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shall submit a signed copy of this record to the Engineer at the end of each week.

**7-2.2.5 Employment of Aliens.** The Contractor shall warrant that it fully complies with all laws regarding employment of aliens and others, and that all of its employees performing services hereunder meet the citizenship or alien status requirements contained in Federal and State statutes and regulations including, but not limited to, the Immigration Reform and Control Act of 1986 (P.L. 99-603). When requested by the Engineer, this warrant shall be in writing to the Agency. The Contractor shall obtain, from all covered employees performing services hereunder, all verification and other documentation of employment eligibility status required by Federal statutes and regulations as they currently exist and as they may be hereafter amended. The Contractor shall retain such documentation for all covered employees for the period prescribed by law. The Contractor shall indemnify, defend, and hold harmless, the Agency, its officers and employees from employer sanctions and any other liability which may be assessed against the Contractor or the Agency or both in connection with any alleged violation of Federal statutes or regulations pertaining to the eligibility for employment of persons performing services under the Contract.

**7-2.2.6 Payroll Records.** Pursuant to Section 1776 of the California Labor Code, the Contractor shall keep accurate payroll records showing the name, address, social security number, work classification, straight time, and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee the Contractor employs in connection with the Work.

Whenever required by the Special Provisions or so requested by the Engineer, the Contractor shall submit to the Engineer a certified copy of each such employee's payroll record ("certified payrolls") at the end of each week for the period ending the previous week. Failure to submit such payroll records will result in the Agency withholding from any monies due the Contractor the amount of \$250 for each week in which certified payrolls have not been submitted.

Add the following subsections:

**7-2.3 County Equal Employment Opportunity (EEO) Provisions.** During the performance of any non-Federally-funded contract in excess of \$10,000.00, 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, its 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 antidiscrimination 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 its 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. The Contractor shall report minority and female employment data monthly on the Federal form provided by the Agency.

This form shall be submitted to the Engineer each month on or before the date of the monthly progress estimate specified in 9-3.2 of the Special Provisions for the following month. Failure to submit this form will result in the Agency withholding \$200 from any monies due the Contractor for each month in which the form was not submitted within the specified time frame.

5) The Contractor shall send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Agency, advising the said labor union or worker's representative of the Contractor's commitments under this subsection.

6) The Contractor shall allow the Agency access to its employment records during regular business hours to verify compliance with these provisions when so requested by the Agency.

7) The Contractor agrees that if the Agency finds that any of the above provisions have been violated, the same shall constitute a material breach of the Contract upon which the Agency may determine to cancel, terminate or suspend the Contract. While the Agency reserves the right to determine independently that the antidiscrimination 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 antidiscrimination laws may constitute a finding by the Agency that the Contractor has violated the antidiscrimination provisions of the Contract.

8) At its option, and in lieu of canceling, terminating or suspending the Contract, the County may impose damages for any violation of the antidiscrimination provisions of this subsection, in the amount of \$200.00 for each violation found and determined. The County and the 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 1 through 8 in every subcontract over \$10,000.00, so that such provisions will be binding upon each Subcontractor performing work required by the Contract.

**7-2.4 County Child Support Compliance Program.** The Contractor shall acknowledge that the County has established a goal of ensuring that all individuals who benefit financially from the Agency through contracts are in compliance with their court-ordered child, family, and spousal support obligations in order to mitigate the economic burden otherwise imposed upon the County and its taxpayers.

As required by the County's Child Support Compliance Program (County Code Chapter 2.200) and without limiting the Contractor's requirements under the Contract to comply with all applicable provisions of law, the Contractor warrants that it is now in compliance, and shall during the duration of the 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 served Wage and Earnings Withholdings Orders or CSSD Notices of Wage and Earnings Assignment for Child, Family, or Spousal Support, pursuant to Code of Civil Procedure Section 706.031 and Family Code Section 5246(b).

**7-2.5 Federal Earned Income Credit Notification.** The 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.

#### **7-2.6 Jury Service Program.**

**7-2.6.1 General.** This Contract is subject to the provisions of the Contractor Employee Jury Service Ordinance ("Jury Service Program") as codified in Sections 2.203.010 through 2.203.090 of the Los Angeles County Code.

**7-2.6.2 Written Employee Jury Service Policy.** Unless the Contractor has demonstrated to the Agency's satisfaction either that the Contractor is not a "Contractor" as defined under the Jury Service Program (Section 2.203.020 of the County Code) or that the Contractor qualifies for an exception to the Jury Service Program (Section 2.203.070 of the County Code), the 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.

For purposes of this subsection, "Contractor" shall mean a person, partnership, corporation or other entity which has a contract with the Agency or a subcontract with an Agency contractor and has received or will receive an aggregate sum of \$50,000 or more in any 12-month period under one or more Agency contracts or subcontracts. "Employee" shall mean any California resident who is a full time employee of the 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 Agency. If the Contractor uses any Subcontractor to perform services for the Agency under the Contract, the Subcontractor shall also be subject to the provisions of this subsection. The provisions

of this subsection shall be inserted into any such subcontract agreement and a copy of the Jury Service Program shall be attached to the agreement.

**7-2.6.3 Change in Contractor Status.** If the Contractor is not required to comply with the Jury Service Program when the Contract commences, the Contractor shall have a continuing obligation to review the applicability of its “exception status” from the Jury Service Program, and the Contractor shall immediately notify the Agency 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 shall immediately implement a written policy consistent with the Jury Service Program. The Agency may also require, at any time during the Contract and at its sole discretion, that the Contractor demonstrate to the Agency’s satisfaction the Contractor either continues to remain outside of the Jury Service Program’s definition of “Contractor” and/or that the Contractor continues to qualify for an exception to the Program.

**7-2.6.4 Noncompliance.** The Contractor’s noncompliance with this subsection may constitute a material breach of the Contract. In the event of such material breach, the Agency may, in its sole discretion, terminate the Contract and/or bar the Contractor from the award of future Agency contracts for a period of time consistent with the seriousness of the breach.

### **7-2.7 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 the County, and where and how to safely surrender a baby. The fact sheet is available on the Internet at [www.babysafela.org](http://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 Contractor shall 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.

### **7-2.8 Recycled Paper.**

Consistent with the Board policy to reduce the amount of solid waste deposited at the County landfills, the Contractor shall use recycled paper to the maximum extent possible throughout the duration of the Contract.

**7-2.9 County Lobbyist Ordinance.** The Contractor and each County lobbyist or County lobbying firm as defined in Los Angeles County Code Section 2.160.010, retained by the Contractor, shall fully comply with the County Lobbyist Ordinance, Los Angeles County Code Chapter 2.160. Failure on the part of the Contractor or any County lobbyist or County lobbying firm retained by the Contractor to fully comply with the County Lobbyist Ordinance

shall constitute a material breach of the Contract upon which the Agency may immediately terminate or suspend the Contract.

**7-3 LIABILITY INSURANCE.** Add the following after the first paragraph:

The policy shall be conditioned to cover the performance of "Extra Work" should such work become necessary.

Replace the last sentence of the fourth paragraph with the following:

The Agency will not be liable for any accident, loss or damage to the Work prior to the time that the Contractor is relieved of responsibility to protect the Work as provided in 6-8 and 6-10 except for certain "Acts of God" in conformance with Section 7105 of the Public Contract Code.

**7-4 WORKERS' COMPENSATION INSURANCE.** Add the following to the end of the third paragraph:

Such policies shall be endorsed to waive subrogation against the Agency 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.

In all cases, the above insurance shall include employer's liability coverage with limits not less than:

Each Accident:	\$1,000,000
Disease – policy limit:	\$1,000,000
Disease – each employee:	\$1,000,000

Add the following to the end of the last paragraph:

Should evidence of the renewal or replacement of the policy not be filed with the Agency prior to the expiration or cancellation date, the Agency will stop all work on the Project and no further work shall be performed until new insurance coverage has been obtained by the Contractor. Such stop order shall not be a cause for a time extension to the Contract duration.

**7-5 PERMITS.** Add the following:

An Oak Tree permit issued by the County of Los Angeles Department of Regional Planning is required prior to trimming, removing, or encroaching within the dripline of any Oak Tree within unincorporated areas with a trunk diameter of 200mm(8 inches) or greater. For further information, call (213) 974-6411.

For Projects affecting trees within an incorporated City, the Contractor shall determine from the appropriate City official(s), the name(s) of any protected tree species within that City. The Contractor shall obtain a permit at its expense from the City to modify or remove any protected tree.



**7-6 THE CONTRACTOR'S REPRESENTATIVE.** Add the following as the last paragraph:

The failure of the designated representative(s) to faithfully prosecute the Work, including, but not limited to, failure to adhere to the Contractor's construction schedule shall be deemed grounds for removal from the Work per 7-2.1.

**7-7 COOPERATION AND COLLATERAL WORK.** Add the following after the last paragraph:

When the Plans or Special Provisions indicate that a portion or all of the above work is to be performed by others, the Contractor shall notify the Engineer a sufficient amount of time in advance of construction to enable the Engineer to give the affected agency 72 hours notice to perform the work. This shall also apply to all other facilities of a similar nature which are located in public streets over which another agency has jurisdiction or control, and which must be relocated, reconstructed, or modified to permit or facilitate the construction of the Project. Such relocation, reconstruction, or modification will be requested when, in the opinion of the Engineer, such work is necessary for construction of the Project. This work will be performed at no cost to the Contractor. However, relocation, reconstruction, or modification of the above-mentioned facilities performed for the convenience of the Contractor, or because of damage caused by the Contractor's operations, shall be at the Contractor's expense.

**7-8 PROJECT SITE MAINTENANCE.**

**7-8.1 Cleanup and Dust Control.** Replace the second paragraph with the following:

During all phases of trenching operations and whenever dirt or base material is stored on paved roadways, the Contractor shall furnish and operate a motorized street sweeper with spray nozzles at least once a day within the areas of his operations and, as determined by the Engineer, along haul routes. The sweeping shall be near or after the end of construction operations for the day. At the same time, the Contractor shall also sweep the sidewalks either manually or with a motorized street sweeper in the vicinity of the construction operations. The sweeping operations shall produce a clean surface throughout the Project area.

If, in the opinion of the Engineer, this effort does not result in satisfactorily clean streets and sidewalks, then the Contractor shall take whatever other measures are necessary to keep the streets and sidewalks clean. Such measures may include, but not be necessarily limited to, more frequent use of a motorized street sweeper as noted above, the use of a self-loading vacuum sweeper and/or sufficient hand labor to satisfactorily comply with this specification.

**7-8.2 Air Pollution Control.** Add the following before the first paragraph:

**7-8.2.1 General.**

Add the following subsection:

**7-8.2.2 Control of Fugitive Dust.** The Contractor shall comply with Amended Rule 403 and Rule 1186 of the South Coast Air Quality Management District. Copies of these rules and further information may be obtained from the following:

South Coast Air Quality  
Management District  
21865 Copley Drive  
Diamond Bar, CA 91765

Telephone: (909) 396-3600

**7-8.7 Drainage Control.** Add the following as the first paragraph:

The Contractor shall ensure that storm and drainage water does not pond due to the temporary blockage of existing drainage facilities. To this end, the Contractor shall provide temporary works which allow for the passage of storm and drainage water in a manner equivalent to the existing drainage system.

The capacity of unlined and concrete-lined channels shall be maintained as follows:

April 15 to May 31:	33%
June 1 to August 31:	5%
September 1 to October 15:	33%
October 16 to April 14:	100%

Any work which could adversely affect the hydraulic capacity or structural integrity of a flood control channel shall be performed during the period between April 15 and October 15. Any work started after April 15 shall be completed prior to the following October 15 and shall be coordinated with the Agency's Water Resources Division, Operations Section, (626) 458-6177.

Add the following subsection:

**7-8.8 Graffiti Removal.** The Contractor shall maintain the Work, all of its equipment, and all traffic control devices, including signage, free of graffiti throughout the duration of the Contract. The Contractor shall respond to any request from the Engineer to remove graffiti within 4 hours of notification. Should the Contractor fail to respond to such request, the Agency reserves the right to make other arrangements for the requested graffiti removal and deduct the cost from any monies due the Contractor.

**7-9 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS.** Add the following:

Except as may otherwise be provided in specific instances, nothing in the Contract or any permit shall be construed as vesting in the Contractor any property right in any material, article or structure existing at the time of award of the Contract within the area in which the Work is to be done; or in any material or article subsequently furnished for the Work by the Contractor after having been accounted for on an approved estimate supporting the Contractor's demand for payment as provided in 9-3. In the latter event any such material, article, structure or work shall become the property of the Agency after being so accounted for.

The Contractor will be required to maintain the pavement within construction areas. Any pavement damaged by the Contractor or its subcontractors and all pavement constructed on the Project which becomes damaged shall be repaired or replaced, as directed by the Engineer, at the Contractor's expense.

Where curb or sidewalk in a pedestrian crosswalk area is damaged by the Contractor or must be removed to construct underground improvements, the Contractor shall construct a curb ramp as part of the restoration required by this subsection. At an intersection, the crosswalk area shall be considered as including, but not necessarily limited to, the entire curb return area. If the damaged or removed curb is in an area where no sidewalk exists, the curb ramp will not be required. The curb ramp shall be constructed in accordance with the Standard Plan referenced on the Plans or as directed by the Engineer. This work shall be performed at the Contractor's expense.

In the event field conditions necessitate a change of plan which requires the removal of curb or sidewalk not previously requiring removal within a pedestrian crosswalk area as specified above, the Contractor shall construct a curb ramp. The curb ramp shall be constructed in accordance with the Standard Plan referenced on the Plans or as directed by the Engineer. Payment for construction of a curb ramp will be considered as "Extra Work" per 3-3 of these Additions and Amendments.

Should any operation of the Contractor cause damage to a sewer or storm drain not delineated on the Plans to be removed, relocated or reconstructed which, in the opinion of the Engineer, cannot be properly restored, replaced or reconstructed without a special plan being prepared, the Contractor and the owner of the sewer or storm drain will be so advised by the Engineer. The Contractor shall prepare and submit a suitable reproducible plan for the restoration, replacement or reconstruction of the facility. The Contractor shall obtain a permit for such work from the owner of the facility. The costs of the permit and the restoration, replacement or reconstruction of the facility and any and all associated delay costs shall be borne entirely by the Contractor. In performing the restoration, replacement or reconstruction of the facility under permit, the owner of the facility will furnish the required inspection in order that the facility may be restored, replaced or reconstructed in a manner satisfactory to the owner, and the cost of inspection shall be borne by the Contractor.

Areas to be excavated for storm drains, waterlines, or sewer lines that are neither presently covered nor scheduled to be permanently covered under the Contract by some type of material, such as asphalt concrete, portland cement concrete, grouted rock, stonework or rubble, which renders such areas unplatable, shall be considered for the purposes of these Specifications to be plantable and shall be covered with a 150mm(6-inch)

layer of topsoil. Unless otherwise specified, the top 150mm(6 inches) of all such plantable areas shall be restored with imported Class A Topsoil per 308. In lieu of importing such topsoil the Contractor may, at its option, reuse the existing top 150mm (6 inches) of soil from such areas, provided it has been carefully segregated during excavation and construction operations, and is approved for use by the Engineer. These requirements do not apply to permanent access roads and beach areas.

With respect to the restoration of lawns for the construction of storm drain, waterline, or sewer line improvements, where the Contract requires their removal, or it has been damaged or removed through the Contractor's operations, the Contractor shall comply with the following minimum requirements: The grass seed used shall be for grass of the same type as was removed, or an approved equal, and shall be sown at the rate recommended by the seed distributing company. Processed deseeded steer manure shall be applied to the planted area at the rate recommended by the vendor. The Contractor shall water and care for replaced lawns until the grass has attained a complete cover and has been given its first cutting, unless other arrangements are made with the affected property owner(s). The lawn restoration, as described above, shall be completed prior to the final Contract payment.

On storm drain, water line, and sewer line construction projects, the Contractor shall be responsible for the relocation, reconstruction, or modification of traffic control, police and fire signal installations, safety lighting, and street lighting. If no items of work are provided therefore, all costs for such work shall be considered as included in the prices in the Bid for the various items of work provided the utilities are shown on the Plans.

All existing permanent traffic and bus stop signs which are removed or altered during construction shall be replaced by the Contractor to a condition equal to or better than, in all respects, the condition which prevailed prior to the start of construction under the Contract. While construction is in progress, any signs which are removed shall be posted by the Contractor in temporary locations as near the original locations as practicable. Signs shall be replaced in their original location as soon as possible. Traffic sign replacement shall be in conformance with the current requirements of the Manual on Uniform Traffic Control Devices, [www.mutcd.fhwa.gov](http://www.mutcd.fhwa.gov), and its California supplements, [www.dot.ca.gov/hg/traffops/signtcch/mutcdsupp](http://www.dot.ca.gov/hg/traffops/signtcch/mutcdsupp). If any sign is damaged or lost, thus requiring a new sign, the Contractor shall immediately notify the Engineer, and shall immediately replace any traffic sign in accordance with the above-mentioned manual at its own expense. The replacement of traffic signs must be approved by the Engineer in writing.

The Contractor shall maintain all existing roadside mailboxes in an erect and functional position and condition at all times during the construction duration, including when in temporary locations if necessary. Blockouts shall be left in new sidewalk, where required, for mailboxes as directed by the Engineer. The Contractor shall install approved mailboxes with posts furnished by box owners in permanent locations in accordance with Standard Plan 101. Any of these facilities which are damaged or lost shall immediately be replaced by the Contractor at no cost to the Agency.

Any sprinkler system damaged by the Contractor's operations shall immediately be replaced and rehabilitated by the Contractor at no cost to the Agency. Vegetation damaged as a result of the sprinkler system being damaged due to the Contractor's operations shall be restored at the Contractor's expense. The Contractor shall completely replace and

rehabilitate any interfering sprinkler system, including relocating sprinkler heads to the back of sidewalk, in order to produce a fully functional system. All costs for removing, modifying, or restoring sprinkler systems, including the relocation of sprinkler heads, shall be considered as included in the prices in the Bid for the various items of work.

The severed ends of block walls shall be rebuilt in-kind at the property line. Half-block voids shall be filled with half-blocks and the exposed ends of walls shall be finished in a neat and workmanlike manner, as directed by the Engineer.

Any fence or railing designated on the Plans to be relocated shall be inspected and its existing condition verified by the Engineer prior to the start of construction. Fence or railing to be relocated shall be carefully removed and stored until ready for reinstallation. It shall be reinstalled, in-kind, in the permanent location indicated on the Plans. Posts, rails, tension rods and wires, boards, fabric, gates, barbed wire, footings and other facilities shall be of a size, strength and condition equal to, or better than, the above-mentioned existing condition. Any material damaged during construction shall be replaced by the Contractor at no cost to the Agency. Full compensation for complying with the above requirements for fence or railing relocation and for all necessary materials, new or used, and all labor shall be considered as included in the Contract Unit Price for the appropriate item(s) for relocating fence or railing. If no such items are included in the Bid, the costs of this work shall be considered as included in the prices in the Bid for the various items of work.

The Contractor shall exercise special care to protect all oak trees in place during construction. Refer to 7-5 of these Additions and Amendments for information regarding oak tree permits. Should watering of an area adjacent to an oak tree be necessary at any time, such water shall not be allowed to come in contact with the tree trunk nor shall it be allowed to pond within the dripline of any tree. The base (root crown) of any oak tree shall be kept clear of soil and debris at all times. Pruning of oak trees shall be limited to the removal of dead or diseased limbs. Heavy pruning will not be permitted at any time. Any tree roots 25mm(1 inch) or greater in diameter which must be removed or are damaged during construction operations shall be saw cut evenly at right angles to the longitudinal axis of the root and shall be painted with "Treeseal" or an equivalent tar product. If the soil level adjacent to the tree is to be raised, a tree well as indicated and detailed on the Plans shall be constructed around the tree prior to the start of fill operations so that soil does not come in contact with the tree trunk. In no case shall any part of the tree well extend any closer to the tree trunk than 0.9m(3 feet) inside the dripline of the tree. If the soil level adjacent to the tree is to be lowered, the grading shall be done outside of the dripline of the tree except as otherwise permitted by the Engineer and the Oak Tree Permit.

The following provisions shall apply for storm drain, waterline, and sewerline construction:

- 1) Concrete pavement removal and replacement shall conform to 302-6 of these Additions and Amendments, and Standard Plan 132, unless otherwise specified.
- 2) In the event a portion of curb, gutter or monolithic curb and gutter is damaged by the Contractor's operations, a minimum of 3.1m(10 feet) of curb, gutter or curb and gutter shall be removed and replaced regardless of how short a length is damaged. One end of said 3.1m(10-foot) section may be taken at a joint or scoring line and the other end shall be measured the minimum distance of 3.1m(10 feet) therefrom. If said 3.1m(10 feet) falls within 0.9m(3 feet) of a joint or scoring line, then the removal shall extend to said joint or scoring line.

- 3) When concrete local depressions are to be constructed at locations where there is an existing monolithic curb and gutter, the existing monolithic curb and gutter shall be removed to the limits of the local depression, or to the next joint or scoring line beyond the local depression if such joint or scoring line is less than 0.9m(3 feet) away. The new curb shall then be reconstructed monolithic with the local depression or with the gutter if the curb was removed beyond the limits of the local depression.
- 4) When concrete local depressions are to be constructed using existing finished street surface as the vertical control for the outer edge of the local depressions, particular attention shall be given to constructing the local depression on a straight grade from outer corner to outer corner.
- 5) Sidewalk and driveway replacement shall conform to Standard Plan 113, unless otherwise specified.
- 6) Unless otherwise specified on the Plans or in the Special Provisions, the removal and replacement of concrete cross gutters and spandrels shall conform to LACDPW Standard Plan 3082.
- 7) The Contractor shall exercise all necessary precautions so as not to damage or destroy any trees or shrubs and shall not trim or remove any trees unless such trees have been approved for trimming or removal by the Engineer. All existing trees and shrubs which are damaged during construction shall be trimmed or replaced by the Contractor, or a licensed tree contractor which employs a certified arborist, to the satisfaction of the Engineer. Tree trimming and replacement shall be accomplished in accordance with the following requirements:
  - (a) Trimming. Symmetry of the tree shall be preserved; no shrubs or splits or torn branches shall be left; and clean cuts shall be made close to the trunk or a large branch. Spikes shall not be used for climbing live trees. All cuts over 38mm(1-1/2 inches) in diameter shall be coated with the tree paint "Prune Tex" as manufactured by the Dau-Hansen Paint Company, Inc.; "Cerano" as manufactured by John Taylor Chemicals; or equal, as approved by the Engineer.
  - (b) Replacement. The Contractor shall immediately notify the Engineer and any city involved if any tree is damaged by its operations. If, in the opinion of the Engineer, the damage is such that replacement is necessary, the Contractor shall replace the tree at its own expense. The tree shall be of a like variety as the damaged tree and shall be subject to the approval of the Engineer. The size of the tree shall be 600mm(24-inch) box and not less than 19mm(3/4-inch) in diameter nor less than 1.8m(6 feet) in height.

## **7-10 PUBLIC CONVENIENCE AND SAFETY.**

### **7-10.1 Traffic and Access.** Add the following to the end of the second paragraph:

Unless the Contractor makes other arrangements satisfactory to the Engineer and the owners, the following shall also apply to business establishments:

1) For each establishment (such as, but not limited to, gas stations, markets and other "drive-in" businesses) on the corner of an intersection which has a driveway (or driveways) on each intersecting street, the Contractor shall provide vehicular access to at least one driveway on each intersecting street unless otherwise approved in writing by the Engineer.

2) For each establishment (such as but not limited to motels, parking lots and garages) which has a one-way traffic pattern with the appropriate entrance driveway and exit driveway, the Contractor shall provide vehicular access to both the entrance driveway and the exit driveway.

Add the following after the second paragraph:

At least 24 hours in advance of closing or restricting access to any property, the Contractor shall notify the owner or resident of said property. A copy of said notification shall be provided to the Engineer. The Contractor shall conduct its operations, including those of its subcontractors and suppliers, so as to provide reasonable access to the adjacent properties and have no greater length or quantity of work under construction than can be properly prosecuted with a minimum of inconvenience to the public and other contractors engaged on adjacent or related work.

### **7-10.2 Storage of Equipment and Materials in Public Streets.** Add the following:

The Contractor shall not park nor store equipment at the site of a church on their sabbath days.

### **7-10.3 Street Closures, Detours, Barricades.** Replace the entire subsection with the following:

#### **7-10.3.1 General.**

The Contractor shall comply with all applicable State, County and City requirements for the closure of streets. The Contractor shall provide flagpersons and watch persons as required to control traffic and advise the public of detours and construction hazards. The Contractor shall also be responsible for compliance with additional public safety requirements which may arise during construction.

If a traffic control plan is not provided by the Agency, the Contractor shall submit to the Engineer within 10 calendar days after award of the Contract, its proposed schedules for street closures and lane closing, and its proposed methods for traffic control to comply with the requirements specified in 7-10.3.3. Key traffic control schedule activities and milestones shall be included in the Contractor's construction schedule as specified in 6-1. This submittal shall be made sufficiently in advance of any rerouting or diversion of traffic by the Contractor

to allow for review and approval of the proposed traffic control by the Agency. Street closure schedules must be submitted 20 calendar days prior to closing any street.

At least 48 hours in advance of closing, or partially closing, or reopening, any street, alley, or other public thoroughfare, the Contractor shall notify the Police, Fire, traffic and engineering departments of jurisdictional agencies involved, and comply with their requirements. Proposed deviations from this procedure must first be approved in writing by the Engineer.

Where streets in which storm drain, waterline, or sewer line conduit is being constructed are to be closed to through traffic, it shall be understood that such closures shall apply only to the portions of such streets where construction is actually in progress. Unless otherwise specified, the Contractor shall provide access for local vehicular and pedestrian traffic on streets closed to through traffic.

Any street or alley, which intersects the street in which mainline conduit construction work is being done and for which traffic requirements are not otherwise specified, may be closed at its intersection with the Work provided that two adjacent streets are not closed simultaneously. However, where the street in which mainline conduit construction work is being done is the only access to a cul-de-sac or dead end street or alley, vehicular access thereto shall be maintained at all times.

Where access to the Work sites involves passage through locked gates, the Contractor shall furnish its own locks in order to provide itself passage through the gates while maintaining security.

It shall be the Contractor's responsibility to allow passage of public transit coaches through construction areas at all times. For the Metropolitan Transportation Authority (MTA), the Contractor shall notify the Stops and Zones Representative, (213) 972-7100, at least 48 hours prior to construction at bus stop zones to allow the MTA to temporarily abandon and relocate bus stop zones within the construction area.

All street closures, detours, lane closures, signs, lights and other traffic safety devices required shall conform to the requirements of the Manual on Uniform Traffic Control Devices, [www.mutcd.fhwa.gov](http://www.mutcd.fhwa.gov), and its California supplements, [www.dot.ca.gov/hg/traffops/signtcch/mutcdsupp](http://www.dot.ca.gov/hg/traffops/signtcch/mutcdsupp).

For all projects other than Private Contract projects, the Agency will furnish any necessary "No Parking" signs (signs) at no cost to the Contractor. Signs shall be installed by the Contractor after approval for such by the Engineer. Signs shall be installed for each construction activity or operation, unless such activities or operations will occur within 2 working days of each other. Signs shall be posted a minimum of 48 hours in advance of the start of each "No Parking" restriction.

In addition to the requirements of this subsection, the Contractor shall conform to the requirements for street closures, lane closures, detours and traffic safety devices as stipulated in the Special Provisions. However, deviations from the requirements stipulated in the Special Provisions may be permitted upon written approval of the Engineer when such deviations are in the best interests of the Agency and are approved by any jurisdictional City



or State agency.

Payment for compliance with the requirements of this Subsection 7-10.3 shall be considered as included in the prices in the Bid for the various items of work, or, if included as a Bid item, in the lump sum Bid price for "TRAFFIC CONTROL."

**7-10.3.2 Work by the Agency.** The Special Provisions will indicate any traffic control work which will be provided by the Agency at no cost to the Contractor. Upon 7 calendar days advance notice by the Contractor, the Engineer will arrange for the Agency services. These services are only available Monday through Thursday excluding legal holidays.

When striping for new pavement or restriping for existing pavement is to be performed by the Agency, it shall be the Contractor's responsibility to provide and maintain the temporary raised reflective markers or delineators in place until such time as the striping or restriping is actually accomplished unless otherwise approved by the Engineer.

**7-10.3.3 Construction Traffic Control and Traffic Control Plan.** Unless the Special Provisions indicate that traffic control is to be provided by the Agency, the Contractor shall provide the traffic control. The Contractor shall submit a traffic control plan per 2-5.3 for approval by the Agency when so specified in the Special Provisions or the Construction Permit. When the traffic control plan is included with the Contract Plans, the Contractor is relieved of this requirement. Traffic control activities and milestones shall be shown as activities on the Contractor's construction schedule per 6-1.

In general, when restriping of a roadway is necessary, a traffic control plan will be required. A traffic control plan will also be required under the following conditions:

1. When traffic is to be diverted to the left of a double yellow centerline for overnight construction, unless otherwise directed by the Engineer.
2. When the Work area is an intersection or adjacent thereto and requires a transition through the intersection.
3. When a traffic lane is obstructed for more than three consecutive nights, unless otherwise approved by the Engineer.
4. When traffic volumes dictate that the minimum number of traffic lanes cannot be maintained with the existing channelization.
5. In other unusual situations where traffic and physical conditions such as speed, restricted visibility, grade or alignment require special treatment.
6. When requested by the Engineer.

The requirements set forth in the Manual on Uniform Traffic Control Devices, [www.mutcd.fhwa.gov](http://www.mutcd.fhwa.gov), and its California supplements, [www.dot.ca.gov/hq/traffops/signtcch/mutcdsupp](http://www.dot.ca.gov/hq/traffops/signtcch/mutcdsupp) shall govern the design of the proposed traffic control. Traffic control plans shall be prepared and stamped by a Civil Engineer registered by the State of California and submitted to the Agency in accordance with 2-5.3.

The traffic control plan shall be drawn to a 1" = 40' scale on common size sheets, either 8 1/2" x 11", 8 1/2" x 14", 11" x 17", or standard 2' x 3' plan sheets as dictated by the length of the Project. The total length of the Project shall be shown including the advance signing and striping transitions in advance of the Work area; and existing striping, signing and raised medians, if any. The sheets shall display the Project name; phase identification; name of firm preparing the plan; name and stamp of the Civil Engineer; approval block for each jurisdictional agency; north arrow; sheet number; and number of sheets comprising the traffic control plans. General notes and symbol definitions shall be included when required. Adequate dimensioning shall be provided to allow for Agency checking and proper field installation.

Simple daytime lane closures may be installed in accordance with the Manual on Uniform Traffic Control Devices, [www.mutcd.fhwa.gov](http://www.mutcd.fhwa.gov), and its California supplements, [www.dot.ca.gov/hq/traffops/signtcch/mutcdsupp](http://www.dot.ca.gov/hq/traffops/signtcch/mutcdsupp), without a plan submittal when approved by the Agency. However, a traffic control sketch may be required by the Agency for more complex temporary daytime installations. The traffic control sketch shall display the phase identification and the name of the designer, firm, and the Project.

In no case shall traffic be diverted from the existing traveled way without prior approval of the Engineer. Detour striping will not be permitted on any finish course of asphalt concrete pavement constructed on the Project. Temporary striping shall be detour grade traffic tape, unless otherwise approved by the Engineer.

In order to facilitate the flow of traffic during the Contract duration, the Agency reserves the right to extend the limits of the Project to include any areas where removal of striping or marking, construction of detour pavement, or signing and delineating is deemed necessary by the Engineer.

**7-10.3.4 Traffic Lanes and Clearances.** The Contractor shall provide and maintain 3.3m(11-foot) wide minimum traffic lanes or (3m(10-foot) wide minimum when approved by the Engineer) with minimum clearances as shown below, unless otherwise directed by the Engineer:

1. 600mm(2 feet) to curb or temporary railing(type k).
2. 3m(10 feet) to poles or other obstructions on an uncurbed roadway.
3. 1.5m(5 feet) to any excavation.

When the 1.5m(5-foot) clearance to an excavation cannot be maintained, temporary railing (type k) shall be placed to separate vehicles from the excavation when the excavation is to be left overnight. However, on road construction projects, a shoulder may be established within the excavation overnight to create the 1.5m(5-foot) clearance. A 0.9m(3-foot) absolute minimum shoulder width shall be maintained for all excavations during the daylight hours.

If determined by the Engineer that it is necessary to decrease the other minimum distances specified above to allow for the prosecution of the Work, the Contractor shall provide all protective devices required by the Engineer to adequately protect the public.

### **7-10.3.5 Traffic Control Devices.**

**(a) General.** Unless otherwise indicated in the Special Provisions, the Contractor shall provide, install, and maintain all the traffic control devices including signing, striping, marking, barricades, delineators, flashing arrow signs, temporary railing (type K), crash cushions, and other facilities deemed necessary for the protection of the vehicular and pedestrian traffic throughout the Project area as required by these Specifications and as directed by the Engineer. The Project area shall include the construction area and areas required for the advance signing and transitions to and from the existing traffic control and the construction traffic control.

Unless otherwise indicated in the Special Provisions, all traffic control devices shall conform to the requirements for composition, usage, and placement as specified in the Manual on Uniform Traffic Control Devices, [www.mutcd.fhwa.gov](http://www.mutcd.fhwa.gov), and its California supplements, [www.dot.ca.gov/hq/traffops/signtcch/mutcdsupp](http://www.dot.ca.gov/hq/traffops/signtcch/mutcdsupp), these Additions and Amendments, the Special Provisions and the Standard Plans.

When no longer required, all temporary traffic control devices installed by the Contractor shall be promptly removed by the Contractor.

Any action on the part of the Engineer in directing the Contractor's attention to any inadequacy of the required devices and services or any action of the Agency to alleviate the Contractor's inadequacies shall not relieve the Contractor from its responsibility for public safety or abrogate its obligation to provide and maintain these devices and services. If the Contractor fails to provide and maintain these devices and services and the Agency is required to alleviate said condition, the total charges of labor, equipment and materials, including overhead and transportation, accrued by the Agency for such work will be deducted from any monies due the Contractor.

**(b) Maintenance.** The Contractor shall be responsible for maintaining traffic control devices in their proper positions at all times. The Contractor shall replace, repair or clean such devices whenever necessary in order to ensure and preserve their appearance and functionality. The Contractor shall remove and dispose of all damaged barricades, including those furnished and placed by the Agency. Payment for removal and disposal shall be per 7-10.3.1.

**7-10.3.6 Removal of Traffic Striping and Pavement Markings.** The Contractor shall perform the work of removing existing and temporary striping and pavement markings where required. Such removal shall be accomplished by wet sandblasting, or other approved methods, at locations designated by the Engineer. Immediately following the removal of striping and pavement markings, the Contractor shall remove all residue from the pavement by power sweeping and thoroughly clean the area. Removal and cleaning shall be completed before relocation of striping is started.

Full compensation for removal of traffic striping and pavement markings, including furnishing all equipment, materials and labor, shall be considered as included in the Contract Unit Price for the appropriate item (s) for removal of traffic striping and pavement markings. If there is no Bid item for this work, it will be considered as "Extra Work" per 3-3 of these Additions and Amendments, unless otherwise specified in the Special Provisions.

**7-10.3.7 Temporary Bridges.** Temporary bridges shall be in accordance with the following requirements:

1) The Contractor shall submit to the Agency for approval, working drawings prepared on 2' x 3' sheets by a Civil or Structural Engineer registered by the State of California per 2-5.3.

2) Working drawings shall include complete calculations bearing an original signature of the designer. Calculations need not accompany working drawings previously approved except as required by the Engineer.

3) Design live load shall be one HS20-44 truck per lane except that bridges for residential driveways may be designed for H15-44 loading.

4) The minimum width of a one lane bridge shall be 4.2m(14 feet) clear between curbs, except for bridges used for private residential driveways which shall have a minimum clear width of 3.0m(10 feet). Minimum width for two lane bridges shall be 7.2m(24 feet) clear.

5) Handrails shall be not less than 1050mm(42 inches) nor more than 1125mm(45 inches) in height measured from the walking surface. The posts shall be not less than 50mm by 100mm(2 inches by 4 inches) in cross section and spaced at 2.4m(8-foot) or closer intervals. The top railings shall be smooth and of 50mm by 100mm(2 inches by 4 inches) or larger material.

6) Plans and calculations for the shoring system shall be included with the bridge plans. Shoring shall be designed per LACDPW Standard Plan 3090 in addition to a uniform horizontal live load of 0.004788MPa(100 psf) applied over the top 3.0m(10 feet) of the trench for trenches 3.0m(10 feet) or more in depth. For trenches less than 3.0m(10 feet) deep, the uniform live load shall vary uniformly with the depth from 0.014364MPa(300 psf) for a trench depth of 0.9m(3 feet) to 0.004788MPa(100 psf) for a trench depth of 3.0m(10 feet). The trench under the bridge shall be supported by Type A solid support shores for a distance equal to the trench depth on each side of the bridge except that the sheeting or lagging shall be continuous and abutting.

7) The minimum curb shall be 150mm by 150mm(6-inch by 6-inch) timber or equivalent steel and the minimum connection shall be with 16mm(5/8-inch)-diameter bolts at 600mm(24 inches) on center through the decking.

8) The maximum clear span for the bridge shall be shown on the working drawings.

9) The bridge decking shall have a uniform non-skid surface. The non-skid surface shall have a coefficient of friction of not less than 0.35 as measured by California Test 342.

10) The dimensions of the bridge; size and locations of the connections; and size and spacing of the members shall be detailed on the working drawings.

11) The bearing pad shall be on firm ground or pavement for support of the bridge.

12) The bridge deck shall be flush with the street surface if the bridge is located within an arterial street. An asphalt concrete ramp with a 10 percent maximum grade change may be used for residential streets.

13) The locations where the temporary bridge is to be used shall be stated on the working drawings.

14) If used material is used for bridge construction, the material shall be sound and of good quality.

15) Installation shall not occur until such time as written approval is obtained from, and the temporary bridge is inspected by, the Engineer.

16) Traffic control plans shall be submitted with the temporary bridge working drawings. Refer to 6-1 and 7-10.3.3.

17) Temporary bridges shall be clearly posted as to load limit, with signs and posting conforming to the current requirements set forth in the Manual on Uniform Traffic Control Devices, [www.mutcd.fhwa.gov](http://www.mutcd.fhwa.gov), and its California supplements, [www.dot.ca.gov/hg/traffops/signtcch/mutcdsupp](http://www.dot.ca.gov/hg/traffops/signtcch/mutcdsupp).

#### **7-10.4 Safety.**

**7-10.4.1 Safety Orders.** Add the following after the first paragraph:

The Contractor shall provide all safety measures necessary to protect the public and workers within the Work area. Particular attention is directed to the possibility of children playing or going to or from school in the Project area. The Contractor shall take all the necessary precautions to ensure that its operations will not create any safety hazard for children.

**7-10.4.2 Use of Explosives.** Add the following:

For blasting in unincorporated County areas, the Contractor shall comply with the following:

1. A blasting permit shall be obtained from the Los Angeles County Forester and Fire Warden, Fire Prevention Bureau.
2. All blasting activities and schedule milestones shall be included in the Contractor's construction schedule per 6-1.
3. The local Los Angeles County Sheriff's Department or jurisdictional city police department shall be notified 24 hours in advance of blasting.
4. The local Los Angeles County Fire Department or jurisdictional city fire department shall be notified 24 hours in advance of blasting.

For work performed by a Private Developer, specific permission must be obtained from the Agency in writing prior to any blasting operations in addition to the above requirements. Add the following subsections:

**7-10.4.5 Protective and Security Fencing.** Fencing or steel plate covers shall be installed in advance of or concurrently with excavation operations in accordance with LACDPW Standard Plan 6008. Fencing shall completely enclose all open excavations and shall remain in place until backfill has been placed to approximately adjacent ground level. Fencing may be removed during working hours as necessary to provide access and working room for construction operations. It shall be the Contractor's responsibility to provide equivalent security during these periods. Fencing shall be of either Type 1 or 2 as defined below or a combination thereof as approved by the Engineer and shall be securely fastened together. However, adjacent to any school or park, fencing shall be Type 2.

Type 1 fencing shall be in accordance with LACDPW Standard Plan 6002. Type 2 fencing shall be 11 gage, 50mm(2-inch) mesh, 1.5m(5-foot) chain link fabric securely fastened to metal posts driven in place at 3.0m(10-foot) maximum spacing and extending at least 1.5m(5 feet) above ground, or securely fastened to the shoring system if in the opinion of the Engineer this method will provide equivalent security to the method of driven posts.

All costs for temporary fencing and/or plating shall be considered as included in the prices in the Bid for the various items of work.

**7-10.4.6 Temporary Manhole Shaft Covers.** The Contractor shall protect the public at all times from accidental entry into manhole or manhole shaft openings. Any such opening shall be covered with an entry-proof cover approved by the Engineer.

**7-10.4.7 Safety in Traffic.** The Contractor's attention is directed to the importance of safety when working in proximity to traffic. The Contractor shall take all precautions and establish such traffic control as is necessary to properly provide for the safety of all personnel and equipment on the Project site.

**7-10.4.8 Project Site 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 Project site.

**7-10.4.9 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 Agency to direct the cessation of all work activities and operations at no cost to the Agency until such time as the Contractor is in compliance.

**7-10.4.10 Safety Indemnification.** To the extent allowed by law, the Contractor agrees to defend, indemnify and hold harmless the Agency 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 Agency, attributable to any alleged act or omission of the Contractor or its

subcontractors 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 Agency may deduct from any payment otherwise due the Contractor any costs incurred or anticipated to be incurred by the Agency, including legal fees and staff costs, associated with any investigation or enforcement proceeding brought by Cal/OSHA arising out of the Project.

**7-13 LAWS TO BE OBSERVED.** Add the following:

The Contractor and each County lobbyist or County lobbying firm as defined in Los Angeles County Code Section 2.160.010, retained by the Contractor, shall fully comply with the County Lobbyist Ordinance, Los Angeles County Code Chapter 2.160. Failure on the part of the Contractor or any County lobbyist or County lobbying firm retained by the Contractor to fully comply with the County Lobbyist Ordinance shall constitute a material breach of the Contract upon which the Agency may immediately terminate or suspend the Contract.

Add the following subsection:

**7-15 AUDITS AND RECORDS.**

The Contractor shall maintain all data and records pertinent to the Work performed under the 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 the Contract, or for such longer period, if any, as is required by applicable statute or by other provisions of the Contract. The authorized representatives of the Agency shall have access to all such data and records for such time period to inspect, audit and make copies thereof during normal business hours. The Contractor shall covenant and agree that it shall require any subcontractor utilized in the performance of the Contract to permit the authorized representatives of the Agency, to similarly inspect and audit all data and records of said subcontractors relating to the performance of said subcontractors under the Contract for the same time period.

**SECTION 8 - FACILITIES FOR AGENCY PERSONNEL**

**8-1 GENERAL.** Add the following:

The Contractor shall provide a Class "A" field office for the Project if a Bid item for "Office Facilities" or "Class "A" Field Office" is included in the Bid.

**8-2 FIELD OFFICE FACILITIES.**

**8-2.1 Class "A" Field Office.** Add the following to the end of the first paragraph:

All exterior doors shall have a locking device consisting of either a padlock hasp or a double cylinder deadbolt lock in which case six keys for the lock shall be provided. Provisions shall be made for the locking of windows from the inside and all windows shall have security bars. The field office, if portable, shall be enclosed with a 1.8m(6-foot) high security fence equipped with a suitable lockable gate. Adequate parking shall be provided

for the Engineer and other such Agency representatives as are assigned to the Project.

Delete the second sentence of the fourth paragraph and substitute the following:

The Contractor shall provide refrigerated drinking water within the field office and integral sanitary facilities directly adjoining for the sole use of the Engineer.

Add the following to the end of the last paragraph:

The Contractor shall install the telephone prior to the start of construction and shall remove it upon completion of the Work. The Contractor shall make all arrangements for installation and removal and shall pay for all costs involved, including the monthly billings. Should telephone service not be operational for more than two working days, cellular phone service shall be provided at no cost to the Agency until such time as telephone service is restored.

Add the following:

The Contractor shall furnish and maintain a photocopy machine and a facsimile(fax) machine in the field office for the Engineer's use. Fax machines capable of producing copies may not be substituted for the photocopy machine. Separate telephone lines shall be provided for the telephone and the fax machine.

The photocopy and fax machines shall be capable of using standard 8½" x 11" bond paper. The photocopy machine shall also be capable of using standard 8½" x 14" bond paper and of automatically producing multiple copies at the rate of 4 pages per minute. The paper necessary for each copy shall be automatically fed. Manually fed copiers will not be allowed.

The Agency will furnish paper for its own use. All other materials required for the photocopy and fax machines shall be furnished by the Contractor.

The location of the field office shall be approved by the Engineer. The field office shall be located on the Project site or within a 0.8km(0.5 mile) drive of the Project limits. The Contractor will not be compensated for a field office located outside the aforementioned limits.

### **8-3 FIELD LABORATORIES.**

**8-3.1 Offsite at Manufacturing Plant.** Replace the first sentence with the following:

Field laboratories shall conform to the requirements for a Class "C" Field Office per 8-2.3 and shall also be equipped with the following:

9. One complete set of 12" diameter sieves for each type of material being produced.
10. Ignition furnace per California Test 382 for determining asphalt content.

A minimum of one sample will be tested at the plant per California Test 382 per 500 tons or a portion thereof of asphalt concrete, rubberized asphalt concrete, and asphalt rubber hot mix placed per day to determine the asphalt content. The plant's quality control personnel shall be present to assist the Engineer in performing these tests. The Engineer may require



that more frequent tests be taken, depending upon the results.

The facilities shall be maintained in a clean condition and accessible for the Engineer's use at all times.

**8-6 BASIS OF PAYMENT.** Add the following:

Payment for office facilities will be made as follows: 25% when completely installed, 75% prorated over the remainder of the Contract duration, unless otherwise specified in the Special Provisions.

## **SECTION 9 - MEASUREMENT AND PAYMENT**

**9-3 PAYMENT.**

**9-3.1 General.** Replace the last sentence of the seventh paragraph with the following:

Responsibility of ownership shall remain with the Contractor who shall store, protect, repair, replace, rebuild or otherwise restore any fully or partially completed work or structure for which payment has been made; or replace any materials or equipment required to be provided under the Contract which may be damaged, lost, stolen or otherwise degraded in any way prior to the time that the Contractor is relieved of responsibility to protect the Work as provided in 6-8 and 6-10.

Replace the last paragraph with the following:

Following acceptance of the Work by the Board, or as prescribed by law, the amount deducted from the final estimate and retained by the Agency will be paid to the Contractor, except such amounts as are required by law to be withheld by properly executed and filed notices to stop payment, or as may be authorized by the Contract to be further retained.

**9-3.2 Partial and Final Payment.** Replace the first sentence of the first paragraph with the following:

Partial payments will be made only if the number of working days for the Project plus any extensions of time granted by the Agency after the Work has started equals 20 or more working days. If partial payments are required, the closure date for the purpose of making monthly progress payments will be indicated in the Special Provisions.

Add the following after the first sentence of the second paragraph:

The Agency will transmit to the Contractor within 10 days after each established monthly payment closure date a copy of the Engineer's Monthly Estimate showing the amount of work completed as of the closure date.

Add the following after the second paragraph:

In the case of a Bid item where several types of work are included in the item, the Agency may make partial payment for the portions of such work that are completed at the time of making the monthly progress estimates, provided, in the opinion of the Engineer, the work considered for payment has been completed in compliance with the requirements of the

Plans and the Specifications. As an aid to the Agency in making partial payments, the Contractor shall, upon request from the Engineer, furnish a Detailed Schedule of the costs included in its Contract Unit Price for the Bid item.

Payment for a lump sum Bid item will be based upon the lump sum Bid price and the Engineer's estimate as to the percentage of completion.

Replace the last paragraph with the following:

Pursuant to Sections 10263 and 22300 of the California Public Contract Code, the Contractor at its own expense may deposit securities with the Agency or with a state or Federally chartered bank as the escrow agent in lieu of having funds withheld by the Agency to ensure performance under the Contract.

The securities which will be allowed to be substituted are those listed in Section 16430 of the Government Code or bank or savings and loan certificates of deposit.

The amount of securities to be deposited shall be equivalent to the maximum amount permitted to be withheld. The Agency may claim and receive all or a portion of these funds to be used for the same purposes and expenditures as if the funds had been withheld as specified above. Formal acceptance of the Project by the Agency terminates the Agency's interest in the securities.

**9-3.3 Delivered Materials.** Replace the entire subsection with the following:

When approved by the Engineer, payment may be made for materials and equipment other than reinforced concrete pipe delivered to and stored at the Project site, or other approved location, for use on the Project but not yet incorporated in the Work. Before accounting for these materials and equipment on the monthly estimate, the Contractor shall furnish to the Engineer paid invoices therefore. The payment will be limited to the cost shown on said invoices until incorporated into the Work.

**9-3.4 Mobilization.** Replace the entire subsection with the following:

When a Bid item is included in the Bid for "MOBILIZATION", the costs of work in advance of construction operations and not directly attributable to any specific Bid item will be included in the progress estimate. When no such Bid item is provided, payment for such costs will be considered to be included in the payment for the various items of work.

Mobilization shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies and incidentals to the Project site and for all other work and operations which must be performed or costs incurred prior to beginning work on the various Contract items on the Project site. Refer to 6-1 of these Additions and Amendments and the Special Provisions.

Payments for mobilization will be made as follows:

1) When the monthly progress payment estimate of the amount earned, not including the amount earned for mobilization, is 5 percent or more of the Contract Price, the total amount earned for mobilization shall be 50 percent of the Contract Unit Price for mobilization or 5 percent of the Contract Price, whichever is less, and said amount will be included in said estimate for payment.

2) When the monthly progress payment estimate of the amount earned, not including the amount earned for mobilization, is 10 percent or more of the Contract Price, the total amount earned for mobilization shall be 75 percent of the Contract Unit Price for mobilization or 7.5 percent of the Contract Price, whichever is less, and said amount will be included in said estimate for payment.

3) When the monthly progress payment estimate of the amount earned, not including the amount earned for mobilization, is 20 percent or more of the Contract Price, the total amount earned for mobilization shall be 95 percent of the Contract Unit Price for mobilization or 9.5 percent of the Contract Price, whichever is less, and said amount will be included in said estimate for payment.

4) When the monthly progress payment estimate of the amount earned, not including the amount earned for mobilization, is 50 percent or more of the Contract Price, the total amount earned for mobilization shall be 100 percent of the Contract Unit Price for mobilization or 10 percent of the Contract Price, whichever is less, and said amount will be included in said estimate for payment.

5) After completion of the Contract Work, the amount, if any, of the Contract Unit Price for mobilization in excess of 10 percent of the Contract Price will be included in the final progress payment.

Add the following subsection:

**9-4 RESOLUTION OF CONSTRUCTION CLAIMS.** Claims shall be resolved in accordance with Article 1.5 (commencing with Section 20104) of Chapter 1 of Part 3 of the Public Contract Code. All claims shall be in writing and shall include the documents necessary to substantiate the claim. Claims must be filed on or before the date of final payment.

For claims of less than \$50,000, the Agency will respond in writing to any written claim within 45 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims the Agency may have against the Contractor. If additional information is thereafter required, it shall be requested and provided pursuant to mutual agreement of the Agency and the Contractor. The Agency's written response to the claim, as further documented, will be submitted to the Contractor within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

For claims of over \$50,000 and less than or equal to \$375,000, the Agency will respond in writing to all written claims within 60 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims the Agency may have against the Contractor. If additional information is thereafter required, it shall be requested and provided pursuant to mutual agreement of the Agency and the Contractor. The Agency's written response to the claim, as further documented, will be submitted to the Contractor within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information or requested documentation, whichever is greater.

If the Contractor disputes the Agency's written response, or the Agency fails to respond within the time prescribed, the Contractor may so notify the Agency, in writing, either within 15 days of receipt of the Agency's response or within 15 days of the Agency's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the Agency will schedule a meet and confer conference within 30 days for settlement of the dispute.

If following the meet and confer conference the claim or any portion remains in dispute, the Contractor may file a claim pursuant to Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the Contractor submits its written claim until the time the claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

The following procedures apply for all civil actions filed to resolve claims subject to this Subsection:

a) Within 60 days, but no earlier than 30 days, following the filing or responsive pleadings, the court will submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.

b) (1) If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act of 1986 [Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of Part 4 of the Code of Civil Procedure] shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.

(2) Notwithstanding any other provision of law, upon stipulation of the parties, arbitrators appointed for purposes of this article shall be experienced in construction law, and upon stipulation of the parties, mediators and arbitrators shall be paid necessary and reasonable hourly rates of pay not to exceed their customary rate, and such fees and expenses shall be paid equally by the parties, except in the case of arbitration where the

arbitrator, for good cause, determines a different division. In no event shall these fees or expenses be paid by state or county funds.

(3) In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, any party who after receiving an arbitration award requests a trial de novo but does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, pay the attorney's fees of the other party arising out of trial de novo.

c) The court may, upon request by any party, order any witnesses to participate in the mediation or arbitration process.

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## PART 2 - CONSTRUCTION MATERIALS

### SECTION 200 - ROCK MATERIALS

Add the following subsection:

#### **200-3 IMPORTED FILL MATERIAL.**

##### **200-3.1 General.**

The Contractor shall implement the following sampling and analysis requirements prior to importing fill material (unclassified fill, imported borrow, structure backfill, and imported backfill) to the Project site.

##### **200-3.2 Sampling Frequency and Location.**

The Contractor shall collect discrete soil samples that are representative of the material to be imported. The Contractor shall establish a grid system over the potential borrow site or stockpile. The Contractor shall collect and analyze one soil sample from each grid. The grid and soil sampling frequency shall be as follows:

<b>Volume of Soil</b>	<b>Number of Grids/Samples</b>
1 to 20 cubic yards	1 sample
21 to 500 cubic yards	1 sample every 50 cubic yards
501 to 1,000 cubic yards	1 sample every 100 cubic yards
>1,000 cubic yards	1 sample every 200 cubic yards

All sampling shall be conducted by qualified personnel under strict chain-of-custody procedures, and analyzed by a State of California Environmental Laboratory Accreditation Program (ELAP)-certified laboratory in accordance with the testing procedures specified in 40 CFR 136.

##### **200-3.3 Soil Sample Analysis.**

All sample analysis, containers, preservation methods, and holding times for soil samples shall be in accordance with test procedures provided by 40 CFR 136 and EPA Publication SW-846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," Third Edition, November 1986.

Soil samples shall be transported, under strict chain-of-custody procedures, to an ELAP-certified analytical laboratory within 24 hours of collection. The soil samples shall be analyzed for the following constituents:

Constituent	EPA Method
Total Recoverable Petroleum Hydrocarbons (TRPH).	EPA Test Method 418.1
Total Petroleum Hydrocarbons (TPH-G) – Gasoline Range C4- C12	Modified EPA Test Method 8015
Total Petroleum Hydrocarbons (TPH-D) - Diesel Range C10-C24	Modified EPA Test Method 8015
Volatile Organic Compounds (VOCs)	EPA Test Method 8260
CCR Title 22 Metals (TTLC)	EPA Method 6010
Simulated Distillation – Hydrocarbon Distribution. Hydrocarbon Chain	EPA Test Method 3550

If the Contractor is aware of other potential contaminants, or the borrow site or stockpile history may indicate other potential contaminants not listed above, the Contractor shall analyze all samples for all other potential contaminants.

Based on the results of the tests, the Engineer may require additional or supplemental soil samples be collected and tested in order to determine whether the proposed imported fill material is acceptable.

**200-3.4 Quality Control.**

One duplicate soil sample shall be collected and analyzed for every ten-soil samples collected and analyzed. If less than ten samples are collected, a minimum of one duplicate sample is required. Duplicate samples shall be collected in separate containers and located immediately adjacent to the original sample location(s).

Any soil samples having a dilution factor of greater than one will be rejected by the Engineer. The Agency reserves the right to approve and observe all sampling, loading, and transportation of soil proposed to be imported.

**200-3.5 Reporting and Documentation.**

Prior to the acceptance of the imported fill material, the Contractor shall submit to the Engineer a summary report of all analytical data from soil sampling activities conducted on the proposed fill material. The report shall include a table summarizing all analytical data and observations, a sketch drawing or diagram of the borrow/stockpile site and sample locations, general soil conditions or classification, description of the borrow/stockpile site, signed laboratory analytical data sheets, signed laboratory analytical QA/QC data sheets, signed/completed chain-of-custody forms, field logbook, and all other pertinent information.

The Contractor shall maintain a bound sample documentation logbook. The logbooks will be used for documenting data collection and work activities. Entries shall be made in ink and shall include sufficient detail to reconstruct site activities without reliance on memory. All samples collected shall be recorded in the logbook.

## **200-3.6 Approval.**

The Engineer will evaluate the data submitted in this report and determine if the proposed material may be imported and used on the Project. The Contractor shall not import any soil on to the Project site until the Agency has reviewed the summary report and written approval has been received from the Engineer.

## **SECTION 201 - CONCRETE, MORTAR AND RELATED MATERIALS**

### **201-1 PORTLAND CEMENT CONCRETE.**

#### **201-1.1 Requirements.**

##### **201-1.1.1 General.** Add the following as the fifth paragraph:

High early strength concrete for underground structures shall conform to 201-1.1.6 of these Additions and Amendments.

##### **201-1.1.3 Concrete Specified by Special Exposure.** Add the following:

Special Exposure shall include exposure to sea water and oil field brine.

Deleterious chemicals are considered present when the chlorides and bromides exceed 15,000 PPM (1.5%) or the soil resistivity is less than 10,000 ohms centimeters. The limits of these conditions, based on laboratory test data and the above criteria, will be shown on the Plans.

##### **201-1.1.4 Concrete Specified by Compressive Strength.** Replace the first paragraph with the following:

The Contractor shall determine the mix proportions of concrete specified by compressive strength in the Special Provisions or on the Plans. Unless otherwise specified, the minimum compressive strength of concrete at 28 days shall be 28MPa(4000 psi). The proposed concrete mix design and aggregate gradations shall be submitted per 2-5.3. The concrete shall contain not less than 330kg(560 pounds) of cement per cubic meter(cubic yard). Twenty-eight (28) MPa(4000 psi) or higher compressive strength concrete shall contain an Agency-approved water-reducing admixture. The combined aggregate grading shall be Grading C except for 28MPa(4000 psi) or higher compressive strength concrete for inverts which shall be Grading B.

Replace the third paragraph with the following:

The proposed mix design for 28MPa(4000 psi) or higher compressive strength concrete shall be evaluated from field tests of a trial batch conforming to the size of load, materials, proportions, slump, mixing and placing equipment and procedures to be used in the Work. The placing of said concrete shall not begin until a trial batch of the mix design to be used has been produced by the Contractor, and sampled and tested by the Agency. The exact proportions of the materials to be used in the trial batches shall be determined by the



Contractor, and sampled and tested by the Agency.

For each trial batch, the materials (brand and type of cement; admixture; source, size and gradation of aggregate), proportions, procedures, size of load, and slump shall be the same as that to be used in the Work. The trial batch shall be representative of the concrete to be used in the Work. Should the materials or procedures be changed, new trial batches will be required.

The Contractor's attention is directed to the time required to test trial batches. The Contractor shall be responsible for production of trial batches at a sufficiently early date so that the progress of the Work is not delayed.

The trial batch procedure herein may be waived with compliance with the following:

- (1) Test data of prior performance of the proposed mix design is presented by the Contractor as described above and approved by the Engineer. The Contractor may, at its option, utilize any strength data on file with the Agency for this purpose. Submitted data shall include recent 7-day and 28-day compressive strength test data for the proposed concrete mix design. In addition, the data shall include the brand name and type of any admixtures used; the type and brand of cement; aggregate source and gradation; mix proportions; procedures; load size; and slump.
- (2) A concrete mix design which includes a Agency-approved water-reducing admixture and a minimum of 360kg(610 pounds) of cement per cubic meter(cubic yard) for 28MPa(4000 psi) concrete, or 390kg(660 pounds) of cement per cubic meter(cubic yard) for 35MPa(5000 psi) concrete.

The Contractor is responsible for submitting mix designs with higher cement contents, as necessary, in order to meet any requirements.

For both alternates to trial batching, the proposed mix design and aggregate gradation shall be submitted per 2-5.3. In the case of alternate 1, the compressive strength data shall be submitted at the same time.

**201-1.1.5 Test for Portland Cement Concrete.** Delete the following tests from the first paragraph:

5) Flexural Strength	C 78
8) Unit Weight Yield	C 138
9) Setting of Mortar	C 191 or C 266
11) Drying Shrinkage (with admixture)	Calif. Test 530

Add the following:

The Contractor shall furnish all materials required by ASTM C 31, C 39-90a, C 143-90a, C 172-90, C 470, C 539, C 540 and C 1064 for sampling and testing fresh concrete including a slump cone, proper scoop, required rod for rodding samples, temperature

gauge, concrete cylinder molds with caps, wheel barrel, shovel and a laborer to assist the Engineer.

If so directed by the Engineer, in addition to the above, the Contractor shall furnish a competent laborer to assist the Engineer in sampling and preparing concrete test cylinders. One set of six cylinders will be required for each 100 cubic yards of concrete or portion thereof placed at each location per day. The Contractor shall furnish a safe place to store and protect the cylinders until picked up by Agency personnel. Payment will be made in accordance with 3-3 of these Additions and Amendments at the Stipulated Unit Price of \$50 for each set of cylinders made.

Add the following subsection:

**201-1.1.6 High Early Strength Concrete for Underground Structures.** Under paved streets, high early strength concrete shall be used in the construction of all cast-in-place structures in open trenches, except invert slabs, Junction Structures per Standard Plans 332 and 334, and sewer manholes.

The Contractor shall provide concrete mix designs for all high early strength concrete applications which meet the specified strength requirements. The proposed mix designs and aggregate gradations shall be submitted per 2-5.3.

If sulfate or seawater conditions exist, a water reducing-accelerating admixture will not be allowed. Refer to 201-1.2.6 of these Additions and Amendments.

High early strength in 23MPa(3250 psi) concrete shall be attained by the use of an Agency-approved water-reducing admixture, or by the use of a concrete mix which has a minimum of 390kg(660 pounds) of either Type II or V cement per cubic meter(cubic yard). Rapid Hardening Hydraulic Cement per 201-1.1.1 may also be used.

The following requirements apply to high early strength in 28MPa(4000 psi) compressive strength concrete:

- (a) The concrete shall attain a seven-day (nine-day where Type V cement is required) strength such that the average of any three consecutive compressive strength tests shall be equal to or greater than 28MPa(4000 psi), and not more than 10 percent of the tests shall be less than 28MPa(4000 psi). No test shall be less than 85 percent of 28MPa(4000 psi).
- (b) The concrete shall include a minimum of 360kg(610 pounds) to a maximum of 445kg(750 pounds) of either Type II or V cement per cubic meter(cubic yard) and an Agency-approved water-reducing admixture.
- (c) Prequalification of the mix for high early strength in 28MPa(4000 psi) concrete by trial batching will not be required.

## **201-1.2 Materials**

**201-1.2.1 Portland Cement.** Add the following before the last sentence of the second paragraph:

The certificate shall be sent to the Materials Engineering Section, Geotechnical and Materials Engineering Division, 4th Floor, Los Angeles County Department of Public Works, 900 South Fremont Avenue, P.O. Box 1460, Alhambra, CA 91802-1460.

## **201-1.3 Proportioning.**

**201-1.3.3 Concrete Consistency.** Add the following as the last paragraph:

Any concrete specified by compressive strength per 201-1.1.4 of these Additions and Amendments having a slump greater than 150mm(6 inches) will be rejected. If the Engineer determines that a slump greater than 150mm(6 inches) is required, it shall be accomplished through the use of an Agency-approved high range, water reducing admixture (ASTM C494, Type F) which shall be submitted to the Engineer for approval.

## **201-2 REINFORCEMENT FOR CONCRETE.**

**201-2.2 Steel Reinforcement.** Add the following after the first sentence:

All steel, except longitudinal steel, for design pipe; box conduit; open channels; tunnel lining; transition structures to be constructed per Standard Plans 341, 342, 343, 344, 345 or 346; open channel transition structures; and special structures shall be Grade 60 billet steel conforming to ASTM A-615. Longitudinal steel shall be Grade 40 billet steel. Steel conforming to ASTM A-706 shall be used if required by the Special Provisions or so noted on the Plans.

## **201-2.4 Samples for Testing.**

**201-2.4.1 General.** Add the following:

Unless otherwise specified, certified mill test reports along with the manufacturer's written certification per 4-1.5 and truck bills of lading are required in lieu of a physical test. The Contractor shall send the aforementioned documents for each truckload of steel to the attention of the Office Engineer specified in 2-5 of the Special Provisions. The certified mill test reports shall include the name and location of the mill at which the steel was produced. An additional report shall be furnished to the Engineer prior to installation for each heat or size of reinforcing steel.

**201-3 EXPANSION JOINT FILLER AND JOINT SEALANTS.** Add the following subsections:

### **201-3.10 Waterproofing Membrane.**

**201-3.10.1 General.** For bridges, the waterproofing membrane shall be as shown on the Plans.

**201-3.10.2 Materials.** Waterproofing membrane shall be butyl rubber with primer and mastic recommended by the membrane manufacturer. Materials shall conform to the following requirements:

a. Butyl Rubber

Butyl rubber membrane shall be 3mm(1/8 inch) thick, and a compound butyl elastomer of the IIR family (Iso butylene - Iso prene rubber) conforming to the following requirements:

Color.....	Black	
Specific Gravity .....	1.20 + 0.03	ASTM D 297-61T
Tensile strength .....	8.3MPa(1200 psi)(min)	ASTM D 412-61T
Modulus @ 300% Elongation .....	4.1MPa(600 psi)(min)	ASTM D 412-61T
Elongation .....	300% (min)	ASTM D 412-61T
Tear resistance, die B .....	1.0MPa(150 psi)(min)	ASTM D 624-54
Hardness, shore A .....	55 + 5 with 5-sec interval before reading	ASTM D 676-59T

Ozone resistance, 70 hr @ 38 °C(100 °F) in 50 PPHM Ozone; 20% elongation .....	no cracks	
Heat aging, 7 days @ 116 °C(240 °F).....	70% of original properties	
Maximum vol. swell (Tricresyl Phosphate Immersion) 72 hr @ 100 °C(212 °F) .....	10%	ASTM D 751-57T
Operating temperature range, (-62 °C to 135 °C)(-40 °F to 275 °F)		
Water absorption, vol. change less than 1%		

b. Adhesive

Adhesive for securing butyl rubber membrane and the protective cover shall be compatible with the membrane and with the materials to which it is bonded. It shall remain workable to its brittle point -62 °C(-40 °F).

c. Cement

Cement for splicing rubber membrane shall be a self-vulcanizing butyl rubber compound conforming to the following requirements:

Viscosity No. 3 Zahn Cup 25 °C(77 °F)	100 to 150 sec
Total Solids	30% (min)
Cement shall be applied at a minimum rate of 7.57L/9.29m <sup>2</sup> (2 gallons per 100 square feet).	

d. Butyl Gum Tape

Butyl gum tape for splicing butyl membrane shall be black, unvulcanized butyl rubber with an 8-mil polyethylene film backing. The tape shall be 4 mils thick, including the backing.

**201-3.10.3 Approval and Tests.** Complete specifications for all waterproofing membrane materials shall be submitted per 2-5.3. No material shall be used until approved by the Engineer.

The initial acceptance of a material by the Engineer shall not prevent its subsequent rejection if found defective. Rejected material shall be promptly removed from the Project site and replaced with acceptable material.

**201-3.11 Joint Waterproofing.** Joint waterproofing shall be applied to bridge abutment backwall construction joints as shown on the Plans. The waterproofing shall consist of a primer course; a 3-ply course of "Yellow Jacket" glass fabric; 5 asphalt emulsion courses; and a protection board.

All waterproofing work shall conform to these provisions and Genstar Roofing Products Company's "Flintkote Specification No. EMW-2" and "Membrane Waterproofing Systems and Dampproofing General Requirements". From Specification No. EMW-2, the requirement that "Vertical cold joints shall be V-grooved and filled flush to surfaces with a sealant compatible with asphaltic materials" is hereby deleted. The primer shall conform to the "Specification for Primer for use with Asphalt in Dampproofing and Waterproofing" (AASHTO M116) and the asphalt emulsion shall conform to the "Specification for Asphalt for Dampproofing and Waterproofing" (AASHTO M115).

**201-3.12 Bridge Deck Joint Seals.** Bridge deck joint seals shall be Type A or Type B per Caltrans Standard Plan B6-21. Sealed joints shall conform to Section 51-1.12F of the Caltrans Standard Specifications for Construction of Local Streets and Roads (latest edition).

## **201-4 CONCRETE CURING MATERIALS.**

### **201-4.1 Membrane Curing Compounds.**

**201-4.1.1 General.** Add the following at the end of the second paragraph:

The maximum drying time for Type 2 curing compound shall be two hours for set-to-touch and four hours to dry-hand condition. The compound will be tested for moisture loss in accordance with California Test 534, except that the compound shall be applied at the rate of one liter per  $6 \pm 1$  square meters (one gallon per  $250 \pm 50$  square feet).

## **201-5 CEMENT MORTAR.**

**201-5.1 General.** Add the following as the last paragraph:

Unless otherwise specified, grout shall be composed of Class "A" mortar.

Add the following subsection:

### **201-5.7 Cement Grout for Subsealing of PCC Pavement.**

**201-5.7.1 Materials.** Type I portland cement grout shall be composed of portland cement, fly ash and water. Portland cement and fly ash shall be proportioned at the rate of 42.6kg(94 pounds) of portland cement to 102.1kg to 115.7kg(225 to 255 pounds) of fly ash. Water shall be added in an amount to provide a grout afflux time of 10 to 16 seconds as determined by California Test 541, Part D.

Type II portland cement grout shall consist of portland cement, sand, water and any other material approved by the Engineer. Other materials may include, but are not limited to, lime, fire clay, silt and wetting agent. One cubic meter(cubic yard) of grout shall contain 330kg(560 pounds) of cement. The grout shall be of a consistency which will flow easily under pressure without buildup under the concrete pavement.

Portland cement for all grout shall be Type II and conform to 201-1.2.1.

Fly ash shall conform to 201-1.2.5 and may be either Class C or Class F fly ash.

Admixtures shall not be used in the grout mixture unless otherwise approved by the Engineer.

Sand for portland cement grout shall conform to the following gradation:

<u>Particle size</u>		<u>% Passing</u>	
Passing 4.75mm	(No. 4)	Sieve	100
Passing 2.36mm	(No. 8)	Sieve	95-100
Passing 660 Fm	(No. 30)	Sieve	70-90
Passing 300 Fm	(No. 50)	Sieve	50-75
Passing 150 Fm	(No. 100)	Sieve	30-50
Passing 75 Fm	(No. 200)	Sieve	20-35
Passing	(No. 270)	Sieve	15-30
Finer than 3 Microns			5-20
Finer than 1 Micron			0-10
Colloids			0-2

**201-5.7.2 Mixing.** Type I grout shall be mixed in a grout plant consisting of a high-speed colloidal mixer. Type II grout shall be mixed in a paddle-type mixer. The grout shall be deposited in a hopper connected to a positive displacement grout injection pump capable of providing a minimum continuous gauge pressure of 0.86MPa(125 psi). A pressure gauge shall be located immediately adjacent to the grout hose supply valve.

Dry cement and fly ash shall be accurately measured by mass(weight), if in bulk, or shall be packaged in containers of uniform mass(weight).

Water shall be introduced into the mixing process through a meter or scale which has a totalizer to measure the amount of water used during each work shift.

Grout not used in the Work within one hour after mixing shall be disposed of as directed by the Engineer.

Add the following subsection:

## **201-8 EPOXY MATERIALS.**

**201-8.1 Epoxy Adhesive.** The adhesive compound shall consist of two components to be mixed at the Project site immediately prior to use. The two parts shall be clearly identified, preferably as "Part A", Epoxy Resin, and "Part B", either of which shall comply with the requirements below. In addition, "Part A" and "Part B" shall be color coded so that when the two components are properly mixed a third color is produced. The color, when mixed, shall be a uniform gray, without black or white streaks, except that other colors may be used when determined by the Engineer as not to be detrimental to the appearance of the structure. Any heating of the two components to facilitate mixing shall be done by application of indirect heat. The use of volatile solvents in the adhesive will not be permitted.

The adhesive shall remain tacky for a minimum of 30 minutes when a 10-mil film of the adhesive is spread at 27 °C(80 °F).

Mixed lots of the adhesive shall remain brushable for at least one hour at an ambient temperature of 24 °C(75 °F). The viscosity of the adhesive one hour after mixing shall not exceed 120 poise (Brookfield) at 24 °C(75 °F).

Strength Requirements per Agency Test Methods:

	Minimum MPa(psi)	
	At 3 Days	At 7 Days
Tensile Strength	1.7(250)	2.8(400)
Flexural Strength	1.4(200)	2.4(350)
Shear Strength	1.4(200)	2.4(300)

The shelf life of the two parts of the adhesive shall be such that for one year hard setting does not occur and that the cure rate remains the same as newly compounded materials at all normal temperatures.

The adhesive shall not adhere to wood forms which have been coated with a releasing agent. The releasing agent shall be standard form oil or other agent, approved by the Engineer, which will not discolor or react with the concrete in any way.

The type of epoxy adhesive to be used shall be subject to the approval of the Engineer and shall be submitted for testing per 4-1.4. The Contractor shall submit certified test results indicating compliance with these Specifications. The Engineer may waive testing on materials previously tested and approved by the Agency.

**201-8.2 Epoxy Mortar.** The proportion of the epoxy mortar shall be such that there will be no more than five parts of aggregate to each part of epoxy adhesive by volume. The aggregate shall be white silica sand and subject to approval of the Engineer. It shall be surface dry at the time of mixing.

The epoxy mortar shall remain workable for a minimum of 30 minutes at a temperature of 21 °C(70 °F) when spread out in a 50mm(2-inch) layer. The epoxy mortar shall develop a minimum compressive strength of 21MPa(3,000 psi) in 24 hours and 41MPa(6,000 psi) in seven days when cured at a temperature of 21 °C(70 °F). It shall also develop a minimum compressive strength of 21MPa(3,000 psi) after curing for three hours at 52 °C(125 °F). The compressive strength shall be determined from 50mm(2-inch) diameter by 100mm(4-inch) long cylinders as defined in ASTM C 39.

The epoxy mortar shall be placed over epoxy adhesive while the epoxy adhesive is still tacky. The area to be covered by epoxy adhesive shall be blast-cleaned per 303-1.8.6. It shall be clean, dry and dust-free when the epoxy is applied.

**201-8.3 Cement Mortar on Epoxy Adhesive.** The following shall apply when the Work includes placing cement mortar on epoxy adhesive:

The area to be covered by epoxy adhesive shall be clean, dry, and dust-free when the epoxy adhesive is applied.

The epoxy adhesive shall be applied in such a manner that it forms a continuous film thickness of at least 10 mils. One liter (gallon) shall not cover more than one square meter(40 square feet) of surface area.

The cement mortar shall be placed while the epoxy adhesive is still tacky.

## **SECTION 203 - BITUMINOUS MATERIALS**

### **203-5 EMULSION-AGGREGATE SLURRY.**

**203-5.2 Materials.** Replace the first two sentences with the following:

Emulsified asphalt shall be of a quick-set type.

**203-5.4 Mix Design.** Replace the first paragraph with the following:

The Contractor, at its expense, shall submit for approval per 2-5.3, laboratory reports of mix designs performed in accordance with ASTM D 3910 modified as follows, specifying the specific materials to be used. For slurry containing Type II aggregate, ASTM D 3910 shall be modified to include the aggregate retained on the 4.75mm (No. 4) sieve if specified in the mix design. The Engineer will determine which mix design is best suited for use on the Project, based upon the content of emulsion and water needed to produce a slurry with a maximum allowable loss of 540 grams per square meter (50 grams per square foot) by the modified Wet Track Abrasion Test. The maximum allowable loss shall be 650 grams per square meter (60 grams per square foot) for slurry containing Type II aggregate if the proposed mix design contains more than 4% aggregate that is retained on the 4.74mm (No.



4) sieve. The Contractor, at its expense, shall calibrate each slurry mixer to be used in the Work according to the approved slurry mix design.

## **203-6 ASPHALT CONCRETE.**

**203-6.2 Mix Designs.** Replace the first sentence of the first paragraph with the following:

The Contractor shall submit per 2-5.3 an asphalt concrete mix design (job mix formula) for each class and grade of asphalt concrete required to construct the Work.

Replace the second sentence of the second paragraph with the following:

The mix design (job mix formula) shall meet the requirements of Table 203-6.4.3 (A) for the class and grade specified on the Plans or in the Special Provisions.

Replace the second sentence of the third paragraph with the following:

The mix design (job mix formula) shall be reformulated whenever the combined grading as defined above does not meet the previously submitted mix design by  $\nabla 3$  percentage points on any screen.

## **203-11 ASPHALT RUBBER HOT MIX (ARHM) WET PROCESS.**

### **203-11.2 Materials.**

**203-11.2.3 Crumb Rubber Modifier (CRM).** Replace the fourth sentence of the first paragraph with the following:

Whole scrap tire CRM shall be derived from whole scrap tires generated within the State of California.

## **SECTION 204 - LUMBER AND TREATMENT WITH PRESERVATIVES**

### **204-1 LUMBER AND PLYWOOD.**

#### **204-1.1 Kinds.**

**204-1.1.1 General.** Add the following after the first paragraph.

Structural timber shall be Douglas Fir No. 1.

The following general provisions apply to all stress-grades:

- a. All material shall be well manufactured. Only pieces consisting of sound wood, free from decay, will be accepted.
- b. All sizes shown on the Plans applying to lumber and timber refer to nominal sizes, and the American Lumber Standard rough and dressed sizes will be accepted as conforming thereto.

**204-1.1.2 Douglas Fir.** Add the following:

Douglas Fir shall be graded in accordance with the current standard grading and dressing rules for Douglas Fir adopted by the West Coast Lumber Inspection Bureau, or the current standard grading rules adopted by the Western Wood Products Association.

**204-1.3 Grade Marking.**

**204-1.3.1 Lumber.** Add the following:

All structural timber and lumber shall be inspected and grade-marked, and shall be accompanied by a certified grading report per 4-1.

**204-2 TREATMENT WITH PRESERVATIVES.**

**204-2.2 Wood Preservatives.** Add the following to the fourth paragraph:

Preservatives used for all lumber shall be "ACQ Preservereg" by Chemical Specialties, Inc. or Agency-approved equal.

**204-2.3 Field Treatment of Cut Surfaces.** Replace the entire subsection with the following:

When field cutting or drilling becomes necessary after plant treatment of timber, the cut or drilled surfaces shall be protected by applying (by brush) "ACQ Preservereg" by Chemical Specialties, Inc. or Agency-approved equal to the exposed surface in accordance with the provisions of AWPA Standard M4.

**204-2.4 Quality Control - Inspection.** Add the following:

The treating plant shall imprint legible symbols in the end of all lumber and timber treated indicating the name of the treating company and the type and year of treatment in accordance with the provisions of AWPA Standards M1 and M6.

Treated timber shall be subject to inspection by the Engineer after arrival at the Project site or after being placed in the completed structure, and no previous inspection at the plant shall bar rejection in the completed structure.

All lumber and timber, whether treated or untreated, shall conform in all respects to the specified grading requirements at the time of delivery to the Project site. Certified treatment reports per 4-1 stating the species of the material to be shipped shall be furnished to the Engineer for all treated timber to be shipped to the Project Site.

## SECTION 206 - MISCELLANEOUS METAL ITEMS

### 206-1 STRUCTURAL STEEL, RIVETS, BOLTS, PINS AND ANCHOR BOLTS.

Add the following subsection:

**206-1.6 Bridge Joint Restrainer Units.** Unless otherwise specified, all materials shall conform to Section 75-1.035 of the Caltrans Standard Specifications for Construction of Local Streets and Roads (latest edition).

### 206-5 METAL RAILINGS.

**206-5.2 Flexible Metal Guardrail Materials.** Replace the entire subsection with Section 83-1.02 B "Metal Beam Guard Railing" of the Caltrans Standard Specifications for Construction of Local Streets and Roads (latest edition).

### 206-6 CHAIN LINK FENCE.

**206-6.1 General.** Add the following after the first sentence of the second paragraph:

The caps shall be secured by spot welding or riveting.

## SECTION 207 - PIPE

### 207-1 NON-REINFORCED CONCRETE PIPE.

**207-1.1 General.** Add the following as the last paragraph:

Where non-reinforced concrete pipe is specified on the Plans, the Contractor shall have the option of using reinforced concrete pipe with an equivalent D-load. The Contractor shall have the option of using either bell and spigot or tongue and groove pipe.

### 207-2 REINFORCED CONCRETE PIPE.

**207-2.2 Materials.** Add the following to the first paragraph:

- 3) Reinforcing steel samples may be required to be tested in accordance with 201-2.5 of these Additions and Amendments.
- 4) Reinforcing steel for reinforced concrete pipe 2700mm(108 inches) and greater in diameter shall be Grade 60 billet steel conforming to ASTM A615.

### 207-2.4 Reinforcement.

**207-2.4.2 Location of Reinforcement.** Add the following after the third paragraph:

The required covers and permitted tolerances shown in Table 207-2.4.2 (A) are applicable to wet cast and spun pipe only. The reinforcement for machine made pipe shall be at the location designated by the manufacturer per their standard details which shall be furnished to the Engineer. The actual location shall not vary more than plus or minus 10mm(3/8 inch) from the designated location; however, in no case shall the cover over the circumferential reinforcement be less than 16mm(5/8 inch). The minimum cover over

longitudinal steel shall be per the table.

Add the following as the last paragraph:

Where single circular reinforcement is used in wet cast or spun pipe, it shall be placed in the center of the wall.

**207-2.5 Joints.** Delete the second paragraph and add the following paragraphs after the first paragraph:

Reinforced concrete pipe with rubber gasketed joints shall conform to 208-3 except as modified herein.

The rubber-gasketed joints shall be as made by Ameron, Precon, Hydro-Conduit, Rialto or other Agency-approved equal. If the joint is of the bell and spigot type similar in shape to that shown on LADPW Standard Plan 3095, additional reinforcement shall comply with Standard Plan 3095.

In sea water conditions, steel joint sleeves for rubber-gasketed reinforced concrete pipe shall be sand blasted and a 3-mil thickness of Dimetcote No. 4, Carbo-Zinc 11, or equal, as approved by the Agency, applied to the interior and exterior surfaces of the sleeves.

**207-2.9 Basis for Acceptance.**

**207-2.9.1 General.** Add the following as the last paragraph:

In addition to the above, rubber-gasketed pipe shall be subjected to the hydrostatic pressure test specified in 207-2.9.6 of these Additions and Amendments.

**207-2.9.3 Structural Design Basis.** Replace the second paragraph with the following:

Concrete used in reinforced concrete pipe for which structural details are shown on the Plans shall attain the following 28-day compressive strength:

The average of any three consecutive tests shall be equal to or greater than 31MPa(4500 psi), and not more than 10 percent of the tests shall be less than 31MPa(4500 psi). No test shall be less than 85 percent of 31MPa(4500 psi).

A strength test shall consist of the average strength of two test cylinders molded from material taken from a single batch of concrete. The cylinders shall be cured in the same manner as the pipe for the entire 28 days, including removal from the cylinder molds when the pipe is stripped.

Add the following subsection:

**207-2.9.6 Hydrostatic Pressure Test.** The test pipe for the hydrostatic pressure test shall be selected in accordance with 207-2.9.2.

The pipe and joint shall be tested concurrently by attaching two pipes together or a pipe

and a standard joint section together. At the Contractor's option, the test section may be filled with water and placed under a hydrostatic pressure of 0.07MPa(10 psi) for a 24-hour period prior to the tests. The hydrostatic pressure in the test section shall be gradually increased until it reaches 0.09MPa(13 psi) or as specified in the Special Provisions.

The test section shall not show measurable leakage when kept under the test pressure for 20 minutes. Damp spots or water drops developing on the surface of the pipe shall not be considered as leakage and cause for rejection. The joint shall show no leakage at the test pressure.

If the test pipe passes the test, the lot will be accepted.

If the test pipe fails the hydrostatic test, two additional pipes from the same lot will be selected for testing. If both pipes pass the test, the lot, except for the first test pipe, will be accepted. If either of the two additional pipes fails the test, the lot will be rejected. The Contractor may elect to test each pipe in a rejected lot for acceptance.

Repair of leaks in rejected test pipe may be made if so approved by the Engineer. The repaired pipe shall be retested.

## **207-9 IRON PIPE AND FITTINGS.**

### **207-9.2 Ductile Iron Pipe for Water and Other Liquids.**

#### **207-9.2.1 General.** Add the following:

Ductile iron pipe for sanitary sewers shall be Class 52 or greater.

**207-9.2.2 Pipe Joints.** For sanitary sewers, delete "Flanged Joint" and "Flanged Joint (Threaded Flanges)" from Table 207-9.2.2 (A).

Add the following:

A polyethylene encasement shall be required per 207-9.2.6.

## **207-15 ABS SOLID WALL PIPE.**

#### **207-15.1 General.** Add the following:

The maximum permitted deflection (flattening) for ABS plastic pipe shall be 3 percent. The maximum allowable SDR shall be 23.5.

Alteration of pipe to achieve deflection fittings is not permitted. All pipe and fittings shall be tested and certified at a testing laboratory approved by the Agency. The certification(s) must be accepted by the Agency prior to installation.

ABS solid wall pipe meeting the requirements of these Specifications may only be used for sewer wye and house lateral connections to ABS composite mainline sewer pipe. The only allowed pipe sizes shall be 100mm and 150mm(4 and 6 inches). ABS solid wall pipe may not be used as mainline sewer pipe. This pipe shall not be used for sewers serving

commercial or industrial areas, or areas that, in the opinion of the Agency, are likely to be rezoned to commercial or industrial use.

### **207-16 ABS OR PVC COMPOSITE PIPE.**

**207-16.1 General.** Add the following:

Alteration of pipe to achieve deflection fittings is not permitted. All pipe and fittings shall be tested and certified at a testing laboratory approved by the Agency. The certification(s) must be accepted by the Agency prior to installation.

ABS or PVC composite pipe meeting the requirements of these Specifications may only be used where specifically shown on the Plans or approved by the Agency. Where ABS or PVC composite pipe is used, it shall be used for the entire length of the sewer between any two manholes and shall include the house laterals in that reach. This pipe shall not be used for sewers serving commercial or industrial areas, or areas that, in the opinion of the Agency, are likely to be rezoned to commercial or industrial zones. The maximum SDR for sewer pipe shall be 35.

### **207-17 PVC PLASTIC PIPE.**

**207-17.1 General.** Add the following:

The maximum permitted deflection(flattening) for PVC plastic pipe shall be five percent. The maximum SDR for PVC pipe shall be 35.

Alteration of pipe to achieve deflection fittings is not permitted. All pipe and fittings shall be tested and certified at a testing laboratory approved by the Agency. The certification(s) must be accepted by the Agency prior to installation.

PVC plastic pipe meeting the requirements of these Specifications may only be used where specifically shown on the Plans or approved by the Agency. Where PVC plastic pipe is used for sewers, it shall be used for the entire length of mainline sewer between any two manholes. House laterals shall be solid wall pipe of the same material as the mainline pipe. The pipe shall not be used for sewers serving commercial or industrial areas, or areas that, in the opinion of the Agency, are likely to be rezoned to commercial or industrial zones.

## **SECTION 209 - ELECTRICAL COMPONENTS**

### **209-2 MATERIALS.**

**209-2.2 Anchor Bolts.** Add the following to the end of the first paragraph:

Each anchor bolt shall be round and provided with a minimum of 200mm(8 inches) of thread.

**209-2.4 Wire.** Substitute the following for the first paragraph:

Traffic control conductors shall be rated at 600 volts and (unless otherwise specified) shall be single conductor, solid copper of gage as indicated herein, insulated with Type TW

polyvinyl chloride conforming to the requirements of ASTM D 2219, the THW polyvinyl chloride, Type XHHW cross-linked polyethylene or Type RHW heat-resistant rubber, all of which shall comply with the following requirements:

Minimum thickness of any of the above insulations shall be 45 mils for conductor sizes No. 14 to 10 AWG, inclusive, and 60 mils for No. 8 to No. 2 AWG, inclusive.

Add the following after the second paragraph:

For all other applications, copper wire shall conform to the applicable portions of ASTM B3 and B8. Wire sizes shall be based on American Wire Gage(AWG).

## **SECTION 210 - PAINT AND PROTECTIVE COATINGS**

### **210-1 PAINT.**

**210-1.5 Paint Systems.** Add the following after Table 210-1.5(A):

Zinc-Rich Primer, Organic Vehicle Type

Zinc-rich primer shall conform to State Specification 8010-31A-36.

Pre-Treatment, Vinyl Wash Primer

Vinyl wash primer shall conform to State Specification 8010-31A-27.

White Tint Base Vinyl Finish Coat

Finish coat shall conform to State Specification 8010-31A-35, tinted a gray color. A sample of the paint color or a color chip shall be submitted to the Engineer for approval prior to use.

### **210-1.6 Paint for Traffic Striping, Pavement Marking, and Curb Marking.**

**210-1.6.1 General.** Replace the entire subsection with the following:

Paint and thermoplastic for traffic striping, pavement markings, and curb markings shall conform to Section 84 (Sections 84-3.06 and 84-3.07 excluded), "Traffic Stripes and Pavement Markings", of the Caltrans Standard Specifications for Construction of Local Streets and Roads (latest edition).

**210-1.6.2 Thermoplastic Paint.** Delete the entire subsection.

**210-1.6.3 Rapid Dry White, Yellow, or Black Traffic Line Paint.** Delete the entire subsection.

**210-1.6.4 Ready-Mixed Traffic Stripe Paints.** Delete the entire subsection.

**210-1.6.5 Reflective Material.** Delete the entire subsection.

## **SECTION 211 - SOILS AND AGGREGATE TESTS**

**211-1 SIEVE ANALYSES.** Add at the end of the sentence, "or C 117."

### **211-1 COMPACTION TESTS.**

**211-1.1 Laboratory Maximum Density.** Replace the second and third paragraphs with the following:

Compaction tests will be performed in accordance with ASTM D 1557 using the appropriate procedure based on the materials gradation where applicable. The Engineer may specify another procedure within this test; require the use of another test procedure; or specify a specific compaction method to be used where this test is not applicable.

All reported maximum densities shall be based on dry unit weight. However, the Engineer may modify the procedure in ASTM D 1557, at its option, to calculate a relative compaction at the site based on adjusted laboratory maximum wet density to give the Contractor an indication of the achieved relative compaction. The adjusted laboratory maximum wet density will be calculated as follows:

**211-1.3 Relative Compaction.** Replace the entire subsection with the following:

The words "Relative Compaction" shall mean the ratio of the field dry density to the laboratory maximum dry density expressed as a percentage.

## **SECTION 214 - PAVEMENT MARKERS**

Replace the entire section with Section 85 (Sections 85-1.08 and 85-1.09 excluded) "Pavement Markers", of the Caltrans Standard Specifications for Construction of Local Streets and Roads (latest edition).

Add the following to Section 85-1.03 "Sampling, Tolerances and Packaging" of the Caltrans Standard Specifications for Construction of Local Streets and Roads (latest edition):

At the time of delivery of each shipment of material, the Contractor shall, upon request, deliver to the Engineer certified copies of the manufacturer's test report. The test report shall indicate the name of the manufacturer, quantity, State Specification number, manufacturer's lot or batch number, and results of the required tests. The test report shall be signed by an authorized representative of the manufacturer. The certified test reports and the testing required in conjunction therewith shall be furnished at no cost to the Agency.



## **PART 3 - CONSTRUCTION METHODS**

### **SECTION 300 - EARTHWORK**

#### **300-1 CLEARING AND GRUBBING.**

##### **300-1.1 General.** Add the following:

An Oak Tree Permit issued by the Department of Regional Planning that specifically permits trimming is required prior to trimming any oak tree with a trunk diameter of 200mm(8 inches) or greater. Refer to 7-5 of these Additions and Amendments for information regarding Oak Tree Permits.

Tree trimming shall include topping, shaping, thinning and reduction of heavy weight as necessary to leave the tree in a balanced symmetrical looking condition. All trimming shall be done to bring out or emphasize the natural characteristics of the tree. This work shall also include removal of dead wood and weak, split, diseased, insect infested, broken, low or crossing limbs. Branches with extremely narrow angles of attachment shall normally be removed. Stubs 25mm(1 inch) in diameter and larger shall be removed throughout the tree. Any structural weaknesses, dead or diseased trees, decayed trunks or branches shall be reported to the Engineer.

Laterals shall be cut to preserve the natural form of the tree. Limbs which extend beyond the natural perimeter or where such overburden appears likely to cause breakage of the limb shall be shortened. The crown shall form a symmetrical shape with the weight evenly distributed when trimming is completed.

The use of climbing spikes will not be permitted except on eucalyptus trees and trees scheduled for removal.

Add the following as the first sentence of the sixth paragraph:

Cutting, trimming or removing trees will not be permitted unless so designated on the Plans or approved by the Engineer.

##### **300-1.3 Removal and Disposal of Materials.**

###### **300-1.3.2 Requirements.**

###### **(a) Bituminous Pavement.** Add the following:

If the edge of trench is within 300mm(12 inches) of the edge of an existing concrete gutter(including integral curb and gutter) or edge of concrete pavement, the existing bituminous pavement shall be completely removed and replaced to join the existing concrete edge of gutter(including integral curb and gutter), or edge of concrete pavement.

###### **(c) Concrete Curb, Walk, Gutters, Cross Gutters, Driveways and Alley Intersections.** Add the following after the last paragraph:

Where portions of existing concrete are designated to be removed, cutting or removal will not be permitted until approved by the Engineer.

Add the following:

(d) **Concrete Channel Walls.** Existing concrete channel walls shall be removed to the limits shown on the Plans to provide a clean, plane surface for new concrete to be bonded to. The Contractor shall not break concrete by means of explosives, self-propelled drop hammers (Astompers®), or a mass attached to a chain, cable or rope.

(e) **Concrete Bridge Structures.** Where portions of the existing concrete structures are to be removed, including coring a portion of the existing abutment walls for utility relocation as shown or indicated on the Plans or as directed by the Engineer, the Contractor shall comply with the following provisions which also shall apply to the removal of any portion of unsatisfactory new work that must be replaced:

- (1) The Contractor shall submit to the Engineer details of the removal operations showing the methods and sequence of removal and equipment to be used. No cutting or removal shall be started until approved by the Engineer.
- (2) Before beginning concrete removal operations involving the removal of a portion of a monolithic concrete element, a saw-cut approximately 25mm(1 inch) deep shall be made to a true line along the limits of removal on all faces of the element which will be visible in the completed work. The concrete shall be carefully removed leaving a clean, plane surface for new concrete to be bonded to. If the edge of any existing concrete to be joined with new work is damaged in any way by the Contractor's operations, the existing concrete shall be saw-cut behind the damaged concrete and replaced.
- (3) Existing reinforcement that is to be incorporated into the new work shall be protected from damage and shall be thoroughly cleaned of all adhering material before being embedded in new concrete. Any damage to this reinforcement shall be repaired by welding, or other approved means, to the satisfaction of the Engineer.
- (4) Where reinforcing steel is exposed by concrete removal in areas that will not be covered by the new work, the steel shall be burned off 25mm(1 inch) below the surface of the remaining concrete and the resulting voids shall be patched with epoxy mortar for bridge decks and abutment backwalls, and Class E cement mortar or portland cement concrete elsewhere.
- (5) Where reinforcing steel is exposed by concrete removal in areas to be covered by new work, steel shall be burned off 50mm(2 inches) from the new finished surface.
- (6) All materials removed shall be disposed of away from the Project site by the Contractor. The Contractor shall make all arrangements for disposal of the material and shall, upon request, file with the Engineer the written consent of the owner of the property upon which disposal is intended.

(f) **Existing Timber Bridges.** All portions of existing timber structures shall be removed, as shown or indicated on the Plans or as deemed necessary to complete the Work and as approved by the Engineer. The Contractor shall submit to the Engineer

details of the removal operations showing the methods and sequence of removal and equipment to be used. No cutting or removal shall be started until approved by the Engineer. These provisions shall also apply for the removal of any portion of unsatisfactory new work that must be replaced.

**(g) Trees.**

Tree removal shall include cutting down and disposing of all tree parts including stump and root removal. All parkway trees scheduled for removal shall be "topped", or if, in the opinion of the Contractor, a tree is unable to withstand the strain of the topping procedure, the branches shall be lowered by some other means, such as a tree crane. Unless impractical, lower limbs shall be removed first, working toward the top until the tree is delimited. Stubs, at least 300mm(12 inches) or more in length, shall be left following delimiting to provide crotches for lowering sections of the trunk or main limbs.

Extreme care shall be taken to prevent limbs, branches, and trunks from falling and damaging adjacent structures, driveways, sidewalks, streets, fences, lawns and other property, both public and private. When necessary, brush mats, tires, logs or skids shall be used to prevent such damage.

Stump removal shall include grinding out the stump and all roots, including surface roots, to a minimum depth of 600mm(24 inches) below existing ground level. Stump holes shall be backfilled with Class "A" Topsoil per 212-1.1.2 and planted per 308 with grass seed or sod of the same variety as the adjacent lawn. Topsoil used for backfill shall be subject to the approval of the Engineer.

All chips and debris from stump removal shall be removed from the Project site by the end of the work day that such chips and debris were generated. No stump removal chips or debris shall be left on the parkway overnight. The Project site shall be raked and left broom-clean.

**300-1.4 Payment.** Add the following:

Unless otherwise specified, all trees to be removed having a trunk 150mm(6 inches) in diameter or greater shall be paid for at the Contract Unit Price for "TREE REMOVAL." Said diameter shall be the smallest diameter measured 150mm(6 inches) above the crown roots. Multi-trunk trees will be considered as one tree if any one trunk is 150mm(6 inches) in diameter or greater. Payment for removal of all other trees shall be considered as included in the prices in the Bid for the other items of work.

Add the following subsection:

**300-1.5 Root Pruning.**

**300-1.5.1 General.** An Oak Tree Permit issued by the Department of Regional Planning that specifically permits root pruning is required prior to pruning any roots of an oak tree with a trunk diameter of 200mm(8 inches) or greater.

Trees to be root pruned shall be trimmed by the drop-crotch method per 300-1.5.3. All pruning and trimming shall be done by professional tree trimmers.

Roots shall be pruned immediately adjacent to the edge of the curb. Cuts shall be at the back of curb and shall be 100mm (4 inches) wide and 450mm(18 inches) deep as measured from the top of curb. The cuts shall extend 1.8m(6 feet) in each direction along the curb from the center of the tree trunk for a total length of 3.6m(12 feet) or as directed by the Engineer. When root pruning adjacent to sidewalk is required, the same details shall apply. Refer to Standard Plan 523.

Root pruning equipment shall be specifically designed for this purpose, sharpened adequately to sever roots in a clean manner, and equipped with padded tracks or rubber tires to prevent scraping or marking of the roadway or curbs.

All cuts shall not be backfilled until a root control barrier is in place, either immediately upon completion of root pruning or upon completion of the adjacent work provided that adequate safety and warning devices are placed and maintained at each location. Root control barriers shall conform to 300-1.5.2 of these Additions and Amendments. Root control barriers shall be located adjacent to the cut roots. The area between the back of curb and the root control barriers shall be backfilled with Class AC@ topsoil per 212-1.

The Contractor shall repair or replace all utility service connections and sprinkler systems within the right-of-way which are damaged or removed as a result of the root pruning operation. Repairs shall be initiated immediately upon the occurrence of damage or removal and completed by the end of each working day. Repairs and replacements shall be the equivalent of, or better than, the existing improvements in material, dimension, and function. All repairs shall be at the Contractor's expense and to the satisfaction of the Engineer.

Root sealer shall be approved by the Engineer a minimum of 2 working days prior to the start of root pruning operations and shall be applied to all cut root areas which are larger than 50mm(2 inches) in diameter. The approved sealer shall be applied as soon as practical after the cuts have been made.

**300-1.5.2 Root Control Barrier.** Root control barriers(barriers) shall be installed at each location immediately following root pruning. Barriers shall extend the full 3.6m(12-foot) length of the root pruning cut or to the length determined by the Engineer. Barriers shall conform to Note 1 of Standard Plan 520.

Barriers may be one continuous piece or be securely connected at splice points. Barriers shall be approved by the Engineer prior to use. Barriers shall be installed per the manufacturer's instructions and shall not be used as a form.

### **300-1.5.3 Drop Crotch Trimming (DCT).**

Drop-crotch trimming is the size reduction of tops, sides, underbranches or individual limbs by trimming back to a strong crotch (see Exhibit "B").

All trunks, limbs and branches larger than 6 inches in diameter shall be cut in sections not to exceed 5 feet in length and shall be lowered to the ground through the use of ropes or other mechanical devices. Smaller limbs with the potential for damage to property or injury to people shall also be lowered using rope or other devices. The means of lowering shall be approved by the Engineer.

All ropes shall be securely attached to the main stem, a strong limb, or an adjacent tree, well above the limb being cut, to prevent binding, should the limb have to be pulled up into the tree before being lowered.

When existing obstructions require controlled movement of limbs being lowered by ropes, an additional guide rope shall be attached to the limb to control movement of the limb during descent.

Tree sealer shall be approved by the Engineer and shall be applied to all cut branch areas which are larger than 3 inches in diameter. The approved sealer shall be applied as soon as practical after the cuts have been made. The tree sealer shall contain a growth retardant to minimize sucker growth at the cut areas.

Drop crotch trimming shall include topping, shaping, thinning and reduction of heavy weight as necessary to leave the tree in a balanced symmetrical looking condition. All trimming shall be done to bring out or emphasize the natural characteristic of the tree.

This work shall include removal of deadwood and weak, split, diseased, insect infested, broken, low or crossing limbs. Branches with extremely narrow angles of attachment shall normally be removed. Remove stubs 1 inch in diameter and larger throughout the tree. Any structural weaknesses, dead or diseased trees, decayed trunks or branches shall be reported to the Engineer.

Cut laterals to preserve the natural form of the tree. Limbs which extend beyond the natural perimeter or where such overburden appears likely to cause breakage of the limb shall be shortened. The crown shall form a symmetrical shape with the weight evenly distributed when trimming is completed.

Foreign vegetation, vines entwined in trees, and all vines and sucker growth on tree trunks shall be removed. Vine tendrills shall be removed without injury to trees and cleared at least 18 inches from the base of the trees.

The work shall include trimming to provide adequate clearance for moving vehicles within the traveled roadway, for pedestrians on sidewalks, and for structures with their connecting utility lines. Final minimum clearance under trees shall be as shown on Exhibit C. When trimming the bottom branches for under clearance, care shall be taken to obtain a balanced appearance when viewed from the opposite side of the street immediately opposite the tree.

All limbs 2 inches in diameter or over shall be pre-cut to prevent splitting. When there is a chance of bark tearing below the crotch, large limbs shall be removed with three cuts (see Exhibit "A"). Make the first cut (A) on the underside of the branch 1 to 2 feet from the crotch. The undercut should be at least one-third of the diameter. Make the second cut (B) on the upper side of the branch a distance equal to the diameter of the limb further from the crotch than the first. The final cut (C) is made at the crotch in a manner to favor the earliest possible covering of the wound by callus growth. Cuts shall not be made so large that they will prevent sap flow. This requires that the cut be as small as practical, be reasonably flush within the shoulder or sap ring area, and that the cambium tissues at the edge of the

cut be alive and healthy. Flush cuts which produce large wounds and weaken the tree at the cut shall not be made.

On all trees known or suspected to be diseased, pruning tools as well as cut surfaces shall be disinfected with a 20% chlorine bleach solution or 70% methyl alcohol solution after each cut and between trees where there is danger of transmitting the disease on tools or as directed by the Engineer. Fresh solution shall be mixed daily.

Trees shall be trimmed to clear all adjacent structures by a minimum of 4 feet. Trimming of the trees shall provide adequate clearance for any obstructed street light standards, mast-arms or globes.

Branches should be cut back to a crotch not less than one-third of the diameter of the branch being removed. Wounds made by splitting limbs should be cleaned of torn and broken wood fibers and bark traces to ensure proper healing. Unbroken branches should be headed back to balance cuts made on broken branches particularly to reduce exposure to future high winds.

As part of drop crotch trimming, trees over 45 feet shall be reduced in height approximately 33%. Trees less than 45 feet tall may be reduced in height; however, this height reduction shall not exceed 33%. Height reduction shall not be performed when this treatment is incompatible with the species. Examples of incompatible species are Canary Island Pine and Cedrus Deodara.

**300-1.5.4 Cleanup.** All debris generated by root pruning and trimming operations shall be removed from the Project site at the end of each working day and properly disposed of outside the right-of-way.

The Contractor shall clean the Project site daily when work is completed, including the raking of leaves, twigs, chips, etc., from lawns and parkways and the sweeping of streets. However, fireplace size logs may be left on parkway areas for pickup by adjacent property owners for a period of up to 4 days following tree trimming or removal. All wood shall be removed from the Project site within five days of the trimming or removal.

**300-1.5.5 Payment.**

Full compensation for excavation, drop crotch trimming of trees to be root pruned, root pruning, furnishing and installing root control barriers, backfilling and cleanup, and all other appurtenant work shall be considered as included in the Contract Unit Price for "ROOT PRUNE TREE INCLUDING ROOT CONTROL BARRIER."

### **300-3 STRUCTURE EXCAVATION AND BACKFILL.**

#### **300-3.1 General.**

Add the following as the fourth paragraph:

For bridge construction, if the groundwater table rises above the bottom of the foundation excavation, the Contractor shall dewater the excavation. Dewatering shall continue until the concrete has reached a strength of 14MPa(2000 psi). When conditions render it impossible or inadvisable, in the opinion of the Engineer, to dewater excavations, the Contractor shall deposit under water a seal course of concrete per 303-1.8.9 and 303-1.11 of these Additions and Amendments.

Add the following as the last paragraph:

Excavation sides shall be cut to a slope which will preclude sloughing or be shored to achieve the same results.

**300-3.3 Foundation Material Treatment.** Add the following to the end of the second paragraph:

If unsuitable material is encountered when the structure excavation has progressed to the required grades, as indicated on the Plans, such unsuitable material shall be excavated and the backfill made with suitable materials to the required grades, as directed by the Engineer. Payment for such additional excavation required to remove unsuitable material below the required grades and compacting backfill to the grades with suitable material will be made at the Contract Unit Prices for "STRUCTURE EXCAVATION" or "STRUCTURE BACKFILL".

### **300-7 EARTHWORK FOR CHANNELS.**

**300-7.6 Measurement and Payment.** Replace the entire subsection with the following:

Payment for clearing, stripping, and excavation shall be per 303-1.11.3.

Compacted fill will be measured for payment to the pay lines shown on the Plans. If no pay lines are shown on the Plans, measurement shall be per 300-4.9. Payment for compacted fill shall be per 300-4.9.

## **SECTION 301 - TREATED SOILS, SUBGRADE PREPARATION AND PLACEMENT OF BASE MATERIAL**

### **301-1 SUBGRADE PREPARATION.**

#### **301-1.2 Preparation of Subgrade.** Add the following:

Where asphalt concrete pavement is required to be placed directly on native soil, the soil shall first be sterilized. All growth shall be removed from said area by scalping the surface and plowing or disking. The area shall then be shaped and recompact, and the subgrade prepared for the pavement.

A herbicide of a nonselective pre-emergent type shall be used. A dry powder or crystal application will not be allowed. The herbicide shall be a commercial product which has been registered and approved for the intended use by the Environmental Protection Agency. It shall be delivered to the Project site in original unopened containers with labels that clearly indicate instructions as required by law.

All herbicides shall be applied strictly in accordance with the manufacturer's label instructions by a person licensed to apply chemical herbicides. Care shall be taken to avoid contamination of existing planted areas and areas to be planted. Herbicide shall not be applied within 0.9m(3 feet) of these areas.

At least 10 working days prior to herbicide application, the Contractor shall submit a written program indicating the proposed herbicide, method of application and name of responsible person who will be performing the application work. The Contractor shall notify the Engineer 24 hours prior to the proposed time of application. Upon completion of the application, the Contractor shall file with the Engineer a certified record of herbicide treatment, including the amount and rate of application, locations, type of herbicide used and the date of application.

#### **301-1.3 Relative Compaction.** Add the following after the first paragraph:

The relative compaction requirements specified above shall apply unless higher relative compaction values are specified in the Special Provisions.

#### **301-1.6 Adjustment of Manhole Frame and Cover Sets to Grade.** Replace the first three sentences of the first paragraph with the following:

Utility manholes, vault frames and covers located within an area to be paved or graded will be adjusted by the owners to finish grade. Other manholes within the area to be paved or graded shall be set to finish grade by the Contractor in accordance with 302-5.8 unless otherwise specified.

Refer to 302-5.2.1 of these Additions and Amendments for adjustment of manholes within a roadway to receive full-width cold milling.



The following shall apply if the Project affects any County Sanitation Districts manholes:

The Contractor shall notify the appropriate County Sanitation Districts (Districts) field office, telephone (310) 638-1161(Compton), (626) 962-8605( San Gabriel), or (661) 266-4683 (Santa Clarita Valley and Antelope Valley), two business days prior to starting any work involving the Districts' manholes and shall furnish the cost, to be confirmed in writing, for adjusting or reconstructing each manhole according to the Specifications. The Districts will notify the Contractor within one business day whether to proceed with the work at the price quoted, or that the Districts will perform the necessary adjusting or reconstruction.

If the Contractor is authorized to proceed to adjust or reconstruct each manhole, then the Districts will issue a purchase order in the amount of the written price. The Contractor shall proceed to adjust or reconstruct each manhole in accordance with the Specifications. The Districts will provide inspection of the work at no cost to the Contractor. Full payment for the work performed will be made within 30 days of the receipt of an invoice and acceptance of the work by the Districts.

If the Districts elect to adjust or reconstruct their own manholes, then the following procedures will be followed:

For each manhole involved, the Districts will place a temporary cover over the channel and will lower the manhole to a point 150mm(6 inches) below subgrade. The Contractor shall provide and place a suitable temporary cover plate for the manhole. Following completion of paving operations, the Contractor shall remove the pavement and base material from the surrounding area, remove the temporary cover plate and remove any construction debris that may have accumulated in the manhole. The Districts will adjust the manhole to final grade. The Contractor shall then backfill and paves the surrounding area.

Where the Districts' manholes are existing within a paved area to be resurfaced, the Contractor shall mark the location of the Districts' manholes which have been paved over. The Districts will perform all removal and adjustment work within 48 hours. The Contractor shall then repave around the adjusted manholes.

Whenever the Contract includes Bid items for adjusting or reconstructing manholes, it shall be understood that said items do not apply to any of the Districts' manholes.

Full payment for performing work adjacent to or to expedite adjustment of the Districts' manholes shall be considered as included in the prices in the Bid for the various related items of work.

**301-1.7 Payment.** Replace the third and fourth paragraphs with the following:

Payment for adjusting a manhole frame and cover to grade, where the difference between the existing and final elevation of the top of the frame is less than 300mm(1 foot) or where the adjusting is accomplished by adjustment rings only, will be made at the Contract Unit Price for  $\Delta$ ADJUST MANHOLE@, unless otherwise specified.

Payment for adjusting a manhole frame and cover to grade, where the difference between the existing and final elevation of the top of the frame is 300mm(1 foot) or more or where the work involves removal of the eccentric concrete cone, will be made at the Contract Unit Price for  $\Delta$ RECONSTRUCT MANHOLE@, unless otherwise specified.

### 301-5 LIME-TREATED SOIL.

#### 301-5.1 General. Add the following:

The Contractor shall supply a sample of lime meeting the requirements of 301-5.2 and of ASTM C 977-89a. The Engineer will arrange for such lime sample to be tested with samples of soils to receive this treatment in accordance with ASTM C 977-89a. Such lime shall meet the minimum pH requirements for this test in establishing the mix percentage.

#### 301-5.2 Lime. Replace the third paragraph with the following:

Hydrated lime shall be protected from moisture exposure until used and shall be sufficiently dry to flow freely. Application shall be within six months of the date of manufacture. Quicklime shall be protected from air and moisture exposure in multiwalled bags. Application shall be within 60 days of the date of manufacture. Prior to spreading, a certificate from the manufacturer stating the date of manufacture, quarry source, and compliance, along with a certified copy of the shipping weight shall be submitted to the Engineer with each delivery.

Replace the “Chemical” and “Percent of Chemical (Min)” portion of Table 301-5.2 (A) with the following:

Chemical	Percent of Chemical	
	Hydrated Lime	Quicklime
Ca (OH) <sub>2</sub>	85 Minimum	119 Minimum
CaO & NaO (on L01-free basis)		90 Minimum
CO <sub>2</sub> (Taken at point of Manufacture)		5 Maximum
Free Moisture		5 Maximum
<b>Test Method</b>	California Test 414 or ASTM C 25-91	
<b>Slaking Test</b>	<b>Degrees C</b>	
Temperature rise		50 Minimum
<b>Test Method</b>	ASTM C110-87	

## SECTION 302 - ROADWAY SURFACING

### 302-4 EMULSION-AGGREGATE SLURRY.

#### 302-4.2 Mixing.

##### 302-4.2.1 General. Add the following:

All trucks which the Contractor proposes to use that exceed the legal load limit when loaded will be required to have overweight permits from the agency having jurisdiction.

Licensed weighmaster's certificates shall be furnished by the Contractor at no cost to the Agency.

##### 302-4.2.2 Continuous-Flow Mixers. Add the following after the second paragraph:

Prior to the beginning of slurry operations, the Contractor shall furnish current licensed weighmaster's certificates indicating the net weight capacity of the aggregate bin of each slurry mixer. Except for partial loads to complete a day's schedule, or for patching, each mixer shall be filled to its rated capacity and the Engineer and the Contractor shall each keep a daily count of the number of loads and/or partial loads applied to the surface of the existing pavement by each slurry mixer. Each aggregate bin shall have permanent calibration marks in maximum increments of 2 tonnes(tons).

#### 302-4.3 Application.

##### 302-4.3.1 General. Delete the last sentence of the first paragraph, Table 302-4.3.1 (A), and the last sentence of the second paragraph. Add the following after the first paragraph:

Type I slurry shall be applied at a rate of  $69\text{m}^2/\text{EL Tonne}$  (2,000 square feet per extra long ton) and Type II slurry shall be applied at a rate of  $114\text{m}^2/\text{EL Tonne}$  (1,350 square feet per extra long ton) unless otherwise specified in the Special Provisions. When placed over a chip seal, Type I slurry shall be applied at a rate of  $93\text{m}^2/\text{EL Tonne}$  (1,100 square feet per extra long ton).

##### 302-4.3.2 Spreading. Replace the first sentence of the third paragraph with the following:

Any necessary preparation of existing pavement will be done by Agency forces; however, the Contractor shall thoroughly sweep or clean the surface, to the satisfaction of the Engineer, prior to application of the slurry.

Add the following after the third paragraph:

Each slurry crew shall be composed of a coordinator at the Project site at all times, a competent continuous-flow mixer operator, a competent driver, and sufficient laborers for any handwork, cleanup and barricading.

Add the following after the sixth paragraph:

Streets having inverted shoulders shall be sealed to the edge of the existing pavement. Spreaders to be used for this operation shall be approved by the Engineer. Adjacent passes shall not overlap more than 300mm(12 inches).

Add the following after the seventh paragraph:

The Contractor will be required to work around all existing utility facilities and to seal up to the edges of said facilities. During sealing operations, the Contractor shall cooperate with the owners of any utility covers and shall cover and completely protect said covers with heavy plastic or other suitable material. All raised pavement markers shall be removed or covered and completely protected as directed by the Engineer. The Contractor shall exercise care to prevent slurry from being deposited on concrete surfaces and shall remove slurry from surfaces not designated to be sealed. Covering of slurry on concrete surfaces with sand, cement, or paint will not be acceptable.

**302-4.3.3 Field Sampling.** Replace Table 302-4.3.3 (A) with the following:

**TABLE 302-4.3.3 (A)**

Tests	ASTM Test Method	Requirements	
		Min.	Max.
Wet Track Abrasion Test, Weight loss, gm/m <sup>5</sup> (gm/ft <sup>5</sup> ), Fine & Type I Aggregate	D 3910	0	540(50)
Wet Track Abrasion Test, Weight loss, (gm/ft <sup>2</sup> ), Type II Aggregate		0	650(60)
Consistency Test (mm)	D 3910	20	40
Extract Test (Emulsion Content, %)	D 2172	∇ 1.0% of mix design	
Water Content, % of Dry Aggregate Weight	D 2172	C	25

Add the following as the third paragraph:

ASTM D 3910, modified per 203-5.4, shall be used on field samples during performance of the Work. These results will be used in conjunction with 302-4.6.2. The Contractor may perform a referee@ sampling on its behalf. Each referee sample shall be taken immediately before, during or after the sampling by the Agency. No changes in machine calibration will be allowed between sampling. The Agency will observe the referee sampling to insure compliance with specified procedures. The Agency shall be given the opportunity to observe the remaining portions of the WTAT to assure the accuracy of the referee test. The Contractor shall notify the Engineer at least 24 hours in advance of actual test performance. The referee WTAT shall be performed by an independent, certified laboratory. The results of each referee test will be compared to the respective test performed by the Agency. At the discretion of the Engineer, the referee test may be used as a basis to modify the result of the respective test performed by the Agency. All costs for referee testing shall be considered as included in the Contract Unit Price for emulsion-aggregate slurry.

**302-4.4 Public Convenience and Traffic Control.** Replace the first paragraph with the following:

At least 6 working days prior to commencing work, the Contractor shall submit a spreading schedule to the Engineer for approval. This schedule shall allow residents on the streets to be sealed ample "on street" parking within a reasonable distance from their homes. Based upon the spreading schedule, the Agency will notify residents and businesses of the proposed work and post temporary "No Parking" signs at no cost to the Contractor. The "No Parking" signs shall be in place no less than 24 hours prior to performing the work. The Contractor shall submit a request for changes in the schedule requiring additional posting to the Engineer for approval a minimum of 48 hours prior to sealing the affected streets.

Once a street has been posted, failure of the Contractor to meet and complete the approved daily schedule due to conditions under the Contractor's control will result in damages being sustained by the Agency. Such damages are, and will continue to be, impractical and extremely difficult to determine. For failure to meet and complete the schedule after posting, the Contractor shall pay to the Agency, or have withheld from any monies due it, the sum of \$500 as liquidated damages for each calendar day of additional posting required to complete the proposed work.

**302-4.5 Measurement and Payment.** Add the following after the first paragraph:

The Contractor shall furnish the Engineer with licensed weighmaster's certificates for all aggregates delivered to the Project site during the course of each day. Aggregate so certified as being delivered for use in the Project shall be used only in the emulsion-aggregate slurry on the Project or when approved by the Engineer and at no cost to the Agency, may be spread over freshly applied slurry to prevent tracking or damage to the slurry. The Contractor shall also present licensed weighmaster's certificates for the amount of such aggregate remaining unused at the completion of the Project. Payment shall be determined by deducting the amount of unused aggregate from the total amount of aggregate delivered, all as shown on the licensed weighmaster's certificates and shall be confirmed by multiplying the number of loads spread by each continuous-flow mixer times the net weight capacity of each mixer as determined by the licensed weighmaster's certificates. Adjustment shall be made in the calculations for partial loads, and the quantity of aggregate used to prevent tracking shall be deducted when determining quantities for payment. If there is an unaccountable difference between the two quantities, final payment will be determined by the method showing the lesser amount of aggregate used.

**302-4.6 Payment Reduction for Noncompliance.**

**302-4.6.1 General.** Replace the first sentence with the following:

Payment to the Contractor will be reduced for failure to comply with the Wet Track Abrasion Testing requirements specified in 302-4.3.3.

**302-4.6.2 Reduction in Payment Based on WTAT.** Replace the entire subsection with the following:

If the average of all Wet Track Abrasion Tests made per slurry mixer per day by the Engineer fail to conform to the requirements specified in 302-4.3.3, the Contractor agrees that payments for the work represented by the failed tests shall be reduced as follows:

**TABLE 302-4.6.2 (A)**

WTAT Loss gm/m5 (gm/ft5)	Payment Reduction (Percent) Fine & Type I Aggregate
0 B 540 (0 B 50)	0
540.1 B 650 (50.1 B 60)	5
650.1 B 750 (60.1 B 70)	15
750.1 B 860 (70.1 B 80)	30
860.1 B 1070 (80.1 B 99)	70
1070.1 or greater (99.1 or greater <sub>o</sub> )	100

1. Slurry seal with WTAT loss greater than 1070.1 gm/m5 (99.1 gm/feet5) shall be removed to the satisfaction of the Engineer.

**TABLE 302-4.6.2 (B)**

WTAT Loss gm/m5 (gm/ft5)	Payment Reduction (Percent) Type II Aggregate
0 B 650 (0 B 60)	0
650.1 - 750 (60.1 - 70)	5
750.1 B 860 (70.1 B 80)	15
860.1 - 970 (80.1 - 90)	30
970.1 B 1170 (90.1 B 109)	70
1170.1 or greater (109.1 or greater <sub>o</sub> )	100

1. Slurry seal with WTAT loss greater than 1170.1 gm/m5 (109.1 gm/feet5) shall be removed to the satisfaction of the Engineer.

**302-5 ASPHALT CONCRETE PAVEMENT.**

**302-5.1 General.** Add the following after the second paragraph:

The Contractor shall schedule the paving work such that no longitudinal dropoffs on the pavement will remain overnight in the travelled way. Any transverse dropoffs on the pavement over 25mm(1 inch) in height that will remain overnight shall be ramped with temporary AC pavement.

Add the following subsection:

**302-5.1.1 Preparation of Existing Pavement by the Agency.** For resurfacing work, any necessary preparation of existing pavement prior to the application of the tack coat by the Contractor will be done by Agency forces unless otherwise indicated on the Plans or in the Special Provisions. However, the Contractor shall remove any raised pavement markers within the area to be resurfaced and thoroughly sweep the surface prior to application of the tack coat.

**302-5.2 Cold Milling Asphalt Concrete Pavement.**

**302-5.2.1 General.** Add the following as the last paragraph:

Prior to cold milling the full width of a roadway, any affected storm drain or sewer manholes (other than County Sanitation Districts= manholes) shall be lowered below the proposed cold milling depth to facilitate cold milling. Refer to 301-1.6 of these Additions and Amendments for the procedure to be followed by the Contractor for the adjustment of

County Sanitation Districts= Manholes. After cold milling and resurfacing have been completed, the affected manholes shall be adjusted to the finished grade in accordance with 302-5.8. Payment for adjusting each manhole twice will be made at the Contract Unit Price for "DOUBLE ADJUST MANHOLE."

**302-5.5 Distribution and Spreading.** Add the following to the end of the first paragraph:

Unless otherwise shown on the Plans, redwood headers will not be required adjacent to alley, roadway or shoulder pavement. Redwood headers will be required adjacent to all driveways and other miscellaneous areas of asphalt concrete pavement unless otherwise directed by the Engineer.

Add the following after the first sentence of the sixth paragraph:

The machine shall operate independently of the vehicle being unloaded and be capable of propelling the vehicle being unloaded at a uniform rate. While being unloaded, the vehicle being unloaded shall be in contact with the machine at all times and the brakes of the vehicle being unloaded shall not be depended upon to maintain contact between the vehicle being unloaded and the machine.

The speed of the spreading and finishing machine shall be coordinated with the supply of the material to eliminate unnecessary delays while awaiting arrival of the material.

Replace Table 302-5.5(A) with the following:

**TABLE 302-5.5 (A)**

Specified Total Thickness of Pavement		Minimum Number of Courses	Class of Mixture
Greater Than mm(Inches)	But not More than mm(Inches)		
0	25(1)	1	D2
25(1)	38(1-1/2)	1	D2
38(1-1/2)	75(3)	1	C2, or B as directed or specified
75(3)	100(4)	2	Base Course - B Surface Course - C2 or as directed or specified
100(4)	-	2 or more	Base Course - B Other Courses - C2 or as directed or specified

**302-5.6.2 Density and Smoothness.** Add the following after the fifth paragraph:

Before acceptance, all pavements shall be water tested to ensure proper drainage as directed by the Engineer. The Contractor shall provide water for this purpose.

Full compensation for complying with the above requirement shall be considered as included in the Contract Unit Price for "AC PAVEMENT", "ASPHALT RUBBER HOT MIX" or "RUBBERIZED ASPHALT CONCRETE."

**302-5.8 Manholes (and other structures).** Replace the first sentence of the first paragraph with the following:

Sewer structures, except those owned by the County Sanitation Districts of Los Angeles County, and storm drain structures extending 50mm(2 inches) or more above the new subgrade shall be removed by the Contractor to the new subgrade before paving.

Add the following after the first sentence of the third paragraph:

Manhole frames and covers shall be cleaned prior to placement of the surface course.

**302-5.9 Measurement and Payment.**

Replace the last paragraph with the following:

Payment for furnishing and installing headers, where required, shall be considered as included in the Contract Unit Price for "AC PAVEMENT."

Add the following after the last paragraph:

When the Contract contains a Bid item for "AC PAVEMENT (DETOUR)", payment for all work involved in constructing and removing the detour, including grading and subgrade preparation, shall be considered as included in the Contract Unit Price for the item unless otherwise specified.

Add the following subsection:

**302-5.10 Asphalt Concrete Curb.**

**302-5.10.1 General.** Asphalt concrete curb shall be constructed of D2-PG 70-10 asphalt concrete conforming to 203-6, and shall be placed upon new or existing asphalt concrete or portland cement concrete pavement. The dimensions and configuration shall be as shown on the Plans.

**302-5.10.2 Tack Coat.** A tack coat conforming to 302-5.4 shall be applied to the existing asphalt concrete pavement prior to placing the curb.



**302-5.10.3 Measurement and Payment.** Asphalt concrete curb will be measured by the linear meter(foot). Payment for asphalt concrete curb will be made at the Contract Unit Price. Said price shall constitute full compensation for furnishing and placing all materials required, including tack coat, and for all labor, equipment, tools and incidentals required to complete the work.

## **302-6 PORTLAND CEMENT CONCRETE PAVEMENT.**

**302-6.1 General.** Add the following after the second paragraph:

To facilitate the flow of traffic or access to properties, the Contractor may be directed to provide admixtures or additional cement to the PCC being used for PCC pavement. Payment will be made based upon the actual invoice cost of the additional materials.

### **302-6.2 Forms and Headers.**

**302-6.2.1 General.** Replace the first sentence of the first paragraph with the following:

Forms and headers for PCC pavement shall be metal except for bus pad construction where wood forms may be used.

**302-6.2.3 Metal Forms.** Add the following as the first sentence:

Metal forms shall be designed specifically for PCC pavement construction.

### **302-6.4 Finishing.**

**302-6.4.1 General.** Add the following as the first two paragraphs:

For bridge deck construction, the Contractor shall inform the Engineer as to the number and type of workers it proposes to utilize in placing and finishing the deck concrete. The number and type of such workers shall be subject to the approval of the Engineer. The Contractor shall employ at least five experienced concrete finishers for finishing the bridge deck. If a finishing machine is used, an experienced operator shall be employed and may be substituted for one of the finishers specified. Two finishers shall have had bridge deck finishing experience including the use of a longitudinal float. Experience records shall be provided if so requested by the Engineer.

Strike-off or finishing machine, longitudinal float, bridges, bull float, broom, 3.0m(10-foot) straight edge, and cutting float for bridge deck construction shall be on the Project site at least 24 hours prior to the date scheduled for the placing of the deck concrete. The equipment shall be inspected and approved by the Engineer prior to the loading of any concrete for placement in the deck.

Add the following as the last two paragraphs:

Finishing machines suitable for the purpose may be used as strike-offs when approved by the Engineer. The use of a finishing machine for strike-off purposes shall in no way be

construed as a substitute for longitudinal floating. The screeds that the finishing machine operates from must be substantial so as not to deflect under the weight of the machine, be well supported and shall be spliced over supports only. Supports for the screeds shall be placed in such a manner that they will not be exposed upon removal of the bottom forms, or shall be removed completely, as directed by the Engineer. The concrete shall be struck-off on the skew, unless otherwise directed by the Engineer.

If a finishing machine is utilized as a strike-off for bridge deck construction, the Contractor shall provide for emergency strike-off methods in case of mechanical breakdown of the machine. This may be a manual strike-off which must be on the Project site with the equipment mentioned above, a stand-by machine or motor, or a source of supply of a machine which would enable delivery to the Project site within 45 minutes after placing a request for an alternate machine.

**302-6.4.2 Tamping.** Add the following as the last paragraph:

Two mechanical tampers (Clary or equal) will be required for roadway pavement when 38m<sup>3</sup> or more (50 or more cubic yards) of concrete are to be placed at any one location. The tampers shall be operated in tandem unless otherwise approved by the Engineer.

**302-6.4.3 Floating.**

**(a) General.** Replace the second sentence with the following:

Bridge decks shall be floated by the longitudinal-float method.

**(d) Longitudinal-Float Method.** Replace the first paragraph with the following:

The longitudinal floats shall be from 3.6m to 4.8m (12 to 16 feet) long with a troweling surface not less than 138mm (5-1/2 inches) nor more than 200mm (8 inches) wide, have plow handles on each end and provision for a rope attachment to its center.

For bridge deck construction, replace the second paragraph with the following:

At least two bridges shall be provided of sufficient length to span the work being finished when placed on the skew, and of sufficient strength and rigidity to support the workmen operating the longitudinal float, without deflecting into deck camber. A long handled bull float shall be used to eliminate any irregularities remaining after longitudinal floating operations.

**302-6.4.4 Final Finishing.** Replace the second paragraph with the following:

Final finishing shall be textured by stiff brooming or other means that will produce a hardened surface having a coefficient of friction of not less than 0.38 as determined by California Test Method No. 342. Completed pavement that is found to have a coefficient of friction of less than 0.38 shall be ground by the Contractor, at no cost to the Agency, in order to provide the required coefficient of friction.

For bridge decks, brooming shall be performed perpendicular to the centerline of the roadway, as directed by the Engineer. For roadway pavement, brooming may be either parallel or perpendicular to the centerline.

All unevenness in excess of the prescribed tolerances shall be removed by a steel shod cutting float ("bump cutter"), as directed by the Engineer. Abrasive means shall be employed if the results obtained by using the cutting float are not satisfactory. Brooming marks eliminated by the cutting operation shall be replaced by scarifying, using methods and equipment approved by the Engineer.

### **302-6.5 Joints.**

**302-6.5.2 Construction Joints.** Replace the last two paragraphs with the following:

Longitudinal and transverse joints shall be constructed per Standard Plan 134.

**302-6.5.4 Weakened-Plane Joints.** Add the following after the first sentence of the first paragraph:

If the locations of the weakened-plane joints are not shown on the Plans for roadway pavement, they shall be saw cut at intervals of 4.5m(15 feet) maximum in both directions.

Add the following after the first paragraph:

Tie bars shall be placed in the middle of the slab centered around the saw cut lines in the last three transverse weakened plane joints at each end of the work. Tie bars shall be size 15M(No. 4) concrete reinforcing bars, 600mm(24 inches) long, and spaced at 600mm(24 inches) on-center.

**302-6.6 Curing.** Replace the first sentence of the first paragraph with the following:

The entire roadway pavement surface shall be covered with Type 2 concrete curing compound conforming to 201-4.1.

Add the following as the third paragraph:

For bridge deck curing, the Contractor shall spray the deck with white pigmented chlorinated rubber curing compound at the rate of one liter per  $6 \pm 1$  square meters(one gallon per  $250 \pm 50$  square feet) as directed by the Engineer. Refer to 201-4.1 of these Additions and Amendments. The application of curing compound shall not eliminate the requirement of water curing the deck.

Add the following subsection:

### **302-6.9 Subsealing of PCC Pavement.**

**302-6.9.1 General.** Pavement subsealing shall consist of drilling holes in PCC pavement as directed by the Engineer, pumping either Type I or Type II portland cement grout or air-refined asphalt through the holes, and sealing the holes with a cement grout.

**302-6.9.2 Materials.** Cement grout shall conform to 201-5.7 of these Additions and Amendments. Air-refined asphalt shall conform to 203-4.

**302-6.9.3 Construction.** Subsealing shall begin at the slab lowest in elevation and progress to the slab highest in elevation. The existing pavement shall be protected from damage or discoloration by covering with sand or other material during subsealing operations.

Holes shall be drilled to the proper size to accommodate the equipment used for pumping the subsealing compound.

Subsealing material shall be pumped through a nozzle inserted in a suitable connecting device set in the drilled holes in such a manner that the material will not spill on to the existing pavement.

Holes shall be washed or blown out as necessary to obtain thorough distribution of the injected grout.

Grout shall be pressure-injected through the holes until all voids under the pavement slab are filled. No portion of the slab shall be moved or raised more than 1.3mm(0.050 inch) as a result of the pressure grouting. The Contractor shall furnish and utilize suitable devices with dial gages to monitor slab movement during pressure grouting.

Grout shall be injected into only one hole at a time on any slab. When grout appears at any longitudinal or transverse joint, crack, or adjacent hole, or when monitoring devices indicate slab movement, pressure grouting shall cease at the hole.

Immediately after the nozzle is removed, the hole shall be temporarily plugged with a round, tapered wooden plug. The plug shall remain in place until pressure grouting at adjacent holes progresses to the point where grout will not be forced up through previously grouted holes.

In the event the Engineer determines that continued grouting at a location is no longer advantageous, the Contractor may be directed to cease subsealing operations at that location.

Grouting shall not be performed when the atmospheric or subgrade temperature is below 7 EC(45E F). or during inclement weather. When standing water is present in the holes, grouting shall not be performed unless otherwise approved by the Engineer.

The Contractor shall take necessary precautions to prevent grout from being injected into any drainage facility or other open structure.

Cracks in the pavement which occur during the injection of grout will be considered as damage to the pavement due to the Contractor's operations. Such damage shall be repaired by the Contractor at its expense and as directed by the Engineer.

At the end of each work shift, the work area shall be swept and left in a clean and neat condition.

#### **302-6.9.4 Measurement.**

Drilled holes will be measured as units from the actual count of holes drilled, subsealed and filled.

Subsealing material, if portland cement grout, will be measured in cubic meters(cubic feet) of material actually pumped.

Subsealing material, if air refined asphalt, will be measured in liters at 16 °C (cubic feet at 60 °F) of material actually pumped. When using U.S. Standard Measures, 1 cubic foot equals 7.48 gallons and one ton equals 234 gallons.

#### **302-6.9.5 Payment.**

Full compensation for complying with the above requirements including furnishing all labor, materials, tools, equipment and incidentals, and for performing all work involved in pavement subsealing as shown on the Plans shall be considered as included in the Contract Unit Prices for "DRILL HOLE FOR SUBSEALING" and "SUBSEALING MATERIAL" unless otherwise specified.

### **SECTION 303 - CONCRETE AND MASONRY CONSTRUCTION**

#### **303-1 CONCRETE STRUCTURES.**

##### **303-1.1 General.** Add the following:

Utility openings in bridge abutments shall be completely filled with brick masonry per 303-4.2 of these Additions and Amendments. This work shall not be performed until all utility lines to be attached to the bridge structure during each stage of bridge construction have been installed in their permanent positions.

Reinforced concrete box storm drain construction in open trenches shall conform to 303 and 306.

##### **303-1.2 Subgrade for Concrete Structures.** Add the following after the first paragraph:

Concrete shall be placed against original ground or compacted backfill as specified herein. Excavation shall be to the elevations specified on the Plans, with the bottom of the excavation carefully shaped to fit the bottom of the structure.

In the event the Contractor excavates below the specified elevation, the Contractor shall either backfill to the specified elevation using 330-B-23 (560-B-3250) concrete or backfill to 150mm(6 inches) above the specified elevation such that not less than 90 percent compaction is achieved and then trim to the specified elevation.

Where original ground is below the specified elevation, the Contractor shall place compacted fill to 150mm(6 inches) above the specified elevation such that not less than 90 percent compaction is achieved and then trim to the specified elevation.

**303-1.3 Forms.** Add the following to the third paragraph:

End bulkhead forms for bridge decks, edge of deck forms and curb forms shall be constructed true to the specified lines, grades, and dimensions. Pour strips will not be permitted at these locations.

Replace subparagraph 2) of the eleventh paragraph with the following:

- 2) If concrete is placed against shoring, such shoring shall be closely fitted and all points shall be outside the concrete lines shown on the Plans. Those surfaces against which the concrete is to be placed shall be faced with building paper, plywood, or other suitable materials approved by the Engineer. Unless otherwise specified herein, all shoring shall be removed, but not until at least 7 days after placing concrete, or until the concrete has attained a compressive strength of 14 MPa(2,000 psi).

Care shall be taken in removing sheeting so as to avoid damaging the concrete. Voids left by the removal of shoring components shall be backfilled with material having a sand equivalent of not less than 30 and consolidated by jetting to the satisfaction of the Engineer.

**303-1.4 Removal of Forms.**

**303-1.4.2 Bridges.** Replace the first sentence of the third paragraph with the following:

Forms and falsework supporting the bridge superstructure shall not be removed or released until the last poured unit of deck concrete has attained a compressive strength of not less than 21MPa(3,000 psi) and has been in place at least 10 days.

**303-1.5 Removal of Forms for Box Sections.** Replace the first sentence of the first paragraph with the following:

In lieu of form removal as specified in 303-1.4, the Contractor may, at its option, strip the forms on the basis of compressive strengths or by the following method:

Add the following after the last paragraph:

The Contractor shall furnish at its own expense, all equipment, material, supplies and labor for performing field tests which will be used as a basis of determining when forms may be removed or stripped. Forms shall not be removed until approval therefore has been given by the Engineer.

The Contractor shall be responsible for determining when concrete placed in the forms has attained the compressive strength specified for form removal by means of tests on specimens made from the concrete placed in the forms. In connection therewith, the Contractor shall make such number of 152mm by 305mm(6-inch by 12-inch) cylindrical test

specimens as may be required to determine whether the specified strength has been attained; however, the number of specimens shall be such as to allow a minimum of three specimens to be tested at any one age. The equipment, materials and supplies to be furnished shall include, but not be limited to, molds, tamping rods, sulfur capping compound, capping compound warmer, a capping device and a compression testing machine.

The specimens shall be made in the presence of the Engineer, during every concrete pour for which stripping strengths are required, by taking representative samples of fresh concrete, preferably direct from the mixer, and placing such concrete into suitable molds where it shall be rodded into place. The specimens shall be made in accordance with ASTM C 31. Specimens shall be made and stored on a casting board made of 16mm(5/8 inch) plywood measuring 533mm x 533mm(21 inches x 21 inches).

The specimens shall be covered by a box fabricated of 13mm(1/2 inch) plywood measuring 533mm x 533mm x 394mm(21 inches x 21 inches x 15 1/2 inches) high, outside dimensions. During the period of November 1 to May 31, inclusive, said casting board and box shall be insulated with an inside covering of 13mm(1/2-inch) thick styrofoam or Department-approved equal. No insulation shall be used during the period of June 1 to October 31, inclusive. The use of plastic sheets, light bulbs or other heating devices, inside or outside of the box, will not be permitted. In connection therewith, not more than three specimens shall be stored under the box at any one time.

The box and board containing the three specimens shall be stored near the point of sampling, either on hardened concrete adjacent to the freshly placed concrete, or on the ground surface adjacent to the freshly placed concrete.

At an appropriate time, prior to loading, the specimens shall be removed from the box and moved to the location where the capping equipment and compression testing machine are kept; however, under no circumstances shall specimens be stored in the box for a period greater than 24 hours. At the aforementioned location, the specimens shall be removed from the molds and capped with a sulfur capping compound in accordance with the methods of ASTM C 31. After the caps have hardened, the specimens shall be loaded to failure in a compression testing machine, in the presence of the Engineer, in accordance with ASTM C 39. The compressive strength of each specimen shall be calculated by dividing the maximum load carried by the specimen during the test by the average cross sectional area, and the result expressed to the nearest 0.1MPa(10 psi). The compressive strength of the concrete represented by the specimens shall be taken as the average compressive strength of three specimens tested at the same age except that if one specimen in a test shows manifest evidence of improper sampling, molding or testing, it shall be discarded and the remaining two strengths averaged. Should more than one specimen representing a given test show definite defects due to improper sampling, molding or testing, the entire test shall be discarded.

In the event specimens are to be tested at ages greater than 24 hours, the specimens shall be taken from the box at an age of 24 hours, removed from the molds when the forms are stripped, and stored at the location where the capping equipment and compression testing machine are kept, where they shall receive, insofar as is practicable, the same

exposure and/or protection from the elements as the portions of the structure which they represent, until the time of testing.

The equipment, materials and supplies to be furnished by the Contractor shall meet the following specifications:

**a) Molds.** Molds for compression test specimens shall be 152mm(6.0 inches) inside diameter by 305mm(12.0 inches) high, made of nonabsorbent material, watertight and shall conform to the requirements of ASTM C 470.

**b) Tamping Rod.** Tamping rods shall be round, straight steel rods, 22mm(7/8 inch) in diameter and 610mm(24 inches) long, having one end rounded to a hemispherical tip of the same diameter.

**c) Sulfur Capping Compound.** Capping compound shall be plasticized, contain at least 55 percent refined sulfur and not more than 45 percent graded silica aggregate, and shall be free of sodium chloride or other water soluble salts, clay, shale, brick, dust, iron filings or similar fillers. It shall have an absorption of less than 0.5 percent by weight, a compressive strength of not less than 34.5MPa(5,000 psi), and a melting point between 129 EC and 143 EC(265 EF and 290 EF)

**d) Capping Compound Warmer.** The capping compound warmer shall be capable of melting the capping compound and maintaining a temperature between 129 EC and 143 EC(265 EF and 290 EF). The capacity of the warmer shall be sufficient to allow at least three specimens to be capped from one filling of the warmer with capping compound.

**e) Capping Device.** The capping device shall be suitable for use with the capping compound. It may hold the cylindrical specimens in either the vertical or horizontal position, and allow both ends of the specimen to be capped simultaneously, or each end may be capped individually. The device shall produce thin caps with plane end surfaces at right angles to the axis of the specimen.

**f) Compression Testing Machine.** The compression testing machine shall contain a hydraulic loading unit with a capacity of not less than 890kN(200,000 pounds). The loads may be developed by means of a hand-operated pump or a motor driven pump. The machine shall be capable of loading specimens at the rate specified in ASTM C 39.

The machine shall accommodate 152mm by 305mm(6-inch by 12-inch) cylindrical specimens between the upper and lower steel bearing blocks. The upper block shall be spherically seated, adjustable for specimen height, not less than 157mm(6.18 inches) in diameter, and have a hardened bearing face. The lower block shall be removable, have a hardened bearing face, and be not less than 157mm(6.18 inches) in diameter.

The testing machine shall have a hydraulic pressure gauge reading directly in kiloNewtons(pounds) of load applied to the specimen. The capacity of the gauge shall not exceed 890kN(200,000 pounds). The gauge shall be not less than 200mm(eight inches) in



diameter, be equipped with a maximum load pointer, and contain a quick coupler which will prevent leakage of hydraulic fluid from the system whenever the gauge is removed.

The testing machine shall be accurate to within one percent of the indicated load and shall be calibrated at intervals not to exceed six months by an agency approved by the Engineer.

The completed specimens may be tested by a certified testing laboratory; however, forms shall not be stripped until the Engineer has been furnished with the results of the tests and until approval has been given by the Engineer to remove the forms.

In the event that the compressive strength as determined from the cylinder tests are less than that required for form removal, and the Contractor does not have sufficient specimens to perform additional tests, then the Contractor shall wait four hours for each 0.7MPa(100 psi) that the compressive strength is below that required before removing the top slab forms.

### **303-1.6 Falsework.**

**303-1.6.1 General.** Replace the first sentence with the following:

The Contractor shall, where required by the Plans or the Special Provisions, submit per 2-5.3 working drawings of the falsework proposed to be used.

### **303-1.7 Placing Reinforcement.**

**303-1.7.1 General.** Delete the first paragraph. Add the following after the second paragraph:

Concrete chairs or blocks shall attain a 28-day compressive strength of 24MPa(3250 psi) or to the requirements prescribed for Class "A" mortar per 201-5.1 of these Additions and Amendments. In either case, the concrete chairs or blocks shall be water-cured per 303-1.10.

The Contractor shall insure that the dowels for bridge sidewalks, curbs, and barrier railings remain tight and on the intended alignment. Any damage to or loss of bond of the dowels caused by the Contractor's operations shall be repaired by the Contractor to the satisfaction of the Engineer. When dowels are placed in drilled holes, the Contractor shall first fill the hole with epoxy adhesive and then insert the dowel to insure positive bonding.

Reinforcing steel that extends from previously placed concrete into new construction shall be cleaned and free of any coating which would be likely to destroy, reduce or impair its proper bonding with the new concrete.

Old reinforcement that is to project into new work shall be straightened or bent to conform to the requirements of the Plans. Any damaged reinforcing steel that is to be left in place and is to be repaired by welding shall be welded in accordance with the provisions

of the American Welding Society Publication, AWS D12.1, "Recommended Practices for Welding Reinforcing Steel, Metal Inserts, and Connections in Reinforced Concrete Construction". The weld shall be sufficient to develop the full strength of the bar.

**303-1.7.2 Splicing.** Replace the entire subsection with the following:

Splices of bars shall be made only where shown on the Plans or approved by the Engineer. Where bars are spliced, the splices shall be staggered. The length of lapped splices shall be as follows: Reinforcing bars size 20M(No. 6), or smaller, shall be lapped 32 diameters of the smaller bar joined; reinforcing bars sizes 25M and 30M(Nos. 7, 8 and 9) shall be lapped at least 49 diameters of the smaller bar joined; and reinforcing bars size 35M(Nos. 10 and 11) shall be lapped at least 60 diameters of the smaller bar joined. Reinforcing bars sizes 45M and 55M(Nos. 14 and 18) shall not be spliced by lapping.

Splicing shall be accomplished by placing the bars in contact with each other and wiring them together.

Welding of reinforcing steel smaller than 45M and 55M (Nos. 14 and 18) will not be permitted unless otherwise shown on the Plans or directed by the Engineer. Welding, when permitted, shall conform to AWS D1.4 and utilize reinforcing bars conforming to ASTM designation A706.

Radiographic examinations shall be performed by the Contractor at its own expense on at least 25 percent of all full penetration butt-welded splices. For each weld found to be defective, a retest shall be made plus one additional splice as selected by the Engineer shall be examined radiographically by the Contractor.

All radiographs shall be submitted to the Engineer with a radiographic report and a certificate of compliance.

Each radiographed splice shall be identified on each radiograph. The radiograph identification and marking system shall be established by the Contractor and approved by the Engineer before radiographic inspection begins.

Welders, welding operators, and tackers shall be prequalified in accordance with the specifications of AWS D1.4 and shall produce written evidence of qualification satisfactory to the Engineer. Written approval of the documentation by the Engineer is required.

**303-1.8 Placing Concrete.**

**303-1.8.1 General.** Replace the second sentence of the first paragraph with the following:

Equipment having components made of aluminum or magnesium alloys which will be in contact with plastic concrete during mixing, transporting or pumping of portland cement concrete shall not be used.

Replace the second paragraph with the following:

Prior to placing any structure concrete, all forms, surfaces of previously placed concrete and reinforcing steel shall be wetted and the free water removed.

Add the following:

Concrete not placed within 10 minutes from the time of leaving the mixer shall be remixed before pouring. Any concrete not poured within a 15-minute interval after mixing shall be wasted.

**303-1.8.2 Grouting.** Delete the entire subsection.

**303-1.8.3 Depositing.** Add the following:

When poured monolithically, top slabs of box sections shall not be poured until the concrete in the walls has been consolidated and settlement has occurred. Vibration of the concrete in the top slab shall be conducted in such a manner as to insure that vibrators penetrate into the concrete previously placed in the walls.

**303-1.8.4 Consolidating.** Replace the first sentence of the third paragraph with the following:

The number of vibrators employed shall be of sufficient size to consolidate the concrete being placed within 15 minutes after it has been placed into the forms.

**303-1.8.6 Joints.** Add the following after the third paragraph:

Before placing fresh concrete, all construction joints shall be thoroughly wetted. Joints which are approximately horizontal, except expansion or contraction joints, shall be covered with 25mm(1 inch) of mortar consisting of one part cement to 2 1/2 parts sand. The quantity of water used shall be only that required to produce a mixture with a consistency comparable to that of the fresh concrete.

Water stops for reinforced concrete conduits and structures, where called for on the Plans, shall be of the type specified on the Plans or in the Special Provisions.

**303-1.8.7 Application of Joint Sealants.** Add the following:

- (f) **Waterproofing Membrane.** Prior to installing waterproofing membrane, a 150mm(6-inch) wide strip of 26-gage galvanized sheet metal shall be placed centered along the expansion joint. The strip shall extend the entire distance between median curbs without splicing. Surfaces to be waterproofed shall be clean, smooth, dry and free of fins, sharp edges, oil, grease and loose or foreign materials. Projections or depressions of the surface on which the membrane is to be applied that may cause injury to the membrane shall be removed or filled as directed by the Engineer. Butyl rubber membrane shall be fastened to the surface to be waterproofed by adhesive material. Membrane sheets with a minimum width of

450mm(18 inches) shall first be positioned and drawn tight without stretching. Positioning shall be offset 13mm(1/2 inch) from center to allow for an excess of 25mm ± 6mm(1 ± 1/4 inch) of membrane to bulge above the expansion joint. The membrane shall then be uniformly rolled up in the opposite direction of the offset. The adhesive shall then be applied to the exposed concrete area.

The adhesive shall be applied at a minimum rate of 4 liters per 10 square meters(1 gallon per 100 square feet). The adhesive shall be allowed to dry so as not to stick to a dry finger touch. A 200mm(8-inch) wide strip of antibond paper centered at the joint shall then be laid above the galvanized sheet metal. The membrane shall be unrolled halfway and pressed firmly into place. The remaining half of membrane shall be adjusted before being firmly pressed into place so it will be properly located to achieve the desired bulge above the joint.

The minimum bond length shall be 114mm(4-1/2 inches) on each side of the expansion joint. The membrane shall be bent 100mm(4 inches) to this side of the curb and have the bulge flattened in order to make the waterproofing effective along the ends. No splicing of the membrane shall be allowed.

Butyl rubber shall not be applied when the atmospheric temperature is below – 12 EC(10 EF).

Any holes in the membrane sheeting shall be patched with a minimum overlap of 100mm(4 inches) and in accordance with the manufacturer's instructions.

During construction, care shall be exercised to prevent damage to the waterproofing membrane by men or equipment.

**(g) Joint Waterproofing.**

Preparation of Surface

All concrete surfaces which are to be waterproofed shall be smooth and free from projections or holes which might cause puncture of the membrane. The surface shall be dry, so as to prevent the formation of steam when hot asphalt or tar is applied, and, immediately before the application of the waterproofing, the surface shall be thoroughly cleaned of dust and loose materials.

No waterproofing shall be done in wet weather, nor when the temperature is below 2 EC(35 EF), without special authorization from the Engineer.

Application

Asphalt shall be heated to a temperature between 149 EC and 177 EC(300 °F and 350 °F), and tar for hot application shall be heated to a temperature between 93 EC and 121 EC(200 EF and 250 EF) with frequent stirring to avoid local overheating. The heating kettles shall be equipped with thermometers.

Each strip of fabric shall be 450mm(18 inches) wide. All end laps shall be at least 300mm(12 inches) long. The full length of the surface shall be mopped with hot asphalt or tar, and the first strip of fabric shall be rolled onto it immediately following the mopping. The fabric shall be carefully pressed into place so as to eliminate all air bubbles and obtain close conformity with the surface.

The entire surface of the first strip shall then be mopped and the fabric rolled into place as before. The entire surface of the second strip shall then be given a final mopping of hot asphalt or tar.

The completed waterproofing shall be a firmly bonded membrane. Under no circumstances shall one layer of fabric touch another layer at any point or touch the surface, as there shall be a minimum of three complete moppings of asphalt or tar.

In all cases the mopping on concrete shall cover the surface so that no gray spots appear, and on cloth it shall be sufficiently heavy to completely conceal the weave. On vertical surfaces not less than 61 liters(15 gallons) of asphalt or tar shall be used for each 10 square meters(100 square feet) of finished work. The work shall be so regulated that, at the close of a day's work, all cloth that is laid shall have received the final mopping of asphalt or tar.

#### Damage Patching

Care shall be taken to prevent injury to the finished membrane. Any damage which may occur shall be repaired by patching. Patches shall extend a minimum of 300mm(12 inches) beyond the outer-most damaged portion and the second ply shall extend at least 75mm(3 inches) beyond the first.

**303-1.8.9 Concrete Deposited Under Water.** Replace the first sentence of the first paragraph with the following:

Structure concrete shall not be placed in or under water unless conditions render it impossible or inadvisable in the opinion of the Engineer to dewater the excavations. If such conditions exist, the Contractor shall deposit underwater, by means of a tremie or underwater bottom-dump bucket, a layer of concrete of sufficient thickness to thoroughly seal the cofferdam or excavation. After sufficient time has elapsed to insure adequate strength in the concrete seal, the excavation or cofferdam shall be dewatered and the top of the concrete cleaned of all scum, laitance and sediment. Before structure concrete is deposited, local high spots shall be removed as necessary to provide proper clearance for reinforcing steel.

Add the following subsection:

**303-1.8.10 Bridge Construction.** The method of placing concrete for the deck shall be such that a rate of placement is obtained which will allow the concrete to be floated while in the proper plastic state. In lieu of this requirement, the Contractor may submit a concrete placing sequence to the Engineer for approval. The amount and size of the equipment, rate of delivery to the Project site and method of placement shall be approved by the Engineer.

No sidewalk or barrier rail concrete placement will be permitted until the concrete in the deck pour has attained a compressive strength of not less than 21MPa(3,000 psi) and the forms for the deck have been released. Sidewalk or barrier rail concrete may be placed before the forms for the deck are released if the forms are supported by the bridge itself.

No closure pour concrete placement will be permitted until the sidewalk and barrier rail concrete placement is completed.

No loads of any character having a total weight in excess of 1,814kg(4,000 pounds), in addition to the sidewalk and barrier rail, will be permitted on any span until all superstructure concrete has attained a compressive strength of not less than 23MPa(3,250 psi).

### **303-1.9 Surface Finishes.**

**303-1.9.2 Ordinary Surface Finish.** Add the following:

- 5) Inside walls of reinforced concrete box storm drain.

**303-1.9.4 Class 2 Surface Finish.** Add the following after the last paragraph:

After completion of the ordinary surface finish on barrier railings, any unsightly bulges or irregularities shall be removed by the use of power carborundum stones or discs or other approved abrasive means to the satisfaction of the Engineer.

After all other work on barrier railings has been completed, which would in any way affect or mar the final finish, the Contractor shall rubber float the entire surface with cement mortar. This floating shall provide a smooth, even surface of uniform appearance. The coating shall be firmly bonded, protected from damage and kept damp for at least three days after placing. Loose areas of coating shall be removed and replaced by the Contractor at no expense to the Agency.

**303-1.10 Curing.** Replace the first paragraph with the following:

As soon after completion of the specified finishing operations as the condition of the concrete will permit without danger of consequent damage thereto, all exposed surfaces shall be sprayed with a curing compound per 201-4.1. Concrete may be cured by the use of earth, sand or burlap kept continuously wet when such method is approved by the Engineer. Bridge decks shall be sprayed with a curing compound before being continuously wet cured. The vertical surfaces of concrete barrier railings on bridges shall not be sprayed with a curing compound if the forms were in place for 12 hours or more.

**303-1.11 Payment.** Add the following after the second paragraph:

Should the Contractor request and obtain permission to use admixtures for its own benefit, the Contractor shall furnish such admixtures and incorporate them in the concrete mixture at its own expense and no additional compensation will be allowed therefor.

Should the Engineer direct the Contractor to incorporate any admixtures in the concrete when their use is not required by the Specifications, furnishing the admixtures and adding

them to the concrete will be paid for as "Extra Work" per 3-3 of these Additions and Amendments.

Add the following after the last paragraph:

All costs involved in modifying structures to be constructed per Standard Plans in accordance with the notes and/or details of the modifications shown on the Plans shall be considered as included in the Contract Unit Prices for the various structure items to be constructed per Standard Plans unless otherwise specified.

All costs involved in constructing local depressions, and in constructing curb and gutter to the ends of the local depressions, per Standard Plan 313 or as shown on the Plans shall be considered as included in the Contract Unit Price for the catch basin involved unless otherwise specified.

All costs involved in constructing the concrete gutter (valley) per Standard Plan 306 shall be considered as included in the Contract Unit Price for the catch basin unless otherwise specified.

Add the following subsections:

**303-1.11.1 Payment for Catch Basins.** The selection of the various depths for the catch basins shown on the Plans was based upon hydraulic requirements and the best available data with respect to the locations of various utilities; however, in order to avoid utilities, or for other reasons deemed necessary by the Engineer, the Agency reserves the right to increase or decrease the depth of any catch basin from that shown on the Plans. If the "V" depth of a catch basin is increased or decreased by order of the Engineer, then an adjustment (greater or less than the Contract Unit Price) for the increase or decrease will be made and the amount thereof will be based upon the method stipulated hereinafter. Furthermore, any increase or decrease in the cost of constructing the connector pipe resulting from the "V" depth change, or of the catch basin due to thickening of the concrete section or addition of steel reinforcement shall be considered as included in said stipulated amounts. Any reduction in "V" depth exceeding 150mm(0.5 feet) must be approved by the Engineer and the jurisdictional agency. Determination of these stipulated amounts involves the exclusion of all metal work and reinforcing steel not necessary to the increase or decrease of the catch basin "V" depth. Such exclusion is accomplished by the factors 0.80, 0.48, and 0.55 used in the stipulated formulas below. If the adjustment is an increase in the total amount of money due the Contractor, then the Contractor will be paid for such increase as "Extra Work" per 3-3 of these Additions and Amendments. If the adjustment is a decrease in the total amount of money due the Contractor, then the Agency shall receive a credit from any monies due the Contractor.

For the purpose of these Specifications, catch basins shall be separated into three groups, namely; Group 1, side opening catch basins without grates and with the deepest and shallowest points of the catch basin not varying in depth by more than 150mm(6 inches); Group 2, side opening catch basins without grates and with the deepest and shallowest points of the catch basin varying by more than 150mm(6 inches) in depth; and Group 3, grating type catch basins.

For the purpose of these Specifications, the average depth shall be the mean of the "V" depths of all the catch basins under one particular item of work.

In addition to the work listed in the Schedule of Prices, the Contractor agrees that, if directed by the Engineer, the Contractor will either increase or decrease the "V" depth of any given catch basin and that the amount to be paid to the Contractor or credited to the Agency therefore shall be based upon the following stipulated method:

**Group 1:**

$$\frac{(\text{Contract Unit Price})}{\text{Average Depth on Which Bid was Based}} (0.80) = \text{Adjustment per } 0.3\text{m}(1 \text{ foot}) \text{ change in average depth as ordered by the Engineer}$$

**Group 2:**

$$\frac{(\text{Contract Unit Price})}{\text{Average Depth on Which Bid was Based}} (0.48) = \text{Adjustment per } 0.3\text{m}(1 \text{ foot}) \text{ change in average depth as ordered by the Engineer}$$

**Group 3:**

$$\frac{(\text{Contract Unit Price})}{\text{Average Depth on Which Bid was Based}} (0.55) = \text{Adjustment per } 0.3\text{m}(1 \text{ foot}) \text{ change in average depth as ordered by the Engineer}$$

The adjustment per 0.3m(1 foot) or fraction thereof of change in average depth (defined hereinabove) is the ratio of the Contract Unit Price for any given catch basin to the average depth of the given basin all multiplied by the applicable factor.

**303-1.11.2 Payment for Reinforced Concrete Box Conduit.** The Contract Unit Price for reinforced concrete box conduit shall include all costs involved for clearing; removal of interfering existing improvements (excluding utilities except those abandoned in place); excavation; temporary supports for existing facilities crossing over the box; control of water; dewatering; formwork; obtaining high early strength; joining to existing structures; furnishing and placing of all materials; backfilling; grading; disposal of excess excavated and removed materials; temporary resurfacing; and all other costs involved in the work not specifically covered by other items of work.

All costs involved in the construction of windows for box conduits shall be considered as included in the Contract Unit Price for the applicable RCB item. For purposes of payment, no additions or deductions in box quantities will be made for windows.

Measurement for payment will be to the nearest meter(foot) measured in the plane of the invert.



### **303-1.11.3 Payment for Reinforced Concrete Channel.**

The Contract Unit Price for reinforced concrete channel shall include all costs involved for clearing; stripping; excavation; removal of interfering existing improvements (excluding utilities, except those abandoned in place); control of water; dewatering; formwork; joining to existing structures; furnishing and placing of all materials; backfilling; grading; disposal of excess excavated and removed material; and all other costs involved in the work not specifically covered by other items of work.

Measurement for payment will be to the nearest meter(foot) measured in the plane of the invert.

**303-1.11.4 Payment for CSP Flared Inlet.** The Contract Unit Price shall be considered as full compensation for all corrugated steel pipe, band couplers, fittings, end sections, concrete collars and other requirements necessary for the CSP Flared Inlet as shown on Standard Plan 351.

### **303-2 AIR PLACED CONCRETE.**

**303-2.4 Tests.** Replace the third sentence of the fifth paragraph with the following:

All of the core test specimens shall be obtained at 14 days, with one tested at 16 days. The tests shall be conducted in the presence of the Engineer. A final report shall be submitted to the Engineer within one week of completion of the tests.

Replace the sixth paragraph with the following:

The minimum strength of test specimens shall be:

16-day cores..... 7MPa(2,500 psi)  
28-day cores..... 23MPa(3,250 psi)

### **303-3 PRESTRESSED CONCRETE CONSTRUCTION.**

**303-3.1 General.** Add the following:

Bridge abutments shall be backfilled in the front and back of the structures prior to the placement of any prestressed girders, unless otherwise required by the Special Provisions, noted on the Plans, or so directed by the Engineer.

Dimensional tolerances for prestressed concrete girders shall be as outlined in Prestressed Concrete Institute MNL-116 unless amended herein or on the Plans. Tolerances for other structural members shall be as follows:

Cross Sectional Dimensions:

Less than 600mm(24 inches)	+6mm(+1/4 inch)
600mm to 900mm(24 to 36 inches)	+9mm(+3/8 inch)
Over 900mm(Over 36 inches)	+13mm(+1/2 inch)

Length:

Less than 7.6m(25 feet)	+13mm(+1/2 inch)
7.6m to 15.2m(25 to 50 feet)	+19mm(+3/4 inch)
Over 15.2m(Over 50 feet)	+25mm(+1 inch)

Deviation in squareness of ends:

	<u>Horizontal</u>	<u>Vertical</u>
Less than 300mm(12 inches)	0.015625 x Length (1/64" per inch)	0.03125 x Length (1/32" per inch)
Over 300mm(12 inches)	1.6mm + 0.015625 x Length(mm) Max + 13mm (1/16" + 1/64" per inch Max + 1/2")	4.7mm + 0.015625 x Length(mm) + 19mm (3/16" + 1/64" per inch Max + 3/4")

Deviation from straight line (Sweep): 5mm per 3m(3/16" per 10 feet) x Total Length in meters(feet)

Deviation from mean camber (as installed): + 0.00104167(+ 1/8" per 10 feet) x Total Length in meters(feet)

Prestressing Steel: Prestressing force and location of C.G.S. limits shall be as shown on the Plans. Location of harping points  $\nabla$  1'.

**303-3.2 Concrete.** Add the following at the end of the first paragraph:

The Contractor shall submit to the Agency for approval the prestressed concrete mix design per 2-5.3.

Add the following to subparagraph 7) of the last paragraph:

"and shall become the property of the Agency".

**303-3.6 Prestressing.** Add the following at the end of the first paragraph:

The Contractor shall cooperate with the Engineer in determining the accuracy of the loads in the stressing strands and provide proper proof of load accuracy if required by the Engineer.

**303-5 CONCRETE CURBS, WALKS, GUTTERS, CROSS GUTTERS, ALLEY INTERSECTIONS, ACCESS RAMPS, AND DRIVEWAYS.**

**303-5.1 Requirements.**

**303-5.1.1 General.** Add the following:

To facilitate access to properties, the Contractor may be directed to include admixtures or additional cement in the concrete mix for driveway aprons. Payment will be made on the basis of the actual invoice cost of the additional materials.

**303-5.3 Placing Concrete.** Add the following after the second paragraph:

At locations where new sidewalk will join a wall, the sidewalk shall be placed in two separate pours. The first pour shall include the portion of the walk from the back of the curb to approximately 150mm(6 inches) off the face of the wall or as directed by the Engineer. The second pour shall be between the wall and the edge of the walk previously placed. Full compensation for complying with these requirements shall be considered as included in the Contract Unit Prices for the various items of work.

**303-5.5 Finishing.**

**303-5.5.3 Walk.** Replace the second paragraph with the following:

After concrete has been deposited in place, it shall be thoroughly tamped in such a manner that coarse aggregate will be forced down and a layer of free mortar approximately 6mm (1/4 inch) thick covers the surface. The concrete shall be screeded to the required grade and floated to a smooth, flat, uniform surface. Immediately after the initial set has taken place, the surface shall be broomed. Brooming shall be accomplished by a fine-hair broom and shall be performed perpendicular to the centerline of the adjacent roadway as directed by the Engineer.

Add the following subsection:

**303-8 EPOXY INJECTION.** Epoxy resin shall be injected into any cracks resulting from shrinkage in bridge abutment walls. The minimum age of concrete shall be 21-28 days for epoxy applications. Epoxy injection shall be performed in accordance with the following procedure:

1. All cracks noted and documented by the Engineer shall be epoxy injected.
2. Clean the cracks or surfaces of any loose materials, oils, paint, rust or any other contaminants which might prevent satisfactory bond and epoxy cure.

3. Space entry ports at a minimum of the wall thickness and at a maximum of 1.5 times the wall thickness.
4. Apply Sikadur 31, Hi-Mod Gel, an epoxy paste adhesive, or an Agency -approved equal, to the crack while ensuring that the surface of the crack is dry.
5. Pressure flush the crack if necessary to remove dirt or deposits that may interfere with adhesion. Use water or mild muriatic acid followed by a water rinse.
6. Start injecting at the end of the crack and use a 100% epoxy injection system, Sikadur 52, an injection resin, or an Agency-approved equal, to completely fill the length of the crack.
7. When the resin reaches the second port, it will have been forced completely through the thickness of the wall.
8. Move injection head from port to port until the complete crack has been filled. Plug each port and leave in place for 24 hours until the resin has set.
9. Force the epoxy adhesive into the cracks by using simple air pressure guns or by using metering and mixing machines.
10. Maximum allowable pressure shall be 0.68MPa(100 psi). Preferred pressure shall be 0.14 to 0.21MPa(20 to 30 psi).

## **SECTION 304 - METAL FABRICATION AND CONSTRUCTION**

### **304-1 STRUCTURAL STEEL.**

#### **304-1.6 Joint and Connections.**

##### **304-1.6.6 Fit of Stiffeners.** Add the following:

Where the end of a stiffener plate is shown **Atight fit@** on the Plans, the end of the plate shall be so fitted that it bears on the beam flange with at least point bearing. Local clearances between the end of the plate and the flange shall not exceed 1.6mm(1/16 inch).

**304-1.7 Bearings and Anchorage.** For bridge construction, delete the last two paragraphs and add the following subsection:

**304-1.7.1 Elastomeric Bearing Pads.** Elastomeric bearing pads shall be manufactured, assembled, and installed in accordance with the requirements specified herein below and Section 51-1.12H of the Caltrans Standard Specifications for Construction of Local Streets and Roads (latest edition), unless otherwise specified in the Special Provisions.

Lamination of elastomer shall be 13mm ± 3mm(1/2 inch ± 1/8-inch) in thickness. Variation in thickness of an individual elastomer shall not exceed 3mm(1/8 inch) within the width or length of a pad and the variation in thickness of all elastomer laminations within a

pad shall be such that each metal or fabric lamination will not vary by more than 3mm(1/8 inch) from a plane parallel to the top or bottom surface of the pad. Pads containing metal laminations shall be fully molded.

Metal laminations shall be rolled mild steel sheets not less than 20-gage in thickness.

The Contractor shall furnish to the Engineer a certification per 4-1.5 provided by the manufacturer that the elastomer and fabric (if used), in the elastomeric bearing pad to be furnished, conforms to all of the above requirements. The certification shall be supported by a certified copy of the results of tests performed by the manufacturer upon samples of the elastomer and fabric to be used in the pads.

The concrete bearing surfaces under the bearing pads shall be uniform and shall not vary from the specified grade by more than 1.5mm(1/16 inch) at the intersection of the girder and bearing centerlines. The bearing surfaces shall be sloped parallel to the roadway along the centerline of girders and finished level normal to the girder centerlines. Where required, adjustment to the above shall be as directed by the Engineer to make allowance for the skew ends and camber of the girders.

**304-1.9 Welding.** Replace the entire subsection with the following:

All welding shall conform to the requirements of the [Bridge Welding Code](#) AWS D1.5, and these Specifications.

Matching weld metal is required for all highway bridge welding except for ancillary products not subject to calculated tensile stress from live load and not welded to main members in tension areas as determined by the Engineer. The electrode or electrode/flux combination shall be in accordance with AWS D1.5 Tables 4.1 or 4.2.

Welders, welding operators, and tackers shall be prequalified in accordance with the specifications of AWS D1.5 and shall produce written evidence of qualification satisfactory to the Engineer. Written approval of the documentation is required from the Engineer.

Unless otherwise shown on the Plans or specified, bearing assemblies that are to be machined after welding shall be stress-relieved by heat treatment before machining, in accordance with the [Structural Welding Code](#), AWS D1.1.

Unless otherwise shown on the Plans or specified, erection bolts required for welded splices or welded connections may be left in place and the ends of all such erection bolts which project beyond the nut shall be burned off flush with the face of the nut. Where the bolt does not project, the end of the bolt and nut shall be tack welded to prevent loosening of the nut. Burning off projecting bolt ends and tack welding shall be performed prior to painting.

All welding may be subject to radiographic or other nondestructive testing. Such nondestructive testing will be performed without charge to the Contractor except that the Contractor shall perform at its own expense the radiographic examination of butt joint

groove welds on bridge girders and for nondestructive reexamination of defective welds. The reexamination of defective welds shall also include the two 425mm(17-inch) lengths of weld adjacent to each end of any radiographed length of defective weld.

The extent of Contractor performed radiographic examination shall be as listed. Where less than 100% inspection of the weld total length is required, the Engineer will select the length and locations of weld for inspection to meet the specified percentages of inspection.

<u>Girder Material</u>	<u>Member</u>	<u>Weld Tension-Compression</u>	<u>Percent Orientation</u>	<u>Inspection</u>
All	Flange	Tension	Transverse	100
All	Flange	Compression	Transverse	25
All	Web	Tension & Compression	Transverse	25
All	Web	Tension & Compression	Longitudinal	10

Radiographic weld inspection-box or trapezoidal shaped girders except those less than 1200mm(48 inches) in width:

<u>Girder Material</u>	<u>Member</u>	<u>Weld Tension-Compression</u>	<u>Percent Orientation</u>	<u>Inspection</u>
A36,A441	Flange	Tension	Transverse	50
A36,A441	Flange	Tension	Longitudinal	10
A36,A441	Flange	Compression	Transverse	25
A36,A441	Flange	Compression	Longitudinal	10
A36,A441	Web	Tension & Compression	Transverse	25
A36,A441	Web	Tension & Compression	Longitudinal	10
A588,A572	Flange	Tension	Transverse	75
A588,A572	Flange	Tension	Longitudinal	10
A588,A572	Flange	Compression	Transverse	25
A588,A572	Flange	Compression	Longitudinal	10
A588,A572	Web	Tension & Compression	Transverse	25
A588,A572	Web	Tension & Compression	Longitudinal	10
A514	Flange	Tension	Transverse	100
A514	Flange	Tension	Longitudinal	15
A514	Flange	Compression	Transverse	50
A514	Flange	Compression	Longitudinal	10
A514	Web	Tension & Compression	Transverse	25
A514	Web	Tension & Compression	Longitudinal	10

All welds to be inspected radiographically shall be ground flush with the base material. Run-off plates and backing strips shall be removed prior to radiographic inspection.

All radiographs shall be submitted to the Engineer with a radiographic report and a certificate of compliance.

At no additional cost to the Agency, all welding processes shall be qualified in accordance with AWS D1.5 Section 1.3.

For bridge construction, full compensation for complying with the requirements of this subsection shall be considered as included in the Contract Unit Price for "STRUCTURAL STEEL" unless otherwise specified.

Add the following subsections:

### **304-5 AUTOMATIC FLAP GATES.**

**304-5.1 General.** Two types of automatic flap gates are covered by these Specifications.

Type 1 - Flap Gates for Normal Service.

Type 2 - Flap Gates for Special Service.

Type 1 flap gates shall be used or furnished unless otherwise indicated on the Plans or specified in the Special Provisions.

The flap gates shall be Rodney Hunt, Waterman or Agency -approved equal designed for 6.0m(20 feet) of seating head.

### **304-5.2 Materials.**

#### **304-5.2.1 Flap Gates for Normal Service (Type 1).**

- (a) The flap gate body, lid and pivot lugs shall be cast from gray iron conforming with ASTM A 48, Class 30 or ASTM A 126, Class B.
- (b) The hinge bars or links shall be cast from steel conforming with ASTM A 27 Grade 60-30, or fabricated from steel conforming with ASTM A 36.
- (c) The assembly bolts, adjusting screws, studs and nuts shall be fabricated from Type 316 stainless steel, or an approved equivalent stainless steel alloy. The anchor bolts and nuts shall be fabricated from carbon steel, ASTM A 307 Grade A (galvanized), or an approved equivalent carbon steel alloy.
- (d) Except for the seating (sealing) surfaces, all flap gates larger than 300mm(12 inches) shall be completely coated with a commercial asphaltum coating prior to delivery for installation. The minimum dry film coating thickness shall be 15 mils. All flap gates 300mm(12 inches) or smaller shall also be coated as specified above except the seating surfaces shall be uniformly coated to a dry film maximum thickness of 15 mils. The stainless fasteners shall not be coated.

### **304-5.2.2 Flap Gates for Special Service (Type 2).**

- (a) The flap gate body and lid shall be cast from gray iron conforming with ASTM A 48, Class 30, or may be fabricated from steel conforming with ASTM A 36.
- (b) The hinge bars or links and the pivot lugs shall be cast from steel ASTM A 27, Grade 60-30, or may be fabricated from steel conforming with ASTM A 36.
- (c) The assembly bolts, adjusting screws, anchor bolts, nuts and washers shall be fabricated from Type 316 stainless steel, or an approved equivalent stainless steel alloy.
- (d) The flap gate body and lid shall have bronze seating surfaces utilizing Naval Bronze, ASTM B 21, or other Agency-approved alloy. The seating surfaces shall be machined after application of bronze seats and shall be matched together for leak tightness.
- (e) The flap gate body, lid, with the exception of seating surfaces, hinge bars or links and pivot lugs of Type 2 flap gates shall be epoxy coated in a shop as specified hereinafter.

### **304-5.3 Epoxy Coatings.**

**304-5.3.1 Cleaning.** The parts to be coated shall be sandblasted to bright metal (SSPC-SP5) in a shop, and then thoroughly cleaned. All casting, fabrication or welding irregularities shall be ground smooth before sandblasting.

Should rust form subsequent to sandblasting but prior to coating, the parts shall again be sand blasted.

**304-5.3.2 Coating Material.** One of the following epoxy coating systems shall be used:

- (1) Liquid Catalyst System - consisting of an 80-100 percent non-volatile solid epoxy resin, mixed with a liquid catalyst.
  - a. Engard 480 High Solids epoxy coating as manufactured by Engard Coating Corporation. This coating does not require the use of a primer.
  - b. Amercoat 1960E epoxy primer and Amercoat 66 epoxy coating, as manufactured by Amercoat Corp.
  - c. Koppers No. 654 epoxy primer and Koppers Glamorglaze epoxy coating as manufactured by Koppers Co. Inc.
- (2) Fusion Process - consisting of the application of 100 percent dry powder epoxy resin using the fusion process and heat curing. The material used shall be "Scotchcote" resin powder as manufactured by the 3M Company or an Agency-approved equal.



The use of alternate epoxy coating materials must be approved by the Engineer prior to application.

**304-5.3.3 Coating Thickness.** The epoxy coatings shall be applied to a minimum of 15 mils dry film thickness.

When the liquid catalyst system requiring the use of primer is used, the zinc rich primer shall be 3-5 mils thick such that the final coats of epoxy shall bring the coating to a total minimum dry film thickness of 15 mils.

**304-5.3.4 Color.** The coating color shall be "haze gray," unless otherwise specified. Pigment shall be included in the epoxy resin.

**304-5.3.5 Coating Inspection.** Upon completion of the application, the applicator shall inspect the coatings as follows:

- (1) Test the thickness with a dry film thickness gage.
- (2) Test the entire coated surfaces for holidays (pin holes) with a high voltage holiday detector (minimum voltage 2000 volts).
- (3) Any pin holes or thin spots thus located shall be repaired with the coating materials to the satisfaction of the Engineer.

**304-5.3.6 Approved Applicators.**

- (1) All coatings shall be applied in the shops of qualified applicators approved by the Agency who perform epoxy coatings application as their primary business. Epoxy coating facilities shall meet the following general requirements:
  - a. The area in which the epoxy coating is applied shall be enclosed on at least three sides and shall have a roof and concrete or asphalt floor. Coating performed in a yard, without proper shelter as described above, will not be acceptable.
  - b. The sandblasting area shall be a separate facility from the coating area, suitably isolated to prevent air-borne dust and sand from reaching the coating area.
  - c. The applicator shall follow suitable dust control procedures to assure that the surfaces to be coated are free of dust and foreign material.
  - d. The Contractor shall provide the necessary inspection equipment (dry film thickness tester and high voltage holiday detector) and operating personnel for final inspection and testing to be performed in the presence of the Engineer.
- (2) The following epoxy applicators are currently approved by the Agency:
  - a. Liquid Catalyst Epoxy Applicator

Soc-Co Plastic Coating Co.  
11251 Jersey Blvd.  
Rancho Cucamonga  
(909) 987-4753

b. Dry Powder Fusion Applicator:

Fusecote Co. Inc.  
9658 Alpaca  
South El Monte  
(626) 443-6760

Alternate applicators must be approved in advance by the Agency.

**304-5.3.7 Touchup Kit.** The epoxy coating applicator shall furnish the Agency an epoxy touchup kit with instructions for field touchup of coatings.

**304-5.4 Manufacturing Requirements.** The plane of the seating faces shall be inclined from the vertical by a minimum of two and one-half (2-1/2) degrees, lower edge outward. The mating seating surfaces shall be machined in pairs to a surface roughness tolerance designation not exceeding 63 micro-inches, as specified in the American National Standard (ANS B 46.1) titled "Surface Texture." After machining, the body and lid of the flap gates shall be clearly and permanently matchmarked for proper assembly of seating surfaces in pairs.

Pivot lugs shall have double bosses to put the top assembly bolts in double shear when the gate is assembled with the links in position. These pivot parts must be adjustable in the horizontal plane without disassembly of the flap from the gate links. This top adjustment shall allow the top pivot point to be moved closer to the gate seat to provide minimum differential head for opening. A minimum of two studs shall be used to connect each pivot lug to the gate frame.

**304-5.5 Shop Drawings.** Shop drawings are not required for flap gates 1500mm(60 inches) in diameter and smaller nor for gates of equivalent rectangular area. However, for all such flap gates, an 8-1/2" x 11" size dimensional assembly drawing with the actual materials used in the manufacture listed thereon shall be submitted.

Shop drawings shall be submitted for all flap gates over 1500mm(60 inches) in diameter or having equivalent rectangular areas. The shop drawings shall indicate all of the details, clearances, types of finishes, types of materials and other pertinent data.

Refer to 2-5.3 and 4-1.3.

**304-5.6 Markings.**

**304-5.6.1 General.** Each lid and frame of each flap gate shall be identified with raised letter markings or other permanent type of identification.

**304-5.6.2 Markings.** The markings shall be cast iron legible raised letters or welded on, and shall identify the flap gate as follows:

- (a) Manufacturer.
- (b) Type 1 or Type 2 designation.

**304-5.7 Adjustments, Handling and Installation.** Flap gates shall be properly adjusted at the factory to minimize leakage. Flap gates shall be crated at the point of manufacturer in strong crates of such design and materials as to effectively protect the flap gates from damage and from harm to the adjustment of said flap gates, and shall be delivered to the Project site in unbroken crates.

Each flap gate furnished for installation on the Project shall have furnished with it a detailed set of instructions covering the manufacturer's recommended method of installation.

The Contractor shall have a representative of the manufacturer of the flap gate adjust each gate in the field after installation to the satisfaction of the Engineer.

The Contractor shall exercise due care in the handling and installation of flap gates. A template shall be used to set the anchor bolts for the gate frames, when mounted on concrete headwalls. The joint between the gate frame and the concrete collar or headwall shall be watertight.

**304-5.8 Payment.** All costs involved in furnishing and installing the automatic flap gates in accordance with the details shown on the Plans, including concrete collars where required, shall be considered as included in the Contract Unit Price for the applicable flap gate item.

The Contract Unit Price for the applicable flap gate item shall not include the costs for the construction of Junction Structures per Standard Plans 331 or 333, unless otherwise specified.

## **304-6 PROTECTION BARRIERS FOR STORM DRAINS.**

**304-6.1 General.** Protection barriers shall be shop fabricated in accordance with the notes and details shown on the Plans and as specified herein.

Two types of protection barriers are covered by these Specifications:

- Type 1 - Protection Barriers for Normal Service.
- Type 2 - Protection Barriers for Special Service.

Type 1 barriers shall be used or furnished unless otherwise indicated on the Plans or specified in the Special Provisions.

### **304-6.2 Materials.**

#### **304-6.2.1 Protection Barriers for Normal Service (Type 1).**

- (a) Steel for all structural shapes shall conform to ASTM A 36, "Steel for Bridges and Buildings."
- (b) Material for bolts and nuts shall conform to ASTM A 307, Grade A, "Low-Carbon Steel Externally and Internally Threaded Standard Fasteners."

- (c) Washers for steel contact fastenings shall be steel washers conforming to ASA B27.1 for "Lock Washers" and ASA B 27.2 for "Plain Washers."
- (d) Bars shall be fabricated from steel conforming to ASTM A 36.
- (e) The pipe for hinges shall be steel conforming to ASTM A 120.

**304-6.2.2 Protection Barriers for Special Service (Type 2).**

- (a) Steel for all structural shapes shall conform to ASTM A 36, "Steel for Bridges and Buildings."
- (b) Bars shall be fabricated from steel conforming to ASTM A 36.
- (c) Hinge assembly, including base plate, anchor bolts, soffit rib, barrier rib, barrier rib mounting plate, hinge pin and nuts, and washers shall be fabricated from stainless steel ASTM A 320 type B8M (AISI 316) with the following strengths:

Minimum yield strength.....206.6MPa(30,000 psi)  
 Minimum tensile strength.....517.1MPa(75,000 psi)

**304-6.3 Fabrication.**

**304-6.3.1 Protection Barriers for Normal Service (Type 1).**

- (a) All welding shall be done by the electric arc welding process, conforming in all respects to the Standard Specifications of the American Welding Society for the applicable type of work. All weldments shall be ground smooth before galvanizing.
- (b) The entire barrier shall be galvanized after fabrication per 210-3.

**304-6.3.2 Protection Barriers for Special Service (Type 2).**

- (a) Fabrication shall be the same as for Type 1 Protection Barriers.
- (b) Sandblast gate to bright metal in a shop, and then thoroughly clean.
- (c) Shop prime coat using an epoxy primer specified by the manufacturer of coal tar epoxy, to a 5-mil thickness. Prime coat shall be permitted to dry for a period of time as specified by the aforementioned manufacturer.
- (d) The entire gate shall be coated with a coal tar epoxy to a thickness of 10 mils in a shop or in the field, giving a total thickness of epoxy primer and coal tar epoxy of 15 mils. The epoxy coating shall be one of the following or an approved equal:
  - (1) Tarset, Porter Tarset Standard No. 7001, as manufactured by Porter Coatings Division, Porter Paint Co.

- (2) Arocoat, EA-850A base with EA-851A blending resin, as manufactured by Reliance Universal Inc.
- (e) Touchup coating after handling, shipping and installation shall be applied as required to the satisfaction of the Engineer.

## **SECTION 305 – PILE DRIVING**

### **305-1 PILE DRIVING.**

**305-1.1 General.** Replace the third paragraph with the following:

For bridge construction, one exploratory pile of the type selected or designated for the Work shall be installed in each pier and abutment area as an exploratory pile. The Contractor shall furnish each exploratory pile in a length 1.5m(5 feet) longer than that required to reach the design tip elevation shown on the Plans. The location of the exploratory piles shall be as determined by the Engineer.

## **SECTION 306 - UNDERGROUND CONDUIT CONSTRUCTION**

### **306-1 OPEN TRENCH OPERATIONS.**

#### **306-1.1 Trench Excavation.**

**306-1.1.1 General.** Replace the first paragraph with the following:

For the purpose of shoring or bracing, a trench is defined as an excavation in which the depth is greater than the width. Shoring and bracing shall be required when the depth is greater than 1.5m(5 feet). In cases where there are unstable soil conditions, shoring or bracing may be required for depths less than 1.5m(5 feet).

Replace the last sentence of the third paragraph with the following:

Removal of groundwater shall be performed to a level sufficiently below the structure subgrade to ensure a firm and stable subgrade for the construction of the structure. All costs for such dewatering shall be considered as included in the prices in the Bid for the various items of work unless otherwise specified in the Special Provisions.

Add the following after the last paragraph:

All open trenches shall be protected by protective and security fencing or plates in accordance with LACDPW Standard Plan 6008. If an exception as specified on LACDPW Standard Plan 6008, Sheet 2 exists, barricades conforming to LACDPW Standard Plan 6009 shall be placed in accordance with the Manual on Uniform Traffic Control Devices, [www.mutcd.fhwa.gov](http://www.mutcd.fhwa.gov), and its California supplements, [www.dot.ca.gov/hq/traffops/signtcch/mutcdsupp](http://www.dot.ca.gov/hq/traffops/signtcch/mutcdsupp). The maximum spacing of barricades shall not exceed 7.5m(25 feet). Such open trench areas shall not be opened for vehicular use

by the public until temporary or permanent resurfacing has been placed to provide a smooth surface for vehicular travel. Areas that are opened for use of the public shall be maintained by the Contractor to provide a smooth surface until the permanent resurfacing is placed.

**306-1.1.2 Maximum Length of Open Trench.** Replace the entire subsection with the following:

Open trench, as referred to herein, shall be defined as all excavations which have not been completely backfilled (including attaining required relative compaction) as required elsewhere in these Specifications, and in which neither temporary nor permanent resurfacing has been placed.

For purposes of this subsection, pavement breaking in advance of excavation is considered a part of the excavation and, as such, is a part of the open trench.

**(a) Case 1, Prefabricated Pipe:** The Contractor shall regulate its rate of excavation so that the length of open trench along any one heading shall not exceed that specified in the following table:

Depth of Cover in Meters(Feet)	Maximum Allowable Trench Length in Multiples of Length of Pipe Actually Laid in a Single Day
0 to 1.5(5)	7
Over 1.5(5) to 3.0(10)	8
Over 3.0(10) to 4.5(15)	9
Over 4.5(15)	10

In the event additional curing time is necessary for poured-in-place concrete structures, these structures will not be considered in the calculation of the maximum allowable trench length but shall be backfilled and the trench restored using either temporary or permanent resurfacing as soon as the required concrete compressive strengths have been attained.

**(b) Case 2, Reinforced Concrete Box:** The Contractor shall regulate its rate of excavation so that the length of open trench along any one heading shall not exceed that specified in the following table:

Depth of Cover in Meters(Feet)	Maximum Allowable Trench Length in Multiples of Length of RCB Actually Poured in a Single Day
0 to 1.5(5)	15
Over 1.5(5) to 3.0(10)	16
Over 3.0(10) to 4.5(15)	17
Over 4.5(15)	18

In the event the Contractor elects to delete the temporary resurfacing and place permanent resurfacing immediately, 2 additional multiples may be added to the above table if so approved by the Engineer. However, the actual length of open trench may be limited by the Engineer during construction due to adverse Project site conditions.

The length completed in a single day as used in both cases above shall be defined as the daily average length completed during the five immediately preceding working days exclusive of placement of resurfacing (temporary or permanent) and restoration of other existing improvements. Where more than one line is shown on the Plans, an operation which moves progressively from one line to another shall be considered a single heading. The depth of cover, as referred to in this subsection, shall be the average distance from the top of the completed structure to the ground surface computed from measurements at equal intervals along the conduit constructed during the five immediately preceding working days.

Additional length of open trench may be permitted by the Engineer for such circumstances as unusual dewatering operations, setting of piles in advance of excavation, or in the event of unforeseen conditions, should it be considered to be in the best interests of the Agency.

Failure by the Contractor to comply with the parameters specified herein, or as may be specifically authorized by the Engineer, may result in a written order from the Engineer to halt progress of the Work until such time as the Contractor is in compliance with this subsection.

**306-1.1.5 Removal and Replacement of Surface Improvements.** Add the following:

Sewer lines and water lines shall be jacked or tunneled under all concrete curbs, gutters, cross gutters, driveways and sidewalks, or upon approval of the Engineer, such surface improvements may be removed and replaced in accordance with the appropriate Standard Plans unless otherwise specified.

**306-1.1.6 Bracing Excavations.** Replace the entire subsection with the following:

**(a) General.** The Contractor shall be fully responsible for securing the design, and for furnishing and installing adequate shoring, fencing, and covers to protect all excavations from slides and cave-ins, and the public from hazardous conditions. The excavations and shorings therefor shall be such as to protect all existing improvements and utilities from any damage and to be fully compatible with all requirements for traffic and access and the safe performance of the Work.

Except as otherwise specified hereinbelow, excavations 1.5m(5 feet) or more in depth shall be shored such that the sides will be supported in accordance with the requirements set forth in LACDPW Standard Plan 3090. Where the use of shields is proposed in lieu of shoring, their use shall be in accordance with LACDPW Standard Plan 3090 and shall be subject to restrictions shown thereon. When a utility is in Zone A as shown on LACDPW Standard Plan 3090, the restrictions on the use of shields may be waived provided that: (1) The Contractor submits written approval from the owner of the utility for its proposed construction method; and (2) the Contractor complies with any support or protection method the utility owner requires and submits such requirements to the Engineer for enforcement.

Materials excavated from the trench shall be placed away from the edge of the trench so as not to overstress the shoring or bracing in accordance with LACDPW Standard Plan 6008.

The design shall be based on "Kw" values and soil parameters not less than those specified in the Special Provisions plus a uniform surcharge of at least 0.0034MPa(72 psf) from the walls of the trench. If these items are not included in the Special Provisions, they shall be determined by the designer of the shoring system. Structural steel design shall be in accordance with the current edition of the AISC Manual of Steel Construction. Timber design shall be in accordance with the National Specification for Stress-Grade Lumber and Its Fastenings. Allowable stresses specified in the listed publications may be increased by one-third. The maximum allowable timber flexural stress shall not exceed 14MPa(2,000 psi). This includes the one-third increase.

Excavations 1.5m(5 feet) or more in depth for catch basin and connector pipe may be shored with a support system designed in accordance with the criteria set forth on LACDPW Standard Plan 3090 or with a system that meets the requirements in Paragraph 1541 of the Construction Safety Orders of the State of California, Department of Industrial Relations, except that where aluminum rails or walers are used for hydraulic shoring, they shall be heavy duty. Use of shields shall be as specified above. If the support system is designed in accordance with LACDPW Standard Plan 3090, the plans shall be prepared by a Civil or Structural Engineer, registered as such in the State of California. The design shall be based on "Kw" values not less than those specified in the Special Provisions or, if they are not included in the Special Provisions, they shall be determined by the designer of the shoring system.

The criteria given on LACDPW Standard Plan 3090 and in the Special Provisions are the minimum for the conditions shown thereon. In addition to shoring the excavations as specified above, it shall be the Contractor's responsibility to provide any and all additional



shoring required to support loads which may exceed those derived by using the criteria set forth. It shall also be the Contractor's responsibility to provide adequate shoring for the protection of existing improvements in the vicinity of any excavation. The design and details of the shoring system, as submitted, shall reflect the additional shoring necessary to provide for these loads and the required protection. The Contractor shall be solely responsible for any damages which may result from its failure to provide adequate shoring to support the excavations under any or all of the conditions of loading which may exist or which may arise during the construction of the Project.

The provisions of this subsection shall not apply to the support of excavations required for tunneling, boring, jacking or other similar underground excavations. However, shoring for jacking pits or similar open excavations used in connection with such work shall be governed by these Specifications. Support of excavations for tunnels shall be in accordance with the Special Provisions, and support of excavations for boring, jacking or other similar underground excavations shall be in accordance with the Tunnel Safety Orders of the State of California, Department of Industrial Relations. Design calculations and details for the excavation support system for tunnels, including pilot tunnels utilized in jacking operations, shall be submitted per 2-5.3. Details of the submittal shall be the same as outlined herein for open cut shoring systems.

Prior to the beginning of work, the Contractor shall designate in writing to the Engineer someone whose responsibility it is to supervise the installation and removal of sheeting, shoring and bracing.

**(b) Submittals.** The Contractor shall prepare and submit per 2-5.3 details of its proposed shoring system showing the reaches, design criteria, calculations, sketches, sequence of placement and removal, and other data required in order to shore the excavation for the appropriate cases of shoring expected to be used on the Project. Where shields are to be used, the working drawings shall include a typical cross section of the proposed conduit showing adjacent utilities. If a previously approved shield is to be used, submittal of calculations for the shield are not required if the current calculated load does not exceed the load for which the shield was previously approved. If it is requested that the limitation on the use of shields in the vicinity of existing utilities be waived, the submittal shall also include the written statements from the affected utility owners and working drawings and calculations of the required utility support. The submitted working drawings shall be of the same format as that shown on LACDPW Standard Plan 3091. In particular, the working drawings shall indicate the methods of sheeting, shoring and bracing which will be used, applicable reaches, and the installation and removal sequence. The working drawings shall also show the positioning of said sheeting, shoring and bracing with respect to the planned location of the proposed structures. Existing improvements which may be affected by the proposed excavation shall also be shown. It is the Contractor's responsibility to submit to the Agency all test data and calculations required to substantiate the load supporting ability of special components of shoring systems such as screw jacks, speed shores, etc.

Working drawings and supporting information shall be submitted per 2-5.3. Partial submittals will be rejected. Submittals shall include the following:

- 1) Shoring plans which show on each sheet the Project title, sheet number, total number of sheets, wet stamp and signature of the California Registered Civil or Structural Engineer responsible for the shoring design.
- 2) Limits of application for the shoring design, with beginning station and end station.
- 3) Working drawings (plans, sections, elevations, and details), material specifications, notes, construction and removal procedures, etc. necessary for the construction and inspection of the shoring system.
- 4) Supporting calculations prepared by the responsible Registered Civil or Structural Engineer, who will wet stamp and sign the first sheet of these calculations. The calculations shall show and justify the design loads on the shoring. The calculations shall also show the capacity of the shoring system is adequate to withstand the imposed loads.
- 5) Shoring design criteria. A sample of some of the information required is shown on LACDPW Standard Plan 3091.
- 6) Notes as shown on LACDPW Standard Plan 3091.
- 7) A statement confirming the Contractor has reviewed the proposed shoring working drawings and found them compatible with the site conditions and proposed construction methods.
- 8) If shields are proposed, the shoring working drawings shall show the limits of Zone A and Zone B offset from the toe of excavation as delineated on LACDPW Standard Plan 3090 Case 4. The shoring designer shall verify the field condition and state on the working drawings that the design conforms with the requirements in Section D ASHIELDS@ on Sheet 4 of LACDPW Standard Plan 3090.

The submittal package shall also include:

- 9) Manufacturer=s specifications/data necessary for the review of the proposed shoring as applicable.
- 10) Traffic Control Plan if it affects the live load surcharge or the aforementioned Zone A requirements on the shoring system.

**(c) Agency Review.** A detailed review of the submitted working drawings and supporting information will be performed by the Agency. The review will be for the purpose of determining that the following items have been considered and are in accordance with the stated criteria. The items are:

- (1) Soil Loads.
- (2) Surcharge Loads, including effect of existing improvements.
- (3) Method of Analysis.
- (4) Allowable Stresses, including soil stresses where applicable.
- (5) Protection of Existing Improvements.

- (6) Feasibility of Construction.
- (7) Delineation of Criteria.
- (8) Calculations.
- (9) Statement of Applicable Reaches.
- (10) Original wet stamp and signature of the California Registered Civil or Structural Engineer responsible for the shoring design.

If the submittal is in conformance with the shoring criteria and the Specifications, the Agency will sign the submitted working drawings.

Acceptance of the Contractor's submitted working drawings shall not be construed to invalidate other provisions of these Specifications which may be affected by the accepted method of shoring such as, but not limited to, the requirements concerning street closures, detours, barricades and utilities.

Acceptance of shoring for excavations with either vertical or sloping banks shall not be construed to have altered any pay lines shown on the Plans.

**(d) Construction.** As construction progresses, should a type of soil be encountered which requires a different method of shoring or shoring of greater strength than previously accepted by the Agency, or should a situation or condition arise which in the opinion of the Engineer and/or California Division of Occupational Safety and Health requires additional shoring, then the Contractor shall submit for acceptance revised shoring details, and work in the affected excavations shall be discontinued until the revised shoring details have been accepted by the Agency. The preparation and furnishing of such revised details shall be done as specified above for the Contractor's proposed method of sheeting, shoring and bracing for the Project excavations. All of the above-specified provisions concerning submittal by the Contractor, commencement of work on sheeting, shoring and bracing by the Contractor, and action to be taken by the Engineer and the Contractor shall apply in the event a different type or additional sheeting, shoring and bracing is required beyond that originally contemplated by the Contractor.

Attention is directed to the trench width, "W", distances shown on LACDPW Standard Plan 3080. The design of the conduit and the shoring is based on this maximum width. If the trench width exceeds the maximum design width, the pipe bedding, pipe D-Load and the shoring shall be redesigned. The Contractor shall be responsible for any additional costs due to the increased trench width.

If excavations are supported employing used materials, such materials shall be free from defects which may impair their protective function. Used materials which are damaged, fatigued, or are otherwise defective to the extent that they will not safely perform their intended function, shall not be used in supporting excavations. It shall be solely the Contractor's responsibility to furnish sheeting, shoring, and bracing of such grades and stresses as specified on the accepted working drawings.

**(e) Vertical Shores for Supporting Trench Excavations.** H-beams, piles or other similar supports for trench excavations shall be placed in holes drilled to the bottom of the excavation and then driven the remainder of the required depth. Sonic pile drivers may not be used. Drilled holes shall be filled with jetted sand having a minimum sand equivalent of 30.

In lieu of the above method, vertical supports may be placed in holes drilled to the full depth required and backfilled to subgrade. Backfill shall be Trench Backfill Slurry conforming to 201-1.1.2. However, where the in-situ material is granular and free-draining, the backfill may be sand conforming to 200-1.5. Trench Backfill Slurry shall be placed 72 hours prior to excavating and sand shall be flooded 24 hours prior to excavating. Calculations for embedment depth shall be based on beam width, not hole diameter.

When driving the vertical supports, as well as when drilling the holes, the Contractor shall take care to avoid damage to any and all existing improvements and utilities.

The Engineer may, upon request of the Contractor, approve in writing the use of means other than drilling for the purpose of placing the vertical supports at locations where the drilling of such holes is impractical because of the existence of running sand, rocks or other similar conditions, and provided impracticability is demonstrated to the satisfaction of the Engineer by actual drilling operations by the Contractor. Such other means, however, must be of a nature which will accomplish, as nearly as possible, the purpose of drilling, namely, the prevention of damage to existing surface or subsurface improvements, both public and private.

The above specifications shall not apply to driven sheet piling where such piling is necessary, because of the type of material being excavated, to adequately and safely support the excavation.

Immediately after the drilling for, or extraction of, a pile, the Contractor shall place a steel cover over the hole which shall be left in place until the pile is inserted or the hole is filled, as applicable. The cover shall be heavy enough to withstand traffic, be anchored to prevent lateral movement and have a minimum mass(weight) of 34kg(75 lbs). Drilling or pile extraction will not be permitted until covers are on the Project site and available for immediate use.

The minimum required depth of penetration for vertical shores below the bottom of the excavation shall be determined using soil resistance based on the following equations, the resultant of which shall be applied at a distance X below the bottom of the excavation.

Case No.	Equation	X	D <sub>min</sub>
1	$F_p = E (D-D1)^2$	2D/3	D1 + 2'
2	$F_p = A (D)^2$	2D/3	2'
3	$F_p = A (D)^2 + B (D)$	$(D/2) + \{D(0.167)/[1 + (B/AD)]\}$	2'
4	$F_p = A (D-D1)^2$	2D/3	D1 + 2'

Where  $F_p$  = Resultant force in pounds per foot of width of vertical shore.  
 $D_{min}$  = Minimum depth of penetration in feet below the bottom of the excavation.  
 $D1$  = Distance in feet between bottom of excavation and point of zero pressure.  
 $X$  = Distance in feet between bottom of excavation and line of action of  $F_p$ .  
 $A, B \text{ \& } E$  = Soil parameters for continuous abutting vertical shores. (Values may be doubled for single or spaced vertical shores.) Unitless.

Applicable Case Nos.,  $D1$  and soil parameters are provided in the Special Provisions and are to be used in conjunction with LACDPW Standard Plan 3090. It should be noted that this type of system is subject to the restriction that the distance from the bottom of the excavation to the lowest strut shall not exceed 4.5m(15 feet). It should be further noted that this information is not applicable to the design of cantilevered shoring or sheet piling.

**(f) Payment.** Payment for shoring of open excavations will be made under the item provided therefore, except all costs involved for the support of underground excavations which are required in tunneling, boring or jacking shall be considered as included in the prices in the Bid for the applicable items.

No change will be made in the amount to be paid for the shoring of open excavations as a result of any required revisions in the shoring details.

Unless otherwise specified, all costs for the use of means other than drilling for the purpose of placing vertical shores, if approved by the Engineer, shall be considered as included in the lump sum Bid price for "SHORING OF OPEN EXCAVATIONS".

### 306-1.2 Installation of Pipe.

#### 306-1.2.1 Bedding.

**(A) General.** For sanitary sewer construction, add the following after the last paragraph:

Pipe bedding for sanitary sewers shall conform to LACDPW Standard Plan 2021 or 2022, as applicable, unless otherwise noted on the Plans.

Bedding for plastic pipe shall conform to LACDPW Standard Plan 2022 and the following table:

TYPE OF PIPE	DEPTH OF COVER	BEDDING REQUIRED
Solid Wall (PVC) 100mm and 150mm (4-inch and 6-inch) size	less than 1.2m(4 feet)	Encasement per Standard Plan 2023 or Special Design
	1.2m(4 feet) to 5.1m(17 feet)	Crushed Rock Bedding to Spring Line per Standard Plan 2022
	5.1m(17 feet) to 9.0m(30 feet)	Encasement per Standard Plan 2023
	greater than 9.0m(30 feet)	Special Design
ABS Composite 200mm to 375mm (8-inch to 15-inch) size	less than 1.2m(4 feet)	Encasement per Standard Plan 2023 or Special Design
	Or	
	1.2m(4 feet) to 2.7m(9 feet)	Standard Plan 2021
	2.7m(9 feet) to 6.0m(20 feet)	Crushed Rock Bedding to Spring Line per Standard Plan 2022
ABS Solid Wall SDR 23.5, 100mm to 150mm(4-inch to 6-inch) diameter	6.0m(20 feet) to 9.0m(30 feet)	Encasement per Standard Plan 2023, or Special Design
	greater than 9.0m(30 feet)	Special Design

For storm drain construction, replace the entire subsection with the following:

Pipe bedding for storm drain construction shall conform to LACDPW Standard Plan 3080. Unless otherwise specified in the Special Provisions, the material obtained from the Project excavations will not be suitable for use as Types A and B bedding. Project excavation material permitted for use as Type A and B bedding shall conform to LACDPW Standard Plan 3080, provided rocks, portland cement concrete and asphalt concrete chunks larger than 25mm(1 inch) for Type A bedding and 100mm(4-inch) for Type B bedding are first removed. The Special Provisions may specify reaches and depth limits of materials suitable for use as Types A and B bedding. These reaches and depths are based on the criteria specified herein for imported bedding material and on evaluation of

the logs of borings and soil report information. The locations of the borings are shown on the Plans. Because of the unknown variability of material between borings, the delineation of suitable reaches and depths are necessarily estimates which may require revision by the Engineer when the Project excavation discloses the actual soil conditions. Revision of the listed reaches will be made to permit the use of those Project excavation materials meeting the requirements for imported bedding material. The increase or decrease in the quantity of Project excavation material found to be suitable for use as bedding shall be a change in work in accordance with Section 3 of the Standard Specifications and these Additions and Amendments.

Materials imported for use as Type B bedding under Case 2 or Case 3 shall have a minimum of 50 percent passing the 4.75mm(No. 4) sieve and a minimum of 15 percent passing the 1.18mm(No. 16) sieve. That portion of such material passing the 4.75mm(No. 4) sieve shall have a sand equivalent of not less than 20 when tested by the method specified in 211-3. In all other respects, all imported material shall conform to the requirements shown on LACDPW Standard Plan 3080.

For areas under the jurisdiction of the Corps of Engineers, bedding material, as such, shall not be used. All material shall be considered backfill. Backfill shall be similar to the existing material, but shall not contain organic material, broken concrete or pavement, boulders or other material unsuitable for compaction. Compaction of backfill by ponding or consolidation by flooding, poling, sluicing or jetting will not be permitted.

The subgrade upon which the pipe is to be constructed shall be firm, thoroughly compacted, and true to grade. Material which is to be used as Type A bedding shall be so shaped as to provide a firm and uniform bearing for the bottom of the pipe for a width equal to at least 0.5 times the outside diameter and for the entire length of the pipe. In the case of gravel, all boulders or stones larger than 25mm(1-inch) in diameter shall be removed from the bedding for a depth of 100mm(4 inches) below the bottom of the pipe and 25mm(1 inch) below the bell or collar.

The Type B bedding, indicated on LACDPW Standard Plan 3080, for any section of pipe conduit shall first be placed such that, after densification, the top of the bedding material will be approximately at the elevation of the spring line of the pipe. A second lift of Type B bedding shall then be placed such that, after densification, the top of the bedding material will be 300mm(1 foot) over the top of the pipe. However, Type B bedding for all pipe 1275mm(51 inches) or less in diameter may be placed in one lift such that, after densification, the top of the bedding material will be 300mm(1 foot) over the top of the pipe.

Bedding material shall be densified by jetting unless otherwise specified in the Special Provisions. The jet pipe shall meet the requirements of 306-1.3.3 of these Additions and Amendments. Jetting shall provide enough water to thoroughly saturate and densify, without voids, the bedding material around the pipe. The jet pipe shall be inserted at intervals of 1m(3 feet) maximum, contiguous along each side of the pipe. Neither flooding, nor free standing water will be permitted. Unless the sheeting or shoring is to be cut off

and left in place, densification of bedding for pipe shall be accomplished after the sheeting or shoring has been removed from the bedding zone, and prior to the placement of backfill.

The placement of backfill shall not begin until the Agency has completed Quality Assurance compaction testing and the Contractor has attained the required relative compaction.

**306-1.2.2 Pipe Laying.** Add the following:

All sewer house laterals shall be laid on a straight grade from their junction with the mainline sewer, and shall not be laid on a slope greater than 45 degrees from a horizontal line unless so indicated on the Plans. House lateral connections using ABS or PVC plastic pipe shall only be made with factory molded wyes. Tee connections or field installed wye saddles will not be permitted.

The connection of plastic sewer pipe to a manhole shall be watertight through the use of an elastomeric gasket or waterstop (flexible boot or sleeve, o-ring or gasket) as recommended by the pipe manufacturer. Use of a transite pipe collar or softening of the pipe surface to achieve a watertight connection will not be allowed.

**306-1.2.4 Installation, Field Jointing, and Inspection of Reinforced Concrete Pipe.**

(b) **Tongue and Groove (T&G) Self-Centering Joints.** Replace the fourth paragraph with the following:

When the pipe is under 750mm(30 inches) in diameter, the joints shall be made by filling the outer joint space with mortar.

Replace the first sentence of the fifth paragraph with the following:

When the pipe is 750mm(30 inches) or greater in diameter, the entire interior annular space of the joint shall be filled to its full depth to ensure a strong, level, and tight joint.

**306-1.2.9 Field Jointing of Solvent-Welded ABS and PVC Pipe.** Add the following before the last paragraph:

The ends of ABS and PVC pipe shall be thoroughly coated with solvent cement.

**306-1.2.13 Installation of Plastic Pipe and Fittings.** Add the following:

For curved sewers using ABS and PVC plastic pipe, the curvature shall not be achieved by pulling of joints or beveling pipe ends. Bending of plastic pipe to achieve vertical or horizontal curves is limited as shown in the following table:



Nominal Pipe Diameter in mm(inches)	Minimum Radius in m(feet)	
	Composite	Solid Wall
100(4)	Not allowed	Not allowed
150(6)	Not allowed	Not allowed
200(8)	116(380)	86(280)
250(10)	147(480)	107(350)
300(12)	177(580)	128(420)
375(15)	220(720)	160(525)

Curves may also be achieved by using deflection fittings having a maximum deflection of 3 degrees. When such deflection fittings are used, the minimum radius of curvature permitted shall be as follows:

Nominal Pipe Diameter in mm(inches)	Minimum Radius in m(feet)
200(8)	37(120)
250(10)	57(185)
300(12)	66(215)
375(15)	84(275)

### 306-1.3 Backfill and Densification

#### 306-1.3.1 General. Add the following after the first paragraph:

Whenever fill or backfill is specified to be placed and no method of placement is indicated, it shall mean that the material may be placed either by mechanical compaction methods per 306-1.3.2 of these Additions and Amendments, or jetted per 306-1.3.3 of these Additions and Amendments, or by a combination of the two methods; however, the option to use jetting does not ensure that the required relative compaction can be attained by that method alone, and the Contractor shall not be relieved of the responsibility for attaining the specified relative compaction.

Add the following after the second paragraph:

For reinforced concrete box or other cast-in-place structures within street right-of-way where the cover is 900mm(3 feet) or less, the backfill 300mm(1 foot) immediately above the structure shall conform to Type B bedding per 306-1.2.1 of these Additions and Amendments, except that the sand equivalent value shall not be less than 30. However, at the Contractor's option, crushed miscellaneous base per 200-2.4 may be placed from the top of the box or structure to pavement subgrade.

Replace the second sentence of the third paragraph with the following:

Compaction requirements shall be in accordance with 306-1.3.5 of these Additions and Amendments.

Add the following after Table 306-1.3.1 (A):

The Contractor may, at its option and at its own expense, furnish all equipment, material, supplies and labor for making field tests of the compressive strength of concrete, and such tests may be used as a basis for determining the time at which backfill operations may be started as described below. Backfill shall not be commenced until approval therefore has been given by the Engineer. The use of tests by the Contractor for determining compressive concrete strengths is permissive only and is subject to the Contractor assuming all risks that may be involved in backfill operations based on the Contractor's tests. Concrete test cylinders shall be prepared and tested in accordance with the applicable provisions of 303-1.5 of these Additions and Amendments. This includes removal from the molds at the time of form stripping and storing at the location where the capping equipment and compression testing machine are kept. They shall receive, insofar as practicable, the same exposure and/or protection from the elements as the portions of the structure which they represent, until the time of testing. For placement of backfill against the sides and top of concrete structures, the required strengths for structures designed for 21MPa(3000 psi) concrete shall be a minimum of 21MPa(3000 psi). For structures designed for 28MPa(4000 psi) concrete, the average of any three consecutive tests shall be equal to, or greater than, 28MPa(4000 psi) and not more than 10 percent of the tests shall be less than 28MPa(4000 psi). No test shall be less than 85 percent of 28MPa(4000 psi).

Note: A test shall consist of the average strength of three concrete cylinder specimens tested at the same age. If less than three tests are available, the individual tests shall be equal to, or greater than, 28MPa(4000 psi).

When high early strength concrete is specified, the Contractor shall make concrete test cylinders as described above to determine the time at which backfill operations may be started.

**306-1.3.2 Mechanically Compacted Backfill.** Add the following after the first paragraph:

During the placement of backfill by mechanical compaction methods around utilities, the use of other than hand-held vibratory plates or tamping equipment will not be permitted within 300mm(1 foot) of any utility.

Mechanical compaction methods of placement below 300mm(1 foot) over the top of pipe conduits shall be limited to the use of hand-held vibratory plates or tamping equipment. The use of impact or roller type compaction equipment will not be allowed for placement of the backfill below 300mm(1 foot) over the top of the pipe.

Mechanical compaction methods of placement shall not include a sheepfoot wheel mounted on a backhoe within the top 0.9m(3 feet) of the pipe or one-half of the internal diameter of the pipe, whichever is greater.

Replace the last paragraph with the following:

Unless otherwise directed by the Engineer, at the beginning of mechanically compacted backfill operations, test sections shall be constructed as follows:

The test section may be any length sufficient, in the opinion of the Engineer, to conclusively demonstrate that the type of compaction equipment, lift thickness and moisture content used will result in the specified relative compactions being met or exceeded. A sufficient number of lifts shall be placed in the test section to conclusively demonstrate that adequate placement is being attained. The Agency will perform the necessary testing, and if the results are in conformance with the Specifications and satisfactory to the Engineer, the type of compaction equipment, lift thickness, moisture content and compactive efforts used in the test section shall be used thereafter in the placing and compacting of backfill. However, when backfill material different from that previously tested is used, or when tests indicate that placement is not in conformance with the Specifications, a new test section shall be constructed and the type of compaction equipment, lift thickness, moisture content and compactive effort shall be adjusted or changed as necessary to attain the specified relative compaction. Approval of equipment, thickness of layers, moisture content and compactive effort shall not be deemed to relieve the Contractor of the responsibility for attaining the specified relative compaction. The Contractor, in planning its work, shall allow sufficient time to perform the work connected with the test sections, and for the Agency to perform the necessary testing for determining compliance.

Each lift shall be evenly spread, moistened and worked by disc harrowing or other means approved by the Engineer, and then mechanically compacted until the specified relative compaction has been attained.

Except for the cost of testing performed by the Agency which will be at no cost to the Contractor, all costs involved in the work described hereinabove shall be considered as included in the prices in the Bid for the various items of work which include backfill.

**306-1.3.3 Jetted Backfill.** Replace the second sentence of subparagraph (1) with the following:

The jet pipe shall be of sufficient length to reach the bottom of the lift being jetted.

Replace subparagraph (3) with the following:

3) The lift of backfill shall not exceed that which can be readily densified by jetting, but in no case shall the undensified lift exceed 1.5m(5 feet).

**306-1.3.5 Jetted Bedding and Backfill Compaction Requirements.** Replace the entire subsection with the following:

Unless otherwise specified in the Special Provisions, trench bedding and backfill densified through jetting shall be densified to the following minimum relative compaction:

1. 90 percent relative compaction.
2. 95 percent relative compaction where required by 301-1.3.

**306-1.3.6 Mechanical Compaction Requirements.** Replace the entire subsection with the following:

Unless otherwise specified in the Special Provisions, mechanically compacted trench backfill shall be densified to the following minimum relative compaction:

1. 90 percent relative compaction.
2. 95 percent relative compaction where required by 301-1.3.

**306-1.3.7 Imported Backfill.** Add the following:

If the Contractor elects or is required by the Special Provisions to import material from a source outside the Project limits for use as backfill, said material shall be clean soil, free from organic material, trash, debris, rubbish, broken portland cement concrete, bituminous pavement, or other objectionable substances, and shall have a minimum sand equivalent of 20.

The Contractor shall inform the Engineer of the actual street address or location from which the intended material will be furnished not less than 15 days prior to its proposed use. The Contractor shall sample and analyze the intended material per 200-3. The Agency will perform other testing as deemed appropriate by the Engineer. The Engineer will determine the suitability of the material for use as imported backfill.

Should the imported backfill material differ substantially from the approved sample, it shall not be used for backfill, and shall be removed from the Work site and replaced with approved imported backfill material at the Contractor's expense.

Add the following subsections:

**306-1.3.10 Backfill for Corrugated Steel Pipe.** No bedding material, as such, or special fill or backfill materials will be required for corrugated steel pipe conduits. The Contractor shall shape the subgrade to receive the pipe and shall provide for at least 90 degrees bearing. Backfill shall be placed uniformly in layers on each side of the pipe to prevent distortion and displacement of the pipe. Compaction shall conform to 306-1.3.5 and 306-1.3.6 of these Additions and Amendments, and the Special Provisions.

**306-1.3.11 Concrete Backfill.** All costs involved for furnishing and placing concrete backfill for main line pipe where indicated on the Plans shall be considered as included in the Contract Unit Price for the pipe. Concrete backfill for connector pipe will be paid for at the Contract Unit Price for the item thereof. If an item is not included in the Bid, payment will be made in accordance with 3-3 of these Additions and Amendments at the Stipulated Unit Price of \$260.00 per cubic meter (\$200.00 per cubic yard), including labor, equipment and materials.

Payment for concrete backfill around reinforced concrete or nonreinforced concrete pipe will be based upon the volume of concrete computed to the following limits:

The lateral limits shall be vertical planes on each side of the pipe located a distance away from the outside barrel equal to the minimum value of "W" as specified on LACDPW Standard Plan 3080.

The upper limit shall be 100mm(4 inches) above the top of the pipe.

The lower limit shall be the top of the Bedding "A" as specified on LACDPW Standard Plan 3080. The length will be determined in the field by the Engineer, and shall meet the requirements of the general note on the Plans.

No deduction in quantities will be made for the space occupied by the bells of concrete pipe or the sheeting, if any, left in place.

For the purpose of computing the volume of concrete backfill, the wall thickness of reinforced concrete and non-reinforced concrete pipe shall be assumed to be the following irregardless of the actual wall thickness:

Pipe Size, mm(inches)	Wall Thickness, mm(inches)
300(12)	50(2)
375(15)	50(2)
450(18)	56(2 1/4)
525(21)	60(2 3/8)
600(24)	63(2 1/2)
675(27)	66(2 5/8)
750(30)	69(2 3/4)
825(33)	72(2 7/8)
900(36)	78(3 1/8)

### **306-1.4 Testing Pipelines.**

#### **306-1.4.1 General.** Replace subparagraph 3) with the following:

Gravity Sanitary Sewers 600mm(24 inches) or less in diameter where difference in elevation between inverts of adjacent manholes is greater than 3m(10 feet) - Air pressure test is required.

#### **306-1.4.5 Water Pressure Test.** Add the following after the first paragraph:

The Contractor shall submit working drawings per 2-5.3 showing its planned scheme of testing before performing the test. The working drawings shall show the proposed method and sequence of testing, details of bulkheads, locations and sizes of pumps, and locations and scales of gages and metering devices.

A calibrated recording pressure gage shall be used to record pressure and a calibrated metering device or calibrated tanks shall be used to record leakage. Calibration certificates shall be submitted for approval; however, gages and meters may be delivered to the Agency for calibration, which will be performed at no cost to the Contractor. One week shall be allowed for the calibration.

The recording pressure gage shall be in continuous operation from the time water first enters the pipe to completion of the test.

During the filling of the pipe, all air shall be purged from the reach to be tested before applying the specified pressure. Taps may be installed at the highest point and, if used, shall be plugged to the satisfaction of the Engineer upon completion of the testing.

Leakage shall be determined by a metering device or suitable tanks to measure the water entering the pipeline while under the required pressure. If leakage exceeds the volume determined by the formula in 306-1.4.5, the Contractor shall determine the point(s) of leakage, make the necessary repairs or replacement, and repeat the test. This procedure shall be repeated until the leakage is equal to or less than the allowable maximum. Regardless of the test results, the Contractor shall repair all detectable leaks.

In lieu of the water pressure test described above, the Contractor may, at its option, pressure test each pipe joint individually using a joint tester. The joint shall be subjected to a pressure of 48KPa(7 psi), unless otherwise noted in the Special Provisions, for a period of one minute and shall not leak. Details of the joint tester shall be submitted to the Engineer for approval prior to commencing tests.

The Contractor shall give the Engineer two working days advance notice of its intentions to conduct a test. All tests shall be performed in the presence of the Engineer. After completion of the test, pressure gauge readings recorded shall be submitted to the Engineer, and become the property of the Agency.

All costs involved in conducting the tests to a successful conclusion, including the furnishing of all water, power, labor, equipment and materials as required, shall be considered as included in the prices bid for the various items of work within the specified reach. The Contractor, however, shall be responsible for any damage to the pipeline which may occur as a result of the pressures imposed during the process of filling the pipe and conducting the tests.

Add the following subsection:

#### **306-1.4.7 Tests of Rubber Gasketed Pipe.**

- (a) Plant Test. Pipe and joints shall be tested at the manufacturing plant per 207-2.9.6 of these Additions and Amendments.
- (b) Field Test. The field test for leakage, if required by the Special Provisions, shall be performed per 306-1.4.5 of these Additions and Amendments. The test pressure (P) shall be equal to 48KPa(7 psi). In lieu of the Water Pressure Test, the Contractor may, at its option, pressure test each pipe joint individually using a joint tester. The joint shall be subjected to a test pressure of 48KPa(7 psi) for a period of one minute and shall not leak. Details of the joint tester shall be submitted to the Engineer for approval prior to commencing tests.

In either case, testing shall be performed prior to the mortaring of the joints.

#### **306-1.5 Trench Resurfacing.**

##### **306-1.5.1 Temporary Resurfacing.** Add the following:

Temporary resurfacing or permanent pavement shall be in place before the traveled way is opened for vehicular traffic unless otherwise indicated in the Special Provisions.

Temporary resurfacing shall be placed as soon as the backfill is densified or immediately when so directed by the Engineer. If further densification of backfill is necessary due to settlement, failure to achieve the specified compaction, or any other reason, the temporary resurfacing shall be removed and replaced at the Contractor's expense.

Prior to placing the temporary resurfacing, the street and surrounding area shall be cleared of rubbish and debris, the street swept, and the surrounding area cleaned thoroughly.

The finished surface of said temporary resurfacing shall be placed flush with the adjoining pavement grade.

Immediately after placement of temporary resurfacing, the surface and surrounding area shall be swept clean of all dust and debris utilizing a self-loading motorized sweeper with spray nozzles (pick-up broom).

The Contractor shall stockpile enough temporary resurfacing material on the Project site to insure a ready supply at all times for necessary repairs to the temporary resurfacing already placed.

Temporary resurfacing shall not be left in place longer than 30 days unless otherwise permitted by the Engineer. Permanent resurfacing shall be placed immediately following the removal of the temporary resurfacing.

Replace the last two paragraphs with the following:

No separate payment will be made for temporary resurfacing. The cost of temporary resurfacing shall be considered as included in the prices in the Bid for the items of work which require removal of pavement for their construction or for which the Contractor, at its option, intends to place temporary resurfacing.

**306-1.6 Basis of Payment for Open Trench Installations.** Replace the third sentence of the first paragraph with the following:

Pipe for storm drain connector pipes to and between catch basins will be measured for payment along the center longitudinal axes of said connector pipes. Distances will be measured between the inside faces of all catch basins or other storm drain structures involved.

Replace the second paragraph with the following:

The Contract Unit Price for pipe and conduit in place shall be considered full compensation for all wyes, tees, bends, monolithic catch basin connections, and specials shown on the Plans; the removal of interfering portions of existing sewers, storm drains, and improvements; the closing or removing of abandoned conduit and structures; the excavations of the trench; the control of ground and surface waters; the preparation of subgrade; placing and joining pipe; joining existing conduits; bedding; backfilling the trench; and all other work necessary to install the pipe or conduit, complete in place, unless otherwise specified.

Add the following after the second paragraph:

All costs involved in sealing the open ends of pipe conduit with bulkheads, as called for on the Plans, shall be considered as included in the Contract Unit Price for the applicable pipe item.

All costs involved in removing interfering portions of existing drainage improvements and sealing open ends, removing existing seals and joining to existing structures as called for on the Plans, shall be considered as included in the Contract Unit Price for the applicable pipe item.

The cost of constructing connector pipe inlets (junction structures) into the mainline conduits per Standard Plans 332 and 334 shall be considered as included in the Contract Unit Price for the connector pipe.



Should the Contractor elect to use reinforced concrete pipe in lieu of non-reinforced concrete pipe, as described in 207-1.1 of these Additions and Amendments, payment for said pipe will be made as though non-reinforced concrete pipe had been used.

All costs of drying, blending, transporting and importing backfill, as applicable, shall be considered as included in the prices in the Bid for the applicable items of work.

The removal of any existing pavement shall be considered as a part of the Work and all costs therefore shall be included in the prices in the Bid for the various items of work unless otherwise specified.

The Agency does not guarantee the accuracy of the limits, type and thickness of existing pavement as shown on the Plans or as specified in the Contract Documents and the Contractor shall so consider this in preparing its Bid. However, additional costs incurred in the removal of pavement which is found to be over 25mm(1 inch) greater in thickness than that indicated on the Plans or in the Special Provisions will be considered as "Extra Work" per 3-3 of these Additions and Amendments. In addition, costs incurred for the removal of portland cement concrete found to underlie pavement which is indicated on the Plans or in the Special Provisions to be entirely bituminous will be paid for as "Extra Work" per 3-3 of these Additions and Amendments.

Replace the last paragraph with the following:

Payment for structures such as manholes, junction structures (except junction structures per Standard Plans 332 and 334), transition structures and catch basins will be made at the Contract Unit Price for each structure and shall be full payment for each structure complete in place, including excavation, backfill, furnishing and installing castings, temporary resurfacing, and all other work necessary to complete the Work.

### **306-2 JACKING OPERATIONS.**

**306-2.1 General.** Add the following as the last sentence of the seventh paragraph:

The use of aluminum pipe and equipment will not be permitted for transporting or pumping grout.

**306-2.2 Jacking Reinforced Concrete Pipe.** Add the following after the first paragraph:

When jacking rubber gasketed pipe, special care is required to insure that the rubber gasket rings are not damaged or unseated during jacking operations. The jacking load shall be applied evenly to the driving ends of the pipe, and the use of mortar packing as shims will not be permitted.

Add the following subsection:

**306-2.2.1 Jacking Reinforced Concrete Box Sections.** The leading and trailing 1.5m(5 feet) of the reinforced concrete box to be jacked shall include additional reinforcement per LACDPW Standard Plan 3096.

Any material increase in jacking limits may require design changes of the structure to withstand the additional stresses. The Contractor shall be responsible for such design changes and shall submit the design changes per 2-5.3. A concrete slab may be poured outside the jacking limits as a base upon which to construct the precast concrete box and provide initial guidance. If used, such a slab must extend the full width and length of the concrete box section which is to be jacked in place. The use of pilot tunnels and guide rails or slabs will not be permitted without the prior written approval of the Engineer.

The details of any such pilot tunnels or guides shall be submitted by the Contractor per 2-5.3. The use of guides may require structural revisions in the precast concrete box to withstand uneven bearing. Where RCB conduit is specified to be constructed by open trench operations, the Contractor may construct the RCB conduit by tunnel or jacking methods, provided that written approval by the Engineer is first obtained. Solid supports are required for pilot tunnels.

**306-2.3 Jacking Steel Casing.** Add the following:

If, in the opinion of the Engineer, the nature of the soil indicates the likelihood of loss of ground outside of the casing, the Contractor shall furnish and install a jacking head. The jacking head shall be fitted to the leading section of the casing in such a manner that it extends around the outer surface of the upper two-thirds of the casing circumference and projects a minimum of 450mm(18 inches) beyond the driving end of the casing. The head shall not extend radially more than 13mm(1/2-inch) outside the outer casing surface, and shall be securely anchored to the casing in such a manner as to prevent wobble or variations in alignment during the jacking operations.

Excavations shall be done entirely within the jacking head and casing. No excavation ahead of the casing or jacking head will be permitted.

**306-2.6 Payment.** Add the following after the last paragraph:

Where the Bid includes alternate proposals for pipe and RCB, and the award of the Contract is made on the RCB proposal, the Contractor shall have the option of jacking the pipe alternate in lieu of the RCB. If the Contractor exercises this option, the Contractor shall construct Transition Structures per Standard Plan 342, either 3.0m(10 feet) in length or with a maximum angle of divergence/convergence of 5°45', whichever is longer, to connect to the adjoining RCB conduits.

If the Contractor elects to jack reinforced concrete pipe in lieu of the RCB conduit, payment will be made as if the RCB conduit had been jacked. All costs involved in performing any additional work, including, but not limited to, the construction of transition structures to connect to the adjoining RCB conduit, shall be the Contractor's responsibility. Construction outside of the jacking limits shown on the Plans, will be paid for as if the specified method of construction had been performed.

Where railroad tracks are involved, all costs involved for adjustment of the tracks due to settlement shall be considered as included in the Contract Unit Price(s) for the jacking conduit(s).

### 306-4 CAST-IN-PLACE NONREINFORCED CONCRETE PIPE (CIPCP).

**306-4.1 General.** Add the following:

- 3) The following submittals are required and shall be approved in writing by the Engineer prior to the commencement of excavation for CIPCP:

A copy of the soils report, including soil borings spaced at a maximum of 300 feet along the centerline of the pipe. The report shall be prepared and signed by a Geotechnical Engineer registered by the State of California. If adverse soil conditions are found, spacing must be reduced to a maximum of 100 feet.

- 4) For CIPCP, the first sentence of the third paragraph of 6-8 is replaced by the following:

CIPCP shall be warranted by the Contractor against defective workmanship and materials for a period of 2 years from the date the Work is completed.

**306-4.2 Materials.** Replace the first sentence with the following:

Concrete shall conform to 201-1 and the following:

- (a) Non-debris carrying flows:

<u>Velocity (fps)</u>	<u>Minimum Concrete Strength (psi)</u>
< 10	4000 (Class 610-B-4000)
10 to < 20	5000 (Class 680-B-5000)
≥ 20	CIPCP shall not be used

- (b) Debris carrying flows:

<u>Velocity (fps)</u>	<u>Minimum Concrete Strength (psi)</u>
< 20	5000 (Class 680-B-5000)
≥ 20	CIPCP shall not be used

Except that:

Replace "1)" with the following:

- 1) The slump shall be 25 mm (1 inch) minimum and 75 mm (3 inches) maximum for CIPCP up to 72 inches in diameter. The slump shall be 25 mm (1 inch) minimum and 60 mm (2-1/2 inches) maximum for CIPCP from 72 to 108 inches in diameter. The slump shall be measured only after all water has been added. No water shall be added after the slump test has been performed, and

### **306-4.4 Placement.**

#### **306-4.4.1 General.** Add the following:

Continuous inspection by the Engineer for all CIPCP, during excavation and concrete placement, is required. When hard or soft pockets are encountered (during excavation), the Contractor shall overexcavate to a minimum depth of 6 inches and place backfill compacted to a minimum relative compaction of 90 percent.

**306-4.4.8 Repairing.** Circumferential cracking (ring cracks) of the CIPCP generally occurs within the first 60-90 days of construction. The proper repair of all cracks is the responsibility of the Contractor during the 2-year warranty period. Inflexible cement grouts are inappropriate for patching ring cracks, as they will shrink and result in the re-emergence of the cracks over time. Proper sealing of ring cracks shall be performed using one of the following two methods:

- a) Routing and sealing the crack by applying a polyurethane elastomeric sealant (i.e. "Sikadur-1a" or "Sikadur-2c") into the crack. A bond breaker may be provided at the bottom of the groove to allow the sealant to expand/contract.
- b) Trowel on a waterproof grout such as Kryton "Bari-cote", which chemically reacts with the concrete to form crystals that penetrate through the crack and seal it. Then to insure against any future cracking or water infiltration in around the sealed crack area, a cementitious brush-applied waterproof slurry sealant (Kryton 'T1') shall be applied for a distance of 1 foot on each side of the sealed crack. The T1 slurry will chemically react with the concrete and form crystals that penetrate into the concrete and make it waterproof.

#### **306-4.5 Backfill.** Replace the second paragraph with the following:

Backfill over CIPCP shall not be placed until the concrete has attained 80 percent of its design strength.

### **306-4.6 Dimensions and Tolerances.**

#### **306-4.6.3 Wall Thickness.** Delete the last sentence of the first paragraph.

#### **306-4.6.5 Grade and Alignment.** Replace the first two sentences of the first paragraph with the following:

Departure from and return to established grade shall not exceed 1 inch per 10 linear feet. Maximum departure shall be limited to 1.5 inches. Contractor shall ensure uniformity of grade through uniform movement of the casting machine during pipe placement.

### **306-5 ABANDONMENT OF CONDUITS AND STRUCTURES.** Add the following after the last paragraph:

Unless otherwise specified, all costs involved in the abandonment of conduits and structures shall be considered as included in the various items of work.

All salvageable sewer manhole frames and covers and other metal appurtenances shall be delivered by the Contractor at its own expense to one of the following Waterworks and Sewer Maintenance Division yards:

1129 East 59th Street, Los Angeles, California 90001,  
(323) 233-3330

2849 South Myrtle Avenue, Irwindale, California 91707,  
(626) 446-5227

45712 Division Street, Lancaster, California 93534,  
(661) 942-6042

12015 Shoemaker Avenue, Santa Fe Springs, California 90670,  
(562) 941-7011

All salvageable storm drain manhole frames and covers and other metal appurtenances shall be delivered by the Contractor at its own expense to one of the following Flood Maintenance Division yards:

5525 E. Imperial Highway, South Gate, California 90280,  
(310) 861-0316

10179 Glenoaks Blvd, Sun Valley, California 91352,  
(818) 896-0594

160 E. Longden Drive, Irwindale, California 91706,  
(626) 445-7630

2986 New York Dr., Pasadena, California 91107,  
(626) 798-6761

5520 W. 83rd St., Los Angeles, California 90045,  
(323) 776-7610

**306-6 REMODELING EXISTING SEWER FACILITIES.** Add the following after the second paragraph:

Whenever cast iron pipe is specified, ductile iron pipe may be used in lieu thereof.

Add the following after the last paragraph:

The locations of existing house connections as shown on the Plans are approximate only. Any house connections, sewer line, or other facilities which are discovered to interfere with the proposed conduit or appurtenant structures and which therefore must be broken into, disturbed or relocated, shall be reconstructed as directed by the Engineer.

The Contractor shall provide suitable trench support devices per 306-1.1.6 of these Additions and Amendments, wherever required, to prevent movement of the ground under

and adjacent to sewers already constructed, wherever the excavation is parallel to and deeper than the sewer.

Add the following subsections:

**306-9 TEMPORARY BULKHEADS FOR STORM DRAINS.** If for its convenience or protection, the Contractor elects to use temporary bulkheads that are not detailed on the Plans, the Contractor shall submit for approval detailed calculations and working drawings of the bulkheads per 2-5.3 prepared and signed by a Civil or Structural Engineer registered by the State of California, whenever the span exceeds 1.2m(4 feet) or the depth of cover above the bottom of the bulkhead exceeds 6.2m(20 feet).

Bulkheads for which a submittal is not required shall have the following minimum structural sections, or the Contractor at its option may submit lesser sections for approval in the manner specified hereinabove.

<u>Material</u>	<u>Grade</u>	<u>Section</u>
Timber	D.F. No. 2	3" thick
Concrete	$f'_c = 2500$ psi	6" thick w/#4 @ 10" parallel to span and #4 @ 18" perpendicular
Brick	2500 psi solid units	12" thick w/#4 @ 9" parallel to span 1/2" from inside course and #4 @ 18" perpendicular to span
Steel Plate	A36 Steel	1/2" thick

All costs involved in temporary bulkhead work for the Contractor's convenience or protection shall be considered as included in the prices in the Bid for the various items of work unless otherwise specified.

**306-10 SUBDRAINAGE SYSTEM FOR FLOOD CONTROL CHANNELS.**

**306-10.2 Subdrainage Pipe.** The subdrainage pipe, both perforated and non-perforated, shall comply with the following:

<b>Material</b>	<b>Joint Type</b>	<b>ASTM Specification</b>
Concrete	Bell & Spigot or Tongue & Groove	C 654
Clay	Bell & Spigot	C 700
Polyvinyl Chloride		D 2729
Polyethylene		F 405

Pipe of the same material shall be used throughout the entire Project.

Concrete pipe shall be at least standard strength quality and conform to the requirements of 207-1 .

**306-10.3 Pipe Perforations.** Perforations shall be located in the bottom half of the pipe as laid.

**306-10.4 Pipe Joints.** The joints between sections of perforated pipe shall be of a type that will hold the pipe securely in alignment and maintain the inner surfaces of abutting pipes flush and even. The joints between perforated sections of bell and spigot concrete or vitrified clay pipe shall have the bottom half of the bell joint filled with mortar. The joints between perforated sections of tongue and groove concrete pipe and "Flat Bell" vitrified clay pipe require no mortar. Joints for non-perforated concrete and clay pipe shall be completely filled with mortar prior to joining and excess mortar shall be removed from the pipe by wiping or by dragging an approved swab through the pipe as applicable.

**306-10.5 Subdrainage Manholes.** Subdrainage manholes, including manholes, inlets, outlets, flap gates, gate boxes and drop steps, shall comply with the requirements of LACDPW Standard Plan 3087, Sheets 1 through 8, unless otherwise specified in the Special Provisions or shown on the Plans.

Manholes include reinforced concrete work below the channel invert slab, gray iron adapters, drop steps and manhole frame and cover.

Manholes may be precast provided they are set on a minimum of 150mm(6 inches) of clean sand. Each precast manhole shall be inspected prior to installation in the system. Any cracks or other defects that cannot be repaired to the Engineer's satisfaction will be cause for rejection.

**306-10.6 Flap Gates.** All flap gates shall be Type 1 in accordance with the requirements of 304-5 of these Additions and Amendments.

**306-10.7 Filter and Drain Materials.** The filter and drain materials shall be placed within the limits shown on LACDPW Standard Plan 3087, Sheets 1 through 8, unless otherwise specified in the Special Provisions or shown on the Plans. The compositions of the filter and drain materials shall each conform to one of the following grading requirements. The particular requirements to be used will be specified in the Special Provisions.

**Filter Material**  
Grading - % Passing

Screen or Sieve Size	F1	F2	F3	F4
37.5mm(1-1/2 inch)				100
19.0mm(3/4 inch)		100	100	70-100
9.5mm(3/8 inch)	100	80-100	70-100	50- 75
4.75mm(No. 4)	90-100	60- 85	45- 75	30- 55
2.36mm(No. 8)	75- 90	45- 70	30- 60	20- 40
1.18mm(No. 16)	55- 80	30- 55	20- 45	10- 30
600µm(No. 30)	30- 60	15- 40	10- 30	5- 20
300µm(No. 50)	10- 40	5- 20	0- 15	0- 10
150µm(No. 100)	0- 15	0- 10	0- 5	0- 5
75µm(No. 200)	0- 5	0- 5		
Approximate Composition	(Sand)	(Sand and No. 4, 2:1)	(Sand and No. 4, 1:1)	(Sand, No. 4 and No. 3, 1:1:1)

The approximate compositions given are for information purposes only; the grading limits specified above shall control.

Screen or Sieve Size	Drain Material Grading - % Passing				
	D1	D2	D3	D4	D5
75mm(3 inch)		100	100	100	100
37.5mm(1-1/2 inch)	100	95-100	90-100	90-100	85-100
25.0mm(1 inch)			65-100		5- 60
19.0mm(3/4 inch)	90-100	75-100	50- 90	20- 60	0- 30
9.5mm(3/8 inch)	60-100	30- 70	0- 50	0- 20	0- 5
4.75mm(No. 4)	5- 50	0- 25	0- 10	0- 5	
2.36mm(No. 8)	0- 10	0- 5	0- 5		
1.18mm(No. 16)	0- 5				
Approximate Composition	(No. 4)	(No. 3 and No. 4, 1:1)	(No. 3)	(No. 2 and No. 3, 1:1)	(No. 2)

The approximate compositions given are for information purposes only; the grading limits specified above shall control.

The materials used shall conform to 200-1.2 and 200-1.4; however, the requirements for grading, specific gravity and reactivity, as stated therein, shall not apply. The minimum bulk specific gravity shall be 2.50.

### 306-10.8 Placement.

**306-10.8.1 General.** The excavated subgrade shall be kept free of surface water. Mud holes, ruts or soft spots due to the Contractor's operations shall be repaired at its own expense, as directed by the Engineer.

The filter and drain material shall be placed around drainage pipe so as to provide even support throughout the entire length of the pipe and to permit the installed pipe to lie upon true alignment and grade.

The filter or drain material shall be spread to such depth as to obtain the specified thickness after compaction and shall be uniform and true to the lines and grades indicated on the Plans. The surface under sloped bank lining or invert shall not show any variation of departure greater than 13mm(1/2 inch) from the testing edge of a 3.0m(10-foot) straight-edge. Ridges and humps shall be regraded, depressions filled and compacted and tested for straightness until grading is accomplished within the tolerance specified. No relative compaction will be required.

Any pipe damaged during placement or compaction shall be replaced at the Contractor's expense.



The Contractor shall exercise due care to prevent water from surface drainage or other sources, mud, muck or debris, from running into the filter or drain material both during and after its placement, until the lining, backfill or structure placed thereon is completed or until the concrete placed thereon has attained its final set. The Contractor shall provide and operate drainage sumps and pumps, or equivalent means satisfactory to the Engineer, to prevent any such saturations of the filter or drain materials.

**306-10.8.2 Under Sloped Bank Lining.** Those portions of filter and drain materials which become subgrade for sloped bank lining shall be compacted by four passes of a roller weighing not less than 272kg(600 pounds), and which applies a minimum 0.36kg per mm(20 lbs per inch) of roller width, or by other means approved by the Engineer.

**306-10.8.3 Under Invert.** Those portions of filter and drain materials which become subgrade for channel invert linings shall be compacted by two passes of a smooth-wheeled roller overlapping 300mm(1 foot) each pass, or by the use of handheld tamping equipment, or by other means as approved by the Engineer. The weight of the roller or the size of the tamper shall be as approved by the Engineer.

**306-10.8.4 In Trenches and Along Heels of Walls or Sides of Structures.** The filter and drain materials shall be placed in 300mm(1 foot) lifts and compacted by hand-held tamping or vibrating equipment to the satisfaction of the Engineer.

**306-10.9 Tests of the Subdrainage System.** Two separate tests shall be made on each subdrain line by the Contractor to assure the proper functioning of the subdrainage system.

Each test shall be conducted in the presence of the Engineer and shall consist of the flushing of the subdrain line with sufficient water to develop a flow of 140 liters per minute(37 gallons per minute), out of the end of the line being tested, as measured by approved measuring equipment furnished by the Contractor.

The first test of each completed section of the subdrain system shall be performed immediately prior to the placement of reinforcing steel for the channel invert slab. The second test shall be performed after completion of the channel invert work. Manholes shall be cleared of all debris prior to beginning the second test.

Final acceptance of the subdrainage system will be made only if the discharge is of uniform flow and of adequate quantity. Any necessary clearing of drain lines to meet the above requirements shall be performed by the Contractor at its own expense.

All costs involved in the performance of the tests, including the furnishing of all labor, equipment and material required thereof, shall be considered as included in the prices in the Bid for the items under which the subdrainage system is to be constructed.

**306-10.10 Payment.** The quantity of filter and drain material will be calculated to the limits of payment shown on the Plans. No deduction will be made in the calculated volume of filter or drain material for the space occupied by the pipe drains.

## SECTION 307 - STREET LIGHTING AND TRAFFIC SIGNALS

### 307-1 GENERAL.

**307-1.1 Description.** Add the following after the second paragraph:

Traffic signal equipment shall conform to the Specifications and to the requirements in the "Traffic Signal Control Equipment Specifications" of the Los Angeles County Department of Public Works, dated March 1997. For information regarding its purchase, contact the Agency's Cashier's Office, (626) 458-6959.

Replace the third paragraph with the following:

All incidental parts which are not shown on the Plans, specified in the Specifications, or included in the Schedule of Prices, and which are necessary to complete or modify the existing systems, shall be furnished and installed as though such parts were shown on the Plans, specified in the Specifications, or included in the Schedule of Prices. The cost for furnishing and installing these incidental parts shall be considered as included in the Contract Unit Price for the equipment that requires such parts to be fully operational, or in the price in the Bid for the appropriate lump sum Bid item. All systems shall be in satisfactory operation at the time of completion and acceptance of the Work.

**307-1.2 Regulations and Codes.** Add the following:

Unless otherwise specified, all references to NEMA traffic signal control equipment and components shall refer to the NEMA "Traffic Control Systems" specification, designated as "TS2-1998".

Wherever reference is made to any of the regulations or codes mentioned above, the reference shall be construed to mean the regulation or code that is in effect on the date of the Notice Inviting Bids for the Work.

**307-1.3 Equipment List and Drawings.** Add the following after the first paragraph:

A wiring diagram for all field modifications to the existing controller cabinet including, but not limited to, the installation of sensor units, switch packs, etc., shall be submitted to the Engineer at least 10 working days prior to performing work in the controller cabinet.

All controller cabinet documentation, labeling, and placards shall be corrected/updated to reflect any changes made within the controller cabinet as a result of all current and past modifications.

**307-1.5 Maintenance of Existing Systems.** Replace the first sentence of the first paragraph with the following:

The agency presently maintaining the existing electrical systems will continue to maintain the existing electrical systems, and will repair or replace existing electrical systems as necessary to maintain the existing electrical systems in effective operation. Damages to existing electrical systems caused by the Contractor shall be repaired or replaced by the Contractor.

Should the Contractor fail to promptly perform the required repairs or replacements, the maintaining agency will perform such repairs and replacements and the costs thereof will be deducted from any monies due the Contractor.

Add the following subsections:

**307-1.6 Existing Signs.** The Contractor shall maintain all existing traffic and street name signs within the right of way in their original location or at an alternate location approved by the Engineer. Any signs lost or damaged by the Contractor shall be replaced at its own expense. When necessary, permanent remounting will be performed by the Agency upon completion of the Work except for illuminated street name signs on signal mast arms.

**307-1.7 Ordering Materials.** In order to ensure the timely completion of the Project, the Contractor shall submit a letter to the Engineer stating that all Contractor furnished traffic signal materials have been ordered. The letter shall contain the names and addresses of the suppliers and the estimated delivery dates. This letter shall be submitted to the Agency within five (5) working days after the execution of the Contract.

## **307-2 CONSTRUCTION GENERAL.**

**307-2.1 Excavation and Backfill.** Add the following after the sixth paragraph.

At any given intersection, all standards shall be erected; foundations, except foundations for controllers, capped; and surfaces restored within six weeks of commencing excavation or breaking concrete.

**307-2.3 Standards and Steel Pedestals.** Replace the entire subsection with the following:

Standards and steel pedestals shall conform to the latest edition of the Caltrans Standard Plans and the Caltrans Standard Specifications for Construction of Local Streets and Roads unless otherwise specified in the Special Provisions or on the Plans.

The end of any new mast arm vehicle head tenon not to be used shall be covered by an approved galvanized steel cap unless otherwise shown on the Plans.

Traffic signal standards shall be located no closer than 36 inches from the centerline of the pole to curb face, unless otherwise shown on the Plans.

**307-2.4 Pull Boxes.** Add the following:

Pull boxes and extensions shall be precast reinforced concrete of the sizes and details shown on the Standard Plans. Unless otherwise specified in the Special Provisions or shown on the Plans, traffic signal pull boxes shall be size No. 6.

Reinforcement for concrete pull boxes shall be bar reinforcement or 19mm(3/4 inch) mesh, No. 20 U.S. gage minimum, hardware cloth.

Covers shall be provided with at least one recessed lifting bolt or bar as shown on the Standard Plans. The lifting bolts or bars shall be designed so as not to provide a path for electrical current to follow through the lid.

**307-2.5 Conduit.** Add the following before the first paragraph:

**307-2.5.1 General.** Replace the first sentence of the second paragraph with the following:

All conduit and fittings shall be Schedule 80 PVC, or, if approved by the Engineer, rigid galvanized steel.

Replace the third paragraph with the following:

Detector, telephone interconnect, street lighting, direct interconnect, load-side electrical service, traffic signal foundation and inductive loop detector and stub-out conduit shall be 50mm(2 inches) nominal size unless otherwise specified or shown on the Plans. Conduit crossing roadways or alleys, or which is a lateral or in a controller cabinet shall be 75mm(3 inches) nominal size unless otherwise specified or shown on the Plans. Line-side electrical service conduit shall be of the size specified by the servicing utility.

Add the following to the seventh paragraph:

For bridge construction, a conduit expansion fitting as detailed on Standard Plan 465 shall be installed at each structure joint, hinge or abutment where lateral movement may occur.

Replace the eighth paragraph with the following:

Conduit shall be placed, bored, or jacked, to a depth of not less than 750mm(30 inches) nor more than 1.5m(60 inches) below the flow line grade, except that conduit placed behind a curb shall not be less than 450mm(18 inches) nor more than 900mm(36 inches) below the top of curb. Conduit placed under railroad tracks shall not be less than 1.5m(60 inches) below the bottom of the ties.

Replace the first sentence of the twelfth paragraph with the following:

Jacking pits adjacent to railroad tracks shall be constructed not less than 4.6m(15 feet) from the centerline of track.

Replace the thirteenth paragraph with the following:

Bends shall be constructed using manufactured elbows only and shall have a minimum radius of not less than six times the inside diameter of the conduit.

Replace the second sentence of the nineteenth paragraph with the following:

The Contractor shall pull a mandrel approved by the Engineer through all PVC conduit runs.

Replace the twenty-third paragraph with the following:

All conduit shall terminate in a pull box except for inductive loop detector stub-out conduit within a roadway.

Add the following subsections:

**307-2.5.2 Non-Metallic Rigid Electrical Conduit (PVC) – General.**

All PVC conduits shall be terminated with a bell end.

All PVC conduits shall be installed with a solid, bare No. 8 copper conductor.

**307-2.5.3 Non-Metallic Rigid Electrical Conduit (PVC) Systems for Street Lighting Construction.** PVC conduit systems for street lighting construction shall conform to 307-2.5.1, 307-2.5.2 and the following:

Ground rods shall be 8' x ½" copper clad.

All street lighting foundations shall be fed with 2-inch PVC conduit from an adjacent No.5 "STREET LIGHTING" pull box with ground rods. Additional No.5 pull boxes with ground rods shall be installed as necessary such that no conduit run exceeds 300 ft.

**307-2.5.4 Non-Metallic Rigid Electrical Conduit Systems (PVC) For Traffic Signal Construction.** PVC conduit systems for traffic signal construction shall conform to 307-2.5.1, 307-2.5.2 and the following:

All PVC conduit systems shall include the installation of a ground rod at the terminus of each crossing within the respective pull box. These ground rods are in addition to the required ground rods at the controller cabinet and electrical service. With the approval of the Engineer, multiple PVC conduit systems may share a common ground rod provided there is a minimum of one ground rod per corner of the intersection.

Add the following subsection:

**307-2.5.5 Measurement and Payment.** Measurement of conduit shall be the horizontal plane distance plus the rise from the minimum required depth to grade.

The Contract Unit Price for each size of conduit, or the Contract Unit Price for the appropriate lump sum Bid item, shall be considered as full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in furnishing and installing the conduit as shown on the Plans, as specified in these Specifications, and as directed by the Engineer, including any necessary excavation and backfill, trenching, jacking, or restoration of sidewalk, pavement and appurtenances damaged or destroyed during construction.

Full compensation for all additional materials and labor, not shown on the Plans or specified in the Specifications, which are necessary to complete the installation of the conduit, shall be considered as included in the Contract Unit Price for the conduit or the appropriate lump sum Bid item and no additional compensation will be allowed therefor.

**307-2.6 Wiring.** Add the following after the second paragraph:

Sufficient conductors shall be provided to perform the operation of the signal and lighting system.

Replace the first sentence of the fifth paragraph with the following:

When splicing is required, splices shall be made only in pull boxes, with 600mm(2 feet) of conductor left between the splice and the end of the conduit. All splices shall be twisted or crimped and soldered.

Replace the eighth paragraph with the following:

For identification of traffic signal and multiple circuit street lighting conductors, insulation shall be of solid color, or of basic colors with a permanent colored stripe as specified in the following table:

Conductor Table				
Circuit	Phase or Function	AWG Size	Conductor	
			Colors	Stripe
Signal	1 & 5	14	Red, Yellow, Brown	Silver *
	2 & 6	14	Red, Yellow, Brown	Black *
	3 & 7	14	Red, Yellow, Brown	Purple *
	4 & 8	14	Red, Yellow, Brown	Orange *
	or Special	14	Red, Yellow, Brown	Violet
	Common	10 or larger	White	None
Pedestrian Buttons	1 & 5	14	Blue	Silver
	2 & 6	14	Blue	Black
	3 & 7	14	Blue	Purple
	4 & 8	14	Blue	Orange
	Common	14	White	None
Flashers	-	14	Black	None
	Common	14 or larger	White	None
Lights: Multiple Highway Sign	-	10 or larger	Black	None
	-	12 or larger	Black	None
	Common	12 or larger	White	None
Services (Any)	-	8 or larger	Black	None
	Common	8 or larger	White	None
Interconnect: Direct	-	14 or larger	Orange	Various
	Common	14 or larger	White	None
Spare: Signal	-	14 or larger	Black	None

- \* Vehicle Head = Single Stripe
- \* Pedestrian Head = Double Stripe

Add the following:

The splices between the stranded and solid wire shall be made by careful cleaning of the bare conductors, twisting the wires together for a good mechanical bond, applying a non-corrosive paste flux to the conductors and then applying heat to the conductors so that when solder is applied to the conductors it will completely melt and flow into all voids. A wire nut shall then be encapsulated within an epoxy pack to form a complete waterproof connection.

Fused splice connectors shall not be used in series circuits. Fuses shall be standard midget, ferrule type and shall be rated as follows:

- 5 amperes for 150-watt lamps
- 5 amperes for 200-watt lamps
- 10 amperes for 250-watt lamps
- 10 amperes for 310-watt lamps
- 10 amperes for 400-watt lamps

The splice connector shall completely enclose the fuse and shall protect the fuse against damage from water and weather. The contact between the fuse and fuse holder shall be by spring pressure. Springs shall not be a part of the current carrying circuit. The terminals of the splice connector shall be rigidly crimped, using a tool of the type recommended by the manufacturer of the fused spliced connector, to the line and ballast conductors. The terminals shall be insulated and made waterproof in accordance with the splice connector manufacturer's recommendations.

Add the following subsection:

**307-2.6.1 Measurement and Payment.** Payment for furnishing and installing conductors shall be considered as included in the Contract Unit Price for each size of conduit or in the Contract Unit Price for the appropriate lump sum Bid item, unless otherwise noted or included as a separate Bid item. In addition, where conductors are required to perform the functional operation of signal and lighting equipment, payment for furnishing and installing conductors from the nearest pull box or from the controller, in the absence of conduit runs as a Bid item, shall be considered as included in the Contract Unit Price for the signal and lighting equipment Bid items or in the appropriate lump sum Bid item.

**307-2.7 Bonding and Grounding.** Add the following:

A separate equipment grounding conductor shall be installed to connect the equipment grounding terminal/buss of the traffic signal controller cabinet to the terminal/buss to which the grounded service conductor is connected in the traffic signal service.

The equipment grounding conductor shall be a Type "THWN", No. 8 AWG stranded copper wire continuously green in color and shall be unspliced and continuous from the service to the traffic signal cabinet.

**307-2.8 Service.** Add the following:

All electrical service connection costs that may be incurred, shall be paid by the Contractor to the serving utility company prior to the expiration of the first 10 percent of the number of working days allowed per 6-7 of the Special Provisions, unless otherwise specified in the Special Provisions.



Add the following subsection:

**307-2.9 High Pressure Sodium Luminaires.** Each high pressure sodium luminaire shall be furnished with a sodium lamp as shown on the Plans.

Each high pressure sodium vapor luminaire shall be horizontal burning full or semi cut-off type as shown below, equipped with flat lens and internal regulator ballasts wired for 120 volt operation and shall provide ANSI/IES medium cut-off Type III light distribution. The luminaires shall not be equipped with glare shields or photoelectric cell sockets.

The high pressure sodium vapor lamps shall have a minimum average rated life of 24,000 hours.

	Lamp Watts	Lumens	ANSI Code
Full Cutoff	70	5,800	
	100	9,500	
	150	16,000	S55
Semi- Cutoff	200	22,000	S66
	250	27,500	S50
	310	37,000	S67
	400	50,000	S51

### **307-3 STREET LIGHTING CONSTRUCTION.**

**307-3.1 General.** Add the following after the first paragraph:

Street lighting electrolier standards shall be installed 750mm(30 inches) from the top of curb to the centerline of the pole. On streets where the sidewalk is 1.5m(5 feet) or less in width and are adjacent to the curb, the street lighting electrolier standards shall be installed outside of the sidewalk area unless otherwise specified or otherwise shown on the Plans.

Clearances between power lines and street lighting electrolier standards shall not be less than 3.1m(10 feet) or as specified in the current General Order No. 95.

**307-3.3 Wiring.** Add the following:

Wiring shall be performed in conformance with 307-2.6.

### **307-4 TRAFFIC SIGNAL CONSTRUCTION.**

**307-4.1 General.** Add the following:

The Contractor shall supply an Agency-approved Traffic Signal Electrician/Technician anytime a modification to a controller cabinet is required by the Plans, Specifications, and/or in support of any work to be performed by the Contractor. The Contractor shall

submit to the Engineer for approval the Traffic Signal Electrician/Technician's name, qualifications, employer's name and contact telephone numbers. Payment for furnishing a Traffic Signal Electrician/Technician shall be considered as included in the Contract Unit Price for controller cabinet modifications or in the Contract Unit Price for the appropriate lump sum Bid item, unless otherwise specified in the Special Provision. In addition, where controller cabinet modifications are required to perform the functional operation of traffic signal equipment, payment for furnishing a Traffic Signal Electrician/Technician, in the absence of a controller cabinet modification Bid item, shall be considered as included in the Contract Unit Price for the controller cabinet equipment or in the Contract Unit Price for the appropriate lump sum Bid item.

**307-4.2 Temporary Signal Systems.** Add the following after the second paragraph:

Temporary mast arm signal standards shall be installed whenever the existing mast arm indication will be inoperative for more than 8 hours. Where there are no existing mast arm standards, temporary Type 1 Standards may be used. All temporary standards shall be as shown on the Caltrans Standard Plans (latest edition), unless otherwise specified in the Special Provisions.

**307-4.5 Wiring.** Replace the first paragraph with the following:

Traffic signal wiring shall also conform to 307-2.6. and the following:

Three spare No. 14 AWG conductors shall be provided throughout the signal light system. The end of spare conductors shall be doubled back and taped. Where traffic signal cable is used exclusively, the three individual spares may be deleted.

Replace the sixth paragraph with the following:

All stranded and braided conductors shall be terminated with approved terminal lugs which shall be soldered to the conductors.

Add the following:

For a signal standard with a luminaire, a fused disconnect spliced connector shall be installed in each pull box adjacent to the standard and shall be readily accessible in the pull box regardless of whether the ballast is remote or is integral with the luminaire. The connector shall have no exposed metal parts.

Three-conductor cable (3CSC), five-conductor cable (5CSC), and twelve-conductor cable (12CSC) may be installed in lieu of individual conductors and shall conform to Section 86-2.08D of the Caltrans Standard Specifications for Construction of Local Streets and Roads (latest edition), unless otherwise specified in the Special Provisions or approved by the Engineer. No other traffic signal (TS) multi-conductor cable will be accepted unless otherwise approved by the Engineer.

TS cable shall not be installed in traffic signals with pre-existing individual conductors unless otherwise approved by the Engineer.

All multi-conductor TS cables shall be continuous from the controller cabinet termination to a pole mounted terminal compartment or pedestrian push button (PPB). For pole top mounted TS heads without terminal compartments, the TS cable shall be terminated directly to the terminal block in the TS head. Splicing in the pull boxes will not be allowed.

A continuous 3CSC shall be installed from each PPB to the controller cabinet.

A continuous 12CSC shall be installed from each TS standard bearing TS vehicle and/or pedestrian head to the controller cabinet. In the event that the TS standard carries more than two (2) vehicle and/or (2) pedestrian phases, a second 12CSC shall be installed.

The ultimate destination location of each TS cable, as shown on the Plans, shall be identified by mechanical durable means near its terminus in the controller cabinet and in every pull box, i.e., LOC 1, LOC 2, etc. In the event that a TS standard has multiple cables, each cable shall be uniquely identified and its ultimate destination included, i.e., LOC 1 A, LOC 1 B, etc. The Engineer shall approve the method.

A continuous 5CSC shall be installed from the terminal block in each mast arm mounted head to the pole mounted terminal compartment. In the event that a mast arm mounted head has indications for more than one phase, another 5CSC shall be installed for each additional phase on the respective mast arm mounted head.

**307-4.6 Signal Heads.** Replace the entire subsection with the following:

**307-4.6.1 General.** Signal heads shall not be installed at any intersection until all other signal equipment, including the controller, is in place and ready for operation, except that signal heads may be mounted if the faces are turned away from traffic or are covered.

Signal heads shall be located and aimed as shown on the Plans or as directed by the Engineer. Mounting and location on standards shall be as shown on the Plans or as directed by the Engineer.

**307-4.6.2 Vehicle Signal Heads.** All new vehicle signal heads installed at any one intersection shall be of the same style and from the same manufacturer, except for programmed visibility heads, and shall conform to the following:

- a) **General.** Each vehicle signal head shall be of the adjustable type conforming to the provisions in ANSI D-10.1.

Adjustment shall permit rotation of 360 degrees about a vertical axis. The number and type of sections shall be as specified herein or as shown on the Plans.

Unless otherwise shown on the Plans, all vehicle signal heads shall contain three sections arranged vertically; red-top, yellow-center, green-bottom.

All vehicle signal heads mounted on mast arms shall be either Type MAS or Type MA-2.

All indications shall be 305mm(12-inch). Visors are required on all signal heads.

Where shown on the Plans, backplates shall be furnished and attached to the signal heads. Backplates shall be constructed of 3003, half-hard, 1.3mm(0.051-inch) minimum thickness aluminum sheet of the dimensions shown on the Caltrans Standard Plans (latest edition). In fabricating backplates, the inside vertical edges, adjacent to the signal head, shall be bent back forming mounting brackets for attaching to the signal head. Backplates shall be formed in two sections and bolted together, thus permitting installation after signal heads are in place.

- b) Optical Units.** Each optical unit shall consist of an LED unit or of a lens, a reflector or reflector assembly, a lamp receptacle and a clear traffic signal lamp. The candlepower distribution, wiring and optical unit shall conform to the provisions of ANSI D-10.1.

All new optical units shall be 12" LED conforming to the requirements in the Special Provisions unless otherwise shown on the Plans.

Lenses shall be made of glass on all incandescent optical units.

Reflectors shall be made of silvered glass or of specular aluminum with an anodic coating.

- c) Housing.** The signal head housing shall consist of an assembly of separate sections, expandable for vertical mounting, joined by stainless steel or cadmium plated bolts and attaching washers or clamping plates, to form a watertight unit of pleasing appearance. No tie rods will be allowed.

Each section shall be an aluminum alloy die casting conforming to ASTM B 85, complete with integrally cast top, bottom and sides, with a one-piece hinged door, mounting for the lens and other parts of the optical unit, watertight neoprene gaskets and a simple door-latching device. The door shall be attached and latched to the housing with stainless steel fastenings (hinge pins, latch screw and wing nut) permitting opening and closing without the use of tools. All latching screws and wing nuts shall be self-captivated to prevent removal.

The sections shall be interchangeable and so constructed that sections can be removed or added. There shall be a round opening in the top and bottom of each head to receive a 38mm(1-1/2-inch) supporting pipe frame. All parts shall be clean, smooth and free from flaws, cracks, blow holes or other imperfections.

Each lens shall be provided with a removable full circle visor. When attached, the visor shall be oriented approximately 3-1/2 degrees downward from the horizontal.

**307-4.6.3 Flashing Beacons.** The beacon shall be as shown on the Caltrans Standard Plans (latest edition), unless otherwise shown on the Plans, and shall consist of a 305mm(12-inch) vehicle signal section and a flasher unit equipped with a radio interference suppressor. Workmanship and materials shall be equal to that specified for controllers.

The vehicle signal section shall also conform to 307-4.6.2.

The flasher mechanism and radio interference suppressor shall be enclosed in a rain tight galvanized housing. Unless otherwise specified, flashing beacon installations in

conjunction with a traffic signal system, as well as individual installations, shall be provided with separate service.

The flasher unit shall meet the requirements of Section 8, "Solid-State Flashers" of the National Electrical Manufacturers Association Standards Publication Number ATS2-1998.

The flasher unit shall be a solid-state device with no contact points or moving parts.

The flasher unit shall provide 2 output circuits to permit alternate flashing of signal faces and shall be capable of carrying a minimum of 10 amperes per circuit at 120 volts.

**307-4.6.4 Pedestrian Signal Heads.** All new pedestrian signal heads shall be modular with international symbols and conform to the following:

- a) **General.** Construction shall generally consist of a single piece cast aluminum housing, a sealed LED message module with a polycarbonate message lens, a single piece cast aluminum swing open door frame, a Z-crate type sun visor and other appropriate hardware. Optically, the subject pedestrian signal shall be capable of displaying, brightly and uniformly, the alternate message symbols "HAND" in Portland Orange and "WALKING PERSON" in Lunar White while being subject to strong ambient light conditions. Under the same strong ambient light conditions, the message shall "Blankout" when the signal is not energized.

In order to facilitate installation and maintenance, the signal shall be designed so that all components are readily accessible from the front by merely opening the signal door.

- b) **Dimensions.** The maximum overall dimension of the signal shall be 469mm(18-1/2 inches) wide, 476mm(18-3/4 inches) high, and 228mm(9 inches) deep, including Z-crate type visor and hinges.
- c) **Messages.** Messages shall be the Portland Orange "HAND" and the Lunar White "WALKING PERSON" illuminated by multiple configuration neon tubes encased in a molded plug-in plastic message module.

The "HAND"/"WALKING PERSON" symbols shall be a minimum of 305mm(12 inches) in height and 178mm(7 inches) in width.

- d) **Message Module.** The message module shall conform to the requirements in the Special Provisions.
- e) **Z-Crate Visor.** Each signal shall be provided with a Z-crate type visor designed to eliminate sun phantom.

The Z-crate assembly shall consist of 20 straight horizontal members and 21 horizontal louvers each preformed in a zig-zag pattern. Every other louver shall be reversed so as to form cells 25mm(1 inch) square but rotated 45 degrees from horizontal to provide diamond shaped cells when assembled. Each diamond shall

then be bisected by insertion of a straight louver interspersed between each pair of formed zig-zag louvers. Where each apex of each formed louver comes in contact with the interspersed straight louver, the entire length of the joint shall be chemically welded.

The basic material used in the construction of the Z-crate shall be nominally 0.8mm(0.030 inch) thick and shall be 100 percent impregnated black polycarbonate plastic processed with a flat finish on both sides.

The assembly shall be enclosed in a mounting frame constructed of 1mm(0.040 inch) minimum thickness aluminum or polycarbonate plastic. This frame shall be 38mm(1-1/2 inches) deep and shall contain mounting holes for direct insertion in or appropriate tabs for attachment to the pedestrian signal door frame. The Z-crate visor assembly shall be held in place by the use of stainless steel screws.

- f) **Case.** The case shall be a one piece corrosion resistant aluminum alloy die casting complete with integrally cast top, bottom, sides and back. Four integrally cast hinge lug pairs shall be provided for operation of a swing open door.

The case when properly mated to other pedestrian signal components and mounting hardware shall provide a dustproof and weatherproof enclosure and shall provide for easy access to and replacement of all components.

- g) **Door Frame.** The door frame shall be a one piece corrosion resistant aluminum alloy die casting, complete with two hinge lugs and two latch slots cast for each door. The door shall be attached to the case by means of two Type 304 stainless steel spring pins. Two stainless steel hinge bolts with captive stainless steel wing nuts and washers shall be attached to the case with the use of stainless steel spring pins. Hence, latching or unlatching of the door shall require no tools.

**307-4.7 Signal Head Mountings.** Replace the first sentence of the first paragraph with the following:

Heads shall be supported by assemblies of 38mm(1-1/2-inch) standard steel pipes with bronze fittings.

Replace the last sentence of the first paragraph with the following:

Construction shall be such that all conductors are concealed within the Standard or mounting assembly.

Replace the second paragraph with the following:

Fittings, slip-fitters and rain tight terminal compartment shall be cast bronze. Signal head mountings for side installations shall include the steel pipe assembly and terminal compartment. Other than as specified above, the terminal compartment shall be designed to bolt securely to the Standard. Each compartment shall be fitted with a terminal block containing 10 terminals of the stud type, each plated brass terminal to be provided with two plated brass nuts and washers. Each terminal shall accommodate at least five No. 14 AWG conductors. A rain tight cover shall be provided giving ready access to the terminal

block. The terminal compartment shall be mounted on the standard on the side away from traffic and parallel with the prolongation of the nearest curb face. For post-top mounting of two-way signal heads, the terminal compartment shall be cast with an integral slip-fitter. For post-top mounting of one-way signal head, an offset slip-fitter without a terminal compartment shall be used. Slip-fitters shall fit over a 114mm(4-1/2-inch) diameter tenon. Each slip-fitter shall be provided with two rows of set screws with three screws in each row to secure assembly in plumb position. Set screws shall be 10mm(3/8 inch), 16 NC x 19mm(3/4-inch) square head, cup point, cadmium plated. Signal heads shall have either integrally cast serrations or shall be equipped with positive lock rings and fittings designed to prevent heads from turning due to external forces. Connecting fittings shall have serrated contacts as shown on the Caltrans Standard Plans (latest edition).

Unless otherwise specified, mounting for a single signal head assembly on mast arm shall be Type MAS or MA-2 with an elevated plumbizer suitable for internal wiring. The cost of the mounting shall be considered as included in the Contract Unit Price for the signal head or as included in the appropriate lump sum Bid item.

Signal head mountings (unless otherwise noted) for Type 1 standards shall be: single-face, Type VP-1; two-face, Type VP-2. Mountings for Type 1-7 standard shall be: single-face, Type VP-1; two-face, Type VPB-1. Mountings for other standards shall be: single-face, Type VB-1; two-face, Type VB-2.

Add the following subsection:

**307-4.7.1 Terminal Blocks.** A separate white (common) lead shall be wired to each lamp receptacle, and a colored lead, corresponding to the lens color, shall be wired to each lamp receptacle terminal. Leads shall be of sufficient length to allow connection to the terminal block specified herein. Each complete signal head of 3 sections or less shall be provided with an eighth-terminal, four-position terminal block, properly mounted in the lower section. Signal heads of 4 or 5 sections shall be provided with a 12-terminal, six-position terminal block mounted in the lower section. All terminal blocks must be able to accommodate No. 10 wires. Stud-type terminal blocks shall have not less than 6mm(1/4 inch) edge clearance to any portion of the stud.

### **307-4.9 Vehicle Detectors.**

**307-4.9.3 Inductive Loops.** Replace subparagraph 1) with the following:

1) Detector loops, and their leads to the nearest pull box, shall be formed from a continuous conductor of No. 12 AWG seven-strand tinned copper wire, having 600-volt Type USE cross-linked polyethylene insulation with a minimum thickness of 1.2 mm(3/64 inch). If the existing conduit system is non-metallic, the No. 8 bare copper wire shall be used as the ground reference for testing.

Replace the third paragraph of subparagraph 2) with the following:

After conductors are installed in the slots cut in the pavement, the slots shall be filled with sealant to within 3mm(1/8 inch) of the pavement surface. The sealant shall be at least 25mm(1 inch) thick above the top conductor in the saw cut. Before setting, surplus sealant shall be removed from the adjacent road surfaces without the use of solvents. The sealant for filling slots shall conform to 307-4.9.6 of these Additions and Amendments.

Add the following before the last paragraph:

- 3) Unless otherwise specified on the Plans, or with prior approval of the Engineer, the following shall be adhered to:

All loops shall be 1.8m(6-foot) diameter round loops unless otherwise shown on the Plans.

Loops			
Length	Number	Combination	Number of Turns
1.8m(6')	1	1	4
1.8m(6')	2	Series	3
1.8m(6')	3	1 Series	3
1.8m(6')	4	2 Series	3
2.4m(8')	1	1	3
2.4m(8')	2	Series	3
2.4m(8')	3	1 Series	3
2.4m(8')	4	2 Series	3
6.1m - 12.2m(20'-40')	1	1	2
6.1m - 12.2m(20'-40')	2	2 Series	2
12.5m - 15.2m(41'-50')	1	1	2
15.5m - 30.5m(51'-100')	1	1	1
1.8m(6') Round	1	1	4
1.8m(6') Round	2	Series	3
1.8m(6') Round	3	Series	3
1.8m(6') Round	4	Series	3
762mm(30") Round	1	1	5
762mm(30") Round	2	Series	5

Add the following:

The distance between the side of a loop and a lead-in saw cut from adjacent detectors shall be 600mm(24 inches) minimum. The distance between lead-in saw cuts shall be 150mm(6 inches) minimum.

The loop lead-in conductors shall be twisted together before being placed in the slot and conduit. The width of the lead-in saw cut shall be at least twice the diameter of the lead-in conductor.

All inductive loops that are to be connected to the same detector lead-in cable shall be spliced in series unless otherwise specified in the Special Provisions or on the Plans.

Adjacent loops on the same sensor unit channel shall be wound in opposite directions.



Add the following subsections:

**307-4.9.5 Inductive Loop Detectors Lead-in Cable.** Inductive loop detectors lead-in cable shall consist of two No. 16 stranded copper conductors with each conductor insulated with 0.51mm(20 mils) of high-density polyethylene. The conductors shall be twisted together with at least two turns per 300mm(1 foot) and the twisted pair shall be protected with a copper or aluminum polyester shield. A No. 20, minimum, copper drain wire shall be provided and connected to the equipment ground within the cabinet. The cable shall be provided with a high-density polyethylene or high-density polypropylene outer jacket with a normal thickness of 0.89mm(35 mils). An amorphous interior moisture penetration barrier of nonhydroscopic polyethylene or polypropylene fillers shall be provided.

**307-4.9.6 Loop Detector Sealant.** Loop detector sealant shall be an elastomeric sealant or a hot-melt® as specified below, or a two-part epoxy sealant approved for use as a loop detector sealant by Caltrans.

**(a) Elastomeric Sealant.** Elastomeric sealant shall be a polyurethane material of a composition that will, within its stated shelf life, cure only in the presence of moisture. Sealant shall be suitable for use in both asphalt concrete and portland cement concrete.

The cured sealant shall have the following characteristics:

Performance	
Property and Results	Measuring Standard and Conditions
Hardness (indentation)- 65-85	ASTM D 2240 Rex, Type A, Model 1700, 25 EC(77 EF), 50% relative humidity
Tensile Strength- 3.4MPa(500 psi), minimum	ASTM D 412 Die C, pulled at 20 IPM
Elongation- 400%, minimum	ASTM D 412 Die C, pulled at 20 IPM
Flex at 4 EC(40 EF)- no cracks	0.64mm(25-mil) Free Film Bend (180 degrees) over 13mm(1/2") Mandrel
Weathering Resistance- Slight chalking	ASTM D 822 Weatherometer 350 hours. Cured 7 days at 25 EC(77 EF) 50% relative humidity
Salt Spray Resistance- 3.4MPa(500 psi), minimum tensile	ASTM B 117 28 days at 38 EC(100 EF), 5% NaCl, Die C, pulled at 20 IPM
Dielectric Constant- Less than 25% change over a temperature range of -30 EC to 50 EC	ASTM D 150

Chemical Resistance	
Chemical and Results	Test Method
De-icing Chemical - No effect	ASTM D 471
Gasoline--Slight Swell	ASTM D 471
Hydraulic Brake Fluid - No effect	ASTM D 471
Motor Oil - No effect	ASTM D 471
Calcium Chloride (5%) - No effect	ASTM D 471

Test conducted on de-aerated 0.51mm(20 mil), dry film liquid immersion. Twenty-eight days at 25 °C(77 °F).

**(b) Hot-Melt Rubberized Asphalt Sealant.** Hot-melt rubberized asphalt sealant shall be in solid form at room temperature and fluid at an application temperature of 191 °C to 204 °C(374 °F to 400 °F).

**307-4.9.7 Measurement.** Inductive loop detectors shall be measured along the horizontal length of the full depth saw-cut.

Measurement of inductive loop lead-in cable shall include the required slack and the rise from minimum conduit depth to grade.

**307-4.9.8 Payment.** Payment for inductive loop detectors will be made at the Contract Unit Price for "INDUCTIVE LOOP DETECTORS AND LEADS SAW CUT."

**307-4.10 Pedestrian Push Buttons.** Add the following:

When pedestrian signal heads are modified or installed, all pedestrian push button signs shall conform to the pedestrian signal message indications as shown on Caltrans Standard Plan ES-5C (latest edition) and to the requirements of the Americans with Disabilities Act (ADA).

The assembly shall be a cast metal housing, weatherproof and constructed such that it will be impossible to receive any electrical shock under any weather conditions.

The pedestrian push button switch shall be a phenolic enclosed precision snap-acting type, single-pole, double-throw, switching unit with screw type terminals, rated 15 amperes at 125 volts, AC, and shall have the following characteristics:

Switching unit shall have a stainless steel plunger actuator and shall be provided with U-frame to permit recessed mounting in the push button housing.

Switching shall have an operating force of 255 to 369 grams(9 to 13 ounces) and a minimum release force of 113 grams(4 ounces).

Pre-travel shall be 0.4mm(1/64 inch) maximum.  
Over travel shall be 5.6mm(7/32 inch) minimum.

Differential travel shall be 0.01mm to 0.05mm(0.0004 inch to 0.002 inch).

Where a pedestrian push button is attached to a Standard, the housing shall be shaped to fit the curvature of the Standard and secured to provide a rigid installation. The sign shall be attached to and securely supported by the housing.

Where a pedestrian push button is mounted on top of a 63mm(2-1/2-inch) diameter post, the housing shall be provided with a slip-fitter fitting and screws for securing rigidly to the post.

Mounting height shall conform to ADA requirements.

### **307-5 INSPECTION AND TESTING.**

#### **307-5.2 Testing.**

##### **307-5.2.3 Megger.** Replace the entire subsection with the following:

A megger test at 500 volts DC shall be made on each circuit between the circuit and a ground. The insulation resistance shall not be less than 10 megaohms on all circuits, except for inductive loop detector circuits which will be tested for continuity, circuit resistance and insulation resistance at the pull box before filling slots. After splicing, test each loop circuit for continuity, circuit resistance and insulation resistance at the controller cabinet location. The loop circuit resistance shall not exceed 0.5 ohms plus 0.35 ohms per 30.5m(100 feet) of lead-in cable. The insulation resistance shall not be less than 100 megaohms.

##### **307-5.2.4 Functional.** Add the following:

Prior to initial turn-on of new or modified signal systems, all equipment and signal displays, as shown on the Plans and/or specified in the Specifications, shall be installed and operable. The initial turn-on shall be made between 9:00 a.m. and 2:00 p.m. on a day not followed by a Saturday, Sunday, or legal holiday, unless otherwise approved by the Engineer. Notification shall be given to the Engineer 48 hours prior to the turn-on day and time requested.

##### **307-6 PAINTING.** Add the following after the first paragraph:

All new electrical equipment and materials, except luminaries, standards and posts, shall be painted per 210-1.5.

##### **307-7 SALVAGE.** Add the following after the first paragraph:

Hauling and stockpiling of salvaged material off the right of way, as directed by the Engineer, will be paid for as "Extra Work" per 3-3 of these Additions and Amendments.

For disposition of salvaged materials, see "REMOVED AND SALVAGED EQUIPMENT" in the Special Provisions.

## SECTION 308 - LANDSCAPE AND IRRIGATION INSTALLATION

### 308-4 PLANTING.

#### 308-4.9 Erosion Control Planting.

Add the following subsection:

##### 308-4.9.6 Erosion Protection Blanket.

(a) **General.** Erosion protection blankets are required only on fill slopes of 1V:3H and steeper and 1.2m(4 feet) or more in height, unless otherwise specified, and will be indicated on the Plans.

(b) **Material.**

1) **Seed.** All seed shall be delivered to the Project site tagged and labeled in accordance with the California Agricultural Code.

Seed shall be a quality which has a minimum pure live seed content of 80% (% purity x % germination) and weed seed shall not exceed 0.5% of the aggregate of pure live seed and other material.

The seed type and amount shall be as specified in the Special Provisions.

2) **Commercial Fertilizer.** Fertilizer shall be a balanced fertilizer in pellet or granular form conforming to the requirements of Article 2 of the Agricultural Code of the State of California for fertilizing materials and shall contain the following chemicals in the minimum guaranteed percentages:

- a. Nitrogen, 14 percent
- b. Phosphoric Acid, 14 percent
- c. Potash, 7 percent

All fertilizer shall be delivered in unbroken or unopened containers bearing the warranty of the producer for the grade furnished.

3) **Erosion Control Fabric.** The erosion control fabric shall be straw/coconut fiber blanket type SC 150 as manufactured by North American Green Inc. (local representative Mr. Bill Saladin, 1279 West Stowell Street, Unit A, Santa Maria, CA 93458, Telephone (805) 925-7737), or Type CS2 as manufactured by Synthetic Industries (local representative Mr. Dean Bradfield, P. O. Box 491, La Canada Flintridge, CA 91012, telephone (818) 790-6525), or a Department-approved equal.

(c) **Installation.**

- 1) **Seedbed Preparation.** The area to be seeded shall have a firm seedbed which has previously been roughened by scarifying, disking, harrowing, chiseling, or otherwise worked to a depth of 25mm to 100mm(2 to 4 inches). No implement shall be used that will create an excessive amount of downward movement of soil or clods on sloping areas. The seedbed may be prepared at the time of completion of earthwork.
- 2) **Seeding.** Seed may be sown by any method that will provide even distribution of the seed at the specified rate and shall be covered with not more than 25mm(1 inch) of Type C Topsoil. If hydromulching methods are used, the topsoil cover shall be omitted. The Contractor shall demonstrate for the Engineer's approval that the method utilized is providing an even distribution of seed without damage to the slopes. If, in the opinion of the Engineer, the desired result is not being achieved, then another method shall be utilized, subject to the same demonstration and approval of the Engineer.
- 3) **Fertilizing.** Fertilizer shall be uniformly spread at a rate of 7.3kg per 100m<sup>2</sup>(15 pounds per 1,000 square feet) of surface.
- 4) **Watering.** Water shall be applied in quantities that will thoroughly moisten the soil for a depth of 75mm(3 inches) but not erode the surface.
- 5) **Placing Erosion Control Fabric.** Erosion control fabric shall be placed in accordance with the manufacturer's recommendations except as specified below:
  - i) All joints and seams shall have a minimum 100mm(4-inch) overlap.
  - ii) Whenever the end of a strip is to be stapled, 75mm to 100mm(3 to 4 inches) shall be tucked under so that stapling is through a double thickness.
  - iii) Staples shall be spaced 225mm(9 inches) center to center at the top and bottom of the slope and at all joints and seams; 450mm(18 inches) center to center at the edges down the slope, and 0.9m(3 feet) center to center, staggered square spacing within the field of the fabric. Staples shall be embedded at a 60 degree angle to the surface.
  - iv) Staples shall be made of wire a minimum of 2.3mm(.091 inches) in diameter, "U" shaped with legs 150mm(6 inches) in length and a 100mm(4-inch) crown.
- 6) **Rolling.** The installed fabric shall be rolled with a roller weighing approximately 97kg(65 pounds) per meter(foot) of roller length. Finished surfaces shall be free of wrinkles.

- (d) **Maintenance.** Watering shall be performed at regular intervals at least until the seeding has germinated and, in the opinion of the Engineer, has firmly established itself, and shall continue until field acceptance of the Project. During the maintenance period, any areas requiring reseeding or repair or replacement of

damaged or otherwise unacceptable portions of the erosion protection blanket shall be performed to the satisfaction of the Engineer.

- (e) **Payment.** Payment for all work described hereinabove will be made under the item or items provided therefor. Calculation of the number of square meters(square feet) of blanket for payment will be based on field measurements of the lengths and widths of blanket constructed, measured on the slopes of the completed blankets. No payment will be made for the additional material and cost required for lapping and folding.

## **SECTION 310 - PAINTING**

### **310-2 SURFACE PREPARATION FOR PAINTING STEEL STRUCTURES.**

**310-2.1 General.** Add the following as the first sentence of the first paragraph:

For bridge construction, all structural steel required, except that which is to be galvanized or embedded in concrete, shall be blast-cleaned in accordance with 310-2.5. The blast cleaning shall be completed prior to delivering the structural steel to the Project site.

### **310-5 PAINTING VARIOUS SURFACES.**

**310-5.1 Painting Structural Steel.** Add the following:

For bridge construction, all structural steel required, except that which is to be galvanized or embedded in concrete, shall be painted in accordance with the provisions herein.

**310-5.1.3 Application of Paint.** Add the following to the ninth paragraph:

The application of the zinc-rich primer shall be completed prior to delivering the structural steel to the Project site.

**310-5.1.4 Payment.** Replace the entire subsection with the following:

Full compensation for complying with the requirements of this subsection shall be considered as included in the Contract Unit Price for the item provided therefore and no additional compensation will be made therefore.

### **310-5.6 Painting, Traffic Striping, Pavement Markings, and Curb Markings.**

**310-5.6.2 Weather conditions.** Replace the entire subsection with Section 84-3.05 "Application" of the Caltrans Standard Specifications for Construction of Local Streets and Roads (latest edition).

**310-5.6.3 Equipment.** Replace the entire subsection with Section 84-3.04 "Application Equipment" of the Caltrans Standard Specifications for Construction of Local Streets and Roads (latest edition).

**310-5.6.4 Geometry, Stripes, and Traffic Lanes.** Delete the entire subsection.

**310-5.6.5 Traffic Stripes and Markings.** Replace the entire subsection with the following:

All referenced striping and marking details (nomenclature) shall conform to the Caltrans Standard Plans for Construction of Local Streets and Roads (latest edition).

**310-5.6.6 Preparation of Existing Surfaces.** Delete the entire subsection.

**310-5.6.7 Layout, Alignment, and Spotting.** Delete the first and second paragraphs.

**310-5.6.8 Application of Paint.** Delete the entire subsection.

**310-5.6.9 Protection of Work, Workers, and the Public.** Delete the entire subsection.

**310-5.6.10 Measurement and Payment.** Replace the entire subsection with the following:

Painting traffic stripes will be measured by the linear meter(foot) along the line of the traffic stripes, without deductions for gaps in broken traffic stripes and shall be included in the price of each traffic line detail as shown on the Plans and described on the Caltrans Standard Plans for Construction of Local Streets and Roads (latest edition). Traffic line details which include one double traffic stripe, consisting of two 100mm(4-inch) wide yellow stripes separated by a 75mm(3-inch) wide black stripe, will be measured along the black stripe. Traffic line details which include two double traffic stripes will be measured along the center line between the two double stripes. Painted pavement markings will be measured by the square meter(square foot) for the actual area painted.

The Contract Unit Price per linear meter(foot) for traffic line details and per square meter(square foot) for paint pavement marking, of the number of coats designated in the Schedule of Prices, shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in painting traffic stripes (regardless of the number, widths, and patterns of individual stripes involved in each traffic line detail) and pavement markings including establishing alignment for stripes, and layout work, complete in place, as shown on the Plans, as specified on the Caltrans Standard Plans for Construction of Local Streets and Roads (latest edition), and as directed by the Engineer.

## **SECTION 312 - PAVEMENT MARKER PLACEMENT AND REMOVAL.**

**312-1 PLACEMENT.** Replace the entire subsection with the following:

The placement of pavement markers shall conform to Section 85 of the Caltrans Standard Specifications for Construction of Local Streets and Roads (latest edition).

**312-4 MEASUREMENT AND PAYMENT.** Replace the entire subsection with the following:

The quantity of reflective, non-reflective and reflective-recessed pavement markers will be measured by the linear meter(foot). The quantity of pavement markers per linear meter(foot) of traffic line detail as shown on the Plans and on the Caltrans Standard Plans for Construction of Local Streets and Roads (latest edition) shall be calculated as the total number of markers required for the detail divided by the total length of the detail, without deductions for gaps in broken lines. The length of traffic line details that include one double traffic stripe, consisting of two 100mm(4-inch) wide yellow stripes or two rows of pavement markers, will be measured along the centerline between the two stripes or rows of pavement markers. The length of traffic line details that include two double traffic stripes will be measured along the centerline between the two double stripes.

The prices per linear meter(foot) for reflective and non-reflective pavement markers shall be considered as included in the Contract Unit Price for traffic line detail and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and placing pavement markers, complete in place, including adhesives, and establishing alignment for pavement markers, as shown on the Plans, as specified on the Caltrans Standard Plans for Construction of Local Streets and Roads (latest edition), and as directed by the Engineer.

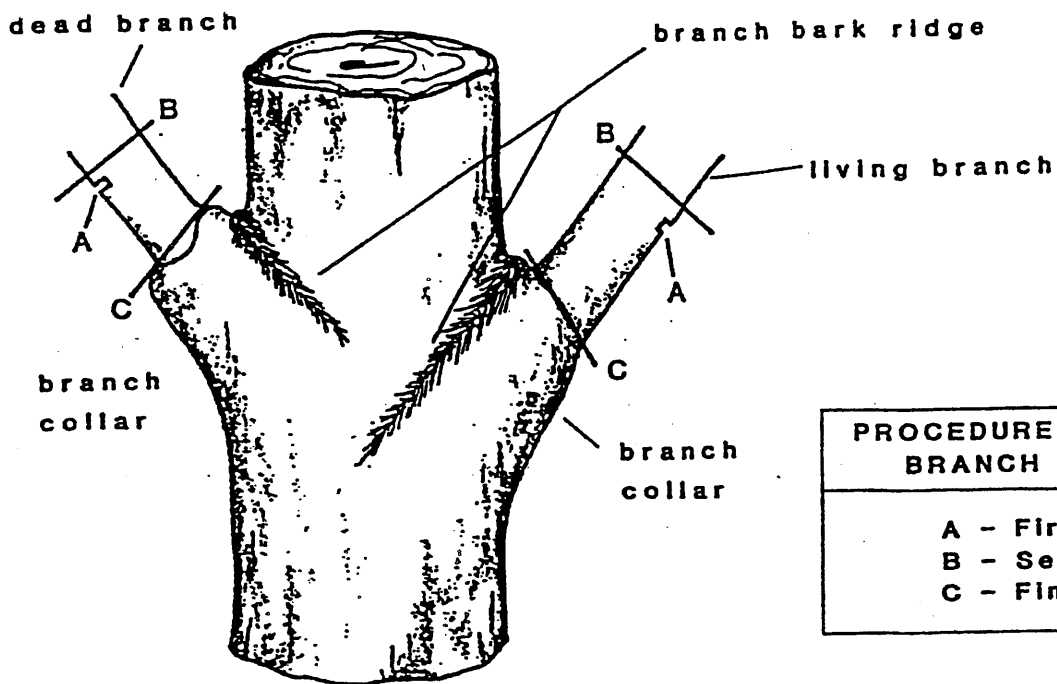
The price per linear meter(foot) for reflective-recessed pavement markers shall be considered as included in the Contract Unit Price for traffic line detail and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and placing reflective pavement markers in recesses, complete in place, including adhesives, constructing the recesses regardless of the type of recess required, and removing and disposing of residue from recess construction, as shown on the Plans, as specified on the Caltrans Standard Plans (latest edition), and as directed by the Engineer.

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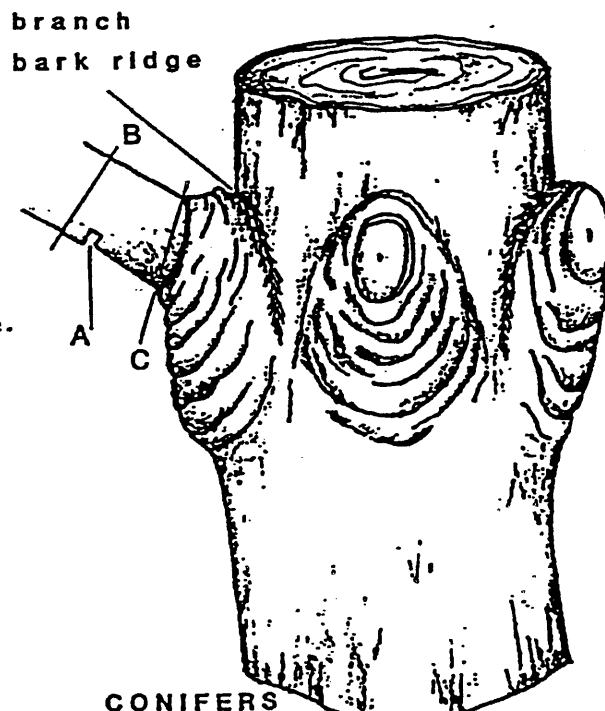
EXHIBIT A

PROPER PRUNING PROCEDURES



<b>PROCEDURE FOR LARGE BRANCH REMOVAL</b>
A - First Cut
B - Second Cut
C - Final Cut

**HARDWOODS**



**CONIFERS**

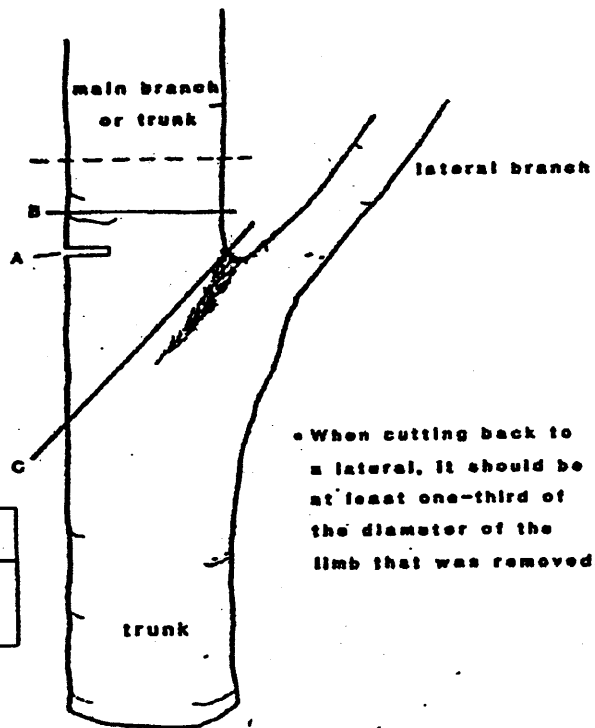
DO NOT

1. Cut behind the branch bark ridge.
2. Leave stubs.
3. Cut the branch collar which is part of the trunk wood.
4. Paint cuts, except for cosmetic reasons, or when specified for sprout regrowth control.

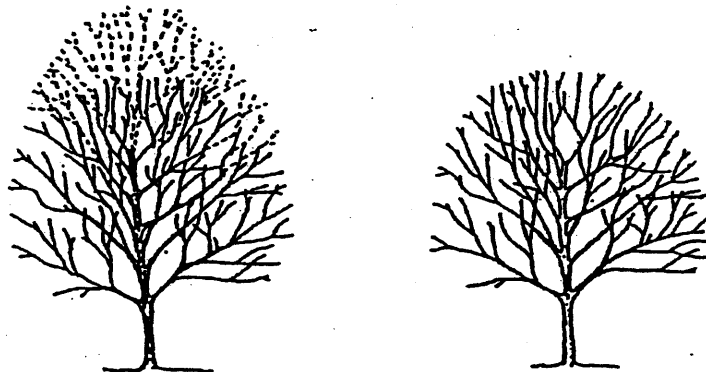
EXHIBIT B

DROP CROTCH PRUNING

Do not leave a flat top when topping.



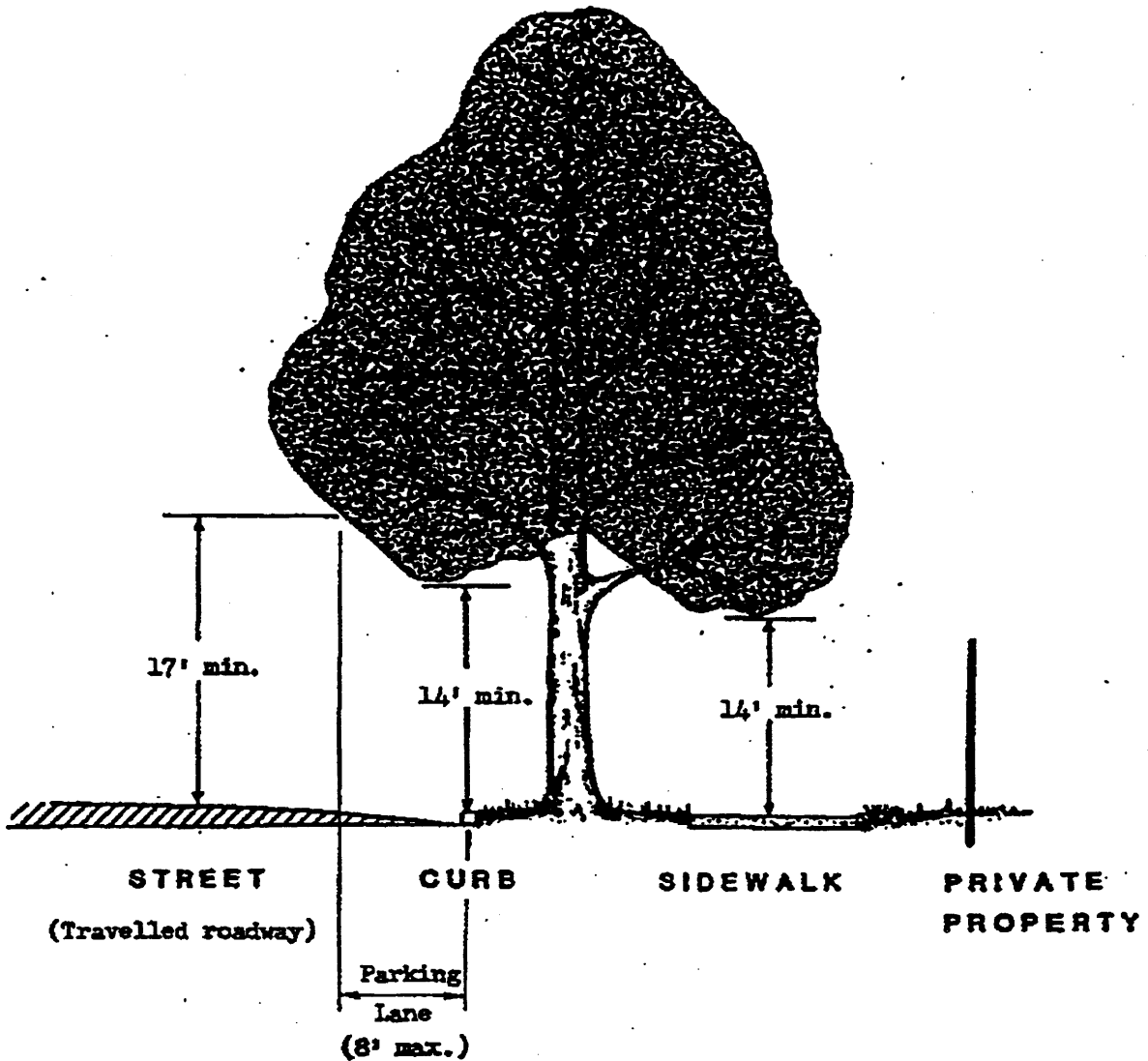
<b>DROP CROTCH PRUNING PROCEDURE</b>
A - First Cut
B - Second Cut
C - Final Cut



"Drop Crotch" Trimming

EXHIBIT C

CLEARANCE TRIM



**NOTE:** At locations where there is no parking lane, the tree shall be trimmed to provide 17' of clearance all the way to the curb or the edge of pavement.