EXHIBIT F

HYDROLOGY STUDY FOR

HIGH DESERT HOSPITAL SITE CLEARANCE

County of Los Angeles, California

Prepared For
SWA Architects
48 East Holly Street
Pasadena, CA 91103

Prepared By

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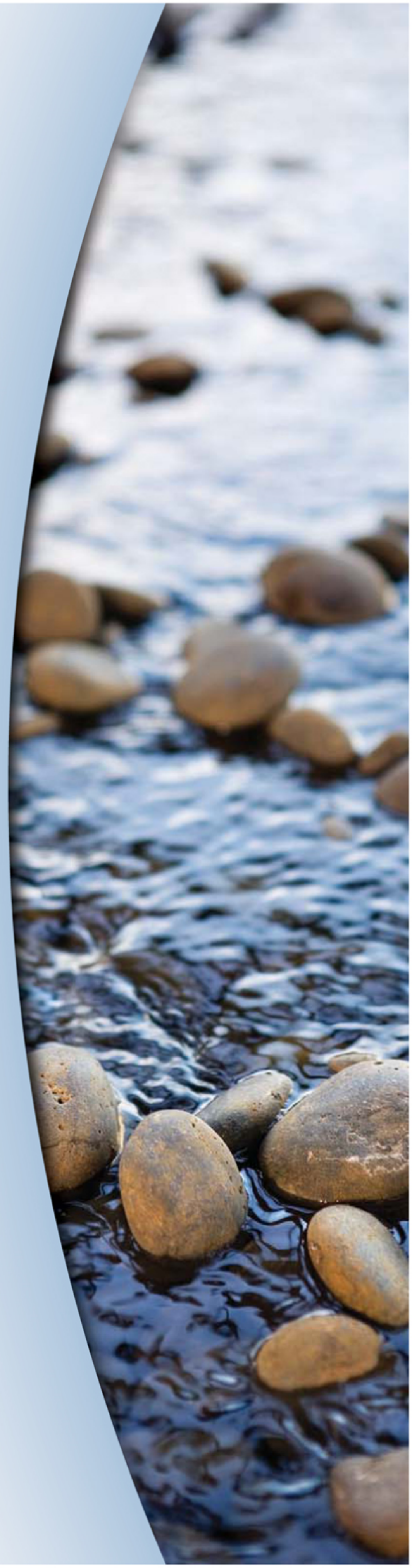
Project Manager:
Brittany Knott, PE
C-76502

Date Prepared: April 25, 2022

Job Number: 499-012-01



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HYDROLOGY STUDY

T.G. 4014-F5 & 4014-F6

HIGH DESERT HOSPITAL
SITE CLEARANCE

Prepared For

SWA ARCHITECTS
48 EAST HOLLY STREET
PASADENA, CA 91103

Prepared By:

Brittany Knott, PE
Fuscoe Engineering
600 Wilshire Blvd, Suite 1470
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RCE 76502

Prepared
April 25, 2022

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1.0 INTRODUCTION

1.1 PROJECT INTRODUCTION AND BACKGROUND

The proposed project site is located at 44900 North 60th Street West in the City of Lancaster, within the County of Los Angeles. The property is bound by West Avenue I to the north, 60th Street to the west, Antelope Valley State Prison to the south, and Mira Loma Detention Center to the east. The property is approximately 361 acres; however, the proposed scope of grading work is limited to a 9.89-acre area.

1.2 PURPOSE OF THIS REPORT

The purpose of this Report is to analyze the pre-development and post-development hydrologic conditions for the project site. The hydrologic review in this report will be limited to the project watershed area as noted in *Appendix A – Hydrology Maps*.

1.3 REFERENCES

Los Angeles County Hydrology Manual, January 2006

1.4 PROJECT SITE LOCATION MAP

The Project site is identified in yellow in the location map shown below.

2.0 HYDROLOGY

2.1 STORM FREQUENCY

Per LA County's requirements for urban floods, the design storm for this project is the 50-year storm event.

2.2 METHODOLOGY

This study was prepared using HydroCalc software in conformance with the Los Angeles County Hydrology Manual. Delta flow rates and volumes are provided for comparison purposes (see *Appendix C & D – Pre & Post Development Hydrology Calculations*).

2.3 EXISTING STORM DRAIN FACILITIES

There is no known storm drain infrastructure on the site within the subject limit of work.

2.4 EXISTING CONDITION HYDROLOGY

Topographically, the site's surface water drainage appears to be conveyed via sheet flow which routes surface runoff towards the neighboring streets. Refer to *Appendix A – Existing Condition Hydrology Map*.

Based upon the County's guidelines, any additional runoff that exceeds that of the existing 50 year storm event must be detained onsite and released at a rate equivalent to the existing 50 year storm. The existing condition 50 year flow rates have been provided on the existing condition hydrology map (see *Appendix A - Existing Condition Hydrology Map*).

For the purposes of this study, the project site was evaluated as a single drainage area, see Table 2.4.1 below. With the project site being a combination of existing buildings, parking lots and hardscape, approximately 90% of the site is impervious. See Table 2.4.2 for existing storm water discharges.

Table 2.4.1

DRAINAGE AREA	DRAINAGE AREA ACREAGE	IMPERVIOUS ACREAGE	IMPERVIOUS PERCENTAGE	RUNOFF COEFFICIENT, Cd
1A	9.89	8.90	90%	0.82
Onsite Total	9.89	8.90	-	-

Table 2.4.2

EXISTING CONDITION DISCHARGES (CFS)						
DRAINAGE MANAGEMENT AREA	2 YEAR EVENT	5 YEAR EVENT	10 YEAR EVENT	25 YEAR EVENT	50 YEAR EVENT	OUTFALL LOCATION
1A	3.30	5.73	5.14	7.41	12.33	TO STREET
Onsite Total	3.30	5.73	5.14	7.41	12.33	-

2.5 PROPOSED CONDITION HYDROLOGY

The proposed site development grading will remain in a rough graded condition until the future use of the land is determined. The site was divided into two areas separated by a ridge with each of these areas sloping towards their respective sediment basins.

All on-site drainage will be collected in two separate sediment basins, one for each area. The sediment basins capacity is larger than what is required as a result of geotechnical recommendations for sloping and earthwork requirements. Each basin has an overflow which has been sized to account for the 50-year clear peak flow rate. Refer to *Appendix E – Site Calculations* for the sizing of the sediment basins and overflow.

Based upon the proposed site plan, included as shown in the Post Development Hydrology Map, an average onsite impervious ratio of 20% was determined (*see Appendix A – Post Development Hydrology Map*).

Using LA County's HydroCalc software, flow rates have been determined for various sub areas within the project site for the Low Development Impact (LID), 2, 5,10, 25, & 50 year storm events *(see Table 3.4.2)*.

The project site will be divided into two (2) distinct Drainage Management Areas (DMAs) for water quality design.

Table 2.5.1

PROPOSED CONDITION DRAINAGE MANAGEMENT AREAS (DMAs)				
DRAINAGE MANAGEMENT AREA	DMA ACREAGE	IMPERVIOUS ACREAGE	IMPERVIOUS PERCENTAGE	RUNOFF COEFFICIENT, Cd
1A	5.77	1.15	20%	0.45
1B	4.12	0.82	20%	0.26
Onsite Total	9.89	1.97	-	-

Table 2.5.2

DRAINAGE MANAGEMENT AREA	2 YEAR EVENT	5 YEAR EVENT	10 YEAR EVENT	25 YEAR EVENT	50 YEAR EVENT	OUTFALL LOCATION
1A	0.45	0.68	0.86	1.79	2.87	Basin No. 1
1B	0.34	0.59	1.03	2.24	2.97	Basin No. 2
Onsite Total	0.79	1.27	1.89	4.03	5.84	-

Based upon a comparison of discharge rates for the various tributary areas described above, discharges rates in the post development condition are less than those of the predevelopment. This is shown in Table 2.5.3.

Table 2.5.3

ON SITE PRE & POST DISCHARGE DIFFERENCES (CFS)					
DRAINAGE MANAGEMENT AREA	2 YEAR EVENT	5 YEAR EVENT	10 YEAR EVENT	25 YEAR EVENT	50 YEAR EVENT
EXISTING	3.30	5.73	5.14	10.16	12.33
PROPOSED	0.79	1.27	1.89	4.03	5.84
DIFFERENCE	--2.51	-4.46	-3.25	-6.13	-6.49

There is no increase in discharge rates between the existing and proposed conditions for the 50-year event, therefore detention is not required.

3.0 CONCLUSIONS

In conclusion, the proposed development's Hydrology meets the design requirements as specified by the County of Los Angeles Hydrology Manual.

4.0 APPENDICES

Appendix A Hydrology Maps

Appendix B Site Characteristics

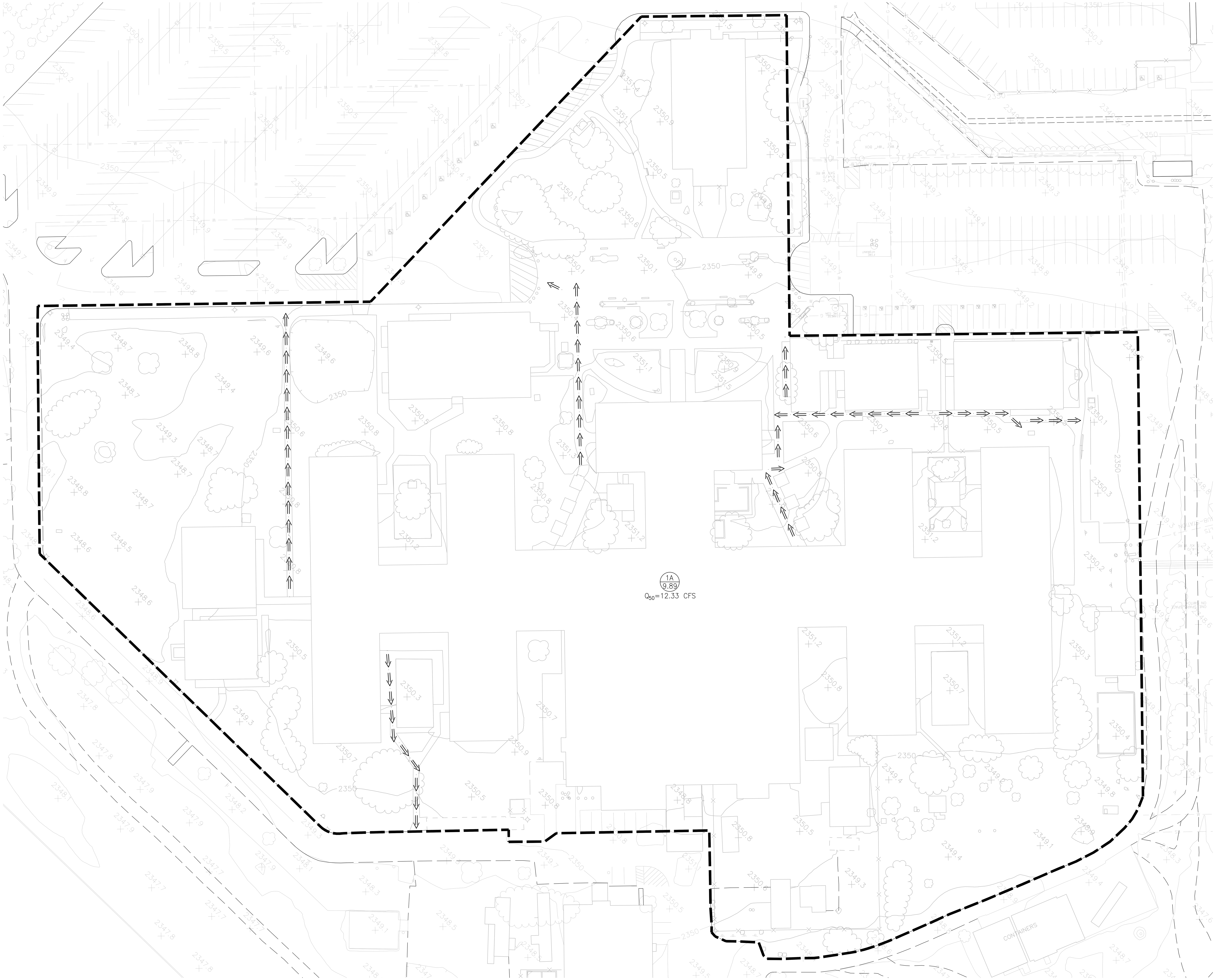
Appendix C Pre Development Hydrology Calculations

Appendix D Post Development Hydrology Calculations

Appendix E Site Calculations

APPENDIX A

Hydrology Maps



LEGEND

- PROJECT WATERSHED AREA (2.5 ACRES)
- SUB AREA BOUNDARY
- FLOW LINE
- ℄ CENTERLINE
- PL PROPERTY LINE
- R/W RIGHT-OF-WAY
- 1A SUBAREA DESIGNATION
- 0.30 AREA

HYDROLOGIC RUN-OFF CALCULATIONS

SITE PARAMETERS: 50 YR ISOHYET = 6 IN
SOIL CLASSIFICATION = 006

FLOOD HAZARD NOTES

1. NOT WITHIN COUNTY ADOPTED FLOODWAY.
2. NOT WITHIN FEMA FLOOD ZONE "A".

TRIBUTARY AREAS

SUBAREA ID	AREA (AC)	AREA RATIO	Q_{50}(CFS)
1A	9.89	100%	12.33
TOTALS	9.89	100%	12.33

N

30' 0' 15' 30'
SCALE: 1" = 30'

EXISTING CONDITION HYDROLOGY MAP

HIGH DESERT HOSPITAL SITE CLEARANCE
44900 NORTH 60TH ST, WEST LANCASTER, CA 93536

FUSCOE ENGINEERING
600 Wilshire Blvd., Suite 1470, Los Angeles, California 90017
tel 213.988.8802 ∘ fax 213.988.8803 ∘ www.fuscoe.com

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LEGEND

▬ ▬ ▬	PROJECT WATERSHED AREA (2.5 ACRES)
■■■■■■■	SUB AREA BOUNDARY
⇐ ⇐	FLOW LINE
℄	CENTERLINE
PL	PROPERTY LINE
R/W	RIGHT-OF-WAY
1A	SUBAREA DESIGNATION
0.30	AREA

HYDROLOGIC RUN-OFF CALCULATIONS

SITE PARAMETERS: 50 YR ISOHYET = 6 IN
SOIL CLASSIFICATION = 006

FLOOD HAZARD NOTES

1. NOT WITHIN COUNTY ADOPTED FLOODWAY.
2. NOT WITHIN FEMA FLOOD ZONE "A".

TRIBUTARY AREAS

SUBAREA ID	AREA (AC)	AREA RATIO	Q_{50}(CFS)
1A	5.77	58%	2.87
1B	4.12	42%	2.97
TOTALS	9.89	100%	5.84

N

30' 0' 15' 30'
SCALE: 1" = 30'

PROPOSED CONDITION HYDROLOGY MAP

HIGH DESERT HOSPITAL SITE CLEARANCE
44900 NORTH 60TH ST, WEST LANCASTER, CA 93536

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APPENDIX B

Site Characteristics

About | Legend | Layers

LA County Hydrology Map

Find address or place

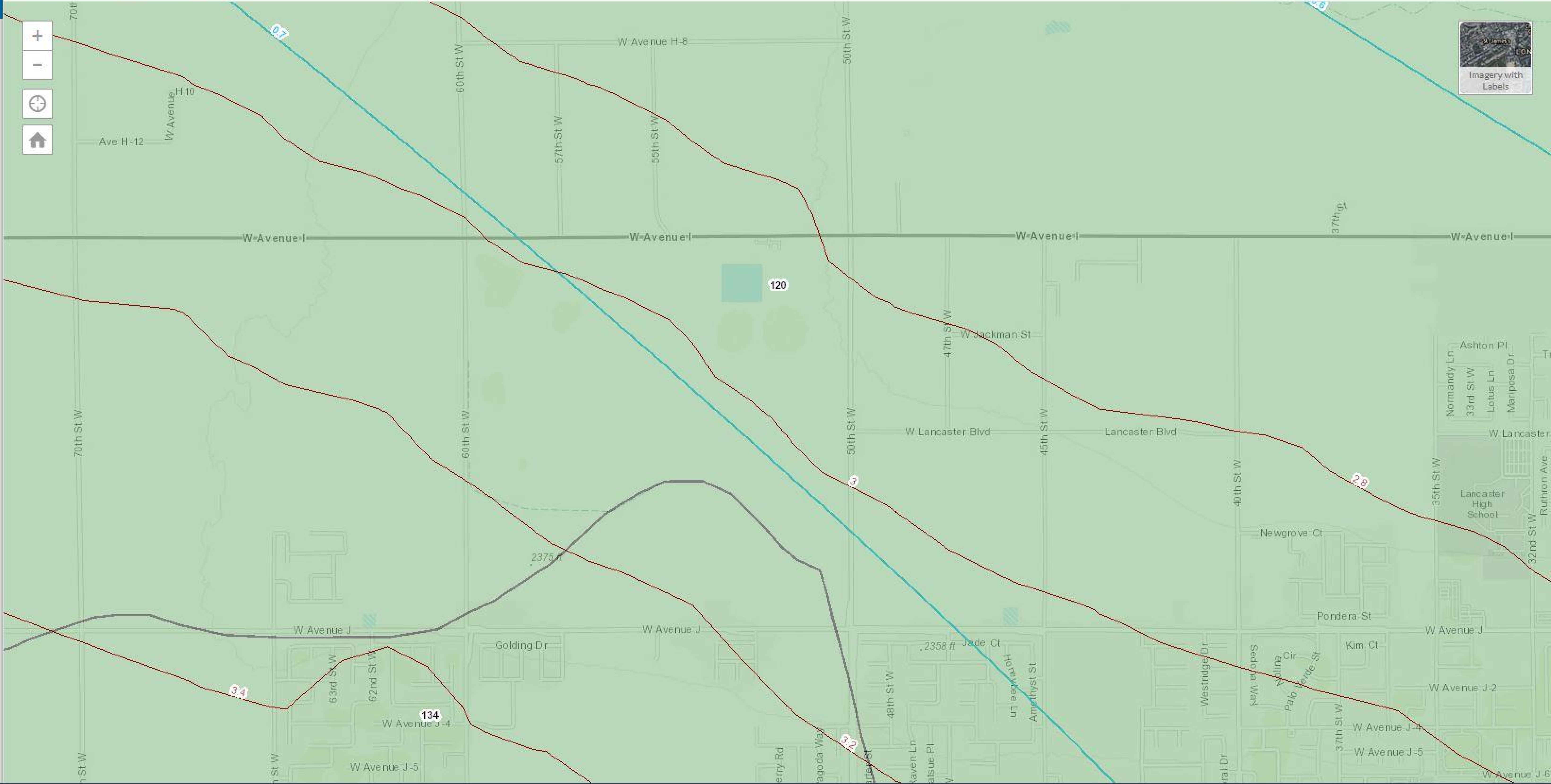
Legend

Hydrology GIS

50yr Two Tenths (Rainfall)

Soils 2004

Final 85th Percentile, 24-hr Rainfall



GEOCON
WEST, INC.

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

LIMITED GEOTECHNICAL INVESTIGATION

HIGH DESERT HOSPITAL DEMOLITION
44900 NORTH 60TH STREET WEST
LANCASTER, CALIFORNIA
APN: 3203-014-901

PREPARED FOR

SWA ARCHITECTS

PASADENA, CALIFORNIA

PROJECT NO. W1339-06-02

OCTOBER 29, 2021

GEOCON
WEST, INC.
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. W1339-06-02
October 29, 2021

VIA E-MAIL

Daniel Bise
SWA Architects
48 E. Holly Street
Pasadena, CA 91103

Subject: LIMITED GEOTECHNICAL INVESTIGATION
HIGH DESERT HOSPITAL DEMOLITION
44900 NORTH 60TH STREET WEST, LANCASTER, CALIFORNIA
APN: 3203-014-901

Dear Mr. Bise:

In accordance with your authorization of our proposal dated August 2, 2021, we have performed a limited geotechnical investigation for the High Desert Hospital Demolition in the City of Lancaster, California. The accompanying report presents the findings of our study and our conclusions and recommendations pertaining to the geotechnical aspects of the proposed demolition and grading activities. Based on the results of our investigation, it is our opinion that the proposed grading and earthwork can be performed, provided the recommendations of this report are followed and implemented during design and construction.

If you have any questions regarding this report, or if we may be of further service, please contact the undersigned.

Very truly yours,

GEOCON WEST, INC.

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LIMITED GEOTECHNICAL INVESTIGATION

1. PURPOSE AND SCOPE

This report presents the results of a limited geotechnical investigation for the High Desert Hospital Demolition at 44900 North 60th Street West, in the City of Lancaster, California (see Vicinity Map, Figure 1). The purpose of the investigation was to evaluate subsurface soil and geologic conditions underlying the area of the proposed improvements and, based on conditions encountered, to provide conclusions and recommendations pertaining to the geotechnical aspects of the proposed earthwork and grading activities.

The scope of this investigation included a site reconnaissance, field exploration, laboratory testing, engineering analysis, and the preparation of this report. The site was explored on September 30, 2021, by excavating four 8-inch-diameter borings to depths between 5 and 51 feet below the ground surface using a truck-mounted hollow-stem auger drilling machine. The approximate locations of the exploratory borings are depicted on the Site Plans (see Figures 2A and 2B). A detailed discussion of the field investigation, including boring logs, is presented in Appendix A.

Laboratory tests were performed on selected soil samples obtained during the investigation to determine pertinent physical and chemical soil properties. Appendix B presents a summary of the laboratory test results.

The recommendations presented herein are based on analyses of the data obtained during our investigation and our experience with similar soil and geologic conditions. References reviewed to prepare this report are provided in the *List of References* section.

If project details vary significantly from those described herein, Geocon should be contacted to determine the necessity for review and possible revision of this report.

2. SITE AND PROJECT DESCRIPTION

The subject site is located in the City of Lancaster, California. The site is bounded by West Avenue I to the north, 60th Street to the west, Antelope Valley State Prison to the south, and Mira Loma Detention Center to the east. The property is approximately 361 acres; however, the proposed scope of work is limited to a 14.2-acre area. Surface water drainage at the site appears to be by sheet flow along the existing ground contours which flow towards the city streets. Vegetation onsite consists of mature trees, bushes and shrubs scattered across the site within landscaped areas.

Based on the information provided to us, it is our understanding that the proposed scope of work includes demolishing the existing structures and utilities, backfilling resulting depressions, and grading the site in a manner optimal for future development. Future development plans have not been determined at this time. The existing site conditions are depicted on the Site Plans (see Figure 2A and 2B).

As a part of the grading operations, the project will be required to implement temporary stormwater treatment BMPs to treat stormwater on site prior to it discharging off site. At this time the team is considering shallow infiltration basins for stormwater infiltration.

Once the design phase proceeds to a more finalized plan, the recommendations within this report should be reviewed and revised, if necessary. Any changes in the design, location or elevation of any improvement, as outlined in this report, should be reviewed by this office. Geocon should be contacted to determine the necessity for review and possible revision of this report.

3. SOIL AND GEOLOGIC CONDITIONS

Based on our field investigation and published geologic maps of the area, the site is underlain by artificial fill and Pleistocene age Older Paralic Deposits (playa deposits) consisting primarily of fine-grained sand, silt and clay (CGS, 2021). Detailed stratigraphic profiles of the materials encountered at the site are provided on the boring logs in Appendix A.

3.1 Artificial Fill

Artificial fill was encountered in our explorations to a maximum depth of 3 feet below existing ground surface. The artificial fill generally consists of brown silty sand with varying amounts of gravel. The fill is characterized as slightly moist and medium dense. The artificial fill is likely the result of past grading activities at the site. Deeper fill may exist between excavations and in other portions of the site that were not directly explored.

3.2 Older Paralic Deposits

Pleistocene age Older Paralic Deposits, associated with the Pleistocene age Lake Thompson, were encountered beneath the artificial fill. The Older Paralic Deposits generally consist of light brown to brown, olive brown or light gray, interbedded poorly graded sand, clayey sand, silty sand, silt and clay. The Older Paralic Deposits are characterized as soft to hard or very loose to very dense, and dry to wet.

4. GROUNDWATER

Review of the “Preliminary” Seismic Hazard Zone Report for the West Lancaster Quadrangle (California Division of Mines and Geology [CDMG], 2003) indicates the historically highest groundwater level in the area is approximately 10 feet beneath the ground surface. This historic high groundwater level was reportedly based on local groundwater data from the Armagosa Wash area (CDMG, 2003). However, review of the “Official” Seismic Hazard Zone Report for the West Lancaster Quadrangle (California Division of Mines and Geology [CDMG], 2005) indicates that the CDMG evaluated a larger, updated groundwater database for this official publication. Based on the 2005 publication, groundwater levels in the area are reported to be approximately 130 feet beneath the ground surface (CDMG, 2005). The discrepancy between the reported historic high groundwater depths was further evaluated with available data from local groundwater monitoring wells (California Department of Water Resources [CDWR], 2021). Based on the available groundwater level data, the depth to groundwater in nearby wells is reported to range between 85 and 100 feet below the ground surface for the monitoring period between 1909 and 1985 (CDWR, 2021). Based on current groundwater basin management practices, it is unlikely that groundwater levels will ever exceed the historic high levels.

Groundwater was not encountered in our borings to a maximum depth of 51 feet. Considering the lack of groundwater in our borings, the historic depth to groundwater in nearby groundwater monitoring wells, and the depth of the proposed grading activities, static groundwater is neither expected to be encountered during construction, nor have a detrimental effect on the project. However, it is not uncommon for groundwater levels to vary seasonally when subjected to excessive irrigation or heavy precipitation. Proper surface drainage of irrigation and precipitation will be critical to future performance of the project. Recommendations for drainage are provided in the S*urface Drainage* section of this report (see Section 6.8).

5. SEISMIC DESIGN CRITERIA

The following table summarizes summarizes site-specific design criteria obtained from the 2019 California Building Code (CBC; Based on the 2018 International Building Code [IBC] and ASCE 7-16), Chapter 16 Structural Design, Section 1613 Earthquake Loads. The data was calculated using the online application *Seismic Design Maps*, provided by OSHPD. The short spectral response uses a period of 0.2 second. We evaluated the Site Class based on the discussion in Section 1613.2.2 of the 2019 CBC and Table 20.3-1 of ASCE 7-16. The values presented below are for the risk-targeted maximum considered earthquake (MCE_R).

2019 CBC SEISMIC DESIGN PARAMETERS

Parameter	Value	2019 CBC Reference
Site Class	D	Section 1613.2.2
MCE_R Ground Motion Spectral Response Acceleration – Class B (short), S_S	1.5g	Figure 1613.2.1(1)
MCE_R Ground Motion Spectral Response Acceleration – Class B (1 sec), S_1	0.6g	Figure 1613.2.1(2)
Site Coefficient, F_A	1.0	Table 1613.2.3(1)
Site Coefficient, F_V	1.7*	Table 1613.2.3(2)
Site Class Modified MCE_R Spectral Response Acceleration (short), S_{MS}	1.5g	Section 1613.2.3 (Eqn 16-36)
Site Class Modified MCE_R Spectral Response Acceleration – (1 sec), S_{M1}	1.02g*	Section 1613.2.3 (Eqn 16-37)
5% Damped Design Spectral Response Acceleration (short), S_{DS}	1.0g	Section 1613.2.4 (Eqn 16-38)
5% Damped Design Spectral Response Acceleration (1 sec), S_{D1}	0.68g*	Section 1613.2.4 (Eqn 16-39)
Note: *Per Section 11.4.8 of ASCE/SEI 7-16, a ground motion hazard analysis shall be performed for projects for Site Class “E” sites with Ss greater than or equal to 1.0g and for Site Class “D” and “E” sites with S1 greater than 0.2g. Section 11.4.8 also provides exceptions which indicates that the ground motion hazard analysis may be waived provided the exceptions are followed. Using the code based values presented in the table above, in lieu of a performing a ground motion hazard analysis, requires the exceptions outlined in ASCE 7-16 Section 11.4.8 be followed.		

The table below presents the mapped maximum considered geometric mean (MCE_G) seismic design parameters for projects located in Seismic Design Categories of D through F in accordance with ASCE 7-16.

ASCE 7-16 PEAK GROUND ACCELERATION

Parameter	Value	ASCE 7-16 Reference
Mapped MCE_G Peak Ground Acceleration, PGA	0.643g	Figure 22-7
Site Coefficient, F_{PGA}	1.1	Table 11.8-1
Site Class Modified MCE_G Peak Ground Acceleration, PGA_M	0.707g	Section 11.8.3 (Eqn 11.8-1)

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 General

6.1.1 This report is intended to address the feasibility of a stormwater infiltration system and to provide grading recommendations for site preparation once demolition of the existing structures is completed. A comprehensive geotechnical investigation that includes additional subsurface exploration, laboratory testing, and engineering analyses should be performed for design and construction of any future improvements.

6.1.2 Up to 3 feet of existing artificial fill was encountered during the site investigation. The existing fill encountered is believed to be the result of past grading and construction activities at the site. Deeper fill may exist in other areas of the site that were not directly explored. Future demolition of the existing structures and improvements which occupy the site will likely disturb the upper few feet of existing site soils. It is our opinion that the existing fill, in its present condition, is not suitable for direct support of future improvements. The existing fill and site soils are suitable for re-use as engineered fill provided the recommendations in the Grading section of this report are followed (see Section 6.4).

6.1.3 As a minimum, the upper 3 feet of existing site soils across the site should be excavated and properly compacted for support of future improvements. Deeper excavations should be conducted as necessary to completely remove all existing fill and unsuitable soils at the direction of the Geotechnical Engineer (a representative of Geocon). Recommendations for earthwork are provided in the *Grading* section of this report (see Section 6.4).

6.1.4 The grading contractor should be aware that the existing soils encountered in B1 are currently at or above optimum moisture content. If the site soils are oversaturated at the time of grading, they will likely require some spreading and drying activities in order to achieve proper compaction; however, this could change seasonally.

6.1.5 It is anticipated that stable excavations can be achieved with sloping measures. Excavation recommendations are provided in the *Temporary Excavations* section of this report (Section 6.6).

6.1.6 The results of the percolation testing indicate that the infiltration rate within the Older Paralic Deposits is less than the minimum accepted infiltration rate of 0.3 inches per hour. Therefore, a stormwater infiltration system is not recommended for this project. It is recommended that stormwater be retained, filtered, and discharged in accordance with the requirements of the local governing agency. Results of percolation testing are provided in the *Stormwater Infiltration* section of this report (see Section 6.7).

6.1.7 Once the design and configuration for future improvements become available, a comprehensive geotechnical investigation should be performed.

6.2 Soil and Excavation Characteristics

6.2.1 The in-situ soils can be excavated with moderate effort using conventional excavation equipment. Caving should be anticipated in unshored excavations, especially since soils are primarily granular.

6.2.2 It is the responsibility of the contractor to ensure that all excavations and trenches are properly shored and maintained in accordance with applicable OSHA rules and regulations to maintain safety and maintain the stability of adjacent existing improvements.

6.2.3 All onsite excavations must be conducted in such a manner that potential surcharges from existing improvements, construction equipment, and vehicle loads are resisted. The surcharge area may be defined by a 1:1 projection down and away from the bottom of an existing improvement or vehicle load. Penetrations below this 1:1 projection will require special excavation measures such as sloping and shoring. Excavation recommendations are provided in the *Temporary Excavations* section of this report (see Section 6.6).

6.2.4 The existing site soils encountered during this investigation are considered to have a “very low” to “low” expansive potential (EI = 19 & 46) and are classified as “expansive” based on the 2019 California Building Code (CBC) Section 1803.5.3. Recommendations presented herein assume that the building foundations and slabs will derive support in these materials.

6.3 Minimum Resistivity, pH, and Water-Soluble Sulfate

6.3.1 Potential of Hydrogen (pH) and resistivity testing as well as chloride content testing were performed on representative samples of soil to generally evaluate the corrosion potential to surface utilities. The tests were performed in accordance with California Test Method Nos. 643 and 422 and indicate that the soils are considered “moderately corrosive” to “corrosive” with respect to corrosion of buried ferrous metals on site. The results are presented in Appendix B (Figure B7) and should be considered for design of underground structures. Due to the corrosive potential of the soils, it is recommended that PVC, ABS or other approved plastic piping be utilized in lieu of cast-iron when in direct contact with the site soils.

6.3.2 Laboratory tests were performed on representative samples of the site materials to measure the percentage of water-soluble sulfate content. Results from the laboratory water-soluble sulfate tests are presented in Appendix B (Figure B7) and indicate that the on-site materials possess “S0” sulfate exposure to concrete structures as defined by 2019 CBC Section 1904 and ACI 318-14 Table 19.3.1.1.

6.3.3 Geocon West, Inc. does not practice in the field of corrosion engineering and mitigation. If corrosion sensitive improvements are planned, it is recommended that a corrosion engineer be retained to evaluate corrosion test results and incorporate the necessary precautions to avoid premature corrosion of buried metal pipes and concrete structures in direct contact with the soils.

6.4 Grading

6.4.1 A preconstruction conference should be held at the site prior to the beginning of demolition and grading operations with the owner, contractor, civil engineer, geotechnical engineer, and building official in attendance. Special soil handling requirements can be discussed at that time.

6.4.2 Earthwork should be observed, and compacted fill tested by representatives of Geocon West, Inc. The existing fill and native soil encountered during exploration are suitable for re-use as engineered fill, provided any encountered oversize material (greater than 6 inches) and any encountered deleterious debris are removed.

6.4.3 Grading should commence with the removal of all existing vegetation and existing improvements from the area to be graded. Deleterious debris such as wood and root structure should be exported from the site and should not be mixed with the fill soils. Asphalt and concrete should not be mixed with the fill soils unless approved in writing by the Geotechnical Engineer. All existing underground improvement planned for removal should be completely excavated and the resulting depressions properly backfilled in accordance with the procedures described herein. Once a clean excavation bottom has been established it must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon West, Inc.).

6.4.4 As a minimum, the upper 3 feet of existing site soils across the site should be excavated and properly compacted for support of future improvements. Deeper excavations should be conducted as necessary to completely remove all artificial fill and unsuitable soils at the direction of the Geotechnical Engineer (a representative of Geocon). The limits of existing fill and/or soft soil removal will be verified by the Geocon representative during site grading activities.

6.4.5 The grading contractor should be aware that the existing soils encountered in boring B1 are currently above the optimum moisture content. Conditions could change seasonally. If the soils are in excess of 3 percent above optimum moisture content at the time of construction the soils will likely require some spreading and drying activities in order to achieve proper compaction.

6.4.6 All excavations must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon). Prior to placing any fill, the upper 12 inches of the excavation bottom must be scarified, moistened, and proof-rolled in the presence of the Geotechnical Engineer (a representative of Geocon West, Inc.).

6.4.7 All fill and backfill soils should be placed in horizontal loose layers approximately 6 to 8 inches thick, moisture conditioned to optimum moisture content, and properly compacted to a minimum 90 percent of the maximum dry density in accordance with ASTM D 1557 (latest edition).

6.4.8 All imported fill shall be observed, tested, and approved by Geocon West, Inc. prior to bringing soil to the site. Rocks larger than 6 inches in diameter shall not be used in the fill. Import soils used as structural fill should have an expansion index less than 50 and corrosivity properties that are equally or less detrimental to that of the existing onsite soils (see Figure B7).

6.4.9 Depressions resulting from utility line removal should be properly backfilled in accordance with the recommendations provided above. It is recommended that all utility line removals be observed by the Geotechnical Engineer to document the placement and location of engineered backfill.

6.4.10 All trench and excavation bottoms must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon), prior to placing engineered fill.

6.5 Shrinkage

6.5.1 Shrinkage results when a volume of material removed at one density is compacted to a higher density. A shrinkage factor of between 5 and 20 percent should be anticipated when excavating and compacting the existing earth materials on the site to an average relative compaction of 95 percent.

6.6 Temporary Excavations

6.6.1 Excavations up to 5 feet in height may be required for demolition of the existing improvements and proposed grading activities. The excavations are expected to expose artificial fill and native soils, which may not be suitable for vertical excavations. Where loose soils or caving sands are not present, and where not surcharged by adjacent traffic or structures, vertical excavations up to 5 feet may be attempted.

6.6.2 All excavations will require sloping and/or shoring measures in order to provide a stable excavation. Where sufficient space is available, temporary unsurcharged embankments up to 5 feet high may be sloped back at a uniform 1:1 slope gradient or flatter. Temporary unsurcharged embankments up to 10 feet high may be sloped back at a uniform 1½:1 slope gradient (H:V) or flatter. A uniform slope does not have a vertical portion. Where space is limited and sloping cannot be achieved, shoring measures will be required. Recommendations for shoring can be provided under separate cover as the design progresses.

6.6.3 Where sloped embankments are utilized, the top of the slope should be barricaded to prevent vehicles and storage loads at the top of the slope within a horizontal distance equal to the height of the slope. If the temporary construction embankments are to be maintained during the rainy season, berms are suggested along the tops of the slopes where necessary to prevent runoff water from entering the excavation and eroding the slope faces. Geocon personnel should inspect the soils exposed in the cut slopes during excavation so that modifications of the slopes can be made if variations in the soil conditions occur. All excavations should be stabilized within 30 days of initial excavation.

6.7 Stormwater Infiltration

6.7.1 During the September 30, 2021, site exploration, borings B1, B2 and B3 were utilized to perform percolation testing. Excessive smearing of the side walls was observed in boring B2 (indicated as B2A) so a 2nd boring was drilled approximately 5 feet north (indicated as B2B) Borings B1 and B3 were backfilled to the proposed invert elevation with a bentonite seal placed at the bottom of the excavation. Boring B2B was excavated to the proposed invert elevation. Slotted casing was placed in the borings, and the annular space between the casing and excavation was filled with gravel. The boring was then filled with water to pre-saturate the soils. Testing was performed the following day by refilling the casings with water and percolation test readings were performed after repeated flooding of the cased excavations.

6.7.2 Based on the test results, the field-measured percolation rate and the design infiltration rate are provided in the following table. The Reduction Factor (Rf), to convert the field-measured percolation rate to an infiltration rate, is also shown in the table below. This value has been calculated in accordance with the Boring Percolation Test Procedure in the County of Los Angeles Department of Public Works GMED Guidelines for Design, Investigation, and Reporting Low Impact Development Stormwater Infiltration (June 2021). Calculations of the percolation rate, reduction factor, and infiltration rate are provided on Figures 3 through 5.

Boring	Soil Type	Infiltration Depth (ft)	Measured Percolation Rate (in / hour)	Design Infiltration Rate (in / hour)
B1	Silty Sand	2-4	0.00	0.00
B2B	Poorly Graded Sand	2-4	0.07	0.04
B3	Poorly Graded Sand	3-5	0.14	0.07

6.7.3 Based on the test method utilized (Boring Percolation Test), the reduction factor RFt may be taken as 2.0 in the infiltration system design. Based on the number of tests performed and consistency of the soils throughout the site, it is suggested that the reduction factor RFv be taken as 1.0. In addition, provided proper maintenance is performed to minimize long-term siltation and plugging, the reduction factor RFs may be taken as 1.0. Additional correction factors may be required and should be applied by the engineer in responsible charge of the design of the stormwater infiltration system and based on applicable guidelines.

6.7.4 The results of the percolation testing indicated that the infiltration rate within the alluvial soils is less than the accepted minimum accepted infiltration rate of 0.3 inches per hour. Therefore, based on the results of percolation testing performed at the site, a stormwater infiltration system is not recommended for this project. It is recommended that stormwater be retained, filtered, and discharged in accordance with the requirements of the local governing agency.

6.8 Surface Drainage

6.8.1 Proper surface drainage is critical to the future performance of the project. Uncontrolled infiltration of irrigation excess and storm runoff into the soils can adversely affect the performance of the future and adjacent improvements. Saturation of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change in the original designed engineering properties. Proper drainage should be maintained at all times.

6.8.2 All site drainage should be collected and controlled in non-erosive drainage devices. Drainage should not be allowed to pond anywhere on the site, and especially not against any foundation or retaining wall. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with 2019 CBC 1804.4 or other applicable standards. In addition, drainage should not be allowed to flow uncontrolled over any descending slope.

6.8.3 Positive site drainage should be provided away from the tops of slopes to swales or other controlled drainage structures.

6.9 Plan Review

6.9.1 Grading plans should be reviewed by the Geotechnical Engineer (a representative of Geocon West, Inc.), prior to finalization to verify that the plans have been prepared in substantial conformance with the recommendations of this report and to provide additional analyses or recommendations.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon West, Inc. should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon West, Inc.

2. This report is issued with the understanding that it is the responsibility of the owner, or of his representative, to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

3. The findings of this report are valid as of the date of this report. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.

4. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.

LIST OF REFERENCES

California Division of Water Resources, 2021, Division of Water Resources Water Data Library, http://wdl.water.ca.gov/waterdatalibrary/

California Geological Survey, 2021, *Compilation of Quaternary Surficial Deposits, California Geological Survey Special Report 217,* https://maps.conservation.ca.gov/cgs/qsd/app/.

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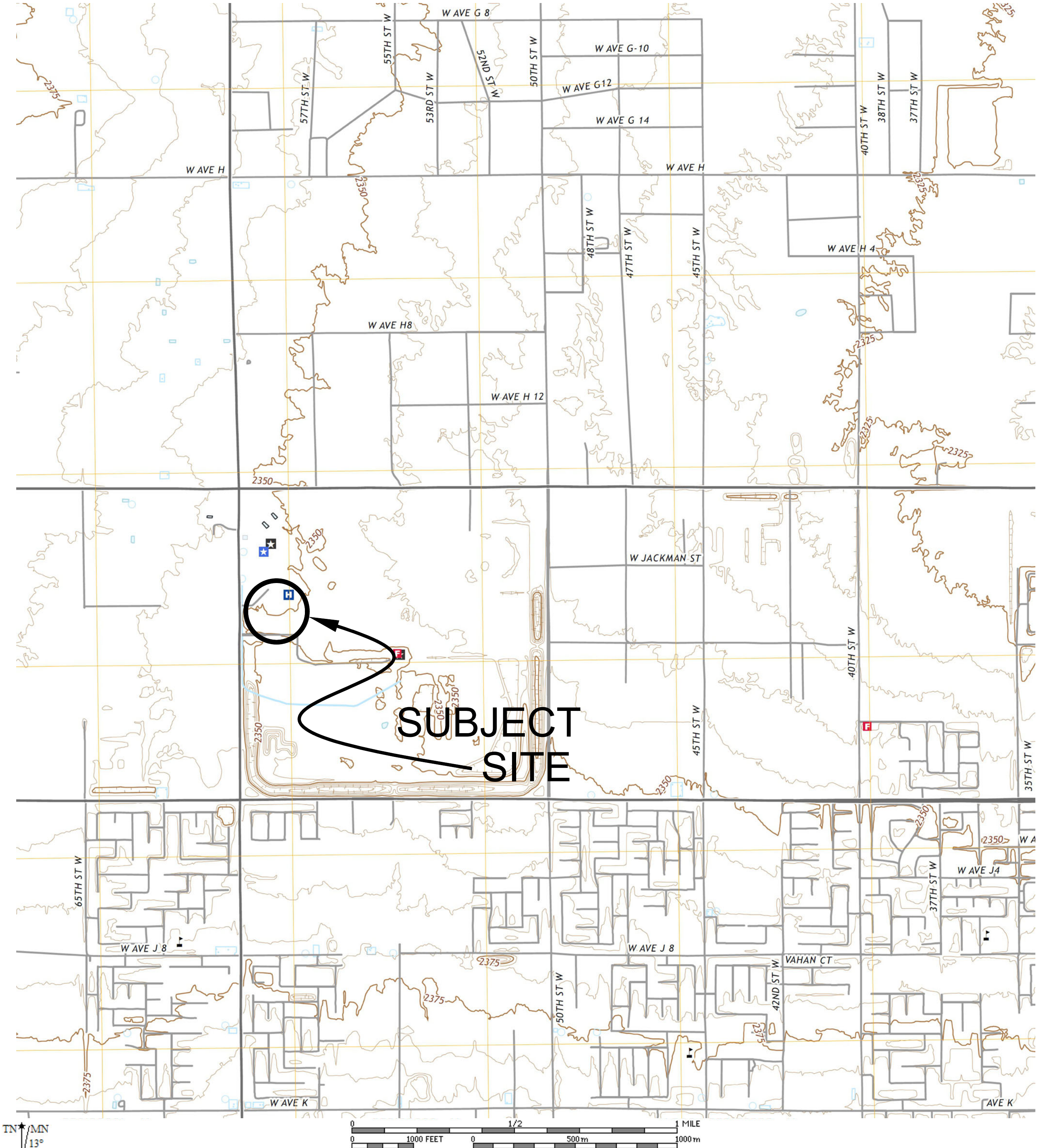

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REFERENCE:U.S.G.S. TOPOGRAPHIC MAPS, 7.5 MINUTE SERIES, LANCASTER WEST, CA QUADRANGLE

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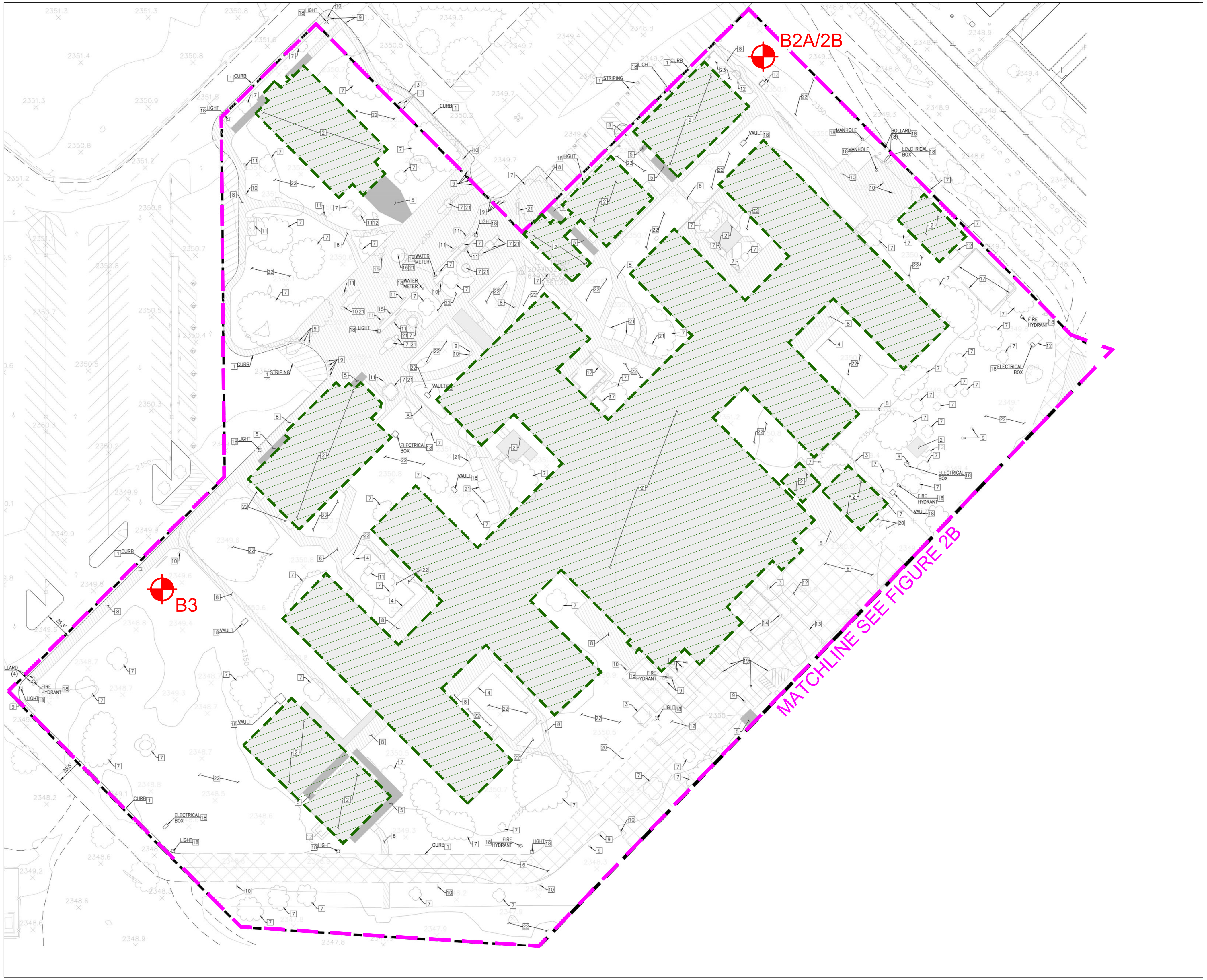
VICINITY MAP

HIGH DESERT HOSPITAL
44900 NORTH 60TH STREET, WEST
LANCASTER, CALIFORNIA

OCTOBER 2021	PROJECT NO. W1339-06-02	FIG. 1



LEGEND

- B3 — Approximate Location of Boring
- Improvement Limits
- Existing Structures To Be Demolished

North

0 100' 200'

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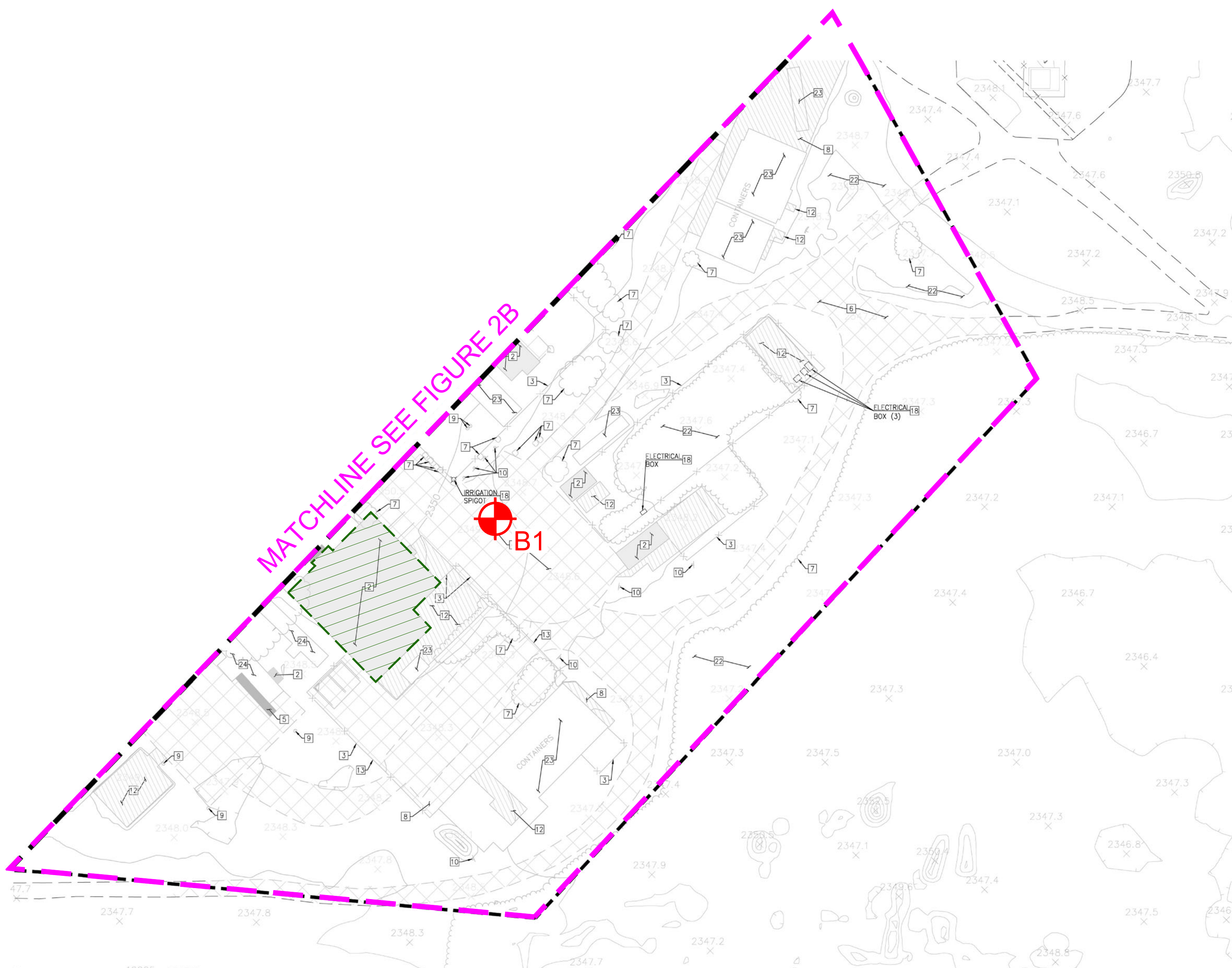
SITE PLAN

HIGH DESERT HOSPITAL
44900 NORTH 60TH STREET, WEST
LANCASTER, CALIFORNIA

OCTOBER 2021	PROJECT NO. W1339-06-02	FIG. 2A



LEGEND

- B3 Approximate Location of Boring
- Improvement Limits
- Existing Structures To Be Demolished

North

0 100' 200'

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SITE PLAN

HIGH DESERT HOSPITAL
44900 NORTH 60TH STREET, WEST
LANCASTER, CALIFORNIA

OCTOBER 2021	PROJECT NO. W1339-06-02	FIG. 2B

BORING PERCOLATION TEST FIELD LOG

Date:	Friday, October 1, 2021	**Boring/Test Number:**	Boring 1 / Test 1
Project Number:	W1339-06-02	**Diameter of Boring:**	8 inches
Project Location:	High Desert Hospital	**Diameter of Casing:**	2 inches
Earth Description:	SM	**Depth of Boring:**	2 feet
Tested By:	JMH	**Depth to Invert of BMP:**	4 feet
Liquid Description:	Clear Clean Tap Water	**Depth to Water Table:**	30 feet
Measurement Method:	Sounder	**Depth to Initial Water Depth (d_1):**	24 inches
Start Time for Pre-Soak:	9:30 AM	**Water Remaining in Boring (Y/N):**	Yes
Start Time for Standard:	10:30 AM	**Standard Time Interval Between Readings:**	30 min

Reading Number	Time Start (hh:mm)	Time End (hh:mm)	Elapsed Time Δtime (min)	Water Drop During Standard Time Interval, Δd (in)	Soil Description Notes Comments
1	10:30 AM	11:00 AM	30	0.0	
2	11:00 AM	11:30 AM	30	0.0	
3	11:30 AM	12:00 PM	30	0.0	
4	12:00 PM	12:30 PM	30	0.0	
5	12:30 PM	1:00 PM	30	0.0	
6	1:00 PM	1:30 PM	30	0.0	Stabilized Readings
7	1:30 PM	2:00 PM	30	0.0	Achieved with Readings
8	2:00 PM	2:30 PM	30	0.0	6, 7, and 8

MEASURED PERCOLATION RATE & DESIGN INFILTRATION RATE CALCULATIONS*

* Calculations Below Based on Stabilized Readings Only

Boring Radius, r: 4 inches

Test Section Height, h: 0.0 inches

$$Test\ Section\ Surface\ Area, A = 2\pi rh + \pi r^2$$

A = **50** in^2

$$Discharged\ Water\ Volume, V = \pi r^2 \Delta d$$

$$Percolation\ Rate = \left(\frac{V/A}{\Delta T}\right)$$

Reading 6	V =	**0**	in^3	Percolation Rate = **0.00**	inches/hour
Reading 7	V =	**0**	in^3	Percolation Rate = **0.00**	inches/hour
Reading 8	V =	**0**	in^3	Percolation Rate = **0.00**	inches/hour

Measured Percolation Rate = **0.00** inches/hour

Reduction Factors

Boring Percolation Test, RF_t = 2

Site Variability, RF_v = 1

Long Term Siltation, RF_s = 1

$$Total\ Reduction\ Factor, RF = RF_t \times RF_v \times RF_s$$

Total Reduction Factor = 2

Design Infiltration Rate

$$Design\ Infiltration\ Rate = Measured\ Percolation\ Rate / RF$$

Design Infiltration Rate = **0.00** inches/hour

FIGURE 3

BORING PERCOLATION TEST FIELD LOG

Date:	Friday, October 1, 2021	**Boring/Test Number:**	Boring 2B / Test 1
Project Number:	W1339-06-02	**Diameter of Boring:**	8 inches
Project Location:	High Desert Hospital	**Diameter of Casing:**	2 inches
Earth Description:	SP	**Depth of Boring:**	5 feet
Tested By:	JMH	**Depth to Invert of BMP:**	2 feet
Liquid Description:	Clear Clean Tap Water	**Depth to Water Table:**	30 feet
Measurement Method:	Sounder	**Depth to Initial Water Depth (d_1):**	24 inches
Start Time for Pre-Soak:	9:30 AM	**Water Remaining in Boring (Y/N):**	Yes
Start Time for Standard:	10:30 AM	**Standard Time Interval Between Readings:**	30 min

Reading Number	Time Start (hh:mm)	Time End (hh:mm)	Elapsed Time Δtime (min)	Water Drop During Standard Time Interval, Δd (in)	Soil Description Notes Comments
1	10:30 AM	11:00 AM	30	2.4	
2	11:00 AM	11:30 AM	30	1.3	
3	11:30 AM	12:00 PM	30	0.7	
4	12:00 PM	12:30 PM	30	0.6	
5	12:30 PM	1:00 PM	30	0.7	
6	1:00 PM	1:30 PM	30	0.6	Stabilized Readings
7	1:30 PM	2:00 PM	30	0.7	Achieved with Readings
8	2:00 PM	2:30 PM	30	0.7	6, 7, and 8

MEASURED PERCOLATION RATE & DESIGN INFILTRATION RATE CALCULATIONS*

* Calculations Below Based on Stabilized Readings Only

Boring Radius, r: 4 inches

Test Section Height, h: 36.0 inches

$$Test\ Section\ Surface\ Area, A = 2\pi rh + \pi r^2$$

A = **955** in^2

$$Discharged\ Water\ Volume, V = \pi r^2 \Delta d$$

$$Percolation\ Rate = \left(\frac{V/A}{\Delta T}\right)$$

Reading 6	V = **30** in^3	Percolation Rate =	**0.06**	inches/hour
Reading 7	V = **36** in^3	Percolation Rate =	**0.08**	inches/hour
Reading 8	V = **36** in^3	Percolation Rate =	**0.08**	inches/hour

Measured Percolation Rate = **0.07** inches/hour

Reduction Factors

Boring Percolation Test, RF_t = 2

Site Variability, RF_v = 1

Long Term Siltation, RF_s = 1

$$Total\ Reduction\ Factor, RF = RF_t \times RF_v \times RF_s$$

Total Reduction Factor = 2

Design Infiltration Rate

$$Design\ Infiltration\ Rate = Measured\ Percolation\ Rate / RF$$

Design Infiltration Rate = **0.04** inches/hour

FIGURE 4

BORING PERCOLATION TEST FIELD LOG

Date:	Friday, October 1, 2021	**Boring/Test Number:**	Boring 3 / Test 1
Project Number:	W1339-06-02	**Diameter of Boring:**	8 inches
Project Location:	High Desert Hospital	**Diameter of Casing:**	2 inches
Earth Description:	SP	**Depth of Boring:**	5 feet
Tested By:	JMH	**Depth to Invert of BMP:**	3 feet
Liquid Description:	Clear Clean Tap Water	**Depth to Water Table:**	30 feet
Measurement Method:	Sounder	**Depth to Initial Water Depth (d_1):**	36 inches
Start Time for Pre-Soak:	9:30 AM	**Water Remaining in Boring (Y/N):**	Yes
Start Time for Standard:	10:30 AM	**Standard Time Interval Between Readings:**	30 min

Reading Number	Time Start (hh:mm)	Time End (hh:mm)	Elapsed Time Δtime (min)	Water Drop During Standard Time Interval, Δd (in)	Soil Description Notes Comments
1	10:30 AM	11:00 AM	30	3.2	
2	11:00 AM	11:30 AM	30	1.9	
3	11:30 AM	12:00 PM	30	1.3	
4	12:00 PM	12:30 PM	30	1.3	
5	12:30 PM	1:00 PM	30	1.1	
6	1:00 PM	1:30 PM	30	1.0	Stabilized Readings
7	1:30 PM	2:00 PM	30	1.0	Achieved with Readings
8	2:00 PM	2:30 PM	30	0.8	6, 7, and 8

MEASURED PERCOLATION RATE & DESIGN INFILTRATION RATE CALCULATIONS*

* Calculations Below Based on Stabilized Readings Only

Boring Radius, r: 4 inches

Test Section Height, h: 24.0 inches

$$Test\ Section\ Surface\ Area, A = 2\pi rh + \pi r^2$$

A = **653** in^2

$$Discharged\ Water\ Volume, V = \pi r^2 \Delta d$$

$$Percolation\ Rate = \left(\frac{V/A}{\Delta T}\right)$$

Reading 6	V = **48** in^3	Percolation Rate =	**0.15**	inches/hour
Reading 7	V = **48** in^3	Percolation Rate =	**0.15**	inches/hour
Reading 8	V = **42** in^3	Percolation Rate =	**0.13**	inches/hour

Measured Percolation Rate = **0.14** inches/hour

Reduction Factors

Boring Percolation Test, RF_t = 2

Site Variability, RF_v = 1

Long Term Siltation, RF_s = 1

$$Total\ Reduction\ Factor, RF = RF_t \times RF_v \times RF_s$$

Total Reduction Factor = 2

Design Infiltration Rate

$$Design\ Infiltration\ Rate = Measured\ Percolation\ Rate\ / RF$$

Design Infiltration Rate = **0.07** inches/hour

FIGURE 5

APPENDIX A

APPENDIX A

FIELD INVESTIGATION

The site was explored on September 30, 2021 by excavating four 8-inch-diameter borings to depths between 5 and 51 feet below the ground surface using a truck-mounted hollow-stem auger drilling machine. Representative and relatively undisturbed samples were obtained by driving a 3-inch, O. D., California Modified Sampler into the “undisturbed” soil mass with blows from a slide hammer and a 140-pound auto-hammer falling 30 inches. The California Modified Sampler was equipped with 1-inch by 2³/₈-inch diameter brass sampler rings to facilitate soil removal and testing. Bulk samples were also obtained.

The soil conditions encountered in the borings were visually examined, classified and logged in general accordance with the Unified Soil Classification System (USCS). The logs of the borings are presented on Figures A1 through A4. The logs depict the soil and geologic conditions encountered and the depth at which samples were obtained. The logs also include our interpretation of the conditions between sampling intervals. Therefore, the logs contain both observed and interpreted data. We determined the lines designating the interface between soil materials on the logs using visual observations, penetration rates, excavation characteristics and other factors. The transition between materials may be abrupt or gradual. Where applicable, the logs were revised based on subsequent laboratory testing. The locations of the borings are shown on Figures 2A and 2B.

BORING 1

ELEV. (MSL.) **- -** DATE COMPLETED **9/30/2021**

EQUIPMENT **HOLLOW STEM AUGER** BY: **JMH**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT*)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0	BULK 0-5'				**AC: 2" BASE: 4"**			
					ARTIFICIAL FILL Silty Sand, poorly graded, medium dense, brown, slightly moist, fine-grained, some gravel.			
2	B1@3'			SM	**OLDER PARALIC DEPOSITS** Silty Sand, poorly graded, medium dense, slightly moist, olive brown, fine-grained, some medium-grained.	29	73.8	25.1
4					- light brown			
6	B1@6'					24	97.4	17.3
8	B1@9'			SC	Clayey Sand, poorly graded, medium dense, moist, light brown, fine- to medium-grained.	17	105.1	18.1
10								
12	B1@12'			CL	Sandy Clay, soft, very moist, light brown.	5	87.7	33.0
14	B1@15'				- slightly moist to moist	11	102.4	20.2
16								
18								
20	B1@20'			CL	Clay, firm, moist to very moist, white, some calcium nodules.	17	55.7	20.2
22								
24								
26								
28								

W1339-06-02 BORING LOGS.GPJ

Figure A1,
Log of Boring 1, Page 1 of 2

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ☒ ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

BORING 1

ELEV. (MSL.) - - DATE COMPLETED 9/30/2021

EQUIPMENT HOLLOW STEM AUGER BY: JMH

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT*)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
30–40	B1@30'			SP	Sand, poorly graded, medium dense, brown, slightly moist, fine-grained, some silt.	18		
40–47	B1@40'			ML	Sandy Silt, hard, slightly moist, brown.	58		
47–51	B1@50'			ML	Silt, stiff, moist, brown, some sand.	22		

Total depth of boring: 51 feet
Fill to 1 foot.
No groundwater encountered.
Percolation testing performed.
Backfilled with soil cuttings and tamped.

*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.
NOTE: The stratification lines presented herein represent the approximate boundary between earth types; the transitions may be gradual.

Figure A1,
Log of Boring 1, Page 2 of 2

W1339-06-02 BORING LOGS.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. W1339-06-02

BORING 2A

ELEV. (MSL.) - - DATE COMPLETED 9/30/2021

EQUIPMENT HOLLOW STEM AUGER BY: JMH

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT*)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**ARTIFICIAL FILL** Silty Sand, poorly graded, medium dense, slightly moist, brown, fine- to medium-grained.			
2					**OLDER PARALIC DEPOSITS** Sand, poorly graded, dense, slightly moist, brown, fine-grained, some fine gravel, trace silt.			
4								
6	B2A@6'			SP		70	113.3	4.3
8								
10	B2A@10'				- medium dense, increase in silt content	46	107.9	7.2
12				SC	Clayey Sand, poorly graded, very loose, wet, light gray, fine-grained, some medium-grained.			
14								
16	B2A@15'			CL	Clay, soft, wet, light gray, some calcium nodules.	6	76.0	30.4
18								
20	B2A@20'					4	70.2	50.4

Total depth of boring: 20.5 feet
Fill to 2 feet.
No groundwater encountered.
Backfilled with soil cuttings and tamped.

*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.
NOTE: The stratification lines presented herein represent the approximate boundary between earth types; the transitions may be gradual.

W1339-06-02 BORING LOGS.GPJ

Figure A2,
Log of Boring 2A, Page 1 of 1

SAMPLE SYMBOLS
- ... SAMPLING UNSUCCESSFUL
- ... DISTURBED OR BAG SAMPLE
- ... STANDARD PENETRATION TEST
- ... CHUNK SAMPLE
- ... DRIVE SAMPLE (UNDISTURBED)
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

BORING 2B

ELEV. (MSL.) - - DATE COMPLETED 9/30/2021

EQUIPMENT HOLLOW STEM AUGER BY: JMH

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT*)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0 – 2					**ARTIFICIAL FILL** Silty Sand, poorly graded, medium dense, brown, slightly moist, fine- to medium-grained, some gravel.			
2 – 5					**OLDER PARALIC DEPOSITS** Sand, poorly graded, dense, slightly moist, brown, fine-grained, some fine gravel, trace silt.			

Total depth of boring: 5 feet
Fill to 2 feet.
No groundwater encountered.
Percolation testing performed.
Backfilled with soil cuttings and tamped.

*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.
NOTE: The stratification lines presented herein represent the approximate boundary between earth types; the transitions may be gradual.

Figure A3,
Log of Boring 2B, Page 1 of 1

W1339-06-02 BORING LOGS.GPJ

SAMPLE SYMBOLS			
	☐ ... SAMPLING UNSUCCESSFUL	◧ ... STANDARD PENETRATION TEST	■ ... DRIVE SAMPLE (UNDISTURBED)
	⊠ ... DISTURBED OR BAG SAMPLE	◪ ... CHUNK SAMPLE	▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. W1339-06-02

BORING 3

ELEV. (MSL.) - - DATE COMPLETED 9/30/2021

EQUIPMENT HOLLOW STEM AUGER BY: JMH

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT*)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**ARTIFICIAL FILL** Silty Sand, poorly graded, medium dense, slightly moist, brown to light brown, fine-grained, some medium-grained.			
2								
4					**OLDER PARALIC DEPOSITS** Sand, poorly graded, very dense, dry, light gray, fine-grained, some gravel.			
6	B3@6'			SP		50 (5")	108.9	5.0
8								
10	B3@10'			SM	Silty Sand, poorly graded, medium dense, slightly moist, olive brown, fine-grained, some medium-grained.	36	114.8	10.2
12								
14					Sandy Clay, soft, very moist, olive brown, some calcium nodules.			
16	B3@15'			CL		4	63.8	50.8
18								
20	B3@20'				- firm	13	55.9	72.5

Total depth of boring: 20.5 feet
Fill to 3 feet.
No groundwater encountered.
Backfilled with soil cuttings and tamped.

*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.
NOTE: The stratification lines presented herein represent the approximate boundary between earth types; the transitions may be gradual.

Figure A4,
Log of Boring 3, Page 1 of 1

W1339-06-02 BORING LOGS.GPJ

SAMPLE SYMBOLS
- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

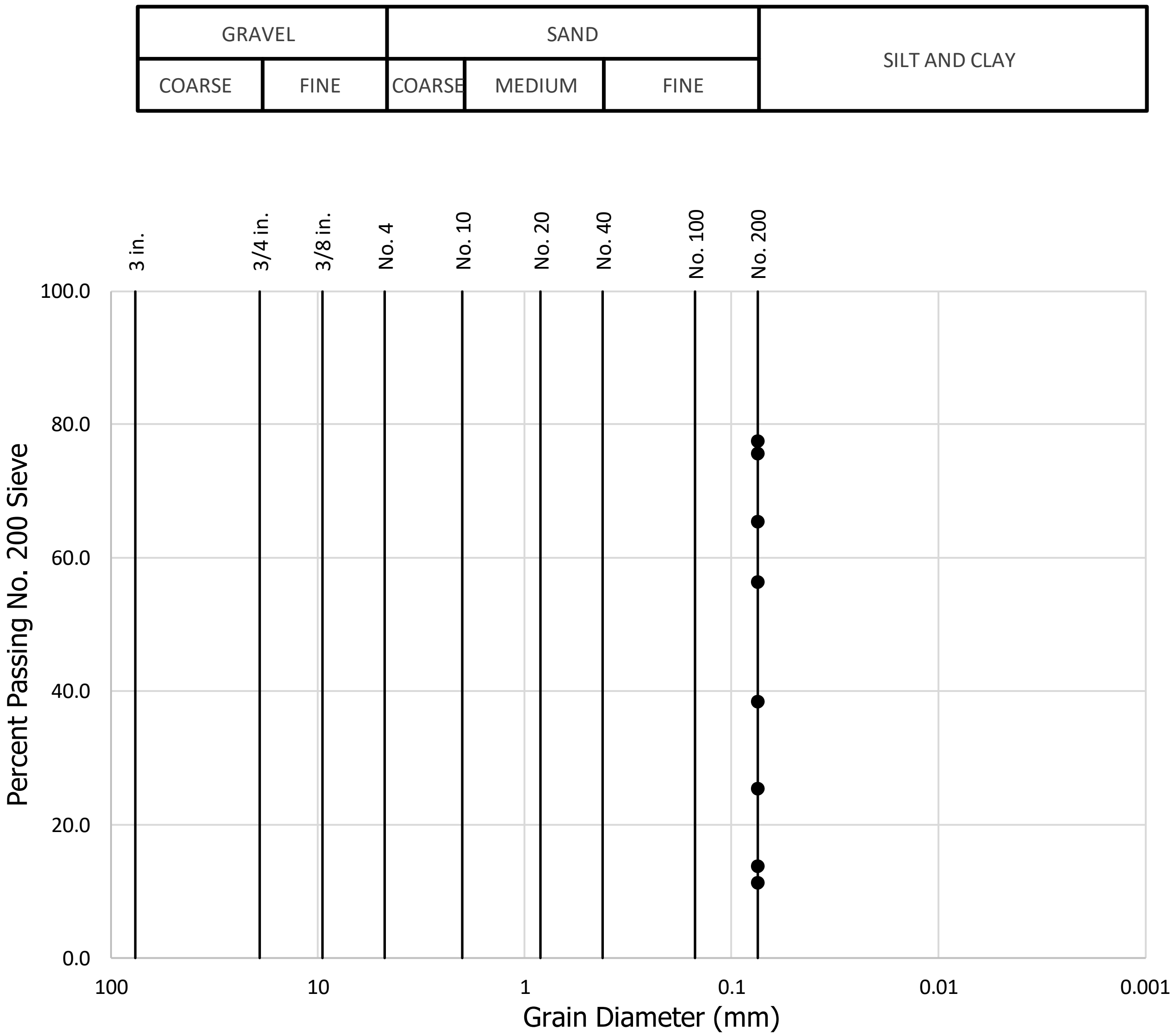
GEOCON

APPENDIX B

APPENDIX B

LABORATORY TESTING

Laboratory tests were performed in accordance with generally accepted test methods of the "American Society for Testing and Materials (ASTM)", or other suggested procedures. Selected samples were tested for expansion characteristics, corrosivity, water-soluble sulfate, in-place dry density and moisture content. The results of the laboratory tests are summarized in Figures B1 through B7. The in-place dry density and moisture content of the samples tested are presented on the boring logs, Appendix A.



Sample No.	Percent Passing No. 200 Sieve
B1 @ 6'	38.5
B1 @ 12'	65.5
B1 @ 20'	75.7
B1 @ 30'	25.4
B1 @ 40'	56.4
B1 @ 50'	77.5
B2 @ 6'	11.3
B2 @ 10'	13.8

GEOCON

GRAIN SIZE ANALYSIS

ASTM D-1140

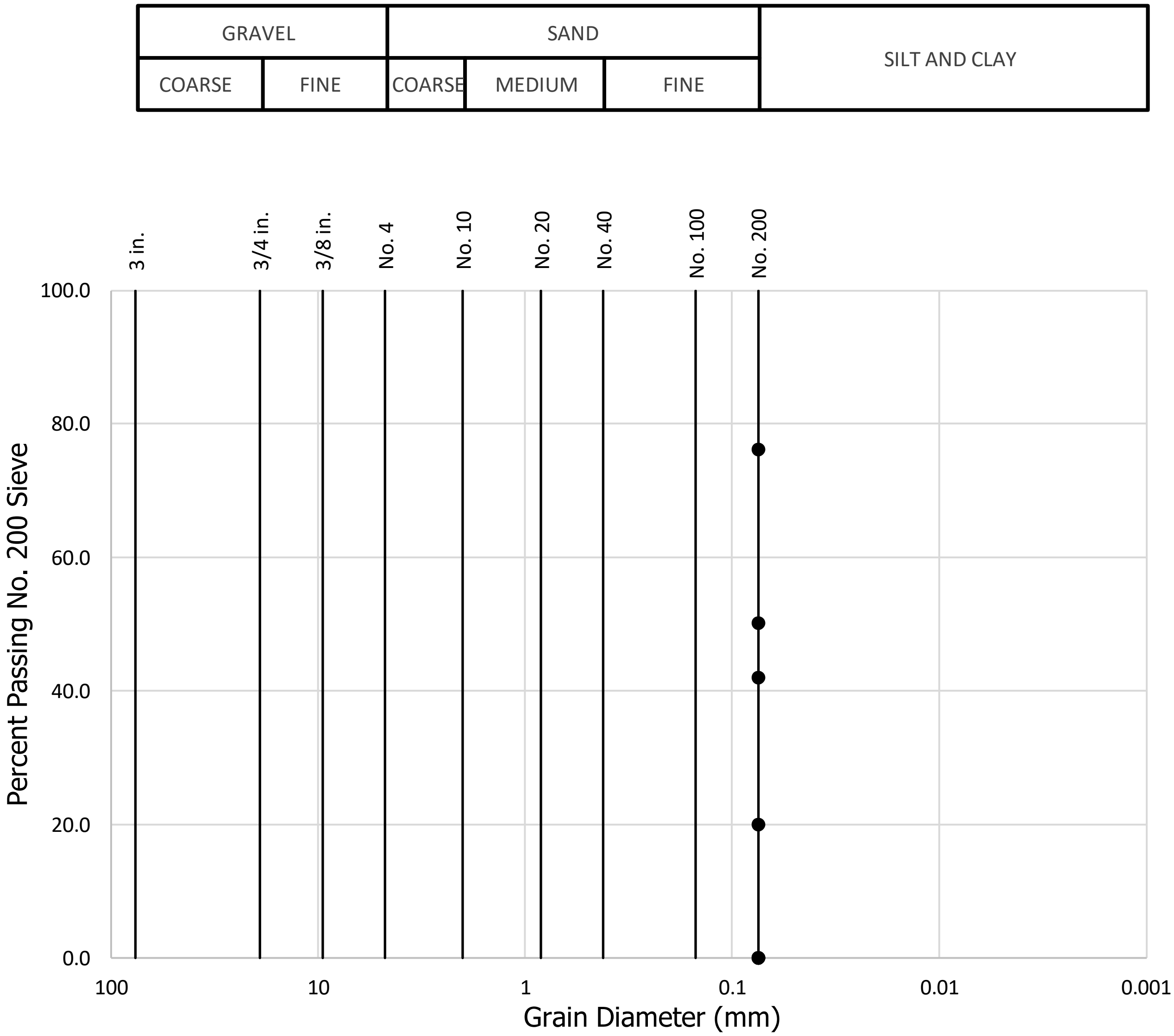
Checked by: JMH

Project No.: W1339-06-02

HIGH DESERT HOSPITAL
44900 NORTH 60TH STREET
LANCASTER, CALIFORNIA

OCTOBER 2021

Figure B1



Sample No.	Percent Passing No. 200 Sieve
B2 @ 15'	76.2
B3 @ 6'	20.0
B3 @ 10'	42.0
B3 @ 15'	50.2

GEOCON

GRAIN SIZE ANALYSIS

ASTM D-1140

Checked by: JMH

Project No.: W1339-06-02

HIGH DESERT HOSPITAL
44900 NORTH 60TH STREET
LANCASTER, CALIFORNIA

OCTOBER 2021

Figure B2

B1@0-5'

MOLDED SPECIMEN		BEFORE TEST	AFTER TEST
Specimen Diameter	(in.)	4.0	4.0
Specimen Height	(in.)	1.0	1.0
Wt. Comp. Soil + Mold	(gm)	737.3	786.2
Wt. of Mold	(gm)	367.9	367.9
Specific Gravity	(Assumed)	2.7	2.7
Wet Wt. of Soil + Cont.	(gm)	498.5	786.2
Dry Wt. of Soil + Cont.	(gm)	463.8	326.6
Wt. of Container	(gm)	198.5	367.9
Moisture Content	(%)	13.1	28.1
Wet Density	(pcf)	111.4	126.0
Dry Density	(pcf)	98.5	98.4
Void Ratio		0.7	0.8
Total Porosity		0.4	0.4
Pore Volume	(cc)	86.0	95.5
Degree of Saturation	(%) [S_{meas}]	50.1	96.0

Date	Time	Pressure (psi)	Elapsed Time (min)	Dial Readings (in.)
10/11/2021	10:00	1.0	0	0.2325
10/11/2021	10:10	1.0	10	0.232
Add Distilled Water to the Specimen				
10/12/2021	10:00	1.0	1430	0.278
10/12/2021	11:00	1.0	1490	0.278

Expansion Index (EI meas) =	46
Expansion Index (Report) =	**46**

Expansion Index, EI_{50}	CBC CLASSIFICATION *	UBC CLASSIFICATION **
0-20	Non-Expansive	Very Low
21-50	Expansive	Low
51-90	Expansive	Medium
91-130	Expansive	High
>130	Expansive	Very High

* Reference: 2019 California Building Code, Section 1803.5.3
** Reference: 1997 Uniform Building Code, Table 18-I-B.

GEOCON

EXPANSION INDEX TEST RESULTS

ASTM D-4829

Checked by: JMH

Project No.: W1339-06-02

HIGH DESERT HOSPITAL
44900 NORTH 60TH STREET
LANCASTER, CALIFORNIA

OCTOBER 2021

MIX B2A&B3@0-5'

MOLDED SPECIMEN		BEFORE TEST	AFTER TEST
Specimen Diameter	(in.)	4.0	4.0
Specimen Height	(in.)	1.0	1.0
Wt. Comp. Soil + Mold	(gm)	765.9	798.1
Wt. of Mold	(gm)	368.1	368.1
Specific Gravity	(Assumed)	2.7	2.7
Wet Wt. of Soil + Cont.	(gm)	498.5	798.1
Dry Wt. of Soil + Cont.	(gm)	472.0	362.6
Wt. of Container	(gm)	198.5	368.1
Moisture Content	(%)	9.7	18.6
Wet Density	(pcf)	120.0	129.5
Dry Density	(pcf)	109.4	109.2
Void Ratio		0.5	0.6
Total Porosity		0.4	0.4
Pore Volume	(cc)	72.7	76.6
Degree of Saturation	(%) [S_{meas}]	48.8	87.9

Date	Time	Pressure (psi)	Elapsed Time (min)	Dial Readings (in.)
10/11/2021	10:00	1.0	0	0.2415
10/11/2021	10:10	1.0	10	0.241
Add Distilled Water to the Specimen				
10/12/2021	10:00	1.0	1430	0.26
10/12/2021	11:00	1.0	1490	0.26

Expansion Index (EI meas) =	19
Expansion Index (Report) =	**19**

Expansion Index, EI_{50}	CBC CLASSIFICATION *	UBC CLASSIFICATION **
0-20	Non-Expansive	Very Low
21-50	Expansive	Low
51-90	Expansive	Medium
91-130	Expansive	High
>130	Expansive	Very High

* Reference: 2019 California Building Code, Section 1803.5.3

** Reference: 1997 Uniform Building Code, Table 18-I-B.

GEOCON

EXPANSION INDEX TEST RESULTS

ASTM D-4829

Checked by: JMH

Project No.: W1339-06-02

HIGH DESERT HOSPITAL
44900 NORTH 60TH STREET
LANCASTER, CALIFORNIA

OCTOBER 2021

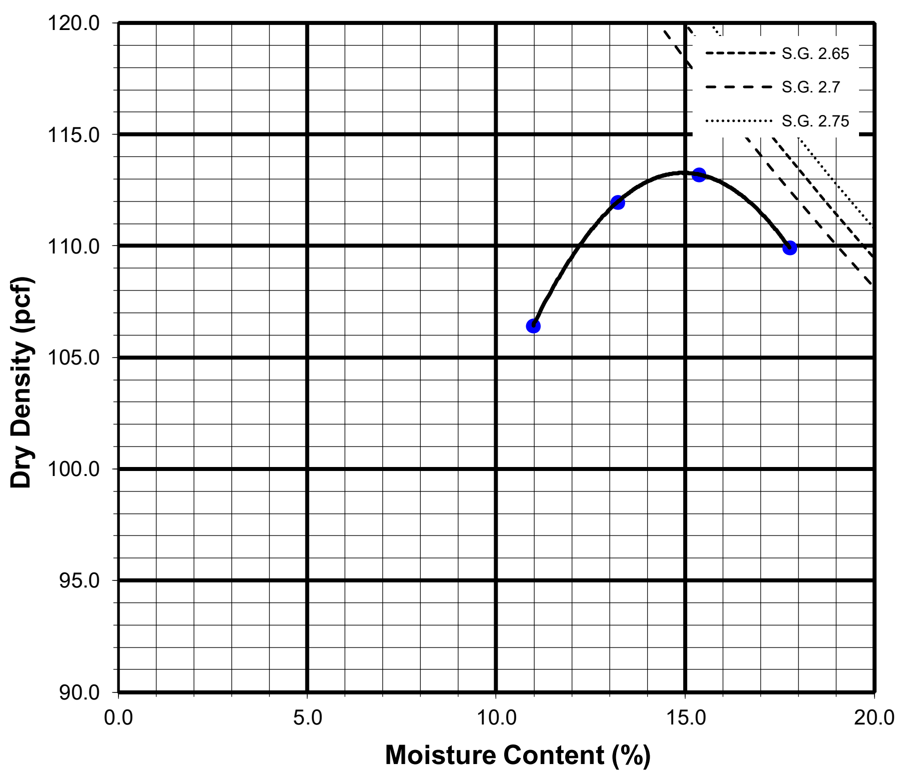
Figure B4

Sample No:

B1@0-5'	Light Brown Silty Sand (SM)

TEST NO.		1	2	3	4	5	6
Wt. Compacted Soil + Mold	(g)	5900	6031	6089	6072		
Weight of Mold	(g)	4116	4116	4116	4116		
Net Weight of Soil	(g)	1784	1915	1973	1955		
Wet Weight of Soil + Cont.	(g)	687.6	700.3	698.0	604.1		
Dry Weight of Soil + Cont.	(g)	634.2	635.7	624.4	531.9		
Weight of Container	(g)	147.8	146.5	145.2	125.2		
Moisture Content	(%)	11.0	13.2	15.4	17.8		
Wet Density	(pcf)	118.1	126.7	130.6	129.4		
Dry Density	(pcf)	106.4	112.0	113.2	109.9		

Maximum Dry Density (pcf)	113.5	Optimum Moisture Content (%)	14.5



Preparation Method: A

GEOCON

COMPACTION CHARACTERISTICS USING MODIFIED EFFORT TEST RESULTS

ASTM D-1557

Checked by: JMH

Project No.: W1339-06-02

HIGH DESERT HOSPITAL
44900 NORTH 60TH STREET
LANCASTER, CALIFORNIA

OCTOBER 2021

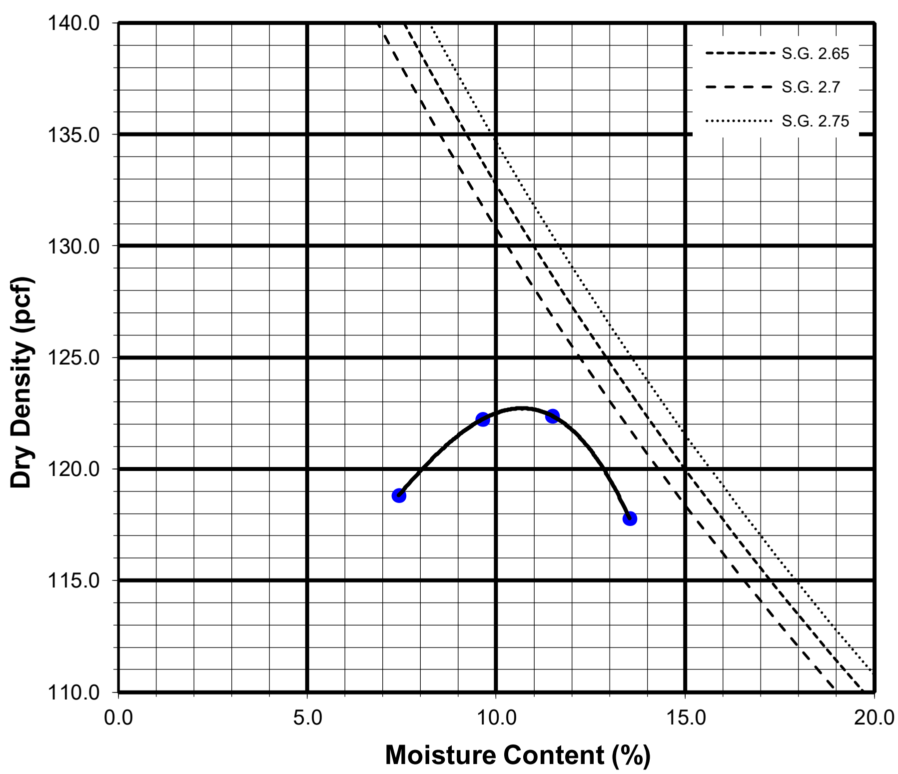
Figure B5

Sample No:

MIX B2A&B3@0-5'	Light Brown Silty Sand (SM)

TEST NO.		1	2	3	4	5	6
Wt. Compacted Soil + Mold	(g)	6044	6141	6177	6136		
Weight of Mold	(g)	4116	4116	4116	4116		
Net Weight of Soil	(g)	1928	2024	2061	2020		
Wet Weight of Soil + Cont.	(g)	641.8	712.9	698.4	637.5		
Dry Weight of Soil + Cont.	(g)	606.2	663.1	641.7	577.4		
Weight of Container	(g)	126.4	146.6	148.1	133.0		
Moisture Content	(%)	7.4	9.6	11.5	13.5		
Wet Density	(pcf)	127.6	134.0	136.4	133.7		
Dry Density	(pcf)	118.8	122.2	122.4	117.8		

Maximum Dry Density (pcf)	**123.0**	**Optimum Moisture Content (%)**	**11.0**



Preparation Method: A

GEOCON	**COMPACTION CHARACTERISTICS USING MODIFIED EFFORT TEST RESULTS** ASTM D-1557	Project No.: W1339-06-02 HIGH DESERT HOSPITAL 44900 NORTH 60TH STREET LANCASTER, CALIFORNIA
	Checked by: JMH	OCTOBER 2021 Figure B6

SUMMARY OF LABORATORY
POTENTIAL OF HYDROGEN (pH) AND RESISTIVITY TEST RESULTS
AASHTO T289 ASTM D4972 and AASHTO T288 ASTM G187

Sample No.	**pH**	**Resistivity (ohm centimeters)**
B1 @ 0-5'	8.5	1300 (Corrosive)
Mix B2A&B3 @ 0-5'	8.5	3000 (Moderately Corrosive)

SUMMARY OF LABORATORY CHLORIDE CONTENT TEST RESULTS
AASHTO T291 ASTM C1218

Sample No.	Chloride Ion Content (%)
B1@0-5'	0.002
Mix B2A&B3	0.008

SUMMARY OF LABORATORY WATER SOLUBLE SULFATE TEST RESULTS
AASHTO T290 ASTM C1580

Sample No.	**Water Soluble Sulfate (% SO_4)**	**Sulfate Exposure**
B1@0-5'	0.056	S0
Mix B2A&B3	0.000	S0

APPENDIX C

Pre Development Hydrology Calculations

Peak Flow Hydrologic Analysis

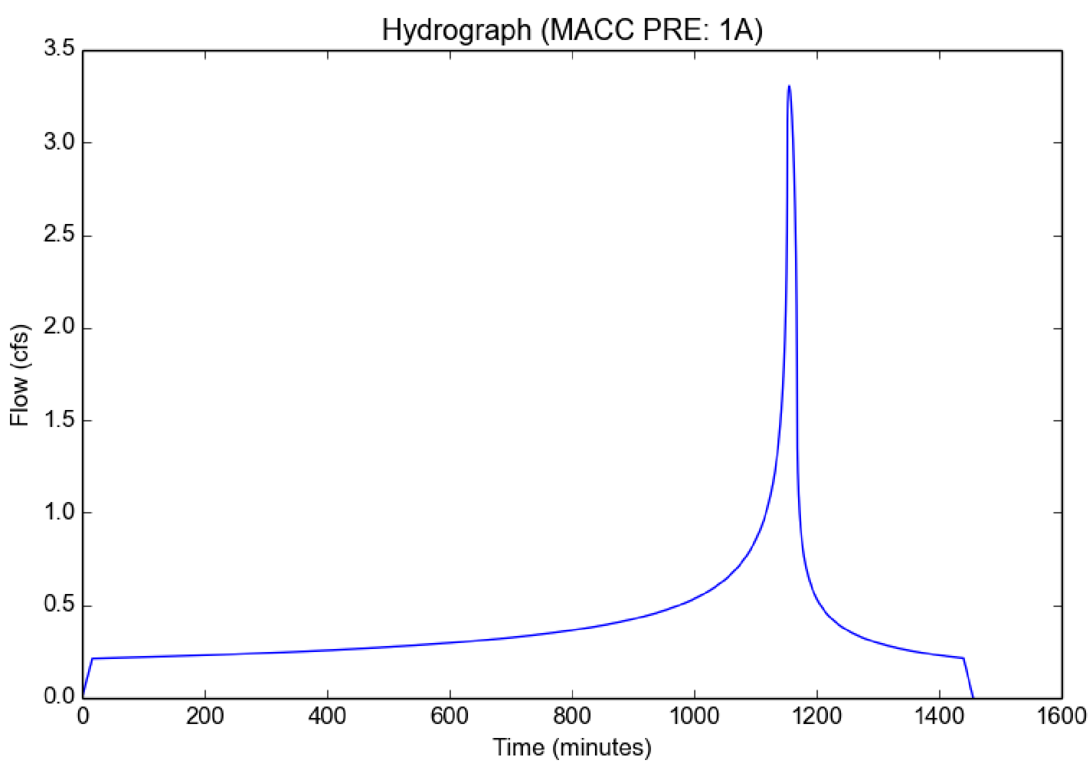
File location: F:/Projects/499/012/_Support Files/Reports/Hydrology/Appendix C - Pre Dev Hydrology Calcs/MACC - Pre - 2 yr.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	MACC PRE
Subarea ID	1A
Area (ac)	9.89
Flow Path Length (ft)	238.0
Flow Path Slope (vft/hft)	0.0038
50-yr Rainfall Depth (in)	3.05
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	1.1804
Peak Intensity (in/hr)	0.4077
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.82
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	3.306
Burned Peak Flow Rate (cfs)	3.306
24-Hr Clear Runoff Volume (ac-ft)	0.7911
24-Hr Clear Runoff Volume (cu-ft)	34460.7603



Peak Flow Hydrologic Analysis

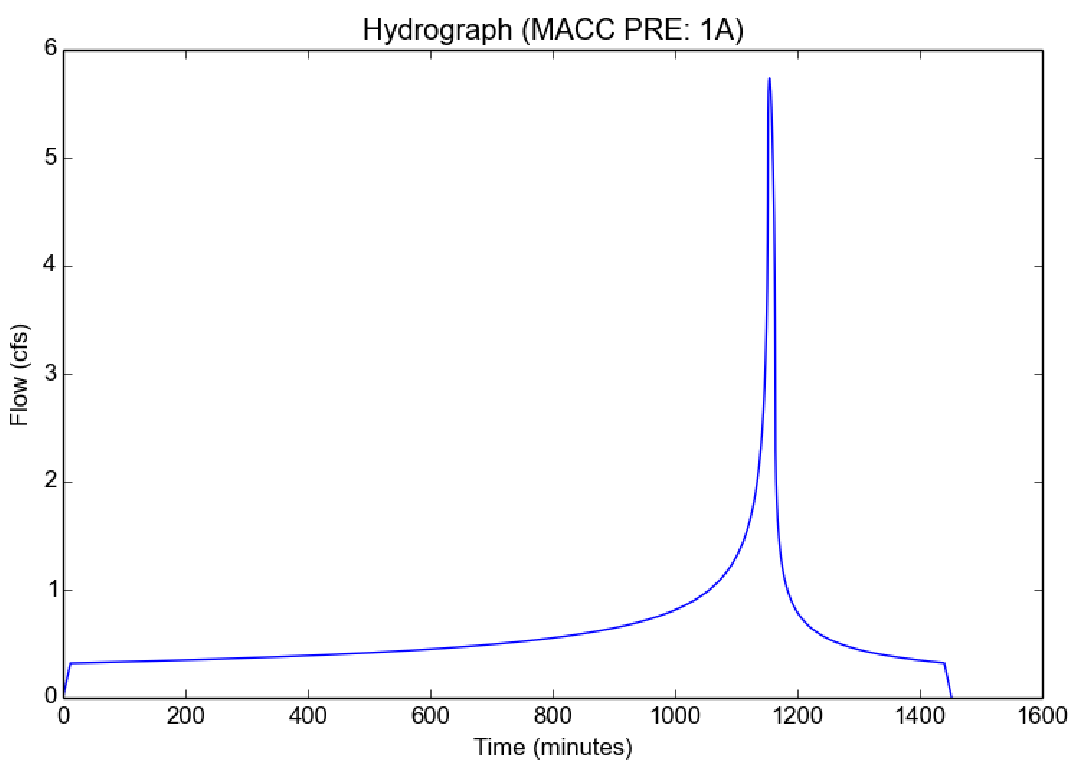
File location: F:/Projects/499/012/_Support Files/Reports/Hydrology/Appendix C - Pre Dev Hydrology Calcs/MACC - Pre - 5 yr.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	MACC PRE
Subarea ID	1A
Area (ac)	9.89
Flow Path Length (ft)	238.0
Flow Path Slope (vft/hft)	0.0038
50-yr Rainfall Depth (in)	3.05
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	1.7812
Peak Intensity (in/hr)	0.7042
Undeveloped Runoff Coefficient (Cu)	0.1348
Developed Runoff Coefficient (Cd)	0.8235
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	5.7354
Burned Peak Flow Rate (cfs)	5.7354
24-Hr Clear Runoff Volume (ac-ft)	1.194
24-Hr Clear Runoff Volume (cu-ft)	52009.5207



Peak Flow Hydrologic Analysis

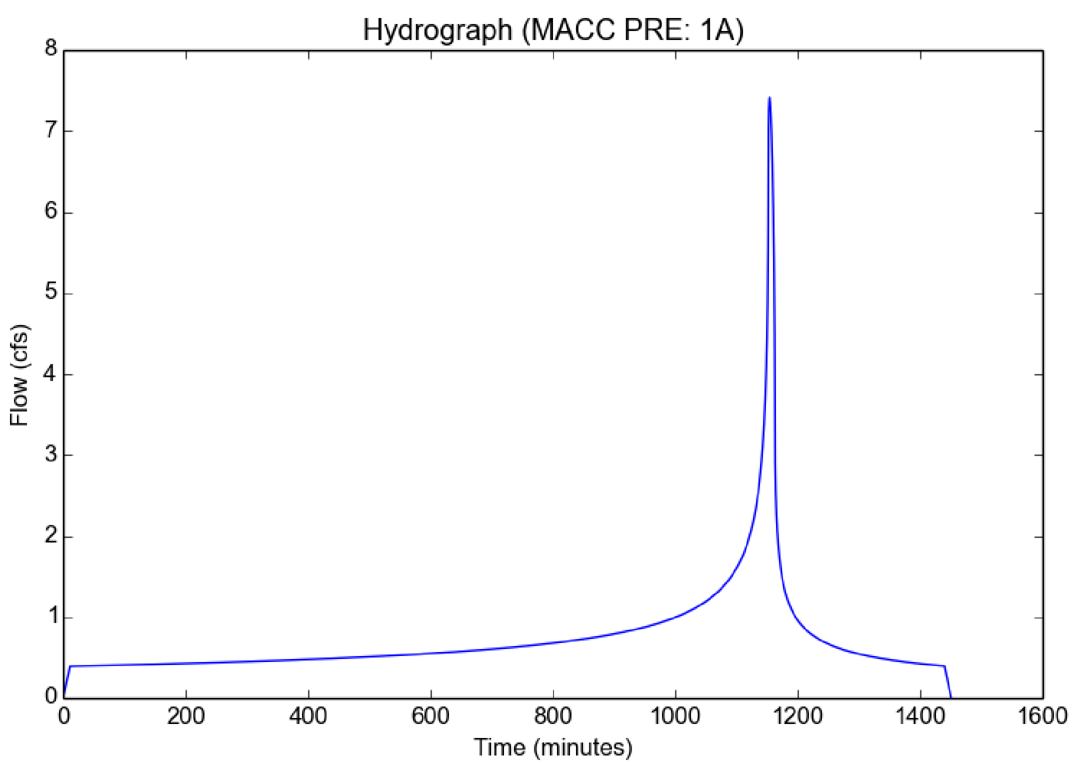
File location: F:/Projects/499/012/_Support Files/Reports/Hydrology/Appendix C - Pre Dev Hydrology Calcs/MACC - Pre - 10 yr.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	MACC PRE
Subarea ID	1A
Area (ac)	9.89
Flow Path Length (ft)	238.0
Flow Path Slope (vft/hft)	0.0038
50-yr Rainfall Depth (in)	3.05
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	2.1777
Peak Intensity (in/hr)	0.8969
Undeveloped Runoff Coefficient (Cu)	0.2583
Developed Runoff Coefficient (Cd)	0.8358
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	7.4144
Burned Peak Flow Rate (cfs)	7.4144
24-Hr Clear Runoff Volume (ac-ft)	1.4609
24-Hr Clear Runoff Volume (cu-ft)	63637.6153



Peak Flow Hydrologic Analysis

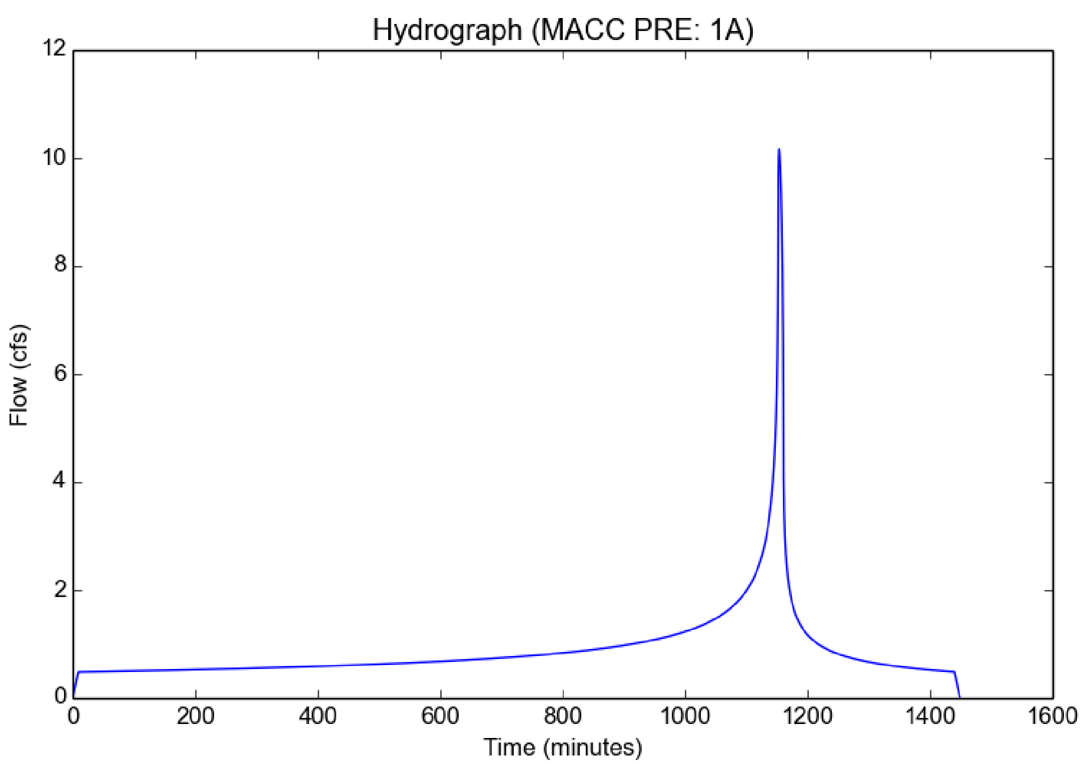
File location: F:/Projects/499/012/_Support Files/Reports/Hydrology/Appendix C - Pre Dev Hydrology Calcs/MACC - Pre - 25 yr.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	MACC PRE
Subarea ID	1A
Area (ac)	9.89
Flow Path Length (ft)	238.0
Flow Path Slope (vft/hft)	0.0038
50-yr Rainfall Depth (in)	3.05
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	2.6779
Peak Intensity (in/hr)	1.212
Undeveloped Runoff Coefficient (Cu)	0.3824
Developed Runoff Coefficient (Cd)	0.8482
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	10.168
Burned Peak Flow Rate (cfs)	10.168
24-Hr Clear Runoff Volume (ac-ft)	1.7984
24-Hr Clear Runoff Volume (cu-ft)	78336.8416



Peak Flow Hydrologic Analysis

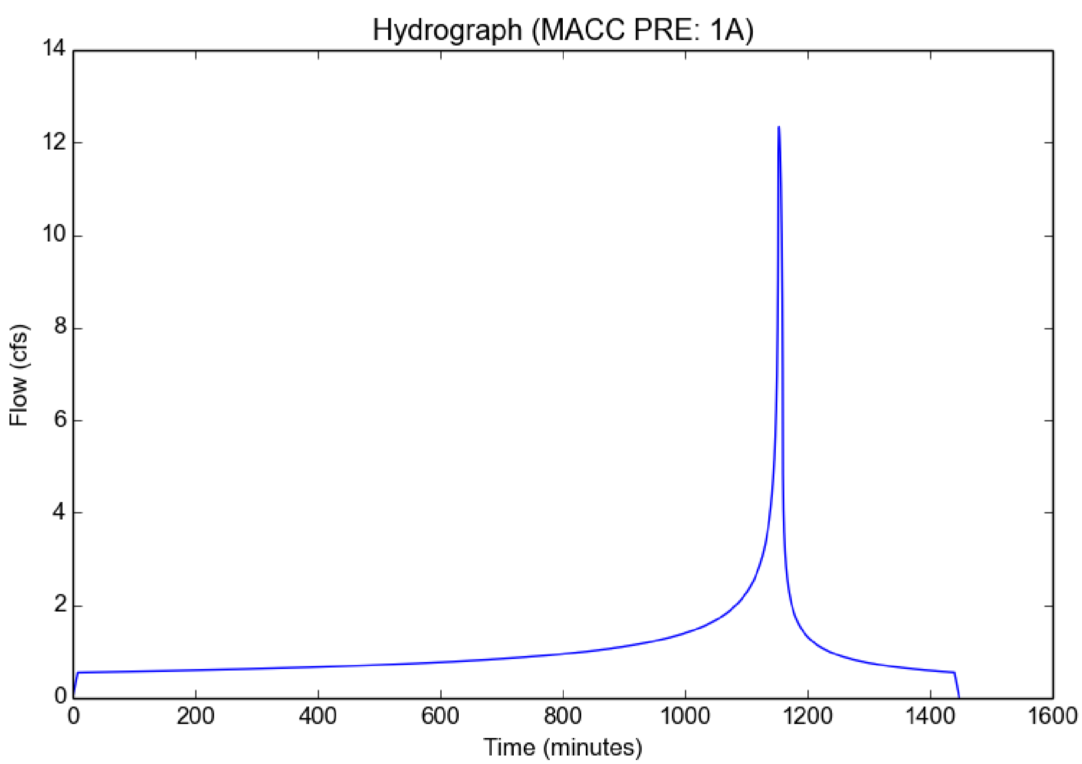
File location: F:/Projects/499/012/_Support Files/Reports/Hydrology/Appendix C - Pre Dev Hydrology Calcs/MACC - Pre - 50 yr.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	MACC PRE
Subarea ID	1A
Area (ac)	9.89
Flow Path Length (ft)	238.0
Flow Path Slope (vft/hft)	0.0038
50-yr Rainfall Depth (in)	3.05
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	3.05
Peak Intensity (in/hr)	1.459
Undeveloped Runoff Coefficient (Cu)	0.4501
Developed Runoff Coefficient (Cd)	0.855
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	12.3377
Burned Peak Flow Rate (cfs)	12.3377
24-Hr Clear Runoff Volume (ac-ft)	2.0494
24-Hr Clear Runoff Volume (cu-ft)	89272.5946



APPENDIX D

Post Development
Hydrology Calculations

Peak Flow Hydrologic Analysis

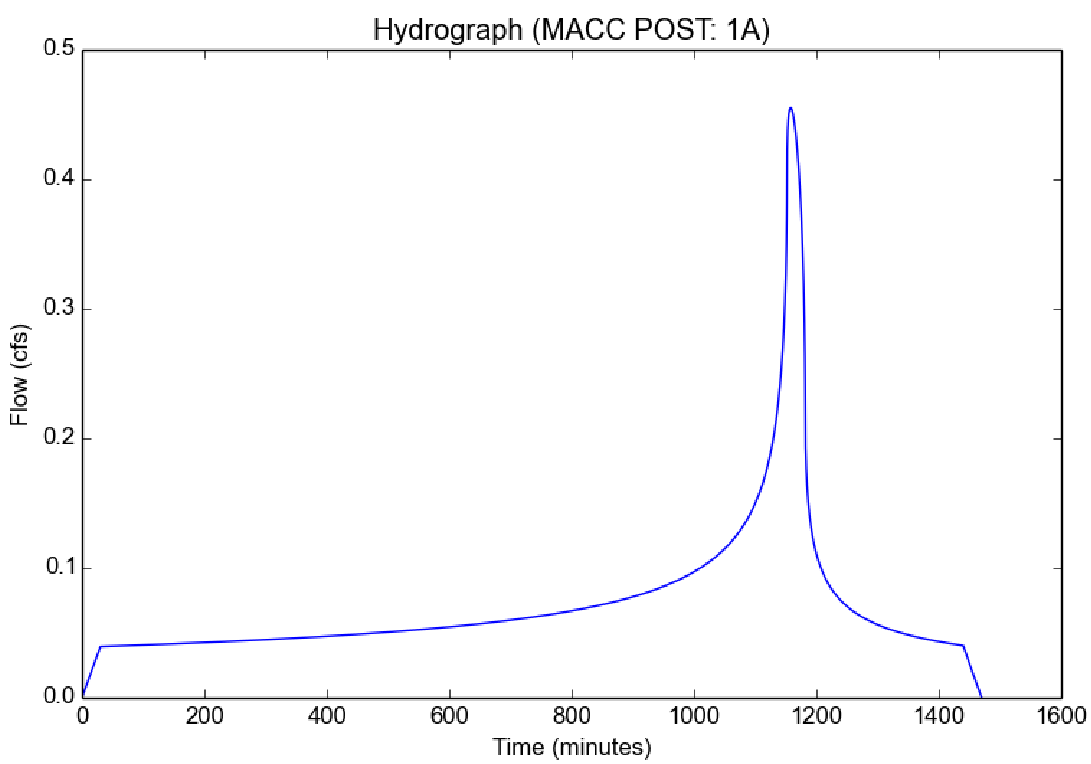
File location: F:/Projects/499/012/_Support Files/Reports/Hydrology/Appendix D - Post Dev Hydrology Calcs/MACC POST - 1A - 2 yr.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	MACC POST
Subarea ID	1A
Area (ac)	5.77
Flow Path Length (ft)	377.0
Flow Path Slope (vft/hft)	0.0083
50-yr Rainfall Depth (in)	3.05
Percent Impervious	0.2
Soil Type	120
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	1.1804
Peak Intensity (in/hr)	0.3034
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.26
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	0.4551
Burned Peak Flow Rate (cfs)	0.4551
24-Hr Clear Runoff Volume (ac-ft)	0.1463
24-Hr Clear Runoff Volume (cu-ft)	6374.813



Peak Flow Hydrologic Analysis

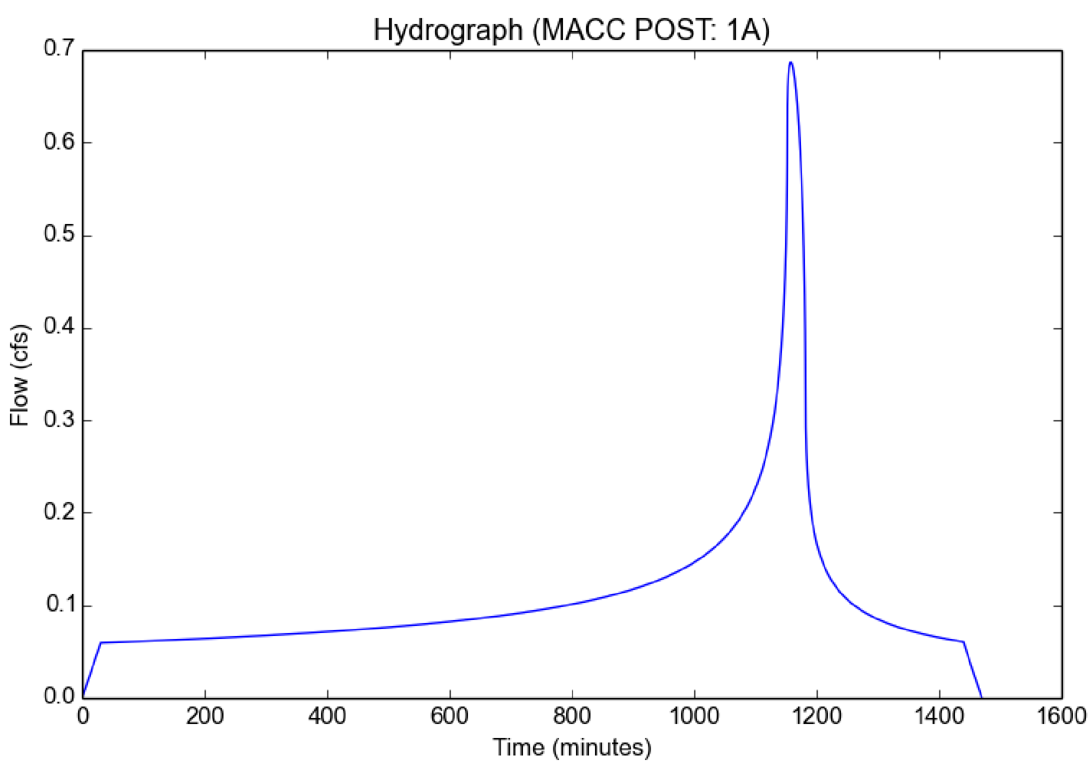
File location: F:/Projects/499/012/_Support Files/Reports/Hydrology/Appendix D - Post Dev Hydrology Calcs/MACC POST - 1A - 5 yr.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	MACC POST
Subarea ID	1A
Area (ac)	5.77
Flow Path Length (ft)	377.0
Flow Path Slope (vft/hft)	0.0083
50-yr Rainfall Depth (in)	3.05
Percent Impervious	0.2
Soil Type	120
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	1.7812
Peak Intensity (in/hr)	0.4578
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.26
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	0.6868
Burned Peak Flow Rate (cfs)	0.6868
24-Hr Clear Runoff Volume (ac-ft)	0.2208
24-Hr Clear Runoff Volume (cu-ft)	9619.8729



Peak Flow Hydrologic Analysis

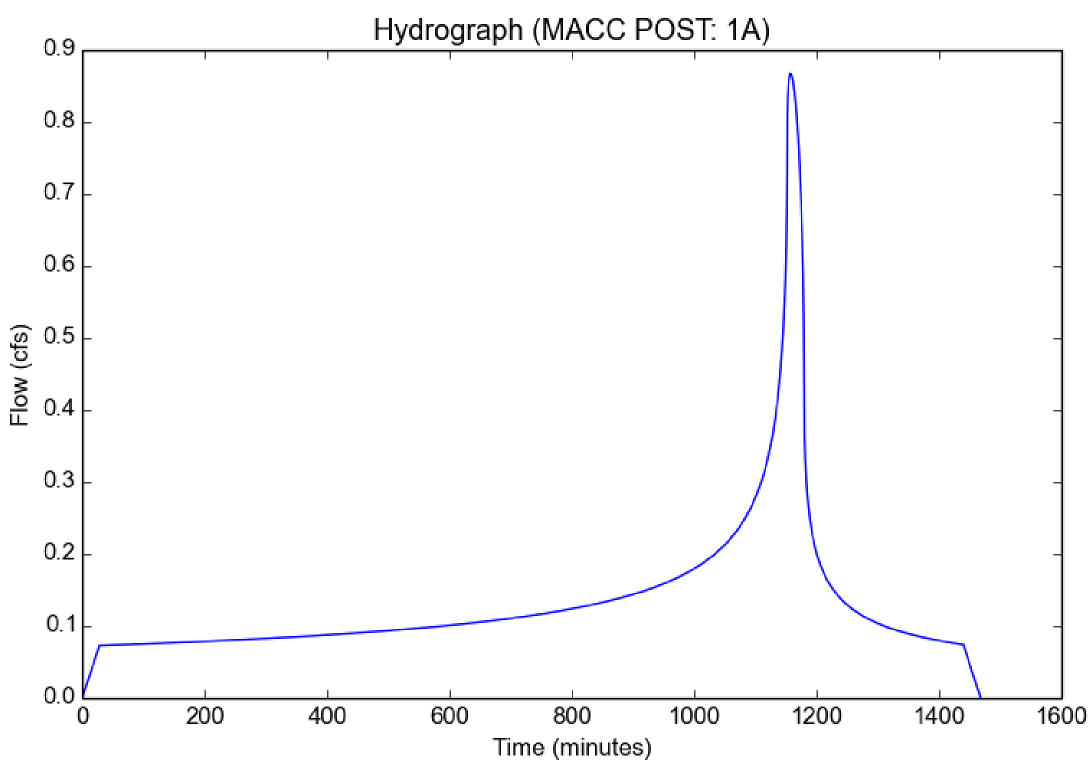
File location: F:/Projects/499/012/_Support Files/Reports/Hydrology/Appendix D - Post Dev Hydrology Calcs/MACC POST - 1A - 10 yr.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	MACC POST
Subarea ID	1A
Area (ac)	5.77
Flow Path Length (ft)	377.0
Flow Path Slope (vft/hft)	0.0083
50-yr Rainfall Depth (in)	3.05
Percent Impervious	0.2
Soil Type	120
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	2.1777
Peak Intensity (in/hr)	0.5782
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.26
Time of Concentration (min)	28.0
Clear Peak Flow Rate (cfs)	0.8674
Burned Peak Flow Rate (cfs)	0.8674
24-Hr Clear Runoff Volume (ac-ft)	0.27
24-Hr Clear Runoff Volume (cu-ft)	11761.2654



Peak Flow Hydrologic Analysis

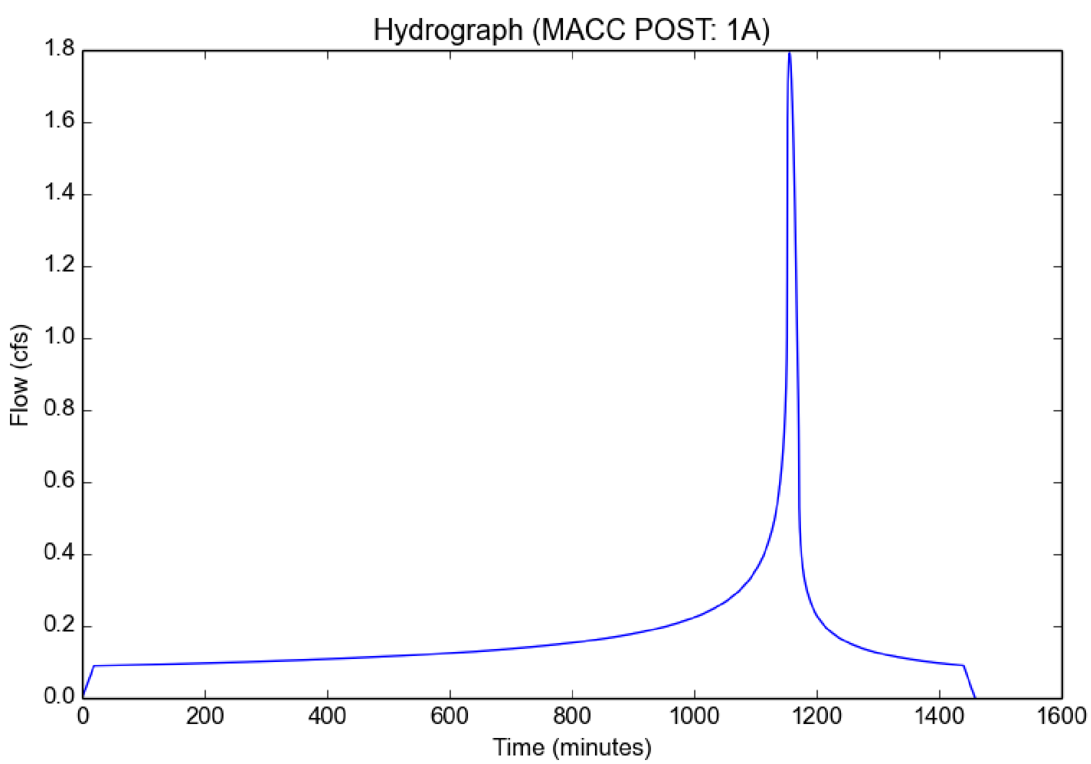
File location: F:/Projects/499/012/_Support Files/Reports/Hydrology/Appendix D - Post Dev Hydrology Calcs/MACC POST - 1A - 25 yr.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	MACC POST
Subarea ID	1A
Area (ac)	5.77
Flow Path Length (ft)	377.0
Flow Path Slope (vft/hft)	0.0083
50-yr Rainfall Depth (in)	3.05
Percent Impervious	0.2
Soil Type	120
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	2.6779
Peak Intensity (in/hr)	0.8531
Undeveloped Runoff Coefficient (Cu)	0.2302
Developed Runoff Coefficient (Cd)	0.3641
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	1.7924
Burned Peak Flow Rate (cfs)	1.7924
24-Hr Clear Runoff Volume (ac-ft)	0.3401
24-Hr Clear Runoff Volume (cu-ft)	14814.9549



Peak Flow Hydrologic Analysis

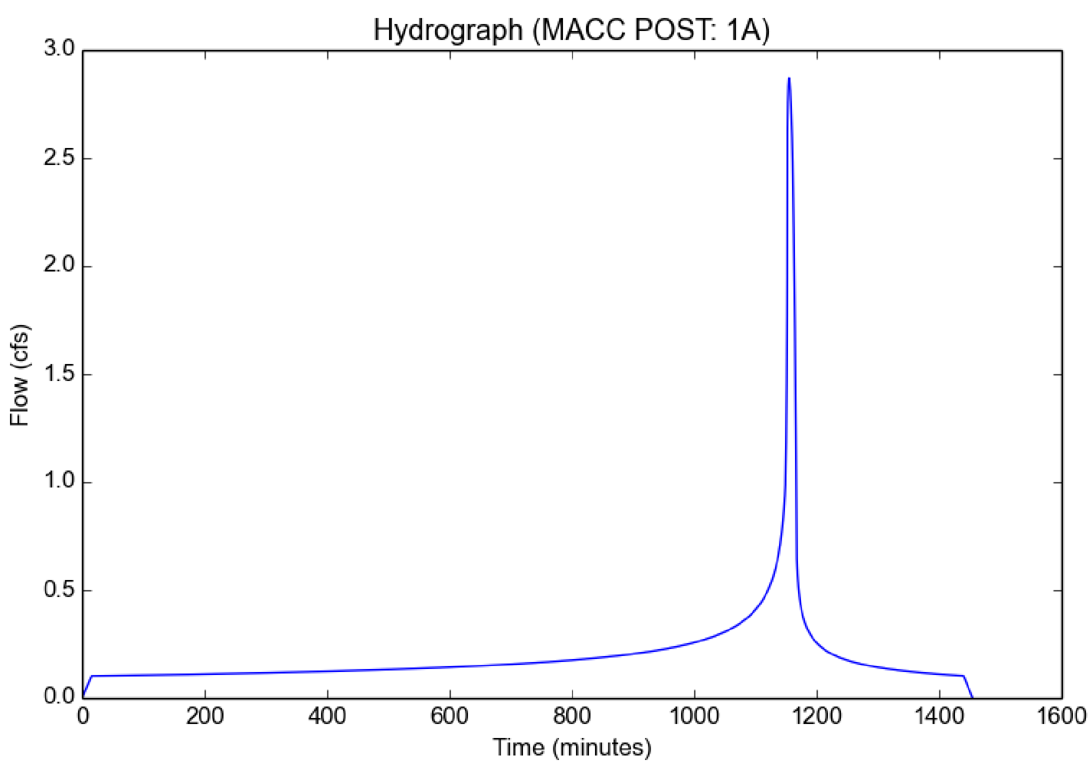
File location: F:/Projects/499/012/_Support Files/Reports/Hydrology/Appendix D - Post Dev Hydrology Calcs/MACC POST - 1A - 50 yr.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	MACC POST
Subarea ID	1A
Area (ac)	5.77
Flow Path Length (ft)	377.0
Flow Path Slope (vft/hft)	0.0083
50-yr Rainfall Depth (in)	3.05
Percent Impervious	0.2
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	3.05
Peak Intensity (in/hr)	1.0858
Undeveloped Runoff Coefficient (Cu)	0.3478
Developed Runoff Coefficient (Cd)	0.4583
Time of Concentration (min)	15.0
Clear Peak Flow Rate (cfs)	2.8711
Burned Peak Flow Rate (cfs)	2.8711
24-Hr Clear Runoff Volume (ac-ft)	0.3981
24-Hr Clear Runoff Volume (cu-ft)	17341.1612



Peak Flow Hydrologic Analysis

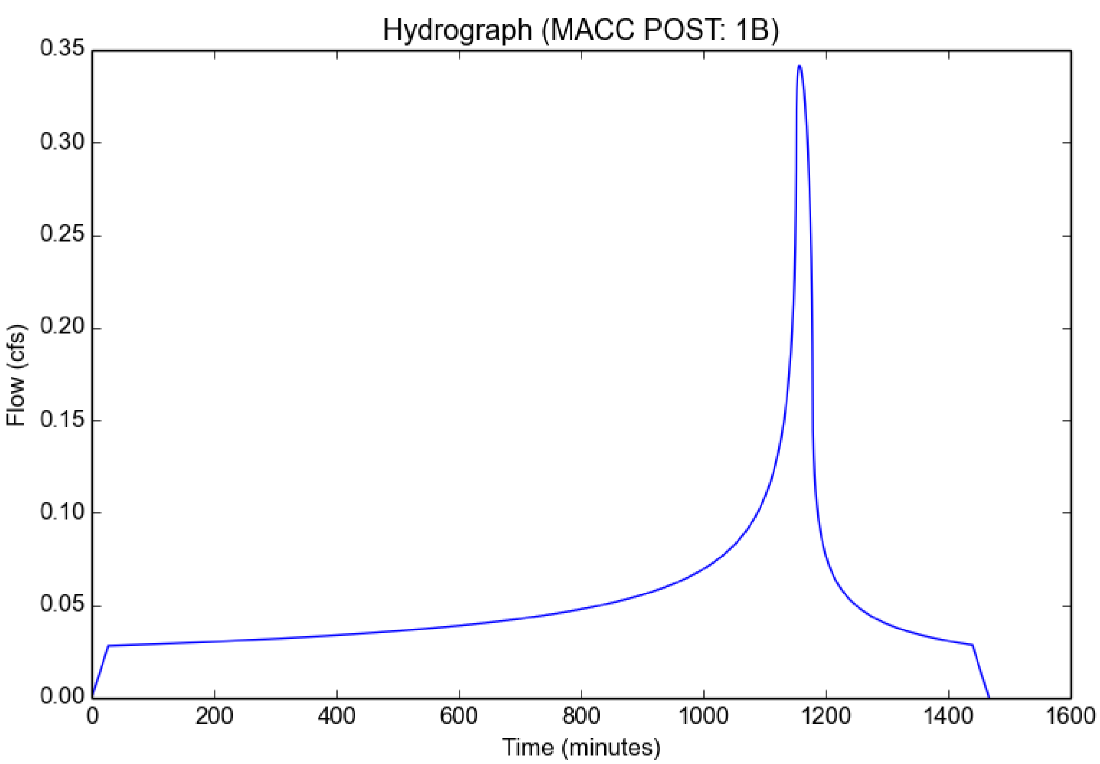
File location: F:/Projects/499/012/_Support Files/Reports/Hydrology/Appendix D - Post Dev Hydrology Calcs/MACC POST - 1B - 2 yr.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	MACC POST
Subarea ID	1B
Area (ac)	4.12
Flow Path Length (ft)	190.0
Flow Path Slope (vft/hft)	0.0091
50-yr Rainfall Depth (in)	3.05
Percent Impervious	0.2
Soil Type	120
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	1.1804
Peak Intensity (in/hr)	0.3188
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.26
Time of Concentration (min)	27.0
Clear Peak Flow Rate (cfs)	0.3415
Burned Peak Flow Rate (cfs)	0.3415
24-Hr Clear Runoff Volume (ac-ft)	0.1045
24-Hr Clear Runoff Volume (cu-ft)	4551.8496



Peak Flow Hydrologic Analysis

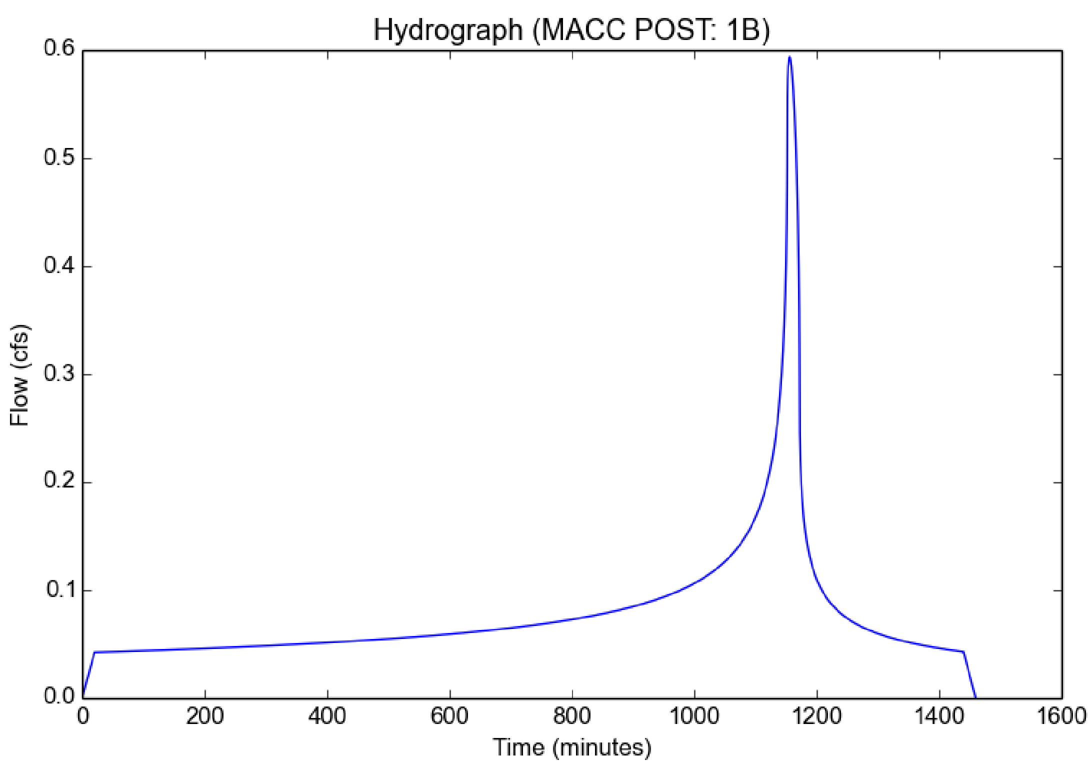
File location: F:/Projects/499/012/_Support Files/Reports/Hydrology/Appendix D - Post Dev Hydrology Calcs/MACC POST - 1B - 5 yr.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	MACC POST
Subarea ID	1B
Area (ac)	4.12
Flow Path Length (ft)	190.0
Flow Path Slope (vft/hft)	0.0091
50-yr Rainfall Depth (in)	3.05
Percent Impervious	0.2
Soil Type	120
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	1.7812
Peak Intensity (in/hr)	0.5539
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.26
Time of Concentration (min)	20.0
Clear Peak Flow Rate (cfs)	0.5934
Burned Peak Flow Rate (cfs)	0.5934
24-Hr Clear Runoff Volume (ac-ft)	0.1577
24-Hr Clear Runoff Volume (cu-ft)	6868.912



Peak Flow Hydrologic Analysis

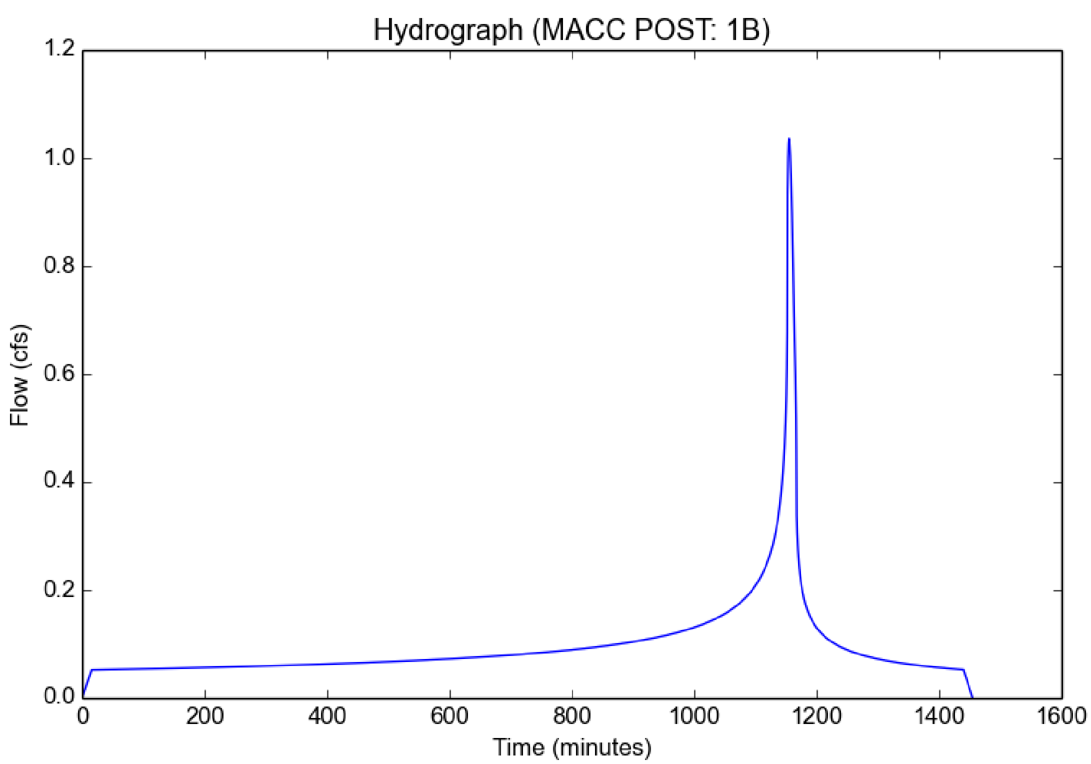
File location: F:/Projects/499/012/_Support Files/Reports/Hydrology/Appendix D - Post Dev Hydrology Calcs/MACC POST - 1B - 10 yr.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	MACC POST
Subarea ID	1B
Area (ac)	4.12
Flow Path Length (ft)	190.0
Flow Path Slope (vft/hft)	0.0091
50-yr Rainfall Depth (in)	3.05
Percent Impervious	0.2
Soil Type	120
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	2.1777
Peak Intensity (in/hr)	0.7753
Undeveloped Runoff Coefficient (Cu)	0.1803
Developed Runoff Coefficient (Cd)	0.3242
Time of Concentration (min)	15.0
Clear Peak Flow Rate (cfs)	1.0356
Burned Peak Flow Rate (cfs)	1.0356
24-Hr Clear Runoff Volume (ac-ft)	0.195
24-Hr Clear Runoff Volume (cu-ft)	8494.5416



Peak Flow Hydrologic Analysis

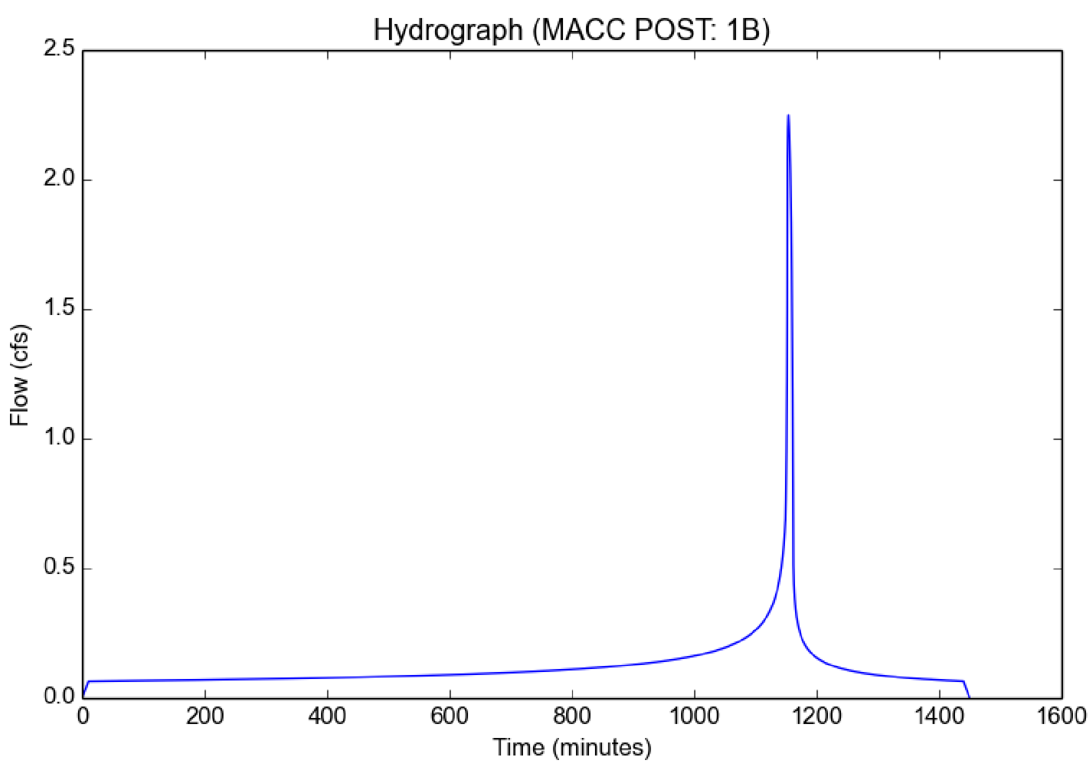
File location: F:/Projects/499/012/_Support Files/Reports/Hydrology/Appendix D - Post Dev Hydrology Calcs/MACC POST - 1B - 25 yr.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	MACC POST
Subarea ID	1B
Area (ac)	4.12
Flow Path Length (ft)	190.0
Flow Path Slope (vft/hft)	0.0091
50-yr Rainfall Depth (in)	3.05
Percent Impervious	0.2
Soil Type	120
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	2.6779
Peak Intensity (in/hr)	1.1535
Undeveloped Runoff Coefficient (Cu)	0.3664
Developed Runoff Coefficient (Cd)	0.4731
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	2.2484
Burned Peak Flow Rate (cfs)	2.2484
24-Hr Clear Runoff Volume (ac-ft)	0.2485
24-Hr Clear Runoff Volume (cu-ft)	10823.8634



Peak Flow Hydrologic Analysis

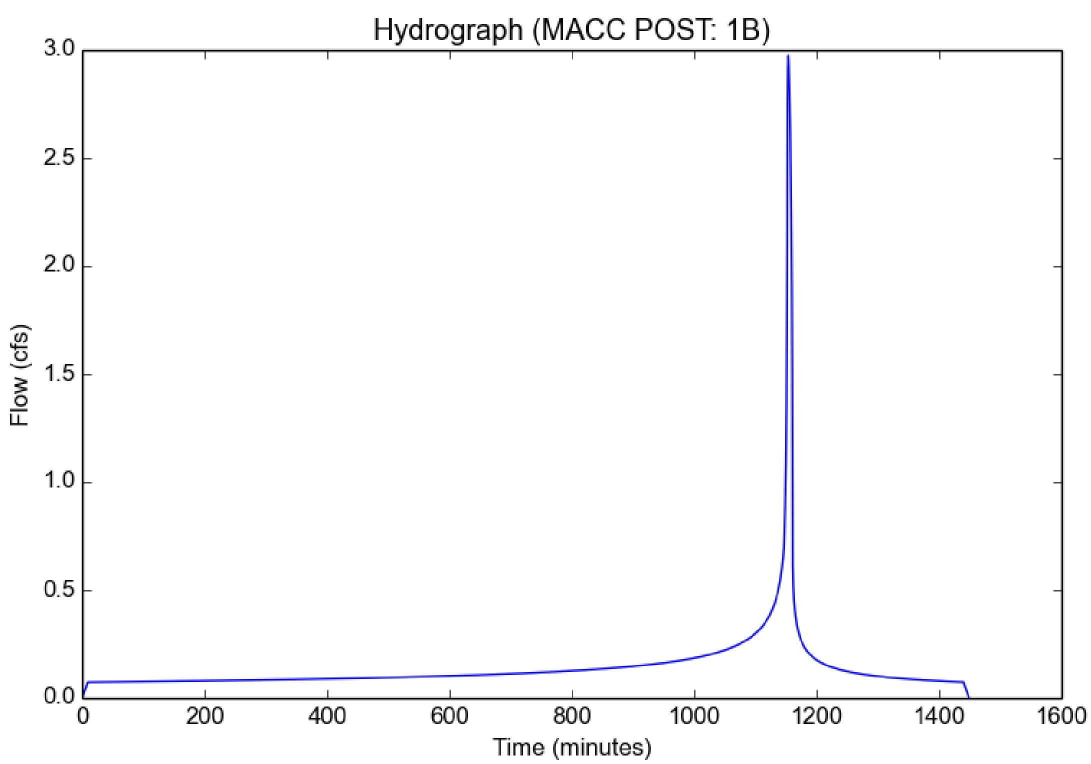
File location: F:/Projects/499/012/_Support Files/Reports/Hydrology/Appendix D - Post Dev Hydrology Calcs/MACC POST - 1B - 50 yr.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	MACC POST
Subarea ID	1B
Area (ac)	4.12
Flow Path Length (ft)	190.0
Flow Path Slope (vft/hft)	0.0091
50-yr Rainfall Depth (in)	3.05
Percent Impervious	0.2
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	3.05
Peak Intensity (in/hr)	1.3805
Undeveloped Runoff Coefficient (Cu)	0.4286
Developed Runoff Coefficient (Cd)	0.5228
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	2.9737
Burned Peak Flow Rate (cfs)	2.9737
24-Hr Clear Runoff Volume (ac-ft)	0.2869
24-Hr Clear Runoff Volume (cu-ft)	12496.7571



APPENDIX E

Site Calculations

FUSCOE ENGINEERING

Project: High Desert Hospital		Project #: 499-012	
By: CK	Date: 11-24-21	Check:	Date:
Sediment Basin Sizing			Page of

Annual Soil Loss per RUSLE Equation

$A = R \times K \times LS \times C \times P$

R = Rainfall Erosion Index = 105.35

K = soil erodibility factor = 0.15

LS = slope length and steepness = 0.74

C = vegetative cover factor = 0.10

P = erosion control practice factor = 1.0

$A = 105.35 \times 0.15 \times 0.74 \times 0.10 \times 1.0$

A = 1.17 tons/acre/year

Subarea 1A is 5.77 acres

$A = 1.17 \times 5.77$

A = 6.75 tons/year × 2000 lbs/tons × 1 ft³/110 lbs = **122.7 CF**

Subarea 2B is 4.12 acres

$A = 1.17 \times 4.12$

A = 4.82 tons/year × 2000 lbs/tons × 1 ft³/110 lbs = **87.6 CF**

Worksheet for Spillway

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.035
Channel Slope	0.005 ft/ft
Normal Depth	6.0 in
Bottom Width	4.00 ft

Results

Discharge	3.26 cfs
Flow Area	2.0 ft²
Wetted Perimeter	5.0 ft
Hydraulic Radius	4.8 in
Top Width	4.00 ft
Critical Depth	3.3 in
Critical Slope	0.033 ft/ft
Velocity	1.63 ft/s
Velocity Head	0.04 ft
Specific Energy	0.54 ft
Froude Number	0.406
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	6.0 in
Critical Depth	3.3 in
Channel Slope	0.005 ft/ft
Critical Slope	0.033 ft/ft