.5 BACKDRAFT AND PRESSURE RELIEF DAMPERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Air Balance Inc.; a division of Mestek, Inc.
 - 2. Cesco Products; a division of Mestek, Inc.
 - 3. Duro Dyne Inc.
 - 4. Greenheck Fan Corporation.
 - 5. Lloyd Industries, Inc.
 - 6. Nailor Industries Inc.
 - 7. NCA Manufacturing, Inc.
 - 8. Ruskin Company.
 - 9. SEMCO Incorporated.
 - 10. Pottorff
- B. Description: Gravity balanced.

- C. Maximum Air Velocity: 3000 fpm.
- D. Maximum System Pressure: See mechanical drawings.
- E. Frame: 0.052-inch-thick, galvanized sheet steel, with welded corners and mounting flange.
- F. Blades: Multiple single-piece blades, maximum 6-inch width, 0.025-inch- thick, roll-formed aluminum with sealed edges.
- G. Blade Action: Parallel.
- H. Blade Seals: Silicone.
- I. Blade Axles:
 - 1. Material: Plated Steel.
 - 2. Diameter: 0.50 inch.
- J. Tie Bars and Brackets: Galvanized steel.
- K. Return Spring: Adjustable tension.
- L. Bearings: Steel ball or synthetic pivot bushings:

1.6 BAROMETRIC RELIEF DAMPERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Air Balance Inc.; a division of Mestek, Inc.
 - 2. Cesco Products; a division of Mestek, Inc.
 - 3. Duro Dyne Inc.
 - 4. Greenheck Fan Corporation.
 - 5. Lloyd Industries, Inc.
 - 6. Nailor Industries Inc.
 - 7. Pottorff; a division of PCI Industries, Inc.
 - 8. Ruskin Company.
 - 9. SEMCO Incorporated.
 - 10. ACCO
- B. Suitable for horizontal or vertical mounting.
- C. Maximum Air Velocity: 2500 fpm.
- D. Maximum System Pressure: See mechanical drawings.

- E. Frame: 0.064-inch-thick, galvanized sheet steel.
- F. Blades.
 - 1. Multiple, roll-formed aluminum.
 - 2. Maximum Width: 6 inches.
 - 3. Action: Parallel.
 - 4. Balance: Gravity.
 - 5. Eccentrically pivoted.
- G. Blade Seals: Vinyl or Neoprene.
- H. Blade Axles: Galvanized steel.
- I. Tie Bars and Brackets:
 - 1. Material: Galvanized steel.
 - 2. Rattle free with 90-degree stop.
- J. Return Spring: Adjustable tension:
- K. Bearings: Synthetic:
- L. Accessories:
 - 1. Adjustment device to permit setting for varying differential static pressures.

1.7 MANUAL VOLUME DAMPERS

- A. Standard, Steel, Manual Volume Dampers.
 - 1. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Air Balance Inc.; a division of Mestek, Inc.
 - b. Flexmaster U.S.A., Inc.
 - c. METALAIRE, Inc.
 - d. Nailor Industries Inc.
 - e. Pottorff; a division of PCI Industries, Inc.
 - f. Ruskin Company.
 - g. Trox USA Inc.
 - h. ACCO
 - i. Superior Duct Fabricators
 - 2. Standard leakage rating.
 - 3. Suitable for horizontal or vertical applications.
 - 4. Frames:
 - a. Hat-shaped, galvanized-steel channels, 0.064-inch minimum thickness.

- b. Mitered and welded corners.
- c. Flanges for attaching to walls and flangeless frames for installing in ducts.
- 5. Blades:
 - a. Rectangular Dampers
 - 1) Multiple or single blade.
 - 2) Parallel- or opposed-blade design.
 - 3) Stiffen damper blades for stability.
 - 4) Galvanized-steel, 0.052 inch thick.
 - b. Round Dampers
 - 1) Single or butterfly type.
 - 2) Flat-galvanized steel 0.064 inch thick.
 - 3) Stamped or stiffened –galvanized steel 0.052 inch thick.
- 6. Blade Axles: Galvanized steel with continuous square rod:
- 7. Bearings:
 - a. Oil-impregnated bronze.
 - b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and closed end bearings.
- 8. Tie Bars and Brackets: Galvanized steel.
- B. Standard, Aluminum, Manual Volume Dampers
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Air Balance Inc.; a division of Mestek, Inc.
 - b. American Warming and Ventilating; a division of Mestek, Inc.
 - c. Flexmaster U.S.A., Inc.
 - d. McGill AirFlow LLC.
 - e. METALAIRE, Inc.
 - f. Nailor Industries Inc.
 - g. Pottorff; a division of PCI Industries, Inc.
 - h. Ruskin Company.
 - i. Trox USA Inc.
 - j. Vent Products Company, Inc.
 - 2. Standard leakage rating.
 - 3. Suitable for horizontal or vertical applications.
 - 4. Frames: Hat-shaped, 0.10-inch-thick, aluminum sheet channels; frames with flanges for attaching to walls and flangeless frames for installing in ducts.
 - 5. Blades:
 - a. Multiple or single blade.
 - b. Parallel- or opposed-blade design.
 - c. Stiffen damper blades for stability.

- d. Roll-Formed Aluminum Blades: 0.10-inch-thick aluminum sheet.
 - e. Extruded-Aluminum Blades: 0.050-inch-thick extruded aluminum.
 - 6. Blade Axles: Galvanized steel .
 - 7. Bearings:
 - a. Oil-impregnated bronze.

 - b. Dampers shall have axles full length of damper blades and bearings at both ends of operating shaft.
 - 8. Tie Bars and Brackets: Aluminum.
- C. Low-Leakage, Steel, Manual Volume Dampers
- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Air Balance Inc.; a division of Mestek, Inc.
 - b. Flexmaster U.S.A., Inc.
 - c. McGill AirFlow LLC.
 - d. METALAIRE, Inc.
 - e. Nailor Industries Inc.
 - f. Pottorff; a division of PCI Industries, Inc.
 - g. Ruskin Company.
 - h. Trox USA Inc.
 - i. ACCO.
 - 2. Low-leakage rating and bearing AMCA's Certified Ratings Seal for both air performance and air leakage.
 - 3. Suitable for horizontal or vertical applications.
 - 4. Frames:
 - a. Hat shaped.
 - b. Galvanized-steel channels, 0.064 inch thick.
 - c. Mitered and welded corners.
 - d. Flanges for attaching to walls and flangeless frames for installing in ducts.
 - 5. Blades:
 - a. Multiple or single blade.
 - b. Parallel- or opposed-blade design.
 - c. Stiffen damper blades for stability.
 - d. Galvanized, roll-formed steel, 0.064 inch thick.
 - 6. Blade Axles: Galvanized steel.
 - 7. Bearings:
 - a. Oil-impregnated bronze or nylon bushings.
 - b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
 - 8. Blade Seals: Felt:

9. Jamb Seals: Cambered aluminum:
10. Tie Bars and Brackets: Galvanized steel
11. Accessories:
 - a. Include locking device to hold single-blade dampers in a fixed position without vibration.

1.8 CONTROL DAMPERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Duro Dyne Inc.
 2. Flexmaster U.S.A. , Inc.
 3. Greenheck Fan Corporation
 4. Lloyd Industries, Inc.
 5. METALAIRE, Inc.
 6. Metal Form Manufacturing, Inc.
 7. Nailor Industries Inc.
 8. Ruskin Company
 9. Young Regulator Company
 10. Pottoroff: A Division of PCI Industries, Inc.
 11. Air Balance Inc.: A Division of Mestek, Inc.
- B. Low-leakage rating, and bearing AMCA's Certified Ratings Seal for both air performance and air leakage.
- C. Frames:
 1. Hat shaped.
 2. Galvanized-steel channels, 0.064 inch thick.
 3. Mitered and welded corners
- D. Blades:
 1. Multiple blade with maximum blade width of 8 inches.
 2. Parallel- and opposed-blade design.
 3. Galvanized steel.
 4. 0.064 inch thick.
 5. Blade Edging: Closed-cell neoprene edging.
 6. Blade Edging: Inflatable seal blade edging, or replaceable rubber seals.
- E. Blade Axles: 1/2-inch-diameter; galvanized steel blade-linkage hardware of zinc-plated steel and brass; ends sealed against blade bearings.
 1. Operating Temperature Range: From minus 40 to plus 200 deg F.
- F. Bearings:

1. Stainless-steel sleeve.
2. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
3. Thrust bearings at each end of every blade.

G. Actuators:

1. 24-volt on 120 volt. See Control Diagrams.
2. Belimo, or equal.
3. 5-year Parts Warranty.

1.9 FIRE DAMPERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Air Balance Inc.; A Division of Mestek, Inc.
 2. Greenheck Fan Corporation
 3. METALAIRE, Inc.
 4. Nailor Industries Inc.
 5. Pottoroff; a division of PCI Industries, Inc.
 6. Prefco; Perfect Air Control, Inc.
 7. Ruskin Company.
- B. Type: Static and dynamic; rated and labeled according to UL 555 and California State Fire Marsall.
- C. Closing rating in ducts up to 4-inch wg static pressure class and minimum velocity 4,000 fpm.
- D. Fire Rating: 1-1/2 and 3 hours.
- E. Frame: Curtain type fabricated with roll-formed, galvanized steel; with mitered and interlocking corners.
- F. Mounting Sleeve: Factory- or field-installed, galvanized sheet steel.
1. Minimum Thickness: thick, as indicated, and of length to suit application.
 2. Exception: Omit sleeve where damper-frame width permits direct attachment of perimeter mounting angles on each side of wall or floor; thickness of damper frame must comply with sleeve requirements
- G. Mounting Orientation: Vertical or horizontal as indicated and per Manufacturer's listing.
- H. Blades: Roll-formed, interlocking, galvanized sheet steel. In place of interlocking blades, use full-length, galvanized-steel blade connectors.
- I. Heat-Responsive Device: Replaceable, 165 deg F rated, fusible links.

1.10 CEILING RADIATION DAMPERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Air Balance Inc.; a division of Mestek, Inc.
 - 2. METALAIRE, Inc.
 - 3. Nailor Industries Inc.
 - 4. Prefco; Perfect Air Control, Inc.
 - 5. Ruskin Company.
 - 6. Pottoroff; a division of PCI Industries, Inc
- B. General Requirements:
 - 1. Labeled according to UL 555C and California State Fire Marshall.
 - 2. Comply with construction details for tested floor- and roof-ceiling assemblies as indicated in UL's "Fire Resistance Directory."
- C. Frame: Galvanized sheet steel, round or rectangular, style to suit ceiling construction.
- D. Blades: Galvanized sheet steel with refractory insulation.
- E. Heat-Responsive Device: Replaceable, 165 deg F rated, fusible links.
- F. Fire Rating: Per plans

1.11 SMOKE DAMPERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Air Balance Inc.: A Division of Mestek Inc.
 - 2. Greenheck Fan Corporation.
 - 3. Nailor Industries Inc.
 - 4. Ruskin Company.
 - 5. Pottoroff; a division of PCI Industries, Inc.
- B. General Requirements: Label according to UL 555S and California State Fire Marshall.
- C. Smoke Detector: Integral, factory wired for single-point connection.
- D. Frame: Multiple-blade type fabricated with roll-formed, galvanized steel; with mitered and interlocking corners.
- E. Blades: Roll-formed, horizontal, interlocking, galvanized sheet steel. In place of interlocking blades, use full-length, galvanized-steel blade connectors.
- F. Leakage: Class II.

- G. Rated pressure and velocity to exceed design airflow conditions. Closure rating up to 4 in w.g. static pressure and minimum 2,000 fpm velocity.
- H. Mounting Sleeve: Factory-installed, 0.052-inch-thick, galvanized sheet steel; length to suit wall or floor application.
- I. Damper Actuator Motors: two-position action.
 - 1. Belimo, 120 Volt Actuator
 - 2. 5-Year Parts Warranty.
- J. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."
 - 1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
 - 2. Permanent-Split-Capacitor or Shaded-Pole Motors: With oil-immersed and sealed gear trains.
 - 3. Spring-Return Motors: Equip with an integral spiral-spring mechanism where indicated. Enclose entire spring mechanism in a removable housing designed for service or adjustments. Size for running torque rating of 150 in. x lbf and breakaway torque rating of 150 in. x lbf.
 - 4. Outdoor Motors and Motors in Outdoor-Air Intakes: Equip with O-ring gaskets designed to make motors weatherproof.
 - 5. Nonspring-Return Motors: For dampers larger than 25 sq. ft., size motor for running torque rating of 150 in. x lbf and breakaway torque rating of 300 in. x lbf.
 - 6. Electrical Connection: 115 V, single phase, 60 Hz.
- K. Accessories:
 - 1. Auxiliary switches for position indication

1.12 COMBINATION FIRE AND SMOKE DAMPERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Greenheck Fan Corporation.
 - 2. Ruskin Company.
 - 3. Pottoroff; a division of PCI Industries, Inc.
- B. Type: Static and dynamic; rated and labeled according to UL 555 and UL 555S and California State Fire Marshall.
- C. Closing rating in ducts up to 4-inch wg static pressure class and minimum 2,000-fpm velocity.
- D. Fire Rating: 1-1/2 and 3 hours.

- E. Frame: Multiple-blade type fabricated with roll-formed, galvanized steel; with mitered and interlocking corners.
- F. Heat-Responsive Device: Replaceable, 165 deg F rated, fusible links.
- G. Blades: Roll-formed, horizontal, interlocking, galvanized sheet steel. In place of interlocking blades, use full-length, galvanized-steel blade connectors.
- H. Leakage: Class II.
- I. Mounting Sleeve: Factory-installed galvanized sheet steel; length to suit wall or floor application.
- J. Damper Actuator Motors: two-position action.
 - 1. Belimo, 120 Volt Actuator
 - 2. 5-Year Parts Warranty.
- K. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."
 - 1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
 - 2. Permanent-Split-Capacitor or Shaded-Pole Motors: With oil-immersed and sealed gear trains.
 - 3. Spring-Return Motors: Equip with an integral spiral-spring mechanism where indicated. Enclose entire spring mechanism in a removable housing designed for service or adjustments. Size for running torque rating of 150 in. x lbf and breakaway torque rating of 150 in. x lbf.
 - 4. Outdoor Motors and Motors in Outdoor-Air Intakes: Equip with O-ring gaskets designed to make motors weatherproof.
 - 5. Nonspring-Return Motors: For dampers larger than 25 sq. ft., size motor for running torque rating of 150 in. x lbf and breakaway torque rating of 300 in. x lbf.
 - 6. Electrical Connection: 115 V, single phase, 60 Hz.
- L. Accessories
 - 1. Auxiliary switches for position indication.

1.13 CORRIDOR COMBINATION FIRE AND SMOKE DAMPERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Ruskin Company.
 - 2. Pottoroff; a division of PCI Industries, Inc.
 - 3. Greenheck
- B. General Requirements: Label combination fire and smoke dampers according to UL 555 for 1-1/2-hour rating and California State Fire Marshall.

- C. Heat-Responsive Device: Replaceable, 165 deg F rated, fusible links.
- D. Frame: Multiple-blade type fabricated with roll-formed, galvanized steel; with mitered and interlocking corners.
- E. Blades: Roll-formed, horizontal, interlocking, galvanized sheet steel. In place of interlocking blades, use full-length, galvanized-steel blade connectors.
- F. Mounting Sleeve: Factory-installed, 0.052-inch-thick, galvanized sheet steel; length to suit wall or floor application.
- G. Damper Motors: two-position action.
- H. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."
- I. Accessories:
 - 1. Auxiliary switches for position indication.
 - 2. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
 - 3. Permanent-Split-Capacitor or Shaded-Pole Motors: With oil-immersed and sealed gear trains.
 - 4. Spring-Return Motors: Equip with an integral spiral-spring mechanism where indicated. Enclose entire spring mechanism in a removable housing designed for service or adjustments. Size for running torque rating of 150 in. x lbf and breakaway torque rating of 150 in. x lbf.
 - 5. Outdoor Motors and Motors in Outdoor-Air Intakes: Equip with O-ring gaskets designed to make motors weatherproof.
 - 6. Nonspring-Return Motors: For dampers larger than 25 sq. ft., size motor for running torque rating of 150 in. x lbf and breakaway torque rating of 300 in. x lbf.
 - 7. Electrical Connection: 115 V, single phase, 60 Hz
- J. Damper Actuator Motors: two-position action.
 - 1. Belimo, 120 Volt Actuator
 - 2. 5-Year Parts Warranty

1.14 FLANGE CONNECTORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Ductmate Industries, Inc.

2. Nexus PDQ; Division of Shilco Holdings Inc.
 3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
 4. ACCO – Roll Formed T-25.
- B. Description: Add-on or roll-formed, factory-fabricated, slide-on transverse flange connectors, gaskets, and components.
- C. Material: Galvanized steel.
- D. Gage and Shape: Match connecting ductwork.

1.15 TURNING VALVES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Ductmate Industries, Inc.
 2. Duro Dyne Inc.
 3. METALAIRE, Inc.
 4. SEMCO Incorporated.
 5. ACCO
- B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.

1.16 DUCT-MOUNTED ACCESS DOORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Ductmate Industries, Inc.
 2. Flexmaster U.S.A., Inc.
 3. Greenheck Fan Corporation.
 4. McGill AirFlow LLC.
 5. Nailor Industries Inc.
 6. Pottorff; a division of PCI Industries, Inc.
 7. Ventfabrics, Inc.
 8. ACCO
 9. WARD

10. Superior

- B. Duct-Mounted Access Doors: Fabricate access panels according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 7-2, "Duct Access Doors and Panels," and 7-3, "Access Panels - Round Duct."

1.17 FLEXIBLE CONNECTORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Ductmate Industries, Inc.
 - 2. Duro Dyne Inc.
 - 3. Ventfabrics, Inc.
- B. Materials: Flame-retardant or noncombustible fabrics.
- C. Coatings and Adhesives: Comply with UL 181, Class 1.
- D. Flexible Connector Fabric: Woven nylon/polyester blend with vinyl coating.
 - 1. Minimum Weight: 22 oz./sq. yd..
 - 2. Tensile Strength: 240 lbf/inch in the warp and 220 lbf/inch in the filling.
 - 3. Service Temperature: Minus 40 to plus 180 deg F.
- E. Flexible Connector Fabric: Woven fiberglass with neoprene coating.
 - 1. Minimum Weight: 30 oz./sq. yd..
 - 2. Minimum Tensile Strength: 500 lbf/inch in the warp and 450 lbf/inch in the filling.
 - 3. Service Temperature: Minus 40 to plus 200 deg F.
- F. City of Los Angeles – LA Excelon.

1.18 FLEXIBLE DUCTS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Flexmaster U.S.A., Inc.
 - 2. McGill AirFlow LLC.
 - 3. CASCO
 - 4. ACCO.
 - 5. Thermaflex.

6. Hart & Cooley.

- B. Noninsulated, Flexible Duct: UL 181, Class 1, single wall aluminum corrugated helically with four ply interlocking seam.
 - 1. Pressure Rating: 2-inch wg positive and 2-inch wg negative.
 - 2. Maximum Air Velocity: 4000 fpm.
 - 3. Temperature Range: 10 to 250 deg F.
- C. Insulated, Flexible Duct: UL 181, Class 1, spunbonded nonwoven nylon supported by helically wound, spring steel wire with non-corrosive coating; fibrous-glass insulation; metalized polyester jacket.
 - 1. Pressure Rating: 2-inch wg positive and 0.5-inch wg negative.
 - 2. Maximum Air Velocity: 4,000 fpm.
 - 3. Temperature Range: 0 to 200 deg F.
 - 4. Insulation R-value: Comply with Title 24.

1.19 DUCT ACCESSORY HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.
- B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

1.20 INSTALLATION

- A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts Third Edition 2005.
- B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and, stainless-steel accessories in stainless-steel ducts.
- C. Install backdraft dampers at outlet of exhaust fans or exhaust ducts as close as possible to exhaust fan unless otherwise indicated.
- D. Set dampers to fully open position before testing, adjusting, and balancing.

- E. Install fire and smoke dampers according to UL listing.
- F. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:
 - 1. As required for filter access.
 - 2. Adjacent to and close enough to fire or smoke dampers, to reset or reinstall fusible links.
 - 3. Control devices requiring inspection.
 - 4. Elsewhere as indicated.
- G. Access Door Sizes:
 - 1. One-Hand or Inspection Access: 12 by 12 inches.
 - 2. Two-Hand Access: 18 by 18 inches.
 - 3. Head and Hand Access: 18 by 18 inches.
 - 4. Head and Shoulders Access: 24 by 24 inches.
 - 5. Body Access: 24 by 24 inches.
 - 6. Body plus Ladder Access: 24 by 24 inches.
- H. Label access doors according to Division 23 Section "Identification for HVAC Piping and Equipment" to indicate the purpose of access door.
- I. Install flexible connectors to connect ducts to equipment where indicated on the plans.
- J. Connect terminal units to supply ducts directly.
- K. Connect flexible ducts to metal ducts with adhesive or UL approved tape plus sheet metal screws.

1.21 FIELD QUALITY CONTROL

- A. Tests & Inspections:
 - 1. Operate dampers to verify full range of movement.
 - 2. Inspect locations of access doors and verify that purpose of access door can be performed.
 - 3. Operate fire, smoke, and combination fire and smoke dampers to verify full range of movement and verify that proper heat-response device is installed.

END OF SECTION

SECTION 233413 – AXIAL HVAC FANS

PART 1 - GENERAL

1.1 MIXED-FLOW FANS

- A. Housings: Steel with one flanged discharge perpendicular to fan inlet.
- B. Wheel Assemblies: Cast aluminum with airfoil-shaped blades mounted on cast-iron wheel keyed to shaft.
- C. Coatings: Coated with Permatector, Concrete Gray-RAL 7023, Fan and Attached Accessories

1.2 AMCA COMPLIANCE:

- A. Comply with AMCA performance requirements and bear the AMCA-Certified Ratings Seal.

END OF SECTION

SECTION 233416 – CENTRIFUGAL HVAC FANS

PART 1 - GENERAL

1.1 BACKWARD-INCLINED CENTRIFUGAL FANS

- A. Housings: Reinforced steel.
- B. Wheels: Steel welded or riveted to flange and backplate; cast-iron or cast-steel hub riveted to backplate.
- C. Shafts: Statically and dynamically balanced; steel with keyway.
- D. Bearings: Grease-lubricated, tapered-roller type, with rating life of 120,000 hours.
- E. Belt Drives: Factory mounted and field adjustable.
 - 1. Service Factor: 1.2.
 - 2. Fan Pulleys: Cast iron or cast steel; split, tapered.
 - 3. Motor Pulleys: Adjustable pitch for motors through 5 hp; fixed pitch for larger motors.

1.2 AMCA COMPLIANCE

- A. Comply with AMCA performance requirements and bear the AMCA-Certified Ratings Seal.

END OF SECTION

SECTION 238219 – FAN COIL UNITS

PART 1 - GENERAL

1.1 PRODUCTS

A. Ductless Fan Coil Units:

1. Ceiling Mounted Fan Coil Unit Configurations: Row split, Multi-Aqua or approved equal.
 - a. Number of Heating Coils: One.
 - b. Number of Cooling Coils: One.
2. Coil section insulation.
3. Main and Auxiliary Drain Pans: Stainless steel.
4. Chassis: Galvanized steel where exposed to moisture.
5. Cabinets: Steel with factory prime coating.
6. Filters: Glass fiber or Pleated, cotton polyester.
7. Hydronic Coils: Copper tube, with aluminum fins.
8. Fan and Motor Board: Removable.
9. Fan: Forward curved, double width, centrifugal; directly connected to motor.
10. Motor: Permanently lubricated multispeed; resiliently mounted.
11. Fan coil units should not be located over expensive equipment such as electron microscopes, computers, etc. Fan coil units installed in furred spaces or attic should have secondary drain pans beneath it to catch overflow drain in case of primary drain clog. Discharge drain to a point where it can be readily observed.
12. Provide access to fan coil units for routine preventive maintenance. This includes replacement of filter and belts, repair of leaks, replacement of motors and controls. Provide all necessary work platforms where units are not directly accessible by a maximum 8 foot step ladder.
13. Provide fan coil units with three speed motors wired to a three speed switch. Design and size fan coil unit to operate at mid-speed.
14. Fan coil controllers shall be DDC and shall seamlessly communicate with the Owner Facility Automation System.
15. Wiring Termination: Plug connection.

END OF SECTION

DIVISION 26

ELECTRICAL

SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section supplements all Sections of this Division and shall apply to all Work specified, indicated in the Drawings, and as required to furnish a complete installation of electrical systems for the Project.
- B. Furnish all labor and services, and furnish all materials, tools, equipment, appliances, facilities, and transportation necessary for and incidental to performing the Work complete, as shown on the drawings and specified herein. All electrical systems and equipment shall be in proper operating order upon completion of the work. Work includes the following:
 - 1. Furnish all incidental work required to provide a complete properly operating system.
 - 2. Provide the Following:
 - a. All construction power and lighting and all power for testing of equipment and systems through final acceptance tests.
 - b. Electric power conduits, conductors and cables, signal and fire alarm conduits and cables, and telephone, television, cameras, and wireless systems conduits only, from their respective terminal locations within the building.
 - c. Conduits and feeders for power and light from the distribution switchboards to new panelboards, and loads.
 - d. A complete system of panelboards, conduits, outlet boxes, switches, receptacles, plates and wiring for power and light.
 - e. Feeders, pullboxes, lighting relays and panelboards, branch circuit wiring and conduit systems, test switches.
 - f. Outlet, junction and pull boxes, plaster rings, plates, conduit only for card readers, telephone and data, television, cameras, access control, security and wireless connection systems.
 - g. A complete fire alarm (design-build) systems including fire alarm control panels, fire alarm annunciators (graphic and touch screen types), remote operators control panels, paging cabinets, smoke and heat detectors, manual pull stations, magnetic door hold-open devices, other alarm and trouble devices as indicated, outlet, junction and pull boxes, plaster rings, conduits and wire, including all field devices, programming, testing, complete.
 - h. All lighting fixtures, and lamps, complete with controls (switching, dimmers, dimmer relays, occupancy sensors, day-light sensors, photocells, time switches, and low voltage relays), including switch packs, and building lighting control system.
 - i. Outlet, junction and pull boxes, conduits, wiring and termination to motor controllers and main point of connection for equipment power for all heating, ventilating and cooling, plumbing, fire protection, food service, and all other

- equipment.
- j. Testing, adjusting and cleaning of the completed work.
 - k. Access panels, fire rated as required, in the ceilings and walls where necessary for access to electrical equipment, junction boxes, pull boxes, conduit stubs, etc., located in the walls or furred ceiling spaces. Access panels shall be furnished as specified in this Section, and shall be installed by Division 08. Location shall be as approved by Owner.
 - l. Core-drilling by Contractor in the performance of the work.
 - m. All sleeves, hangers, supports, inserts, anchors, bolts, etc., required for the installation of this work, including design of supports and seismic restraints.
 - n. Certified report including seismic calculations for anchorage or support of all electrical system equipment (as indicated in appropriate Specification Section), signed by a Structural Engineer registered in California. Report shall carry the approval of State Fire Marshal.
 - o. Shop drawings and technical data; operation and maintenance (O&M) manuals.
 - p. "As-built" drawings:
 - 1) At the completion of the project furnish the as-built drawings, in accordance with Division 01, and furnish the drawings on digital CD (compact disc) in the 2013 version of AutoCAD and in hard copy.
 - 2) Include Owner's final room numbers on these Drawings and panelboard directories, and indicate conduit runs (including those discovered during construction), and conduit stub-outs and all pullboxes from building walls on all As-built Drawings.
 - q. Contractor shall be responsible to coordinate with Owner regarding the protection of Owner's installed telecommunications and security cabling/wiring.
 - r. Furnish training to Owner's personnel, as scheduled by Owner's Representative, for the operation of the following:
 - 1) Power distribution equipment – eight (8) hours.
 - 2) Lighting controls, and occupancy sensors – eight (8) hours.
 - 3) Fire Alarm system “ as indicated in Section 28 3111, DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM.
 - 4) Other training as required by other Sections of these Specifications.
 - 5) Coordinate all training with Owner.
 - s. Schedule all outages with Owner.
 - t. Guarantee: Refer to General Conditions, Paragraph 12.2 for information regarding the 1-year Guarantee to Repair Period. For items requiring longer guarantee periods, refer to individual Sections of the Specifications.
 - u. On completion of the installation, furnish operation and maintenance (O&M) manuals, a minimum of six (6) copies. O&M manuals shall include complete instructions from manufacturer for operation and maintenance of equipment and devices, and shall be furnished for lighting sensors, lighting fixtures, lighting controls, power distribution equipment, fire alarm system, and other items in this Division. Each manual shall include installation and operations instructions, all reports, calculations, settings, as-built shop drawings, and product data, wiring diagrams, guarantees, calculations, settings for each device, all tabulated with device designations, locations and settings available, and selected for each device.

- Comply with paragraph 'hh' below.
- v. Commissioning:
 - 1) In addition comply with requirements of Division 01 and Division 26.
 - 2) Lighting systems shall be commissioned tested to certify by a third party the proper operation and in to certify compliance with Title 24. Furnish all information as needed for commissioning, and coordinate between trades to furnish and obtain data for O&M manuals.
 - w. Operation and Maintenance manual shall include instructions, all respective reports, and all its contents in electronic PDF (Printable Document File) files on compact disk (CD-Rom), in each binder. Include names, addresses, telephone number of contractor (and sub-contractors) the respective data. Submit organized manuals on each system in separate piano-hinged binders. Contents of O&M manual shall be as approved by Owner.
 - x. New electrical equipment shall be a fully rated system. Each new protecting device shall have AIC rating of 110% of calculated value. Series connected breaker ratings are not acceptable.

1.2 REFERENCE STANDARDS

A. The Following Abbreviations Apply to All Sections of Division 26:

- 1. AC: Alternating Current.
- 2. AIC: Ampere Interrupting Capacity.
- 3. ADA: Americans with Disabilities Act.
- 4. AISI: American Iron and Steel Institute.
- 5. ANSI: American National Standards Institute.
- 6. ASTM: American Society for Testing and Materials.
- 7. AWG: American Wire Gauge.
- 8. CCR: California Code of Regulations.
- 9. CBC: California Building Code.
- 10. CBM: Certified Ballast Manufacturers.
- 11. CEC: California Electrical Code.
- 12. DC: Direct Current.
- 13. ETL: Electrical Testing Laboratory.
- 14. FS: Federal Specification.
- 15. HID: High Intensity Discharge.
- 16. HP: Horsepower.
- 17. ICEA: Insulated Cable Engineers Association
- 18. IEEE: Institute of Electrical and Electronic Engineers.
- 19. NEMA: National Electrical Manufacturers' Association.
- 20. NETA: National Electrical Testing Association, Inc.
- 21. NFPA: National Fire Protection Association.
- 22. OSHA: Occupational Safety and Health Act.
- 23. PVC: Polyvinyl chloride.
- 24. UBC: Uniform Building Code.
- 25. UL: Underwriters' Laboratories, Inc.
- 26. CSFM: California State Fire Marshal.

1.3 QUALITY ASSURANCE

A. General Requirements:

1. Work performed under this Division shall be installed by craftsmen skilled in the trade involved, and apprentices as indicated in the General Conditions.
2. Furnish all control equipment for electrically operated equipment except when equipment is furnished with control equipment.
3. Furnish all electrical Work required for the service and connection of electrically operated and controlled equipment specified in other Divisions of the Specification.
4. All electrical power, signal, alarm and communication systems shall be complete, tested, and ready for use.

B. Requirements of Regulatory Agencies:

1. Codes and Ordinances: In addition to the requirements of Division 01, all materials shall bear the UL label.

C. Factory Tests:

1. See each Section and Division 01, for the required factory tests and their procedures.
2. Test Reports Shall Include the Following:
 - a. Description of equipment tested.
 - b. Description of tests.
 - c. Test results.
3. Owner shall be notified fourteen (14) days in advance of when tests shall be performed. Owner shall witness tests.
4. Submit factory test reports, a minimum of fourteen (14) days prior to shipping equipment to project site.

D. Electrical Acceptance Tests:

1. General Scope:
 - a. Contractor shall engage the services of a qualified testing laboratory for the purpose of performing inspections and tests of installed Work as herein specified and specified in other Sections of Division 26 of these Specifications.
 - b. The testing laboratory shall furnish all material, equipment, labor and technical supervision to perform such tests and inspections.
 - c. All tests shall be performed in compliance with the recommendations and requirements of the NETA, per Applicable Code Requirements.
 - d. Upon completion of the tests and inspections noted in these specifications, a label shall be attached to all serviced devices. These labels shall indicate date serviced and the service company responsible.
 - e. The tests and inspections shall determine suitability for continued reliable operation.
 - f. All tests shall be conducted in the presence of Owner and Owner's Electrical Inspector.
2. Qualifications of Testing Agency:
 - a. The testing laboratory shall meet the Federal OSHA criteria for accreditation of testing laboratories, Title 29, Part 1907.

- b. Contractor shall submit proof of the above qualifications.
- c. All instruments used to evaluate electrical performance shall meet NETA's Specifications for Test Instruments.
3. Test Reports Shall Include the Following:
 - a. Description of equipment tested.
 - b. Description of test, and applicable test standards used.
 - c. Test results.
 - d. Conclusions and recommendations, including corrective measures performed.
 - e. Appendix, including appropriate test forms, and related NETA Specifications.
 - f. List of test equipment used and calibration date.
4. A copy of all test reports shall be included in the Operation and Maintenance binder submittal.
5. All tests to be performed and test reports submitted for review by Owner's Representative, minimum of ten (10) working days prior to energization of equipment.

1.4 LOCATION AND ROUTING

- A. The Drawings indicate diagrammatically the desired location or arrangement of conduit runs, outlets, equipment, etc., and shall be followed as closely as possible. Execute the Work so as to secure the best possible installation in the available space and overcome local difficulties due to space limitations or interference with structural conditions.
- B. Locations shown on architectural ceiling Drawings or on wall elevations shall take precedence over electrical drawing locations.
- C. Verify dimensions and the correct location of equipment before proceeding with the roughing-in of connections.
- D. Lighting fixtures in mechanical spaces and elevator machine rooms are shown in their approximate locations only. Do not install light outlets or fixtures until mechanical piping and ductwork are installed; then lighting fixtures shall be installed in locations best suited for equipment arrangement and as approved by Owner. Verify locations of fixtures with elevator installer in elevator machine rooms before installation.
- E. All scaled and figured dimensions are approximate of typical equipment of the class indicated. Before proceeding with any Work, check and verify all dimensions, sizes, etc., with the Drawings to see that the equipment being installed shall fit into the spaces furnished.
- F. Locations of Openings: Locate all chases, shafts and openings required for the installation of the electrical Work during framing of the structure. Do any cutting and patching required due to incorrectly located or omitted openings as approved and at no additional cost to Owner. Cutting or drilling in any structural member is prohibited without prior written approval of Owner.
- G. Access to Equipment. Locate starters, switches, receptacles, and pull boxes to provide easy access for operation, repair, and maintenance and, if concealed, furnish access doors.

- H. Rough-in locations for all electrical equipment shall be determined from approved shop drawings or from the equipment itself, and shall be coordinated with work specified in other sections

1.5 MATERIAL STANDARDS

- A. All materials and equipment shall be new. All power distribution equipment shall be approved for seismic zone and requirements.
- B. All Work shall comply with Applicable Codes Requirements. Refer to Division 01, including:
 - 1. NEMA.
 - 2. ANSI.
 - 3. IEEE.
 - 4. ICEA.
 - 5. CEC
 - 6. UL.
- C. Items for similar application shall be of the same manufacturer.
- D. The label of listing by UL shall appear on all materials and equipment for which standards have been established by the agency.
- E. Where Codes listed in Division 01, establish label or approval requirements, furnish all materials and equipment with either the required labels affixed or the necessary written approval.
- F. Furnish the type and quantity of electrical materials and equipment necessary to complete Work and all systems in operation, tested and ready for use.
- G. Furnish all incidental items that belong to the Work described and which are required for complete systems.

1.6 TESTING

- A. Upon completion of the Work and adjustment of all equipment, conduct an operating test for each system approval. Conduct the test in the presence of Owner and Owner's Electrical Inspector. Demonstrate all systems and equipment to operate in accordance with all requirements of the Contract Documents and to be free from all electrical and mechanical defects. Furnish all systems free from short circuits and incorrect grounds and show an insulation resistance between phase conductors and ground not less than 250,000 ohms. Test all circuits and terminations for correct neutral connection, as well as phase connections.
- B. Conduct resistance to ground tests by journeymen electricians and the required number of apprentices to measure resistance to ground at all grounding electrodes. If the resistances exceed values specified in Section 26 0526, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS, perform all corrective measures as approved and at no additional cost to Owner.

- C. Complete all tests prior to final field observation of Project, including corrective Work based on the results of the tests.

1.7 SETTING OF PROTECTIVE DEVICES

- A. Perform the settings of all protective devices in accordance with the coordination study, prior to final inspection by Owner's Inspectors.
- B. Inspection and subsequent corrections shall be completed prior to project completion.

1.8 TRAINING

- A. Furnish a period of sixteen (16) hours for the necessary training programs and instructions to Owner's personnel, unless indicated otherwise in individual specification sections.
- B. Refer to Paragraph 1.1B.2.b in this section and as noted in other sections of this Specification.

1.9 GENERAL

- A. Whenever possible, all materials and equipment used in the installation of the work shall be of the same brand or manufacturer for each class of material or equipment, and be U.L. Listed.

1.10 INSTALLATION

- A. Be responsible for and install electrical equipment as specified in individual specification sections, and in accordance with manufacturers' recommendations, and per Applicable Code Requirements, for safe installation.

1.12 EXCAVATION AND BACKFILL

- A. General:
 - 1. Perform all excavation and backfill outside of building perimeter in accordance with requirements specified in Division 31.
- B. Excavation: Bury conduits outside the building to a depth of not less than 2'-6" below finish grade unless noted otherwise.
- C. Backfilling: Do not backfill until final inspection and approval for the conduit installation by the Owner. Backfill material shall be as specified in Division 31.

1.13 SERVICE CONTINUITY

- A. Refer to Division 01.

1.14 PROTECTION AND CLEANING

- A. Protection: Fully protect all finished parts of the materials and equipment against physical damage from whatever cause during the progress of this work and until completion.
- B. During construction, cap all conduits so as to prevent the entrance of sand and dirt.
- C. Cleaning: After installation has been completed, the Contractor shall clean all systems as follows:
 - 1. Equipment with factory finish: Clean exterior thoroughly to remove grease, oil, plaster, cement and dirt, and leave surfaces clean and polished.
 - 2. Equipment to be painted: Clean exterior of piping and equipment exposed in completed structure, removing rust, plaster, cement and dirt by wire brushing. Remove grease, oil and similar materials by wiping with clean rags and solvents.

1.15 CUTTING AND PATCHING

- A. Sleeves and Inserts: Furnish all sleeves, inserts, and openings necessary for the installation of the electrical work. Sleeves shall be as approved by Owner.
- B. Openings for All Electrical Equipment Shall be Field Verified:
 - 1. Special forming, recesses, chases, and curbs, as necessary for the correct reception and installation of the electrical equipment, as shown on the Drawings, are specified in other Divisions.

1.16 The Contractor shall examine all Drawings to ascertain that correct provisions have been made for the work.

1.17 Seismic Restraints and Vibration Isolation

- A. Furnish seismic restraints and supports for new equipment and work as specified in Section 26 0548, VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS, other specification sections, and as noted on drawings. Seismic restraints and supports shall be installed directly after installation of any work requiring them, so as to avoid concealment or difficulty of access.
- B. Equipment Supports:
 - 1. Furnish seismic calculations, and submit to Owner for review, for each location. Calculations to be stamped and signed by California registered Structural Engineer.

1.20 POWER SYSTEM STUDIES

- A. Short circuit study shall be furnished as specified in Division 26. Contractor shall furnish equipment in compliance with same, and test each protective device, adjustable settings, and submit test reports. Adjustable settings shall be in accordance with Contractor furnished coordination study. Contractor to submit coordination study, including each new

and existing protective device (typical curves and values not acceptable), for review by Owner.

- B. Ground Fault Settings: Adjust settings for system ground fault devices, in accordance with Contractor furnished coordination study and Owner's short circuit study, as applicable.
- C. Equipment Compliances
 - 1. Contractor shall furnish equipment in full compliance with study recommendations of the Short Circuit Study and the Coordination Study, for proper operation.
- D. Coordination Study Report and Arc Flash Hazard Analysis Report
 - 1. Protective Device Testing, Calibration and Adjustment: Equipment manufacturer shall furnish the services of a qualified field engineer employed by switchgear manufacturer, and necessary tools and equipment to test, calibrate and adjust the protective relays and circuit breaker trip devices as recommended in the Contractor furnished Coordination Study, as well as the Owner's Short Circuit Study.
 - 2. Arc Flash Hazard Analysis Report shall be submitted along with the Coordination Study.
- E. Coordination Study and Arc Flash Hazard Analysis Report

END SECTION 260500

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 MATERIALS

A. Conductors and Cables:

1. Conductors: Copper.
2. Conductor Insulation: Type THW/THW-2 Type THHN/THWN-2.
3. VFC Cable: Type TC-ER
4. Romex Copper.

1.2 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except VFC cable, which shall be extra flexible stranded.

1.3 CONDUCTOR INSULATION APPLICATIONS AND WIRING METHOD

- A. Feeders: Type THW-2 or THHN/THWN-2, single conductors in raceway.
- B. Branch Circuits: Type THHN/THWN-2, single conductors in raceway.
- C. VFC Output Circuits: Type TC-ER cable with braided shield.
- D. Romex, without conduit and in conduits when exposed.

1.4 INSTALLATION

A. The Following Color Code Prevails for All Branch Circuits and Feeders:

1. Neutral: White for 208/120.
2. Ground: Green.
3. Phase A: Black for 208/120
4. Phase B: Red for 208/120
5. Phase C: Blue for 208/120
6. Three-way travelers - Orange.
7. Switch legs same color as phase leg.

B. Ratings:

1. Feeders serving lighting and miscellaneous power loads shall be sized of great capacity required by Code with final rating to be reviewed and approved by the Owner's

Representative to allow for future growth.

- C. Identify all feeders as to phase or leg in each panelboard with identifying tape a minimum of 2" wide color coded according to Paragraph 0.4.A above.
- D. For conductors installed in areas subjected to temperatures exceeding 140°F, including terminating in incandescent lighting fixtures and installed through or into housing containing ballasts, furnish type THHN.
 - E. Not more than three lighting or convenience outlet circuits in one conduit unless otherwise indicated.
 - F. Provide separate raceways for emergency system conductors,
 - G. For conductors installed in exposed conduit outside of buildings and conduit within or just under roofing material, furnish type THHN.
 - H. Control Circuits for Mechanical Equipment: Use 600 volt UL Type THWN conductors except where subject to abnormally high temperatures such as on or near boilers. Under these conditions, use UL Type THHN.
 - I. Tape all connections made with non-insulated type connectors with insulating tape to 150 percent of the insulating value of conductor insulation.
 - J. Each circuit shall correspond to the branch circuit number indicated on the panel schedule shown on the Drawings unless otherwise approved by Owner's Representative.
 - K. Where conductors in conduit pass through exterior walls, a sealing compound of moisture-resistant material shall be applied in the ends of the conduits to seal around the conductors. Sealant shall be Dow-Corning No. 795, or equal.
 - L. Identify conductors of power circuits and the various signal and sound systems. Conductors shall be identified in each junction box, pull box, wireways or auxiliary gutter and at each device, motor outlet, panelboard, switchboard or other conductor termination. Label shall show feeder number, size, phase and origin.
 - M. Wiring within all equipment enclosures shall be neatly grouped and tied together.
 - N. Pigtails shall be extended from branch wiring in outlet boxes for attachment to devices. Loops in through wiring shall not be acceptable.
 - O. Conductors in outlet boxes shall have a minimum of 8 inches of extra conductors.
 - P. Identify all conductors in pull boxes, junction boxes, pull boxes, and wireways, indicating panel board and circuit number.
 - Q. Identify all feeder conductors with designation (power source and circuit number) in each equipment enclosure.

- R. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- S. Complete raceway installation between conductor and cable termination points according to Section 26 0533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- T. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- U. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- V. Romex wiring will be allowed where allowed by CEC.

1.5 FIELD QUALITY CONTROL

- A. Testing: By Contractor-engaged agency.

END SECTION 260519

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 QUALITY ASSURANCE

- A. Quality Standard for Grounding and Bonding Materials and Equipment: UL 467.

1.2 PRODUCTS

- A. Insulated Conductors: Copper wire or cable.
- B. Bare Copper Conductors:
 - 1. Solid conductors.
 - 2. Stranded conductors.
 - 3. Tinned conductors.
 - 4. Stranded bonding conductors.
 - 5. Copper tape braided bonding jumpers.
 - 6. Tinned-copper braided bonding jumpers.
- C. Connectors: Bolted and exothermic-welded type.

1.3 INSTALLATION

- A. In addition to the requirements of the Codes referenced for this project, provide grounding and bonding in accordance with all requirements of CEC, Drawings and following descriptions.
- B. Metallic conduits, wireways, metal enclosures of busways, electrical equipment housing and all non-current metallic parts shall be grounded. The metallic conduit system shall be used for equipment and enclosure grounding but not as a system ground conductor.
 - 1. Low resistance contacts, with high mechanical strength, shall be made between conduits and boxes and at all panels, panelboards, terminal cabinets, outlet boxes, junction and pull boxes and wherever the conduit run is broken. Permanently and effectively ground all conduits, fixtures, motors, and other apparatus and equipment.
- C. All conduit stub-ups shall be grounded and where multiple stub-ups are made within an equipment enclosure, such as a switchboard, they shall be equipped with grounding bushings and bonded together and to the enclosure and the enclosure ground bus.
- D. All feeder runs and branch circuit wiring in non-metallic conduit shall carry a green

insulated CEC sized ground conductor per circuit correctly connected for electrical ground continuity.

- E. An equipment ground conductor shall be installed in each raceway with branch circuit wiring, adjust conduit size as required per Applicable Code Requirements.
- F. Each feeder conduit shall be furnished with an equipment ground conductor with 600 volt insulation, adjust conduit size as required per Applicable Code Requirements.
- G. Where ungrounded conductors are increased in size from sizes shown on drawings, the ground conductor shall also be increased in size proportionately.
- H. Flexible conduit shall not be used as a ground path. Include CEC sized green conductor in all flex conduit.
- I. Furnish CEC approved bonding devices, fittings or jumpers at expansion fitting, isolation sections or wherever continuity of ground is broken.
- J. Furnish bonding devices, fittings, jumpers, at expansion fittings, isolation sections or wherever continuity of ground is broken.
- K. Install grounding and bonding conductors with sufficient slack to prevent breaking due to settlement and movement of conductors at attached points.

END SECTION 260526

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a California Registered Professional Engineer, using performance requirements and design criteria indicated.
- B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- D. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.2 PRODUCTS

- A. Support, Anchorage, and Attachment Components:
 - 1. Steel slotted support systems with metallic coatings.
 - 2. Raceway and cable supports.
 - 3. Steel and malleable-iron conduit and cable hangers, clamps, and associated accessories.
 - 4. Support for non-armored conductors and cables in vertical conduit risers.
 - 5. Structural steel for fabricated supports and restraints.
 - 6. Mounting, Anchoring, and Attachment Components:
 - a. Powder-actuated fasteners.
 - b. Mechanical-expansion anchors.
 - c. Concrete inserts.
 - d. Clamps for attachment to steel structural elements.
 - e. All steel, springhead toggle bolts.
 - f. Threaded hanger rods.
- B. Raceway and Cable Supports: As described in CEC Chapter 3.

- C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

- D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- E. Fabricated Metal Equipment Support Assemblies: Welded or bolted steel shapes.

1.3 INSTALLATION

- A. Comply with CEC Chapter 3 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by CEC. Minimum rod size shall be 1/4 inch in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted [or other] support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 - 1. Secure raceways and cables to these supports with two-bolt conduit clamps.
- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.
- E. Raceway Support Methods: In addition to methods described in CEC, EMT may be supported by openings through structure members, as permitted in CEC.
- F. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits.
- G. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.
- H. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- I. Anchor equipment to concrete base.
 - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.

- J. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

END SECTION 260529

SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 MATERIALS

- A. Metal Conduits, Tubing, and Fittings:
 - 1. GRC.
 - 2. PVC-coated rigid steel conduit.
 - 3. EMT.
 - 4. FMC: Zinc-coated steel.
 - 5. LFMC.
 - 6. Fittings:
 - a. Conduit fittings for hazardous (classified) locations.
 - b. EMT: Steel, watertight compression type.
 - c. Expansion fittings.
 - d. PVC coated.
- B. Aluminum raceways are prohibited.
- C. Metal Wireways and Auxiliary Gutters: Sheet metal with hinged covers.
- D. Surface Metal Raceways: Metal, galvanized steel, with snap-on covers.
- E. Surface Nonmetallic Raceways: Two- or three-piece, rigid PVC.
- F. Boxes, Enclosures, and Cabinets:
 - 1. Metal Outlet and Device Boxes: Ferrous alloy.
 - 2. Nonmetallic outlet and device boxes.
 - 3. Metal Floor Boxes: Cast metal, fully adjustable.
 - 4. Nonmetallic Floor Boxes: Non-adjustable, round.
 - 5. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb.
 - 6. Paddle Fan Outlet Boxes: Nonadjustable, designed for attachment of paddle fan weighing 70 lb.
 - 7. Small sheet metal pull and junction boxes.
 - 8. Cast-metal access, pull, and junction boxes.
 - 9. Box extensions.
 - 10. Gangable boxes are allowed are prohibited.
 - 11. Hinged- Cover Enclosures: Metal.
 - 12. Cabinets: Galvanized steel.

1.2 RACEWAY APPLICATION

A. General

1. The size of the conduits for the various circuits shall be as indicated on the Drawings and as required by CEC for the size and number of conductors to be pulled therein. CEC requirements shall prevail where fill is not shown on Drawings.
2. Open ends of conduits shall be capped or plugged until ready to pull in conductors.
3. Deliver conduits to site in standard length and store where protected from moisture and weather.
4. No conduit shall be smaller than $\frac{3}{4}$ inch for power and 1" inch for telecommunications unless otherwise indicated on the Drawings with the exception for single circuit branches, which dead-ends into light fixtures and receptacles, which may be $\frac{1}{2}$ ".
5. Complete raceway installation before stating conductor installation.
6. Arrange stub-ups so curved portions of bends are not visible above the finished slab.
7. Install no more than the equivalent of four 90-degree bends in any conduit run. For communication conduit, fewer bends are allowed.
8. Install raceway sealing fittings at suitable, approved and accessible locations as required by CEC and fill with listed sealing compound.
9. Raceway terminations at locations subject to moisture or vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
10. Use insulated bushings and locknuts on all conduits where entering pullboxes, junction boxes, outlet boxes, cabinets and similar enclosures, and for all signal and telephone conduits terminated in cabinet or backboards.
11. Tag all empty conduits at each accessible end with a permanent tag identifying the purpose of the conduit and the location of the other end. In wet, corrosive outdoor or underground locations, use brass, bronze, or copper 16 gauge tags or lead tags secured to conduit ends with #16 or larger galvanized wire. Inscribe on the tags, with steel punch dies, clear and complete identifying information.
12. Provide expansion and deflection fittings where two rigidly supported conduits may move in relation to each other at expansion or seismic joint crossings.
13. From each panel which is flush mounted in a wall, stub from top of the panels minimum of (4) $\frac{3}{4}$ -inch conduits to the nearest ceiling space or other accessible location and cap for future use.
14. Ream the ends of all conduits.
15. Identify fire alarm conduits with a 1-inch wide red band every 5 feet of run.
16. Seal all conduits from exterior outlets at first interior junction to prevent moisture from entering the building through the conduits.
17. In order to prevent water from coming in, all conduits entering buildings, substations, and other structures shall have seals between the conduits and the

- structure walls. The space between the cables and conduit inside walls shall be sealed as well as using separable conduit sealing bushings manufactured by 3M or equal. Empty conduits shall be securely plugged or capped to prevent water seeping.
18. Sleeves: Where conduits pass through concrete walls, suspended slabs or metal deck floors, provide sleeves of ample size to permit installation of conduits. Sleeves extend 2 inches above floor surfaces. Verify location with Owner's Representative.
 19. Finish Around Sleeves: Rough edges shall be finished smooth. Space between conduits and sleeves where conduit passes through exterior walls shall be sealed to permit movement of conduit, but prevent entrance of water. Space between conduit and sleeves where conduits pass through fire rated interior walls and slabs shall be sealed with approved materials to furnish a fire barrier conforming to the requirement of the codes related to this project.
 20. Install all exposed conduits parallel to and perpendicular to the building structure.
 21. Exposed conduits larger than 1" shall be suspended with pipe hangers. Pipe hangers for individual conduits shall be suspended from hanger rods.
 22. Conduits 1" and smaller, in metal and stud partitions, shall be tied to the furring channels with No. 12 gauge galvanized tie wire spaced not more than 5' apart. Conduits 1" and smaller for service to lighting fixtures (other than home runs) may be supported in the same way. Conduits above metal channel lath and plaster ceilings for other services and lighting home runs shall be supported.
 23. Conduit clamps and hanger rods attached to concrete structures shall be secured by machine bolts or rods screwed into anchors. Anchors not cast into the concrete shall be of the expansion shield type, Phillips "Red Head", or equal.
 24. Wherever conduits extend through roof, furnish approved galvanized sheet metal flashing. Flashing shall extend 6" above roof.
 25. Install conduit seals in all conduits entering or leaving hazardous areas, refrigerated rooms and clean rooms. Use seals as described in Paragraph 3.1.G.21 above.
 26. Telephone, data, wireless systems, and television conduit runs shall not have more than two 90° radius bends. All other conduit runs (below 600 volts) shall not have more than four 90° radius bends between pull boxes, junction boxes or terminal cabinets. Furnish boxes as required to maintain limitation of bends.
 27. Conduit shall not be run closer than 6" to any hot water pipe, and 12" from steam pipe, and heater flue or vent.
 28. Furnish condulets for exposed runs of conduits where junctions, 90° bends or offsets are required, whether such condulets are indicated on the Drawings or not. Conduit bends shall not be permitted around the corners of beams, walls or equipment. All condulet covers shall be accessible.
 29. All control apparatus, outlet boxes, junction and pull boxes, and other similar equipment shall be installed and maintained in accessible positions and locations.
 30. Conduits in furred spaces shall be routed to clear access openings.

31. Where steel conduits enter a concrete floor below a surface mounted panelboard, they shall be encased in a concrete curb of sufficient height to match the height of the finished base tile, and a minimum of 4 inches.
32. Holes for conduits through existing concrete walls or floors shall be made by the "core-drill" method.
33. For Telecom, data, access system, cameras, card readers, building entry units, dimmer devices or equipment, furnish pull box for every 180 degrees of bending in conduit route.
34. Furnish independent support for all conduits rising from floor for motor connections if over 18" above floor. Do not support to motor, to ductwork or mechanical equipment.
35. Conduits which are installed above dry type suspended ceilings shall not be secured to ceiling support wires. Support such conduit independent of ceiling suspension systems.
36. Keep bends and offsets in conduit runs to an absolute minimum. Replace all deformed, flattened or kinked conduits at Contractor's expense.
37. Support conduits 1" and larger with pipe clamps either suspended from structural slabs with a rod at least ¼" diameter with adjustable pipe ring, or mounted on wall from channel supports. Attach to concrete with Phillips "Red Head", "Hilti", or equal drilled anchors. Where two or more conduits 1-1/2" and larger are suspended from ceiling, use trapeze type hanger suspended from rods.
38. Where rigid metal conduits and electrical metallic tubing are supported from building members, supports shall be installed as follows:
 - a. Conduit Sizes:
 - 1) 3/4" to 1-1/4" Inclusive: Within 18" of each outlet and on either side of couplings and fittings and at a spacing not to exceed 8'.
 - 2) 1-1/2" and Larger: Within 3' of each junction or pullbox and terminal cabinet and at a spacing not to exceed 8'.
 - b. When rigid conduits are supported from trapezes, the supports shall be spaced not more than 8' apart.
 - c. Conduit trapezes shall consist of "Unistrut" or "Kindorf" channels and fittings, or equal, in accordance with the manufacturer's printed recommendation.
39. Secure exposed conduit runs on concrete, plaster or other construction in place with cast conduit clamps affixed with metallic expansion anchors, and cadmium plated machine or lag screws.
40. Do not strap or fasten rigid conduits to mechanical equipment, or to equipment subject to vibration or mounted on shock absorbing bases.

B. Rigid Steel Conduits

1. Use for all sizes where directly exposed to weather; where subject to abnormal conditions of heat, cold, moisture, humidity, fumes and hazardous elements; where installed exposed below 7-½', in areas where subject to mechanical injury. Use for all conduit installed exposed below 7-½' and subject damage in all electrical and mechanical equipment rooms.
2. Cut threads on conduits to standard taper and to a length such that all bare metal exposed by the threading operation shall be completely covered by the couplings

or fittings used. Securely tighten all threaded connections. The ends of all conduit shall be cut square and reamed to full size with a tapered burring reamer. Treat any exposed threads at box hubs with protective coating to prevent corrosion, but maintain ground continuity.

3. For use as elbows underground, wrap with two layers of 10 mil tape.

C. Rigid Plastic Conduits:

1. All conduits installed underground 5' outside or inside of building lines, except sweeps and risers
shall be PVC Schedule 40, unless otherwise noted.
2. Make all fittings in plastic conduits watertight with approved solvent-weld cement specifically manufactured for the purpose. Apply heat for bends so that conduit does not distort or discolor. Use a spring mandrel as required to assure full inside diameter at all bends.

D. Electrical Metallic Tubing (EMT)

1. Use for all sizes up to and including 4" maximum trade size in dry locations as in stud partitions and furred ceiling spaces.
2. Conduits shall be continuous from outlet to outlet to panel except where rigid steel conduits are required or indicated.
3. EMT shall not be installed in concrete.

E. Flexible Steel Conduits:

1. Install for all attachments to transformers and motorized equipment or vibrating equipment connections, minimum 36" long, or for connections to recessed fixtures from junction or pullboxes. Maximum length for any application shall be 6'. Flexible conduits shall be installed so they are slack-to-the-touch so they are easily moveable.
2. Furnish liquidtight flexible steel conduits with separate insulated, stranded copper equipment ground conductors for connections in areas exposed to the weather, damp or wet locations and connections to motors, variable frequency or speed drives, transformer enclosures, and other vibrating equipment regardless of location.
3. Cut flexible conduits at right angles for installation.
4. Do not use flexible conduits for telephone, data, television, cameras, card readers, building entry units, dimmer devices or equipment.

F. PVC Jacketed Steel Conduits:

1. Cut threads on conduits to standard taper and to a length such that all bare metal exposed by the threading operation shall be completely covered by the couplings or fittings used. Securely tighten all threaded connections.
2. All conduits and fittings which have a damaged PVC coating shall be replaced at Contractor's expense.

G. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Threaded rigid steel conduit fittings.

2. PVC Externally Coated, Rigid Steel Conduits: Fittings listed for use with this type of conduit.
3. EMT: Steel compression type fittings.
4. Flexible Conduit: Fittings listed for use with flexible conduit.

1.3 INSTALLATION OF BOXES AND ENCLOSURES

- A. Furnish all boxes necessary for installation of the electrical Work in compliance with CEC requirements. Coordinate access with accessible ceiling panels locations, as necessary.
- B. Secure recessed boxes for ceiling outlets with galvanized steel bar hangers, specifically manufactured for the purpose, to ceiling channels to permit the installation of the box.
- C. Single gang wall outlet boxes located at metal studs shall be screwed to the stud with sheet metal screws.
- D. Single or multiple wall outlet boxes located between studs shall be secured in place to bar hangers between studs.
- E. Nails shall not be used to support outlet boxes.
- F. Secure recessed, pressed steel boxes in place with steel hangers specifically manufactured for the purpose. Fully or partially hammer driven screws are not permitted.
- G. Use extension rings with blank covers for making exposed conduit connections to flush wall or ceiling boxes.
- H. For boxes not specified or indicated, use boxes and mounting height as required by equipment and recommended by equipment manufacturer.
- I. For outlets flush in exterior walls, use weatherproof joints and connections all around. Outlets shall have cast covers and be fitted with gaskets.
- J. Do not locate outlet boxes not containing a circuit device in any public space. Place these boxes in storage rooms, electrical closets, or above accessible ceilings.
- K. Place boxes and conduits which must be exposed to public view in a location approved by Owner's Representative. Furnish covers or plates to match adjacent surfaces as approved by Owner's Representative.
- L. Covers for flush outlets shall finish flush with plaster or other finished surface.
- M. Where both emergency and normal circuits feed a single light fixture, furnish an outlet box for each system.

- N. For boxes installed in concrete, furnish the type specifically designed for the purpose to prevent entrance of concrete and to permit placement of box and conduit without displacing reinforcing steel.
- O. Use boxes sized to legally accommodate all devices and conductors contained therein. Use no box smaller than 4 inch square by 2-1/8 inches deep, unless otherwise indicated.
- P. Securely fasten all outlet boxes to the structural members. In concrete or drywall construction, set recessed boxes so that the front of the plaster ring or front of the box for those without plaster rings is not more than 1/4 inch behind the final finished surface. Set all recessed boxes in other types of construction so that the fronts are flush with the finished surface. Where these settings are not achieved, furnish a 24-gauge or heavier galvanized steel liner flush with finished surface.
- Q. Furnish UL approved factory made knockout seals in the boxes where unused knockouts are not intact. Furnish recessed threaded plugs in all unused hubs of cast boxes.
- R. Label the cover of each accessible junction box with panel and circuit designation and function, per specification Section 26 0553, IDENTIFICATION FOR ELECTRICAL SYSTEMS.
- S. Multiple gang boxes containing switches on different circuits shall have barrier between such switches.
- T. Paint the outside of all boxes containing fire alarm devices with red paint.
- U. Where boxes are mounted back-to-back in any wall, the minimum offset shall be 24", edge-to-edge in fire rated walls, and minimum 16" with a stud in-between, in non-rated walls.
- V. Furnish and maintain sufficient access and working space to permit access and safe maintenance to all boxes.
- W. Each box shall have a device plate or blank coverplate, as applicable.
- X. Pullboxes shall be installed in all conduit runs wherever indicated, and where necessary to facilitate the pulling of wires and cables. Coordinate access with accessible ceiling panel locations, as necessary.
- Y. Securely fasten to structural members or channel supports, per Applicable Code Requirements.
- Z. Do not install pullboxes in public areas unless specifically indicated on Drawings.
- AA. Install sheet metal pullboxes in dry protected locations.
- BB. Furnish access panels for pull boxes located above ceilings.

- CC. Install cast iron pullboxes in wet and damp locations. Boxes shall be flush with grade or above roof slab.
- DD. Furnish tight fitting bore or punch holes, through which rigid conduit shall be secured to boxes with a double lock nut and bushing.
- EE. Furnish nameplates on covers of interior wireways and pullboxes, describing system and function. Tag all conductors to identify circuits and origin, per specification Section 26 0553, IDENTIFICATION FOR ELECTRICAL SYSTEMS.

END SECTION 26053

SECTION 260544 - PRECAST MANHOLES AND HANDHOLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general conditions, Division 1, and Basic Electrical Requirements (Section 26 05 00) are part of this section and the contract for this work and apply to this section as fully as if repeated herein.
- B. Reference to other sections: The applicable requirements from other Division 26 sections required for a complete and operational system shall form a part of the electrical work and each section shall be thoroughly reviewed by the Contractor for application to all other sections.

1.2 SUBMITTALS

- A. Submit shop drawings for review including the following:
 - 1. Manhole material
 - 2. Handhole material
 - 3. Installation materials and methods
- B. Product data: For the following:
 - 1. Shop drawings for precast or factory-fabricated manholes and handholes: Include plans, elevations, sections, details, attachments to other work, and accessories, including the following:
 - a. Duct entry provisions, including locations and duct sizes.
 - b. Reinforcement details.
 - c. Frame and cover design and manhole frame support rings.
 - d. Ladder details.
 - e. Grounding details.
 - f. Dimensioned locations of cable rack inserts, pulling-in and lifting irons, and sumps.
 - g. Joint details.

2. Shop drawings for factory-fabricated manholes and handholes other than precast concrete: Include dimensioned plans, sections, and elevations, and fabrication and installation details, including the following:
 - a. Duct entry provisions, including locations and duct sizes.
 - b. Cover design.
 - c. Grounding details.
 - d. Dimensioned locations of cable rack inserts, and pulling-in and lifting irons.
 3. Product Certificates: For concrete and steel used in precast concrete manholes and handholes, as required by ASTM C 858.
 4. Qualification Data: For professional engineer and testing agency.
 5. Source quality-control test reports.
 6. Field quality-control test reports.
- C. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- D. Comply with ANSI C2.
- E. Comply with NFPA 70.
- 1.3 DELIVERY, STORAGE, AND HANDLING
- A. Store precast concrete and other factory-fabricated underground utility structures at project site as recommended by manufacturer to prevent physical damage. Arrange so identification markings are visible.
 - B. Lift and support precast concrete units only at designated lifting or supporting points.
- 1.4 COORDINATION
- A. Coordinate layout and installation of manholes and handholes with final arrangement of other utilities, site grading, and surface features as determined in the field.
 - B. Coordinate elevations of ducts and duct-bank entrances into manholes and handholes with final locations and profiles of ducts and duct banks as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations from those indicated as required to suit field conditions and to ensure that duct runs drain to manholes and handholes, and as approved by Architect.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE HANDHOLES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Jensen.
 - 2. Oldcastle Precast Group.
 - 3. Utility Vault Co.
 - 4. Equal
- C. Comply with ASTM C 858 for design and manufacturing processes.
- D. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover shall form top of enclosure and shall have load rating consistent with that of handhole.
 - 1. Frame and Cover: Weatherproof cast-iron frame, with cast-iron cover with recessed cover hook eyes and tamper-resistant, captive, cover-securing bolts.
 - 2. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 - 3. Cover Legend: Molded lettering, as indicated for each service.
 - 4. Configuration: Units shall be designed for flush burial and have Integral closed bottom, unless otherwise indicated.
 - 5. Handholes 12 inches wide by 24 inches long and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.
 - 6. Handholes located in vehicle areas shall feature a minimum full traffic H-20 rating.

2.2 PRECAST CONCRETE MANHOLES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Jensen.
 - 2. Oldcastle Precast Group.
 - 3. Utility Vault Co.
 - 4. Equal
- C. Comply with ASTM C 858, with interlocking mating sections, complete with accessories, hardware, and features.
- D. Manholes located in vehicle areas shall feature a minimum full traffic H-20 rating.
- E. Concrete Knockout Panels: 1-1/2 to 2 inches thick, for future conduit entrance and sleeve for ground rod.
- F. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at the installation location with the ground-water level at grade.

2.3 SOURCE QUALITY CONTROL

- A. Test and inspect precast concrete utility structures according to ASTM C 1037.

PART 3 - EXECUTION

3.1 INSTALLATION OF CONCRETE MANHOLES AND HANDHOLES

- A. Precast Concrete Handhole and Manhole Installation:
 - 1. Comply with ASTM C 891, unless otherwise indicated.
 - 2. Install units level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances.
 - 3. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, and compacted to same density as adjacent undisturbed earth.
- B. Elevations:
 - 1. Manhole Roof: Install with rooftop at least 15 inches below finished grade.

2. Manhole Frame: In paved areas and trafficways, set frames flush with finished grade. Set other manhole frames 1 inch above finished grade.
 3. Handhole Covers: In paved areas and trafficways, set surface flush with finished grade. Set covers of other handholes 1 inch above finished grade.
- C. Drainage: Install drains in bottom of manholes where indicated. Coordinate with drainage provisions indicated on civil drawings.
- D. Manhole Access: Circular opening in manhole roof; sized to match cover size.
- 3.2 GROUNDING
- A. Ground underground ducts and utility structures according to Division 26 Section "Grounding and Bonding."
- 3.3 FIELD QUALITY CONTROL
- A. Perform the following tests and inspections and prepare test reports:
1. Test manhole and handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Division 26 Section "Grounding and Bonding."
- B. Correct deficiencies and retest as specified above to demonstrate compliance.
- 3.4 CLEANING
- A. Clean internal surfaces of manholes and handholes. Remove foreign material.

END OF SECTION 260544

SECTION 260548 - VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 PERFORMANCE REQUIREMENTS

A. Shop Drawings, Product Data and Calculations:

1. The Following Includes the Minimum Required Shop Drawing Data and Calculations:
 - a. Manufacturer's model number for each restraining device and the equipment to which it shall be applied.
 - b. Seismic Zone 4 approval for vibration isolators.
 - c. Seismic and anchorage design, including methods to achieve vertical restraint for seismic slack cables.
 - d. Tabular form indicating use of particular isolation for each application.

B. All submittals shall be signed by a Structural Engineer registered in the State of California.

1.2 PRODUCTS

A. Vibration Isolators:

1. Neoprene pads.
2. Spring isolators.
3. Restrained spring isolators.

B. Seismic-Restraint Devices:

1. Channel support systems.
2. Galvanized restraint cables.
3. Steel tube or steel slotted-support-system sleeve with internally bolted connections hanger rod stiffeners.
4. Bushings for floor-mounted equipment anchors.
5. Bushing assemblies for wall-mounted equipment anchorage.
6. Resilient isolation washers and bushings.
7. Mechanical anchors.
8. Adhesive anchors.
9. Factory Finishes: Standard.

1.3 INSTALLATION

- ##### A. Furnish restraints for distribution boards, transformers, generators and also for any other new floor standing electrical equipment shown on the drawing.

- B. Furnish restraints for all suspended electrical equipment as required per code.
- C. Install restraints after equipment has been set on isolators and after the isolators have been adjusted for required deflection.
- D. Suspended electrical equipment shall be supported on an appropriate steel frame from Type HS hangers, selected for a minimum static deflection of 0.75 inch.
- E. All floor mounted equipment shall be anchored on four (4) inch high concrete pads.

1.4 FIELD QUALITY CONTROL

- A. Testing
 - 1. Inspect the installation of all vibration isolators in accordance with manufacturer's printed recommendations.

END SECTION 260548

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 QUALITY ASSURANCE

- A. Comply with ANSI A13.1 and IEEE C2.

1.2 PRODUCTS

- A. Power and Control Raceway Identification: Vinyl labels.
- B. Power and Control Cable Identification: Vinyl labels and Metal tags.
- C. Conductor Identification: Color-coding conductor tape.
- D. Floor Marking Tape: Pressure-sensitive vinyl tape.
- E. Underground-Line Warning Tape: Permanent, bright-colored, continuous-printed, polyethylene tape, with embedded continuous metallic strip or core.
- F. Warning Labels and Signs: Baked-enamel warning signs.
- G. Instruction Signs: Engraved, laminated acrylic or melamine plastic.
- H. Equipment Identification Labels: Engraved, laminated acrylic or melamine plastic.

1.3 APPLICATION

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- B. Colors for Printed Legend:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage and system or service type.
- C. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.

- D. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- E. Snap-Around, Color-Coding Bands for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

1.4 EQUIPMENT IDENTIFICATION LABELS

- A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch.
- B. Fabricated Nameplates Shall Clearly State the Following:
 - 1. Manufacturer's name and equipment design ratings including current, voltage, KVA.
 - 2. System nominal voltage, equipment rating KVA, amperes.
 - 3. Panel designation, voltage and phase.
- C. Manufacturer's Device Nameplates: Circuit number; manufacturer and electrical characteristic ratings including the following:
 - 1. Circuit Breakers: Voltage, maximum interrupting current and trip current.
 - 2. Switches: Voltage, horsepower or maximum current switching. If fused, include nameplate stating "Fuses must be replaced with current limiting type of identical characteristics."
 - 3. Contactors: Voltage, continuous current, horsepower or interrupting current, and whether "mechanically held" or "electrically held."
- D. Controllers: Voltage, current.

1.5 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties.
 - 1. Minimum Width: 3/16 inch.
 - 2. Tensile Strength: 50lb, minimum
 - 3. Temperature Range: Minus 40 to plus 185 deg F.
 - 4. Color: Black, except where used for color coding.

- B. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
- C. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

1.6 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. Attach signs and plastic labels that are not self-adhesive type with screws and auxiliary hardware appropriate to the location and substrate.
- F. Color Coding for Phase and Voltage Level Identification, 600V and Less:
 - 1. Colors for 208/120V Circuits;
 - a. Phase A: Black
 - b. Phase B: Red
 - c. Phase C: Blue
 - d. Neutral: White
 - e. Ground: Green
- G. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
- H. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.

1.7 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Cables of Auxiliary Systems: Identify the following systems with color-coded, self-adhesive vinyl tape applied in bands:
 - 1. Fire Alarm System: Red.
- B. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape. Identify source and circuit number of each set of conductors. For single conductor cables, identify phase in addition to the above.
- C. Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use color-coding conductor tape. Identify each ungrounded conductor according to source and circuit number.
- D. Conductors to Be Extended in the Future: Attach marker tape to conductors and list source and circuit number.
- E. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
 - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 - 2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 - 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.
- F. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- G. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions at equipment used for power transfer.
- H. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
 - 1. Labeling Instructions:

- a. Indoor Equipment: Screwed-on engraved white laminated plastic sheet with minimum 3/8 inch to 3/4 inch black lettering for normal systems and red laminated plastic sheet with lettering for emergency systems.
 - b. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
2. Equipment to Be Labeled:
- a. Identification labeling of some items listed below may be required by individual Sections or by CEC.
 - b. Panelboards, electrical cabinets, and enclosures.
 - c. Switchgear.
 - d. Switchboards.
 - e. Transformers:
 - f. Substations.
 - g. Emergency system boxes and enclosures.
 - h. Motor-control centers.
 - i. Enclosed switches.
 - j. Enclosed circuit breakers.
 - k. Enclosed controllers.
 - l. Power transfer equipment.
 - m. Contactors.
 - n. Remote-controlled switches, dimmer modules, and control devices.
 - o. Battery-inverter units.
 - p. Battery racks.
 - q. Power-generating units.
 - r. Monitoring and control equipment.
 - s. UPS equipment.
 - t. Fire-alarm control panel and annunciators.
- I. Devices: P-Touch adhesive label on each device plate with 3/16" high block letters in black where noted and as follows:

1. Lock switch and switch with pilot light – device controlled.
 2. Switch for fan, motor, unit heater – equipment controlled.
 3. Switch where lights or equipment are out of sight – equipment controlled.
 4. Switches in gangs of three or more – description of lights or equipment switched.
 5. All receptacles and switches – panel and circuit number reflecting installed condition.
 6. All equipment on the normal and emergency systems – panel and circuit number reflecting installed condition.
 7. Receptacles over 150V to ground and/or 30A and higher rating – voltage and ampere rating.
 8. Where wording is not indicated, allow for ten letters per device and use wording as directed.
- J. For switch cabinets engrave each device or furnish engraved nameplate.

END SECTION 260553

SECTION 260572 - OVERCURRENT PROTECTIVE DEVICE SHORT-CIRCUIT STUDY

PART 1 - GENERAL

1.1 SUMMARY

- A. Computer-based, fault-current study. Series rated equipment is allowed. Since the system has been approved by the City as a fully rated system, contractor shall compensate the Electrical Engineer of Record for obtaining approval of the specific equipment they propose if Series Rated system is proposed instead.

1.2 SOFTWARE COMPATIBILITY

- A. Comply with IEEE 399 and IEEE 551.

1.3 EXECUTION

- A. Fault-Current Study: Electrical distribution system from normal and alternate power sources.
- B. Begin short-circuit current analysis at the service, extending down to the system overcurrent protective devices as follows:
 - 1. To normal system low-voltage load buses where fault current is 10 kA or less.
- C. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault at:
 - 1. Electric utility's supply termination point.
 - 2. Incoming switchgear.
 - 3. Unit substation primary and secondary terminals.
 - 4. Low-voltage switchgear.
 - 5. Motor-control centers.
 - 6. Automatic transfer switches.
 - 7. Branch circuit panelboards.
 - 8. Disconnect switches.

END SECTION 260572

SECTION 260573 - OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY

PART 1 - GENERAL

1.1 SUMMARY

- A. Computer-based, overcurrent protective device coordination studies.

1.2 E CAPABILITY

- A. Comply with IEEE 242 and IEEE 399.
- B. Computer software program for plotting and diagramming time-current-characteristic curves and for reporting settings and ratings of all overcurrent protective devices.
- C. Optional Computer Program Features:
 - 1. Arcing faults.
 - 2. Simultaneous faults.
 - 3. Explicit negative sequence.
 - 4. Mutual coupling in zero sequence.

1.3 EXECUTION

- A. Begin analysis at the service, extending down to the system overcurrent protective devices as follows:
 - 1. To normal system low-voltage load buses where fault current is 10 kA or less.
- B. Study electrical distribution system from normal and alternate power sources.
- C. Coordination study includes the following:
 - 1. Transformer primary overcurrent protective devices.
 - 2. Conductor protection.
 - 3. Protective device evaluation.
- D. Load-flow and voltage-drop study.
- E. Field Adjusting: Adjust relay and protective device settings to the settings provided by the coordination study.

END SECTION 260573

SECTION 260574 - OVERCURRENT PROTECTIVE DEVICE ARC-FLASH STUDY

PART 1 - GENERAL

1.1 SUMMARY

- A. Computer-based, arc-flash study to determine the arc-flash hazard distance and the incident energy to which personnel could be exposed during work on or near electrical equipment.

1.2 SOFTWARE CAPABILITY

- A. Comply with IEEE 1584 and NFPA 70E.
- B. Produce 3.5-by-5-inch labels for each work location included in the analysis.

1.3 EXECUTION

- A. Calculate the arc-flash protection boundary and incident energy at locations in the electrical distribution system where personnel could perform work on energized parts.
- B. Include medium- and low-voltage equipment locations, except 240-V ac and 208-V ac systems fed from transformers less than 125 kVA.
- C. Specify safe working distances based on the calculated arc-flash boundary at incident energy of 1.2 cal/sq.cm.
- D. Base arc-flash calculations on actual overcurrent protective device clearing time. Cap maximum clearing time at two seconds based on IEEE 1584, Section B.1.2.

END SECTION 260574

SECTION 260923 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 PRODUCTS

- A. Time Switches: Electronic, programmable units, with multiple channels.
- B. Outdoor Photoelectric Switches: Solid state, with dry contacts, 30-second time delay, and metal-oxide varistor surge protection.
- C. Daylight-harvesting switching controls.
- D. Daylight-harvesting dimming controls.
- E. Indoor Occupancy Sensors: Dual-technology type, with separate, externally mounted relay unit.
- F. Switchbox-mounted occupancy sensors.
- G. High-bay occupancy sensors.
- H. Extreme-temperature occupancy sensors.
- I. Outdoor Motion Sensors: Lighting-fixture and individually mounted.
- J. Lighting Contactors: Electrically operated and electrically held, with fusible switch.
- K. Emergency Shunt Relay: Normally closed, electrically held, arranged for wiring in parallel with manual or automatic switching contacts.
- L. Wall-Box Multiscene Dimming Controls:
 - 1. Manual dimming equipment consisting of a wall-box-mounted master controller and indicated number of wall-box zone stations. Each zone is adjustable to indicated number of scenes, which reside in the memory of zone controller.
- M. Multipreset Modular Dimming Controls:
 - 1. Manual dimming equipment consisting of the following:
 - a. Master controller.
 - b. Dimmer panels and indicated number of zone stations.
 - c. Controls and dimmers integrated for mounting in a multigang wall box under a single wall plate.
 - d. Each zone adjustable to indicated number of scenes, which reside in the memory of zone controller.

N. Configurable Zone Loads:

1. LED lamps with electronic drivers.
2. Non-dim, on-off switching only.

O. Control Cables:

1. Power Cables: Not smaller than No. 14 AWG.
2. Classes 2 and 3 Control Cables: Stranded-copper conductors, not smaller than No. 18 AWG.
3. Class 1 Control Cables: Stranded-copper conductors, not smaller than No. 14 AWG.
4. Class 2 Control Cable: Multiconductor cable with stranded-copper conductors.

1.2 INSTALLATION

- A. Wiring Method.

1.3 FIELD QUALITY CONTROL

- A. Testing: By Contractor.

END SECTION 260923

SECTION 260943 - RELAY-BASED LIGHTING CONTROLS

PART 1 - GENERAL

1.1 PRODUCTS

- A. Standalone Lighting Control Panels: Mechanically latched relays to control lighting and appliances. All systems proposed to meet Title 24 requirements shall be California Energy Commission approved.
1. Single enclosure with incoming lighting branch circuits, control circuits, switching relays, and on-board timing and control unit.
 - a. Control Unit: Power supply and electronic control for operating and monitoring individual relays.
 - b. Timing Unit: 365-day calendar; astronomical clock; four independent schedules, each having 24 Insert number time periods.
 - c. Sequencing control with override.
 - d. Override control "blink warning" approximately five minutes before off sequence.
 - e. Nonvolatile memory retains setup configurations.
 2. Operator Interface: Integral alphanumeric keypad and digital display.
- B. Networked Lighting Control Panels: Mechanically latched relays to control lighting and appliances, interconnected with digital communications to appear as a single lighting control system.
1. Main Control Unit: Installed in the main lighting control panel only; powered from the branch circuit of the standard control unit.
 - a. Control Unit: Power supply and electronic control for operating and monitoring individual relays.
 - b. Timing Unit: 365-day calendar; astronomical clock; four independent schedules, each having 24 Insert number time periods.
 - c. Sequencing control with override.
 - d. Override control "blink warning" approximately five minutes before off sequence.
 - e. Nonvolatile memory retains setup configurations.
 2. Ethernet Communications: MS Windows TCP/IP Insert network protocol protocol.
 3. Operator Interface: At the main control unit, provide interface for a tethered connection of a portable PC running MS Windows Insert digital device and operating system for configuring networked lighting control panels using setup software designed for the specified operating system.

- C. Manual Switches and Plates: Modular, momentary contact, three wire, for operating one or more relays and to override automatic controls.
 - D. Field-Mounted Signal Sources:
 - 1. Daylight harvesting switching controls.
 - 2. Indoor occupancy sensors.
 - E. Conductors and Cables:
 - 1. Power Wiring: Not smaller than No. 12 AWG.
 - 2. Control Cables: Multiconductor copper cables.
 - 3. Digital and Multiplexed Signal Cables: Category 5e Category 6, unshielded, twisted-pair, copper conductors.
- 1.2 INSTALLATION
- A. Wiring Method: In raceways except in accessible indoor ceiling spaces and attics where Concealed cable can be used.
 - B. Testing Agency: Owner Contractor engaged.
 - C. Adjusting: On-site assistance in adjusting system to suit occupied conditions.
 - D. Software:
 - 1. Software technical support and upgrade services for two years.
 - 2. Upgrade Notice: At least 30 Insert number days.

END OF SECTION 260943

SECTION 262413 -SWITCHBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general conditions, Division 1, and Basic Electrical Requirements (Section 26 05 00) are part of this section and the contract for this work and apply to this section as fully as if repeated herein.
- B. Reference to other sections: The applicable requirements from other Division 26 sections required for a complete and operational system shall form a part of the electrical work and each section shall be thoroughly reviewed by the Contractor for application to all other sections.

1.2 SUBMITTALS

- A. Submit shop drawings per Section 26 05 00 for review including the following:
 - 1. Switchboards
 - 2. Overcurrent protection
 - 3. Instrumentation
 - 4. Dimensions, weights, ratings, and layouts
 - 5. Device settings and trip ratings

PART 2 - PRODUCTS

- 2.1 Switchboards shall be factory assembled, dead-front, metal enclosed, self-supporting floor standing sections as noted in the construction documents.
- 2.2 Vertical sections shall contain overcurrent protective devices including circuit breakers and fuses and shall be nominally 90" in height.
- 2.3 Switchboard finish shall be baked enamel factory paint of manufacturer's standard color.
- 2.4 Provide front accessibility for wireways on each side of overcurrent protective devices for entire height of section. Provide welded steel framework with screw covers removable from the front; covers may be hinged.
- 2.5 All bussing shall be silver-coated copper (maximum 1000A/square inch current density) with ratings as indicated in the construction documents.
- 2.6 Switchboard, bussing, and devices shall be fully-rated for the available short circuit current as determined by the Contractor's short circuit study (see 2.16 below), inclusive of all motor contribution and utility contribution. The minimum AIC ratings of the equipment may exceed

those indicated on the construction documents, due to the results of the Contractor's short circuit study. The Contractor shall include all study costs and resultant equipment costs during bidding. The Contractor may provide series-rated equipment, fully compliant with all NEC requirements and the short circuit study, but shall not provide series-rated equipment without explicit written permission from the Engineer.

- 2.7 Switchboards shall be equipped with lifting eyes.
- 2.8 Switchboards shall be suitable for the environment in which they are located and shall be NEMA 1, indoor, and rated for Seismic Design Category D, unless noted otherwise on the construction documents.
- 2.9 Main circuit breakers shall be provided and shall be insulated case solid-state (LSIG) trip type with ratings as noted. Main breakers shall be 100% rated devices.
- 2.10 Circuit breakers 1200A and above shall be provided with a code approved Arc Energy Reduction system.
- 2.11 Main circuit breaker shall be individually mounted, unless noted otherwise.
- 2.12 Main circuit breaker shall have maximum closing time of five (5) cycles, three (3) cycles upon opening.
- 2.13 Main circuit breaker shall have field-replaceable trip plugs.
- 2.14 Distribution circuit breakers shall be molded case type. All circuit breakers shall be bolt-on type.
- 2.15 Cross bussing shall be fully rated (maximum 1000A/square inch current density) for the length of the switchboard.
- 2.16 Instrumentation shall be provided where noted. Utility company metering shall be provided in accordance with the serving utility company requirements.
- 2.17 The Contractor shall contract a California Registered Professional Electrical Engineer to furnish and submit a coordination/short circuit study (using SKM "Power Tools" software or equal) for the entire system provided including long time, short time, instantaneous, and ground fault settings.
- 2.18 Provide permanently adhered "bakelite" labels indicating the identification of each device on the switchboard adjacent to the device and visible on the enclosure exterior.
- 2.19 Provide a ground bus in each switchboard section with connecting ground bonds between sections. Ground bus shall be rated at 30% of the incoming capacity.
- 2.20 Rodent-proof ventilation as required to maintain allowable temperature rise at rated capacity.
- 2.21 Acceptable manufacturers shall be Eaton, General Electric, Square D, or Siemens.

PART 3 - EXECUTION

- 3.1 Installation method of switchboards shall comply with the latest enforced edition of the National Electrical Code and the authority having jurisdiction.
- 3.2 Install all switchboards in accordance with the manufacturer's recommendations and requirements.
- 3.3 Coordinate switchboard location and size with architectural and interior drawings. Coordinate with other trades to identify conflicts with switchboard locations and notify the Engineer of any conflicts.
- 3.4 Coordinate switchboard size with concrete housekeeping pads.
- 3.5 Check all connections, phase rotation, ground resistance and insulation resistance levels.
- 3.6 Ground fault protective devices shall be tested by an approved third party testing agency and a written report submitted with the operation manual for review.
- 3.7 Test all switchboards and overcurrent protection devices for voltage level, continuity, ground fault, and short circuits.
- 3.8 Install all switchboards plumb and square to structure and adjacent surfaces.
- 3.9 Connect and inspect all ground bonds prior to energizing switchboard.
- 3.10 Demonstrate the proper operation of all ground fault protective devices.
- 3.11 Clean all switchboard interiors and exteriors to be free of dirt, dust and debris prior to handing over to University. Touch up scratched paint and finishes as necessary.
- 3.12 Adjust and set all devices for proper operation. Set all protective devices as per the written report recommendations.

END OF SECTION 262413

SECTION 262416 - PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Indoor and outdoor distribution panelboards and lighting and appliance branch-circuit panelboards.

1.2 PERFORMANCE REQUIREMENTS

- A. Furnish Seismic tested equipment as follows:
- B. The equipment and major components shall be suitable for and certified to meet all applicable seismic requirements of the California Building Code (CBC) through zone 4 application. Panelboards for the house loads shall be Title 24 approved for load segregation and metering. Guidelines for the installation consistent with these requirements shall be furnished by the switchgear manufacturer and be based upon testing of representative equipment. The test response spectrum shall be based upon a 5% minimum damping factor, CBC: a peak of 2.15g's, and a ZPA of 0.86g's applied at the base of the equipment. The tests shall fully envelop this response spectrum for all equipment natural frequencies up to at least 35 Hz.

1.3 WARRANTY

- A. Panelboards: One year.
 - 1. Furnish to Owner a written guarantee for SPDs against all defects in materials and workmanship for two (2) years from date of acceptance. Refer to Section 01 7800, CLOSE-OUT SUBMITTALS, for submittal form.
- B. SPD: Five years.
 - 1. Furnish to Owner a written guarantee for SPDs against all defects in materials and workmanship for five (5) years from date of acceptance. Refer to Section 01 7800, CLOSE-OUT SUBMITTALS, for submittal form.

1.4 SUBMITTALS

- A. Shop Drawings and Product Data: The following list includes the required shop drawing information that shall be submitted.
 - 1. Thickness, gauges, and finish of materials.
 - 2. Types of materials and bus bracing.

3. Circuit breaker ratings, interrupting capacities, and FS compliance.
 4. Sheet metal enclosure construction and sizes, and UL approval.
 5. Installation instructions, with seismic restraint calculations.
 6. Compliance with Short Circuit and Coordination studies.
- B. Seismic Qualification Certificates: Submit certification that panelboards, overcurrent protective devices, accessories, and components will withstand seismic forces defined in Section 26 0548 "Vibration and Seismic Controls for Electrical Systems." Include the following:
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- C. Field Quality-Control Reports:
1. Test procedures used.
 2. Test results that comply with requirements.
 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.
- D. Panelboard Schedules: For installation in panelboards.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: ISO 9001 or 9002 certified.
- B. The manufacturer of the assembly shall be the manufacturer of the major components within the assembly.
- C. When requested by Owner's Representative, an acceptable list of installations with similar equipment shall be furnished demonstrating.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.
- E. Comply with CEC.

1.6 PRODUCTS

- A. Fabricate and test panelboards according to IEEE 344 to withstand seismic forces defined in Section 26 0548 "Vibration and Seismic Controls for Electrical Systems."
- B. Enclosures: Flush- and surface-mounted cabinets. Minimum 20" wide by 5-3/4" deep

1. Rated for environmental conditions at installed location.
 - a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
 - b. Outdoor Locations: NEMA 250, Type 3R.
 2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
 3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
 4. Skirt for Surface-Mounted Panelboards: Same gage and finish as panelboard front with flanges for attachment to panelboard, wall, and ceiling or floor.
 5. Gutter Extension and Barrier: Same gage and finish as panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.
 6. Finishes:
 - a. Panels and Trim: Steel and galvanized steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
 - b. Back Boxes: Same finish as panels and trim.
 7. Directory Card: Inside panelboard door, mounted with transparent protective cover.
 8. All panelboards shall be keyed alike.
- C. Incoming Mains Location: Top and bottom.
- D. Phase, Neutral, and Ground Buses:
1. Material: Provided with flush locks, hard-drawn copper, 98 percent conductivity.
 2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
 3. Isolated Ground Bus: Adequate for branch-circuit isolated ground conductors; insulated from box.
 4. Extra-Capacity Neutral Bus: Neutral bus rated 200 percent of phase bus and UL listed as suitable for nonlinear loads.
- E. Conductor Connectors: Suitable for use with conductor material and sizes.
1. Material: Hard-drawn copper, 98 percent conductivity.
 2. Main and Neutral Lugs: Compression type.
 3. Ground Lugs and Bus-Configured Terminators: Compression type.
 4. Feed-Through Lugs: Compression type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
 5. Subfeed (Double) Lugs: Compression type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.
 6. Gutter-Tap Lugs: Compression type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.
 7. Extra-Capacity Neutral Lugs: Rated 200 percent of phase lugs mounted on extra-capacity neutral bus.

- F. Future Devices: Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.
- G. Panelboard Short-Circuit Current Rating: Shall be 110% of calculated rated fault current.

1.7 DISTRIBUTION BOARDS

- A. Panelboards: NEMA PB 1, power and feeder distribution type.
- B. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
 - 1. For doors more than 36 inches high, provide two latches, keyed alike.
- C. Mains: As indicated in schedules or shown in Single Line Diagram.
- D. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller: Plug-in circuit breakers.
- E. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.

1.8 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.
- B. Mains: As indicated in Panel Schedules.
- C. Branch Overcurrent Protective Devices: Plug-in circuit breakers, replaceable without disturbing adjacent units.
- D. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

1.9 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 400 A and larger.
 - 2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
 - 3. GFCI Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).
 - 4. Ground-Fault Equipment Protection (GFEP) Circuit Breakers: Class B ground-fault protection (30-mA trip).
 - 5. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:

- a. Standard frame sizes, trip ratings, and number of poles.
- b. Lugs: Compression style, suitable for number, size, trip ratings, and conductor materials.
- c. Ground-Fault Protection: Integrally mounted, self-powered type with mechanical ground fault indicator, relay with adjustable pickup and time-delay settings,

push-to-test feature, internal memory and shunt trip unit, and three phase, zero sequence current transformer/sensor.
- d. Shunt Trip: Trip coil energized from separate circuit, with coil clearing contact.

1.10 INSTALLATION

- A. Receive, inspect, handle, and store panelboards according to NECA 407
- B. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.
- C. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.
- E. Installation of adjacent panelboards shall be such that top trims are level and at the same height, unless specifically noted otherwise. Protection device heights shall be a maximum of 6'-6" to the device handle for panelboards over 29" in height, and 5'-6" in panelboards 29" high or less, except where adjacent to taller panelboards, where they shall align.
- F. From each flush mounted panelboard, route 4-3/4" empty conduits into accessible ceiling space.
- G. All lighting and power panelboards shall be rigidly supported independently of conduit with Unistrut P1000 Channel, or equal, from concrete floor to concrete floor.
- H. Panelboards located in mechanical areas shall have weatherproof gaskets on trims and doors.

1.11 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Section 26 0553 "Identification for Electrical Systems."
- B. Create a directory to indicate installed circuit loads after balancing panelboard loads. Obtain Owner's room numbering system and include these room numbers in final typewritten panelboard directories.

- C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems."
- D. Device Nameplates: Label each branch circuit device in distribution panelboards with a nameplate complying with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems."

1.12 FIELD QUALITY CONTROL

- A. Testing: By Contractor-engaged agency.
- B. Perform the following tests and inspections and prepare reports:
 - 1. Visual and Mechanical Inspection
 - a. Inspect for physical damage and code violations.
 - b. Ensure all nameplates, labels and warning signs are correct and in place.
 - c. Verify panel schedule accuracy.
 - C. Molded Case Circuit Breakers (Frame Size Larger than 100 Amps)
 - 1. Visual and Mechanical Inspection:
 - a. Check circuit breaker for proper mounting and physical damage.
 - b. Check mechanical operation.
 - c. Check tightness of electrical cable connections.
 - d. Check settings against coordination study.
 - 2. Electrical Tests:
 - a. Measure contact resistance.
 - b. Measure long-term delay by primary current injection at three (3) times long-time pickup current.
 - c. Measure instantaneous pickup current by primary current injection.
 - d. Check trip unit reset operation.
- D. Perform insulation resistance test phase-to-ground, phase-to-phase and across open contacts.

END SECTION 262416

SECTION 262713 - ELECTRICITY METERING

PART 1 - GENERAL

1.1 SUMMARY

- A. Utility electricity metering infrastructure shall be approved by LA DWP.
- B. Private metering shall be provided as indicated on the plans. This section covers private metering equipment.

1.2 MANUFACTURERS

- A. Provide products by one of the following:
 - 1. E-mon D-mon.
 - 2. Or equal.

1.3 SOFTWARE SERVICE AGREEMENT

- A. Technical Support: Two years.
- B. Upgrade Service: Two years.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For electricity-metering equipment.
 - 1. Dimensioned plans and sections or elevation layouts.
 - 2. Wiring Diagrams: For power, signal, and control wiring. Identify terminals and wiring designations and color-codes to facilitate installation, operation, and maintenance. Indicate recommended types, wire sizes, and circuiting arrangements for field-installed wiring, and show circuit protection features.

1.5 PRODUCTS

- A. General Requirements for Meters:

1. Comply with UL 1244.
 2. Meters used for billing shall have an accuracy of 0.2 percent of reading, complying with requirements in ANSI C12.20.
 3. Enclosure: NEMA 250, Type 1 minimum, with hasp for padlocking or sealing.
 4. Identification: Comply with requirements in Section 26 0553 "Identification for Electrical Systems."
 5. Memory Backup: Self-contained to maintain memory throughout power outages of 72 hours, minimum.
 6. Sensors: Current-sensing type, with current or voltage output, selected for optimum range and accuracy for meters indicated for this application.
 - a. Type: Split core.
 7. Building Automation System (BAS) Interface: One digital KY pulse to a user-definable increment of energy measurement. Match signal to BAS input and arrange to convey the instantaneous, integrated, demand level measured by meter to provide data for processing and possible programmed demand control action by destination system.
- B. Kilowatt-hour Meter: Electronic three-phase meters, measuring electricity use and demand.
1. Voltage and Phase Configuration: Meter shall be designed for use on circuits with voltage rating and phase configuration indicated for its application.
 2. Display: LCD with characters not less than 0.25 inch high, indicating accumulative kilowatt-hours and current kilowatt load. Retain accumulated kilowatt-hour in a nonvolatile memory, until reset.
- C. Kilowatt-hour/Demand Meter: Electronic three-phase meters, measuring electricity use and demand. Demand shall be integrated over a 15-minute interval.
1. Voltage and Phase Configuration: Meter shall be designed for use on circuits with voltage rating and phase configuration indicated for its application.
 2. Display: LCD with characters not less than 0.25 inch high, indicating accumulative kilowatt-hours, current time and date, current demand, and historic peak demand, and time and date of historic peak demand. Retain accumulated kilowatt-hour and historic peak demand in a nonvolatile memory, until reset.
- D. Data Transmission Cable: Transmit KY pulse data over Class 1 control-circuit conductors in raceway. Comply with Section 26 0519, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES.

1.6 FIELD QUALITY CONTROL

- A. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Tests and Inspections:
1. Connect a load of known kilowatt rating, 1.5 kW minimum, to a circuit supplied by metered feeder.
 2. Turn off circuits supplied by metered feeder and secure them in off condition.
 3. Run test load continuously for eight hours minimum, or longer, to obtain a measurable meter indication. Use test-load placement and setting that ensures continuous, safe operation.
 4. Check and record meter reading at end of test period and compare with actual electricity used, based on test-load rating, duration of test, and sample measurements of supply voltage at test-load connection. Record test results.
- C. Electricity metering will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

END SECTION 262713

SECTION 262726 - WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Receptacles, switches, dimmers, floor outlets, wall box occupancy sensors and other wiring devices.

1.2 SUBMITTALS

- A. Product Data:
 - 1. Each device indicating FS number, amperage and voltage rating, materials, color and manufacturer's catalog sheet.
 - 2. Each device plate indicating materials and thickness or gauge of materials, color and manufacturer's catalog sheet.
 - 3. All switches and receptacles shall be of same manufacturer.
 - 4. Occupancy and daylight sensors layout drawings and sensor certification by California Energy Commission.

1.3 PRODUCTS

A. GENERAL

- 1. All devices shall conform to NEMA standards, shall be UL listed and labeled, and shall be "Specification Grade," meeting the requirements of FS WC-596-F and switches meeting the requirements of FS WS-896-E.

B. SWITCHES

- 1. Wall switches shall be fully enclosed, quiet type tumbler switches rated 20 amperes, 120 or 277-volt, nylon or composition.
- 2. Quiet switches, 20 ampere type, may be used in quiet locations at full rating for inductive or non-inductive loads and incandescent or fluorescent lighting loads.
- 3. Single Pole Quiet Switches.
- 4. Double Pole Quiet Switches.
- 5. Three-way Quiet Switches. Four-way quiet switches.

6. Control switches for lighting shall be 3-way, normally open, momentary contact, tumbler switches. The switch shall be wired so that the lights shall be "ON" when the switch is moved to the "UP" position.
7. Remote control motor switches shall be standard duty, momentary contact, push button, or selector switches, with pilot lights and jewels.
8. Switches in outdoor locations shall have weatherproof plates.
9. Manual motor control switches for single-phase motors shall be flush or surface mounted, as required, full-voltage type with thermal overload protection and with pilot light and jewel where specified.
10. Contactors for the control of lighting circuits shall be mechanically held, NEMA Size 2 or larger, with the number of poles as required by the schedules or diagrams. Contactors shall have coil clearing contacts.

C. RECEPTACLES

1. Single and duplex convenience receptacles shall be U-grounded type, 125 volts, side and back wired with binding screws only. Rating 15 or 20 amperes as indicated.
2. The grounding contact shall be internally connected to the frame with ground terminal for external ground.
3. Special receptacles shall be as indicated on Drawings by NEMA configuration.
4. Ground fault receptacles, self-testing type, shall be 20 amperes, 125 volt, duplex, three wire grounding with pilot lights and test and reset buttons, suitable for self-testing type, suitable for feed-through, color to be white.
5. Corridor Cleaning Receptacles shall be 20 ampere.
6. Wiring devices in exposed weatherproof boxes shall be the devices specified in this Section, and shall be installed in "FS" or "FD" series condulets with weatherproof cast metal covers, and gaskets as required.
7. Isolated-Ground, Duplex Convenience Receptacles, 125V, 20A, comply with NEMA WD 1, NEMA WD6, configuration 5-20R, and UL 498. Straight blade; equipment grounding contacts shall be connected only to the green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.
8. All receptacles shall have matching plates.
9. All devices shall be Decora Style.

D. FLOOR OUTLETS

1. Where floor outlets are shown, boxes and covers as specified in Section 26 0533, RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS. Receptacles shall be as specified in this section.
2. Where 120, 208, or 240 volts are used, standard NEMA receptacles, suitable for the service, shall be used. Receptacles shall be Hubbell, or equal, with ampere and voltage ratings as required.

E. PLATES

1. Furnish plates for all switches, occupancy sensors, daylight sensors, photocells, receptacles, junction boxes, telephone and other outlets.
2. Furnish labeled plates for all lock switches, pilot switches, switches from which equipment or circuit controlled cannot be readily seen, three or more switches under a common plate and for switches as indicated, and for each receptacle and switch, indicating panel and circuit number.
3. Where outlets are indicated to be weatherproof, furnish a AISI Type 302 stainless with double hinged covers.
4. Furnish plates equipped with close fitting openings for the exact device to be used.
5. Finish of Plates and Devices Shall be as Follows:

Location	Plate	Device Color*
General Interior, Finished Areas	White	White
Conference Rooms (where noted in		White
Labs and Lab Support Spaces	Stainless Steel, Satin Brushed	Grey
On Exterior, Weatherproof	Cast Aluminum with Spring Loaded Cover	White
In Equipment Rooms of Other Generally		White
Unfinished Areas		
Janitor and Utility Rooms		White
Toilet (Public)		White
Emergency Circuits		Red
Isolated Ground Receptacle		Orange
* Device colors except for emergency (red) may be changed at Owner Representative's request if desirable to match building color scheme.		

SENSORS

1. General
 - a. One year manufacturer's warrantee.
 - b. Coordinate exact locations of sensors with all trades, and submit plans indicating sensor locations and coverages, confirmed by sensor manufacturer, for review by Owner's Representative.
 - c. Furnish occupancy sensors, including switch power packs, control/units, relays, to suit function of rooms.
2. Occupancy Sensors
 - a. Furnish California Energy Commission approved, UL listed, dual-technology, (passive infrared and ultrasonic) occupancy sensors in individual rooms, at locations indicated on drawings, with no interference with hearing aid devices. Locate sensors in locations recommended by manufacturer, and as approved by Owner's Representative. Each sensor shall be furnished with switch/power pack.
 - b. Wall Sensor.
 - 1) Automatic on-off control of lighting loads in rooms as indicated, rated for both incandescent and fluorescent lighting. Maximum load of 600 VA at 120V and up to 1200 VA at 277V with Adaptive Technology, with zero prent switching, capable of switching electronic fluorescent ballasts which are to be installed. Coordinate with Section 26 5100, INTERIOR LIGHTING, and include all requirements.
 - 2) Area covered – minimum 800 square feet with 9 foot ceiling.
 - 3) Two position switch; automatic mode, and override of the automatic mode to turn lights off even if room is occupied.
 - 4) Delayed automatic "off" (time-out) adjustable from minimum of 1 minute to a maximum of 20 minutes. Movement in the room during the time-out period to reset the time delay.
 - 5) An ambient light override that may be set so that when sufficient ambient light (daylight) is present, the lighting shall not turn on. Adjustable from full daylight to less than 40 foot candles. Built-in photocell with normal super-saver mode for daylight.

- 6) Ivory (unless otherwise noted) injection molded thermoplastic device body for mounting on a single gang plaster ring, with panel and circuit number.
 - 7) Sensor with bi-level switches where indicated on Drawings.
 - 8) Sensor to have adaptive technology that continuously analyses occupancy patterns, and adjusts the time and sensitivity providing a setting to ensure that sensor is providing a zone maintenance-free sensor.
3. Ceiling Sensor
- a. Automatic on-off control of lighting loads in rooms as indicated. Unit complete with low voltage power supply, relay for switching multiple circuits with local manual switches, single or multiple sensors as indicated on drawings.
 - b. Each sensor to have a field of range minimum of 1000 square feet area. Multiple sensors to double the range.
 - c. Sensor to have on-auto switch, adjustable time delay between 1-20 minutes, adjustable sensitivity and normally closed relay to leave lights "on" on sensors failure.
 - d. Housing made of rugged high impact injected molded plastic colored white.
4. Daylight Sensors
- a. Daylight sensors shall have adjustable light level settings. Setting shall be made to activate the interior lights, when outside daylight falls to a level as acceptable to Owner's Representative. Settings to be made in presence of Owner's Representative.
 - b. Sensor to be mounted on junction box which is to contain the power switch relay controlling the respective lights. Each sensor to be furnished with this relay.
 - c. Sensor located in area exposed to weather to be U.L. Listed for such application.
 - d. Exact location of sensors to be coordinated with manufacturer, other trades, and Owner's Representative.

1.4 INSTALLATION

- A. Mount switches 4' above finished floor and vertically in all locations unless indicated otherwise.
Refer to Architectural elevations.
- B. All convenience and telephone/data/CATV outlets mounted 18" above the floor shall be installed vertically. Install receptacle with the grounding terminal up. Outlets required to be

located above casework counters or back splashes shall be mounted horizontally at 4" above top of counter or backsplash. Receptacles with the ground slot to the left.

- C. CEC sized (#12 minimum) bonding jumper shall connect grounded outlet box to receptacle grounding terminal on all flush mounted units.
- D. Align and plumb all devices and plates. Plates shall fit flat against wall and tight against device surface without strain on plate.
- E. Each class of device shall be furnished by one manufacturer for total Project. Mixing devices of different suppliers shall not be permitted.
- F. Coordinate exact placement of occupancy sensors with other trades, and per manufacturer's recommendations.
- G. Manual dimmers shall be installed in individual outlet boxes. Do not install in ganged boxes with other devices.
- H. Locate all ceiling mounted devices on reflected ceiling plan for coordination with work specified
in other sections for Owner's Representative review.
- I. Contractor shall furnish the services of the manufacturer's trained employee in adjusting the

END SECTION 262726

SECTION 262813 - FUSES

PART 1 - GENERAL

1.1 SUMMARY

- A. Low-voltage cartridge fuses rated 600volts AC and less.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material, dimensions, descriptions of individual components, and finishes for spare-fuse cabinets. Include the following for each fuse type indicated:
 - 1. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
 - 2. Current-limitation curves for fuses with current-limiting characteristics.
 - 3. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse.
 - 4. Coordination charts and tables and related data.
 - 5. Fuse sizes for elevator feeders and elevator disconnect switches.

1.3 PRODUCTS

- A. Quality Standards: NEMA FU 1 for cartridge fuses.
- B. Cartridge Fuses: Nonrenewable.
- C. Spare-Fuse Cabinet: Wall-mounted steel unit with fuse pullers for each size of fuse.
- D. Cartridge Fuses Rated 600 Volts Or Less:
 - 1. Characteristics: Nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages. Refer to Drawings for ratings.
 - a. 600 Ampere or Less: Class J, time delay.
 - b. Fuses Protecting Control Circuits: Class CC, time delay.

1.4 INSTALLATION

- A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.
- B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.

- C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.
- E. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

1.5 IDENTIFICATION

- A. Install labels complying with requirements for identification specified in Section 26 0553 and indicating fuse replacement information on inside door of each fused switch and adjacent to each fuse block, socket, and holder.

END SECTION 262813

SECTION 262816 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Indoor enclosed dead-front switchboards rated 600V and below.

1.2 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Enclosed switches and circuit breakers on emergency power systems shall withstand the effects of earthquake motions determined according to ASCE/SEI 7, Seismic Zone 4.
 - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
- B. Coordinate AIC and fuse ratings with contractor furnished Overcurrent Protective Device Coordination study.

1.3 SUBMITTALS

- A. Shop Drawings and Product Data: The following list includes the required shop drawings that shall be submitted.
 - 1. Complete equipment shop drawings for each type of enclosed switch, accessory and component indicated. Include dimensioned elevations, sections, weights and manufacturer's technical data on features, performance, electrical characteristics, ratings accessories and finishes.
- B. Seismic calculations shall be by Structural Engineer, registered in State of California, for the support of disconnect switches, and drawings, indicating intended installation.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single source from single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Comply with CEC.

- D. Comply with Federal Specification W-S-865.
- E. Comply with UL 98 and NEMA KS1 for fusible and nonfusible switches.
- F. Comply with UL 489, NEMA AB1, and NEMA AB3, for enclosed molded-case circuit breakers.
- G. Comply with ASME A17.1 for shunt trip switches.
- H. Comply with Federal Specification W-S-865.

1.5 PRODUCTS

- A. All disconnect switches shall be the "Heavy Duty" type and shall meet the latest edition of FS W-S-865.
- B. Type HD heavy duty single throw 600V AC 30A unless otherwise noted on drawings, horsepower rated, lockable handle with capability to accept three padlocks and interlocked with cover in closed position.
- C. Furnish all disconnect switches with devices enabling the switch to be locked in the open and closed positions.
- D. Manual motor starters shall be motor rated tumbler switches rated 3 HP 208 or 480 volts, three-phase with overload heaters as specified or shown to protect equipment served.
- E. Externally operable safety switches shall have quick-make, quick-break mechanism, capable of switching 10 times the switch rating, and with cover interlocks with defeat mechanism for maintenance.
- F. Furnish switches with number of poles, ampere, voltage and HP rating, types of enclosures and fusible or nonfusible as indicated and as required for the particular application. Disconnect switches shall be heavy duty type unless otherwise indicated.
- G. Furnish NEMA 1 enclosures for interior locations and NEMA 3R enclosures for exterior or wet locations unless otherwise indicated. Switches having a dual rating when used with dual element fuses shall have rating so indicated on the metal plate. Fuses, where required, shall be UL listed current limiting type RK5.
- H. For disconnect between variable speed starters and the motor served, furnish auxiliary contact in switch, wired to disconnect the starter coil in OFF position. Auxiliary contact to open before disconnect.
- I. Fuses, where indicated to be used, shall be current-limiting type, with rejection type fuse holders. And fuse adaptors as needed.

- J. Accessories:
 - 1. Equipment Ground Kit: Internally mounted and labeled for copper ground conductors.
 - 2. Neutral Kit: Internally mounted, insulated, capable of being grounded and bonded, labeled for copper neutral conductors.
 - 3. Auxiliary Contact Kit: Two normally open/normally closed Form C auxiliary contacts arranged to activate before switch blades open.
- K. Lugs: Mechanical type suitable for number and size of copper conductors indicated.
- L. Enclosures:
 - 1. Enclosed Switches and Circuit Breakers: NEMA 250, and UL 50, to comply with environmental conditions at installed location.
 - a. Indoor, Dry and Clean Locations: Type 1.
 - b. Outdoor Locations: Type 3R.

1.6 FIELD QUALITY CONTROL

- A. Testing: By Contractor.
 - 1. Visual and mechanical
 - a. Inspect for physical damage and code violations.
 - b. Ensure all nameplates and labels are correct and in place.

1.7 INSTALLATION

- A. Install switches, disconnects and safety, where indicated on the Drawings, or required by applicable code requirements.
- B. Securely fasten to structural members or channel support. In outdoors, mount on epoxy coated unistrut support, at plus 42 inches AFF. Comply with restrictions on penetrating of roofing material.
- C. Install manual motor starters flush mounted for switching motors 3 HP and smaller in finished areas.
- D. Install manual motor starters, surface mounted, in equipment rooms and nonfinished areas.
- E. Where installed above ceilings, access panels shall be furnished.

1.8 ADJUSTING

- A. Set field-adjustable circuit-breaker trip ranges.

END SECTION 262816

SECTION 265100 - INTERIOR LIGHTING

PART 1 - GENERAL

1.1 ACTION SUBMITTAL

- A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:
1. Physical description of lighting fixture including dimensions.
 2. Energy-efficiency data.
 3. Life, output (lumens, CCT, and CRI), and energy-efficiency data for lamps.
 4. Photometric data and adjustment factors based on laboratory tests, complying with IESNA Lighting Measurements Testing & Calculation Guides, of each lighting fixture type. The adjustment factors shall be for lamps, ballasts, and accessories identical to those indicated for the lighting fixture as applied in this Project.
 - a. Testing Agency Certified Data: For indicated fixtures, photometric data shall be certified by a qualified independent testing agency. Photometric data for remaining fixtures shall be certified by manufacturer.
 - b. Manufacturer Certified Data: Photometric data shall be certified by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
- B. Shop Drawings: For nonstandard or custom lighting fixtures. Include plans, elevations, sections, details, and attachments to other work.
1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 2. Wiring Diagrams: For power, signal, and control wiring.
- C. Installation instructions.

1.2 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.
- B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as

defined by OSHA in 29 CFR 1910, complying with the IESNA Lighting Measurements Testing & Calculation Guides.

- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.
- D. Comply with CEC.
- E. FM Global Compliance: Lighting fixtures for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.
- F. All lighting fixtures shall be Title 24 compliant for their application on residential dwelling units and commercial applications, depending where they are been installed.

1.3 COORDINATION

- A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

1.4 PRODUCTS

- A. Products: Subject to compliance with requirements, provide product indicated on Drawings or Equal.

1.5 GENERAL REQUIREMENTS FOR LIGHTING FIXTURES AND COMPONENTS

- A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures. Air tight fixtures shall be used as required by Title 24 in their specific applications in the building.
- B. Metal Parts: Free of burrs and sharp corners and edges.
- C. Sheet Metal Components: Steel unless otherwise indicated. Form and support to prevent warping and sagging.
- D. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
- E. Diffusers and Globes:
 - 1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 - a. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

- b. UV stabilized.
 - 2. Glass: Annealed crystal glass unless otherwise indicated.
- F. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
- 1. Label shall include the following lamp and ballast characteristics:
 - a. "USE ONLY" and include specific lamp type.
 - b. Lamp diameter code (T-4, T-5, T-8, T-12, etc.), tube configuration (twin, quad, triple, etc.), base type, and nominal wattage for fluorescent and compact fluorescent luminaires.
 - c. Lamp type, wattage, bulb type (ED17, BD56, etc.) and coating (clear or coated) for HID luminaires.
 - d. Start type (preheat, rapid start, instant start, etc.) for fluorescent and compact fluorescent luminaires.
 - e. ANSI ballast type (M98, M57, etc.) for HID luminaires.
 - f. CCT and CRI for all luminaires.

1.6 EXIT SIGNS

- A. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.
- B. Internally Lighted Signs:
 - 1. Lamps for AC Operation: LEDs, 50,000 hours minimum rated lamp life.
 - 2. Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.
 - a. Battery: Sealed, maintenance-free, nickel-cadmium type.
 - b. Charger: Fully automatic, solid-state type with sealed transfer relay.
 - c. Operation: Relay automatically energizes lamp from battery when circuit voltage drops to 80 percent of nominal voltage or below. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
 - d. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - e. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 - f. Remote Test: Switch in hand-held remote device aimed in direction of tested unit initiates coded infrared signal. Signal reception by factory-installed infrared receiver in tested unit triggers simulation of loss of its normal power supply, providing visual confirmation of either proper or failed emergency response.
 - g. Integral Self-Test: Factory-installed electronic device automatically initiates

code-required test of unit emergency operation at required intervals. Test failure is announced by an integral audible alarm and a flashing red LED.

3. Master/Remote Sign Configurations:
 - a. Master Unit: Comply with requirements above for self-powered exit signs, and provide additional capacity in LED power supply for power connection to remote unit.
 - b. Remote Unit: Comply with requirements above for self-powered exit signs, except omit power supply, battery, and test features. Arrange to receive full power requirements from master unit. Connect for testing concurrently with master unit as a unified system.
- C. Self-Luminous Signs: Powered by tritium gas, with universal bracket for flush-ceiling, wall, or end mounting. Signs shall be guaranteed by manufacturer to maintain the minimum brightness requirements in UL 924 for 10 years.
- D. Self-Luminous Signs: Using strontium oxide aluminate compound to store ambient light and release the stored energy when the light is removed. Provide with universal bracket for flush-ceiling, wall, or end mounting.

1.7 LIGHTING FIXTURE SUPPORT COMPONENTS

- A. Comply with Section 26 0529 "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and nonmetallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.
- C. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.
- D. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage.
- E. Wires for Humid Spaces: ASTM A 580/A 580M, Composition 302 or 304, annealed stainless steel, 12 gage.
- F. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.
- G. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

1.8 SOLID STATE LIGHTING / LIGHT EMITTING DIOT (LED) LAMPS AND LUMINAIRES

- A. General:

1. Luminaire manufacturer shall have a minimum of five years' experience in the manufacture and design of LED products and systems and no less than 100 North American installations.
 2. Unless otherwise specified, all LED luminaires and power/data supplies shall be provided by a single manufacturer to ensure compatibility.
 3. All components, peripheral devices and control software are to be provided by and shall be the responsibility of a single entity. All components shall perform successfully as a complete system.
 4. Provide submittals as described in Part 1.4 and Part 1.5 above.
 5. Include all components necessary for a complete installation. Provide all power supplies, synchronizers, data cables, and data terminators for a complete working system.
 6. All LED sources used in the LED luminaire shall be of proven quality from established and reputable LED manufacturers and shall have been fabricated after 2007.
- B. Replacement and Spares:
1. Manufacturer shall submit written guarantee of the following:
 - a. Manufacturer will keep an inventory of replacement parts (source assembly, power and control components).
 2. All parts of system shall be replaceable in field. Manufacturer shall submit written guarantee of the following:
 - a. Manufacturer has in place a written recycling and re-use program, and will accept returned product and/or components for recycling or reuse.
 - b. Manufacturer will properly dispose of non-recyclable components that are deemed harmful to the environment.
 3. System shall carry a full warranty for one year.
- C. Products and Components – Performance
1. LED luminaires and components shall be UL listed or UL classified
 2. LED luminaires and components shall be CE certified.
 3. LED luminaires and components shall be PSE marked.
 4. All LED luminaires shall be subjected to the following JEDEC Reliability Tests for Lead-free Semiconductors: HTOL, RTOL, LTOL, PTMCL, TMSK, Mechanical Shock, Variable Vibration Frequency, SHR, and Autoclave.
 5. To ensure luminaire quality, luminaire shall have been tested under accelerated life test conditions including an operating temperature span of 360 degrees F, and cyclic loading up to 60G.
 6. All products included in system shall use Mil-Std 810F, Random Vibration 7.698g as a minimum standard. In installations subject to vibration, luminaire shall be installed with vibration isolation hardware to sufficiently dampen vibrations.
 7. All LED components shall be mercury and lead-free.

8. All manufacturing processes and materials shall conform to the requirements of the European Union's Restriction on the Use of Hazardous Substances in Electrical and Electronics Equipment (RoHS) Directive 2002/95/EC.
9. LEDs shall comply with ANSI/NEMA/ANSLG C78.377-2008 - Specifications for the Chromaticity of Solid State Lighting Products. Color shall remain stable throughout the life of the lamp. Color shall match approved sample.
10. LEDs shall comply with IESNA LM-80 - Standards for Lumen Maintenance of LED Lighting Products.
11. White LEDs shall have a rated source life of 50,000 hours under normal operating conditions. RGB LEDs shall have a rated source life of 100,000 hours. LED "rated source life" is defined as the time when a minimum of 70% of initial lumen output remains.
12. Luminaire assembly shall include a method of dissipating heat so as to not degrade life of source, electronic equipment, or lenses. LED luminaire housing shall be designed to transfer heat from the LED board to the outside environment. Luminaire housing shall have no negative impact on life of components.
13. Manufacturer shall supply in writing a range of permissible operating temperatures in which system will perform optimally.
14. LEDs shall be adequately protected from moisture or dust in interior applications.
15. For wet and damp use, LED-based luminaires itself shall be sealed, rated and tested for appropriate environmental conditions, not accomplished by using an additional housing or enclosure. Such protection shall have no negative impact on rated life of source or components, or if so, such reductions shall be explicitly brought to the attention of the Owner's Representative.
16. All hardwired connections to LED luminaires shall be reverse polarity protected and provide high voltage protection in the event connections are reversed or shorted during the installation process.
17. The LED luminaire shall be operated at constant and carefully regulated current levels. LEDs shall not be overdriven beyond their specified nominal voltage and current.
18. RGB LED luminaires shall utilize an equal combination of high brightness red, blue and green LEDs, unless otherwise noted, to provide up to 16.7 million additive RGB colors and shall be capable of at least 8-bit control.
19. Manufacturer shall Own be able to provide supporting documentation of the product meeting third party regulatory compliance.
20. Manufacturer shall ensure that products undergo and successfully meet appropriate design and manufacturability testing including Design FMEA, Process FMEA, Environmental Engineering Considerations and Laboratory Tests, IEC standards and UL/CE testing.
21. All LED luminaires (100% of each lot) shall undergo a minimum 24 hour burn-in during manufacturing, prior to shipping.
22. Manufacturer shall provide Luminaire Efficacy (lm/W), total luminous flux (lumens), luminous intensity (candelas) chromaticity coordinates, CCT and CRI optical

performance, polar diagrams, and relevant luminance and illuminance photometric data. Submit data in IES file format in accordance with IES LM-79-2008, based on test results from an independent Nationally Recognized Testing Laboratory.

23. Power / data supply shall have the following:
 - a. Supply outputs shall have current limiting protection.
 - b. Supply shall provide miswiring protection.
 - c. Supply shall have power factor correction.
 - d. Supply shall provide connections that are conduit-ready or clamp-style connections in the case of low-voltage wiring.
 - e. Supply shall come with a housing that meets a minimum IP20 rating for dry location installation unless located in a damp or wet location.
 - f. Supply shall be UL listed for Class 1 or Class 2 wiring.
 24. Contractor shall make due allowance for voltage drop limitations in the selection of wire gauge on secondary (low voltage) side of power supplies.
 25. All LED sources shall utilize Class 2 drivers. The Class 2 driver is to be marked "Class 2" and have been tested to ANSI/UL1310; or marked "LPS" (Limited Power Source) and have been tested to ANSI/UL60950.
- D. LED Control and Communication – Performance.
- E. LED luminaires shall be able to be switched with fluorescent luminaires on the same circuit.

END SECTION 265100

SECTION 265600 - EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 PERFORMANCE REQUIREMENTS

- A. Pole Live Load: Single load of 500 lbf .
- B. Pole Ice Load: 3 lbf/sq. ft. .
- C. Pole wind load:
 - 1. Wind speed for poles exceeding 10 feet in height is 100 mph

1.2 ACTION SUBMITTALS

- A. Product Data: For each luminaire, and support component, arranged in order of lighting unit designation. Include data on features, accessories, finishes, and the following:
 - 1. Physical description of luminaire, including materials, dimensions, effective projected area, and verification of indicated parameters.
 - 2. Details of attaching luminaires and accessories.
 - 3. Details of installation and construction.
 - 4. Luminaire materials.
 - 5. Photometric data based on laboratory tests of each luminaire type, complete with indicated lamps, ballasts, and accessories.
 - 6. Photoelectric relays.
 - 7. Lamps, including life, output, CCT, CRI, lumens, and energy-efficiency data.
 - 8. Means of attaching luminaires to supports, and indication that attachment is suitable for components involved.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Wiring Diagrams: For power, signal, and control wiring.
 - 3. Include plans, elevations, sections, and mounting and attachment details. All plans, elevations, sections and details are to be scaled drawings that provide accurate graphic representation of assembly.
 - 4. Detail fabrication and assembly of poles and pole accessories.

5. Foundation construction details, including material descriptions, dimensions, anchor bolts, support devices, and calculations, signed and sealed by a professional engineer licensed in the state of installation.
6. Anchor bolt templates keyed to specific poles and certified by manufacturer.
7. Method and procedure of pole installation. Include manufacturer's written installations.

1.3 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.
- B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.
- D. Comply with IEEE C2, "National Electrical Safety Code."
- E. Comply with CEC.
- F. All fixtures and controls shall be Title 24 compliant.

1.4 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide product indicated on Drawings or Equal.

1.5 GENERAL REQUIREMENT FOR LUMINAIRES

- A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.
 1. LER Tests Incandescent Fixtures: Where LER is specified, test according to NEMA LE 5A.
 2. LER Tests Fluorescent Fixtures: Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.
 3. LER Tests HID Fixtures: Where LER is specified, test according to NEMA LE 5B.
- B. Lateral Light Distribution Patterns: Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.

- C. Metal Parts: Free of burrs and sharp corners and edges.
- D. Sheet Metal Components: Corrosion-resistant aluminum unless otherwise indicated. Form and support to prevent warping and sagging.
- E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.
- F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.
- G. Exposed Hardware Material: Stainless steel.
- H. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
- I. Light Shields: Metal baffles, factory installed and field adjustable, arranged to block light distribution to indicated portion of normally illuminated area or field.
- J. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:
 - 1. White Surfaces: 85 percent.
 - 2. Specular Surfaces: 83 percent.
 - 3. Diffusing Specular Surfaces: 75 percent.
- K. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.
- L. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.
- M. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."

2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
 - a. Color: As selected from manufacturer's standard catalog of colors.
 - b. Color: Match Architect's sample of manufacturer's standard color.
 - c. Color: As selected by Architect from manufacturer's full range.

- N. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
 2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20; and seal aluminum surfaces with clear, hard-coat wax.
 3. Class I, Clear Anodic Finish: AA-M32C22A41 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

1.6 SOLID STATE LIGHTING / LIGHT EMITTING DIODE (LED) LAMPS AND LUMINAIRES

A. General:

1. Luminaire manufacturer shall have a minimum of five years' experience in the manufacture and design of LED products and systems and no less than 100 North American installations.
2. Unless otherwise specified, all LED luminaires and power/data supplies shall be provided by a single manufacturer to ensure compatibility.
3. All components, peripheral devices and control software are to be provided by and shall be the responsibility of a single entity. All components shall perform successfully as a complete system.
4. Provide submittals as described in Part 1.4 and Part 1.5 above.
5. Include all components necessary for a complete installation. Provide all power supplies, synchronizers, data cables, and data terminators for a complete working system.
6. All LED sources used in the LED luminaire shall be of proven quality from established and reputable LED manufacturers and shall have been fabricated after 2007.

B. Replacement and Spares:

1. Manufacturer shall submit written guarantee of the following:
 - a. Manufacturer will keep an inventory of replacement parts (source assembly, power and control components).
2. All parts of system shall be replaceable in field. Manufacturer shall submit written guarantee of the following:

- a. Manufacturer has in place a written recycling and re-use program, and will accept returned product and/or components for recycling or reuse.
 - b. Manufacturer will properly dispose of non-recyclable components that are deemed harmful to the environment.
 3. System shall carry a full warranty for one year.
- C. Products and Components – Performance
1. LED luminaires and components shall be UL listed or UL classified
 2. LED luminaires and components shall be CE certified.
 3. LED luminaires and components shall be PSE marked.
 4. All LED luminaires shall be subjected to the following JEDEC Reliability Tests for Lead-free Semiconductors: HTOL, RTOL, LTOL, PTMCL, TMSK, Mechanical Shock, Variable Vibration Frequency, SHR, and Autoclave.
 5. To ensure luminaire quality, luminaire shall have been tested under accelerated life test conditions including an operating temperature span of 360 degrees F, and cyclic loading up to 60G.
 6. All products included in system shall use Mil-Std 810F, Random Vibration 7.698g as a minimum standard. In installations subject to vibration, luminaire shall be installed with vibration isolation hardware to sufficiently dampen vibrations.
 7. All LED components shall be mercury and lead-free.
 8. All manufacturing processes and materials shall conform to the requirements of the European Union's Restriction on the Use of Hazardous Substances in Electrical and Electronics Equipment (RoHS) Directive 2002/95/EC.
 9. LEDs shall comply with ANSI/NEMA/ANSI C78.377-2008 - Specifications for the Chromaticity of Solid State Lighting Products. Color shall remain stable throughout the life of the lamp. Color shall match approved sample.
 10. LEDs shall comply with IESNA LM-80 – Standards for Lumen Maintenance of LED Lighting Products.
 11. White LEDs shall have a rated source life of 50,000 hours under normal operating conditions. RGB LEDs shall have a rated source life of 100,000 hours. LED “rated source life” is defined as the time when a minimum of 70% of initial lumen output remains.
 12. Luminaire assembly shall include a method of dissipating heat so as to not degrade life of source, electronic equipment, or lenses. LED luminaire housing shall be designed to transfer heat from the LED board to the outside environment. Luminaire housings shall have no negative impact on life of components.
 13. Manufacturer shall supply in writing a range of permissible operating temperatures in which system will perform optimally.
 14. LEDs shall be adequately protected from moisture or dust in interior applications.
 15. For wet and damp use, LED-based luminaires itself shall be sealed, rated and tested for appropriate environmental conditions, not accomplished by using an additional housing

or enclosure. Such protection shall have no negative impact on rated life of source or components, or if so, such reductions shall be explicitly brought to the attention of the Owner's Representative.

16. All hardwired connections to LED luminaires shall be reverse polarity protected and provide high voltage protection in the event connections are reversed or shorted during the installation process.
17. The LED luminaire shall be operated at constant and carefully regulated current levels. LEDs shall not be overdriven beyond their specified nominal voltage and current.
18. RGB LED luminaires shall utilize an equal combination of high brightness red, blue and green LEDs, unless otherwise noted, to provide up to 16.7 million additive RGB colors and shall be capable of at least 8-bit control.
19. Manufacturer shall be able to provide supporting documentation of the product meeting third party regulatory compliance.
20. Manufacturer shall ensure that products undergo and successfully meet appropriate design and manufacturability testing including Design FMEA, Process FMEA, Environmental Engineering Considerations and Laboratory Tests, IEC standards and UL/CE testing.
21. All LED luminaires (100% of each lot) shall undergo a minimum 24 hour burn-in during manufacturing, prior to shipping.
22. Manufacturer shall provide Luminaire Efficacy (lm/W), total luminous flux (lumens), luminous intensity (candelas) chromaticity coordinates, CCT and CRI optical performance, polar diagrams, and relevant luminance and illuminance photometric data. Submit data in IES file format in accordance with IES LM-79-2008, based on test results from an independent Nationally Recognized Testing Laboratory.
23. Power / data supply shall have the following:
 - a. Supply outputs shall have current limiting protection.
 - b. Supply shall provide miswiring protection.
 - c. Supply shall have power factor correction.
 - d. Supply shall provide connections that are conduit-ready or clamp-style connections in the case of low-voltage wiring.
 - e. Supply shall come with a housing that meets a minimum IP20 rating for dry location installation unless located in a damp or wet location.
 - f. Supply shall be UL listed for Class 1 or Class 2 wiring
24. Contractor shall make due allowance for voltage drop limitations in the selection of wire gauge on secondary (low voltage) side of power supplies.
25. All LED sources shall utilize Class 2 drivers. The Class 2 driver is to be marked Class 2 and have been tested to ANSI/UL1310; or marked LPS (Limited Power Source) and have been tested to ANSI/UL60950.

D. LED Control and Communication – Performance

- E. LED luminaires shall be able to be switched with fluorescent luminaires on the same circuit.

1.7 STEEL POLES

- A. Source Limitations: For poles, obtain each color, grade, finish, type, and variety of pole from single source with resources to provide products of consistent quality in appearance and physical properties.
- B. Poles: Comply with ASTM A 500/A 500M, Grade B carbon steel with a minimum yield of 46,000 psig (317 MPa); one-piece construction up to 40 feet (12 m) in height with access handhole in pole wall.
 - 1. Mounting Provisions: Butt flange for bolted mounting on foundation or breakaway support.
- C. Poles: Comply with ASTM A 240/A 240M ASTM A 666 stainless steel with a minimum yield of 55,000 psig (379 MPa); one-piece construction up to 40 feet (12 m) in height with access handhole in pole wall.
 - 1. Mounting Provisions: Butt flange for bolted mounting on foundation or breakaway support.
- D. Steel Mast Arms: Single-arm, Truss, type, continuously welded to pole attachment plate. Material and finish same as plate.
- E. Brackets for Luminaires: Detachable, cantilever, without underbrace.
 - 1. Adaptor fitting welded to pole, allowing the bracket to be bolted to the pole-mounted adapter, then bolted together with stainless-steel bolts.
 - 2. Cross Section: Tapered oval, with straight tubular end section to accommodate luminaire. Match pole material and finish.
- F. Pole-Top Tenons: Fabricated to support luminaire or luminaires and brackets indicated, and securely fastened to pole top.
- G. Fasteners: Stainless steel size and type as determined by manufacturer. Corrosion-resistant items compatible with support components.
 - 1. Materials: Compatible with poles and standards as well as the substrates to which poles and standards are fastened and shall not cause galvanic action at contact points.
 - 2. Anchor Bolts, Leveling Nuts, Bolt Caps, and Washers: Hot-dip galvanized after fabrication unless otherwise indicated.
- H. Grounding and Bonding Lugs: Welded 1/2-inch threaded lug, complying with requirements in Section 26 0526 "Grounding and Bonding for Electrical Systems," listed for attaching grounding and bonding conductors of type and size indicated, and accessible through handhole.

- I. Handhole: Oval shaped, with minimum clear opening of 2-1/2 by 5 inches , with cover secured by stainless-steel captive screws.
 - J. Platform for Lamp and Ballast Servicing: Factory fabricated of steel, with finish matching that of pole.
 - K. Prime-Coat Finish: Manufacturer's standard prime-coat finish ready for field painting.
 - L. Galvanized Finish: After fabrication, hot-dip galvanize according to ASTM A 123/A 123M.
 - M. Factory-Painted Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying and designating finishes.
 - 1. Surface Preparation: Clean surfaces according to SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, according to SSPC-SP 5/NACE No. 1 or SSPC-SP 8.
 - 2. Interior Surfaces of Pole: One coat of bituminous paint, or otherwise treat for equal corrosion protection.
 - 3. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high gloss, high-build polyurethane enamel.
 - a. Color: As selected by Architect from manufacturer's full range.
 - N. Powder-Coat Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying and designating finishes.
 - 1. Surface Preparation: Clean surfaces according to SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair powder coat bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, according to SSPC-SP 5/NACE No. 1 or SSPC-SP 8.
 - 2. Powder Coat: Comply with AAMA 2604.
 - a. Electrostatic-applied powder coating; single application and cured to a minimum 2.5- to 3.5-mils dry film thickness. Coat interior and exterior of pole for equal corrosion protection.
 - b. Color: As selected by Architect from manufacturer's full range.
- 1.8 ALUMINUM POLES
- A. Poles: Seamless, extruded structural tube complying with ASTM B 221, Alloy 6063-T6, with access handhole in pole wall.
 - B. Poles: Seamless, extruded structural tube complying with ASTM B 221, Alloy 6061-T6, with access handhole in in pole wall.
 - 1. Shape: [Round, tapered] [Round, straight].

2. Mounting Provisions: Butt flange for bolted mounting on foundation or breakaway support.
- C. Mast Arms: [Aluminum] [Steel] [Single-arm] [Truss] type, continuously welded to pole attachment plate. Material and finish same as plate.
- D. Brackets for Luminaires: Detachable, cantilever, without underbrace.
1. Adaptor fitting welded to pole, allowing the bracket to be bolted to the pole-mounted adapter, then bolted together with stainless-steel bolts.
 2. Cross Section: Tapered oval, with straight tubular end section to accommodate luminaire. Match pole material and finish.
- E. Pole-Top Tenons: Fabricated to support luminaire or luminaires and brackets indicated, and securely fastened to pole top.
- F. Grounding and Bonding Lugs: Bolted 1/2-inch threaded lug, complying with requirements in Section 26 0526 "Grounding and Bonding for Electrical Systems," listed for attaching grounding and bonding conductors of type and size listed in that Section, and accessible through handhole.
- G. Fasteners: Stainless steel, size and type as determined by manufacturer. Corrosion-resistant items compatible with support components.
1. Materials: Compatible with poles and standards as well as to substrates to which poles and standards are fastened and shall not cause galvanic action at contact points.
 2. Anchor Bolts, Leveling Nuts, Bolt Caps, and Washers: Hot-dip galvanized after fabrication unless otherwise indicated.
- H. Handhole: Oval shaped, with minimum clear opening of 2-1/2 by 5 inches , with cover secured by stainless-steel captive screws.
- I. Prime-Coat Finish: Manufacturer's standard prime-coat finish ready for field painting.
- J. Aluminum Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying and designating finishes.
1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
 2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20 requirements; and seal aluminum surfaces with clear, hard-coat wax.
 3. Class I, Clear-Anodic Finish: AA-M32C22A41 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I clear coating of 0.018 mm or thicker), complying with AAMA 611.
 4. Class I, Color-Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: Medium; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I integrally

colored or electrolytically deposited color coating 0.018 mm or thicker), complying with AAMA 611.

- K. Factory-Painted Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying and designating finishes.
 - 1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, according to SSPC-SP 5/NACE No. 1 or SSPC-SP 8.
 - 2. Interior Surfaces of Pole: One coat of bituminous paint, or otherwise treat for equal corrosion protection.
 - 3. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
 - a. Color: As selected by Architect from manufacturer's full range.
- L. Powder-Coat Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying and designating finishes.
 - 1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair powder coat bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, according to SSPC-SP 5/NACE No. 1 or SSPC-SP 8.
 - 2. Powder coat shall comply with AAMA 2604.
 - a. Electrostatic applied powder coating; single application with a minimum 2.5- to 3.5- mils dry film thickness; cured according to manufacturer's instructions. Coat interior and exterior of pole for equal corrosion protection.
 - b. Color: As selected by Architect from manufacturer's full range.

1.9 LUMINAIRE INSTALLATION

- A. Install lamps in each luminaire.
- B. Fasten luminaire to indicated structural supports.
 - 1. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.
- C. Adjust luminaires that require field adjustment or aiming. Include adjustment of photoelectric device to prevent false operation of relay by artificial light sources, favoring a north orientation.

1.10 BOLLARD LUMINAIRE INSTALLATION

- A. Align units for optimum directional alignment of light distribution.

- B. Install on concrete base with top 4 inches above finished grade or surface at bollard location. Cast conduit into base, and shape base to match shape of bollard base. Finish by troweling and rubbing smooth. Concrete materials, installation, and finishing are specified in Section 03 3000 "Cast-in-Place Concrete."

1.11 POLE INSTALLATION

- A. Alignment: Align poles as indicated.
- B. Clearances: Maintain the following minimum horizontal distances of poles from surface and underground features unless otherwise indicated on drawing.
 - 1. Fire Hydrants and Water Piping: 60 inches
 - 2. Water, Gas, Electric, Communications, and Sewer Lines: 10 feet
Trees: 15 feet from tree trunk.
- C. Concrete Pole Foundations: Set anchor bolts according to anchor-bolt templates furnished by pole manufacturer. Concrete materials, installation, and finishing requirements are specified in Section 03 3000 "Cast-in-Place Concrete." Contractor is responsible for a Structural Engineer designed pole concrete foundation.
- D. Foundation-Mounted Poles: Mount pole with leveling nuts and tighten top nuts to torque level according to pole manufacturer's written instructions.
 - 1. Use anchor bolts and nuts selected to resist seismic forces defined for the application and approved by manufacturer.
 - 2. Grout void between pole base and foundation. Use nonshrink or expanding concrete grout firmly packed to fill space.
 - 3. Install base covers unless otherwise indicated.
 - 4. Use a short piece of 1/2 -inch diameter pipe to make a drain hole through grout. Arrange to drain condensation from interior of pole.
 - 5. Contractor is responsible for a Structural Engineer designed pole concrete foundation.
- E. Poles and Pole Foundations Set in Concrete-Paved Areas: Install poles with a minimum 6-inch- wide, unpaved gap between the pole or pole foundation and the edge of the adjacent concrete slab. Fill unpaved ring with pea gravel. Insert material to a level 1 inch below top of concrete slab.
- F. Raise and set pole using web fabric slings (not chain or cable) at locations indicated by manufacturer.

1.12 INSTALLATION OF INDIVIDUAL GROUND-MOUNTING LUMINARIES

- A. Install on concrete base with top 4 inches above finished grade or surface at luminaire location. Cast conduit into base, and finish by troweling and rubbing smooth. Concrete materials, installation, and finishing are specified in Section 03 3000 "Cast-in-Place Concrete."

1.13 GROUNDING

- A. Ground metal support structures according to Section 26 0526 "Grounding and Bonding for Electrical Systems."
 - 1. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.
- B. Ground nonmetallic poles and support structures according to Section 26 0526 "Grounding and Bonding for Electrical Systems."
 - 1. Install grounding conductor and conductor protector.

1.14 FIELD-QUALITY CONTROL

- A. Inspect each installed fixture for damage. Replace damaged fixtures and components.
- B. Illumination Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.
 - 1. Verify operation of photoelectric controls.
- C. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

1.15 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain luminaire lowering devices.

END SECTION 265600

ATTACHMENT 1

Geotechnical Evaluation Fire Camp 13 BOQ Building Replacement Project

Pages 1-42

Geotechnical Evaluation
Fire Camp 13 BOQ Building Replacement Project
County of Los Angeles
Department of Public Works
County of Los Angeles, California

Huitt-Zollars, Inc.

555 West Fifth Street, Suite 2950 | Los Angeles, California 90013

October 31, 2022 | Project No. 212082001



Geotechnical | Environmental | Construction Inspection & Testing | Forensic Engineering & Expert Witness

Geophysics | Engineering Geology | Laboratory Testing | Industrial Hygiene | Occupational Safety | Air Quality | GIS

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

Geotechnical Evaluation
Fire Camp 13 BOQ Building Replacement
Project
County of Los Angeles
Department of Public Works
Los Angeles County, California

Mr. Steve White

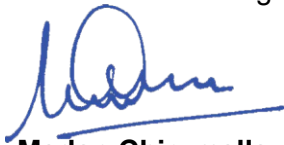
Huitt-Zollars, Inc.

555 West Fifth Street, Suite 2950 | Los Angeles, California 90013

October 31, 2022 | Project No. 212082001

A handwritten signature in blue ink, appearing to read "A. E. Scharf".

Aura E. Scharf, GIT
Senior Staff Geologist

A handwritten signature in blue ink, appearing to read "Madan Chirumalla".

Madan Chirumalla, PE, GE
Principal Engineer

AES/RDH/MAC/mlc

A handwritten signature in blue ink, appearing to read "Ronald D. Hallum".

Ronald Hallum, PG, CEG
Principal Geologist



CONTENTS

1	INTRODUCTION	1
2	SCOPE OF SERVICES	1
3	SITE DESCRIPTION AND PROPOSED CONSTRUCTION	1
4	SUBSURFACE EVALUATION AND LABORATORY TESTING	2
5	GEOLOGY AND SUBSURFACE CONDITIONS	3
5.1	Regional Geology	3
5.2	Site Geology	3
5.3	Groundwater	3
6	FAULTING AND SEISMICITY	4
6.1	Surface Fault Rupture	4
6.2	Ground Motion	4
6.3	Liquefaction Potential	5
6.4	Seismically Induced Landslides	5
7	CONCLUSIONS	5
8	RECOMMENDATIONS	6
8.1	Earthwork	7
8.1.1	Pre-Construction Conference	7
8.1.2	Clearing and Site Preparation	7
8.1.3	Remedial Grading and Subgrade Preparation	7
8.1.4	Excavation Characteristics	8
8.1.5	Temporary Excavations	8
8.1.6	Shoring	8
8.1.7	Fill Material	9
8.1.8	Fill Placement and Compaction	10
8.2	Underground Utilities	10
8.2.1	Pipe Bedding	10
8.2.2	Modulus of Soil Reaction	11
8.3	Seismic Design Considerations	11
8.4	Foundations	11
8.4.1	Spread Footings	11

8.4.2	BOQ Building Slabs-On-Grade	12
8.4.3	Drilled Pier Foundations	13
8.4.4	Retaining Walls	14
8.5	Corrosivity	14
8.6	Concrete Placement	14
8.7	Drainage	15
9	CONSTRUCTION OBSERVATION	15
10	LIMITATIONS	16
11	REFERENCES	18

TABLE

1 – 2019 California Building Code Seismic Design Criteria	11
---	----

FIGURES

1 – Site Location
2 – Site Aerial and Test Pit Locations
3 – Regional Geology
4 – Fault Locations
5 – Seismic Hazards Zones
6 – Lateral Earth Pressures for Temporary Cantilevered Shoring
7 – Lateral Earth Pressures for Braced Excavation (Granular Soil)

APPENDICES

A – Test Pit Logs
B – Laboratory Testing

1 INTRODUCTION

In accordance with your request and authorization, we have performed a geotechnical evaluation for the Fire Camp 13 BOQ Building Replacement Project located at 1250 Encinal Canyon Road in the Santa Monica Mountains of Los Angeles County, California (Figure 1). The purpose of the project is to replace the BOQ building that was damaged or destroyed during the Woolsey Fire in 2018. The purpose of our study was to evaluate the soil and geologic conditions at the site and provide geotechnical recommendations for the design and construction of the proposed new BOQ Building. This report presents the findings from our background review and subsurface exploration, results of our laboratory testing, conclusions regarding the subsurface conditions at the site, and geotechnical recommendations for design and construction of this project.

2 SCOPE OF SERVICES

Our scope of services included the following:

- Project coordination, planning, attending project meetings, and scheduling of the subsurface exploration.
- Review of readily available background materials, including published geologic and seismic hazards maps, previous reports, published literature, in-house information, stereoscopic aerial photographs, and plans provided by the client.
- A site reconnaissance to observe and document existing site conditions and to mark test pit locations for utility clearance by Underground Service Alert.
- Subsurface exploration consisting of excavating, logging, and sampling of three test pits to depths of up to approximately 4½ feet. The test pits were logged in the field by our representative and bulk samples were collected and returned to our laboratory for evaluation and testing. The test pits were backfilled with on-site soils.
- Laboratory testing on selected soil samples including evaluation of in-situ moisture content, gradation, percent of soil particles finer than the No. 200 sieve, and soil corrosivity.
- Data compilation and engineering analysis of the information from our background review, subsurface exploration, and laboratory testing.
- Preparation of this report presenting our findings, conclusions, and recommendations pertaining to the geotechnical aspects of the design and construction of the proposed improvements.

3 SITE DESCRIPTION AND PROPOSED CONSTRUCTION

Fire Camp 13 is located in a mountainous area in the Santa Monica Mountains in Los Angeles County, north of the city of Malibu, California. Fire Camp 13 is bordered by Encinal Canyon Road on the north and west and by Rattle Snake Road on the south and east. The proposed BOQ

Building is located on the central, northwest portion of Fire Camp 13, adjacent to Encinal Canyon Road. The project site is situated on sloping terrain with elevations ranging from approximately 1320 to 1330 feet above mean sea level from southwest to northeast (United States Geological Survey [USGS], 2021 and 2022). The current site consists of a relatively flat concrete slab-on-grade foundation with an area of approximately 1,200 square feet that is surrounded by concrete hardscape. An approximately 3- to 5-foot tall retaining wall is located on the northwest and northeast side of the slab-on-grade. A partially buried pump house is located on the northwest side of the slab-on-grade. From the southeastern edge of the level foundation area, an approximately 2:1 (horizontal to vertical) slope descends to retaining walls located adjacent to the side and rear yards of the single-story structures (Figure 2). The slopes are vegetated with brush and trees. The existing retaining walls will remain in-place. Existing in-place utilities at site are sewer, gas, and water.

We understand that the BOQ Building that was destroyed in Woolsey fire was a modular unit with a concrete slab-on-grade foundation and had an area of approximately 950 square feet. A new officer's sleeping quarters building will be constructed at this location and will consist of four bedrooms, two bathrooms with showers, day room, and kitchenette (Advance Design, 2022). The new building will be a one-story structure and is anticipated to be supported on shallow spread footing and/or slab-on-grade. Additional improvement includes small light poles and site utilities.

4 SUBSURFACE EVALUATION AND LABORATORY TESTING

Our subsurface exploration at the site was conducted on September 27, 2022, and consisted of the excavating, logging, and sampling of three test pits (TP-1, TP2, and TP-3). Test pits TP-1, TP2, and TP-3 were excavated to refusal depths of approximately 2.7, 4.0, and 4.5 feet, respectively, using a rubber tire backhoe. The test pits were logged in the field by a representative of Ninyo & Moore. Representative bulk soil samples were collected from the borings at selected depths for laboratory testing and transported to our laboratory. The approximate locations of the borings are presented on Figure 2. Logs of the test pits are presented in Appendix A.

Laboratory testing was performed on representative soil samples collected from the test pits. The laboratory testing included evaluation of in-situ moisture content, gradation, percent of soil particles finer than the No. 200 sieve, and soil corrosivity. The results of the in-situ moisture content tests are presented on the test pit logs in Appendix A. The other laboratory testing results are presented in Appendix B.

5 GEOLOGY AND SUBSURFACE CONDITIONS

5.1 Regional Geology

The project is located in the Santa Monica Mountains within the Transverse Ranges Geomorphic Province, which is characterized by east to west oriented blocks and intervening valleys that are generally bounded by east to west trending faults (Norris and Webb, 1990). Regional geologic maps indicate that the mountainous terrain in the site vicinity is underlain by a mixture of extrusive and intrusive volcanic rocks collectively known as the Conejo Volcanics (Dibblee, 1990 and 1993). These volcanic rocks consist of a variety of types, including extrusive basaltic and andesitic flows and breccias, and intrusive dacite and andesite. Regional geologic mapping by Dibblee (1990 and 1993) indicates the site is generally underlain by basaltic rocks that are massive to vaguely layered (Figure 3). Based on regional geologic mapping, landslides have not been mapped within the site and evidence of landslides was not observed during our site reconnaissance.

5.2 Site Geology

Materials encountered during our subsurface exploration consisted of fill, colluvium, and volcanic bedrock. Surficial fill was encountered at the ground surface of the test pits to depths ranging from approximately 0.5 to 2.0 feet. The fill material generally consisted of dry to moist, loose to medium dense, silty sand, silty sand with gravel, clayey sand with gravel, and silty gravel. Debris consisting of pieces of tile and concrete were encountered. Colluvium was encountered below the fill in test pit TP-2 to a depth of approximately 2 feet and generally consisted of dry to moist, loose, silty sand with gravel. Volcanic bedrock was encountered below the fill in test pits TP-1 and TP-3, and below the colluvium in test pit TP-2. The volcanic bedrock generally consisted of moist, soft to moderately hard basalt in various stages of weathering. Increasingly difficult excavation conditions in the bedrock were encountered at total depths explored. Our test pits encountered refusal in bedrock.

5.3 Groundwater

Groundwater was not encountered in our test pits at the time of excavation to the depths explored. Groundwater monitoring well data from the State of California Water Resources Control Board's GeoTracker website (2022) indicates that the depth to groundwater at a monitoring well located approximately 300 feet southeast of the site ranged from approximately 5.4 to 16.5 feet below the ground surface. The monitoring well is located at approximately 30 feet lower elevation than the site. Fluctuations in groundwater levels will occur due to variations in precipitation, ground surface topography, subsurface stratification, irrigation, groundwater pumping, and other factors that may not have been evident at the time of our field evaluation.

6 FAULTING AND SEISMICITY

The site is located in a seismically active area, as is the majority of southern California, and the potential for strong ground motion in the project area is considered significant during the design life of the proposed improvements. The approximate locations of major faults in the region and their geographic relationship to the project sites are shown on Figure 4. Based on our review of seismic hazard maps, geologic literature, and geologic maps, the site is not located within a State of California Earthquake Fault Zone (formerly known as Alquist-Priolo Special Studies Zone), and no active faults are known to cross the subject site (Hart and Bryant, 2018). The active Malibu Coast Fault is located approximately 3 miles south of the site (USGS, 2008). The principal seismic hazards evaluated at the subject site are surface fault rupture, ground motion, liquefaction, and seismically induced landslides. A brief description of these hazards and the potential for their occurrences on site are discussed in the following sections.

6.1 Surface Fault Rupture

Based on our review of the referenced literature and our site reconnaissance, no active faults are known to cross the project site. Therefore, the probability of damage from surface fault rupture is considered to be low. However, lurching or cracking of the ground surface as a result of nearby seismic events is possible.

6.2 Ground Motion

Considering the proximity of the site to active faults capable of producing a maximum moment magnitude of 6.0 or more, the project area has a high potential for experiencing strong ground motion. The 2019 California Building Code (CBC) specifies that the risk-targeted maximum considered earthquake (MCE_R) ground motion response accelerations be used to evaluate seismic loads for design of buildings and other structures. The MCE_R ground motion response accelerations are based on the spectral response accelerations for 5 percent damping in the direction of maximum horizontal response and incorporate a target risk for structural collapse equivalent to 1 percent in 50 years with deterministic limits for near-source effects. The horizontal peak ground acceleration that corresponds to the MCE_R for the project area was calculated as 0.72g using the 2022 Applied Technology Council [ATC] seismic design tool (web-based). The mapped maximum considered earthquake geometric mean (MCE_G) peak ground acceleration (PGA_M) with adjustment for site class based on the geometric mean PGA with a 2 percent probability of exceedance in 50 years was calculated as 0.77g. Spectral response acceleration parameters, consistent with the 2019 CBC, are also provided in Section 8.3 for the evaluation of seismic load on the proposed BOQ Building. The site is considered to be Site Class C.

6.3 Liquefaction Potential

Liquefaction is the phenomenon in which loosely deposited granular soils and non-plastic silts located below the water table undergo rapid loss of shear strength when subjected to strong earthquake-induced ground shaking. Ground shaking of sufficient duration results in the loss of grain-to-grain contact due to a rapid rise in pore water pressure, and causes the soil to behave as a fluid for a short period of time. Liquefaction is known generally to occur in saturated or near-saturated cohesionless soils at depths shallower than 50 feet below the ground surface. Liquefaction is also known to occur in relatively fine-grained soils (i.e., sandy silt and clayey silt) with a plasticity index (PI) of less than 12 and an in-place moisture content more than 85 percent of the liquid limit and sensitive silts and clays with a PI more than 18. Factors known to influence liquefaction potential include composition and thickness of soil layers, grain size, relative density, groundwater level, degree of saturation, and both intensity and duration of ground shaking.

The State of California Seismic Hazard Zones Map (Figure 5) indicates the site is not located within a mapped area subject to seismically induced liquefaction hazards (CDMG, 2002a and 2002b). Based on the results of our subsurface evaluation and the relatively shallow depths to bedrock, it is our opinion that liquefaction is not a design consideration for this project.

6.4 Seismically Induced Landslides

Landslides may be induced by strong vibratory motion produced by earthquakes. Research and historical data indicate that seismically induced landslides tend to occur in weak soil and rock on steep terrain. The process for zoning earthquake-induced landslides incorporates expected future earthquake shaking, existing landslide features, slope gradient, and strength of earth materials on the slope. The State of California (CDMG, 2002a and 2002b) indicates that the site is not located within a Seismic Hazard Zone for earthquake-induced landsliding; however, the steep hillsides located along the canyon northwest of the project site are zoned as being susceptible to earthquake-induced landsliding (Figure 5). According to Dibblee (1990 and 1993), landslides have not been mapped within the site and evidence of landslides was not observed during our site reconnaissance. The bedrock materials that comprise the surrounding hillside terrain are composed of relatively hard, volcanic rock of the Conejo Volcanics and are massive to vaguely layered (Dibblee, 1990 and 1993).

7 CONCLUSIONS

Based on the results of our evaluation, it is our opinion that replacement of the BOQ Building is feasible from a geotechnical perspective, provided that the recommendations presented in this

report are incorporated into the design and construction of the project. In general, the following findings and conclusions were made:

- Based on our test pits, the site is underlain by fill soils, colluvium, and volcanic bedrock. In general, the fill and colluvium consisted of dry to moist, loose to medium dense, silty sand, silty sand with gravel, clayey sand with gravel, and silty gravel. Debris consisting of pieces of tile and concrete were encountered in the fill. The volcanic bedrock generally consisted moist, soft to moderately hard basalt in various stages of weathering.
- Excavations in the fill and colluvial materials should be feasible with heavy duty earthmoving equipment in good working condition. Caving of loose materials should be anticipated. Excavations in the volcanic bedrock will vary in difficulty depending on the weathering state of the rock. Our test pits encountered refusal in bedrock. Difficult excavating to non-rippable conditions are anticipated and should be considered by the design team and contractor.
- We anticipate that excavated soils should be generally suitable for use as compacted fill provided they meet the Fill Material section criteria in this report. Excavations in the volcanic bedrock on site are anticipated to generate oversize rock fragments. Special handling and disposal of oversize materials should be anticipated by the contractor.
- Groundwater was not encountered during our subsurface exploration to the depth explored of up to approximately 4.5 feet. Groundwater is not anticipated to be a design consideration for the project. Fluctuations in groundwater levels may occur due to variations in precipitation, ground surface topography, subsurface stratification, irrigation, groundwater pumping, and other factors which may not have been evident at the time of our field evaluation.
- The site is not located within a State of California Earthquake Fault Zone (formerly known as an Alquist-Priolo Special Studies Zone). Based on our review of published geologic maps, there are no known active faults underlying the site. Therefore, the potential for surface fault rupture at the site is considered to be low.
- Based on our site reconnaissance, subsurface exploration, and review of published geologic maps and aerial photographs, there are no known landslides at the project site; however, CDMG (2002a and 2002b) has mapped the southwest facing steep hillside to the north of the project as susceptible to earthquake-induced landsliding.
- Our limited laboratory corrosivity testing indicates that the on-site materials may be classified as non-corrosive based on the California Department of Transportation (Caltrans, 2021) corrosion guidelines.

8 RECOMMENDATIONS

The recommendations presented in the following sections provide geotechnical criteria regarding the design and construction of the proposed site improvements. The recommendations are based on the results of our subsurface evaluation, geotechnical analysis, and our project understanding. The proposed work should be performed in conformance with the recommendations presented in this report, project specifications, and appropriate agency standards.

8.1 Earthwork

Based on our understanding of the project, earthwork at the site is anticipated to consist of site clearing, relatively shallow remedial grading to prepare the ground surface for the BOQ Building. Earthwork operations at the site should be performed in accordance with the recommendations provided in the following sections of this report and applicable governing agencies.

8.1.1 Pre-Construction Conference

We recommend that a pre-construction conference be held. The owner and/or their representative, the governing agencies' representatives, the civil engineer, the geotechnical engineer, and the contractor should attend to discuss the work plan, project schedule, and earthwork requirements.

8.1.2 Clearing and Site Preparation

Prior to performing excavations, the site should be cleared of vegetation, debris, surface obstructions, and other deleterious materials. Obstructions that extend below finish grade, if any, should be removed and the resulting holes filled with compacted soils. Materials generated from the clearing operations should be removed from the project site and disposed of at a legal dumpsite.

8.1.3 Remedial Grading and Subgrade Preparation

In order to provide suitable support for the BOQ Building, we recommend that the foundations be supported on competent volcanic bedrock or compacted fill. Existing undocumented fill and loose colluvium should be over-excavated to bedrock and replaced with compacted structural fill. The overexcavation bottom should expose relatively dense and competent volcanic bedrock material. The excavation bottom should be evaluated by the project geotechnical consultant during the excavation work. The limits of the excavations should extend laterally so that the bottoms of the excavations are approximately 3 feet beyond the outside edges of the foundation footprints, or a distance corresponding to the depth of the overexcavations, whichever is farther. Unless otherwise recommended by the geotechnical engineer, the exposed subgrade should be scarified to a depth of approximately 8 inches, moisture-conditioned, and compacted prior to the placement of fill. On-site and imported soils placed to backfill the excavation should be comprised of low expansion potential, granular soil compacted to 90 percent relative compaction as evaluated by ASTM International (ASTM) D 1557.

8.1.4 Excavation Characteristics

We anticipate that excavations in the fill and colluvium can be accomplished with heavy duty earthmoving equipment in good working condition. We anticipate that the fill and colluvium will generally consist of silty sand, clayey sand, and silty gravel. Concrete and debris should be anticipated in the fill material. The bedrock materials will generally consist of variably weathered basalt. Our test pits encountered refusal in bedrock. Moderate to heavy ripping should be anticipated while excavating the bedrock. Relatively hard zones within the bedrock, should be anticipated. During excavations, the contractor should anticipate encountering oversized materials. The contractor should be prepared to take appropriate measures to address the presence of oversized materials and hard materials. Difficult excavating should be anticipated within the less weathered bedrock, which may involve special excavating equipment, such as rippers, pneumatic chippers, and jackhammers. Excavating difficulty will also depend on the degree of fracturing/jointing in the rock. The contractor should make their own independent evaluation of the excavatability of the on-site materials prior to submitting their bids.

8.1.5 Temporary Excavations

We recommend that excavations be designed and constructed in accordance with the OSHA regulations. These regulations provide shoring design parameters for excavations and trenches up to 20 feet deep based on the soil types encountered. For planning purposes, we recommend that the undocumented fill materials and colluvium be considered as OSHA soil Type C. Volcanic bedrock materials should be considered as OSHA soil Type B for planning purposes. OSHA requirements regarding personnel safety should be met by using appropriate shoring or by laying back the slopes. The contractor's competent person should make their own evaluation of the soil types encountered during construction.

It is our opinion that temporary slopes in the on-site fill and colluvium should be stable at inclinations of approximately 1.5:1 (horizontal to vertical) or flatter, and temporary slopes in the volcanic bedrock should be stable at inclinations of approximately 1:1 (horizontal to vertical) or flatter. Some surficial sloughing may occur, especially if seepage zones are encountered. Temporary slopes should be evaluated in the field in accordance with OSHA criteria. Where temporary excavations cannot be sloped as indicated above, temporary shoring may be appropriate for the excavations.

8.1.6 Shoring

We anticipate that construction of the project improvements may involve shored vertical excavations. Shoring systems should be designed using the lateral earth pressure values

presented on Figure 6 and 7. The recommended design pressures are based on the assumptions that the shoring system is constructed without raising the ground surface elevation behind the shoring system, that there are no surcharge loads, such as soil stockpiles and construction materials, and that no loads act above a 1:1 (horizontal to vertical) plane extending up and back from the base of the shoring system. For shoring systems subjected to the above-mentioned surcharge loads, the contractor should include the effect of these loads on the lateral pressures against the shoring system.

We anticipate that settlement of the ground surface will occur behind the shoring wall during excavation. The amount of settlement depends heavily on the type of shoring system, the contractor's workmanship, and the soil conditions. To reduce the potential for distress to adjacent structures, we recommend that the shoring system be designed to limit the ground settlement behind the shoring system to ½ inch or less.

The contractor should retain the services of a qualified and experienced engineer licensed in the State of California to provide the design and stamped drawings for the contractor's proposed shoring system. The shoring parameters presented in this report are preliminary in nature. The contractor should evaluate the adequacy of these parameters and make the appropriate modifications for their design. We recommend that the contractor take appropriate measures to protect workers. OSHA requirements pertaining to worker safety should be observed.

8.1.7 Fill Material

In general, the on-site soils should be suitable for re-use as fill, structural fill, and trench backfill, provided that they are free of trash, debris, roots, vegetation, or other deleterious materials. Fill should generally be free of rocks or lumps of material in excess of 4 inches in diameter. Rocks or hard lumps larger than approximately 4 inches in diameter should be broken into smaller pieces or should be removed from the site. On-site soils and bedrock materials used as fill will involve moisture-conditioning to achieve appropriate moisture content for compaction.

Imported materials, if used, should consist of clean, non-expansive, granular material, which conforms to the latest edition of "Greenbook" Standard Specifications for Public Works Construction for structure backfill in accordance with ASTM D 4829 (CBC, 2019). Soil should also be tested for corrosive properties prior to importing. We recommend that the imported materials comply with the Caltrans (2021) criteria for non-corrosive soils (i.e., soils having a chloride concentration of less than 500 parts per million (ppm), a soluble sulfate content of less than approximately 0.15 percent (1,500 ppm), a pH value higher than 5.5, and a

resistivity of more than 1,500 ohm-centimeters (ohm-cm)). Materials for use as fill should be evaluated by the geotechnical consultant prior to importing. The contractor should be responsible for the uniformity of import material brought to the site.

8.1.8 Fill Placement and Compaction

Fill placed for support of the proposed structure or other site improvements and trench backfill should be compacted in horizontal lifts to a relative compaction of 90 percent or more as evaluated by ASTM D 1557. Fill soils should be placed at slightly above the optimum moisture content as evaluated by ASTM D 1557. The optimum lift thickness of fill will depend on the type of compaction equipment used but generally should not exceed 8 inches in loose thickness. Placement and compaction of the fill soils should be in general accordance with appropriate governing agency grading ordinances and good construction practice.

8.2 Underground Utilities

We anticipate that new underground utility pipelines will be supported on compacted fill or bedrock. Utility trenches should not be excavated parallel to building footings. If needed, trenches can be excavated adjacent to a continuous footing, provided that the bottom of the trench is located above a 1:1 (horizontal to vertical) plane projected downward from a point 6 inches above the bottom of the adjacent footing. Utility lines that cross beneath footings should be encased in concrete below the footing.

8.2.1 Pipe Bedding

We recommend that pipelines be supported on 6 inches or more of granular bedding material such as sand with a sand equivalent (SE) value of 30 or more. Bedding material should be placed and compacted around the pipe, and 12 inches or more above the top of the pipe in accordance with the current “Greenbook” Standard Specifications for Public Works. We do not recommend the use of crushed rock for bedding material. It has been our experience that the voids within a crushed rock material are sufficiently large enough to allow fines to migrate into the voids, thereby creating the potential for sinkholes and depressions to develop at the ground surface.

Special care should be taken not to allow voids beneath and around the pipe. Bedding material and compaction requirements should be in accordance with the recommendations of this report, the project specifications, and applicable requirements of the appropriate agencies. Compaction of the bedding material and backfill should proceed along both sides of the pipe concurrently and be compacted to 90 percent or more relative compaction as evaluated by ASTM D 1557.

8.2.2 Modulus of Soil Reaction

The modulus of soil reaction is used to characterize the stiffness of soil backfill placed on the sides of buried flexible pipelines for the purpose of evaluating lateral deflection caused by the weight of the backfill above the pipe. We recommend that a modulus of soil reaction of 1,000 pounds per square inch (psi) be used for design, provided that relatively granular bedding material is placed adjacent to the pipe, as recommended in this report.

8.3 Seismic Design Considerations

Seismic design of the proposed improvements should be performed in accordance with the requirements of the governing jurisdictions and applicable building codes. Table 1 presents the seismic design parameters for the site in accordance with the CBC (2019) guidelines and adjusted MCE_R spectral response acceleration parameters (ATC, 2022).

Seismic Design Factors	Value
Site Class	C
Site Coefficient, F_a	1.2
Site Coefficient, F_v	1.475
Mapped Spectral Response Acceleration at 0.2-second Period, S_s	1.503 g
Mapped Spectral Response Acceleration at 1.0-second Period, S_1	0.525 g
Spectral Response Acceleration at 0.2-second Period Adjusted for Site Class, S_{MS}	1.803 g
Spectral Response Acceleration at 1.0-second Period Adjusted for Site Class, S_{M1}	0.774 g
Design Spectral Response Acceleration at 0.2-second Period, S_{DS}	1.202 g
Design Spectral Response Acceleration at 1.0-second Period, S_{D1}	0.516 g
Maximum Considered Earthquake Geometric Mean (MCE_G) Peak Ground Acceleration, PGA_M	0.770 g

8.4 Foundations

Recommendations for spread footings for the BOQ Building and drilled pier foundations for the light poles are presented in the following sections. Foundations should be designed in accordance with structural considerations and the following recommendations. In addition, requirements of the appropriate governing jurisdictions and applicable building codes should be considered in the design of the structures.

8.4.1 Spread Footings

Spread or continuous footings should extend 24 inches or more below the adjacent finished grade. Continuous footings should have a width of 18 inches and spread footings should have a width of 24 inches. Spread footings should be reinforced with a minimum of two No. 4 steel reinforcing bars, one placed near the top and one placed near the bottom of the footings, and further detailed in accordance with the recommendations of the structural engineer.

Footings, as described above and bearing on competent bedrock or compacted fill soils with low expansion potential, may be designed using a net allowable bearing capacity of 3,500 psf. The bearing capacity may be increased by 250 or 500 psf for each additional foot of width or depth, respectively, up to a value of 5,000 psf. The allowable bearing capacity may be increased by one-third when considering loads of short duration such as wind or seismic forces. Total and differential settlements for footings designed and constructed in accordance with the above recommendations are estimated to be on the order of approximately 1 inch and ½ inch over a horizontal span of 40 feet, respectively. Foundations typically experience some deflection due to loads placed on them and the reaction of the soils underlying the foundation. A design modulus of subgrade reaction (K) of 100 pounds per cubic inches (pci) may be used for the subgrade soils in evaluating such deflections for footings up to 4 feet in width.

Footings bearing on competent bedrock or granular compacted fill may be designed using a coefficient of friction of 0.35, where the total frictional resistance equals the coefficient of friction times the dead load. Footings may be designed using a passive resistance of 350 psf per foot of depth for level ground condition up to a value of 3,500 psf. This value assumes that the ground is horizontal for a distance of 10 feet, or three times the height generating the passive pressure, whichever is more. The allowable lateral resistance can be taken as the sum of the frictional resistance and passive resistance provided the passive resistance does not exceed one-half of the total allowable resistance. In the event that the passive resistance is greater than one-half of the total allowable resistance, the passive resistance should be reduced to be the same value as the frictional resistance. The passive resistance may be increased by one-third when considering loads of short duration such as wind or seismic forces.

Footings located adjacent to utility trenches should have their bearing surfaces situated below an imaginary 1:1 plane projected upward from the bottom edge of the adjacent utility trench. Foundation setback should be in accordance with the CBC (Figure 1808.7.1, Foundation Clearances from Slopes).

8.4.2 BOQ Building Slabs-On-Grade

BOQ Building floor slabs should be designed by the project structural engineer based on the anticipated loading conditions. BOQ Building floor slabs should be underlain by compacted soil prepared in accordance with the recommendations presented in this report. We recommend that slabs be 5 inches thick or more and reinforced with No. 4 steel reinforcing bars placed 18 inches on-center (each way) placed near the mid-height of the slab. The

placement of the reinforcement in the slab is vital for satisfactory performance. The floor slab and foundations should be tied together by extending the slab reinforcement into the foundations. The slab should be underlain by a vapor retarder and capillary break system consisting of a polyethylene vapor retarder (with a thickness of 10 mil or more) membrane placed over 4 inches of medium to coarse, clean sand or pea gravel. As an alternative, the slab underlayment may consist of a 15-mil Stego Wrap vapor retarder (or equivalent) placed over 4 inches of crushed gravel. The steel reinforcements for the floor slab shall be placed on the vapor retarder using chairs, as appropriate. The vapor retarder is recommended in areas where moisture-sensitive floor coverings are anticipated. Soils underlying the slabs should be moisture-conditioned and compacted in accordance with the recommendations presented in this report prior to concrete placement. Joints should be constructed at intervals designed by the structural engineer to help reduce random cracking of the slab.

8.4.3 Drilled Pier Foundations

Drilled pier foundations for new light poles or other similar improvements should have a diameter of 24 inches or more and embedded in bedrock. The piers may be designed using an allowable side friction (side resistance) of 300 psf. Allowable uplift capacity may be assumed to be half of the allowable compression capacity. The lateral capacity of drilled piers may be evaluated using a lateral bearing capacity (passive resistance) of 350 psf per foot of depth, up to a value of 3,500 psf. The passive resistance may be doubled when considering loads of short duration such as wind or seismic forces for isolated poles that can tolerate ½-inch of deflection at the ground surface. These values also assume that the ground is horizontal for a distance of 10 feet, or three times the height generating the passive pressure, whichever is more.

Drilled pile excavations may be difficult to perform due to the presence of construction debris and volcanic bedrock. Coring or rock breaking may be needed. The drilled pile construction should be observed by Ninyo & Moore during construction to evaluate if the earth materials encountered are consistent with the design assumptions and the piles have been extended to the design depths. The drilled holes should be cleaned of loose soil and gravel. It is the contractor's responsibility to (a) take appropriate measures for maintaining the integrity of the drilled holes, (b) see that the holes are cleaned and straight, and (c) see that sloughed loose soil is removed from the bottom of the hole prior to the placement of concrete. Drilled piles should be checked for alignment and plumbness during installation. The amount of acceptable misalignment of a pile is approximately 3 inches from the plan location. It is usually acceptable for a pile to be out of plumb by 1 percent of the depth of the pile. The center-to-center spacing of piles should be no less than three times the nominal diameter of the pile.

8.4.4 Retaining Walls

As noted, the existing retaining walls will remain in-place. Minor site walls less than 4 feet in height may be planned at the site. The remedial grading, bearing capacity, lateral resistance, and static settlement recommendations for shallow foundations provided in the previous sections are also applicable for retaining walls. For the design of a yielding retaining wall that is not restrained against movement by rigid corners or structural connections, an active lateral earth pressure with an equivalent fluid weight of 37 pcf is recommended. For yielding retaining wall backfilled with granular compacted soil, the movement of top of wall (deflection) to generate active earth pressure is assumed to be 0.001 times the wall height. Restrained walls (non-yielding) may be designed for at-rest lateral earth pressure with an equivalent fluid weight of 57 pcf. These pressures assume select backfill materials, free draining conditions, and no surcharge loads. If the walls are subject to surcharge loads, those should be considered in design. Dynamic earth pressures need not be considered in design for wall heights of less than 6 feet. Measures should be taken to reduce the potential for build-up of moisture behind the retaining walls. A drain should be provided behind the retaining wall and connected to an appropriate outlet.

8.5 Corrosivity

The corrosion potential of the site soils was evaluated using the results of a selected, representative sample obtained from our exploratory test pits. Laboratory testing was performed to evaluate pH, minimum electrical resistivity, soluble sulfate, and chloride content. Soluble sulfate content is addressed in the following section of this report. The soil pH and minimum resistivity tests were performed in accordance with California Test Method (CT) 643. The test for chloride content of the soils was performed using CT 422. Sulfate testing was performed in general accordance with CT 417. The laboratory test results are presented in Appendix B.

The chloride content of the tested sample was approximately 25 ppm. The sulfate content of the tested sample was approximately 10 ppm. The soil pH of the sample was approximately 5.9, and the electrical resistivity measured in the laboratory was approximately 2,423 ohm-centimeters. Based on the laboratory test results and Caltrans (2021) corrosion criteria, the soils at the project site may be classified as non-corrosive, which is defined as having earth materials with less than 500 ppm chlorides, less than 0.15 percent sulfates (i.e., 1,500 ppm), a pH of 5.5 or more, or an electrical resistivity of 1,500 ohm-cm or more.

8.6 Concrete Placement

Concrete in contact with soil, bedrock, or water that contains high concentrations of water-soluble sulfates can be subject to premature chemical and/or physical deterioration. Based on the CBC

criteria, the potential for sulfate attack is negligible for water-soluble sulfate contents in soil or bedrock ranging from 0.00 to 0.10 percent by weight and moderate for water-soluble sulfate contents ranging from 0.10 to 0.20 percent by weight. The potential for sulfate attack is severe for water-soluble sulfate contents ranging from 0.20 to 2.00 percent by weight and very severe for water-soluble sulfate contents over 2.00 percent by weight. The soil sample tested for this evaluation, using Caltrans Test Method 417, indicates a water-soluble sulfate content of 0.001 percent by weight (i.e., 10 ppm). Accordingly, the on-site soils are considered to have a negligible potential for sulfate attack. However, due to the potential variability of the soils on site, consideration should be given to using Type II/V cement for the project.

In order to reduce the potential for shrinkage cracks in the concrete during curing, we recommend that the concrete for the proposed structures be placed with a slump of 4 inches based on ASTM C 143. The slump should be checked periodically at the site prior to concrete placement. We further recommend that concrete cover over reinforcing steel for foundations be provided in accordance with CBC (2019). The structural engineer should be consulted for additional concrete specifications.

8.7 Drainage

Positive surface drainage is imperative for performance of site improvements. Positive drainage should be provided and maintained to transport surface water away from foundations and other site improvements. Positive drainage incorporates a slope of 2 percent or more over a distance of 5 feet or more away from structures, pavements, and top of slopes. Surface water should not be allowed to flow over slope faces or pond adjacent to footings.

9 CONSTRUCTION OBSERVATION

The recommendations provided in this report are based on our understanding of the proposed project and our evaluation of the data collected based on subsurface conditions observed in our exploratory test pits. It is imperative that the geotechnical consultant checks the subsurface conditions during construction.

During construction, we recommend that the duties of the geotechnical consultant include, but not be limited to:

- Observing clearing, grubbing, and removals.
- Observing excavation, placement, and compaction of fill, including trench backfill.
- Evaluating on-site soil and bedrock for suitability as use as engineered fill/structural backfill prior to placement.

- Evaluating imported materials prior to their use as fill, if used.
- Performing field tests to evaluate fill compaction.
- Observing foundation excavations for bearing materials and cleaning prior to placement of reinforcing steel or concrete.
- Performing material testing services including concrete compressive strength and steel tensile strength tests and inspections.

The recommendations provided in this report are based on the assumption that Ninyo & Moore will provide geotechnical observation and testing services during construction. In the event that the services of Ninyo & Moore are not utilized during construction, we request that the selected consultant provide the owner with a letter (with a copy to Ninyo & Moore) indicating that they fully understand Ninyo & Moore's recommendations, and that they are in full agreement with the design parameters and recommendations contained in this report.

10 LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analyses presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request. Please also note that our evaluation was limited to assessment of the geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purposes only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports

prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified, and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

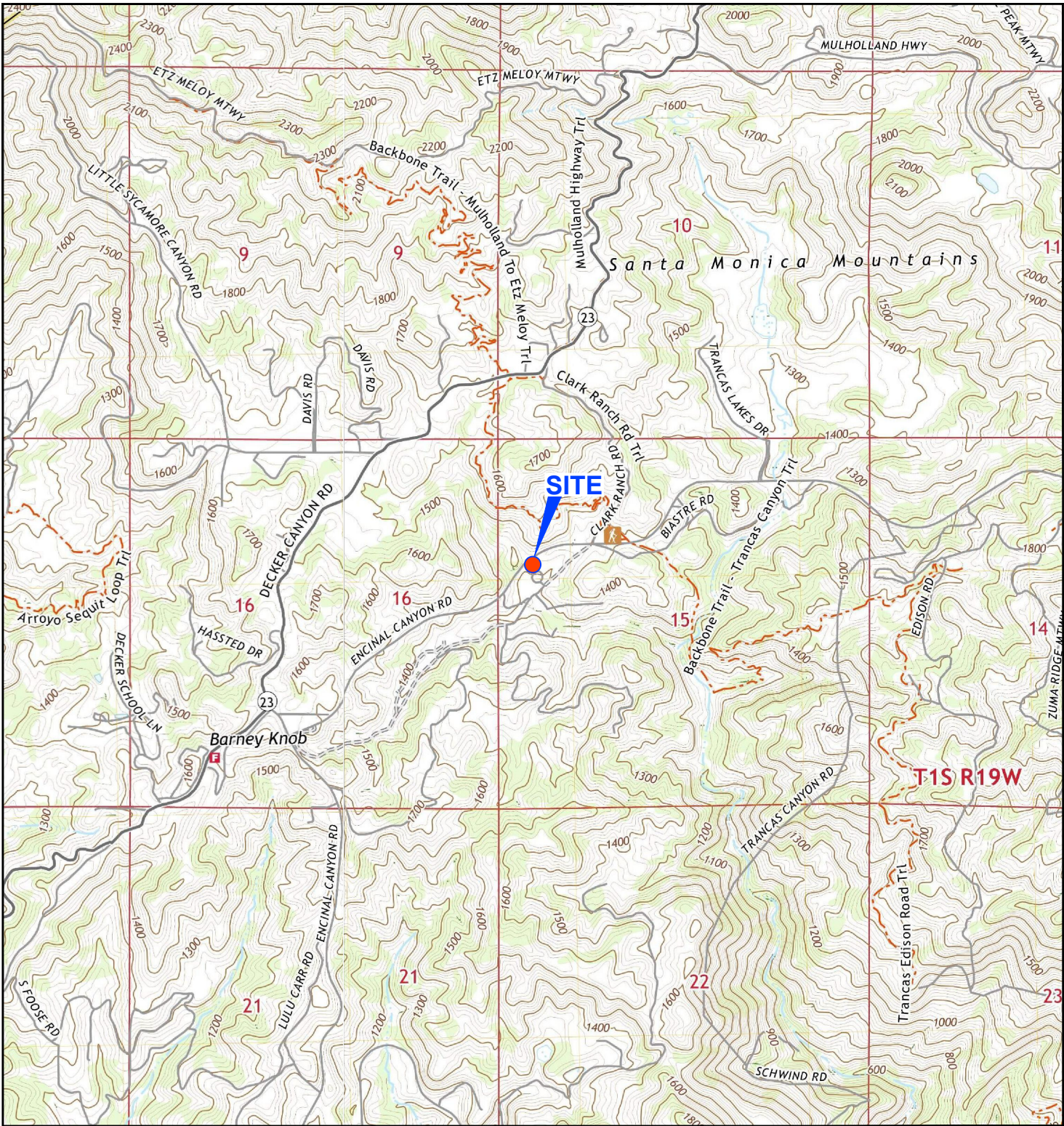
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FIGURES



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NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. | REFERENCE: USGS, 2021 & 2022.

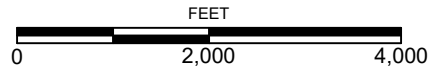
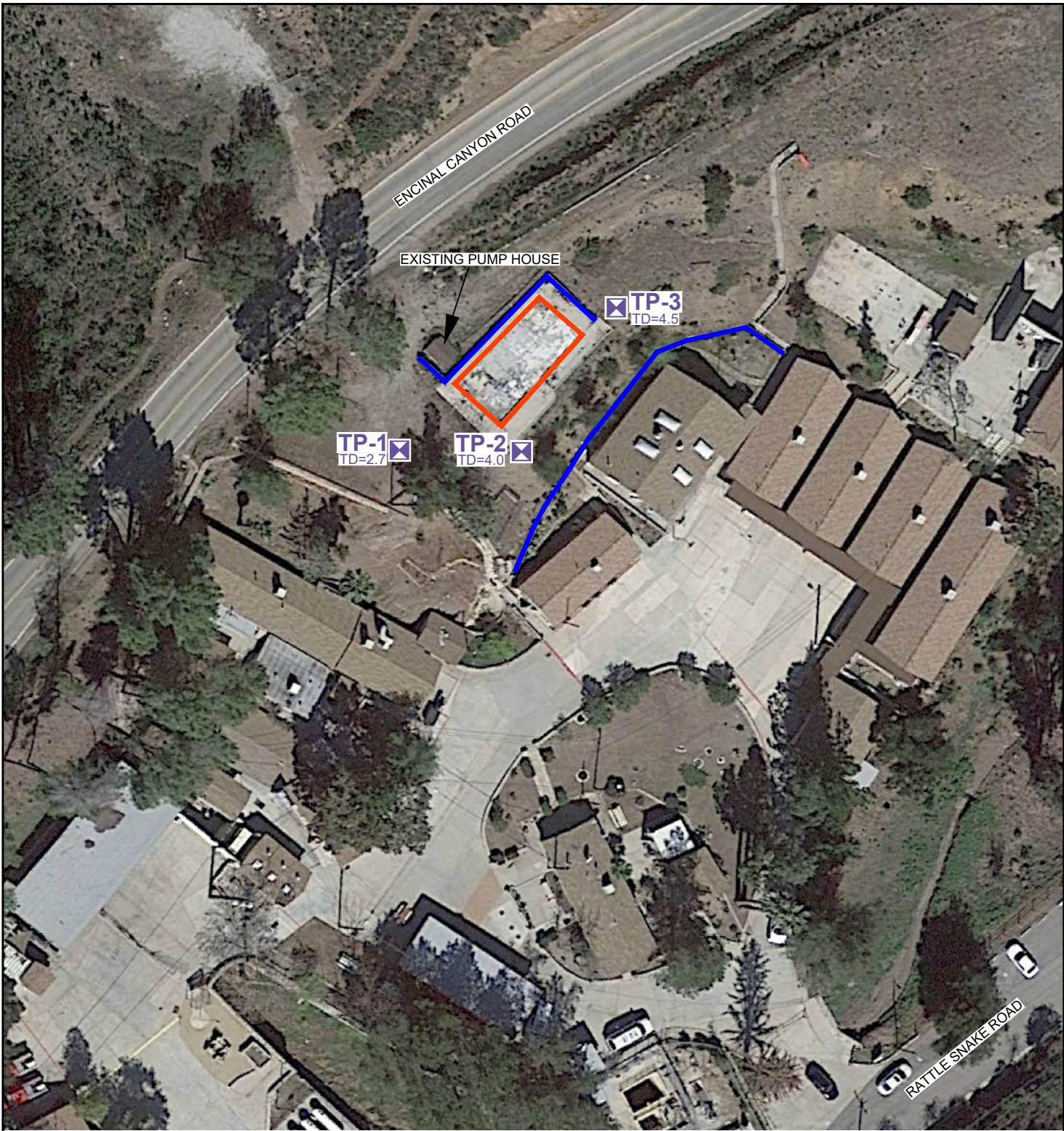


FIGURE 1

SITE LOCATION

FIRE CAMP 13 BOQ BUILDING REPLACEMENT PROJECT
 COUNTY OF LOS ANGELES, CALIFORNIA





LEGEND

- TP-3

 TEST PIT;
 TD=4.5 TD=TOTAL DEPTH IN FEET
- EXISTING RETAINING WALL
- PROPOSED BUILDING LOCATION

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. | REFERENCE: GOOGLE EARTH, 2022.

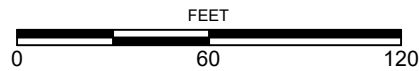
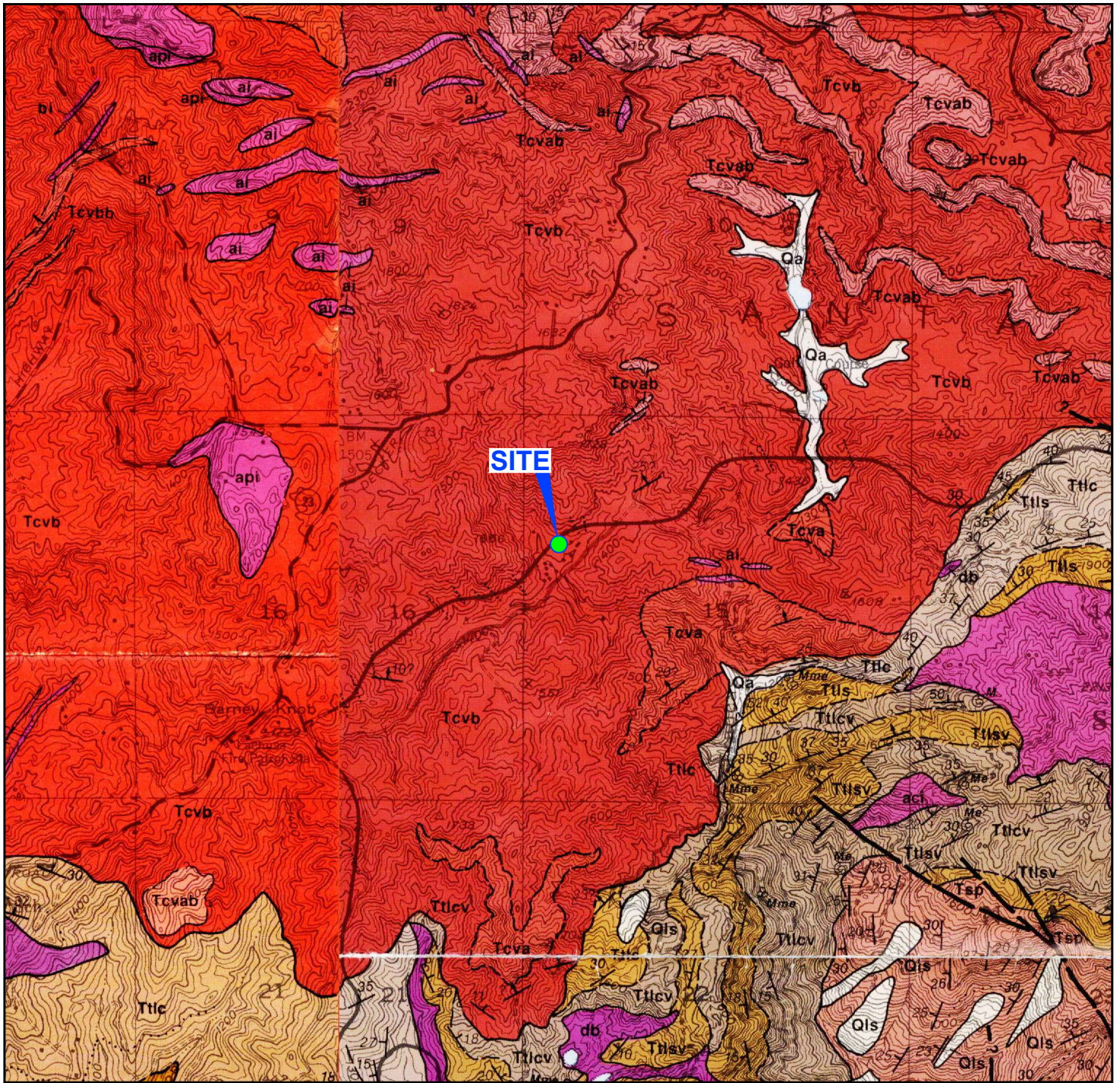



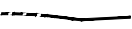




FIGURE 2

SITE AERIAL AND TEST PIT LOCATIONS

FIRE CAMP 13 BOQ BUILDING REPLACEMENT PROJECT
 COUNTY OF LOS ANGELES, CALIFORNIA



LEGEND

- | | | | | |
|---|--------------|-------------------------|---|---|
|  | Tcva | CONEJO VOLCANICS |  | GEOLOGIC CONTACT; DASHED WHERE APPROXIMATED |
|  | Tcvb | |  | FAULT; DASHED WHERE APPROXIMATED |
|  | Ttlcv | LOWER TOPANGA FORMATION | | |
|  | Ttlsv | | | |

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. | REFERENCE: DIBBLEE, T.W., JR., 1990 & 1993.

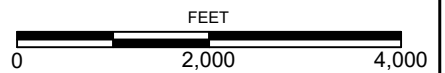
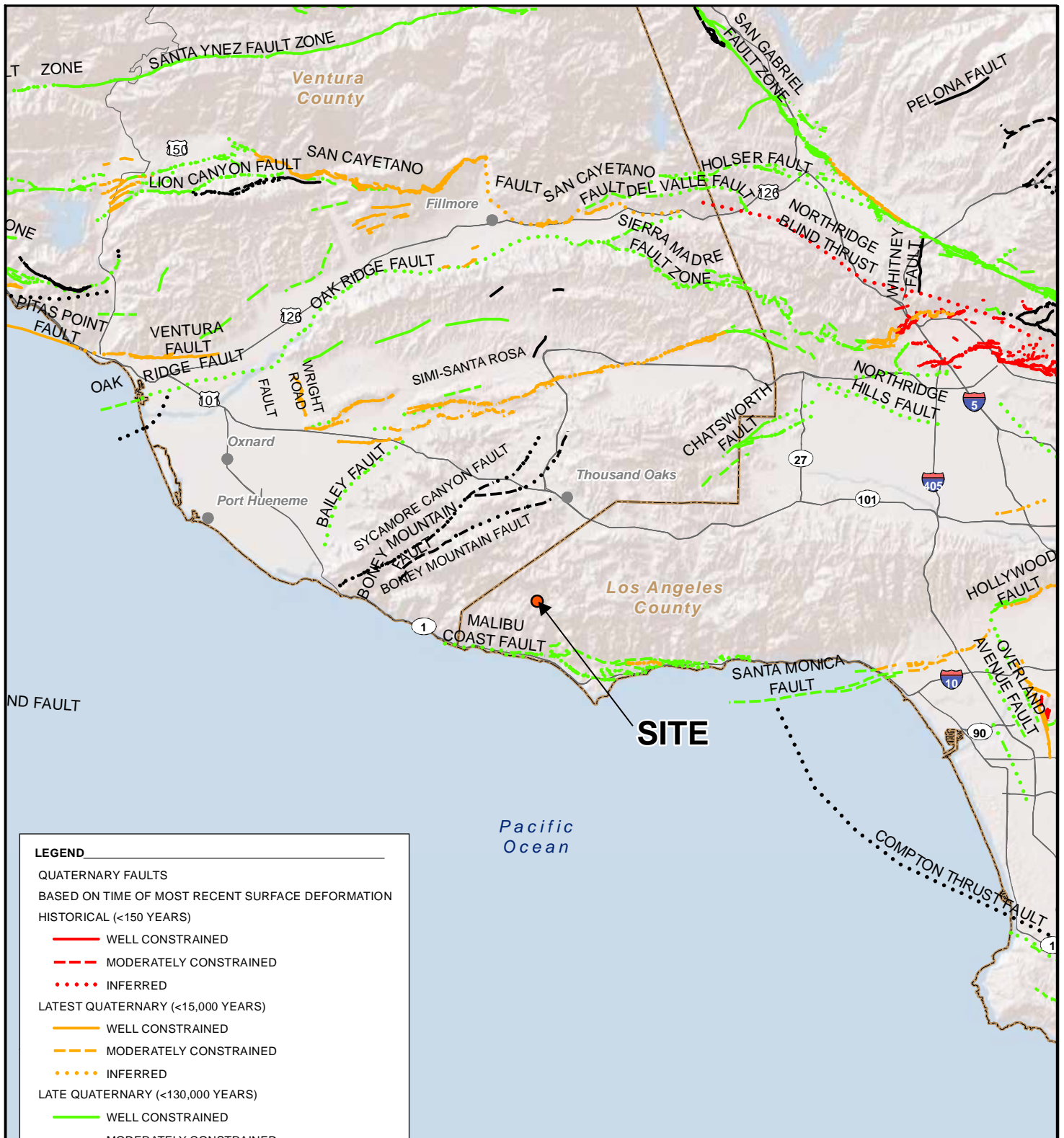


FIGURE 3

REGIONAL GEOLOGY

FIRE CAMP 13 BOQ BUILDING REPLACEMENT PROJECT
COUNTY OF LOS ANGELES, CALIFORNIA



LEGEND

QUATERNARY FAULTS
 BASED ON TIME OF MOST RECENT SURFACE DEFORMATION
 HISTORICAL (<150 YEARS)

- WELL CONSTRAINED
- - - MODERATELY CONSTRAINED
- INFERRED

LATEST QUATERNARY (<15,000 YEARS)

- WELL CONSTRAINED
- - - MODERATELY CONSTRAINED
- INFERRED

LATE QUATERNARY (<130,000 YEARS)

- WELL CONSTRAINED
- - - MODERATELY CONSTRAINED
- INFERRED

UNDIFFERENTIATED QUATERNARY (<1.6 MILLION YEARS)

- WELL CONSTRAINED
- - - MODERATELY CONSTRAINED
- INFERRED

SOURCES: CALIFORNIA GEOLOGICAL SURVEY, ACCESSED OCTOBER 25, 2022, AT: <https://www.usgs.gov/natural-hazards/earthquake-hazards/faults/>; ESRI, 2021.



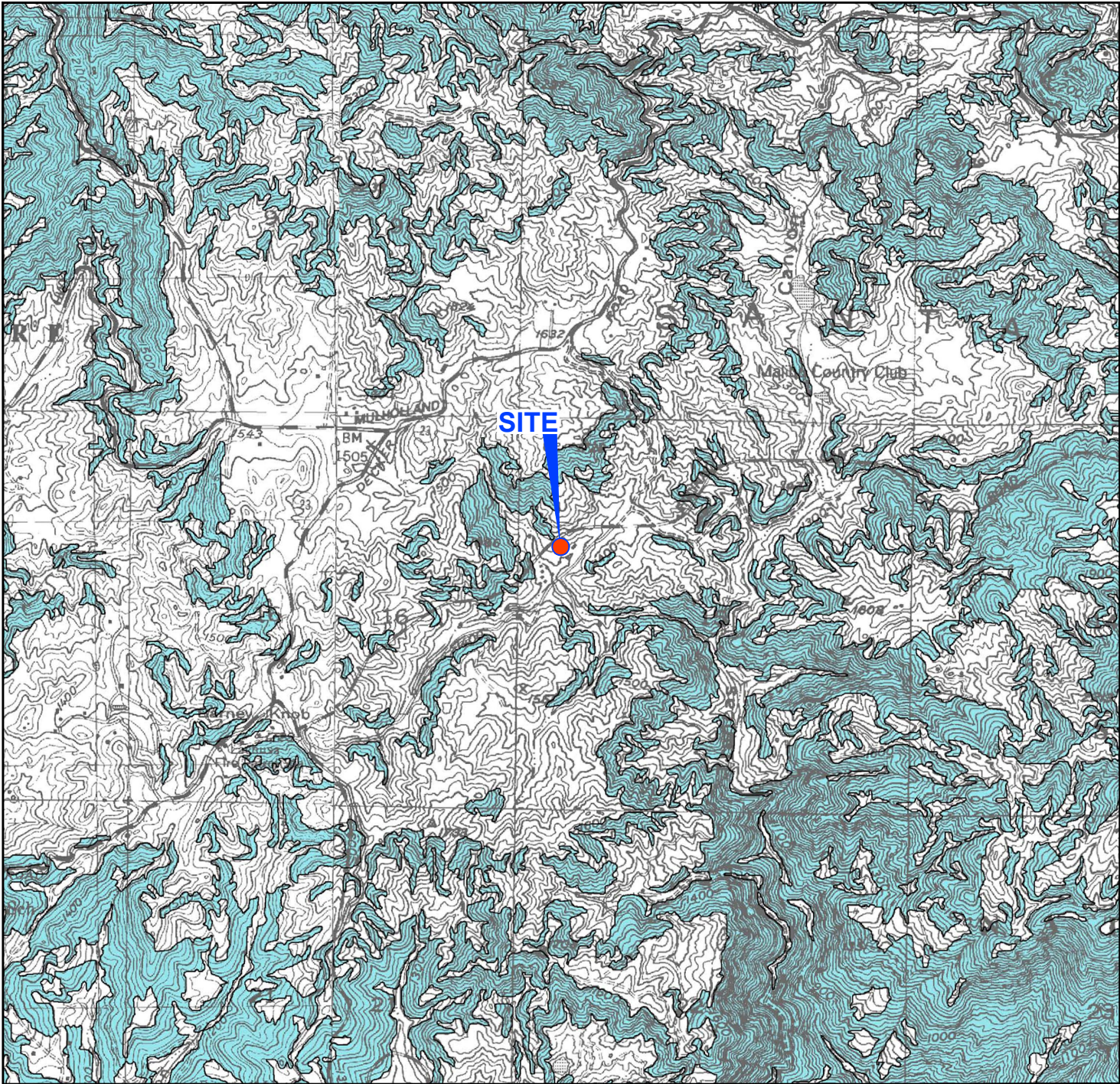
NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

FIGURE 4

FAULT LOCATIONS

FIRE CAMP 13 BOQ BUILDING REPLACEMENT PROJECT
 COUNTY OF LOS ANGELES, CALIFORNIA

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LEGEND



EARTHQUAKE-INDUCED LANDSLIDES
 Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. | REFERENCE: CDMG, 2002a & 2002b.

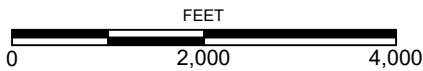
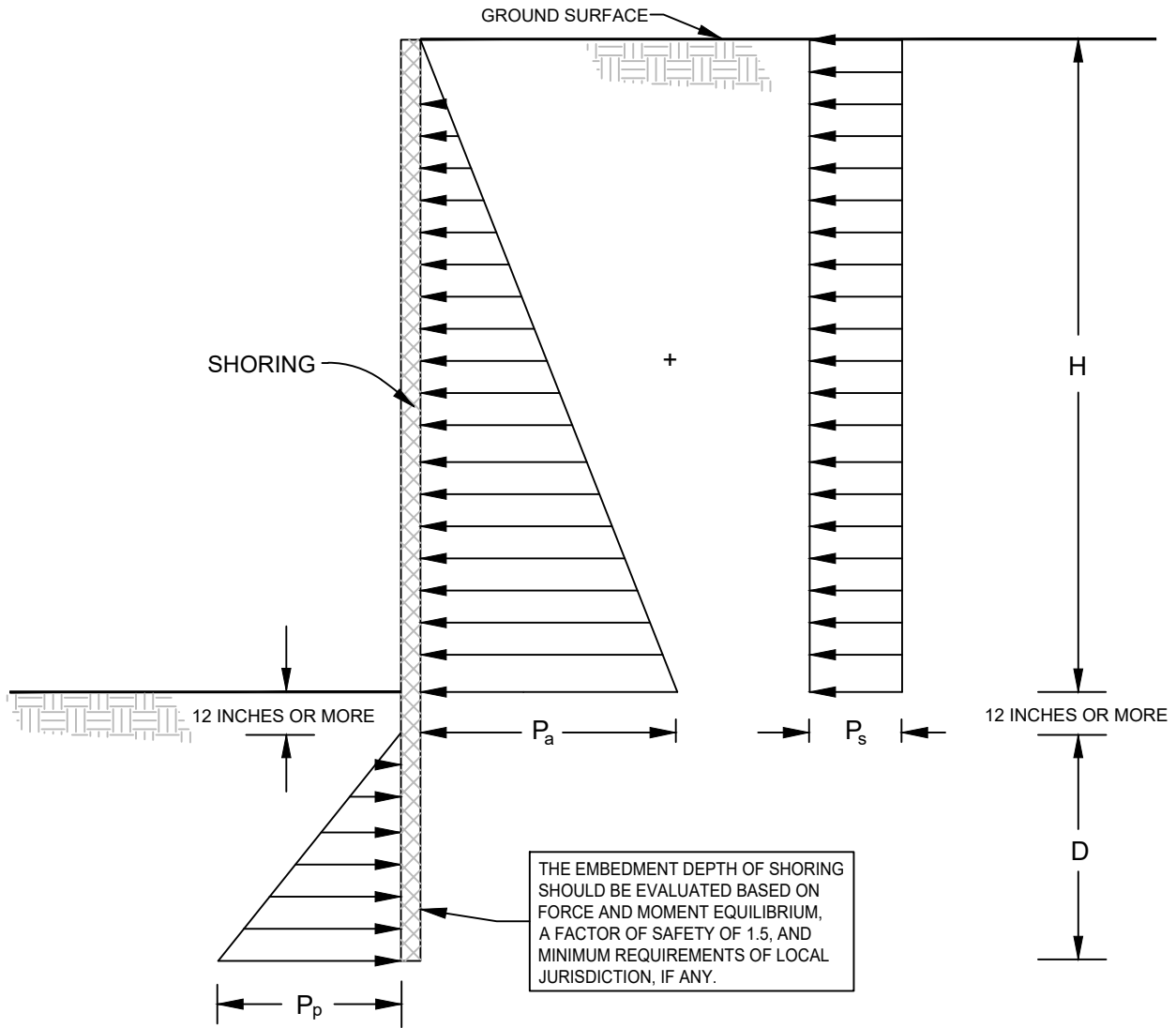


FIGURE 5



NOTES:

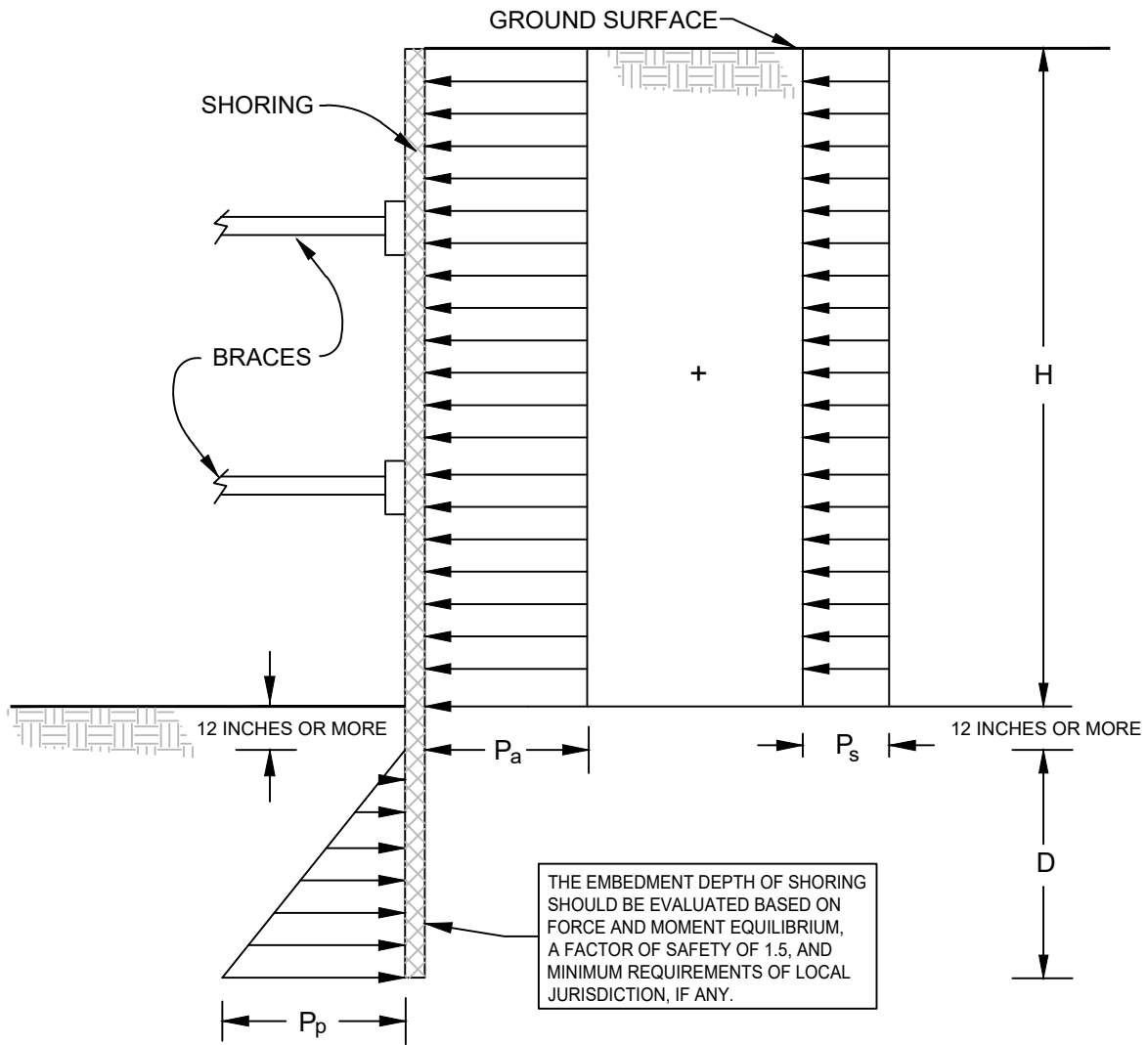
1. ACTIVE LATERAL EARTH PRESSURE, P_a
 $P_a = 40H$ psf
2. CONSTRUCTION TRAFFIC INDUCED SURCHARGE PRESSURE, P_s
 $P_s = 72$ psf
3. PASSIVE LATERAL EARTH PRESSURE, P_p
 $P_p = 350D$ psf
4. ASSUMES GROUNDWATER IS NOT PRESENT
5. H AND D ARE IN FEET

NOT TO SCALE

FIGURE 6

**LATERAL EARTH PRESSURES FOR
TEMPORARY CANTILEVERED SHORING**

FIRE CAMP 13 BOQ BUILDING REPLACEMENT PROJECT
COUNTY OF LOS ANGELES, CALIFORNIA



NOTES:

1. APPARENT LATERAL EARTH PRESSURE, P_a
 $P_a = 26H$ psf
2. CONSTRUCTION TRAFFIC INDUCED SURCHARGE PRESSURE, P_s
 $P_s = 120$ psf
3. PASSIVE LATERAL EARTH PRESSURE, P_p
 $P_p = 350D$ psf
4. ASSUMES GROUNDWATER IS NOT PRESENT
5. SURCHARGES FROM EXCAVATED SOIL OR CONSTRUCTION MATERIALS ARE NOT INCLUDED
6. H AND D ARE IN FEET

NOT TO SCALE

FIGURE 7

LATERAL EARTH PRESSURES FOR BRACED EXCAVATION (GRANULAR SOIL)

FIRE CAMP 13 BOQ BUILDING REPLACEMENT PROJECT
COUNTY OF LOS ANGELES, CALIFORNIA



APPENDIX A

Test Pit Logs

APPENDIX A

TEST PIT LOGS

Field Procedure for the Collection of Disturbed Samples

Disturbed soil samples were obtained in the field using the following method.

Bulk Samples

Bulk samples of representative earth materials were obtained from the exploratory test pits. The samples were bagged and transported to the laboratory for testing.

LOCATION: Southwest of Building Pad	TRENCH NO.: TP-1	SAMPLES/ FIELD TESTS	MOISTURE (%)	DRY DENSITY (PCF)
GROUND ELEVATION: 1,325± (MSL)	LOGGED BY: ECH			
METHOD OF EXCAVATION: Backhoe (JES Engineering)	DATE LOGGED: 9/27/2022			

DESCRIPTION

FILL:

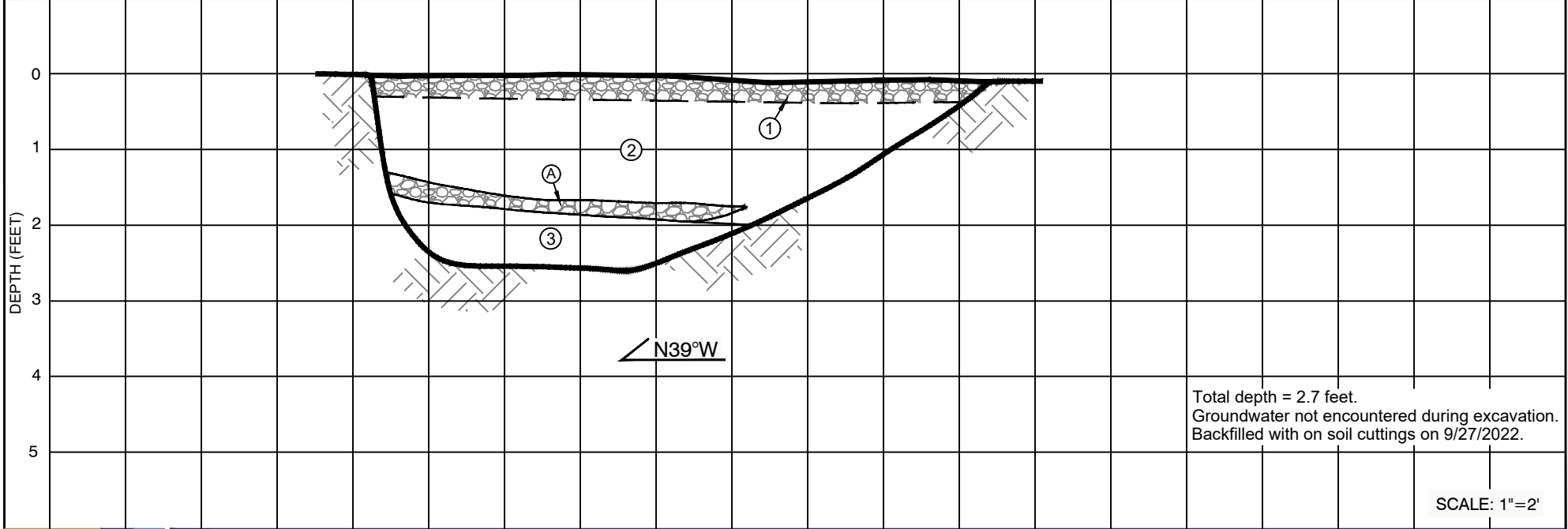
① Gray, dry to moist, medium dense; silty GRAVEL; up to approximately 1" to 2" gravel.

② Grayish brown, moist, medium dense, silty SAND with gravel.
 A @1.5': Interbedded with an approximately 3" thick gravel lense.

CONEJO VOLCANICS:

③ Reddish brown, moist, moderately hard, BASALT; weathered.

(0.5' - 1.5') Medium Bulk	5.8	
---------------------------	-----	--



Total depth = 2.7 feet.
 Groundwater not encountered during excavation.
 Backfilled with on soil cuttings on 9/27/2022.

SCALE: 1"=2'

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FIGURE A-1

TEST PIT LOG TP-1

FIRE CAMP 13 BOQ BUILDING REPLACEMENT PROJECT
 COUNTY OF LOS ANGELES, CALIFORNIA

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LOCATION: _____ South of Building Pad _____	TRENCH NO.: _____ TP-2 _____	SAMPLES/ FIELD TESTS	MOISTURE (%)	DRY DENSITY (PCF)
GROUND ELEVATION: _____ 1,325± (MSL) _____	LOGGED BY: _____ ECH _____			
METHOD OF EXCAVATION: _____ Backhoe (JES Engineering) _____	DATE LOGGED: _____ 9/27/2022 _____			

DESCRIPTION

FILL:

① Brown, dry to moist, loose, silty SAND; trace gravel; trace pieces of tile and concrete.

(1.0' - 2.0') Medium Bulk

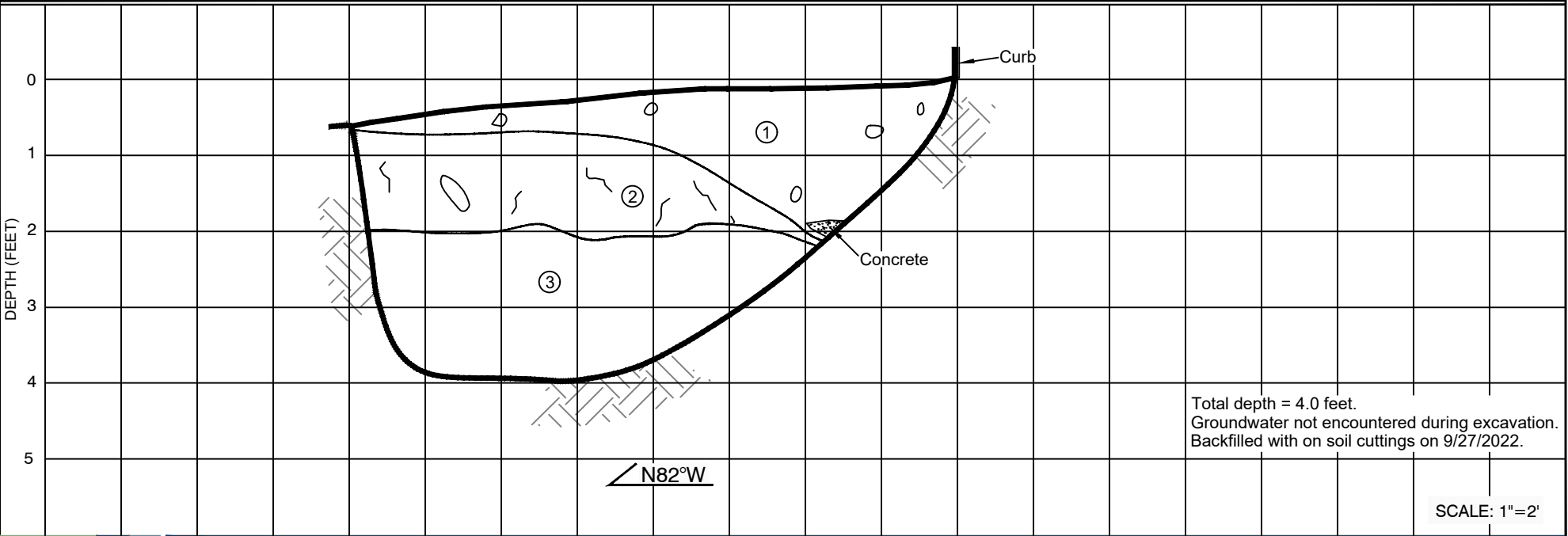
7.4

COLLUVIUM:

② Brown, moist, loose, silty SAND with gravel; coarse sand; gravel consists of pieces of basalt; few rootlets; porosity.

CONEJO VOLCANICS:

③ Brown, dry to moist, soft to moderately soft, BASALT; decomposed.
@3.5': Brown to grayish brown, moderately soft to moderately hard, BASALT.



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FIGURE A-2

LOCATION: Northwest of Building Pad	TRENCH NO.: TP-3	SAMPLES/ FIELD TESTS	MOISTURE (%)	DRY DENSITY (PCF)
GROUND ELEVATION: 1,325± (MSL)	LOGGED BY: ECH			
METHOD OF EXCAVATION: Backhoe (JES Engineering)	DATE LOGGED: 9/27/2022			

DESCRIPTION

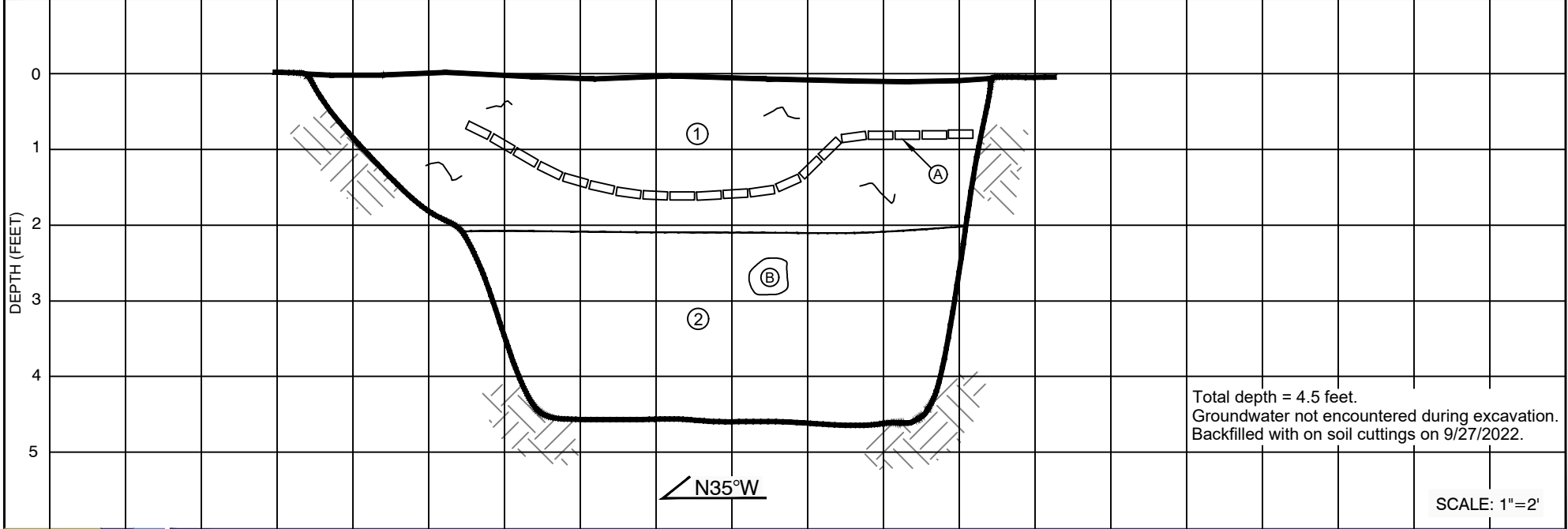
FILL:

① Brown, moist, loose, clayey SAND with gravel; trace rootlets.
 Ⓐ @0.6'-1.5': approximately 2" thick layer of concrete; continuous only around northeast and southeast walls.

CONEJO VOLCANICS:

② Brown to grayish brown, moist, moderately soft; BASALT; weathered; iron oxide on bedrock surfaces; trace calcium carbonate;
 Ⓑ @2.5': extremely weathered BASALT; weathered to clayey sand.
 @3.5': grayish brown, moderately hard; decrease in weathering.

(1.0' - 2.0') Medium Bulk	7.8	
---------------------------	-----	--



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FIGURE A-3



APPENDIX B

Laboratory Testing

APPENDIX B

LABORATORY TESTING

Classification

Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488. Soil classifications are indicated on the logs of the test pits in Appendix A.

Moisture Content

The moisture content of samples obtained from the exploratory excavations was evaluated in accordance with ASTM D 2216. The test results are presented on the logs of the exploratory excavations in Appendix A.

Gradation Analysis

A gradation analysis test was performed on a selected representative soil sample in general accordance with ASTM D 422. The grain-size distribution curve is shown on Figure B-1. This test result was utilized in evaluating the soil classification in accordance with the USCS.

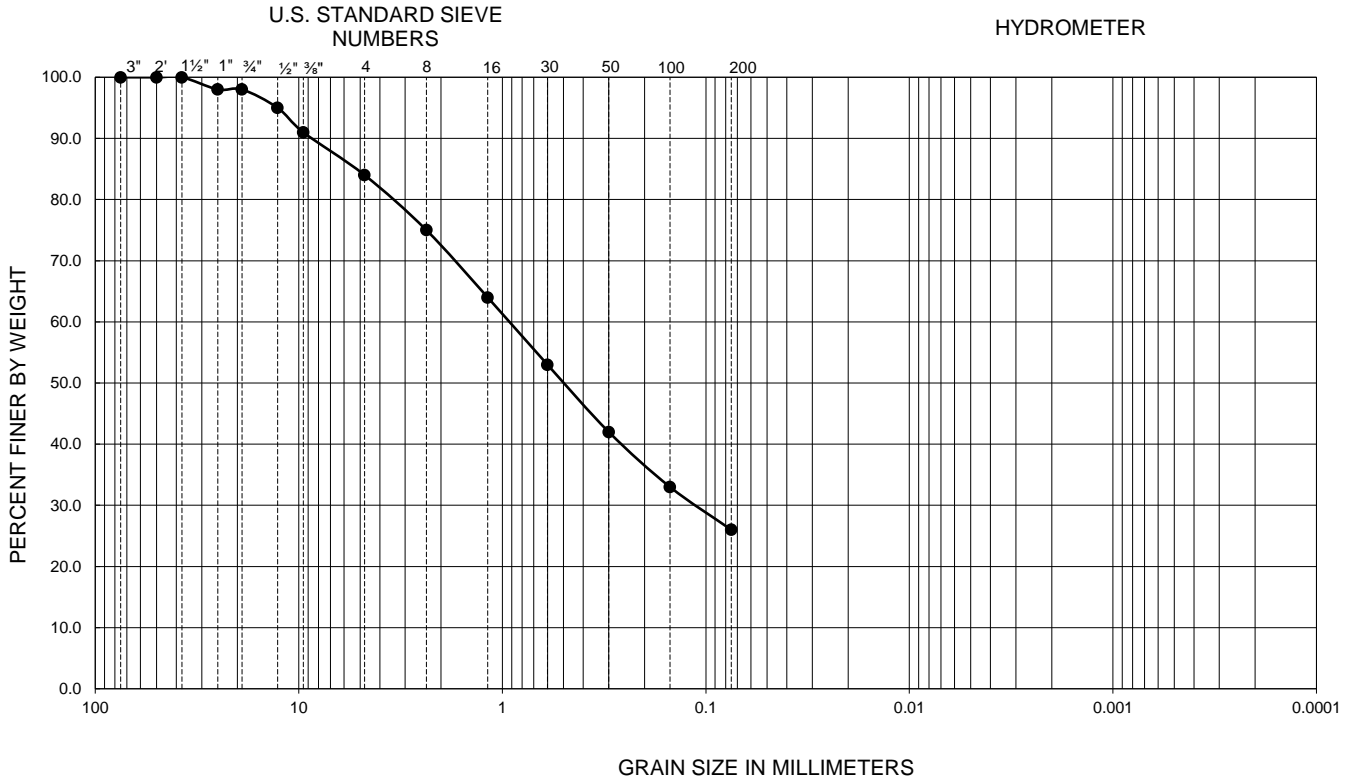
Percent Finer than No. 200 Sieve

An evaluation of the percentage of particles finer than the No. 200 sieve in selected soil samples was performed in general accordance with ASTM D 1140. The results of the tests are presented on Figure B-2.

Soil Corrosivity Tests

Soil pH and resistivity tests were performed on a representative sample in general accordance with California Test (CT) 643. The soluble sulfate and chloride content of the selected sample were evaluated in general accordance with CT 417 and CT 422, respectively. The test results are presented on Figure B-3.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (percent)	USCS
●	TP-2	1.0-2.0	--	--	--	--	--	--	--	--	26	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

FIGURE B-1

GRADATION TEST RESULTS

FIRE CAMP 13 BOQ BUILDING REPLACEMENT PROJECT
 COUNTY OF LOS ANGELES, CALIFORNIA



SAMPLE LOCATION	SAMPLE DEPTH (ft)	DESCRIPTION	PERCENT PASSING NO. 4	PERCENT PASSING NO. 200	USCS (TOTAL SAMPLE)
TP-3	1.0-2.0	CLAYEY SAND WITH GRAVEL	79	21	SC

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 1140

FIGURE B-2

SAMPLE LOCATION	SAMPLE DEPTH (ft)	pH ¹	RESISTIVITY ¹ (ohm-cm)	SULFATE CONTENT ²		CHLORIDE CONTENT ³ (ppm)
				(ppm)	(%)	
TP-2	1.0-2.0	5.9	2,423	10	0.001	25

¹ PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 643

² PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 417

³ PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 422

FIGURE B-3

CORROSIVITY TEST RESULTS

FIRE CAMP 13 BOQ BUILDING REPLACEMENT PROJECT
 COUNTY OF LOS ANGELES, CALIFORNIA

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475 Goddard, Suite 200 | Irvine, California 92618 | p. 949.753.7070

ARIZONA | CALIFORNIA | COLORADO | NEVADA | TEXAS | UTAH

ninyoandmoore.com

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

ATTACHMENT 2

Limited Hazardous Materials Survey Report

Pages 1-25

May 1, 2023

3139.2005

Mr. Alioune Dioum
Project Manager
Los Angeles County Public Works
900 South Fremont Avenue, 5th Floor
Alhambra, CA 91803

Sent via email to: adioum@dpw.lacounty.gov

RE: Limited Hazardous Materials Survey for:
Project Title: Fire Camp 13 Reconstruction
PCA: P88721HR
Project ID: 2191
PW15541 MECA Consulting, Inc.

Millennium Consulting Associates (Millennium) is pleased to present the Limited Hazardous Materials Survey Report for the referenced project site.

The findings of our Survey are presented in this report. If you have comments or questions regarding this report, please do not hesitate to contact the undersigned at (310) 415-5607.

Sincerely,

Millennium Consulting Associates
A MECA Consulting, Inc. Company

Prepared by:



Dustin Stafford, CSST, CDPH
Assistant Project Manager
CSST #19-6701, CDPH #6343

Reviewed by:



Scott Nunes, CAC, CDPH
Director of Building Sciences, SoCal Division
CAC #92-0547, CDPH I/A #1010

TABLE OF CONTENTS

TABLE OF CONTENTSi

LIST OF APENDICES.....ii

ACRONYM GUIDE iii

EXECUTIVE SUMMARY 1

Summary ACM Tables1

Summary LCM Table1

Recommendations2

1.0 INTRODUCTION..... 3

2.0 LIMITING CONDITIONS 3

3.0 SITE DESCRIPTION..... 4

4.0 ACM MATERIAL SURVEY..... 4

4.1 ACM Survey Overview4

4.2 ACM Survey Results5

5.0 LEAD SURVEY 5

5.1 Lead Survey Overview5

5.2 Lead Survey Results5

6.0 CONCLUSIONS AND RECOMMENDATIONS..... 6

6.1 Asbestos6

6.2 Lead Containing Materials7

LIST OF TABLES

Table 1	Lead Analytical Data
Table 2	Summary Non-Asbestos
Table 3	Lead Analytical Data

LIST OF APPENDICES

Appendix A	Analytical Laboratory Report (Asbestos)
Appendix B	Analytical Laboratory Report (Lead)
Appendix C	Certifications

ACRONYM GUIDE

ACCM	Asbestos-Containing Construction Material
ACM	Asbestos-Containing Material
Cal OSHA	California Occupational Safety and Health Administration
CCR	California Code of Regulations
CDPH	California Department of Public Health
CFR	Code of Federal Regulations
CMU	Concrete Masonry Unit
CPSC	Consumer Product Safety Commission
EPA	Environmental Protection Agency
HSG	Homogeneous Sampling Group
HUD	U.S. Department of Housing and Urban Development
HVAC	Heating Ventilation and Air Conditioning
LBP	Lead-Based Paint
NEA	Negative Exposure Assessment
NESHAP	National Emission Standards for Hazardous Air Pollutants
PLM	Polarized Light Microscopy
ppm	Parts per million
PQL	Practical Quantification Limit
PCB	Polychlorinated Biphenyl
RACM	Regulated Asbestos Containing Material
RFT	Resilient Floor Tile
TSI	Thermal System Insulation

EXECUTIVE SUMMARY

Millennium Consulting Associates (Millennium) was retained by Los Angeles County Public Works (County) to conduct a limited pre-renovation hazardous materials assessment for the Classroom Building at Fire Camp 13, located at 1250 Encinal Canyon Road, Malibu, California. Our services included the performance of a limited asbestos-containing materials (ACM) survey and a lead-containing materials (LCM) survey within areas of the building scheduled for renovation. For the purposes of this assessment, LCM refers to both lead-based paint, as defined by the California Department of Public Health (CDPH) and U.S. Department of Housing and Urban Development (HUD), lead-containing paint, and other lead-containing materials, including ceramic tile and floor varnish.

Millennium performed field reconnaissance and sample collection on April 26, 2023. Millennium conducted a walkthrough of the project site to identify and collect information regarding hazardous materials included in the scope of work. Millennium used the available information to create a sampling strategy representing suspect materials located throughout the renovation areas.

For the limited ACM survey, Millennium collected nine (9) samples of suspect ACM throughout the project site. For the LCM survey, Millennium utilized paint chip sampling to identify lead concentrations on surfaces. A total of six (6) paint chip samples were collected throughout the project site.

The following subsections contain summary tables for the ACM and LCM survey.

Summary ACM Tables

No asbestos was detected in the materials sampled.

Summary LCM Table

Lead-containing materials (LCM) have been found in the subject building therefore we do not certify the building to be “Lead Free”. Materials found to contain detectable levels of lead are inventoried in the following table:

Table 1. Summary Lead Results.

Sample No.	Material Description	Material Location	Results
			Lead Concentration ¹ (ppm)
042623-29-01Pb	Beige Metal Window Frame	Exterior	5.4
042623-29-02Pb	Dark Brown Wood Eave	Exterior	<16
092623-29-03Pb	Beige Metal Side Wall Panels	Exterior	37
042623-29-04Pb	Gray Drywall Interior Partition Wall	Interior	<4.7
042623-29-05Pb	White Wood Door Frame	Shower Room	<4.9

042623-29-06Pb	White Wood Door	Shower Room	<14
¹ Result ≥ 5,000 ppm = lead-based paint. <i>Result < 5,000 ppm but > RDL = lead-containing paint.</i>			

Recommendations

Based on the data provided and referenced herein, Millennium recommends the following course of actions:

1. No asbestos was detected in the materials sampled. However, if previously unsampled materials are discovered during renovation, the materials should be sampled for asbestos content.
2. Due to the presence of lead-containing materials (LCM), renovation of the subject building which disturbs LCM shall be performed in compliance with the Cal-OSHA Lead in the Construction Industry Standard, 8 CCR 1532.1. The contractor(s) and all subcontractors must ensure that their renovation workers receive training in compliance with the Standard, and that negative exposure assessments and/or interim protections (required for Trigger Task activities only) for workers be provided upon request. Interim protections include, but are not limited to, provision of a written lead compliance plan, medical surveillance, provision of PPE, a respiratory protection program, provision of hygiene facilities, and performance of exposure assessments in compliance with the Lead in Construction Standard.
3. Waste profiling for lead shall be performed prior to disposal of building components with known lead containing coatings for purposes of compliance with Federal RCRA and California Title 22 regulations. Building components intended for recycling or re-use do not necessarily require additional waste profiling, however depending on final use of the subject material (e.g., crushed concrete re-used as aggregate base), additional profiling may be necessary for compliance with site specific use requirements.

1.0 INTRODUCTION

Millennium Consulting Associates (Millennium) was retained by Los Angeles County Public Works (County) to conduct a limited pre-renovation hazardous materials assessment for the Classroom Building at Fire Camp 13, located at 1250 Encinal Canyon Road, Malibu, California. Our services included the performance of an asbestos-containing materials (ACM) survey and a lead-containing materials (LCM) survey within areas of the building scheduled for renovation. For the purposes of this assessment, LCM refers to both lead-based paint, as defined by the California Department of Public Health (CDPH) and U.S. Department of Housing and Urban Development (HUD), lead-containing paint, and other lead-containing materials, including ceramic tile and floor varnish.

Based on Millennium's understanding of the client's needs, the following scope of services was conducted:

1. Visual reconnaissance of the site's proposed areas of renovation, to document homogeneous areas and locate suspect ACM and LCM materials.
2. ACM survey of proposed areas of renovation in accordance with the listed criteria in California Occupational Safety and Health Administration (Cal- OSHA) standard 8 California Code of Regulations (CCR) 1529, South Coast Air Quality Management District (SCAQMD) Rule 1403, OSHA standard 29 Code of Federal Regulations (CFR) 1926.1101 and Environmental Protection Agency (EPA) standard 40 CFR Part 61.145 (a), including the analysis of bulk samples via polarized light microscopy (PLM) methodology.
3. Lead-containing material (LCM) survey of proposed areas of renovation utilizing paint chip sampling.
4. Preparation of a written report detailing the survey information, including description of the samples and sample locations, analytical results in tabular form, interpretation of results, and recommendations for the future.

2.0 LIMITING CONDITIONS

Millennium conducted the survey on April 26, 2023, in general accordance with industry standards and procedures in existence at the time of the project for bulk asbestos and lead containing materials. The scope of the survey was limited to proposed areas of renovation and was dependent on accessibility to certain areas at the time of the survey.

The conclusions and recommendations presented in this report are based on the applicable standards of our profession at the time this report was prepared. Copies of this report are furnished to provide the factual data that were gathered and summarized in the report.

The analyses and recommendations submitted in this report are based on the data obtained from specific and discrete sampling locations from representative building components. However, the nature and extent of variations between the sampling locations may not become evident until planned demolition procedures commence. If potential variations are identified during renovation activities, it may be necessary to conduct additional bulk sampling and assessments.

This report has been prepared for the exclusive use of Los Angeles County Public Works for specific application to the ACM and LCM materials survey performed on the property. This report may not be copied (except by our client) without the written permission of Los Angeles County Public Works. No other representation, expressed or implied, is made.

3.0 SITE DESCRIPTION

The project site consists of a one-story classroom building located at 1250 Encinal Canyon Road, Malibu, California.

The building is a steel structure on a steel-frame and concrete foundation. The building included a shower room. Millennium's survey had a scope to address planned renovation activities due to damage sustained by the Woolsey Fire.

4.0 ACM MATERIAL SURVEY

This limited asbestos survey was carried out by Dustin Stafford (CSST #19-6071), under the supervision of Scott Nunes (CAC #92-0557).

4.1 ACM Survey Overview

As part of the survey methodology, a preliminary walk-through of the subject property building was performed to familiarize the inspectors with the structures and to identify suspect ACM.

All areas were accessed, and most affected rooms were visually observed. Bulk sampling was performed in select areas deemed to be representative. Below grade appurtenances and non-affected areas were not evaluated.

During the walk-through, the building was assessed for suspect asbestos-containing surfacing materials, suspect asbestos-containing miscellaneous friable materials, suspect asbestos-containing Category I non-friable materials, and suspect asbestos-containing Category II non-friable materials. Friable materials are defined as those materials, when dry, that can be crumbled or reduced to powder by hand pressure. Category I non-friable materials are defined as packing, gaskets, asphalt roofing materials and resilient flooring materials and associated mastics in which the asbestos fibers are bound within a resinous matrix. Category II non-friable materials are defined as other non-friable materials such as asbestos cement in which the asbestos fibers are bound within a cement-like matrix.

During the walk-through, homogeneous sample groups (HSGs) were identified in the building. Based on the identified HSG and analytical data, a bulk-sampling plan for suspect ACM was developed.

Bulk sampling was conducted in accordance with procedures outlined in the Asbestos Hazard Emergency Response Act (40 CFR 763.86, Sampling). The procedure requires the inspector(s) to select random sampling locations from homogeneous materials suspected to contain asbestos.

On April 26, 2023, Millennium collected and analyzed nine (9) samples, including nineteen (19) discrete layers of suspect ACM bulk samples were collected throughout the building. The samples were shipped under chain-of-custody procedures to LA Testing, located in Huntington Beach, California. EMSL/LA Testing is accredited by the California Department of Health Services and National Institute of Standards and Technology's National Voluntary Laboratory Accreditation

Program. The ACM bulk samples were analyzed using Polarized Light Microscopy (PLM) in accordance with the EPA Method for the Determination of Asbestos in Bulk Building Materials (Method 600/R-93/116).

4.2 ACM Survey Results

No asbestos was detected in the materials sampled.

The analytical laboratory report is provided in Appendix A.

Summary non-ACM

Based on the analytical results of the samples surveyed at this time, the inventory of materials tested and found to contain no detectable concentrations of asbestos are presented in the table below:

Table 2. Summary Non-Asbestos.

Sample No.	Material Description	Material Location
042623-29-1 to 3	Drywall/Joint Compound	Interior Partition Wall
042623-29-4 to 6	Drywall/Joint Compound	Interior Shower Room
042623-29-7 to 9	Asphalt Shingle	Roof

5.0 LEAD SURVEY

The limited lead survey was carried out by Dustin Stafford (CDPH #6343), under the supervision of Scott Nunes (CDPH I/A #1010).

5.1 Lead Survey Overview

Millennium conducted a limited pre-renovation lead survey of the building utilizing paint chip sampling methodology. This involves taking a small bulk sample of suspect lead-related coatings. Six (6) paint chip samples were collected and submitted under chain of custody procedures to LA Testing in Huntington Beach, California. EMSL/LA Testing is accredited under the California A2HA Laboratory Accreditation Program. The samples were analyzed by Flame Atomic Absorption for total lead content (EPA Method 3050B/7000B).

5.2 Lead Survey Results

The “detectable” sample results and locations are presented below. The analytical laboratory report is provided in Appendix B.

Table 3. Summary Lead Results.

Sample No.	Material Description	Material Location	Results
			Lead Concentration ¹ (ppm)
042623-29-01Pb	Beige Metal Window Frame	Exterior	5.4

042623-29-02Pb	Dark Brown Wood Eave	Exterior	<16
092623-29-03Pb	Beige Metal Side Wall Panels	Exterior	37
042623-29-04Pb	Gray Drywall Interior Partition Wall	Interior	<4.7
042623-29-05Pb	White Wood Door Frame	Showers Room	<4.9
042623-29-06Pb	White Wood Door	Showers Room	<14

¹ **Result ≥ 5,000 ppm = lead-based paint.**
Result < 5,000 ppm but > RDL = lead-containing paint.

No Detectable Lead Summary

Please note that lead-related materials or components were found to be present in the subject building and therefore the subject building is not certified to be “Lead Free.”

Lead Waste Profiling and Disposal

Under California Title 22 and Federal RCRA regulations, there are multiple criteria for lead hazardous waste including definitions of total and soluble lead content. Wastes-containing total lead in excess of 1000 ppm (0.1% by weight) or soluble lead exceeding 5.0 mg/L by STLC is considered a lead hazardous waste in California. Wastes that contain soluble lead in concentrations exceeding 5.0mg/L by TCLP are considered Federal RCRA hazardous wastes. Wastes that contain lead exceeding the total or soluble lead hazardous waste definitions must be packaged and transported according to hazardous waste handling regulations and disposed of at landfills permitted to accept the waste.

Waste profile testing is generally requested by landfills prior to acceptance of materials known to contain elevated lead levels. Limited preliminary waste profiling for lead has been performed as part of this survey to provide guidance on disposal of wastes that may be produced during renovation. However, waste profiling is intended to represent the waste stream as it will be delivered to the landfill. Typically, high lead-containing materials (i.e. paint coatings) are not segregated from their substrates and multiple materials may be commingled as a normal part of the demolition process. Depending on methods of renovation and debris handling a variety of different waste streams may be produced by this project.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Lead-regulated components have been detected in building components throughout the project site, exceeding a variety of regulatory criteria. To ensure safe handling of material, protection of worker and public health and safety, and compliance with regulatory requirements, we make the following recommendations.

6.1 Asbestos

1. No asbestos was detected in the materials sampled. Any materials not previously sampled, if encountered during renovation activities, shall be tested for asbestos prior to renovation or when site conditions allow.

6.2 Lead Containing Materials

Lead Safe Work Practices

Due to the presence of lead-containing building materials, compliance with Cal-OSHA 8 CCR 1532.1, Lead in the Construction Industry Standard will be required for the general demolition contractor and subcontractor. Workers shall have, at minimum, lead awareness training for any work that disturbs lead-containing materials. Additionally, should any trigger task activity listed in section (d)(2)(A-D) of 8 CCR 1532.1, including, but not limited to, manual demolition, manual scraping, manual sanding, power tool cleaning with or without local exhaust ventilation, abrasive blasting, welding, and cutting where lead-containing paints or components are present be performed, the contractor shall comply with the following requirements:

1. Provide a negative exposure assessment performed within the past 12 months for each anticipated trigger task.
OR
2. Provide workers with interim protections including, but not limited to, provision of a written lead compliance plan, medical surveillance, provision of PPE, a respiratory protection program, provision of hygiene facilities, and performance of exposure assessments in compliance the Lead in Construction Standard.

Typical demolition tasks, such as manual demolition, manual paint scraping, or manual sanding of lead-containing building components, that might be required for this project fall under Trigger Task 1. Because performance of these tasks requires either a negative exposure assessment or performance of the above listed interim protections, it may be difficult for a general contractor to comply with the Cal-OSHA requirements. Please note heavy demolition of lead-containing building components using powered equipment requires compliance with the training and exposure assessment requirements of the Lead Standard.

Other Regulatory Definitions of Lead Paint are detailed in 8 CCR and 22 CCR and CFR title 40 regulations. Cal-OSHA regulations require employee personnel monitoring at any detectable levels of lead until statistically reliable results indicate that exposure will remain consistently below the Cal-OSHA Action Level of $30\text{-}\mu\text{g}/\text{m}^3$ and the Permissible Exposure Level of $50\text{-}\mu\text{g}/\text{m}^3$ for an 8-hour day. The employer must then produce a “Negative Exposure Assessment” to indicate that it is not possible with the specific lead—related paint product to create excessive lead exposure levels.

Lead Waste Profiling

The preliminary waste characterization documented herein suggests that lead is not present in building components above regulatory criteria for hazardous waste. However, because full depth samples could not be collected from painted wall and structural components prior to renovation, Millennium recommends additional waste characterization be performed on debris with lead-containing paint systems. Lead-containing paints are called out in the summary tables in Section 5.0 as profile prior to renovation. Please note that those results, except where noted otherwise, represent paint or single layer samples only. Waste characterization sampling should consist of full depth samples that represent the entire waste stream including substrate and any other inseparable or commingled building components.

Prior to developing a waste characterization plan, we recommended that the contractor contact their preferred landfill and request their acceptance criteria for lead wastes. Based on the landfill acceptance criteria a plan for waste characterization sampling should be developed. Depending on landfill criteria, it may also be possible to composite whole building debris, or groups of building components into single waste streams for waste profiling and disposal. This may result in reduced waste profiling, waste handling, and disposal costs should the profile be non-hazardous. However, there is a risk that the entire commingled waste stream could be profiled as hazardous if a high lead component is present in the composite.

Building components intended for re-use or recycling, do not require additional waste profiling, however, any disturbance of lead-containing materials does require compliance with the above referenced Cal-OSHA Lead Standard.

Appendix A

Analytical Laboratory Reports (Asbestos)



LA Testing

5431 Industrial Drive Huntington Beach, CA 92649

Tel/Fax: (714) 828-4999 / (714) 828-4944

<http://www.LATesting.com> / gardengrovelab@latestesting.com

LA Testing Order: 332307661

Customer ID: MECA62A

Customer PO: DS042623-01

Project ID:

Attention: Jenice Feiner
Millennium Consulting Associates, Inc.
14241 E. Firestone Blvd
Suite 300
La Mirada, CA 90638

Phone: (310) 402-8755

Fax:

Received Date: 04/27/2023 3:10 PM

Analysis Date: 04/28/2023

Collected Date:

Project: 3139.2005 FIRE CAMP 13 RECONSTRUCTION LMTD, HAZMAT SURVEY

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
042623-29-01-Joint Compound <small>332307661-0001</small>	INTERIOR PARTITION WALL - DRYWALL/JOINT COMPOUND	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
042623-29-01-Drywall <small>332307661-0001A</small>	INTERIOR PARTITION WALL - DRYWALL/JOINT COMPOUND	Brown/White Fibrous Heterogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
042623-29-02-Joint Compound <small>332307661-0002</small>	INTERIOR PARTITION WALL - DRYWALL/JOINT COMPOUND	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
042623-29-02-Drywall <small>332307661-0002A</small>	INTERIOR PARTITION WALL - DRYWALL/JOINT COMPOUND	Brown/White Fibrous Heterogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
042623-29-03-Joint Compound 1 <small>332307661-0003</small>	INTERIOR PARTITION WALL - DRYWALL/JOINT COMPOUND	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
042623-29-03-Joint Compound 2 <small>332307661-0003A</small>	INTERIOR PARTITION WALL - DRYWALL/JOINT COMPOUND	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
042623-29-03-Drywall <small>332307661-0003B</small>	INTERIOR PARTITION WALL - DRYWALL/JOINT COMPOUND	Brown/White Fibrous Heterogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
042623-29-04-Joint Compound <small>332307661-0004</small>	INTERIOR SHOWER RM N WALL - DRYWALL/JOINT COMPOUND	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
042623-29-04-Drywall <small>332307661-0004A</small>	INTERIOR SHOWER RM N WALL - DRYWALL/JOINT COMPOUND	Brown/White Fibrous Heterogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
042623-29-05-Joint Compound <small>332307661-0005</small>	INTERIOR SHOWER RM S WALL - DRYWALL/JOINT COMPOUND	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
042623-29-05-Drywall <small>332307661-0005A</small>	INTERIOR SHOWER RM S WALL - DRYWALL/JOINT COMPOUND	Brown/White Fibrous Heterogeneous	12% Cellulose	88% Non-fibrous (Other)	None Detected
042623-29-06-Joint Compound <small>332307661-0006</small>	INTERIOR SHOWER RM W WALL - DRYWALL/JOINT COMPOUND	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 04/28/2023 16:07:27



LA Testing

5431 Industrial Drive Huntington Beach, CA 92649

Tel/Fax: (714) 828-4999 / (714) 828-4944

<http://www.LATesting.com> / gardengrovelab@latesting.com

LA Testing Order: 332307661

Customer ID: MECA62A

Customer PO: DS042623-01

Project ID:

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
042623-29-06-Mesh 332307661-0006A	INTERIOR SHOWER RM W WALL - DRYWALL/JOINT COMPOUND	Green Fibrous Homogeneous	90% Glass	10% Non-fibrous (Other)	None Detected
042623-29-06-Drywall 332307661-0006B	INTERIOR SHOWER RM W WALL - DRYWALL/JOINT COMPOUND	Brown/White Fibrous Heterogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
042623-29-07-Shingle 1 332307661-0007	EXTERIOR ROOF SHINGLE S EDGE - ASPHALT SHINGLE	Brown/Tan/Black Fibrous Heterogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
042623-29-07-Shingle 2 332307661-0007A	EXTERIOR ROOF SHINGLE S EDGE - ASPHALT SHINGLE	Gray/Black Fibrous Heterogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
042623-29-08 332307661-0008	EXTERIOR ROOF SHINGLE N EDGE - ASPHALT SHINGLE	Brown/Tan/Black Fibrous Heterogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
042623-29-09-Shingle 1 332307661-0009	EXTERIOR ROOF SHINGLE W EDGE - ASPHALT SHINGLE	Brown/Black Fibrous Heterogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
042623-29-09-Shingle 2 332307661-0009A	EXTERIOR ROOF SHINGLE W EDGE - ASPHALT SHINGLE	Brown/Gray/Black Fibrous Heterogeneous	10% Glass	90% Non-fibrous (Other)	None Detected

Analyst(s)

Erica Hunter (11)

Mindy Le (8)

Michael Chapman, Laboratory Manager
or Other Approved Signatory

LA Testing maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by LA Testing. LA Testing bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore LA Testing recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by LA Testing Huntington Beach, CA NVLAP Lab Code 101384-0, CA ELAP 1406

Initial report from: 04/28/2023 16:07:27



LA Testing Chain of Custody - One Chain

LA Testing Order Number / Lab Use Only

LA Testing
5431 Industrial Drive
Huntington Beach, CA 92649

PHONE: (714) 828-499
EMAIL: huntingtonbeachlab@latestesting.com

#33230/061

If Bill-To is the same as Report-To leave this section blank. Third-party billing requires written authorization.

Customer Information and Billing Information section containing fields for Customer ID, Company Name (MILLENNIUM CONSULTING ASSOCIATES), Contact Name (JENICE FEINER), Street Address (14241 E. FIRESTONE BLVD. STE 300), City, State, Zip (LA MIRADA, CA 90638), Country (USA), and Billing details.

Project Information section containing Project Name/No. (3139.2005 FIRE CAMP 13 RECONSTRUCTION LMTD. HAZMAT SURVEY), Purchase Order (DS042623-01), US State (CA), and Sampling details (Sampled By Name: DUSTIN STAFFORD).

Turn-Around-Time (TAT) section with checkboxes for 3 Hour, 6 Hour, 24 Hour (checked), 32 Hour, 48 Hour, 72 Hour, 96 Hour, 1 Week, and 2 Week.

ASBESTOS testing options section including PCM Air, TEM - Air, TEM - Bulk, TEM - Settled Dust, and Soil - Rock - Vermiculite (reporting limit) with various NIOSH and EPA method checkboxes.

Filter Pore Size (Air Samples) section with checkboxes for 0.8um and 0.45um.

LEAD (PB) and ICP testing options section including Flame Atomic Absorption and various EPA/NIOSH methods.

MAT-SCI (TAT End of Business Day) section with checkboxes for Common Particle ID, Full Particle ID, Basic Material ID, Advanced Material ID, Physical Testing, Combustion-By-Products, X-Ray Fluorescence, X-Ray Diffraction, MMVFs, Particle Size, Combustible Dust, and Petrographic Examination.

MICROBIOLOGY section including Swab and Bulk Samples, Air Samples, Sewage Screen, Water Samples, DNA & PCR Testing, Legionella, and IAQ (TAT End of Business Day) testing options.

Other Test (please specify) section for additional testing requirements.

Special Instructions and/or Regulatory Requirements section containing contact information: SNUNES@MECAENVIRO.COM and DSTAFFORD@MECAENVIRO.COM.

Relinquished and Received by section with signatures and dates: Relinquished by Dustin Stafford on 04/27/23, Received by G. J. ... on 4/27/23 3:10.

Controlled Document - COC-17 LAT One Chain LA Testing R5 2/28/2021. AGREE TO ELECTRONIC SIGNATURE (By checking, I consent to signing this Chain of Custody document by electronic signature.)

Appendix B

Analytical Laboratory Reports (Lead)



LA Testing

5431 Industrial Drive, Huntington Beach, CA 92649

Phone: (714) 828-4999 Fax: (714) 828-4944 Email: gardengrovelab@latesting.com

Attn:

Jenice Feiner
Millennium Consulting Associates, Inc.
14241 E. Firestone Blvd
Suite 300
La Mirada, CA 90638

Phone: (310) 402-8755

Fax:

4/28/2023

The following analytical report covers the analysis performed on samples submitted to LA Testing on 4/27/2023. The results are tabulated on the attached data pages for the following client designated project:

**3139.2005 FIRE CAMP 13 RECONSTRUCTION LMID HAZMAT
SURVEY**

The reference number for these samples is EMSL Order #332307663. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (714) 828-4999.

Approved By:

Michael Chapman, Laboratory Manager

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.



LA Testing

5431 Industrial Drive, Huntington Beach, CA 92649
 Phone/Fax: (714) 828-4999 / (714) 828-4944
<http://www.LATesting.com> gardenrovelab@latesting.com

LA Testing Order: 332307663
 CustomerID: MECA62A
 CustomerPO: D5042632-02
 ProjectID:

Attn: **Jenice Feiner**
Millennium Consulting Associates, Inc.
14241 E. Firestone Blvd
Suite 300
La Mirada, CA 90638

Phone: (310) 402-8755
 Fax:
 Received: 4/27/2023 03:10 PM
 Collected:

Project: 3139.2005 FIRE CAMP 13 RECONSTRUCTION LMID HAZMAT SURVEY

Analytical Results

Client Sample Description 042623-29-01PB **Collected:** **Lab ID:** 332307663-0001
 EXTERIOR W SIDE WINDOW FRAME -
 BEIGE/METAL

Method	Parameter	Result	RL	Units	Prep Date & Time	Analysis Date & Time
METALS						
3050B/6010D	Lead	5.4	4.8	ppm	4/28/2023 cc	4/28/2023 TH

Client Sample Description 042623-29-02PB **Collected:** **Lab ID:** 332307663-0002
 EXTERIOR N SIDE ROOF LINE EVE - DRK
 BRWN/WOOD

Method	Parameter	Result	RL	Units	Prep Date & Time	Analysis Date & Time
METALS						
3050B/6010D	Lead	<16	16	ppm	4/28/2023 cc	4/28/2023 TH

Client Sample Description 042623-29-03PB **Collected:** **Lab ID:** 332307663-0003
 EXTERIOR W SIDE WALL PANELS -
 BEIGE/METAL

Method	Parameter	Result	RL	Units	Prep Date & Time	Analysis Date & Time
METALS						
3050B/6010D	Lead	37	4.8	ppm	4/28/2023 cc	4/28/2023 TH

Client Sample Description 042623-29-04PB **Collected:** **Lab ID:** 332307663-0004
 INTERIOR PARTITION WALL - GREY/DRYWALL

Method	Parameter	Result	RL	Units	Prep Date & Time	Analysis Date & Time
METALS						
3050B/6010D	Lead	<4.7	4.7	ppm	4/28/2023 cc	4/28/2023 TH

Client Sample Description 042623-29-05PB **Collected:** **Lab ID:** 332307663-0005
 INTERIOR SHOWER RM DOOR FRAME -
 WHITE/WOOD

Method	Parameter	Result	RL	Units	Prep Date & Time	Analysis Date & Time
METALS						
3050B/6010D	Lead	<4.9	4.9	ppm	4/28/2023 cc	4/28/2023 TH



LA Testing

5431 Industrial Drive, Huntington Beach, CA 92649
Phone/Fax: (714) 828-4999 / (714) 828-4944
<http://www.LATesting.com> gardengrovelab@latesting.com

LA Testing Order: 332307663
CustomerID: MECA62A
CustomerPO: D5042632-02
ProjectID:

Attn: **Jenice Feiner**
Millennium Consulting Associates, Inc.
14241 E. Firestone Blvd
Suite 300
La Mirada, CA 90638

Phone: (310) 402-8755
Fax:
Received: 4/27/2023 03:10 PM
Collected:

Project: 3139.2005 FIRE CAMP 13 RECONSTRUCTION LMID HAZMAT SURVEY

Analytical Results

Client Sample Description 042623-29-06PB **Collected:** **Lab ID:** 332307663-0006
INTERIOR SHOWER RM DOOR - WHITE/WOOD

Method	Parameter	Result	RL	Units	Prep Date & Time	Analysis Date & Time
METALS						
3050B/6010D	Lead	<14	14	ppm	4/28/2023 cc	4/28/2023 TH

Definitions:

- MDL - method detection limit
- J - Result was below the reporting limit, but at or above the MDLND - indicates that the analyte was not detected at the reporting limit
- RL - Reporting Limit (Analytical)
- D - Dilution Sample required a dilution which was used to calculate final results



LA Testing Chain of Custody - One Chain

LA Testing Order Number / Lab Use Only

LA Testing
5431 Industrial Drive
Huntington Beach, CA 92649

#332307663

PHONE: (714) 828-499
EMAIL: huntingtonbeachlab@latesting.com

If Bill-To is the same as Report-To leave this section blank. Third-party billing requires written authorization.

Customer Information	Customer ID:	Billing ID:
	Company Name: MILLENNIUM CONSULTING ASSOCIATES	Company Name:
	Contact Name: JENICE FEINER	Billing Contact:
	Street Address: 14241 E. FIRESTONE BLVD. STE 300	Street Address:
	City, State, Zip: LA MIRADA, CA 90638 Country: USA	City, State, Zip: SAME Country:
Phone: 424-293-8845	Phone:	
Email(s) for Report: JFEINER@MECAENVIRO.COM	Email(s) for Invoice:	

Project Information	
Project Name/No: 3139. 2005 FIRE CAMP 13 RECONSTRUCTION LMTD HAZMAT SURVEY	Purchase Order: DS042623-02
LAT LIMS Project ID: (If applicable, EMSL will provide)	US State where samples collected: State of Connecticut (CT) must select project location: <input type="checkbox"/> Commercial (Taxable) <input type="checkbox"/> Residential (Non-Taxable)
Sampled By Name: DUSTIN STAFFORD	Sampled By Signature: <i>[Signature]</i> No. of Samples in Shipment: 6

Turn Around Time (TAT)
 3 Hour 6 Hour 24 Hour 32 Hour 48 Hour 72 Hour 96 Hour 1 Week 2 Week
 Please call ahead for large projects and/or turnaround times 6 Hours or Less. *32 Hour TAT available for select tests only; samples must be submitted by 11:30am.

<p>PCM Air</p> <input type="checkbox"/> NIOSH 7400 <input type="checkbox"/> NIOSH 7400 w/ 8hr. TWA <p>PLM - Bulk (reporting limit)</p> <input type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> PLM EPA NOB (<1%) <input type="checkbox"/> POINT COUNT <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1,000 (<0.1%) POINT COUNT w/ GRAVIMETRIC <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1,000 (<0.1%) <input type="checkbox"/> NIOSH 9002 (<1%) <input type="checkbox"/> NYS 198.1 (Friable - NY) <input type="checkbox"/> NYS 198.6 NOB (Non-Friable - NY) <input type="checkbox"/> NYS 198.8 (Vermiculite SM-V) <input type="checkbox"/> Positive Stop - Clearly Identified Homogeneous Areas (HA)	<p>ASBESTOS</p> <p>TEM - Air</p> <input type="checkbox"/> AHERA 40 CFR, Part 763 <input type="checkbox"/> NIOSH 7402 <input type="checkbox"/> EPA Level II <input type="checkbox"/> ISO 10312* <p>TEM - Bulk</p> <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> NYS NOB 198.4 (Non-Friable-NY) <input type="checkbox"/> TEM EPA 600/R-93/116 w Milling Prep (0.1%) <p>Other Test (please specify)</p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div> <p><i>*Please call with your project-specific requirements.</i></p>	<p>TEM - Settled Dust</p> <input type="checkbox"/> Microvac - ASTM D5755 <input type="checkbox"/> Wipe - ASTM D6480 <input type="checkbox"/> Qualitative via Filtration Prep <input type="checkbox"/> Qualitative via Drop Mount Prep <p>Soil - Rock - Vermiculite (reporting limit)*</p> <input type="checkbox"/> PLM EPA 600/R-93/116 with milling prep (<0.25%) <input type="checkbox"/> PLM EPA 600/R-93/116 with milling prep (<0.1%) <input type="checkbox"/> TEM EPA 600/R-93/116 with milling prep (<0.1%) <input type="checkbox"/> TEM Qualitative via Filtration Prep <input type="checkbox"/> TEM Qualitative via Drop Mount Prep
--	---	--

Filter Pore Size (Air Samples) 0.8um 0.45um

<p>LEAD (PB)</p> <p>Flame Atomic Absorption</p> <input checked="" type="checkbox"/> Chips SW846-7000B or AOAC 974.2 <input type="checkbox"/> Soil SW846-7000B/7420 <input type="checkbox"/> Air NIOSH 7082 <input type="checkbox"/> Wastewater SM3111B or SW846-7000B/7420 <input type="checkbox"/> ASTM Wipe SW846-7000B/7420 <input type="checkbox"/> Non-ASTM Wipe SW846-7000B/7420 <input type="checkbox"/> TCLP SW846-1311/ 7420/ SM3111B	<p>ICP</p> <input type="checkbox"/> TEM EPA 600/R-93/116 w Milling Prep (0.1%) <input type="checkbox"/> Chatfield SOP	<p>MAT-SCI (TAT End of Business Day)</p> <input type="checkbox"/> Common Particle ID (large particles) <input type="checkbox"/> Full Particle ID (environmental dust) <input type="checkbox"/> Basic Material ID (solids) <input type="checkbox"/> Advanced Material ID <input type="checkbox"/> Physical Testing (Tensile, Compression) <input type="checkbox"/> Combustion-By-Products (Soot, Char, etc.) <input type="checkbox"/> X-Ray Fluorescence (Elem. Analysis) <input type="checkbox"/> X-Ray Diffraction (Crystalline Part.) <input type="checkbox"/> MMVFs (Fibrous Glass, RCFs) <input type="checkbox"/> Particle Size (Sieve, Microscopy, Laser) <input type="checkbox"/> Combustible Dust <input type="checkbox"/> Petrographic Examination
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<p>MICROBIOLOGY</p> <p>Swab and Bulk Samples</p> <input type="checkbox"/> Mold & Fungi - Direct Examination <input type="checkbox"/> Mold & Fungi Culture (Genus Only) <input type="checkbox"/> Mold & Fungi Culture (Genus & Species) <input type="checkbox"/> Bacterial Count & ID (Up to 3 Types) <input type="checkbox"/> Bacterial Count & ID (Up to 5 Types) <p>Sewage Screen</p> <input type="checkbox"/> Sewage Screen (P/A) <input type="checkbox"/> Sewage Screen (Membrane Filtration) <p>Water Samples</p> <input type="checkbox"/> Total Coliform & E. Coli (P/A, SM 9223B) <input type="checkbox"/> Heterotrophic Plate Count (PP, SM 9251B) <input type="checkbox"/> Fecal Coliform (SM 9222D)		<p>Air Samples</p> <input type="checkbox"/> Mold & Fungi (Spore Trap) <input type="checkbox"/> Mold & Fungi Culture (Genus Only) <input type="checkbox"/> Mold & Fungi Culture (Genus & Species) <input type="checkbox"/> Bacterial Count & ID (Up to 3 Types) <input type="checkbox"/> Bacterial Count & ID (Up to 5 Types) <p>DNA & PCR Testing: (See Analytical Guide for Code) Test Code:</p> <p>Legionella: (See Analytical Guide for Code) Test Code:</p> <p>P/A= Presence/Absence, PP= Pour Plate</p>	<p>IAQ (TAT End of Business Day)</p> <input type="checkbox"/> Nuisance Dust <input type="checkbox"/> NIOSH 0500 <input type="checkbox"/> NIOSH 0600 <input type="checkbox"/> Airborne Dust <input type="checkbox"/> PM10 <input type="checkbox"/> TSP Silica Analysis: <input type="checkbox"/> All Species Silica Analysis - Single Species <input type="checkbox"/> Alpha Quartz <input type="checkbox"/> Cristobalite <input type="checkbox"/> Tridymite <input type="checkbox"/> HVAC Efficiency <input type="checkbox"/> Carbon Black <input type="checkbox"/> Airborn Oil Mist Radon Testing: Call for Kit and COC
--	--	--	---

Other Test (please specify)

FOR RESULTS
 PLEASE INCLUDE: SNUNES@MECAENVIRO.COM & DSTAFFORD@MECAENVIRO.COM * PLEASE REPORT IN PPM

Method of Shipment:	Sample Condition Upon Receipt:
Relinquished by: <i>[Signature]</i> Date/Time: 04/27/13	Received by: <i>[Signature]</i> Date/Time: 4/27/23 3:10
Relinquished by: <i>[Signature]</i> Date/Time:	Received by: <i>[Signature]</i> Date/Time:

Appendix C

Certifications

State of California
Division of Occupational Safety and Health
Certified Asbestos Consultant

Scott Matthew Nunes

Name



Certification No. 92-0547

Expires on 03/04/24

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.

State of California
Division of Occupational Safety and Health
Certified Site Surveillance Technician

Dustin D Stafford

Name

Certification No. 19-6701

Expires on 01/15/24

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.



ATTACHMENT 3

Security Clearance Form

Pages 1-2

CONFIDENTIAL

**SIERRA CONSERVATION CENTER
JAMESTOWN, CALIFORNIA
REQUEST FOR SECURITY CLEARANCE**

A GATE CLEARANCE is required on any person entering the prison's security area. Before admittance, a security clearance is required on all individuals. Once obtained, a security clearance is valid for **no more than one year** from the date of CI&I. To complete a security clearance, the information below must be provided. Any omissions may result in denial of visiting Sierra Conservation Center. **THIS FORM IS NOT FOR PRE-EMPLOYMENT SCREENINGS FOR ANY CDCR OR CONTRACT EMPLOYEE.**

**** PLEASE READ AND SIGN BOTH FRONT AND BACK OF FORM ****

VISITOR NAME (PRINT):		Attorney/Legal Visit: <input type="checkbox"/> Put Inmate name, CDC # in comment section	
GENDER <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE		ETHNIC <input type="checkbox"/> WHI <input type="checkbox"/> HISP <input type="checkbox"/> ASIAN <input type="checkbox"/> BLK <input type="checkbox"/> AMI <input type="checkbox"/> OTH	
VISITOR OR BUSINESS/AGENCY ADDRESS AND PHONE NUMBER:			
DATE OF BIRTH	SOCIAL SECURITY # or STATE BAR #	DRIVERS LICENSE # & STATE	
PURPOSE OF VISIT:		<input type="checkbox"/> ONE DAY VISIT on _____ <input type="checkbox"/> VARIOUS DATES	
HAVE YOU EVER BEEN ARRESTED? YES <input type="checkbox"/> NO <input type="checkbox"/> If yes explain in comments below			
HAVE YOU EVER BEEN CONVICTED OF A FELONY? YES <input type="checkbox"/> NO <input type="checkbox"/> If yes explain in comments below			
COMMENTS:			
VISITOR SIGNATURE:			DATE

D E P A R T M E N T U S E O N L Y	REQUESTING EMPLOYEE NAME AND TITLE (PRINT):		REQUESTING EMPLOYEE SIGNATURE:			
	REQUESTING EMPLOYEE DEPARTMENT:		PHONE EXT.:	DATE:	NEW CI&I <input type="checkbox"/> CI&I RENEWAL <input type="checkbox"/>	
	Custody Captain:		APPROVED: YES <input type="checkbox"/> NO <input type="checkbox"/>		DATE:	
	Associate Warden, Central Division		APPROVED: YES <input type="checkbox"/> NO <input type="checkbox"/>		DATE:	
	Warden (if applicable):		APPROVED: YES <input type="checkbox"/> NO <input type="checkbox"/>		DATE:	
	CI&I APPROVAL BY:					
	CORRECTIONAL CASE RECORDS MANAGER				DATE:	
	FOYER USE ONLY		INPUT DATE: _____	INPUT BY: (Initials) _____		
	EXP. DATE (not to exceed one year):					

BACK OF ATTACHEMENT A

Listed below are outlined rules and regulations governing the behavior of visitors and guest of the Sierra Conservation Center, Jamestown, California. The California Penal Code provides the following:

Section 4534: Any person who helps a prisoner escape or attempt to escape shall be imprisoned not more than ten years and may be fined not more than \$10,000.00.

Section 4545: Any person who carries into a State Prison anything useful to help a prisoner escape shall be imprisoned for one year to life.

Section 4570: Any person who communicates with any prisoner, or gives to him, or takes from him, any letter, writing or reading matter, without prior permission is guilty of a misdemeanor, and is subject to a sentence of six months and a fine of \$5,000.00

Section 4571: Any inmate of a California State Prison who comes on-grounds of any prison without permission of the person in charge may be imprisoned for not more than five years.

Section 4573, 4573.5 and 4573.6, **Health and Safety Code 1107**: Any person who brings into prison any drugs, tobacco, alcoholic beverage, **and medicinal marijuana**, without the specific authorization of the proper officials, is subject to a sentence of six months to five years.

Section 4574: Any person who brings firearms, deadly weapons, or explosives, into any prison may be imprisoned for two, three, or four years.

Section 4567: Any person who brings any cellular device or other wireless communication with the intent to deliver, or delivers, to an inmate is subject to a sentence of six months and/or a fine not to exceed five thousand dollars for each device.

The Department of Corrections Rehabilitation Manual, Chapter 3, Article 11, Smoking/Non-Smoking and Tobacco Prohibition states that smoking is prohibited on state property. All tobacco products must remain in vehicles while on state property.

RULES CONCERNING VISITORS:

Trading or bartering on the part of the visitor with inmates is forbidden. Visitors must not give to or receive anything from an inmate without the prior approval of the office in charge. Visitors shall not indulge in familiarity with inmates nor shall they permit any familiarity on the part of inmates toward themselves. No visitor may come upon the grounds of the institution if he/she appears to have been using intoxicants or drugs. .

No tips, gifts or reward of any kind shall be given or promised to any inmate for any reason. No inmate shall ask for or accept a gift or favor from any visitor, nor shall be given a gift or a promise of one.

IN ADDITION TO THE RULES AND REGULATIONS ABOVE PLEASE BE ADVISED OF THE FOLLOWING:

All outside guest must be previously cleared through the Warden in advance of visiting the institution. The Custody Captain's Office maintains a log of all person(s) that are approved or disapproved.

Visitors must understand that the California Department of Corrections & Rehabilitation does not recognize hostages for bargaining purposes.

No male or female visitor wearing blue jeans or chambray (blue denim) shirts will be allowed into the institution.

If currently on parole, you must submit written approval from your parole or probation officer before approval is granted to visit Sierra Conservation Center.

VISITOR'S SIGNATURE

DATE