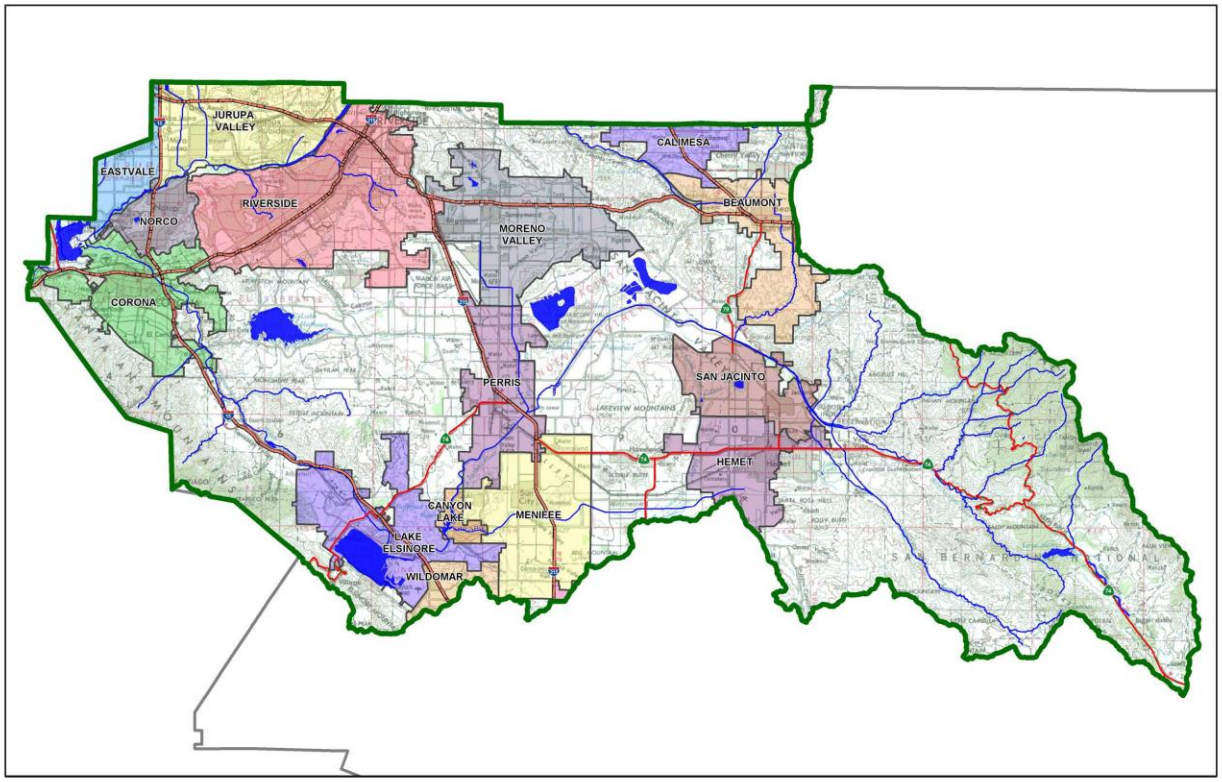
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: Northgate – 6th and Main Street

Development No: DPR 2023-0021

Design Review/Case No: WQ24-014P/PWWQ2024-0020



☒ **Preliminary**
☐ **Final**

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Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**

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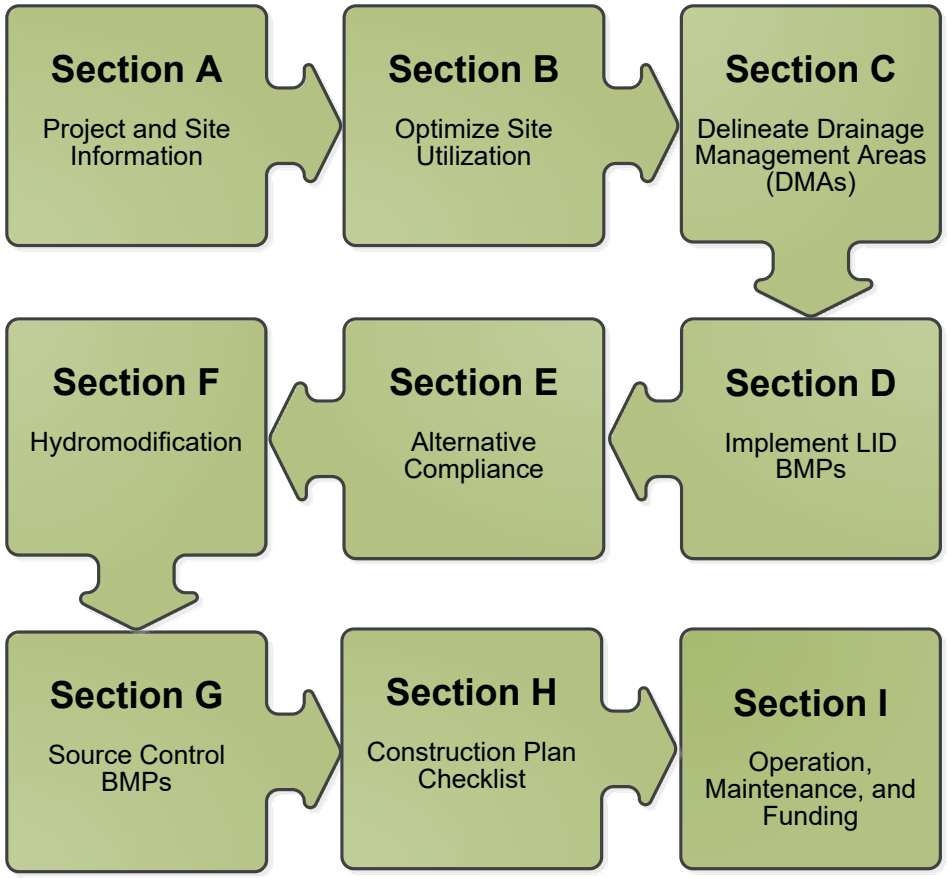
A Brief Introduction

This Project-Specific WQMP Template for the **Santa Ana Region** has been prepared to help guide you in documenting compliance for your project. Because this document has been designed to specifically document compliance, you will need to utilize the WQMP Guidance Document as your "how-to" manual to help guide you through this process. Both the Template and Guidance Document go hand-in-hand, and will help facilitate a well prepared Project-Specific WQMP. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for Northgate Gonzalez Real Estate by Albert A. Webb Associates for the Northgate – 6th and Main Street project.

This WQMP is intended to comply with the requirements of the City of Corona for Corona Municipal Code Chapter 13.27 which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under City of Corona Water Quality Ordinance (Corona Municipal Code Chapter 13.27).

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature	Date
Owner's Printed Name	Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Preparer's Signature	Date
Preparer's Printed Name	Preparer's Title/Position

Preparer's Licensure:

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Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	Commercial
Planning Area:	City of Corona
Community Name:	Downtown Corona
Development Name:	SP-98-01 Downtown Corona Revitalization
PROJECT LOCATION	
Latitude & Longitude (DMS): 33°52'35.88"N, 117°34'5.22"W	
Project Watershed and Sub-Watershed: Santa Ana Watershed	
APN(s): 117-144-017, 117-142-0(06-09, 15-20), 117-103-0(26-27)	
Map Book and Page No.: Thomas Bros. Map Page 743 Grid D5	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Commercial
Proposed or Potential SIC Code(s)	5999
Area of Impervious Project Footprint (SF)	188,140
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	180925
Does the project consist of offsite road improvements?	☒ Y ☐ N
Does the project propose to construct unpaved roads?	☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?	☐ Y ☒ N
EXISTING SITE CHARACTERISTICS	
Total area of existing Impervious Surfaces within the project limits (SF)	95840
Is the project located within any MSHCP Criteria Cell?	☐ Y ☒ N
If so, identify the Cell number:	N/A
Are there any natural hydrologic features on the project site?	☐ Y ☒ N
Is a Geotechnical Report attached?	☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	B
What is the Water Quality Design Storm Depth for the project?	0.78 in

Project Description

The Northgate – 6th and Main Street project is a commercial development on approximately 5.7 acres of partially developed land. The project is bounded by Main Street to the east, Belle Avenue to the west, 6th Street to the south and residential lots to the north. The project proposes a commercial development to include a 40,000 sf market building, asphalt drive aisles and parking stalls, landscaped areas, concrete walkways and utility improvements and improvements to the existing bank building on the southwest corner of the site.

Runoff generated by the development of the Northgate project is proposed to be treated for water quality requirements by MWS units located throughout the site before being conveyed to an underground chamber system for increased runoff mitigation. A 4'x8', 4'x17', and an 8'x20' MWS unit are proposed onsite. A pump is proposed to limit the flows to Belle Avenue, following the existing drainage pattern.

Water quality treatment of runoff produced by the northeastern 0.2 acres of the project site (NE Area) discharging to Washburn Avenue is addressed by LID principles to achieve treatment to the maximum extent practicable. The landscaped areas are self-treating within the NE Area. The proposed condition impervious area is smaller than in the existing condition for this area and the QBMP calculation for the NE area results in a QBMP of 0.0 cfs Therefore, the overall site meets water quality treatment requirements.

A.1 Maps and Site Plans

When completing your Project-Specific WQMP, include a map of the local vicinity and existing site. In addition, include all grading, drainage, landscape/plant palette and other pertinent construction plans in Appendix 2. At a **minimum**, your WQMP Site Plan should include the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling

Use your discretion on whether or not you may need to create multiple sheets or can appropriately accommodate these features on one or two sheets. Keep in mind that the Co-Permittee plan reviewer must be able to easily analyze your project utilizing this template and its associated site plans and maps.

A.2 Identify Receiving Waters

Using Table A.1 below, list in order of upstream to downstream, the receiving waters that the project site is tributary to. Continue to fill each row with the Receiving Water's 303(d) listed impairments (if any), designated beneficial uses, and proximity, if any, to a RARE beneficial use. Include a map of the receiving waters in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Temescal Creek Reach 1A	Copper, Iron, Malathion, Oil and Grease	REC1, REC2, WARM, WILD	
Prado Basin Management Zone	pH	RARE, REC1, REC2, WARM, WILD	N/A
Santa Ana River Reach 2	N/A	AGR, GWR, RARE, REC1, REC2, SPWN, WARM, WILD	
Santa Ana River Reach 1	N/A	REC1, REC2, WARM, WILD	

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N

US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)* City of Corona Grading Permit, City of Corona Building Permit	☐ Y	☐ N

If yes is answered to any of the questions above, the Co-Permittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

Section B: Optimize Site Utilization (LID Principles)

Review of the information collected in Section 'A' will aid in identifying the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, **constraints** might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. **Opportunities** might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention BMPs), and differences in elevation (which can provide hydraulic head). Prepare a brief narrative for each of the site optimization strategies described below. This narrative will help you as you proceed with your LID design and explain your design decisions to others.

The 2010 Santa Ana MS4 Permit further requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible. Therefore, it is important that your narrative identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Similarly, you should also note opportunities that exist which will be utilized during project design. Upon completion of identifying Constraints and Opportunities, include these on your WQMP Site plan in Appendix 1.

Site Optimization

The following questions are based upon Section 3.2 of the WQMP Guidance Document. Review of the WQMP Guidance Document will help you determine how best to optimize your site and subsequently identify opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

The existing drainage pattern consists of sheet flow northwest towards Belle Avenue. The proposed project follows the existing drainage pattern. The overall project area will mitigate for increased runoff before discharging as surface flows to Belle Avenue.

Did you identify and protect existing vegetation? If so, how? If not, why?

The existing site is partially developed with two buildings and parking lots. The vacant lots have minimal vegetation so no existing vegetation is proposed to be protected.

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

Per a geotechnical investigation, the recommended design infiltration rates vary from 0.14 to 0.22 in/hr throughout the site. Due to poor infiltration capacities within the underlying soils of the project site, an infiltration-based BMP is not feasible to treat for water quality requirements. A copy of the investigation report can be found in Appendix 3.

Did you identify and minimize impervious area? If so, how? If not, why?

The impervious area will be minimized as much as possible while maintaining safe and usable facilities onsite. Landscaped areas have been provided throughout the project site along concrete walkways, around the proposed building, adjacent to parking areas, and in other feasible locations throughout the site.

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

Yes, however, based on the nature of the commercial development, not all runoff can feasibly be directed towards a pervious area before being captured. Pervious landscaped areas are proposed around the proposed buildings and within the parking lot areas in order to maximize the chances of runoff dispersing into landscaped areas before being captured. All inlets located onsite are provided with an MWS Treatment Vault to provide water quality treatment.

Section C: Delineate Drainage Management Areas (DMAs)

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping your project site into individual DMAs, complete Table C.1 below to appropriately categorize the types of classification (e.g., Type A, Type B, etc.) per DMA for your project site. Upon completion of this table, this information will then be used to populate and tabulate the corresponding tables for their respective DMA classifications.

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	DMA Type
DMA A	Roofs	7,215	D-Biotreatment
DMA A	Concrete/Asphalt	17,641	D-Biotreatment
DMA A	Ornamental Landscaping	2,965	D-Biotreatment
DMA B	Roofs	25,251	D-Biotreatment
DMA B	Concrete/Asphalt	93,400	D-Biotreatment
DMA B	Ornamental Landscaping	16,528	D-Biotreatment
DMA C	Roofs	20,923	D-Biotreatment
DMA C	Concrete/Asphalt	25,393	D-Biotreatment
DMA C	Ornamental Landscaping	5,524	D-Biotreatment

[1]*Reference Table 2-1 in the WQMP Guidance Document to populate this column*

Table C.2 Type 'A', Self-Treating Areas

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
NE Area	2,306		

Table C.3 Type 'B', Self-Retaining Areas

Self-Retaining Area				**Type 'C' DMAs that are draining to the Self-Retaining Area**		
DMA Name/ ID	Post-project surface type	Area (square feet) [A]	Storm Depth (inches) [B]	DMA Name / ID	[C] from Table C.4 = [C]	Required Retention Depth (inches) [D]

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA					**Receiving Self-Retaining DMA**		
DMA Name/ ID	Area (square feet)	Post-project surface type	Runoff factor	Product		Area (square feet)	Ratio
	[A]		[B]	[C] = [A] x [B]	DMA name /ID	[D]	[C]/[D]

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
DMA A	MWS Vault (4'x8')
DMA B	MWS Vault (8'x20')
DMA C	MWS Vault (4'x17')

Note: More than one drainage management area can drain to a single LID BMP, however, one drainage management area may not drain to more than one BMP.

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (see discussion in Chapter 2.4.4 of the WQMP Guidance Document for further details)? ☐ Y ☒ N

If yes has been checked, Infiltration BMPs shall not be used for the site. If no, continue working through this section to implement your LID BMPs. It is recommended that you contact your Co-Permittee to verify whether or not your project discharges to an approved downstream 'Highest and Best Use' feature.

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Co-Permittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.4.5. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		X
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		X
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?	X	
If Yes, list affected DMAs: **All DMAs**		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		X
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		X
Describe here:		

If you answered "Yes" to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

D.2 Harvest and Use Assessment

Please check what applies*:*

☐ Reclaimed water will be used for the non-potable water demands for the project.

☐Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).

☐The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired.

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If neither of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

Irrigation Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site:

Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.

Total Area of Irrigated Landscape: 0.63 ac

Type of Landscaping (Conservation Design or Active Turf): Active Turf

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: 4.4 ac

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

Enter your EIATIA factor: 0.98

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.

Minimum required irrigated area: 4.3 ac

Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
4.3 ac	0.63 ac

Toilet Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site:

Step 1: Identify the projected total number of daily toilet users during the wet season, and account for any periodic shut downs or other lapses in occupancy:

Projected Number of Daily Toilet Users: 75

Project Type: Commercial

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for toilet use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: 4.4 ac

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-1 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

Enter your TUTIA factor: 167 tu/ac

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of toilet users that would be required.

Minimum number of toilet users: 735

Step 5: Determine if harvesting stormwater runoff for toilet flushing use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required Toilet Users (Step 4)	**Projected number of toilet users (Step 1)**
735	75

Other Non-Potable Use Feasibility

Are there other non-potable uses for stormwater runoff on the site (e.g. industrial use)? See Chapter 2 of the Guidance for further information. If yes, describe below. If no, write N/A.

N/A

Step 1: Identify the projected average daily non-potable demand, in gallons per day, during the wet season and accounting for any periodic shut downs or other lapses in occupancy or operation.

Average Daily Demand: N/A

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for the identified non-potable use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: N/A

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-3 in Chapter 2 to determine the minimum demand for non-potable uses per tributary impervious acre.

Enter the factor from Table 2-3: N/A

Step 4: Multiply the unit value obtained from Step 4 by the total of impervious areas from Step 3 to develop the minimum number of gallons per day of non-potable use that would be required.

Minimum required use: N/A

Step 5: Determine if harvesting stormwater runoff for other non-potable use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required non-potable use (Step 4)	**Projected average daily use (Step 1)**
N/A	N/A

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment, unless a site-specific analysis has been completed that demonstrates technical infeasibility as noted in D.3 below.

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

Select one of the following:

☒ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (note the requirements of Section 3.4.2 in the WQMP Guidance Document).

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee to discuss this option. Proceed to Section E to document your alternative compliance measures.

D.4 Feasibility Assessment Summaries

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.2 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
DMA A	☐	☐	☐	☒	☐
DMA B	☐	☐	☐	☒	☐
DMA C	☐	☐	☐	☒	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

Based on the LID BMP Hierarchy, the Northgate – 6th and Main Street project proposes will utilize biotreatment (MWS units) to treat the water quality requirements. Infiltration BMPs are not feasible as a geotechnical investigation determined insufficient infiltration rates throughout the project site. Harvest and use BMPs are not feasible as the minimum required irrigated areas and toilet users are not met by the estimated project values. Bioretention BMPs are not feasible due to an insufficient area available for a bioretention basin.

D.5 LID BMP Sizing

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First**,** calculate the Design Capture Volume for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second**,** design the LID BMP to meet the required V_{BMP} using a method approved by the Copermittee. Utilize the worksheets found in the LID BMP Design Handbook or consult with your Copermittee to assist you in correctly sizing your LID BMPs. Complete Table D.3 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*DMA A*		
	[A]		[B]	[C]	[A] x [C]			
BLDG	*7215*	*Roofs*	*1*	*0.89*	*6435.8*	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate, Q_{BMP} (cfs)*	*Proposed Flow Rate on Plans (cfs)*
CONC	*17641*	*Concrete or Asphalt*	*1*	*0.89*	*15735.8*			
LS	*2965*	*Ornamental Landscaping*	*0.1*	*0.11*	*327.5*			
	A_T = Σ[A] 27821				Σ= [D] 22499.1	[E] 0.2	$[F] = \frac{[D]x[E]}{12}$ 0.1	[G] **0.1**

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*DMA B*		
	[A]		[B]	[C]	[A] x [C]			
BLDG	*25251*	*Roofs*	*1*	*0.89*	*22523.9*	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate, Q_{BMP} (cfs)*	*Proposed Flow Rate on Plans (cfs)*
CONC	*93400*	*Concrete or Asphalt*	*1*	*0.89*	*83312.8*			
LS	*16528*	*Ornamental Landscaping*	*0.1*	*0.11*	*1825.6*			
	A_T = Σ[A] 135179				Σ= [D] 107662.3	[E] 0.2	$[F] = \frac{[D]x[E]}{12}$ 0.5	[G] **0.5**

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*DMA C*		
	[A]		[B]	[C]	[A] x [C]			
BLDG	*20923*	*Roofs*	*1*	*0.89*	*18663.3*			
CONC	*25393*	*Concrete or Asphalt*	*1*	*0.89*	*22650.6*			
LS	*5524*	*Ornamental Landscaping*	*0.1*	*0.11*	*610.2*			
	A_T = Σ[A] 51840				Σ= [D] 41924.1	*Design Rainfall Intensity (in/hr)* [E] 0.2	*Design Flow Rate,* Q_{BMP} *(cfs)* $[F] = \frac{[D]x[E]}{12}$ 0.2	*Proposed Flow Rate on Plans (cfs)* [G] **0.2**

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

☒ LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

E.1 Identify Pollutants of Concern

Utilizing Table A.1 from Section A above which noted your project's receiving waters and their associated EPA approved 303(d) listed impairments, cross reference this information with that of your selected Priority Development Project Category in Table E.1 below. If the identified General Pollutant Categories are the same as those listed for your receiving waters, then these will be your Pollutants of Concern and the appropriate box or boxes will be checked on the last row. The purpose of this is to document compliance and to help you appropriately plan for mitigating your Pollutants of Concern in lieu of implementing LID BMPs.

Table E.1 Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features (check those that apply)	General Pollutant Categories							
	Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease
☐ Detached Residential Development	P	N	P	P	N	P	P	P
☐ Attached Residential Development	P	N	P	P	N	P	P	P(2)
☒ Commercial/Industrial Development	P(3)	P	P(1)	P(1)	P(5)	P(1)	P	P
☐ Automotive Repair Shops	N	P	N	N	P(4, 5)	N	P	P
☐ Restaurants (>5,000 ft²)	P	N	N	N	N	N	P	P
☐ Hillside Development (>5,000 ft²)	P	N	P	P	N	P	P	P
☒ Parking Lots (>5,000 ft²)	P(6)	P	P(1)	P(1)	P(4)	P(1)	P	P
☐ Retail Gasoline Outlets	N	P	N	N	P	N	P	P
Project Priority Pollutant(s) of Concern	☒	☒	☒	☒	☒	☒	☒	☒

P = Potential

N = Not Potential

(1) A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected

(2) A potential Pollutant if the project includes uncovered parking areas; otherwise not expected

(3) A potential Pollutant is land use involving animal waste

(4) Specifically petroleum hydrocarbons

(5) Specifically solvents

(6) Bacterial indicators are routinely detected in pavement runoff

E.2 Stormwater Credits

Projects that cannot implement LID BMPs but nevertheless implement smart growth principles are potentially eligible for Stormwater Credits. Utilize Table 3-8 within the WQMP Guidance Document to identify your Project Category and its associated Water Quality Credit. If not applicable, write N/A.

Table E.2 Water Quality Credits

Qualifying Project Categories	Credit Percentage[2]
N/A	
Total Credit Percentage[1]	

[1]*Cannot Exceed 50%*
[2]*Obtain corresponding data from Table 3-8 in the WQMP Guidance Document*

E.3 Sizing Criteria

After you appropriately considered Stormwater Credits for your project, utilize Table E.3 below to appropriately size them to the DCV, or Design Flow Rate, as applicable. Please reference Chapter 3.5.2 of the WQMP Guidance Document for further information.

Table E.3 Treatment Control BMP Sizing

DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Area x Runoff Factor**		***Enter BMP Name / Identifier Here***		
	[A]		[B]	[C]	[A] x [C]				
N/A						*Design Storm Depth (in)*	*Minimum Design Capture Volume or Design Flow Rate (cubic feet or cfs)*	*Total Storm Water Credit % Reduction*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*
	A_T = Σ[A]				Σ= [D]	[E]	$[F] = \frac{[D]x[E]}{[G]}$	[F] X (1-[H])	[I]

[B], [C] is obtained as described in Section 2.3.1 from the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is for Flow-Based Treatment Control BMPs [G] = 43,560, for Volume-Based Control Treatment BMPs, [G] = 12
[H] is from the Total Credit Percentage as Calculated from Table E.2 above
[I] as obtained from a design procedure sheet from the BMP manufacturer and should be included in Appendix 6

E.4 Treatment Control BMP Selection

Treatment Control BMPs typically provide proprietary treatment mechanisms to treat potential pollutants in runoff, but do not sustain significant biological processes. Treatment Control BMPs must have a removal efficiency of a medium or high effectiveness as quantified below:

- **High**: equal to or greater than 80% removal efficiency
- **Medium**: between 40% and 80% removal efficiency

Such removal efficiency documentation (e.g., studies, reports, etc.) as further discussed in Chapter 3.5.2 of the WQMP Guidance Document, must be included in Appendix 6. In addition, ensure that proposed Treatment Control BMPs are properly identified on the WQMP Site Plan in Appendix 1.

Table E.4 Treatment Control BMP Selection

Selected Treatment Control BMP Name or ID[1]	Priority Pollutant(s) of Concern to Mitigate[2]	Removal Efficiency Percentage[3]

[1] Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.

[2] Cross Reference Table E.1 above to populate this column.

[3] As documented in a Co-Permittee Approved Study and provided in Appendix 6.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

Once you have determined that the LID design is adequate to address water quality requirements, you will need to assess if the proposed LID Design may still create a HCOC. Review Chapters 2 and 3 (including Figure 3-7) of the WQMP Guidance Document to determine if your project must mitigate for Hydromodification impacts. If your project meets one of the following criteria which will be indicated by the check boxes below, you do not need to address Hydromodification at this time. However, if the project does not qualify for Exemptions 1, 2 or 3, then additional measures must be added to the design to comply with HCOC criteria. This is discussed in further detail below in Section F.2.

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply.

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, report results in Table F.1 below and provide your substantiated hydrologic analysis in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration	INSERT VALUE	INSERT VALUE	INSERT VALUE
Volume (Cubic Feet)	INSERT VALUE	INSERT VALUE	INSERT VALUE

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption? ☒ Y ☐ N

If Yes, HCOC criteria do not apply and note below which adequate sump applies to this HCOC qualifier:

Project is located within the Hydromodification exemption area based on Riverside County WAP geodatabase approved April 20, 2017. See Appendix 7. The Prado Dam serves as an adequate sump for the project site.

F.2 HCOC Mitigation

If none of the above HCOC Exemption Criteria are applicable, HCOC criteria is considered mitigated if they meet one of the following conditions:

a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

Be sure to include all pertinent documentation used in your analysis of the items a, b or c in Appendix 7.

Section G: Source Control BMPs

Source control BMPs include permanent, structural features that may be required in your project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and "housekeeping", that must be implemented by the site's occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective permanent BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, review the following procedure to specify Source Control BMPs for your site:

1. ***Identify Pollutant Sources*:** Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.

2. ***Note Locations on Project-Specific WQMP Exhibit*:** Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1.

3. ***Prepare a Table and Narrative*:** Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of runoff Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. **Add additional narrative** in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.

4. ***Identify Operational Source Control BMPs:*** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
On-site storm drain inlets	Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.	• Maintain and periodically repaint or replace inlet markings • Provide stormwater pollution prevention information to new site owners, lessees, or operators • See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality

		Handbooks at www.cabmphandbooks.com Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
Need for future indoor & structural pest control	Building features should discourage entry of pests	Provide Integrated Pest Management information to owners, lessees, and operators.
Landscape/Outdoor Pesticide Use	Final landscape plans will accomplish all of the following: • Preserve existing native trees, shrubs, and ground cover to the maximum extent possible • Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. • Where landscaped areas are used or retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. • Consider using pest-resistant plants, especially adjacent to hardscape. To ensure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plan interactions	• Maintain landscaping using minimum or no pesticides. • See applicable operations BMPs in "What you should know for……Landscape and Gardening" at http://rcflood.org/stormwater Provide IPM information to new owners, lessees and operators
Food Service	• Drains in the designated cleaning areas will connect to a grease interceptor before discharging to the sanitary sewer.	See the brochure, "The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ Provide this brochure to new site owners, lessees, and operators.
Refuse Areas	• Signs will be posted on or near dumpsters with the	Adequate number of receptacles will be provided throughout the site.

	words "Do not dump hazardous materials here" or similar. Enclosed refuse containers are to be used	Receptacles shall be regularly inspected, repaired and/or replaced if any leaks are identified. Receptacles shall be kept covered. Prohibit/prevent dumping of liquid or hazardous waste. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
Loading Docks	Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.	Move loaded and unloaded items indoors as soon as possible. See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
Fire Sprinkler Test Water	Water discharged from the fire sprinkler systems shall not enter the storm drain system. Discharged water from fire sprinkler testing shall be collected and used for onsite landscape or disposed of at a local waste water treatment plant.	See Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
Plazas, sidewalks, and parking lots		Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Section H: Construction Plan Checklist

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. Co-Permittee staff can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Section H will be completed and addressed in the Final WQMP.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

BELLE STREET

6TH STREET

MAIN STREET

WASHBURN AVENUE

PROP. UNDER SIDEWALK DRAIN

PROP. V-DITCH

PROP. PUMP

669.18 LP

646.09 FG

652.66 LP

652.81 LP

653.14 LP

666.20 LP

DMA A
Q_{BMP}=0.1 CFS

DMA B
Q_{BMP}=0.5 CFS

DMA C
Q_{BMP}=0.2 CFS

NE AREA
TREATED TO THE MAXIMUM EXTENT PRACTICABLE BY LID PRINCIPLES*.

SWEEP ROADWAYS REGULARLY TO PREVENT ACCUMULATION OF LITTER AND DEBRIS

MAINTAIN AND PERIODICALLY REPAINT INLET MARKINGS. NO DISCHARGE SHALL BE DUMPED INTO THE CATCH BASIN (TYP.)

POTENTIAL FOR LANDSCAPING/OUTDOOR PESTICIDE USE AT LANDSCAPED AREAS (TYP.) MAINTAIN LANDSCAPING USING MINIMUM OR NO PESTICIDES.

PROP. SD LINE

PROP. GREASE INTERCEPTOR

PROP. 4'X8' MWS

PROP. SEWER LINE

PROP. UNDERGROUND CHAMBER

PROP. 8'X20' MWS

PROP. 4'XIT' MWS

EX. SD

DCDA

LEGEND

- DRAINAGE MANAGEMENT BOUNDARY
- LANDSCAPING
- ROOF
- CONCRETE OR ASPHALT
- DMA A
- DMA B
- DMA C
- SELF-TREATING*
- FLOW DIRECTION
- SD — STORM DRAIN PIPE
- STORM INLET
- TRASH ENCLOSURE

DRAINAGE MANAGEMENT AREAS

LEGEND	DMA-A	DMA-B	DMA-C	NE AREA*
ROOFS (SF)	7,215	25,251	20,923	-
CONCRETE (SF)	17,641	93,400	25,393	6,020
LANDSCAPE (SF)	2,965	16,528	5,524	-
SELF-TREATING (SF)	-	-	-	2,306
Q_{BMP} (CFS)	0.1	0.5	0.2	0.0
Q_{TREAT} (CFS)	0.1	0.5	0.2	0.0

*NOTE: APPROX. 0.2 ACRES AT THE NORTHEAST CORNER OF THE SITE (NE AREA) DISCHARGES DIRECTLY TO WASHBURN AVE AS IN THE EXISTING CONDITION. DUE TO GRADING CONSTRAINTS TO CONNECT TO EXISTING WASHBURN AVE, THIS AREA IS TREATED TO THE MAXIMUM EXTENT PRACTICABLE BY LID PRINCIPLES. THE PROPOSED CONDITION IMPERVIOUS AREA IS LESS THAN IN THE EXISTING CONDITION IN THIS AREA AND THE QBMP CALCULATED FOR THIS AREA USING THE COUNTY WORKSHEET SHOWS A QBMP OF 0 CFS. THEREFORE, THE OVERALL SITE IS ACHIEVING THE PROPER WATER QUALITY TREATMENT REQUIREMENTS.
NE AREA EXISTING CONDITION % IMPERVIOUS: 84.7%
NE AREA PROPOSED CONDITION % IMPERVIOUS: 72.3%

1" = 30'
15 0 30 60 90

CITY OF CORONA

NORTHGATE - 6TH AND MAIN STREET
PRELIMINARY WQMP EXHIBIT

SCALE: 1" = 30'	ALBERT A. WEBB ASSOCIATES	ENGINEERING CONSULTANTS 3788 McCRAY STREET RIVERSIDE CA. 92506 PH. (951) 686-1070 FAX (951) 788-1256	W.O. 22-0253
DATE: 10/9/2025			SHEET 1
DESIGNED: EP			OF 2 SHEETS
CHECKED: JG			DWG. NO.
PLN CK REF:			
F.B.			

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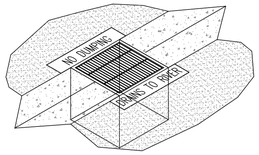
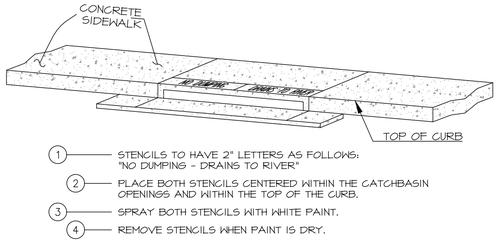
EXHCAD

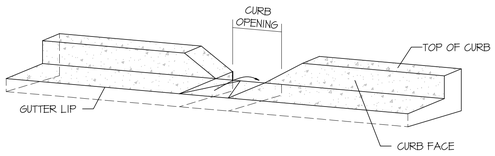




1. STENCILS TO HAVE 2" LETTERS AS FOLLOWS: "NO DUMPING - DRAINS TO RIVER"
2. PLACE BOTH STENCILS CENTERED WITHIN THE CATCHBASIN OPENINGS AND WITHIN THE TOP OF THE CURB.
3. SPRAY BOTH STENCILS WITH WHITE PAINT.
4. REMOVE STENCILS WHEN PAINT IS DRY.

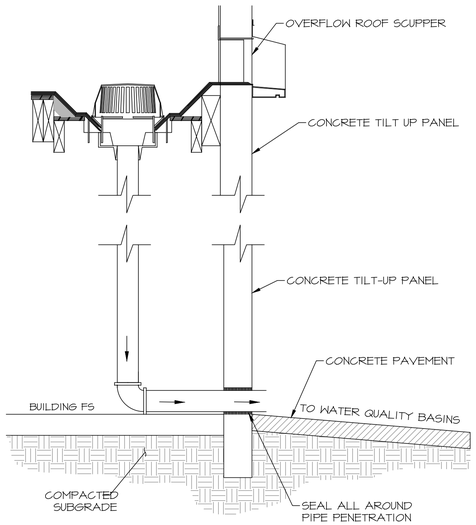
CATCH BASIN STENCILING DETAIL

NTS



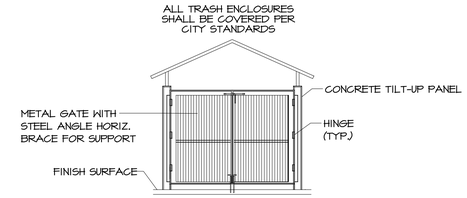
TYPICAL CURB OPENING DETAIL

N.T.S.



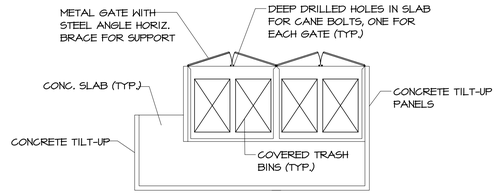
ROOF DRAIN DETAIL

N.T.S.



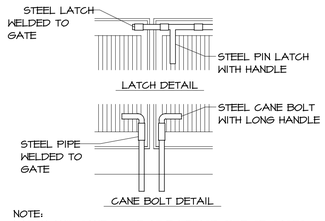
TRASH ENCLOSURE GATE ELEVATION

N.T.S.



TRASH ENCLOSURE PLAN DETAIL

N.T.S.



NOTE:
LATCH AND CANE TO BE AT EXTERIOR SIDE OF GATES

TRASH ENCLOSURE GATE LATCHES DETAIL

N.T.S.

CITY OF CORONA

NORTHGATE - 6TH AND MAIN STREET PRELIMINARY WQMP EXHIBIT

SCALE: N/A	ALBERT A. WEBB ASSOCIATES	W.O. 22-0253
DATE: 10/9/2025	ENGINEERING CONSULTANTS 3788 McCRAY STREET RIVERSIDE CA. 92506 PH. (951) 686-1070 FAX (951) 788-1256	SHEET 2
DESIGNED: EP		OF 2 SHEETS
CHECKED: JG		DWG. NO.
PLN CK REF:		
F.B.		

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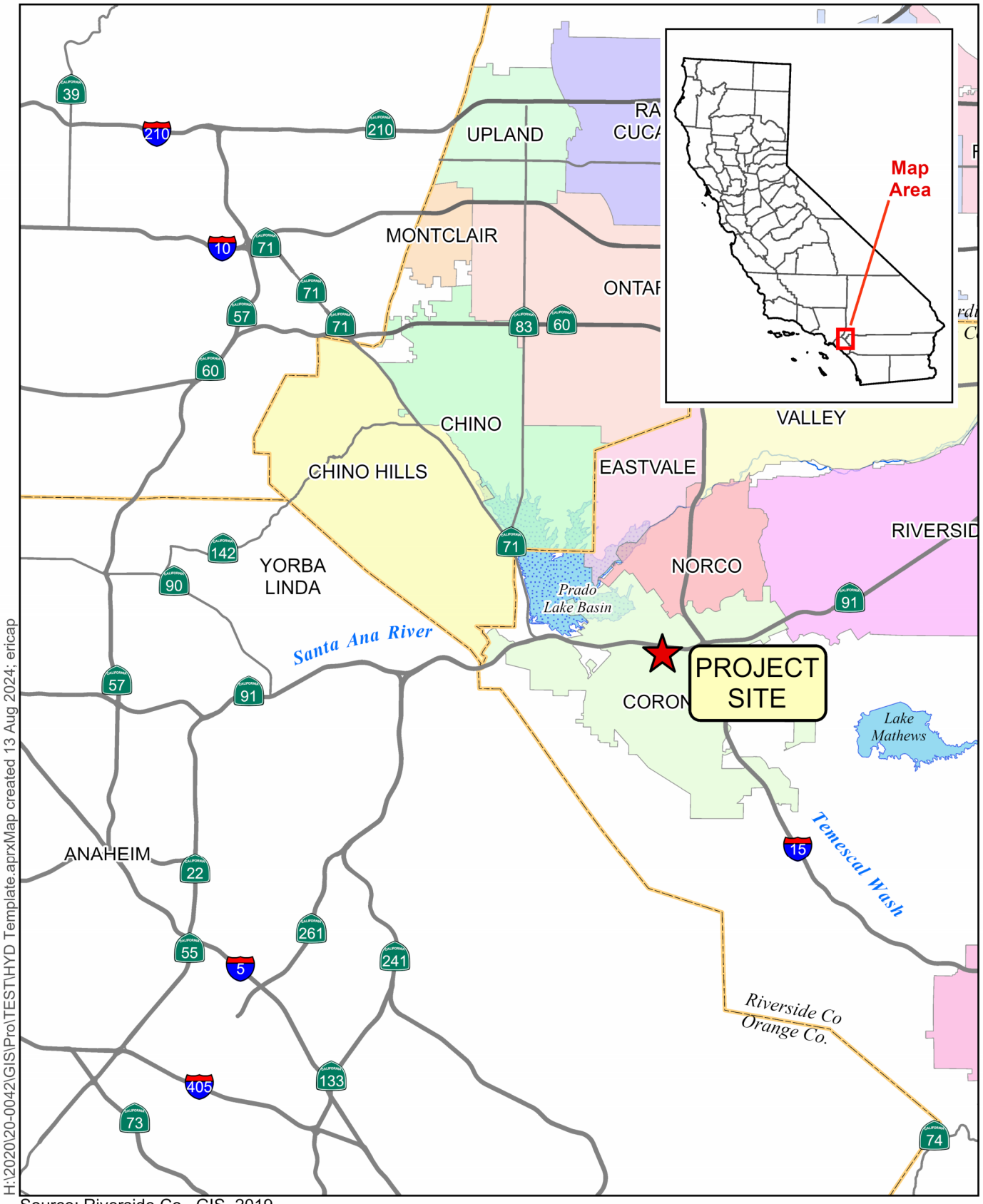
EXCAP



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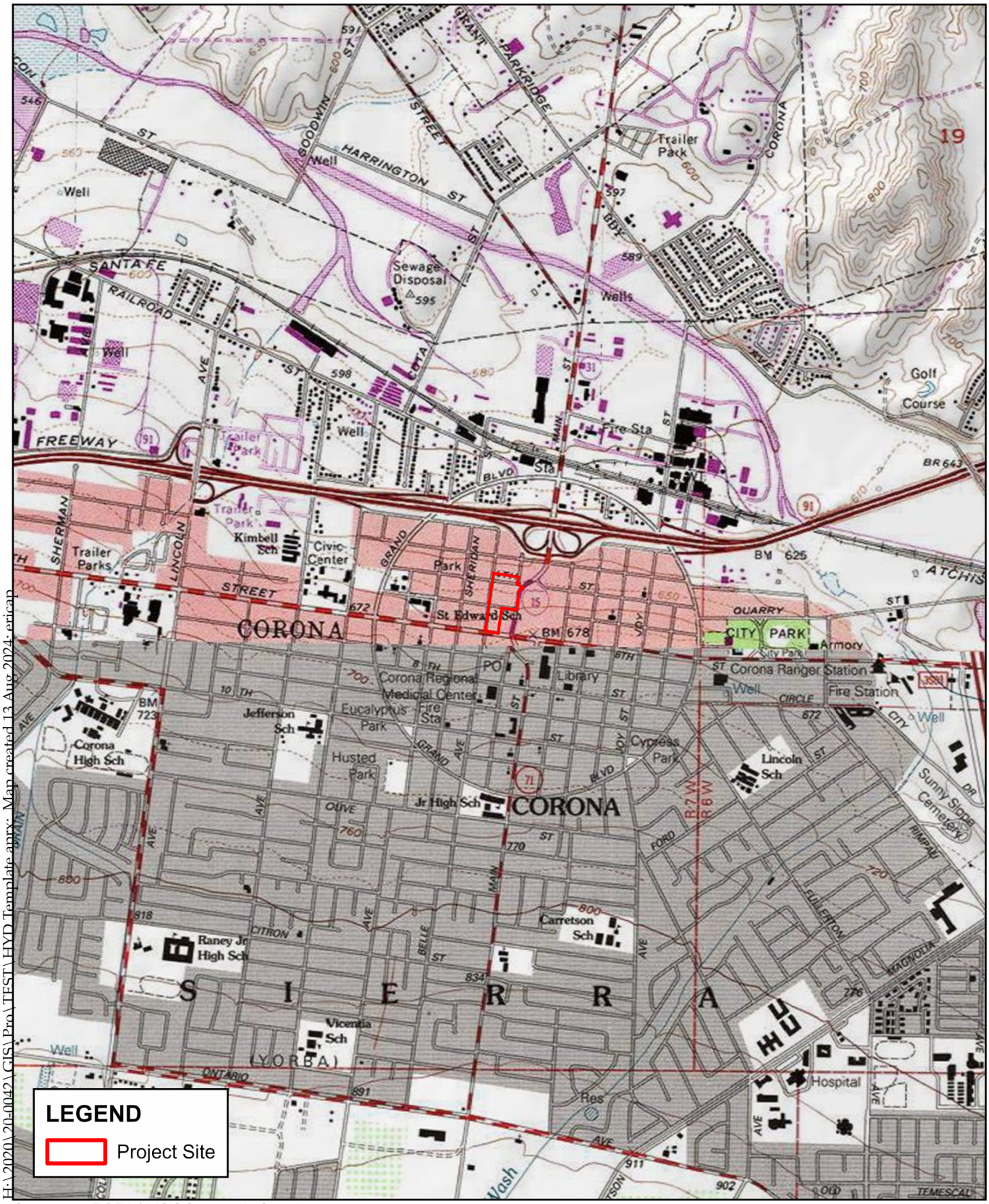
Source: Riverside Co. GIS, 2019

0 2 4 6 Miles

Figure 1 – Vicinity Map

22-0253 Northgate

ALBERT A. WEBB ASSOCIATES



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Sources: ESRI / USGS 7.5min Quad
DRGs: PERRIS

0 1,000 2,000 3,000 Feet

Figure 2 - USGS Map
22-0253 Northgate

ALBERT A. WEBB ASSOCIATES

H:\2020\20-0042\GIS\Pro\TEST\HYD Template.aprx Map created 13 Aug 2024

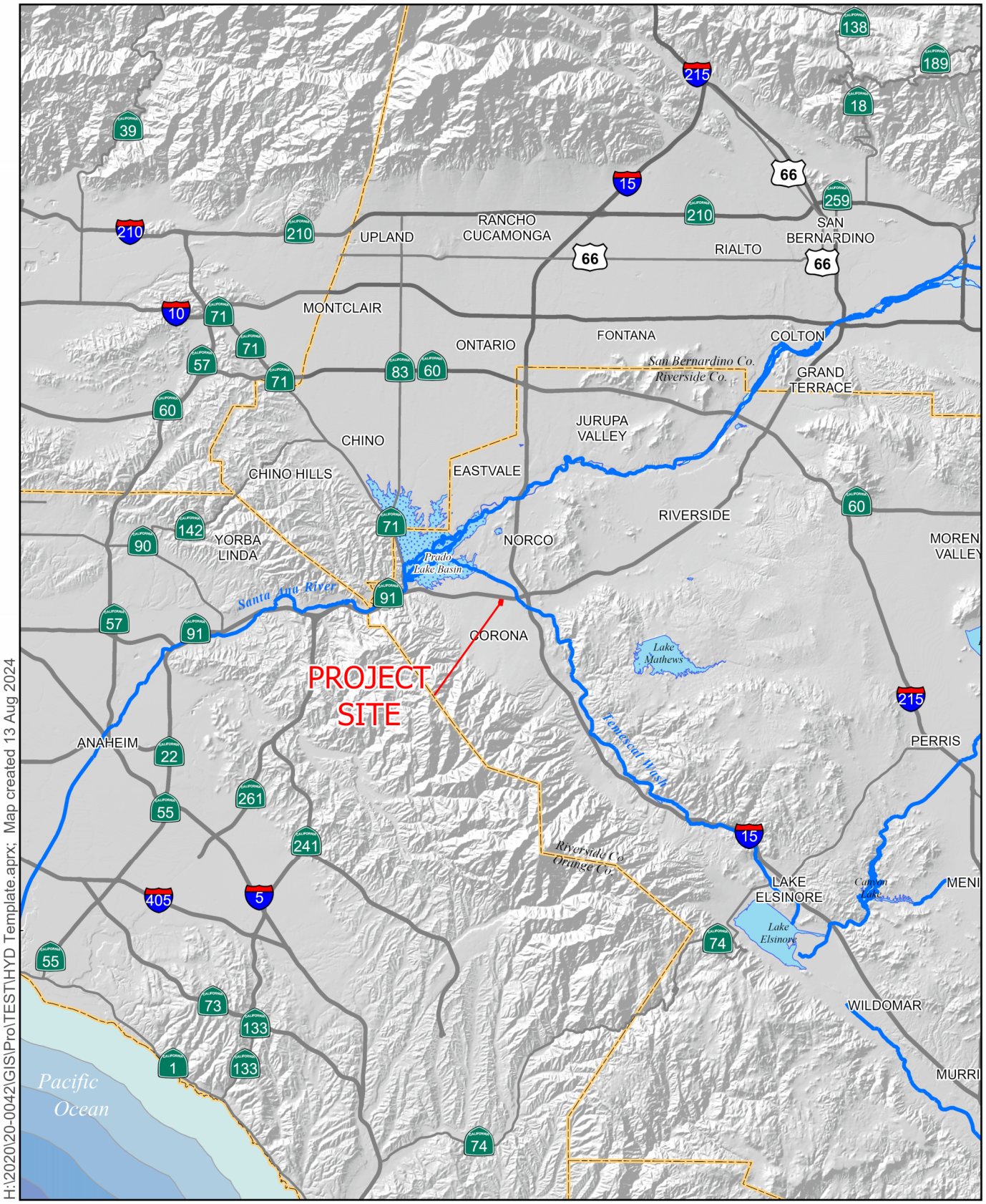
Source: Riverside Co. GIS, Jan. 2020.

Figure 3 - Aerial Map

22-0253 Northgate

0 600 1,200 1,800 Feet

ALBERT A. WEBB ASSOCIATES



Sources: USGS DLG; USGS 30m DEM

0 2 4 6 8 Miles

Figure 4 – Receiving Waterbodies

22-0253 Northgate

ALBERT A. WEBB ASSOCIATES

Appendix 2: Construction Plans

Grading and Drainage Plans

To be provided during Final engineering.

DPR2023-0021

IN THE CITY OF CORONA, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA
DEVELOPMENT PLAN REVIEW-2023-0021
NORTHGATE - 6TH & MAIN STREET

LEGAL DESCRIPTION

THIS PROPERTY SURVEYED AND SHOWN HEREON IS THE SAME PROPERTY AS DESCRIBED IN SCHEDULE A OF FIRST AMERICAN TITLE INSURANCE COMPANY PRELIMINARY REPORT ORDER NO. NCS-1200940-SA1, DATED NOVEMBER 21, 2023. THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF CORONA, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

APN(S): 117-144-017
LOTS 7 THROUGH 12, INCLUSIVE, OF BLOCK 145 OF THE SOUTH RIVERSIDE TOWNSITE, IN THE CITY OF CORONA, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP RECORDED IN BOOK 9, PAGES 6 AND 8 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY, TOGETHER WITH ALL THAT PORTION OF THE EAST-WEST UNNAMED ALLEY (16 FEET WIDE), AS VACATED AND CLOSED TO PUBLIC USE BY RESOLUTION NO. 76-70, RECORDED JUNE 24, 1976 AS INSTRUMENT NO. 90734 AND THE EASTERLY 6 FEET OF BELLE AVENUE VACATED AND CLOSED TO PUBLIC USE BY RESOLUTION 76-81, RECORDED JULY 16, 1976 AS INSTRUMENT NO. 103431, BOTH OF OFFICIAL RECORDS OF RIVERSIDE COUNTY.

APN(S): 117-142-006
THE NORTH 25 FEET OF LOT 10 IN BLOCK 154 OF SOUTH RIVERSIDE COLONY LANDS, AS SHOWN BY MAP ON FILE IN BOOK 9, PAGES 6 AND 8 OF MAPS, SAN BERNARDINO COUNTY RECORDS.

APN(S): 117-142-007
THE SOUTH 25 FEET OF LOT 10, BLOCK 154, SOUTH RIVERSIDE TOWNSITE, IN THE CITY OF CORONA, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 9, PAGES 6 AND 8 OF MAPS, SAN BERNARDINO COUNTY RECORDS.

APN(S): 117-142-008 & 117-142-009
LOTS 11 AND 12, BLOCK 154, OF THE SOUTH RIVERSIDE TOWNSITE, IN THE CITY OF CORONA, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 9, PAGES 6 AND 8, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN BERNARDINO COUNTY. EXCEPTING THEREFROM THE EASTERLY RECTANGULAR 70 FEET OF LOTS 11 AND 12.

APN(S): 117-142-015
LOT 7 OF BLOCK 154, LANDS OF SOUTH RIVERSIDE LAND AND WATER COMPANY, IN THE CITY OF CORONA, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 9, PAGES 6 AND 8 OF MAPS, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA.

TOGETHER WITH THAT PORTION OF FOURTH STREET, AS DESCRIBED IN RESOLUTION NO. 91-122 OF THE CITY COUNCIL OF THE CITY OF CORONA, ABANDONING A PORTION OF FOURTH STREET, RECORDED JUNE 30, 1993 AS INSTRUMENT NO. 252481, OF OFFICIAL RECORDS, WHICH WOULD PASS WITH SAID LAND BY OPERATION OF LAW.

ALSO TOGETHER WITH THAT PORTION OF THE NORTH/SOUTH ALLEY ALONG THE EASTERLY BOUNDARY OF SAID LAND, AS DESCRIBED IN RESOLUTION NO. 91-122 OF THE CITY COUNCIL OF THE CITY OF CORONA, ABANDONING A PORTION OF SAID ALLEY, RECORDED JUNE 30, 1993 AS INSTRUMENT NO. 252481, OF OFFICIAL RECORDS, WHICH WOULD PASS WITH SAID LAND BY OPERATION OF LAW.

APN(S): 117-142-016
LOT 6 IN BLOCK 154 OF THE SOUTH RIVERSIDE TOWNSITE, AS SHOWN BY MAP ON FILE IN BOOK 9, PAGE 8 OF MAPS, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA.

TOGETHER WITH THAT PORTION OF PARCELS A AND B VACATED BY RESOLUTION NO. 91-122, RECORDED JUNE 30, 1993 AS INSTRUMENT NO. 252481 OF OFFICIAL RECORDS, THAT WOULD PASS BY OPERATION OF LAW.

APN(S): 117-142-017
LOTS 4 AND 5 IN BLOCK 154 OF THE SOUTH RIVERSIDE TOWNSITE, AS SHOWN BY MAP ON FILE IN BOOK 9, PAGE 8 OF MAPS, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA;

TOGETHER WITH THAT PORTION OF THE WEST HALF OF WASHBURN AVENUE (NOW KNOWN AS MAIN STREET), ADJOINING SAID LOTS 4 AND 5 ON THE EAST, AS VACATED AND CLOSED TO PUBLIC USE BY RESOLUTION NO. 3818, RECORDED NOVEMBER 10, 1970 AS INSTRUMENT NO. 113229 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

AND TOGETHER WITH THAT PORTION OF PARCELS A AND B VACATED BY RESOLUTION NO. 91-122, RECORDED JUNE 30, 1993 AS INSTRUMENT NO. 252481 OF OFFICIAL RECORDS, THAT WOULD PASS BY OPERATION OF LAW.

APN(S): 117-142-018
LOT 8, BLOCK 154, OF SOUTH RIVERSIDE TOWNSITE, IN THE CITY OF CORONA, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 9, PAGES 6 AND 8, INCLUSIVE OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

TOGETHER WITH THAT PORTION OF THE NORTH/SOUTH ALLEY ALONG THE EASTERLY BOUNDARY OF SAID LAND, AS DESCRIBED IN RESOLUTION NO. 91-122 OF THE CITY COUNCIL OF THE CITY OF CORONA, ABANDONING A PORTION OF SAID ALLEY, RECORDED JUNE 30, 1993 AS INSTRUMENT NO. 252481, OF OFFICIAL RECORDS, WHICH WOULD PASS WITH SAID LAND BY OPERATION OF LAW.

APN(S): 117-142-019
LOT 9 OF BLOCK 154, OF SOUTH RIVERSIDE LAND AND WATER COMPANY, IN THE CITY OF CORONA, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 9, PAGES 6 AND 8 OF MAPS, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA.

TOGETHER WITH THAT PORTION OF THE NORTH/SOUTH ALLEY ALONG THE EASTERLY BOUNDARY OF SAID LAND, AS DESCRIBED IN RESOLUTION NO. 91-122 OF THE CITY COUNCIL OF THE CITY OF CORONA, ABANDONING A PORTION OF SAID ALLEY, RECORDED JUNE 30, 1993 AS INSTRUMENT NO. 252481, OF OFFICIAL RECORDS, WHICH WOULD PASS WITH SAID LAND BY OPERATION OF LAW.

APN(S): 117-142-020
LOTS 1, 2 AND 3 IN BLOCK 154 OF SOUTH RIVERSIDE TOWNSITE, AS SHOWN BY MAP ON FILE IN BOOK 9, PAGES 6 THROUGH 8 OF MAPS, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA.

APN(S): 117-103-026
LOT 12 IN BLOCK 168 OF SOUTH RIVERSIDE LAND AND WATER COMPANY, AS SHOWN BY MAP ON FILE IN BOOK 9 PAGES 6, 7 AND 8 OF MAPS, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA;

TOGETHER WITH THE PORTION OF THE WESTERLY HALF OF THE ALLEY ADJOINING SAID LOT 12 ON THE EAST AS VACATED BY RESOLUTION NO. 91-122, RECORDED JUNE 30, 1993 AS INSTRUMENT NO. 93-252481 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA;

AND TOGETHER WITH THAT PORTION OF THE NORTH HALF OF FOURTH STREET LYING BETWEEN THE SOUTHERLY PROLONGATIONS OF THE WESTERLY LINE OF SAID LOT 12 AND THE EASTERLY LINE OF THE WESTERLY HALF OF SAID ALLEY AS VACATED BY SAID RESOLUTION NO. 91-122.

APN 117-103-027
LOT 1 IN BLOCK 168 OF SOUTH RIVERSIDE TOWNSITE, AS SHOWN BY MAP ON FILE IN BOOK 9, PAGE(S) 8 OF MAPS, RECORDS OF RIVERSIDE COUNTY, CALIFORNIA;

TOGETHER WITH THE PORTION OF THE EASTERLY HALF OF THE ALLEY ADJOINING SAID LOT 1 ON THE WEST AS VACATED BY RESOLUTION NO. 91-122, RECORDED JUNE 30, 1993 AS INSTRUMENT NO. 93-252481 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA;

AND TOGETHER WITH THAT PORTION OF THE NORTH HALF OF FOURTH STREET LYING BETWEEN THE SOUTHERLY PROLONGATIONS OF THE EASTERLY HALF OF SAID ALLEY AND THE EASTERLY LINE OF SAID LOT 1 AS VACATED BY SAID RESOLUTION NO. 91-122;

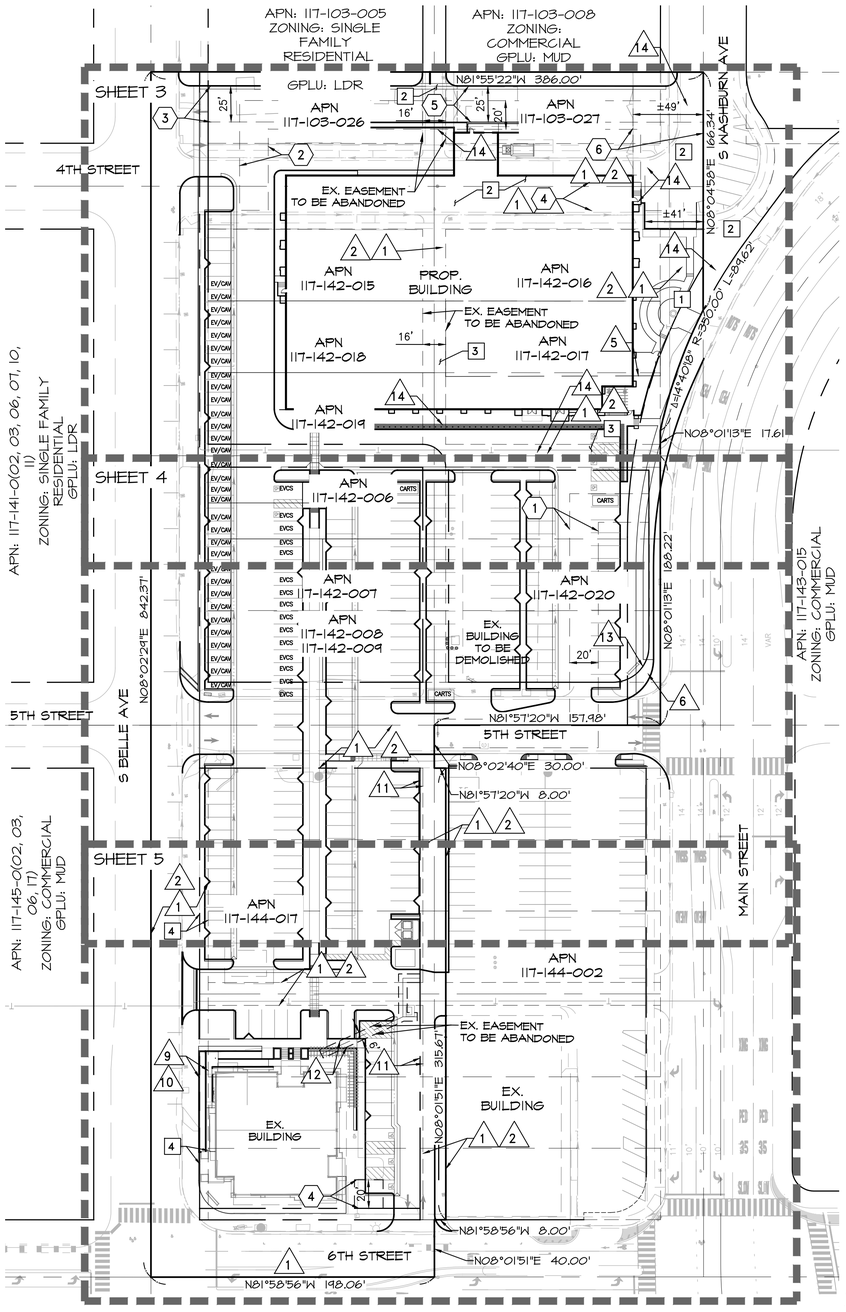
AND TOGETHER WITH THAT PORTION OF THE WEST HALF OF WASHBURN AVENUE ADJOINING LOT 1 ON THE EAST AS VACATED BY SAID RESOLUTION NO. 91-122.

DRAINAGE NOTE

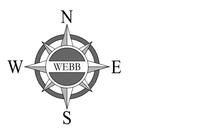
PROJECT PROPOSES STORM DRAIN CONNECTIONS AT MAIN STREET EXISTING STORM DRAIN (DRAWING NO. 1486 DATED 8-30-1967).

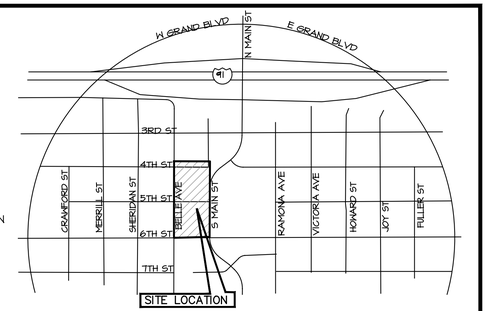
EXISTING UTILITY NOTE

AS-BUILT PLANS FOR MAJORITY OF EXISTING UTILITIES ARE NOT AVAILABLE FOR THIS PROJECT SITE PER CITY OF CORONA AND COUNTY OF RIVERSIDE. CONCEPTUAL UTILITY POINTS OF CONNECTIONS SHOWN AT BELL AVENUE AND MAIN STREET FOR INITIAL COORDINATION PURPOSES.



INDEX MAP
1" = 50'





UTILITY COMPANIES

WATER:	CITY OF CORONA (951) 736-2234
SEWER:	CITY OF CORONA (951) 736-2234
ELECTRIC:	SOUTHERN CALIFORNIA EDISON 1-(800) 655-4555
GAS:	SO. CAL. GAS COMPANY 1-(877) 238-0092
TELEPHONE:	CHARTER COMMUNICATIONS 1-(833) 694-4259

ENGINEER

ALBERT A. WEBB ASSOCIATES
3788 McCRAY STREET
RIVERSIDE, CA 92506
CONTACT: JENNIFER GILLEN
TEL: 951-320-6041

APPLICANT/DEVELOPER

NORTHGATE GONZALEZ REAL ESTATE
1201 N. MAGNOLIA AVE
ANAHEIM, CA 92801
CONTACT: ELIZABETH RESENDIZ
TEL: 714-687-7037

ARCHITECT

NADEL ARCHITECTURE & PLANNING
1990 S. BUNDY DRIVE, SUITE 400
LOS ANGELES, CA 90025
CONTACT: DAVID ANDERSON
TEL: 310-826-2100

PROPOSED SITE

NET SITE AREA	±4.88 AC
BUILDING TOTAL	46,930 SF
SITE COVERAGE	22.1%
FAR	0.22

BUILDING AREAS

MARKET	40,000 SF
BANK	3,693 SF
REST	3,247 SF
TOTAL	46,930 SF

PROPOSED PARKING

PARKING REQUIRED	258 STALLS
PARKING PROVIDED	271 STALLS
STREET PARKING	35 STALLS
LOT PARKING	236 STALLS
PARKING RATIO	5.69/1000

LAND USE

EXISTING LAND USE: COMMERCIAL
PROPOSED LAND USE: COMMERCIAL
EXISTING ZONING: DOWNTOWN, SINGLE FAMILY, GATEWAY BUSINESS
PROPOSED ZONING:DOWNTOWN SPECIFIC PLAN: (SP-98-01 DOWNTOWN CORONA REVITALIZATION)
EXISTING GENERAL PLAN LAND USE: MUD, GC AND LDR
PROPOSED GENERAL PLAN LAND USE: MUD (MIXED USE DOWNTOWN)

SHEET INDEX

PARCEL AREA TABLE		
PARCEL NO.	GROSS AREA	NET AREA
PARCEL 1	5.68 ACRES	4.88 ACRES

EASEMENT TABLE

1 — A RIGHT OF WAY RESERVED TO THE SOUTH RIVERSIDE LAND AND WATER COMPANY, ITS SUCCESSORS OR ASSIGNS, FOR THE CONSTRUCTION AND MAINTENANCE OF ALL NECESSARY WATER PIPES, DITCHES, FLUMES AND CONDUITS, FOR ALL PURPOSES OF IRRIGATION AND DOMESTIC USE; THE EXACT LOCATION THEREOF NOT BEING DISCLOSED BY THE RECORDS. [AFFECTS STREETS AND ALLEYS]

2 — AN EASEMENT SHOWN OR DEDICATED ON THE MAP OF SOUTH RIVERSIDE TOWNSITE RECORDED DECEMBER 12, 1887 AND ON FILE IN BOOK 9, PAGE(S) 6 AND 8, OF SAN BERNARDINO COUNTY TRACT MAPS. FOR: RIGHT TO LAY PIPES AND MAKE WATER DITCHES FOR PURPOSES OF CONVEYING WATER AND RUN STREET CARS, PROPELLED BY HORSES, STEAM, ELECTRICITY OR OTHER MOTIVE POWER AND INCIDENTAL PURPOSES. [AFFECT STREETS AND ALLEY

5 — THE EFFECT OF AN AGREEMENT RELATING TO A PARTY WALL ON THE NORTHERLY LINE OF THE LAND ADJOINING ON THE SOUTH, EXECUTED BY T.S. MCNAIR AND HELEN V. MCNAIR, HUSBAND AND WIFE, AS OWNERS OF THE PROPERTY HEREIN DESCRIBED, AND ALFRED C. WILSON AND OPAL M. WILSON, HUSBAND AND WIFE, AS OWNERS OF SAID ADJOINING PROPERTY, RECORDED JANUARY 27, 1954 IN BOOK 1548, PAGE 565 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA. REFERENCE HEREBY BEING MADE TO THE RECORD FOR FULL PARTICULARS.

6 — AN EASEMENT FOR STREETS AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED JUNE 03, 1968 AS INSTRUMENT NO. 1968-51414 OF OFFICIAL RECORDS. [CANNOT BE PLOTTED FROM RECORD INFORMATION DUE TO MISSING DISTANCES] [APPROXIMATE LOCATION SHOWN HEREON]

8 — THE FACT THAT THE LAND LIES WITHIN THE BOUNDARIES OF THE WASHBURN AVENUE (NOW KNOWN AS MAIN STREET) REDEVELOPMENT PROJECT AREA, AS DISCLOSED BY THE DOCUMENT RECORDED NOVEMBER 10, 1970 AS INSTRUMENT NO. 113229 OF OFFICIAL RECORDS.

9 — AN EASEMENT FOR CONSTRUCT, MAINTAIN, OPERATE, REPLACE, ENLARGE, REMOVE AND RENEW SANITARY SEWERS AND STORM DRAINS AND APPURTENANT STRUCTURES IN, UPON, OVER, BENEATH, UNDER, BELOW, ABOVE AND ACROSS SAID STREET OR PORTION THEREOF PROPOSED HEREIN TO BE VACATED AND PURSUANT TO ANY EXISTING FRANCHISES OR RENEWALS THEREOF OR OTHERWISE; AND TO CONSTRUCT, MAINTAIN, OPERATE, REPLACE, ENLARGE, REMOVE AND RENEW LINES OF PIPE, CONDUITS, CABLES, WIRES, GAS MAINS, UNDERGROUND CONDUITS, POLES, ANCHORS, WATER MAINS, AND OTHER CONVENIENT STRUCTURES, EQUIPMENT AND FIXTURES FOR THE OPERATION OF WATER, SEWAGE, AND GAS PIPELINES AND FOR THE TRANSPORTATION AND DISTRIBUTION OF WATER, ELECTRIC ENERGY, SEWAGE, GAS, TELEPHONE AND OTHER COMMUNICATION SERVICES AND INCIDENTAL PURPOSES, RECORDED JUNE 24, 1976 AS INSTRUMENT NO. 90734 OF OFFICIAL RECORDS, IN FAVOR OF SOUTHERN CALIFORNIA EDISON COMPANY, SOUTHERN CALIFORNIA GAS COMPANY AND PACIFIC TELEPHONE COMPANY.

10 — THE RIGHTS, IF ANY, OF A CITY, PUBLIC UTILITY OR SPECIAL DISTRICT TO PRESERVE A PUBLIC EASEMENT IN BELLE AVENUE AS THE SAME WAS VACATED BY THE DOCUMENT RECORDED JULY 16, 1976 AS INSTRUMENT NO. 103431 OF OFFICIAL RECORDS.

11 — AN EASEMENT FOR PUBLIC STREET AND INCIDENTAL PURPOSES, RECORDED NOVEMBER 29, 1976 AS INSTRUMENT NO. 76-182042 OF OFFICIAL RECORDS, IN FAVOR OF CITY OF CORONA, A MUNICIPAL CORPORATION AND A POLITICAL SUBDIVISION OF THE STATE OF CALIFORNIA.

12 — AN EASEMENT FOR UNDERGROUND ELECTRICAL SUPPLY SYSTEMS AND COMMUNICATION SYSTEMS AND INCIDENTAL PURPOSES, RECORDED MARCH 5, 1982 AS INSTRUMENT NO. 38131 OF OFFICIAL RECORDS, IN FAVOR OF SOUTHERN CALIFORNIA EDISON COMPANY, A CORPORATION.

13 — AN EASEMENT FOR PUBLIC ALLEY, PUBLIC STREET AND INCIDENTAL PURPOSES, RECORDED AUGUST 18, 1986 AS INSTRUMENT NO. 1986-191561 OF OFFICIAL RECORDS, IN FAVOR OF THE CITY OF CORONA.

14 — AN EASEMENT FOR UTILITIES AND RIGHTS OF WAY AND INCIDENTAL PURPOSES, RECORDED JUNE 30, 1993 AS INSTRUMENT NO. 252481 OF OFFICIAL RECORDS, IN FAVOR OF CITY OF CORONA.

(1) PROPOSED PUBLIC SEWER EASEMENT.
(2) PROPOSED PUBLIC WATER EASEMENT.
(3) PROPOSED INGRESS AND EGRESS EASEMENT.
(4) PROPOSED DCDA EASEMENT.
(5) PROPOSED EMERGENCY ACCESS EASEMENT.
(6) PROPOSED PUBLIC ACCESS EASEMENT.

NOTES:

1. VACATED AND CLOSED TO PUBLIC USE BY RESOLUTION NO. 3818, RECORDED NOVEMBER 10, 1970 AS INSTRUMENT NO. 113229 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.
2. PORTIONS OF PARCEL "A" VACATED BY RESOLUTION NO. 91-122, RECORDED JUNE 30, 1993 AS INSTRUMENT NO. 252481 O.R.
3. PORTIONS OF PARCEL "B" VACATED BY RESOLUTION NO. 91-122, RECORDED JUNE 30, 1993 AS INSTRUMENT NO. 252481 O.R.
4. VACATED PER INST. #1976-09734, RECORDED 06/24/1976 & INST. #1976-103431, RECORDED 07/16/1976.

PRELIMINARY

REVISIONS	DATE	BY

SCALE: 1" = 50'
DATE: 7/1/25
DESIGNED: RH
CHECKED: JRG
PLN CK REF:
F.B.

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE, CA. 92506
PH. (951) 686-1070
FAX (951) 788-1256

PLOT DATE: 7/1/25

CITY OF CORONA - DEVELOPMENT PLAN REVIEW 2023-0021
TITLE SHEET
NORTHGATE - 6TH & MAIN STREET

W.O. 22-0253
SHEET / OF 7 SHEETS
DWG. NO.

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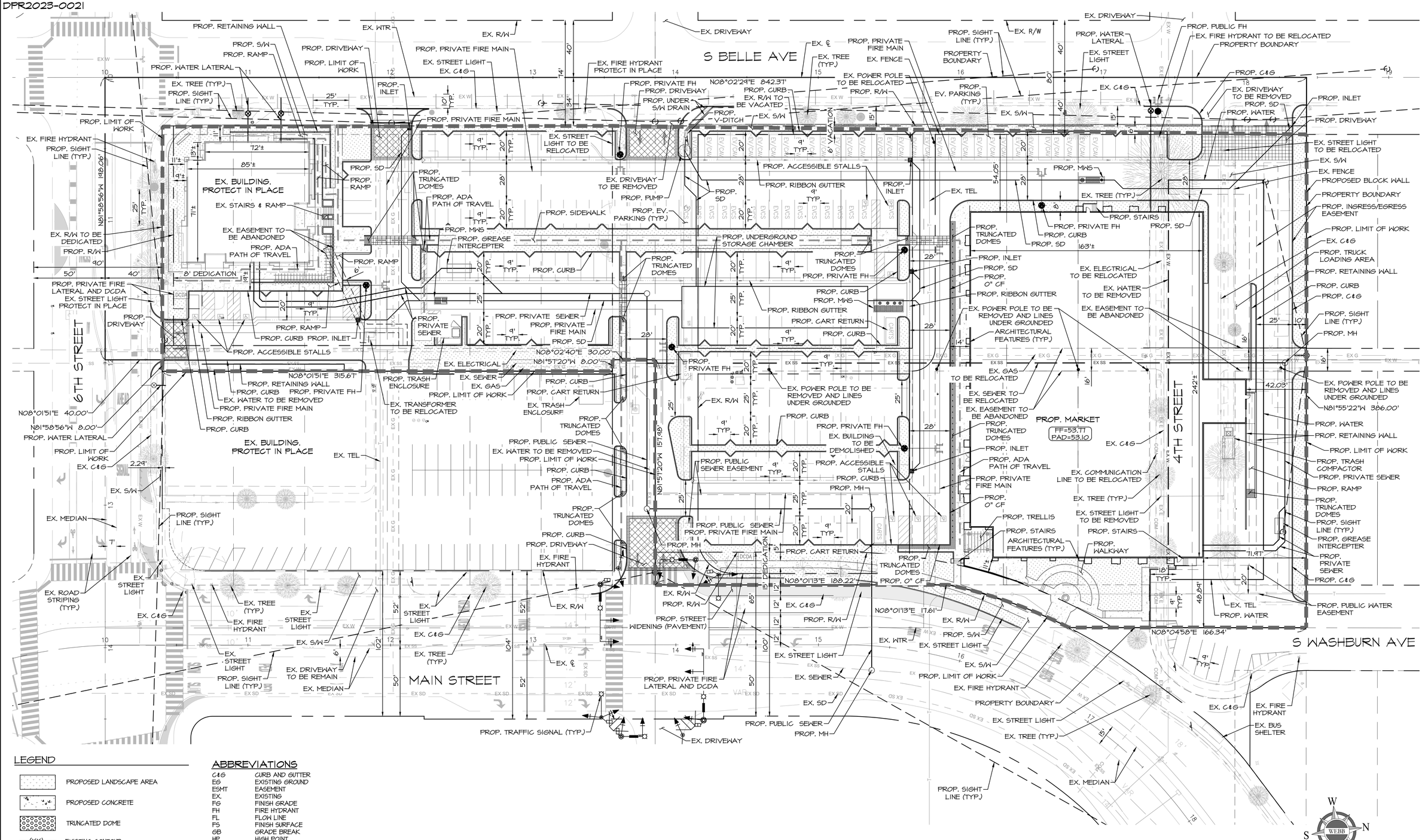
DPR2023-0021



LEGEND

- PROPOSED LANDSCAPE AREA
- PROPOSED CONCRETE
- TRUNCATED DOME
- —(XX)— EXISTING CONTOUR
- —XX— PROPOSED CONTOUR
- PROPOSED/EXISTING RIGHT OF WAY
- PROPERTY BOUNDARY
- ADA PATH OF TRAVEL
- PROPOSED SEWER
- PROPOSED WATER
- PROPOSED STORM DRAIN
- PROPOSED RETAINING WALL
- PROPOSED EASEMENT

ABBREVIATIONS

C&G	CURB AND GUTTER
EG	EXISTING GROUND
ESMT	EASEMENT
EX.	EXISTING
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FS	FINISH SURFACE
GB	GRADE BREAK
HP	HIGH POINT
LA	LANDSCAPE AREA
LP	LOW POINT
MWS	MODULAR WETLAND SYSTEM
P/L	PARCEL LINE
PP	POWER POLE
PROP.	PROPOSED
R/W	RIGHT OF WAY
SCE	SOUTHERN CALIFORNIA EDISON
SD	STORM DRAIN
SWR	SEWER
S/W	SIDEWALK
TC	TOP OF CURB
TYP.	TYPICAL
TPM	TENTATIVE PARCEL MAP
WTR	WATER

REVISIONS	DATE	BY

SCALE: 1" = 30'
DATE: 7/1/25
DESIGNED: RH
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PLN CK REF:
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FAX (951) 788-1256

PLOT DATE: 7/1/25

CITY OF CORONA - DEVELOPMENT PLAN REVIEW 2023-0021
PROPOSED SITE PLAN
NORTHGATE - 6TH & MAIN STREET

W.O. 22-0253
SHEET 2 OF 7 SHEETS
DWG. NO.

PRELIMINARY

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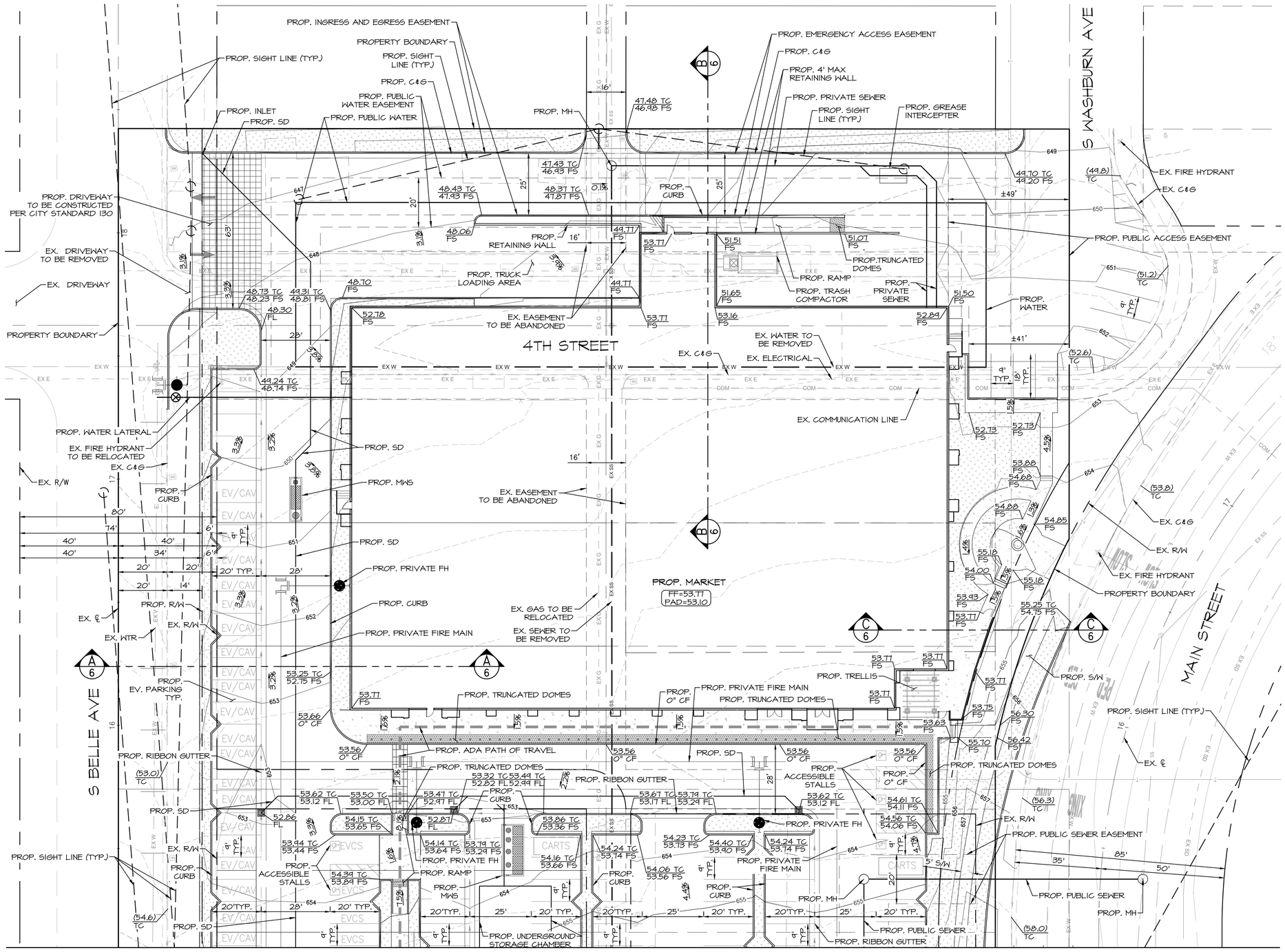
NOTE: ADD 600 TO ALL PROPOSED ELEVATIONS



SEE SHEET 4

LEGEND

- PROPOSED LANDSCAPE AREA
- PROPOSED CONCRETE
- TRUNCATED DOME
- (XX) EXISTING CONTOUR
- XX PROPOSED CONTOUR
- PROPOSED/EXISTING RIGHT OF WAY
- PROPERTY BOUNDARY
- ADA PATH OF TRAVEL
- PROPOSED SEWER
- PROPOSED WATER
- PROPOSED STORM DRAIN
- PROPOSED RETAINING WALL
- PROPOSED EASEMENT

EASEMENT TABLE

1	PROPOSED PUBLIC SEWER EASEMENT.
2	PROPOSED PUBLIC WATER EASEMENT.
3	PROPOSED INGRESS AND EGRESS EASEMENT.
4	PROPOSED DCDA EASEMENT.
5	PROPOSED EMERGENCY ACCESS EASEMENT.
6	PROPOSED PUBLIC ACCESS EASEMENT.

N W E S WEBB

1" = 20'

20 0 20 40 60

PRELIMINARY

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REVISIONS	DATE	BY

SCALE: 1" = 20'
DATE: 7/1/25
DESIGNED: RH
CHECKED: JRG
PLN CK REF:
F.B.

ALBERT A. WEBB ASSOCIATES
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FAX (951) 788-1256

PLOT DATE: 7/1/25

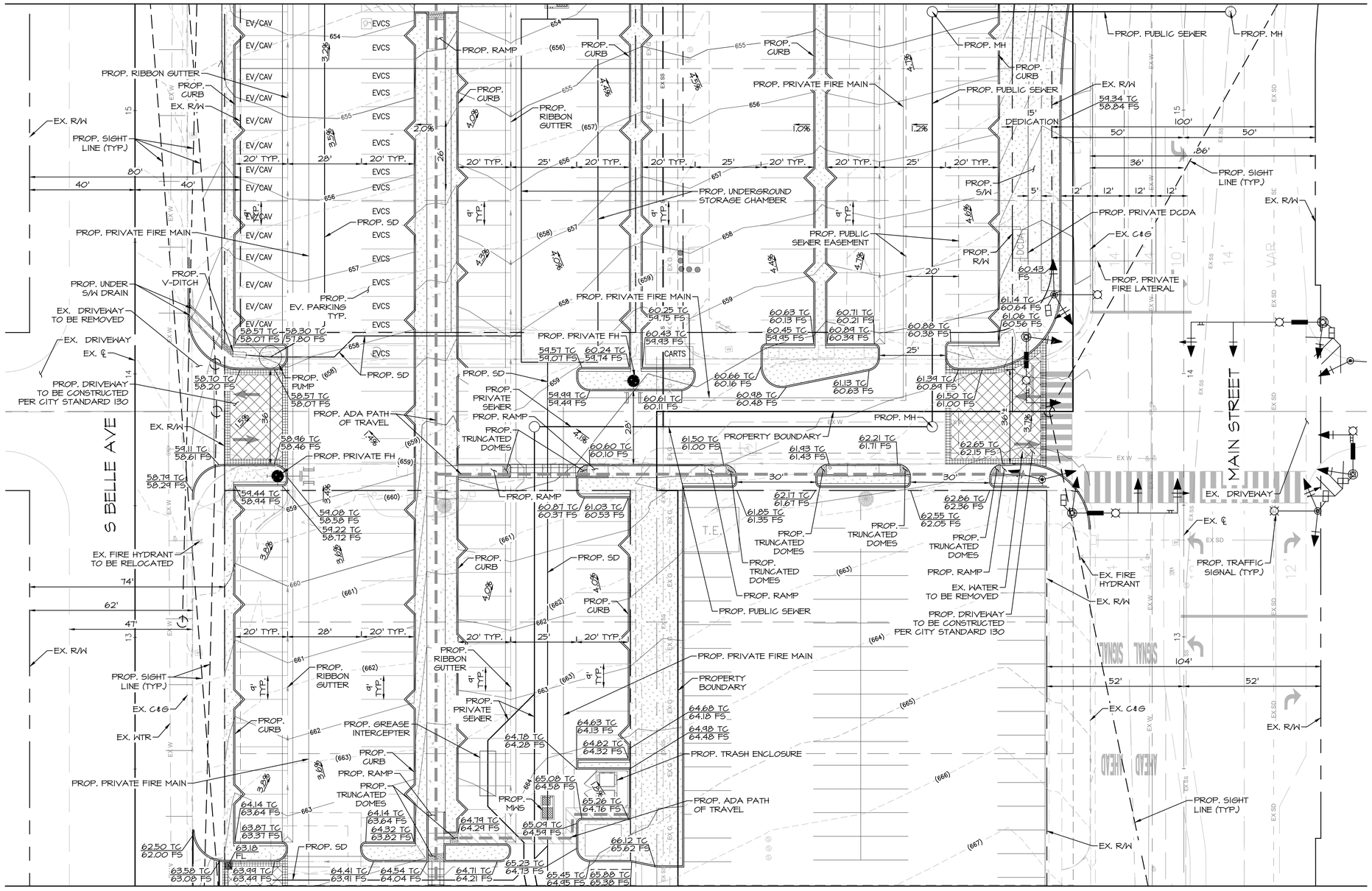
CITY OF CORONA - DEVELOPMENT PLAN REVIEW 2023-0021
CONCEPTUAL GRADING PLAN
NORTHGATE - 6TH & MAIN STREET

W.O. 22-0253
SHEET 3 OF 7 SHEETS
DWG. NO.

DPR2023-0021

NOTE: ADD 600 TO ALL PROPOSED ELEVATIONS

SEE SHEET 3



SEE SHEET 5

LEGEND

- PROPOSED LANDSCAPE AREA
- PROPOSED CONCRETE
- TRUNCATED DOME
- (XX) EXISTING CONTOUR
- XX PROPOSED CONTOUR
- PROPOSED/EXISTING RIGHT OF WAY
- PROPERTY BOUNDARY
- ADA PATH OF TRAVEL
- PROPOSED SEWER
- PROPOSED WATER
- PROPOSED STORM DRAIN
- PROPOSED RETAINING WALL
- PROPOSED EASEMENT

N W E S WEBB

1" = 20'

20 0 20 40 60

PRELIMINARY

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REVISIONS	DATE	BY

SCALE: 1" = 20'
DATE: 7/1/25
DESIGNED: RH
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PLOT DATE: 7/1/25

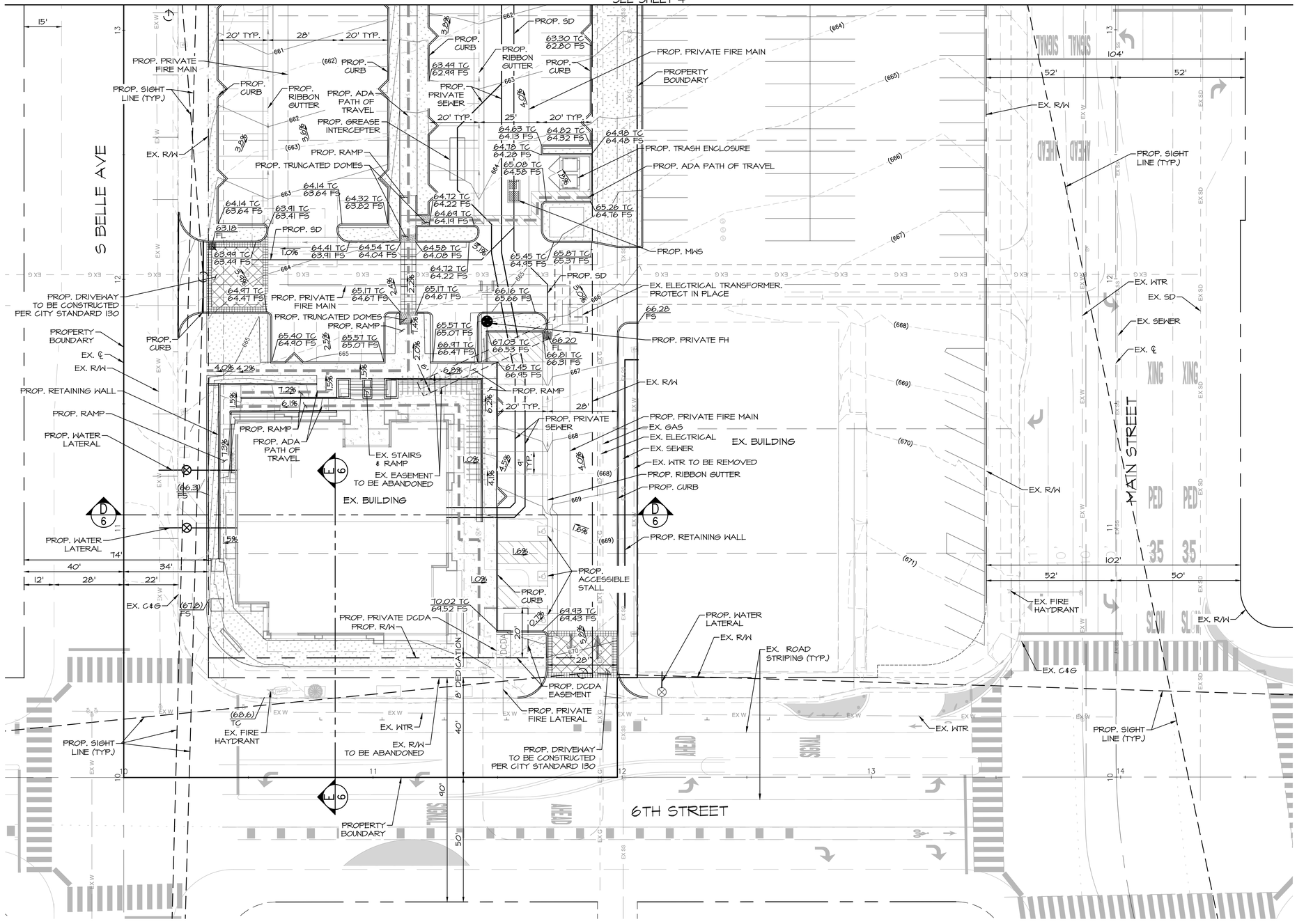
CITY OF CORONA - DEVELOPMENT PLAN REVIEW 2023-0021
CONCEPTUAL GRADING PLAN
NORTHGATE - 6TH & MAIN STREET

W.O. 22-0253
SHEET 4 OF 7 SHEETS
DWG. NO.

DPR2023-0021

SEE SHEET 4

NOTE: ADD 600 TO ALL PROPOSED ELEVATIONS



LEGEND

- PROPOSED LANDSCAPE AREA
- PROPOSED CONCRETE
- TRUNCATED DOME
- (XX) EXISTING CONTOUR
- XX PROPOSED CONTOUR
- PROPOSED/EXISTING RIGHT OF WAY
- PROPERTY BOUNDARY
- ADA PATH OF TRAVEL
- PROPOSED SEWER
- PROPOSED WATER
- PROPOSED STORM DRAIN
- PROPOSED RETAINING WALL

N W E S

1" = 20'

20 0 20 40 60

PRELIMINARY

REVISIONS	DATE	BY

SCALE: 1" = 20'
DATE: 7/1/25
DESIGNED: RH
CHECKED: JRG
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F.B.

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CITY OF CORONA - DEVELOPMENT PLAN REVIEW 2023-0021
CONCEPTUAL GRADING PLAN
NORTHGATE - 6TH & MAIN STREET

W.O. 22-0253
SHEET 5 OF 7 SHEETS
DWG. NO.

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DPR2023-0021

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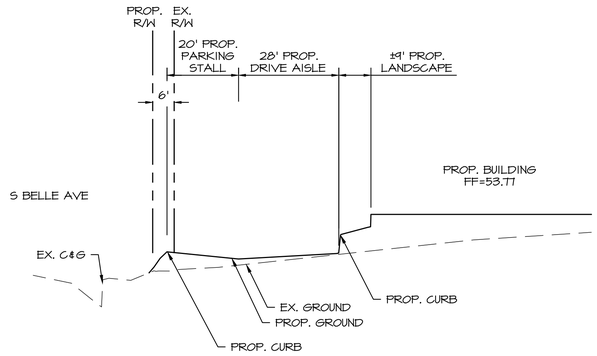
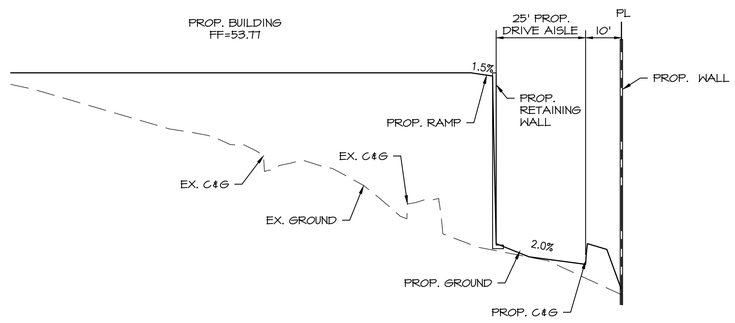


SECTION A-A

SCALE: 1" = 20'
VERTICAL EXAGGERATION: 10



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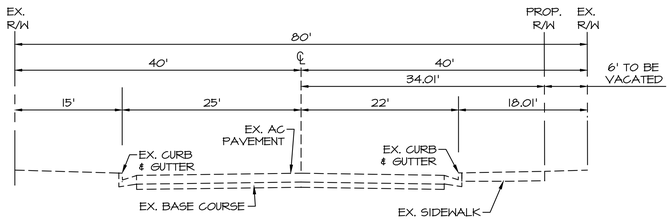
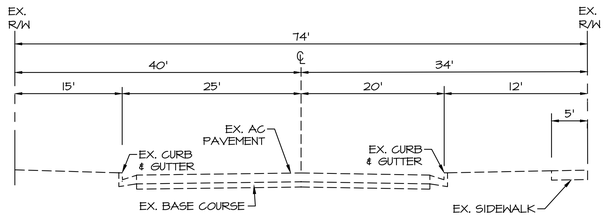


S BELLE AVE
NORTH OF 5TH STREET
NTS



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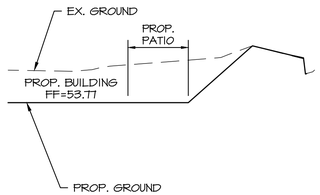

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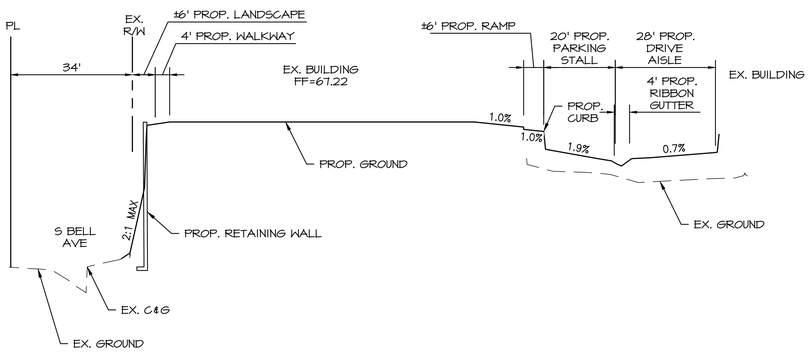

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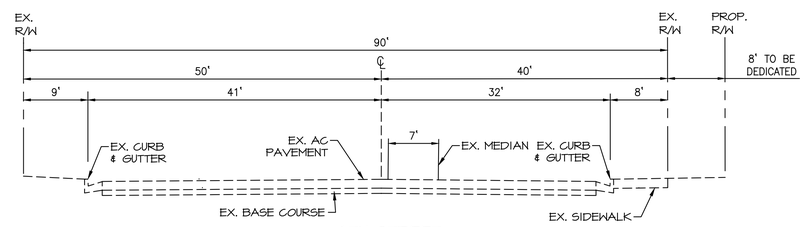

6TH STREET
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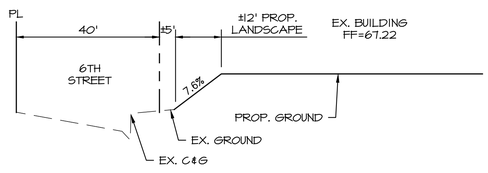

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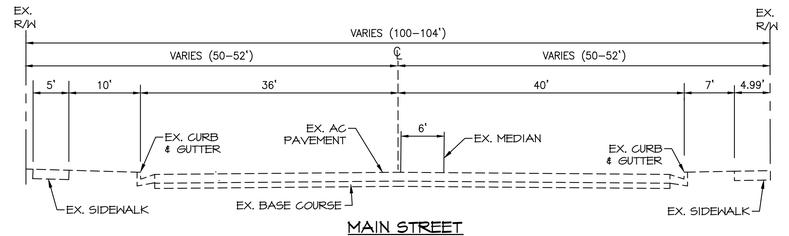
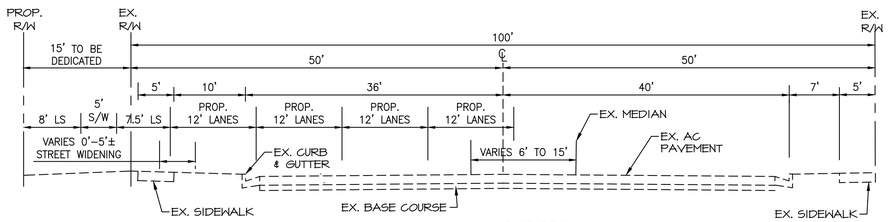


MAIN STREET
NTS



MAIN STREET
NORTH OF 5TH STREET
R/W VACATION ALONG FRONTAGE
NTS

PRELIMINARY

H:\2022\22-0253\DRAWINGS\ENTITLEMENT\22-0253-DPR PLAN.DWG 7/1/2025 8:49:49 AM Katrina

REVISIONS	DATE	BY	
SCALE: 1" = 20'			
DATE: 7/1/25			
DESIGNED: RH			
CHECKED: JRG			
PLN CK REF:			
F.B.			

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH: (951) 686-1070
FAX (951) 788-1256

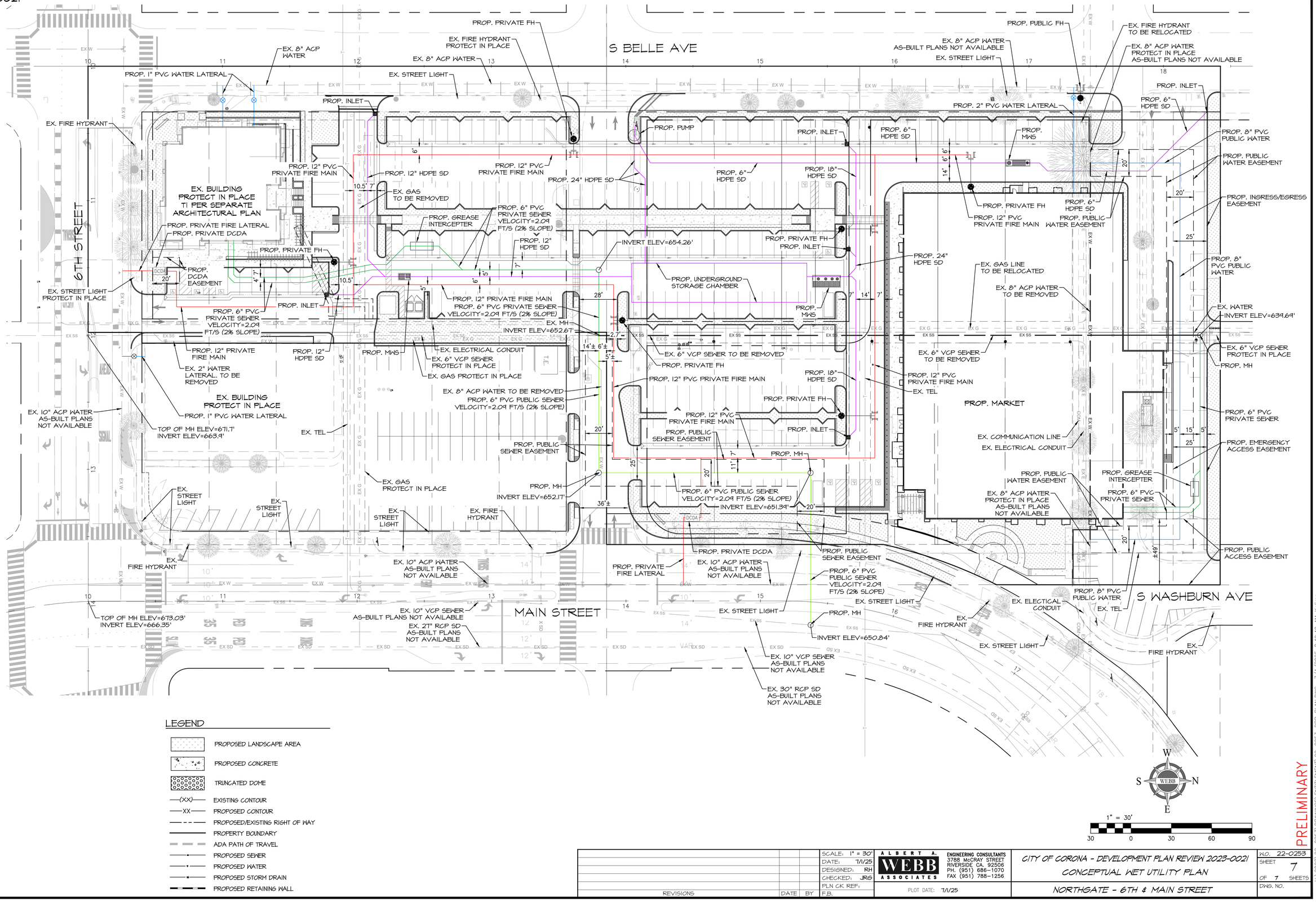
PLOT DATE: 7/1/25

CITY OF CORONA - DEVELOPMENT PLAN REVIEW 2023-0021
CROSS SECTIONS

NORTHGATE - 6TH & MAIN STREET

W.O. 22-0253
SHEET 6
OF 7 SHEETS
DWG. NO.

DPR2023-0021



LEGEND

- PROPOSED LANDSCAPE AREA
- PROPOSED CONCRETE
- TRUNCATED DOME
- (XX) EXISTING CONTOUR
- XX PROPOSED CONTOUR
- PROPOSED/EXISTING RIGHT OF WAY
- PROPERTY BOUNDARY
- ADA PATH OF TRAVEL
- PROPOSED SEWER
- PROPOSED WATER
- PROPOSED STORM DRAIN
- PROPOSED RETAINING WALL

PRELIMINARY

REVISIONS	DATE	BY

SCALE: 1" = 30'
DATE: 7/1/25
DESIGNED: RH
CHECKED: JRG
PLN CK REF:
F.B.

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FAX (951) 788-1256

PLOT DATE: 7/1/25

CITY OF CORONA - DEVELOPMENT PLAN REVIEW 2023-0021
CONCEPTUAL WET UTILITY PLAN

NORTHGATE - 6TH & MAIN STREET

W.O. 22-0253
SHEET 7
OF 7 SHEETS
DWG. NO.

H:\2022\22-0253\DRAWINGS\ENTITLEMENT\22-0253-DPR PLAN.DWG 7/1/2025 8:49:49 AM Katrina

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

GEOTECHNICAL • ENVIRONMENTAL • GEOLOGY • MATERIALS TESTING & INSPECTION • FORENSIC • LABORATORY

SALEM
engineering group, inc.

GEOTECHNICAL ENGINEERING INVESTIGATION

PROPOSED RETAIL DEVELOPMENT
NWC 6TH STREET & MAIN STREET
CORONA, CALIFORNIA

SALEM PROJECT NO. 3-222-1216
DECEMBER 20, 2022

PREPARED FOR:

MS. ELIZABETH RESENDIZ
NORTHGATE GONZALES REAL ESTATE, LLC
1201 N. MAGNOLIA AVENUE
ANAHEIM, CA 92801

PREPARED BY:

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December 20, 2022 Project No. 3-222-1216

Ms. Elizabeth Resendiz
Northgate Gonzales Real Estate, LLC
1201 N. Magnolia Avenue
Anaheim, CA 92801

SUBJECT: **GEOTECHNICAL ENGINEERING INVESTIGATION**
PROPOSED RETAIL DEVELOPMENT
NWC 6TH STREET & MAIN STREET
CORONA, CALIFORNIA

Dear Ms. Resendiz:

At your request and authorization, SALEM Engineering Group, Inc. (SALEM) has prepared this Geotechnical Engineering Investigation report for the Proposed Retail Development to be located at the subject site.

The accompanying report presents our findings, conclusions, and recommendations regarding the geotechnical aspects of designing and constructing the project as presently proposed. In our opinion, the proposed project is feasible from a geotechnical viewpoint provided our recommendations are incorporated into the design and construction of the project.

We appreciate the opportunity to assist you with this project. Should you have questions regarding this report or need additional information, please contact the undersigned at (909) 980-6455.

Respectfully Submitted,

SALEM ENGINEERING GROUP, INC.

Ibrahim Foud Ibrahim, PE
Senior Managing Engineer
RCE 86724

Clarence Jiang, GE
Senior Geotechnical Engineer
RGE 2477

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GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED RETAIL DEVELOPMENT
NWC 6TH STREET & MAIN STREET
CORONA, CALIFORNIA

1. PURPOSE AND SCOPE

This report presents the results of our Geotechnical Engineering Investigation for the site of the Proposed Retail Development to be located at the northwest corner of the intersection of 6th Street and Main Street in the city of Corona, California (see Figure 1, Vicinity Map).

The purpose of our geotechnical engineering investigation was to observe and sample the subsurface conditions encountered at the site, and provide conclusions and recommendations relative to the geotechnical aspects of constructing the project as presently proposed.

The scope of this investigation included a field exploration, laboratory testing, engineering analysis and the preparation of this report. Our field exploration was performed on December 1, 2022, and included the drilling of eight (8) small-diameter soil borings to a maximum depth of 21½ feet at the site. Additionally, two (2) percolation tests were performed at depths of approximately 2½ and 4 feet below ground surface to determine the infiltration rates. The locations of the soil borings and percolation tests are depicted on the Site Plan, Figure 2. A detailed discussion of our field investigation, exploratory boring logs, and percolation tests are presented in Appendix A.

Laboratory tests were performed on selected soil samples obtained during the investigation to evaluate pertinent physical properties for engineering analyses. Appendix B presents the laboratory test results in tabular and graphic format. The recommendations presented herein are based on analysis of the data obtained during the investigation and our experience with similar soil and geologic conditions.

If project details vary significantly from those described herein, SALEM should be contacted to determine the necessity for review and possible revision of this report. Earthwork and Pavement Specifications are presented in Appendix C. If text of the report conflict with the specifications in Appendix C, the recommendations in the text of the report have precedence.

2. PROJECT DESCRIPTION

Based on the Site Plan provided to us, we understand that the proposed development of the site will include demolition of two existing commercial buildings and construction of a 35,000 square-foot market building and an 8,000 square-foot restaurant/shops building, and remodel of an existing 11,273 square-foot building. Maximum wall load is expected to be on the order of 3 kips per linear foot. Maximum column load is expected to be on the order of 50 kips. Floor slab soil bearing pressure is expected to be on the order of 150 psf.

A site grading plan was not available at the time of preparation of this report. As the site is gently sloping to the north, we anticipate that cuts and fills during the earthwork will be limited to providing level building pads and positive site drainage. In the event that changes occur in the nature or design of the project, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and the conclusions of our report are modified. The site configuration and locations of proposed improvements are shown on the Site Plan, Figure 2.

3. SITE LOCATION AND DESCRIPTION

The subject site is near rectangular in shape and is located at the northwest corner of the intersection of 6th Street and Main Street in the city of Corona, California (see Vicinity Map, Figure 1). The site extends to 4th Street to the north, with 5th street dividing the northern and southern halves of the site.

At the time of our field exploration, the site was predominately developed with 3 commercial buildings and a drive-thru kiosk with associated asphalt concrete pavement and landscaping. The northern portion of the site was mostly vacant with miscellaneous grass, and former slabs and paved areas. The site is gently sloping to the north with elevations ranging from 669 to 647 feet above mean sea level based on Google Earth imagery.

Based on available historical imagery, the northern portion of the site was previously occupied by single-family residences and a commercial/industrial building. Those buildings were demolished starting from around 2005 through 2013.

4. FIELD EXPLORATION

Our field exploration consisted of site surface reconnaissance and subsurface exploration. The exploratory test borings (B-1 through B-8) were drilled on December 1, 2022, at the approximate locations shown on the Site Plan, Figure 2. The test borings were advanced with 6⅝-inch hollow stem augers rotated by a truck-mounted CME 75 drill rig. The test borings were extended to a maximum depth of 21½ feet below existing grade. Drilling depth was limited at borings B-1 through B-4 due to auger refusal on gravel and cobbles.

The materials encountered in the test borings were visually classified in the field, and logs were recorded by a field engineer and stratification lines were approximated on the basis of observations made at the time of drilling. Visual classification of the materials encountered in the test borings were generally made in accordance with the Unified Soil Classification System (ASTM D2488). A soil classification chart and key to sampling is presented on the Unified Soil Classification Chart, in Appendix "A." The logs of the test borings are presented in Appendix "A." The Boring Logs include the soil type, color, moisture content, dry density, and the applicable Unified Soil Classification System symbol.

The location of the test borings were determined by measuring from features shown on the Site Plan provided to us. Hence, accuracy can be implied only to the degree that this method warrants. The actual boundaries between different soil types may be gradual and soil conditions may vary. For a more detailed description of the materials encountered, the Boring Logs in Appendix "A" should be consulted.

Soil samples were obtained from the test borings at the depths shown on the logs of borings. The MCS samples were recovered and capped at both ends to preserve the samples at their natural moisture content;

SPT samples were recovered and placed in a sealed bag to preserve their natural moisture content. The borings were backfilled with soil cuttings and patched with asphalt (within pavement areas) after completion of the drilling.

5. LABORATORY TESTING

Laboratory tests were performed on selected soil samples to evaluate their physical characteristics and engineering properties. The laboratory-testing program was formulated with emphasis on the evaluation of natural moisture and density, shear strength, consolidation, maximum density and optimum moisture determination, and gradation of the materials encountered.

In addition, chemical tests were performed to evaluate the corrosivity of the soils to buried concrete and metal. Details of the laboratory test program and the results of laboratory test are summarized in Appendix "B." This information, along with the field observations, was used to prepare the final boring logs in Appendix "A".

6. GEOLOGIC SETTING

The subject site is located within the Inland Valley, within the Peninsular Ranges Geomorphic Province of California. The Inland Valley is situated between the San Bernardino Mountains to the northeast, the San Gabriel Mountains to the north, the Chino Hills to the southwest, and to the southeast by the hilly uplands that separate it from the San Jacinto Basin. These mountain ranges are part of the Transverse Ranges Geomorphic Province of California.

The Inland Valley is dominated by northwest-trending faults and adjacent anticlinal uplifts. The intervening deep synclinal troughs are filled with poorly consolidated Upper Pleistocene and unconsolidated Holocene sediments. Tectonism of the region is dominated by the interaction of the East Pacific Plate and the North American Plate along a transform boundary. The Inland Valley has been filled with a variable thickness of relatively young, heterogeneous alluvial deposits. Deposits encountered on the subject site during exploratory drilling are discussed in detail in this report.

7. GEOLOGIC HAZARDS

7.1 Faulting and Seismicity

Based on the proximity of several dominant active faults and seismogenic structures, as well as the historic seismic record, the area of the subject site is considered subject to relatively high seismicity. The seismic hazard most likely to impact the site is ground-shaking due to a large earthquake on one of the major active regional faults. Moderate to large earthquakes have affected the area of the subject site within historic time.

There are no known active fault traces in the project vicinity. The project area is not within an Alquist-Priolo Earthquake Fault (Special Studies) Zone and will not require a special site investigation by an Engineering Geologist. Soils on site are classified as Site Class D – Default in accordance with Chapter 16 of the California Building Code.

The proposed structures are determined to be in **Seismic Design Category E**. To determine the distance of known active faults within 100 miles of the site, we used the United States Geological Survey (USGS) web-based application *2008 National Seismic Hazard Maps - Fault Parameters*. Site latitude is 33.8774° North; site longitude is 117.5679° West. The ten closest active faults are summarized in Table 7.1.

TABLE 7.1
REGIONAL FAULT SUMMARY

Fault Name	Distance to Site (miles)	Max. Earthquake Magnitude, M_w
Chino; alt 2	2.3	6.8
Chino; alt 1	2.4	6.7
Elsinore; W+GI+T+J+CM	3.6	7.9
Elsinore; GI+T+J+CM	3.6	7.7
San Jose	17.1	6.7
Puente Hills (Coyote Hills)	17.3	6.9
Elsinore; T+J+CM	17.7	7.6
San Joaquin Hills	18.6	7.1
Cucamonga	19.4	6.7
Sierra Madre Connected	19.6	7.3

The faults tabulated above and numerous other faults in the region are sources of potential ground motion. However, earthquakes that might occur on other faults throughout California are also potential generators of significant ground motion and could subject the site to intense ground shaking.

7.2 Surface Fault Rupture

The site is not within a currently established State of California Earthquake Fault Zone for surface fault rupture hazards. No active faults with the potential for surface fault rupture are known to pass directly beneath the site. Therefore, the potential for surface rupture due to faulting occurring beneath the site during the design life of the proposed development is considered low.

7.3 Ground Shaking

Seismic coefficients and spectral response acceleration values were developed based on the 2019 California Building Code (CBC). The CBC methodology for determining design ground motion values is based on the Office of Statewide Health Planning and Development (OSHPD) Seismic Design Maps, which incorporate both probabilistic and deterministic seismic ground motion.

Based on the 2019 CBC, a Site Class D – Default represents the on-site soil conditions. A table providing the recommended design acceleration parameters for the project site, based on the Site Class D – Default designation, is included in Section 9.2.1 of this report.

Based on the Office of Statewide Health Planning and Development (OSHPD) Seismic Design Maps, the estimated design peak ground acceleration adjusted for site class effects (PGA_M) was determined to be 1.026g (based on both probabilistic and deterministic seismic ground motion).

7.4 Liquefaction

Soil liquefaction is a state of soil particles suspension caused by a complete loss of strength when the effective stress drops to zero. Liquefaction normally occurs under saturated conditions in soils such as sand in which the strength is purely frictional. Primary factors that trigger liquefaction are: moderate to strong ground shaking (seismic source), relatively clean, loose granular soils (primarily poorly graded sands and silty sands), and saturated soil conditions (shallow groundwater). Due to the increasing overburden pressure with depth, liquefaction of granular soils is generally limited to the upper 50 feet of a soil profile. However, liquefaction has occurred in soils other than clean sand.

The soils encountered within the depth of 21½ feet on the project site consisted predominately of loose to very dense silty sand with various amounts of gravel, gravelly silty sand and sandy gravel; and firm to hard sandy silt with various amounts of gravel. The historically highest groundwater is estimated to be at a depth of greater than 50 feet below ground surface according to the regional groundwater data. In according with the Riverside County Office of Information Technology GIS, the site is located within a low liquefaction potential zone. Based on the depth to groundwater, the liquefaction potential of the site is considered to be low and mitigation measures are not warranted.

7.5 Lateral Spreading

Lateral spreading is a phenomenon in which soils move laterally during seismic shaking and is often associated with liquefaction. The amount of movement depends on the soil strength, duration and intensity of seismic shaking, topography, and free face geometry. Due to the low liquefaction potential, we judge the likelihood of lateral spreading to be low.

7.6 Landslides

There are no known landslides at the site, nor is the site in the path of any known or potential landslides. We do not consider the potential for a landslide to be a hazard to this project.

7.7 Tsunamis and Seiches

The site is not located within a coastal area. Therefore, tsunamis (seismic sea waves) are not considered a significant hazard at the site. Seiches are large waves generated in enclosed bodies of water in response to ground shaking. No major water-retaining structures are located immediately up gradient from the project site. Flooding from a seismically-induced seiche is considered unlikely.

8. SOIL AND GROUNDWATER CONDITIONS

8.1 Subsurface Conditions

The subsurface conditions encountered appear typical of those found in the geologic region of the site. In general, the soils within the depth of exploration consisted of loose to very dense silty sand with various amounts of gravel, gravelly silty sand and sandy gravel; and firm to hard sandy silt with various amounts of gravel.

Fill soils are expected to be present onsite between our test boring locations since the site was graded for the previous and current developments. The consistency of the fill materials should be verified during site grading. Prior to fill placement, Salem Engineering Group, Inc. should inspect the bottom of the excavation to verify no additional excavation will be required.

The soils were classified in the field during the drilling and sampling operations. The stratification lines were approximated by the field engineer on the basis of observations made at the time of drilling. The actual boundaries between different soil types may be gradual and soil conditions may vary. For a more detailed description of the materials encountered, the Boring Logs in Appendix "A" should be consulted. The Boring Logs include the soil type, color, moisture content, dry density, and the applicable Unified Soil Classification System symbol. The locations of the test borings were determined by measuring from feature shown on the Site Plan, provided to us. Hence, accuracy can be implied only to the degree that this method warrants.

8.2 Groundwater

The test boring locations were checked for the presence of groundwater during and after the drilling operations. Free groundwater was not encountered during this investigation. The historically highest groundwater within the site vicinity is estimated to be at a depth greater than 50 feet below ground surface according to regional groundwater well data.

It should be recognized that water table elevations may fluctuate with time, being dependent upon seasonal precipitation, irrigation, land use, localized pumping, and climatic conditions as well as other factors. Therefore, water level observations at the time of the field investigation may vary from those encountered during the construction phase of the project. The evaluation of such factors is beyond the scope of this report.

8.3 Soil Corrosion Screening

Excessive sulfate in either the soil or native water may result in an adverse reaction between the cement in concrete and the soil. The 2014 Edition of ACI 318 (ACI 318) has established criteria for evaluation of sulfate and chloride levels and how they relate to cement reactivity with soil and/or water. A soil sample was obtained from the project site and was tested for the evaluation of the potential for concrete deterioration or steel corrosion due to attack by soil-borne soluble salts and soluble chloride. The water-soluble sulfate concentration in the saturation extract from the soil sample was detected to be less than 50 mg/kg. ACI 318 Tables 19.3.1.1 and 19.3.2.1 outline exposure categories, classes, and concrete requirements by exposure class.

ACI 318 requirements for site concrete based upon soluble sulfate are summarized in Table 8.3 below.

TABLE 8.3
WATER SOLUBLE SULFATE EXPOSURE REQUIREMENTS

Water Soluble Sulfate (SO_4) in Soil, % by Weight	Exposure Severity	Exposure Class	Maximum w/cm Ratio	Min. Concrete Compressive Strength	Cementitious Materials Type
<0.0050	Not Severe	S0	N/A	2,500 psi	No Restriction

The water-soluble chloride concentration detected in saturation extract from the soil samples was 50 mg/kg. This level of chloride concentration is considered to be mildly corrosive. It is recommended that a qualified corrosion engineer be consulted regarding protection of buried steel or ductile iron piping and conduit or, at a minimum, applicable manufacturer's recommendations for corrosion protection of buried metal pipe be closely followed.

8.4 Percolation Testing

Two percolation tests (P-1 and P-2) were performed within assumed infiltration areas and were conducted in accordance with the guidelines established by the County of Riverside. Results of the falling head tests are presented in the attachments to this report.

The approximate locations of the percolation tests are shown on the attached Site Plan, Figure 2. The boreholes were advanced to the depths shown on the percolation test worksheets. The holes were pre-saturated before percolation testing commenced. Percolation rates were measured by filling the test holes with clean water and measuring the water drops at a certain time interval. The difference in the percolation rates are reflected by the varied type of soil materials at the bottom of the test holes. The test results are shown on the table below.

TABLE 8.4
PERCOLATION TEST RESULTS

Test No.	Depth (Feet)	Tested Infiltration Rate[1] (inch/hour)	Design Infiltration Rate[2] (inch/hour)	Soil Type[3]
P-1	3	**0.66**	0.22	Silty SAND (SM)
P-2	4	**0.42**	0.14	Silty SAND (SM)

[1] Tested infiltration Rate = (ΔH 60 r) / (Δt(r + 2H_{avg}))
[2] FS=3 according to the Riverside County – Low Impact Development BMP Design Handbook
[3] At bottom of drilled holes

The soil infiltration rate is based on test conducted with clear water. The infiltration rate may vary with time as a result of soil clogging from water impurities. The infiltration rate will deteriorate over time due to the soil conditions and an appropriate factor of safety (FS) may be applied. SALEM recommends a minimum factor of safety of 3 be used in design. The soils may also become less permeable to impermeable if the soil is compacted. Thus, periodic maintenance consisting of clearing the bottom of the drainage system of clogged soils should be expected. The infiltration rate may become slower if the

surrounding soil is wet or saturated due to prolonged rainfalls. Additional infiltration tests should be conducted at bottom of the drainage system during construction to verify the infiltration rate. Groundwater, if closer to the bottom of the drainage system, will also reduce the infiltration rate.

The scope of our services did not include a groundwater study and was limited to the performance of percolation testing and soil profile description, and the submitted data only. Our services did not include those associated with septic system design. Neither did services include an Environmental Site Assessment for the presence or absence of hazardous and/or toxic materials in the soil, groundwater, or atmosphere; or the presence of wetlands. Any statements, or absence of statements, in this report or on any boring logs regarding odors, unusual or suspicious items, or conditions observed, are strictly for descriptive purposes and are not intended to convey engineering judgment regarding potential hazardous and/or toxic assessment.

The geotechnical engineering information presented herein is based upon professional interpretation utilizing standard engineering practices. The work conducted through the course of this investigation, including the preparation of this report, has been performed in accordance with the generally accepted standards of geotechnical engineering practice, which existed in the geographic area at the time the report was written. No other warranty, express or implied, is made. Please be advised that when performing percolation testing services in relatively small diameter borings, that the testing may not fully model the actual full scale long term performance of a given site. This is particularly true where percolation test data is to be used in the design of large infiltration system such as may be proposed for the site. The measured percolation rate includes dispersion of the water at the sidewalls of the boring as well as into the underlying soils. Subsurface conditions, including percolation rates, can change over time as fine-grained soils migrate. It is not warranted that such information and interpretation cannot be superseded by future geotechnical engineering developments. We emphasize that this report is valid for the project outlined above and should not be used for any other sites.

9. CONCLUSIONS AND RECOMMENDATIONS

9.1 General

9.1.1 Based upon the data collected during this investigation, and from a geotechnical engineering standpoint, it is our opinion that the site is suitable for the proposed construction of improvements at the site as planned, provided the recommendations contained in this report are incorporated into the project design and construction. Conclusions and recommendations provided in this report are based on our review of available literature, analysis of data obtained from our field exploration and laboratory testing program, and our understanding of the proposed development at this time.

9.1.2 The primary geotechnical constraints identified in our investigation is the presence of potentially compressible (collapsible) materials at the site. Recommendations to mitigate the effects of these soils are provided in this report.

9.1.3 No significant fill soils were encountered in our test borings. Fill soils are anticipated to be present onsite between our test boring locations since the site was graded for the former and current developments. Undocumented fill materials are not suitable to support any future structures and should be excavated and replaced with Engineered Fill. Prior to fill placement, Salem Engineering Group, Inc. should inspect the bottom of the excavation to verify no

additional excavation will be required. Verification of the extent of fill should be determined during site grading.

9.1.4 The scope of this investigation did not include subsurface exploration within the existing building and structure areas during field exploration. As such, subsurface soil conditions and materials present below the existing site structures are unknown and may be different than those noted within this report. The presence of potentially unacceptable fill materials, undocumented fill, and/or loose soil material that may be present below existing site features shall be taken into consideration. Our firm shall be present at the time of demolition activities to verify soil conditions are consistent with those identified as part of this investigation.

9.1.5 Site demolition activities shall include removal of all surface obstructions not intended to be incorporated into final site design. In addition, underground buried structures and/or utility lines encountered during demolition and construction should be properly removed and the resulting excavations backfilled with Engineered Fill. It is suspected that possible demolition activities of the existing structures may disturb the upper soils. After demolition activities, it is recommended that disturbed soils be removed and/or recompacted.

9.1.6 The near-surface onsite soils are moisture-sensitive and are anticipated to be moderately compressible (collapsible) under saturated conditions. Proposed structures may experience excessive post-construction settlement, when the foundation soil become near saturated. The compressible or weak soils should be removed and re-compacted according to the recommendations in the Grading section of this report (Section 9.5).

9.1.7 Based on the subsurface conditions at the site and the anticipated structural loading, we anticipate that the proposed buildings may be supported using conventional shallow foundations the proposed provided that the recommendations presented herein are incorporated in the design and construction of the project.

9.1.8 Provided the site is graded in accordance with the recommendations of this report and foundations constructed as described herein, we estimate that total settlement due to static loads utilizing conventional shallow foundations for the proposed buildings will be within 1 inch and corresponding differential settlement will be less than ½ inch over a horizontal distance of 20 feet.

9.1.9 SALEM shall review the project grading and foundation plans prior to final design submittal to assess whether our recommendations have been properly implemented and evaluate if additional analysis and/or recommendations are required. If SALEM is not provided plans and specifications for review, we cannot assume any responsibility for the future performance of the project.

9.1.10 SALEM shall be present at the site during site demolition and preparation to observe site clearing/demolition, preparation of exposed surfaces after clearing, and placement, treatment and compaction of fill material.

9.1.11 SALEM's observations should be supplemented with periodic compaction tests to establish substantial conformance with these recommendations. Moisture content of footings and slab

subgrade should be tested immediately prior to concrete placement. SALEM should observe foundation excavations prior to placement of reinforcing steel or concrete to assess whether the actual bearing conditions are compatible with the conditions anticipated during the preparation of this report.

9.2 Seismic Design Criteria

9.2.1 For seismic design of the structures, and in accordance with the seismic provisions of the 2019 CBC, our recommended parameters are shown below. These parameters were determined using California's Office of Statewide Health Planning and Development (OSHPD) Seismic Design Map Tool Website (https://seismicmaps.org/) in accordance with the 2019 CBC. The Site Class was determined based on the soils encountered during our field exploration.

TABLE 9.2.1
SEISMIC DESIGN PARAMETERS

Seismic Item	Symbol	Value	2016 ASCE 7 or 2019 CBC Reference
Site Coordinates (Datum = NAD 83)		33.8774 Lat -117.5679 Lon	
Site Class	--	D	ASCE 7 Table 20.3-1
Soil Profile Name	--	Default	ASCE 7 Table 20.3-1
Risk Category	--	II	Table 1604.5
Site Coefficient for PGA	F_{PGA}	1.2	ASCE 7 Table 11.8-1
Peak Ground Acceleration (adjusted for Site Class effects)	PGA_M	1.026g	ASCE 7 Equation 11.8-1
Seismic Design Category	SDC	**E**	CBC Table 1613.2.5
Mapped Spectral Acceleration (Short period - 0.2 sec)	S_S	2.037 g	CBC Figure 1613.2.1(1-8)
Mapped Spectral Acceleration (1.0 sec. period)	S_1	0.772 g	CBC Figure 1613.2.1(1-8)
Site Class Modified Site Coefficient	F_a	1.2	CBC Figure 1613.2.3(1)
Site Class Modified Site Coefficient	F_v	1.7*	CBC Figure 1613.2.3(2)
MCE Spectral Response Acceleration (Short period - 0.2 sec) $S_{MS} = F_a S_S$	S_{MS}	2.444 g	CBC Equation 16-36
MCE Spectral Response Acceleration (1.0 sec. period) $S_{M1} = F_v S_1$	S_{M1}	1.312* g	CBC Equation 16-37
Design Spectral Response Acceleration $S_{DS}=⅔S_{MS}$ (short period - 0.2 sec)	S_{DS}	1.629 g	CBC Equation 16-38
Design Spectral Response Acceleration $S_{D1}=⅔S_{M1}$ (1.0 sec. period)	S_{D1}	0.875* g	CBC Equation 16-39
Short Term Transition Period (S_{D1}/S_{DS}), Seconds	T_S	0.537	ASCE 7-16, Section 11.4.6
Long Period Transition Period (seconds)	T_L	8	ASCE 7-16, Figure 22-14

*** Determined per ASCE Table 11.4-2 for use in calculating T_S only.**

9.2.2 Site Specific Ground Motion Analysis was not included in the scope of this investigation. Per ASCE 11.4.8, structures on Site Class D with S_1 greater than or equal to 0.2 may require Site Specific Ground Motion Analysis. However, a site specific motion analysis may not be required based on Exceptions listed in ASCE 11.4.8. The Structural Engineer should verify whether Exception No. 2 of ASCE 7-16, Section 11.4.8, is valid for the site. In the event that a site specific ground motion analysis is required, SALEM should be contacted for these services.

9.2.3 Conformance to the criteria in the above table for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a large earthquake occurs. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.

9.3 Soil and Excavation Characteristics

9.3.1 Based on the soil conditions encountered in our soil borings, the onsite soils can be excavated with moderate effort using conventional excavation equipment.

9.3.2 It is the responsibility of the contractor to ensure that all excavations and trenches are properly shored and maintained in accordance with applicable Occupational Safety and Health Administration (OSHA) rules and regulations to maintain safety and maintain the stability of adjacent existing improvements.

9.3.3 The upper soils are moisture-sensitive and moderately collapsible under saturated conditions. These soils, in their present condition, possess moderate risk to construction in terms of possible post-construction movement of the foundations and floor systems if no mitigation measures are employed. Accordingly, measures are considered necessary to reduce anticipated collapse potential. Mitigation measures will not eliminate post-construction soil movement, but will reduce the soil movement. Success of the mitigation measures will depend on the thoroughness of the contractor in dealing with the soil conditions.

9.3.4 The near surface soils identified as part of our investigation are, generally, slightly moist to moist due to the absorption characteristics of the soil. Earthwork operations may encounter very moist unstable soils which may require removal to a stable bottom. Exposed native soils exposed as part of site grading operations shall not be allowed to dry out and should be kept continuously moist prior to placement of subsequent fill.

9.4 Materials for Fill

9.4.1 Excavated soils generated from cut operations at the site are suitable for use as general Engineered Fill in structural areas provided they do not contain deleterious matter, organic material, or rocks larger than 3 inches in maximum dimension.

9.4.2 Rocks greater than 3 inches but less than 8 inches in size may be placed below a minimum depth of 2 feet of finish grade as engineered fill provided they comprise less than 20 percent of the fill,. The oversized rocks should be placed in such a manner as to assure the filling of all voids around the rocks and with sufficient well graded soils to avoid any rock-to-rock contact. Rocks over 8 inches in size should not be used as Engineered Fill. Any areas containing insufficient fines or

with rock nesting conditions should be reworked with ample water and additional fines to the satisfaction of the geotechnical consultant.

9.4.3 The preferred materials specified for Engineered Fill are suitable for most applications with the exception of exposure to erosion. Project site winterization and protection of exposed soils during the construction phase should be the sole responsibility of the Contractor, since they have complete control of the project site.

9.4.4 Import soil shall be well-graded, slightly cohesive silty fine sand or sandy silt, with relatively impervious characteristics when compacted. A clean sand or very sandy soil is not acceptable for this purpose. This material should be approved by the Engineer prior to use and should typically possess the soil characteristics summarized in Table 9.4.4 on next page.

TABLE 9.4.4
IMPORT FILL REQUIREMENTS

Minimum Percent Passing No. 200 Sieve	15
Maximum Percent Passing No. 200 Sieve	50
Minimum Percent Passing No. 4 Sieve	70
Maximum Particle Size	3"
Maximum Plasticity Index	10
Maximum CBC Expansion Index	15

9.4.5 Environmental characteristics and corrosion potential of import soil materials should also be considered.

9.4.6 Proposed import materials should be sampled, tested, and approved by SALEM prior to its transportation to the site.

9.5 Grading

9.5.1 A representative of our firm should be present during all site clearing and grading operations to test and observe earthwork construction. This testing and observation is an integral part of our service as acceptance of earthwork construction is dependent upon compaction of the material and the stability of the material. The Geotechnical Engineer may reject any material that does not meet compaction and stability requirements. Further recommendations of this report are predicated upon the assumption that earthwork construction will conform to recommendations set forth in this section as well as other portions of this report.

9.5.2 A preconstruction conference should be held at the site prior to the beginning of grading operations with the owner, contractor, civil engineer and geotechnical engineer in attendance.

9.5.3 Site preparation should begin with removal of existing surface/subsurface structures, underground utilities (as required), any existing uncertified fill, and debris. Excavations or

depressions resulting from site clearing operations, or other existing excavations or depressions, should be restored with Engineered Fill in accordance with the recommendations of this report.

9.5.4 Surface vegetation consisting of grasses and other similar vegetation should be removed by stripping to a sufficient depth to remove organic-rich topsoil. The upper 2 to 4 inches of soil containing vegetation, roots, and other objectionable organic matter encountered at the time of grading should be stripped and removed from the surface. Deeper stripping may be required in localized areas. The stripped vegetation, will not be suitable for use as Engineered Fill or within 5 feet of building pads or within pavement areas. However, stripped topsoil may be stockpiled and reused in landscape or non-structural areas or exported from the site.

9.5.5 Tree root systems in proposed improvement areas should be removed to a minimum depth of 3 feet and to such an extent which would permit removal of all roots greater than ½ inch in diameter. Tree roots removed in parking areas may be limited to the upper 2 feet of the ground surface. Backfill of tree root excavations is not permitted until all exposed surfaces have been inspected and the Soils Engineer is present for the proper control of backfill placement and compaction. Burning in areas which are to receive fill materials shall not be permitted.

9.5.6 Any undocumented fill material encountered during grading should be removed and replaced with engineered fill. The actual depth of the overexcavation and recompaction should be determined by our field representative during construction.

9.5.7 Structural building pad areas should be considered as areas extending a minimum of 5 feet horizontally beyond the outside dimensions of building, including footings and non-cantilevered overhangs carrying structural loads.

9.5.8 Rocks greater than 3 inches but less than 8 inches in size may be placed below a minimum depth of 2 feet of finish grade as engineered fill provided they comprise less than 20 percent of the fill,. The oversized rocks should be placed in such a manner as to assure the filling of all voids around the rocks and with sufficient well graded soils to avoid any rock-to-rock contact. Rocks over 8 inches in size should not be used as Engineered Fill. Any areas containing insufficient fines or with rock nesting conditions should be reworked with ample water and additional fines to the satisfaction of the geotechnical consultant.

9.5.9 To minimize post-construction soil movement and provide uniform support for the proposed building, overexcavation and recompaction within the proposed building areas should be performed to a minimum depth of **five (5) feet** below existing grade or **three (3) feet** below proposed footing bottom, whichever is deeper. The overexcavation and recompaction should also extend laterally to a minimum of 5 feet beyond the outer edges of the proposed footings.

9.5.10 Within pavement areas, it is recommended that overexcavation and recompaction be performed to a minimum depth of **one (1) foot** below existing grade or finished grade, whichever is deeper. The subgrade should be uniformly moisture-conditioned to near optimum moisture content and compacted to at least 95% relative compaction.

9.5.11 Prior to placement of fill soils, the upper 10 to 12 inches of native subgrade soils should be scarified, moisture-conditioned to **no less** than the optimum moisture content and recompacted to a minimum of 95% of the maximum dry density based on ASTM D1557 Test Method.

9.5.12 All Engineered Fill (including scarified ground surfaces and backfill) should be placed in thin lifts which will allow for adequate bonding and compaction (typically 6 to 8 inches in loose thickness).

9.5.13 Engineered Fill soils should be moisture conditioned to near optimum moisture content and compacted to at least 95% of the maximum dry density based on ASTM D1557-07 Test Method.

9.5.14 An integral part of satisfactory fill placement is the stability of the placed lift of soil. If placed materials exhibit excessive instability as determined by a SALEM field representative, the lift will be considered unacceptable and shall be remedied prior to placement of additional fill material. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.

9.5.15 Final pavement subgrade should be finished to a smooth, unyielding surface. We further recommend proof-rolling the subgrade with a loaded water truck (or similar equipment with high contact pressure) to verify the stability of the subgrade prior to placing aggregate base.

9.5.16 The most effective site preparation alternatives will depend on site conditions prior to grading. We should evaluate site conditions and provide supplemental recommendations immediately prior to grading, if necessary.

9.5.17 We do not anticipate groundwater or seepage to adversely affect construction if conducted during the drier moths of the year (typically summer and fall). However, groundwater and soil moisture conditions could be significantly different during the wet season (typically winter and spring) as surface soil becomes wet; perched groundwater conditions may develop. Grading during this time period will likely encounter wet materials resulting in possible excavation and fill placement difficulties.

Project site winterization consisting of placement of aggregate base and protecting exposed soils during construction should be performed. If the construction schedule requires grading operations during the wet season, we can provide additional recommendations as conditions warrant.

9.5.18 Wet soils may become non conducive to site grading as the upper soils yield under the weight of the construction equipment. Therefore, mitigation measures should be performed for stabilization.

Typical remedial measures include: discing and aerating the soil during dry weather; mixing the soil with dryer materials; removing and replacing the soil with an approved fill material or placement of slurry, crushed rocks or aggregate base material; or mixing the soil with an approved lime or cement product.

The most common remedial measure of stabilizing the bottom of the excavation due to wet soil condition is to reduce the moisture of the soil to near the optimum moisture content by having

the subgrade soils scarified and aerated or mixed with drier soils prior to compacting. However, the drying process may require an extended period of time and delay the construction operation.

To expedite the stabilizing process, slurry or crushed rock may be utilized for stabilization provided this method is approved by the owner for the cost purpose. If the use of slurry or crushed rock is considered, it is recommended that the upper soft and wet soils be replaced by 6 to 24 inches of 2-sack slurry or ¾-inch to 1-inch crushed rocks. The thickness of the slurry or rock layer depends on the severity of the soil instability. The recommended 6 to 24 inches of slurry or crushed rock material will provide a stable platform.

It is further recommended that lighter compaction equipment be utilized for compacting the crushed rock. A layer of geofabric is recommended to be placed on top of the compacted crushed rock to minimize migration of soil particles into the voids of the crushed rock, resulting in soil movement. Although it is not required, the use of geogrid (e.g. Tensar NX750) below the crushed rock will enhance stability and reduce the required thickness of crushed rock necessary for stabilization.

Our firm should be consulted prior to implementing remedial measures to provide appropriate recommendations.

9.6 Shallow Foundations

9.6.1 The site is suitable for use of conventional shallow foundations consisting of continuous footings and isolated pad footings bearing in properly compacted Engineered Fill.

9.6.2 The bearing wall footings considered for the structure should be continuous with a minimum width of 15 inches and extend to a minimum depth of 18 inches below the lowest adjacent soil grade. Isolated column footings should have a minimum width of 24 inches and extend a minimum depth of 18 inches below the lowest adjacent soil grade. Footing depth should be measured at the time of footing trench excavation not to include any future material (e.g. base, concrete, asphalt, etc.) over the subgrade.

9.6.3 Footing concrete should be placed into neat excavation. The footing bottoms shall be maintained free of loose and disturbed soil.

9.6.4 Footings proportioned as recommended above may be designed for the maximum allowable soil bearing pressures shown in the table below.

Loading Condition	Allowable Bearing
Dead Load Only	2,000 psf
Dead-Plus-Live Load	2,500 psf
Total Load, Including Wind or Seismic Loads	3,325 psf

9.6.5 For design purposes, total settlement due to static loadings on the order of 1 inch may be assumed for shallow footings. Differential settlement due to static loadings, along a 20-foot exterior wall

footing or between adjoining column footings, should be ½ inch, producing an angular distortion of 0.002. Most of the settlement is expected to occur during construction as the loads are applied. However, additional post-construction settlement may occur if the foundation soils are flooded or saturated. The footing excavations should not be allowed to dry out any time prior to pouring concrete.

9.6.6 Resistance to lateral footing displacement can be computed using an allowable coefficient of friction factor of 0.43 acting between the base of foundations and the supporting native subgrade.

9.6.7 Lateral resistance for footings can alternatively be developed using an equivalent fluid passive pressure of 320 pounds per cubic foot acting against the appropriate vertical native footing faces. An increase of one-third is permitted when using the alternate load combination that includes wind or earthquake loads. The frictional and passive resistance of the soil may be combined without reduction in determining the total lateral resistance.

9.6.8 Underground utilities running parallel to footings should not be constructed in the zone of influence of footings. The zone of influence may be taken to be the area beneath the footing and within a 1:1 plane extending out and down from the bottom edge of the footing.

9.6.9 The foundation subgrade should be sprinkled as necessary to maintain a moist condition without significant shrinkage cracks as would be expected in any concrete placement. Prior to placing rebar reinforcement, foundation excavations should be evaluated by a representative of SALEM for appropriate support characteristics and moisture content. Moisture conditioning may be required for the materials exposed at footing bottom, particularly if foundation excavations are left open for an extended period.

9.7 Concrete Slabs-on-Grade

9.7.1 The following recommendations are intended for lightly loaded interior slabs on grade not subject to vehicular traffic. Slab thickness and reinforcement should be determined by the structural engineer based on the anticipated loading. We recommend that non-structural slabs-on-grade be at least 4 inches thick and underlain by six (6) inches of clean crushed aggregate base (CAB) over the depth of engineered fill recommended in section 9.5 of this report. The CAB should meet the Greenbook requirements and be compacted to at least 95% relative compaction.

9.7.2 Crushed Miscellaneous or Recycled Base (CMB) containing recycled materials should not be used as granular aggregate subbase within the building areas.

9.7.3 We recommend reinforcing slabs, at a minimum, with No. 3 reinforcing bars placed 18 inches on center, each way.

9.7.4 Slabs subject to structural loading may be designed utilizing a modulus of subgrade reaction K of 180 pounds per square inch per inch. The K value was approximated based on inter-relationship of soil classification and bearing values (Portland Cement Association, Rocky Mountain Northwest).

9.7.5 The spacing of crack control joints should be designed by the project structural engineer. In order to regulate cracking of the slabs, we recommend that construction joints or control joints be provided at a maximum spacing of 15 feet in each direction for 5-inch thick slabs and 12 feet for 4-inch thick slabs.

9.7.6 Crack control joints should extend a minimum depth of one-fourth the slab thickness and should be constructed using saw-cuts or other methods as soon as practical after concrete placement. The exterior floors should be poured separately in order to act independently of the walls and foundation system.

9.7.7 It is recommended that the utility trenches within the structure be compacted, as specified in our report, to minimize the transmission of moisture through the utility trench backfill. Special attention to the immediate drainage and irrigation around the structures is recommended.

9.7.8 Moisture within the structure may be derived from water vapors, which were transformed from the moisture within the soils. This moisture vapor penetration can affect floor coverings and produce mold and mildew in the structure. To minimize moisture vapor intrusion, it is recommended that a vapor retarder be installed in accordance with manufacturer's recommendations and/or ASTM guidelines, whichever is more stringent. In addition, ventilation of the structure is recommended to reduce the accumulation of interior moisture.

9.7.9 In areas where it is desired to reduce floor dampness where moisture-sensitive coverings are anticipated, construction should have a suitable waterproof vapor retarder (a minimum of 15 mils thick polyethylene vapor retarder sheeting, Raven Industries "VaporBlock 15, Stego Industries 15 mil "StegoWrap" or W.R. Meadows Sealtight 15 mil "Perminator") incorporated into the floor slab design. The water vapor retarder should be decay resistant material complying with ASTM E96 not exceeding 0.04 perms, ASTM E154 and ASTM E1745 Class A. The vapor barrier should be placed between the concrete slab and the compacted granular aggregate subbase material. The water vapor retarder (vapor barrier) should be installed in accordance with ASTM Specification E 1643-94.

9.7.10 The concrete may be placed directly on vapor retarder. The vapor retarder should be inspected prior to concrete placement. Cut or punctured retarder should be repaired using vapor retarder material lapped 6 inches beyond damaged areas and taped.

9.7.11 The recommendations of this report are intended to reduce the potential for cracking of slabs due to soil movement. However, even with the incorporation of the recommendations presented herein, foundations, stucco walls, and slabs-on-grade may exhibit some cracking due to soil movement. This is common for project areas that contain expansive soils since designing to eliminate potential soil movement is cost prohibitive. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics. Their occurrence may be reduced and/or controlled by limiting the slump of the concrete, proper concrete placement and curing, and by the placement of crack control joints at periodic intervals, in particular, where re-entrant slab corners occur.

9.7.12 Proper finishing and curing should be performed in accordance with the latest guidelines provided by the American Concrete Institute, Portland Cement Association, and ASTM.

9.8 Lateral Earth Pressures and Frictional Resistance

9.8.1 Active, at-rest and passive unit lateral earth pressures against footings and walls are summarized in the table below:

Lateral Pressure Level Backfill and Drained Conditions	Equivalent Fluid Pressure, pcf
Active Pressure	35
At-Rest Pressure	55
Passive Pressure	320
Related Parameters	
Allowable Coefficient of Friction	0.43
In-Place Soil Density (lbs/ft^3)	120

9.8.2 Active pressure applies to walls, which are free to rotate. At-rest pressure applies to walls, which are restrained against rotation. The preceding lateral earth pressures assume sufficient drainage behind retaining walls to prevent the build-up of hydrostatic pressure.

9.8.3 The top one-foot of adjacent subgrade should be deleted from the passive pressure computation.

9.8.4 A safety factor consistent with the design conditions should be included when using the values in the above table.

9.8.5 For stability against lateral sliding, which is resisted solely by the passive pressure, we recommend a minimum safety factor of 1.5.

9.8.6 For stability against lateral sliding, which is resisted by the combined passive and frictional resistance, a minimum safety factor of 2.0 is recommended.

9.8.7 For lateral stability against seismic loading conditions, we recommend a minimum safety factor of 1.1.

9.8.8 For dynamic seismic lateral loading the following equation shall be used:

Dynamic Seismic Lateral Loading Equation
Dynamic Seismic Lateral Load = $\frac{3}{8}\gamma K_h H^2$
Where: γ = In-Place Soil Density
K_h = Horizontal Acceleration = $\frac{2}{3}PGA_M$
H = Wall Height

9.9 Retaining Walls

9.9.1 Retaining and/or below grade walls should be drained with either perforated pipe encased in free-draining gravel or a prefabricated drainage system. The gravel zone should have a minimum width of 12 inches wide and should extend upward to within 12 inches of the top of the wall. The upper 12 inches of backfill should consist of native soils, concrete, asphaltic-concrete or other suitable backfill to minimize surface drainage into the wall drain system. The gravel should be completely wrapped in nonwoven polypropylene geotextiles (filter fabric) to minimize migration of soil particles into the voids of the crushed rock.

9.9.2 Prefabricated drainage systems, such as Miradrain®, Enkadrain®, or an equivalent substitute, are acceptable alternatives in lieu of gravel provided they are installed in accordance with the manufacturer's recommendations. If a prefabricated drainage system is proposed, our firm should review the system for final acceptance prior to installation.

9.9.3 Drainage pipes should be placed with perforations down and should discharge in a non-erosive manner away from foundations and other improvements. The top of the perforated pipe should be placed at or below the bottom of the adjacent floor slab or pavements. The pipe should be placed in the center line of the drainage blanket and should have a minimum diameter of 4 inches. Slots should be no wider than 1/8-inch in diameter, while perforations should be no more than ¼-inch in diameter.

9.9.4 If retaining walls are less than 5 feet in height, the perforated pipe may be omitted in lieu of weep holes on 4 feet maximum spacing. The weep holes should consist of 2-inch minimum diameter holes (concrete walls) or unmortared head joints (masonry walls) and placed no higher than 18 inches above the lowest adjacent grade. Two 8-inch square overlapping patches of geotextile fabric (conforming to the CalTrans Standard Specifications for "edge drains") should be affixed to the rear wall opening of each weep hole to retard soil piping.

9.9.5 During grading and backfilling operations adjacent to any walls, heavy equipment should not be allowed to operate within a lateral distance of 5 feet from the wall, or within a lateral distance equal to the wall height, whichever is greater, to avoid developing excessive lateral pressures. Within this zone, only hand operated equipment ("whackers," vibratory plates, or pneumatic compactors) should be used to compact the backfill soils.

9.10 Temporary Excavations

9.10.1 We anticipate that the majority of the sandy site soils will be classified as Cal-OSHA "Type C" soil when encountered in excavations during site development and construction. Excavation sloping, benching, the use of trench shields, and the placement of trench spoils should conform to the latest applicable Cal-OSHA standards. The contractor should have a Cal-OSHA-approved "competent person" onsite during excavation to evaluate trench conditions and make appropriate recommendations where necessary.

9.10.2 It is the contractor's responsibility to provide sufficient and safe excavation support as well as protecting nearby utilities, structures, and other improvements which may be damaged by earth movements. All onsite excavations must be conducted in such a manner that potential surcharges

from existing structures, 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 foundation or vehicle load.

9.10.3 Temporary excavations and slope faces should be protected from rainfall and erosion. Surface runoff should be directed away from excavations and slopes.

9.10.4 Open, unbraced excavations in undisturbed soils should be made according to the slopes presented in the following table:

RECOMMENDED EXCAVATION SLOPES

Depth of Excavation (ft)	Slope (Horizontal : Vertical)
0-5	1:1
5-10	2:1

9.10.5 If, due to space limitation, excavations near property lines or existing structures are performed in a vertical position, slot cuts, cantilever shoring, braced shorings or shields may be used for supporting vertical excavations. Therefore, in order to comply with the local and state safety regulations, a properly designed and installed shoring system would be required to accomplish planned excavations and installation. A Specialty Shoring Contractor should be responsible for the design and installation of such a shoring system during construction.

9.10.6 Braced shorings should be designed for a maximum pressure distribution of 30H, (where H is the depth of the excavation in feet). The foregoing does not include excess hydrostatic pressure or surcharge loading. Fifty percent of any surcharge load, such as construction equipment weight, should be added to the lateral load given herein. Equipment traffic should concurrently be limited to an area at least 3 feet from the shoring face or edge of the slope.

9.10.7 The excavation and shoring recommendations provided herein are based on soil characteristics derived from the borings within the area. Variations in soil conditions will likely be encountered during the excavations. SALEM Engineering Group, Inc. should be afforded the opportunity to provide field review to evaluate the actual conditions and account for field condition variations not otherwise anticipated in the preparation of this recommendation. Slope height, slope inclination, or excavation depth should in no case exceed those specified in local, state, or federal safety regulation, (e.g. OSHA) standards for excavations, 29 CFR part 1926, or Assessor's regulations.

9.11 Underground Utilities

9.11.1 Underground utility trenches should be backfilled with properly compacted material. The material excavated from the trenches should be adequate for use as backfill provided it does not contain deleterious matter, vegetation or rock larger than 3 inches in maximum dimension. Trench backfill should be placed in loose lifts not exceeding 8 inches and compacted to at least 95% relative compaction at or above optimum moisture content.

9.11.2 Bedding and pipe zone backfill typically extends from the bottom of the trench excavations to approximately 6 to 12 inches above the crown of the pipe. Pipe bedding and backfill material should conform to the requirements of the governing utility agency.

9.11.3 It is suggested that underground utilities crossing beneath new or existing structures be plugged at entry and exit locations to the buildings or structures to prevent water migration. Trench plugs can consist of on-site clay soils, if available, or sand cement slurry. The trench plugs should extend 2 feet beyond each side of individual perimeter foundations.

9.11.4 The contractor is responsible for removing all water-sensitive soils from the trench regardless of the backfill location and compaction requirements. The contractor should use appropriate equipment and methods to avoid damage to the utilities and/or structures during fill placement and compaction.

9.12 Surface Drainage

9.12.1 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 planned improvements. Saturation of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change to important engineering properties. Proper drainage should be maintained at all times.

9.12.2 The ground immediately adjacent to the foundation shall be sloped away from the building at a slope of not less than 5 percent for a minimum distance of 10 feet.

9.12.3 Impervious surfaces within 10 feet of the building foundation shall be sloped a minimum of 2 percent away from the building and drainage gradients maintained to carry all surface water to collection facilities and off site. These grades should be maintained for the life of the project. Ponding of water should not be allowed adjacent to the structure. Over-irrigation within landscaped areas adjacent to the structure should not be performed.

9.12.4 Roof drains should be installed with appropriate downspout extensions out-falling on splash blocks so as to direct water a minimum of 5 feet away from the structures or be connected to the storm drain system for the development.

9.13 Pavement Design

9.13.1 Based on site soil conditions, an R-value of 30 was assumed for the preliminary flexible asphaltic concrete pavement design. The R-value may be verified during grading of the pavement areas.

9.13.2 The asphaltic concrete (flexible pavement is based on a 20-year pavement life for traffic indexes of 5.0 and 6.0. If higher traffic loading is anticipated, SALEM should be contacted to provide revised pavement thickness recommendations.

TABLE 9.13.2
ASPHALT CONCRETE PAVEMENT THICKNESSES

Traffic Index	Asphaltic Concrete	Clean Crushed Aggregate Base*	Compacted Subgrade*
5.0 (Parking and Vehicle Drive Areas)	3.0"	5.0"	12.0"
6.0 (Occasional Truck Areas)	4.0"	6.0"	12.0"

95% compaction based on ASTM D1557-07 Test Method

9.13.3 The following recommendations are for light-duty and medium-duty Portland Cement Concrete pavement sections.

TABLE 9.13.3
PORTLAND CEMENT CONCRETE PAVEMENT THICKNESSES

Traffic Index	Portland Cement Concrete*	Clean Crushed Aggregate Base**	Compacted Subgrade**
5.0 (Light Duty)	5.0"	5.0"	12.0"
6.0 (Medium Duty)	6.0"	5.0"	12.0"

**** Minimum Compressive Strength of 4,000 psi; Min. Reinforcement of #4 bars at 18" O.C., each way***
***** 95% compaction based on ASTM D1557-07 Test Method***

10. PLAN REVIEW, CONSTRUCTION OBSERVATION AND TESTING

10.1 Plan and Specification Review

10.1.1 SALEM should review the project plans and specifications prior to final design submittal to assess whether our recommendations have been properly implemented and evaluate if additional analysis and/or recommendations are required.

10.2 Construction Observation and Testing Services

10.2.1 The recommendations provided in this report are based on the assumption that we will continue as Geotechnical Engineer of Record throughout the construction phase. It is important to maintain continuity of geotechnical interpretation and confirm that field conditions encountered are similar to those anticipated during design. If we are not retained for these services, we cannot assume

any responsibility for others interpretation of our recommendations, and therefore the future performance of the project.

10.2.2 SALEM should be present at the site during site preparation to observe site clearing, preparation of exposed surfaces after clearing, and placement, treatment and compaction of fill material.

10.2.3 SALEM's observations should be supplemented with periodic compaction tests to establish substantial conformance with these recommendations. Moisture content of footings and slab subgrade should be tested immediately prior to concrete placement. SALEM should observe foundation excavations prior to placement of reinforcing steel or concrete to assess whether the actual bearing conditions are compatible with the conditions anticipated during the preparation of this report.

11. LIMITATIONS AND CHANGED CONDITIONS

The analyses and recommendations submitted in this report are based upon the data obtained from the test borings drilled at the approximate locations shown on the Site Plan, Figure 2. The report does not reflect variations which may occur between borings. The nature and extent of such variations may not become evident until construction is initiated.

If variations then appear, a re-evaluation of the recommendations of this report will be necessary after performing on-site observations during the excavation period and noting the characteristics of such variations. The findings and recommendations presented in this report are valid as of the present and for the proposed construction.

If site conditions change due to natural processes or human intervention on the property or adjacent to the site, or changes occur in the nature or design of the project, or if there is a substantial time lapse between the submission of this report and the start of the work at the site, the conclusions and recommendations contained in our report will not be considered valid unless the changes are reviewed by SALEM and the conclusions of our report are modified or verified in writing.

The validity of the recommendations contained in this report is also dependent upon an adequate testing and observations program during the construction phase. Our firm assumes no responsibility for construction compliance with the design concepts or recommendations unless we have been retained to perform the on-site testing and review during construction. SALEM has prepared this report for the exclusive use of the owner and project design consultants.

SALEM does not practice in the field of corrosion engineering. It is recommended that a qualified corrosion engineer be consulted regarding protection of buried steel or ductile iron piping and conduit or, at a minimum, that manufacturer’s recommendations for corrosion protection be closely followed. Further, a corrosion engineer may be needed to incorporate the necessary precautions to avoid premature corrosion of concrete slabs and foundations in direct contact with native soil.

The importation of soil and or aggregate materials to the site should be screened to determine the potential for corrosion to concrete and buried metal piping. The report has been prepared in accordance with generally accepted geotechnical engineering practices in the area. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office at (909) 980-6455.

Respectfully Submitted,

SALEM ENGINEERING GROUP, INC.

Jared Christiansen, MS, EIT
Geotechnical Staff Engineer

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Senior Managing Engineer
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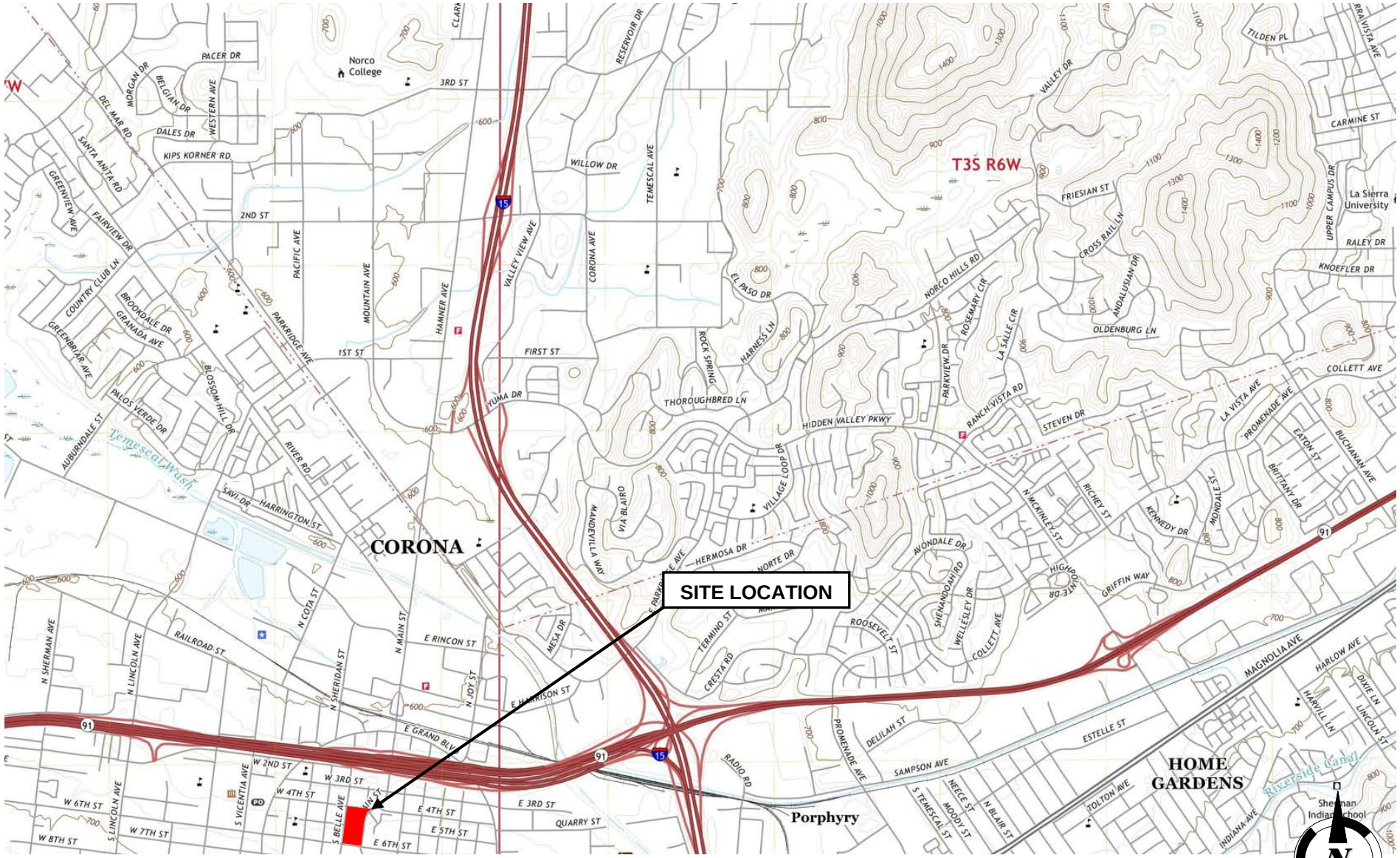
RGE 2477



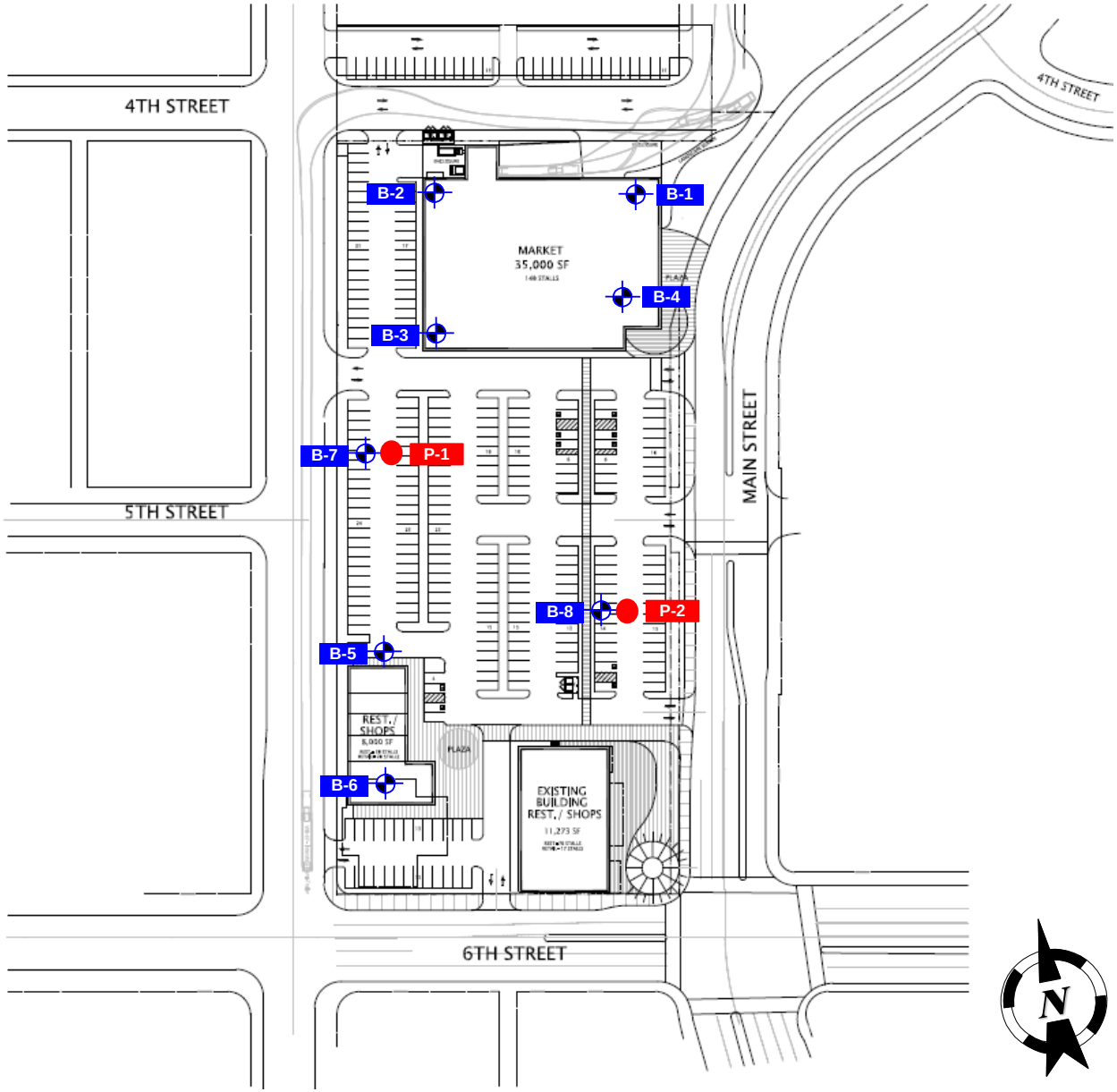
Source Image: U.S. Geological Survey, Corona North, California, https://ngmdb.usgs.gov/topoview (2022)

VICINITY MAP

GEOTECHNICAL ENGINEERING INVESTIGATION
Proposed Retail Development
NWC of 6th Street and Main Street
Corona, California

SCALE:	DATE:
NOT TO SCALE	12/2022
DRAWN BY:	APPROVED BY:
JC	CJ
PROJECT NO.	FIGURE NO.
3-222-1216	1

SALEM engineering group, inc.



SITE PLAN

GEOTECHNICAL ENGINEERING INVESTIGATION
Proposed Retail Development
NWC of 6th Street and Main Street
Corona, California

SCALE: NOT TO SCALE	DATE: 12/2022
DRAWN BY: JC	APPROVED BY: CJ
PROJECT NO. 3-222-1216	FIGURE NO. 2

LEGEND:

B-1 Soil Boring Locations
P-1 Percolation Locations

All Locations Approximate

SALEM engineering group, inc.

APPENDIX

A

APPENDIX A
FIELD EXPLORATION

Fieldwork for our investigation (drilling) was conducted on December 1, 2022, and included a site visit, subsurface exploration, and soil sampling. The locations of the exploratory borings and are shown on the Site Plan, Figure 2. Boring logs for our exploration are presented in figures following the text in this appendix. Borings were located in the field using existing reference points. Therefore, actual boring locations may deviate slightly.

In general, our borings were performed using a truck-mounted CME 75 drill rig equipped with 6⅝-inch diameter hollow-stem augers. Sampling in the borings was accomplished using a hydraulic 140-pound hammer with a 30-inch drop. Samples were obtained with a 3-inch outside-diameter (OD), split spoon (California Modified) sampler, and a 2-inch OD, Standard Penetration Test (SPT) sampler. The number of blows required to drive the sampler the last 12 inches (or fraction thereof) of the 18-inch sampling interval were recorded on the boring logs. The blow counts shown on the boring logs should not be interpreted as standard SPT "N" values; corrections have not been applied. Upon completion, the borings were backfilled with soil cuttings, and patched with cold asphalt (within paved areas).

Subsurface conditions encountered in the exploratory borings were visually examined, classified and logged in general accordance with the American Society for Testing and Materials (ASTM) Practice for Description and Identification of Soils (Visual-Manual Procedure D2488). This system uses the Unified Soil Classification System (USCS) for soil designations. The logs depict soil and geologic conditions encountered and depths 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, drill rig penetration rates, excavation characteristics and other factors. The transition between materials may be abrupt or gradual. Where applicable, the field logs were revised based on subsequent laboratory testing.

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Test Boring: B-1 **Page** 1 **Of:** 1

Project Number: 3-222-1216

Date: 12/01/2022

Client: Northgate Gonzales Real Estate, LLC

Project: Proposed Retail Development

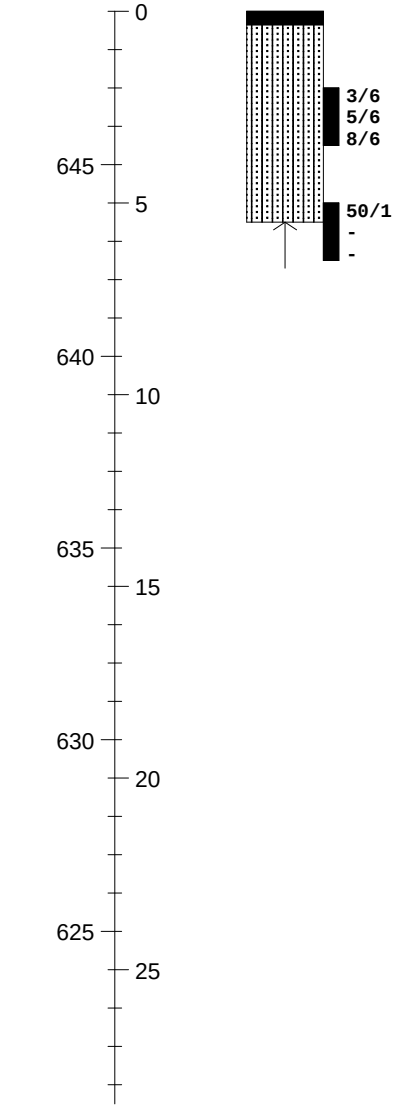
Location: NWC 6th Street & Main Street, Corona, California

Drilled By: SALEM **Logged By:** CC

Drill Type: CME 75 **Elevation:** 649'

Auger Type: 6-5/8 in. Hollow Stem Auger **Initial Depth to Groundwater:** N/A

Hammer Type: Automatic Trip - 140 lb/30 in **Final Depth to Groundwater:** N/A



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
		AC	Asphalt Concrete = 4.25 in.				
		SM	*No Aggregate Base				
			Gravelly, Silty SAND Loose; moist; brown; fine to coarse grain sand; fine to coarse gravel.	13	4.0	102.2	
			Grades as above; less gravel.	50/1"	6.0	-	Disturbed sample.
			Refusal at 5.5 feet BSG due to gravel/cobbles.				

Notes:

Figure Number A-1

SALEM
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Test Boring: B-2 **Page** 1 **Of:** 1

Project Number: 3-222-1216

Date: 12/01/2022

Client: Northgate Gonzales Real Estate, LLC

Project: Proposed Retail Development

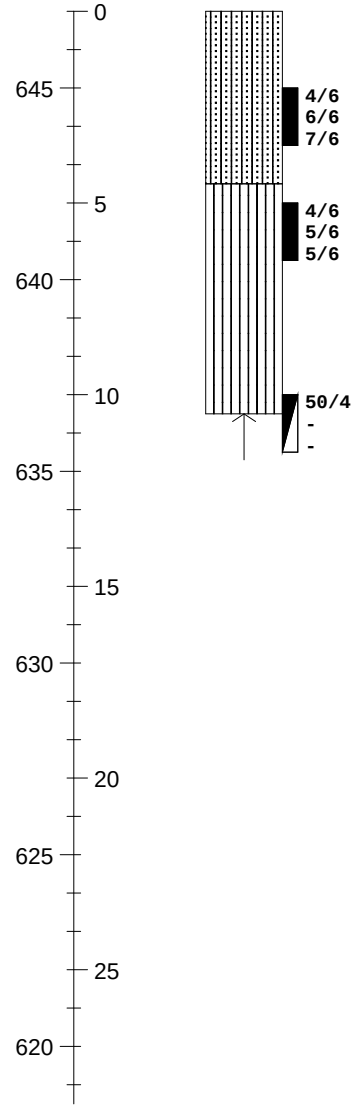
Location: NWC 6th Street & Main Street, Corona, California

Drilled By: SALEM **Logged By:** CC

Drill Type: CME 75 **Elevation:** 647'

Auger Type: 6-5/8 in. Hollow Stem Auger **Initial Depth to Groundwater:** N/A

Hammer Type: Automatic Trip - 140 lb/30 in **Final Depth to Groundwater:** N/A



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
		SM	Silty SAND Loose; slightly moist; brown; fine to coarse grain sand; with gravel.	13	10.2	105.7	
		ML	Sandy SILT Firm; moist; brown; fine to medium grain sand; trace gravel.	10	10.7	113.1	
			Grades as above; hard.	50/4"	12.6	-	
			Refusal at 10.5 feet BSG due to gravel/cobbles.				

Notes:

Figure Number A-2

SALEM
engineering group, inc.

Test Boring: B-3 **Page** 1 **Of:** 1

Project Number: 3-222-1216

Date: 12/01/2022

Client: Northgate Gonzales Real Estate, LLC

Project: Proposed Retail Development

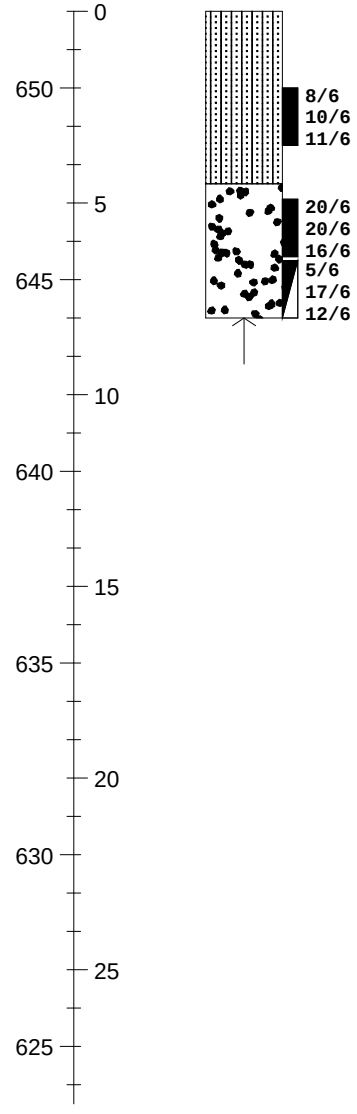
Location: NWC 6th Street & Main Street, Corona, California

Drilled By: SALEM **Logged By:** CC

Drill Type: CME 75 **Elevation:** 652'

Auger Type: 6-5/8 in. Hollow Stem Auger **Initial Depth to Groundwater:** N/A

Hammer Type: Automatic Trip - 140 lb/30 in **Final Depth to Groundwater:** N/A



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
		SM	Silty SAND Medium dense; slightly moist; brown; fine to coarse grain sand.	21	4.9	85.8	
		GP	Sandy GRAVEL Medium dense; slightly moist; grayish brown; fine to coarse gravel; fine to coarse grain sand.	36 20	2.5 1.9	- -	Disturbed sample.
			Refusal at 8 feet BSG due to gravel/cobbles.				

Notes:

Figure Number A-3

SALEM
engineering group, inc.

Test Boring: B-4 **Page** 1 **Of:** 1

Project Number: 3-222-1216

Date: 12/01/2022

Client: Northgate Gonzales Real Estate, LLC

Project: Proposed Retail Development

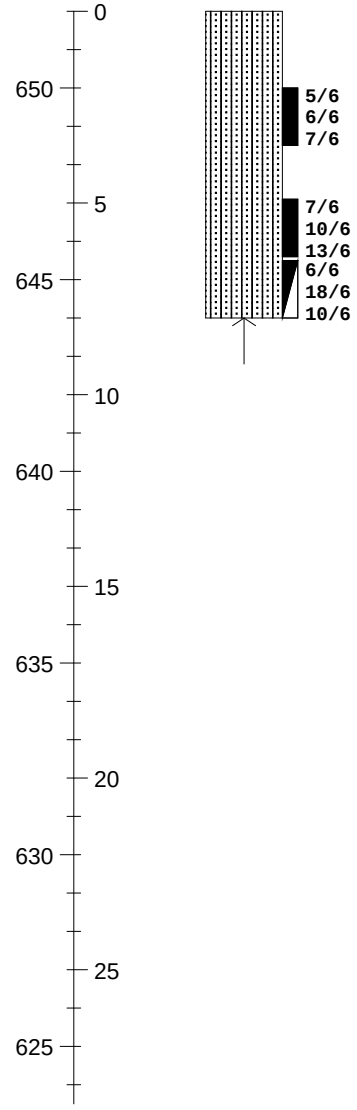
Location: NWC 6th Street & Main Street, Corona, California

Drilled By: SALEM **Logged By:** CC

Drill Type: CME 75 **Elevation:** 652'

Auger Type: 6-5/8 in. Hollow Stem Auger **Initial Depth to Groundwater:** N/A

Hammer Type: Automatic Trip - 140 lb/30 in **Final Depth to Groundwater:** N/A



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
		SM	Silty SAND Loose; slightly moist; brown; fine to coarse grain sand; with gravel.	13	3.2	110.5	
			Grades as above; medium dense.	23	2.9	115.8	
			Grades as above; moist.	28	10.7	-	
			Refusal at 8 feet BSG due to gravel/cobbles.				

Notes:

Figure Number A-4

SALEM
engineering group, inc.

Test Boring: B-5 **Page** 1 **Of:** 1

Project Number: 3-222-1216

Date: 12/01/2022

Client: Northgate Gonzales Real Estate, LLC

Project: Proposed Retail Development

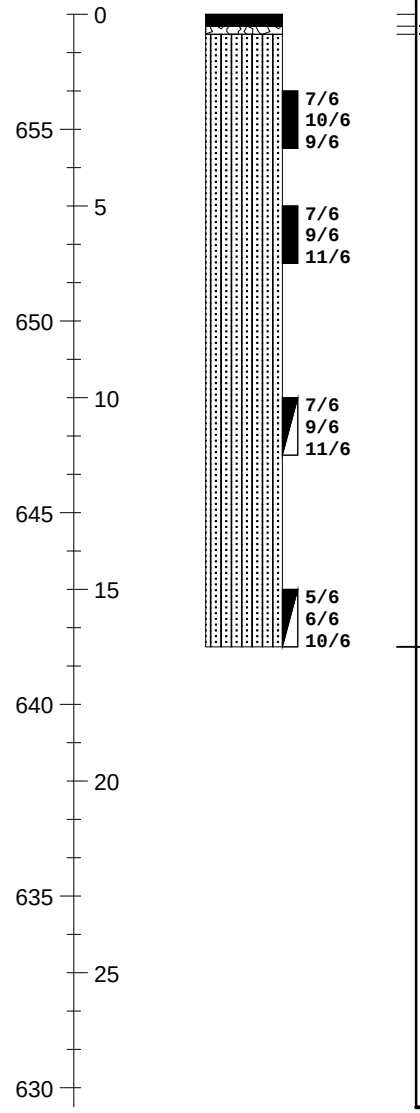
Location: NWC 6th Street & Main Street, Corona, California

Drilled By: SALEM **Logged By:** CC

Drill Type: CME 75 **Elevation:** 658'

Auger Type: 6-5/8 in. Hollow Stem Auger **Initial Depth to Groundwater:** N/A

Hammer Type: Automatic Trip - 140 lb/30 in **Final Depth to Groundwater:** N/A



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
		AC	Asphalt Concrete = 3.75 in.				
		AB	Aggregate Base = 2.5 in.				
		SM	Silty SAND Medium dense; slightly moist; mottled brown/gray; fine to medium grain sand; with gravel.	19	4.8	116.7	
			Grades as above; moist; brown; trace gravel.	20	7.9	107.4	
			Grades as above; slightly moist; fine to coarse grain sand; with gravel.	20	4.2	-	
			Grades as above; mottled brown/ reddish brown/gray.	16	4.6	-	
			End of boring at 16.5 feet BSG.				

Notes:

Figure Number A-5

SALEM
engineering group, inc.

Test Boring: B-6 **Page** 1 **Of:** 1

Project Number: 3-222-1216

Date: 12/01/2022

Client: Northgate Gonzales Real Estate, LLC

Project: Proposed Retail Development

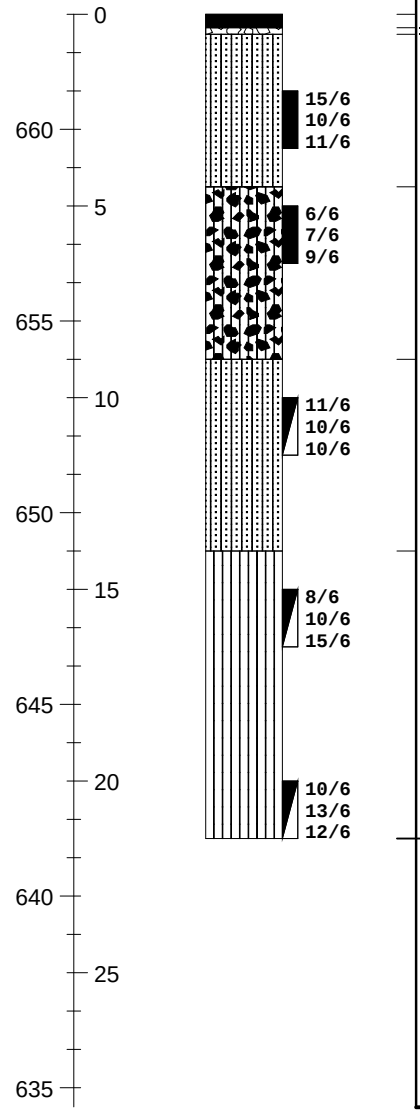
Location: NWC 6th Street & Main Street, Corona, California

Drilled By: SALEM **Logged By:** CC

Drill Type: CME 75 **Elevation:** 663'

Auger Type: 6-5/8 in. Hollow Stem Auger **Initial Depth to Groundwater:** N/A

Hammer Type: Automatic Trip - 140 lb/30 in **Final Depth to Groundwater:** N/A



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
		AC	Asphalt Concrete = 3.25 in.				
		AB	Aggregate Base = 3 in.				
		SM	Silty SAND Medium dense; slightly moist; brown; fine to coarse grain sand; with fine gravel.	21	5.4	106.0	
		GM	Sandy, Silty GRAVEL Medium dense; moist; brown; fine to coarse gravel; fine to coarse grain sand.	16	4.6	116.1	
			Grades as above; trace gravel.				
		SM	Silty SAND Medium dense; moist; mottled brown/gray; fine to coarse grain sand; with fine gravel.	20	6.1	-	
		ML	Sandy SILT Very stiff; moist; reddish brown; fine grain sand.	25	12.6	-	
			Grades as above.	25	11.8	-	
			End of boring at 21.5 feet BSG.				

Notes:

Figure Number A-6

SALEM engineering group, inc.

Test Boring: B-7 **Page** 1 **Of:** 1

Project Number: 3-222-1216

Date: 12/01/2022

Client: Northgate Gonzales Real Estate, LLC

Project: Proposed Retail Development

Location: NWC 6th Street & Main Street, Corona, California

Drilled By: SALEM **Logged By:** CC

Drill Type: CME 75 **Elevation:** 654'

Auger Type: 6-5/8 in. Hollow Stem Auger **Initial Depth to Groundwater:** N/A

Hammer Type: Automatic Trip - 140 lb/30 in **Final Depth to Groundwater:** N/A

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
0	7/6 6/6 9/6	SM	Silty SAND Medium dense; slightly moist; grayish brown; fine to coarse grain sand; with gravel.	15	4.4	-	
650 5			End of boring at 3 feet BSG.				
645 10							
640 15							
635 20							
630 25							

Notes:

Figure Number A-7

SALEM engineering group, inc.

Test Boring: B-8 **Page** 1 **Of:** 1

Project Number: 3-222-1216

Date: 12/01/2022

Client: Northgate Gonzales Real Estate, LLC

Project: Proposed Retail Development

Location: NWC 6th Street & Main Street, Corona, California

Drilled By: SALEM **Logged By:** CC

Drill Type: CME 75 **Elevation:** 660'

Auger Type: 6-5/8 in. Hollow Stem Auger **Initial Depth to Groundwater:** N/A

Hammer Type: Automatic Trip - 140 lb/30 in **Final Depth to Groundwater:** N/A

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
660 — 0	3/6 6/6 8/6 3/6 4/6 7/6	AC	Asphalt Concrete = 5.25 in.				
		SM	*No Aggregate Base	14	7.3	117.3	
			Silty SAND Loose; moist; dark brown; fine to coarse grain sand; with gravel.	11	4.4	-	
655 — 5			End of boring at 4 feet BSG.				
650 — 10							
645 — 15							
640 — 20							
635 — 25							

Notes:

Figure Number A-8

KEY TO SYMBOLS

Symbol Description

Strata symbols


Asphaltic Concrete


Silty sand


Silt


Poorly graded gravel


Aggregate Base


Silty gravel

Misc. Symbols


Drill rejection

Soil Samplers


California sampler


Standard penetration test

Notes:

Granular Soils
Blows Per Foot (Uncorrected)

	MCS	SPT
Very loose	<5	<4
Loose	5-15	4-10
Medium dense	16-40	11-30
Dense	41-65	31-50
Very dense	>65	>50

Cohesive Soils
Blows Per Foot (Uncorrected)

	MCS	SPT
Very soft	<3	<2
Soft	3-5	2-4
Firm	6-10	5-8
Stiff	11-20	9-15
Very Stiff	21-40	16-30
Hard	>40	>30

MCS = Modified California Sampler
SPT = Standard Penetration Test Sampler

Percolation Test Worksheet

Project: **Proposed Retail Development**
NWC of 6th Street & Main Street
Corona, California

Job No.: **3-222-1216**
Date Drilled: **12/1/2022**
Soil Classification: **Silty SAND (SM)**

Hole Radius: 4 in.
Pipe Dia.: 3 in.
Total Depth of Hole: 36 in.

Test Hole No.: **P-1**
Tested by: **CC**
Drilled Hole Depth: **3** ft.

Presoaking Date: **12/1/2022**
Test Date: **12/2/2022**

Pipe Stick up: 2 ft.

Time Start	Time Finish	Depth of Test Hole (ft)#	Refill-Yes or No	Elapsed Time (hrs:min)	Initial Water Level# (ft)	Final Water Level# (ft)	Δ Water Level (in.)	Δ Min.	Meas. Perc Rate (min/in)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Infiltration Rate, It (in/hr)
10:55	11:25	5.0	Y	0:30	3.02	3.43	4.92	30	6.1	23.8	18.8	21.3	0.84
11:25	11:55	5.0	N	0:30	3.43	3.72	3.48	30	8.6	18.8	15.4	17.1	0.73
11:55	12:25	5.0	N	0:30	3.72	3.95	2.76	30	10.9	15.4	12.6	14.0	0.69
12:25	12:55	5.0	N	0:30	3.95	4.15	2.40	30	12.5	12.6	10.2	11.4	0.72
12:55	13:25	5.0	N	0:30	4.15	4.31	1.92	30	15.6	10.2	8.3	9.2	0.68
13:25	13:55	5.0	N	0:30	4.31	4.44	1.56	30	19.2	8.3	6.7	7.5	0.66
13:57	14:27	5.0	Y	0:30	2.88	3.24	4.32	30	6.9	25.4	21.1	23.3	0.68
14:27	14:57	5.0	N	0:30	3.24	3.54	3.60	30	8.3	21.1	17.5	19.3	0.68
14:57	15:27	5.0	N	0:30	3.54	3.79	3.00	30	10.0	17.5	14.5	16.0	0.67
15:27	15:57	5.0	N	0:30	3.79	4.00	2.52	30	11.9	14.5	12.0	13.3	0.66
15:57	16:27	5.0	N	0:30	4.00	4.18	2.16	30	13.9	12.0	9.8	10.9	0.67
16:27	16:57	5.0	N	0:30	4.18	4.33	1.80	30	16.7	9.8	8.0	8.9	0.66
											Infiltration Rate		**0.66**

SALEM engineering group, inc.

Percolation Test Worksheet

Project: **Proposed Retail Development**
NWC of 6th Street & Main Street
Corona, California

Job No.: **3-222-1216**
Date Drilled: **12/1/2022**
Soil Classification: **Silty SAND (SM)**

Hole Radius: 4 in.
Pipe Dia.: 3 in.
Total Depth of Hole: 48 in.

Test Hole No.: **P-2**
Tested by: **CC**
Drilled Hole Depth: **4.0** ft.

Presoaking Date: **12/1/2022**
Test Date: **12/2/2022**

Pipe Stick up: 0.5 ft.

Time Start	Time Finish	Depth of Test Hole (ft)#	Refill-Yes or No	Elapsed Time (hrs:min)	Initial Water Level# (ft)	Final Water Level# (ft)	Δ Water Level (in.)	Δ Min.	Meas. Perc Rate (min/in)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Infiltration Rate, It (in/hr)
9:50	10:20	4.5	Y	0:30	2.75	2.98	2.76	30	10.9	21.0	18.2	19.6	0.51
10:20	10:50	4.5	N	0:30	2.98	3.17	2.28	30	13.2	18.2	16.0	17.1	0.48
10:50	11:20	4.5	N	0:30	3.17	3.33	1.92	30	15.6	16.0	14.0	15.0	0.45
11:20	11:50	4.5	N	0:30	3.33	3.47	1.68	30	17.9	14.0	12.4	13.2	0.44
11:50	12:20	4.5	N	0:30	3.47	3.60	1.56	30	19.2	12.4	10.8	11.6	0.46
12:20	12:50	4.5	N	0:30	3.60	3.71	1.32	30	22.7	10.8	9.5	10.1	0.43
12:53	13:23	4.5	Y	0:30	3.03	3.20	2.04	30	14.7	17.6	15.6	16.6	0.44
13:23	13:53	4.5	N	0:30	3.20	3.35	1.80	30	16.7	15.6	13.8	14.7	0.43
13:53	14:23	4.5	N	0:30	3.35	3.48	1.56	30	19.2	13.8	12.2	13.0	0.42
14:23	14:53	4.5	N	0:30	3.48	3.60	1.44	30	20.8	12.2	10.8	11.5	0.43
14:53	15:23	4.5	N	0:30	3.60	3.71	1.32	30	22.7	10.8	9.5	10.1	0.43
15:23	15:53	4.5	N	0:30	3.71	3.81	1.20	30	25.0	9.5	8.3	8.9	0.44
											Infiltration Rate		**0.42**

SALEM engineering group, inc.

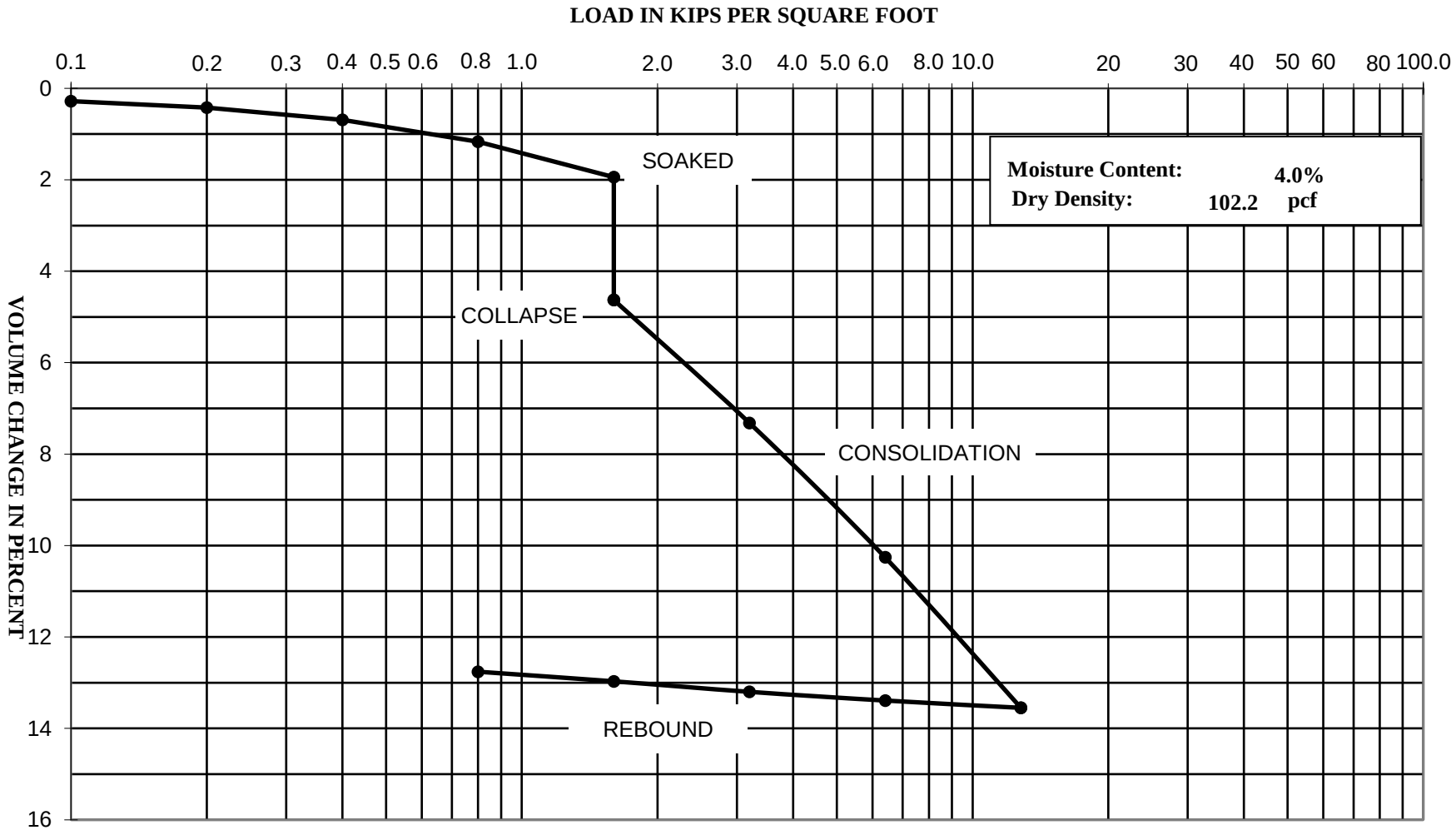
APPENDIX

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), Caltrans, or other suggested procedures. Selected samples were tested for in-situ dry density and moisture content, corrosivity, shear strength, maximum density and optimum moisture content, and grain size distribution. The results of the laboratory tests are summarized in the following figures.

CONSOLIDATION - PRESSURE TEST DATA
ASTM D2435



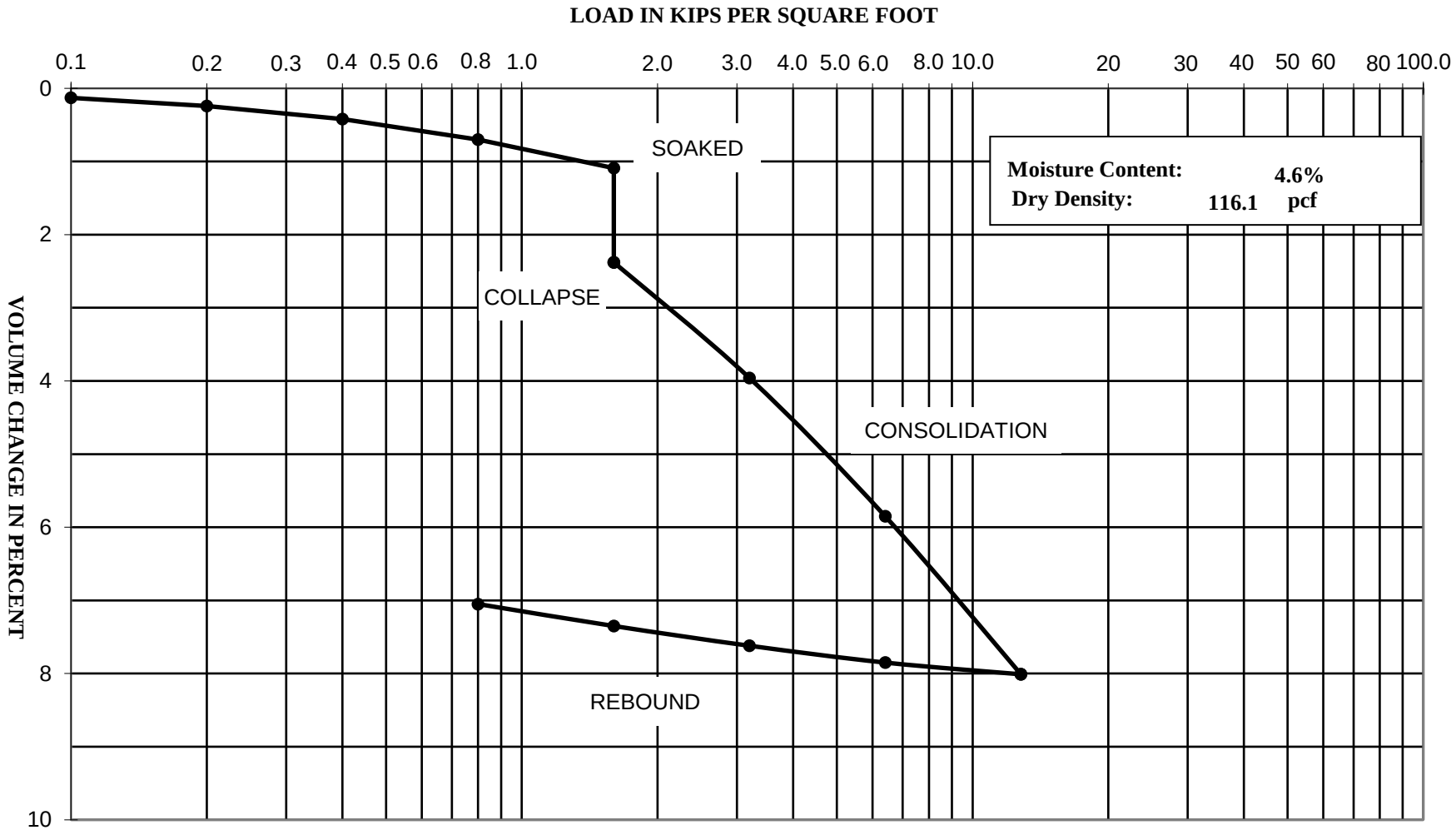
Project Name: Proposed Retail Development - Corona, CA

Project Number: 3-222-1216

Boring: B-1 @ 2'

SALEM engineering group, inc.

CONSOLIDATION - PRESSURE TEST DATA
ASTM D2435



Project Name: Proposed Retail Development - Corona, CA

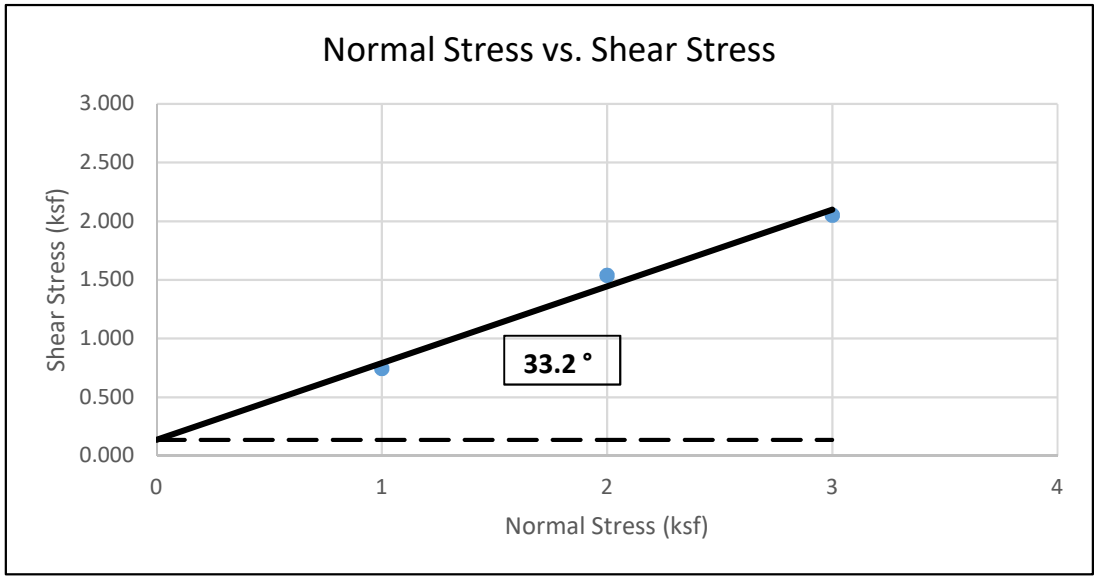
Project Number: 3-222-1216

Boring: B-6 @ 5'

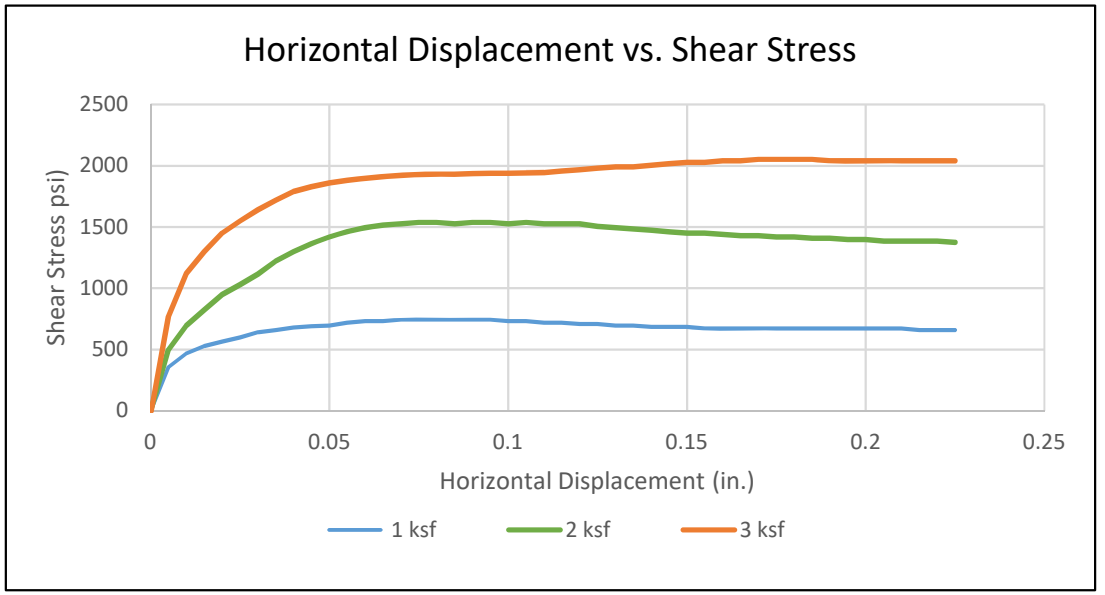
SALEM engineering group, inc.

Direct Shear Test (ASTM D3080)

Project Name:	Proposed Retail Development - Corona, CA
Project Number:	3-222-1216
Client:	Northgate Gonzales Real Estate, LLC
Sample Location:	B-2 @ 5'
Sample Type:	Undisturbed Ring
Soil Classification:	Sandy SILT (ML) w/trace Gravel
Tested By:	M. Noorzay
Reviewed By:	CJ
Date:	12/13/2022
Equipment Used:	Geomatic Direct Shear Machine



	Sample 1	Sample 2	Sample 3
Normal Stress (ksf)	1.000	2.000	3.000
Shear Rate (in/min)	0.004		
Peak Shear Stress (ksf)	0.744	1.538	2.052
Residual Shear Stress (ksf)	0.000	0.000	0.000



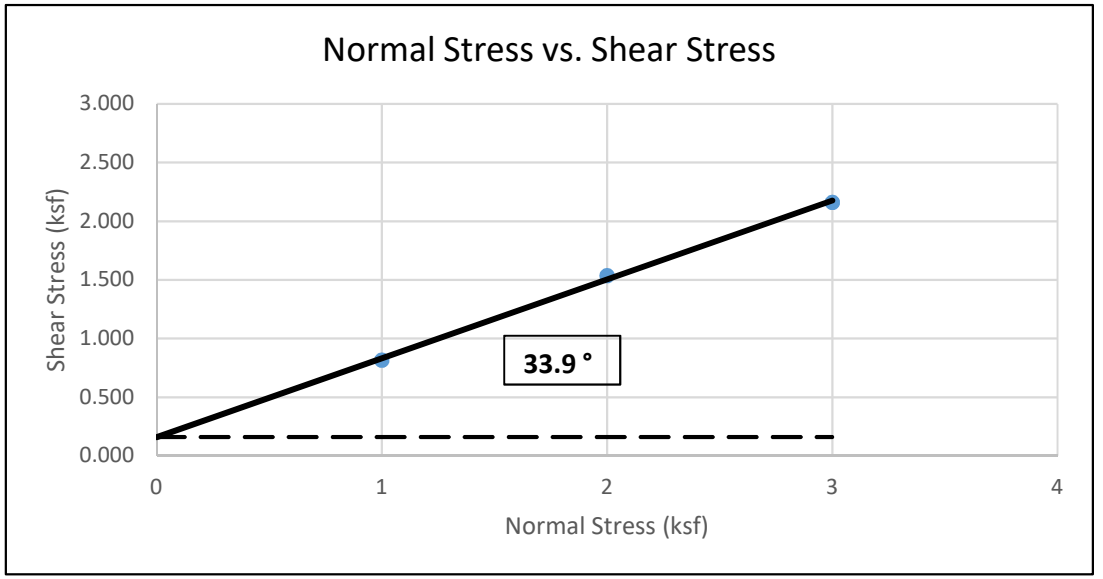
Initial Height of Sample (in)	1.000	1.000	1.000
Height of Sample before Shear (in.)	1	1	1
Diameter of Sample (in)	2.416	2.416	2.416
Initial Moisture Content (%)	10.3		
Final Moisture Content (%)	20.1	16.8	18.5
Dry Density (pcf)	110.2	114.6	112.8

Peak Shear Strength Values	
Slope	0.65
Friction Angle	33.2
Cohesion (psf)	137

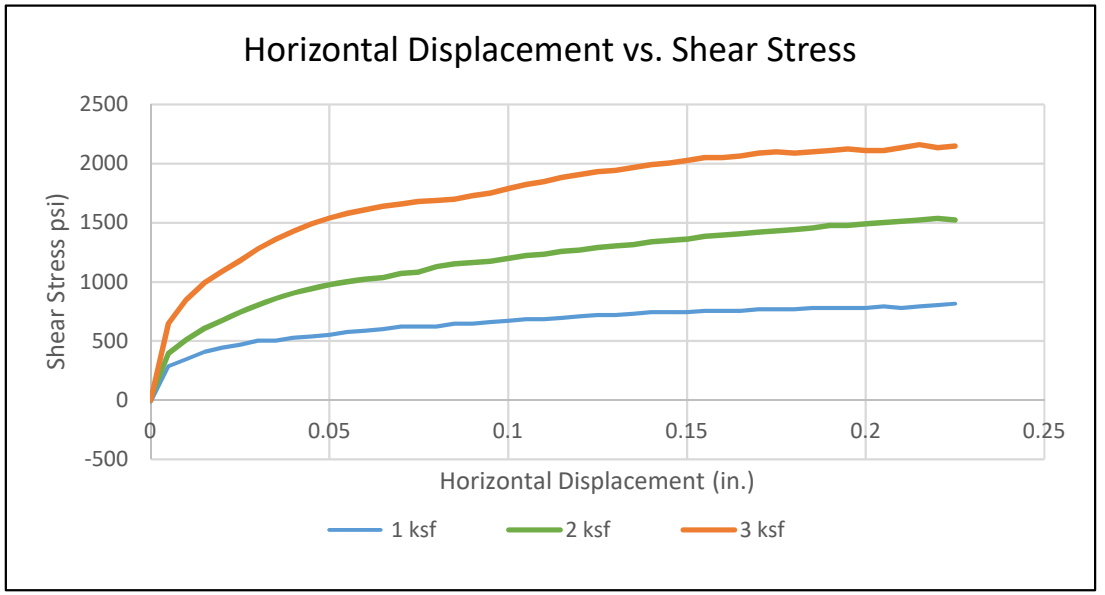
SALEM engineering group, inc.

Direct Shear Test (ASTM D3080)

Project Name:	Proposed Retail Development - Corona, CA
Project Number:	3-222-1216
Client:	Northgate Gonzales Real Estate, LLC
Sample Location:	B-6 @ 2'
Sample Type:	Undisturbed Ring
Soil Classification:	Silty SAND (SM) w/Gravel
Tested By:	M. Noorzay
Reviewed By:	CJ
Date:	12/14/2022
Equipment Used:	Geomatic Direct Shear Machine



	Sample 1	Sample 2	Sample 3
Normal Stress (ksf)	1.000	2.000	3.000
Shear Rate (in/min)	0.004		
Peak Shear Stress (ksf)	0.816	1.536	2.160
Residual Shear Stress (ksf)	0.000	0.000	0.000



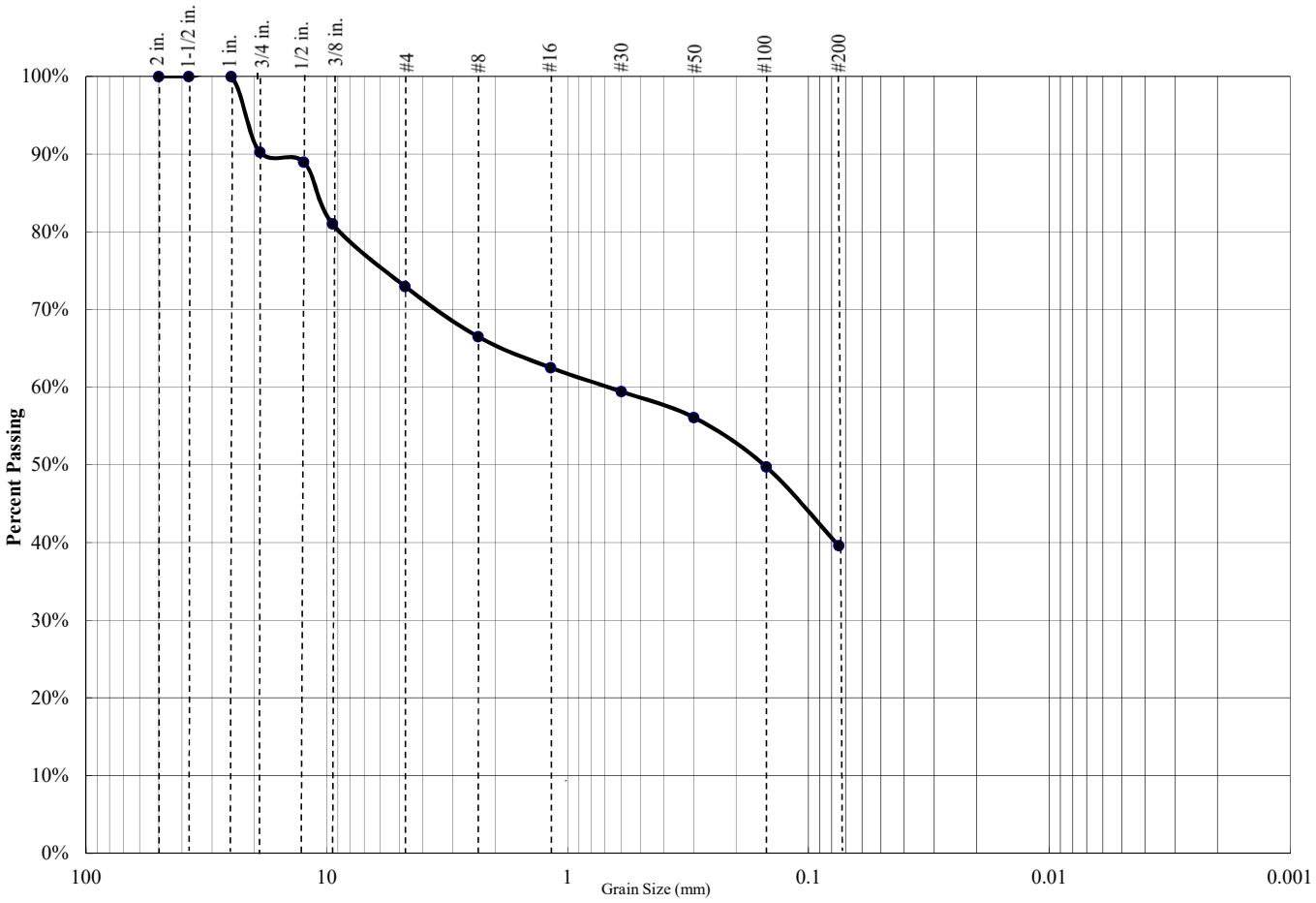
Initial Height of Sample (in)	1.000	1.000	1.000
Height of Sample before Shear (in.)	1	1	1
Diameter of Sample (in)	2.416	2.416	2.416
Initial Moisture Content (%)	5.2		
Final Moisture Content (%)	17.0	16.9	14.9
Dry Density (pcf)	105.6	106.4	107.7

Peak Shear Strength Values	
Slope	0.67
Friction Angle	33.9
Cohesion (psf)	160

SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
27%	33%	40%

Sieve Size	Percent Passing
3/4 inch	90.3%
1/2 inch	89.0%
3/8 inch	81.0%
#4	73.0%
#8	66.5%
#16	62.5%
#30	59.4%
#50	56.1%
#100	49.8%
#200	39.6%

Atterberg Limits		
PL=	LL=	PI=

Coefficients					
D_{85}=		D_{60}=		D_{50}=	
D_{30}=		D_{15}=		D_{10}=	
C_u=	N/A	C_c=	N/A		

USCS CLASSIFICATION
Gravelly, Silty SAND (SM)

Project Name: Proposed Retail Development - Corona, CA

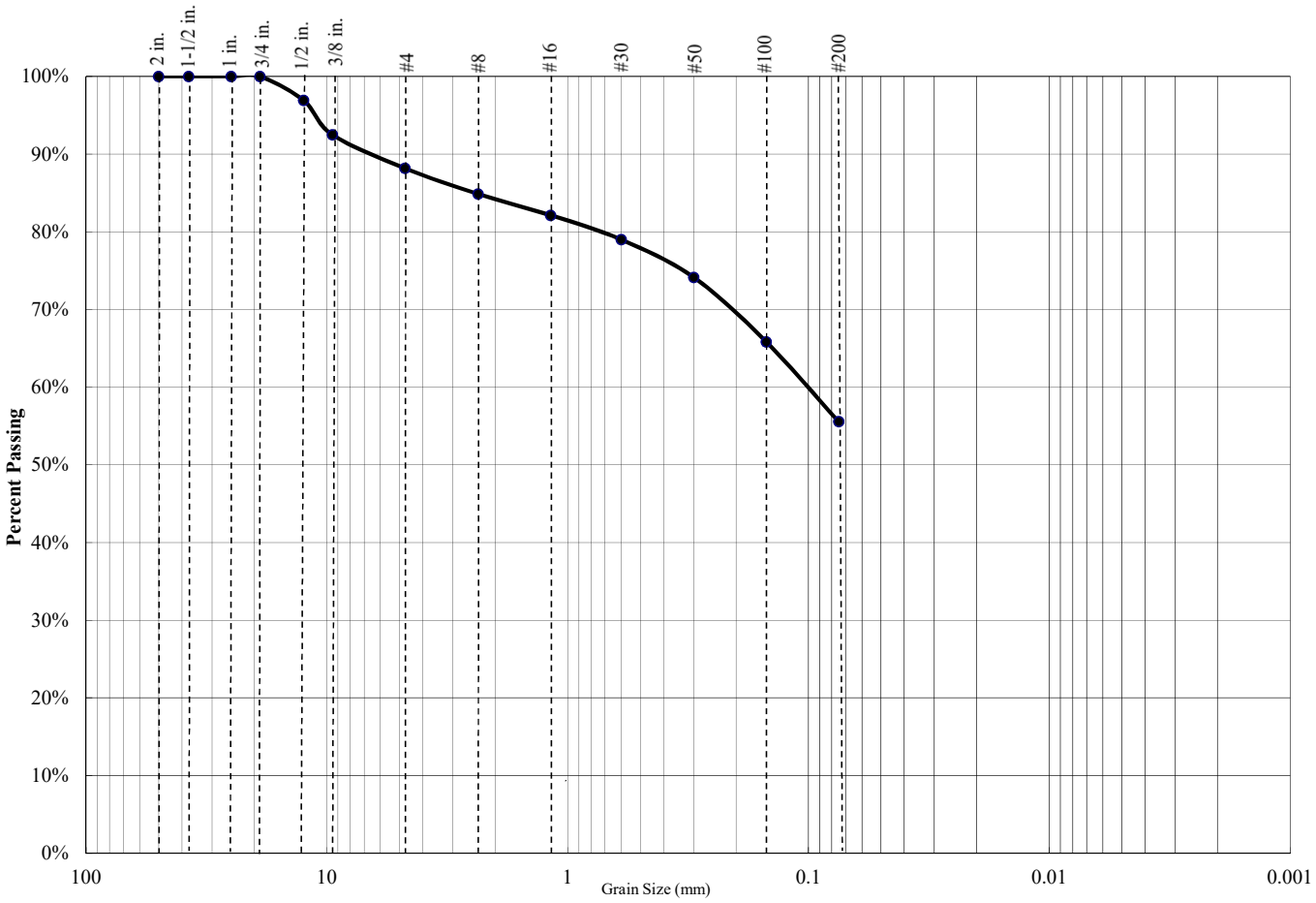
Project Number: 3-222-1216

Boring: B-1 @ 2'

SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
12%	33%	56%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	96.9%
3/8 inch	92.5%
#4	88.2%
#8	84.9%
#16	82.1%
#30	79.0%
#50	74.1%
#100	65.8%
#200	55.6%

Atterberg Limits		
PL=	LL=	PI=

Coefficients					
D_{85}=		D_{60}=		D_{50}=	
D_{30}=		D_{15}=		D_{10}=	
C_u=	N/A	C_c=	N/A		

USCS CLASSIFICATION
Sandy SILT (ML)

Project Name: Proposed Retail Development - Corona, CA

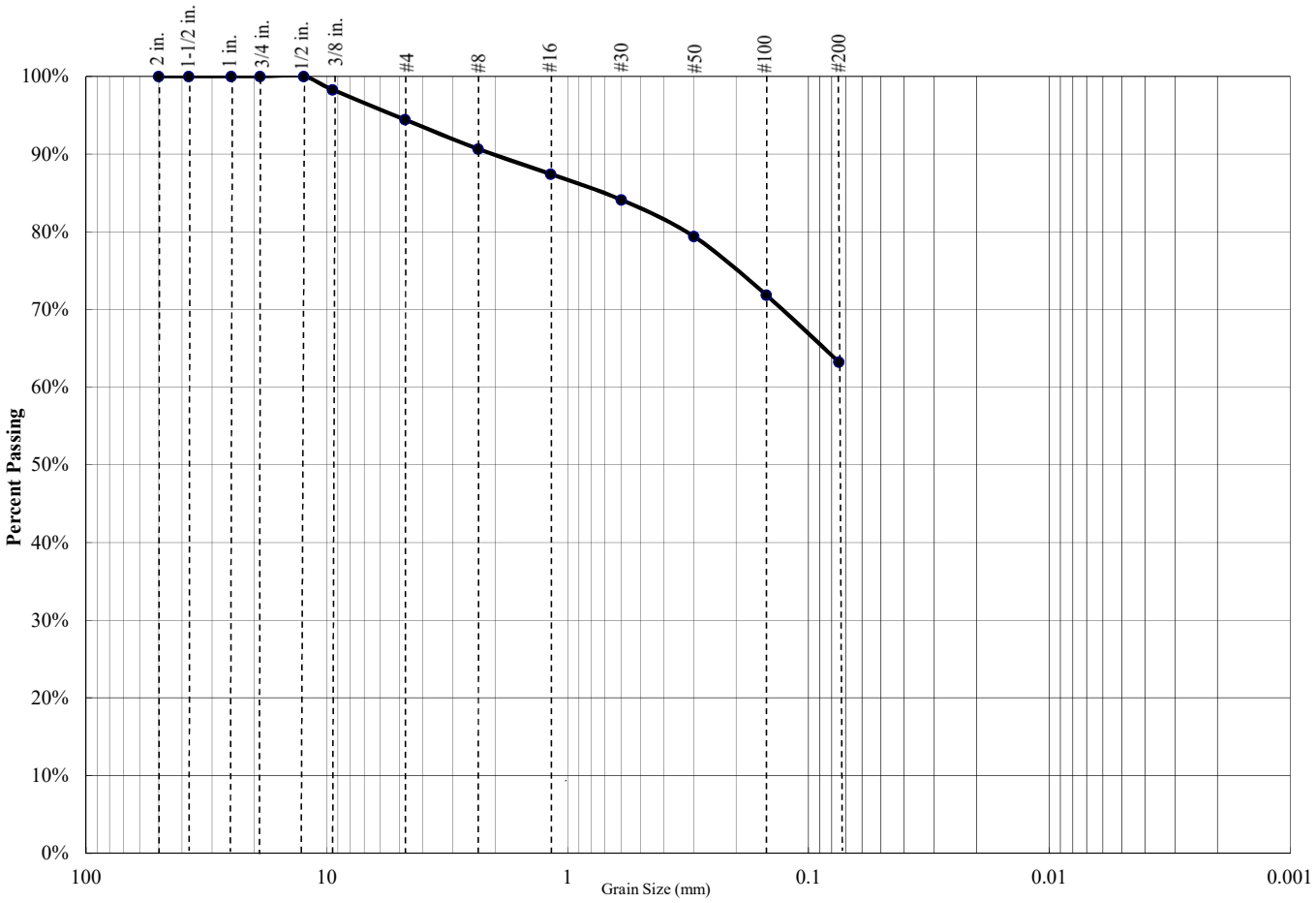
Project Number: 3-222-1216

Boring: B-2 @ 5'

SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
6%	31%	63%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	98.3%
#4	94.4%
#8	90.7%
#16	87.4%
#30	84.1%
#50	79.4%
#100	71.9%
#200	63.3%

Atterberg Limits		
PL=	LL=	PI=

Coefficients					
D_{85}=		D_{60}=		D_{50}=	
D_{30}=		D_{15}=		D_{10}=	
C_u=	N/A	C_c=	N/A		

USCS CLASSIFICATION
Sandy SILT (ML)

Project Name: Proposed Retail Development - Corona, CA

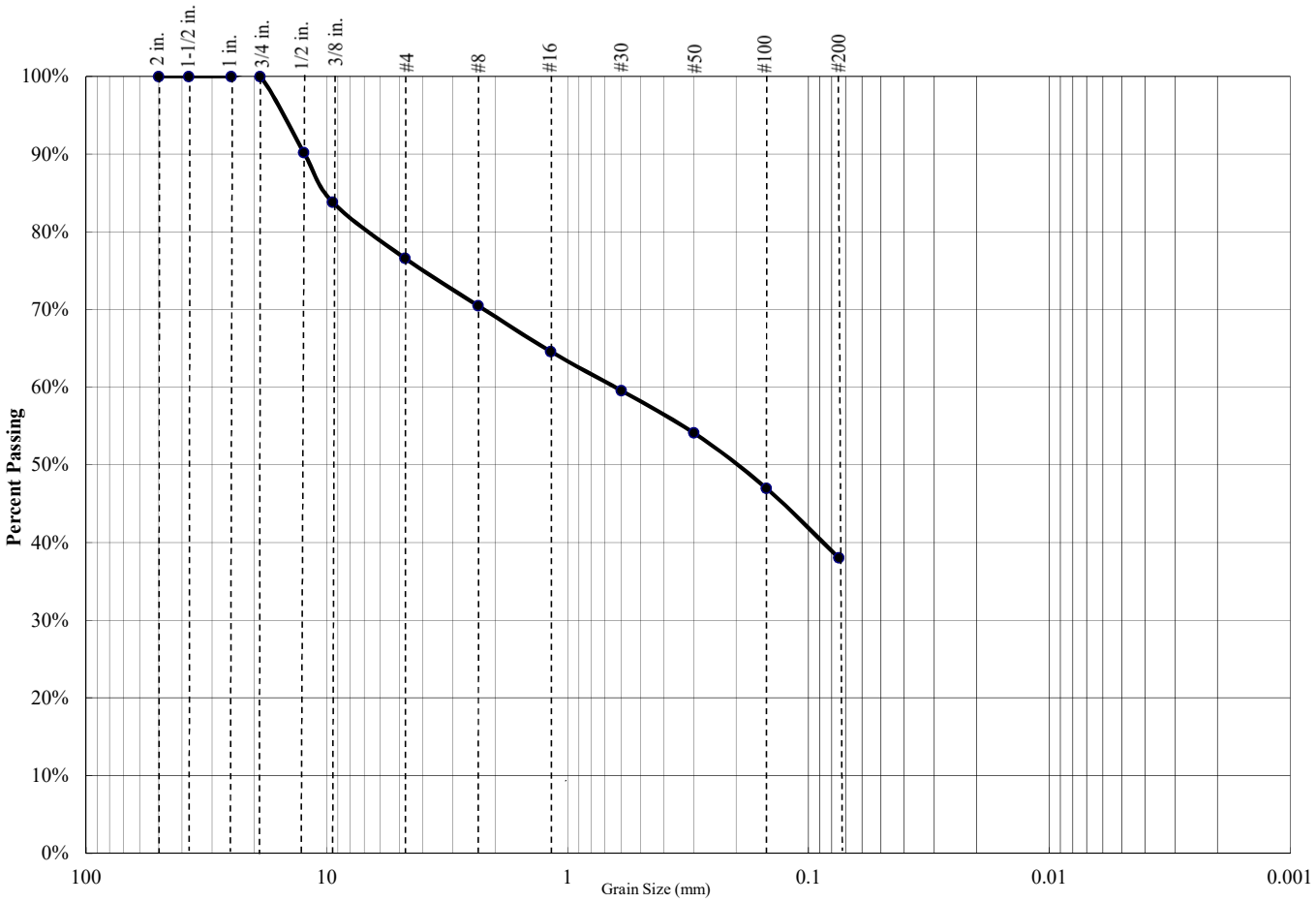
Project Number: 3-222-1216

Boring: B-2 @ 10'

SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
23%	39%	38%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	90.2%
3/8 inch	83.8%
#4	76.6%
#8	70.5%
#16	64.6%
#30	59.6%
#50	54.1%
#100	47.0%
#200	38.0%

Atterberg Limits		
PL=	LL=	PI=

Coefficients					
D_{85}=		D_{60}=		D_{50}=	
D_{30}=		D_{15}=		D_{10}=	
C_u=	N/A	C_c=	N/A		

USCS CLASSIFICATION
Silty SAND (SM) w/Gravel

Project Name: Proposed Retail Development - Corona, CA

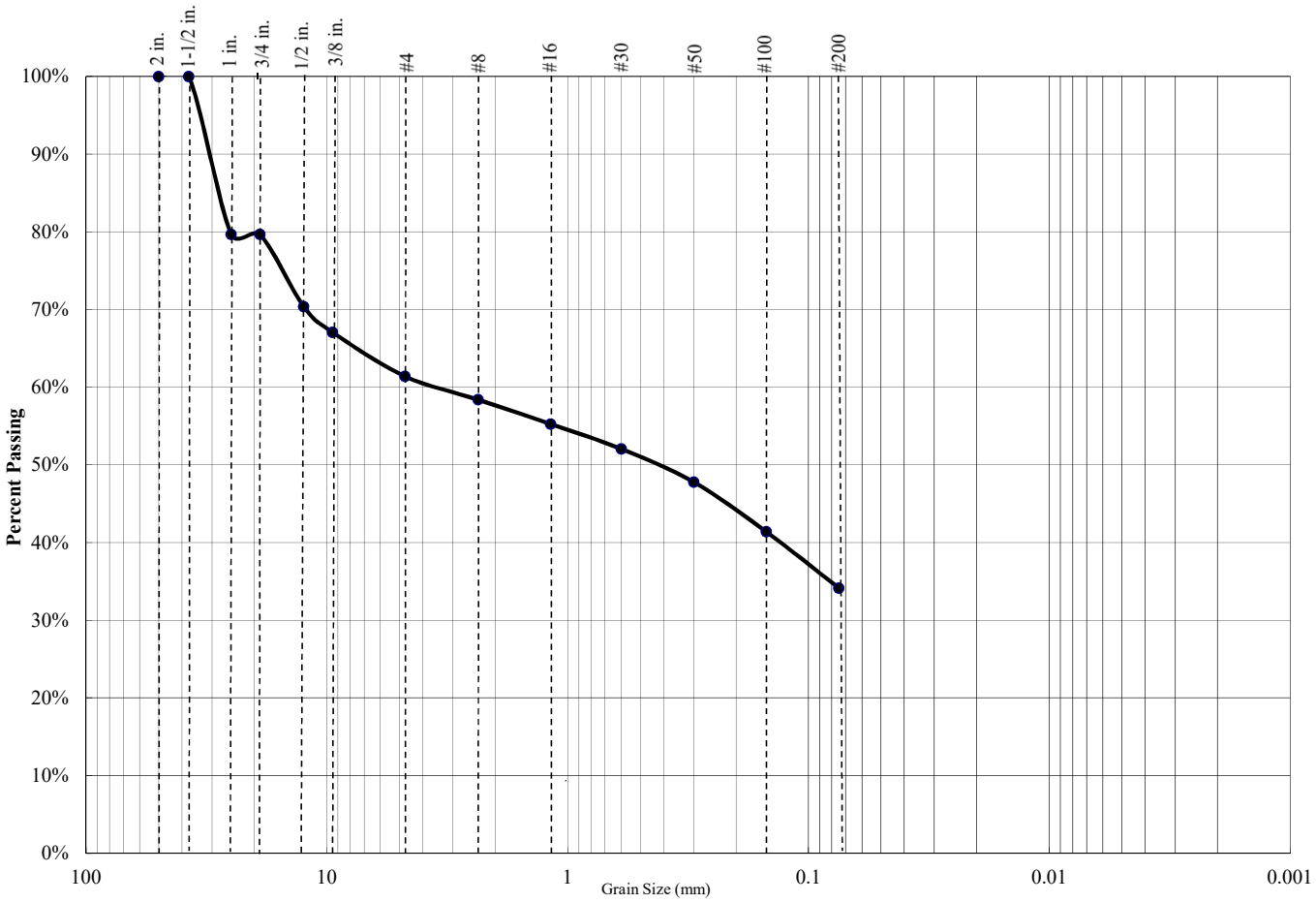
Project Number: 3-222-1216

Boring: B-6 @ 2'

SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
39%	27%	34%

Sieve Size	Percent Passing
3/4 inch	79.7%
1/2 inch	70.4%
3/8 inch	67.1%
#4	61.4%
#8	58.4%
#16	55.3%
#30	52.0%
#50	47.8%
#100	41.4%
#200	34.2%

Atterberg Limits		
PL=	LL=	PI=

Coefficients					
D_{85}=		D_{60}=		D_{50}=	
D_{30}=		D_{15}=		D_{10}=	
C_u=	N/A	C_c=	N/A		

USCS CLASSIFICATION
Sandy, Silty GRAVEL (GM)

Project Name: Proposed Retail Development - Corona, CA

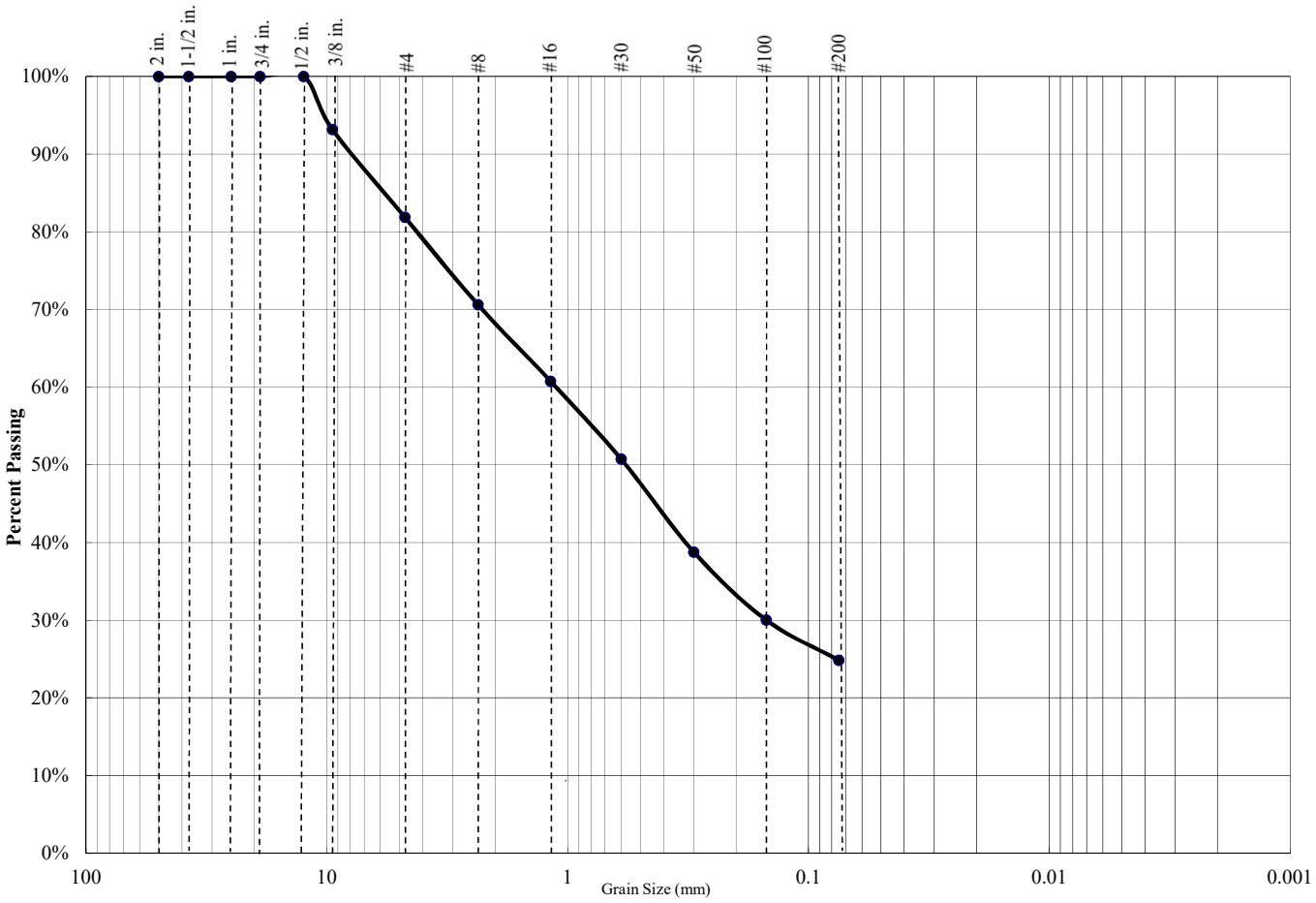
Project Number: 3-222-1216

Boring: B-6 @ 5'

SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
18%	57%	25%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	93.2%
#4	81.9%
#8	70.6%
#16	60.8%
#30	50.7%
#50	38.8%
#100	30.0%
#200	24.9%

Atterberg Limits		
PL=	LL=	PI=

Coefficients					
D_{85}=		D_{60}=		D_{50}=	
D_{30}=		D_{15}=		D_{10}=	
C_u=	N/A	C_c=	N/A		

USCS CLASSIFICATION
Silty SAND (SM)

Project Name: Proposed Retail Development - Corona, CA

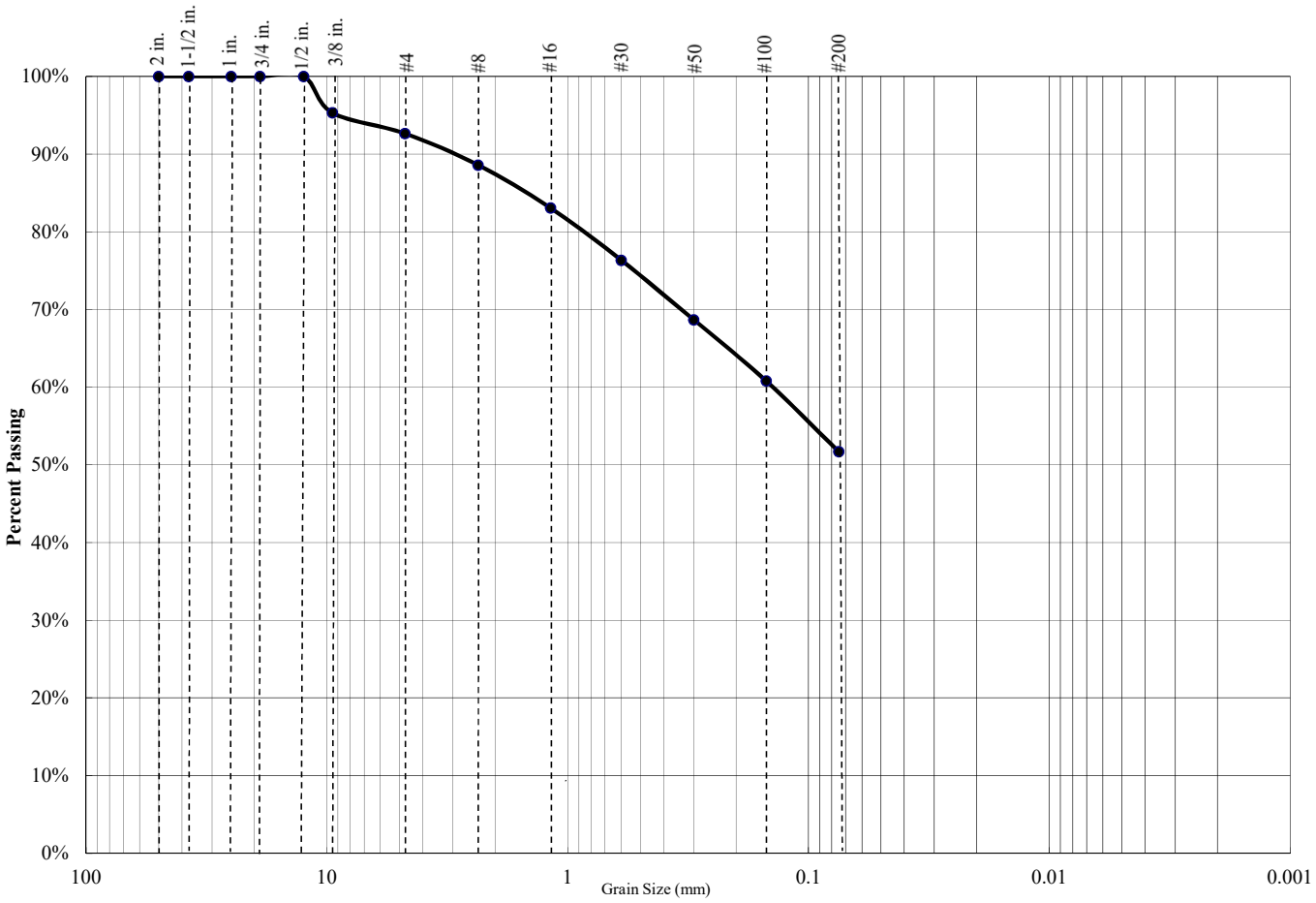
Project Number: 3-222-1216

Boring: B-6 @ 10'

SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
7%	41%	52%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	95.3%
#4	92.7%
#8	88.6%
#16	83.1%
#30	76.3%
#50	68.7%
#100	60.8%
#200	51.7%

Atterberg Limits		
PL=	LL=	PI=

Coefficients					
D_{85}=		D_{60}=		D_{50}=	
D_{30}=		D_{15}=		D_{10}=	
C_u=	N/A	C_c=	N/A		

USCS CLASSIFICATION
Sandy SILT (ML)

Project Name: Proposed Retail Development - Corona, CA

Project Number: 3-222-1216

Boring: B-6 @ 20'

SALEM engineering group, inc.

CHEMICAL ANALYSIS

SO_4 - Modified CTM 417 & Cl - Modified CTM 417/422

Project Name: Proposed Retail Development - Corona, CA
Project Number: 3-222-1216
Date Sampled: 12/1/2022 Date Tested: 12/14/2022
Sampled By: CC Tested By: M. Noorzay
Soil Description: Brown Gravelly, Silty SAND (SM)

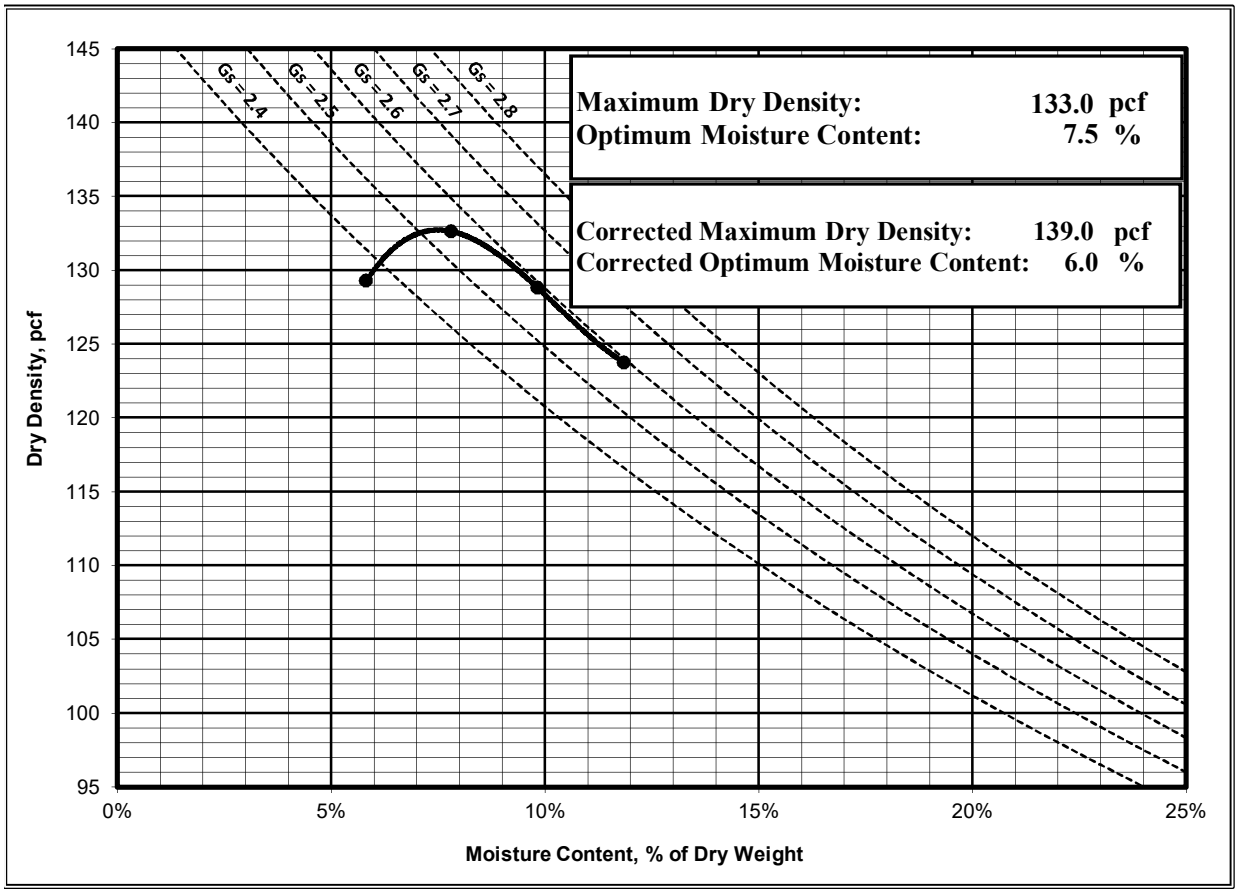
Sample Number	Sample Location	Soluble Sulfate SO_4-S	Soluble Chloride Cl	pH
1a.	B-1 @ 1'-4'	< 50 mg/kg	52 mg/kg	7.9
1b.	B-1 @ 1'-4'	< 50 mg/kg	50 mg/kg	7.9
1c.	B-1 @ 1'-4'	< 50 mg/kg	49 mg/kg	7.9
Average:		**< 50 mg/kg**	**50 mg/kg**	**7.9**

SALEM
engineering group, inc.

Laboratory Compaction Curve
ASTM D1557

Project Name: Proposed Retail Development - Corona, CA
Project Number: 3-222-1216
Date Sampled: 12/1/2022 Date Tested: 12/14/2022
Sampled By: CC Tested By: M. Noorzay
Sample Location: B-1 @ 1'-4'
Soil Description: Brown Gravelly, Silty SAND (SM)
Test Method: Method B

	1	2	3	4
Weight of Moist Specimen & Mold, (g)	6348.5	6442.0	6419.0	6372.8
Weight of Compaction Mold, (g)	4280.2	4280.2	4280.2	4280.2
Weight of Moist Specimen, (g)	2068.3	2161.8	2138.8	2092.6
Volume of Mold, (ft^3)	0.0333	0.0333	0.0333	0.0333
Wet Density, (pcf)	136.8	143.0	141.5	138.4
Weight of Wet (Moisture) Sample, (g)	200.0	200.0	200.0	200.0
Weight of Dry (Moisture) Sample, (g)	189.0	185.5	182.1	178.8
Moisture Content, (%)	5.8%	7.8%	9.8%	11.9%
Dry Density, (pcf)	129.3	132.6	128.8	123.7



SALEM engineering group, inc.

APPENDIX

C

APPENDIX C
GENERAL EARTHWORK AND PAVEMENT SPECIFICATIONS

When the text of the report conflicts with the general specifications in this appendix, the recommendations in the report have precedence.

1.0 SCOPE OF WORK: These specifications and applicable plans pertain to and include all earthwork associated with the site rough grading, including, but not limited to, the furnishing of all labor, tools and equipment necessary for site clearing and grubbing, stripping, preparation of foundation materials for receiving fill, excavation, processing, placement and compaction of fill and backfill materials to the lines and grades shown on the project grading plans and disposal of excess materials.

2.0 PERFORMANCE: The Contractor shall be responsible for the satisfactory completion of all earthwork in accordance with the project plans and specifications. This work shall be inspected and tested by a representative of SALEM Engineering Group, Incorporated, hereinafter referred to as the Soils Engineer and/or Testing Agency. Attainment of design grades, when achieved, shall be certified by the project Civil Engineer. Both the Soils Engineer and the Civil Engineer are the Owner's representatives. If the Contractor should fail to meet the technical or design requirements embodied in this document and on the applicable plans, he shall make the necessary adjustments until all work is deemed satisfactory as determined by both the Soils Engineer and the Civil Engineer. No deviation from these specifications shall be made except upon written approval of the Soils Engineer, Civil Engineer, or project Architect.

No earthwork shall be performed without the physical presence or approval of the Soils Engineer. The Contractor shall notify the Soils Engineer at least 2 working days prior to the commencement of any aspect of the site earthwork.

The Contractor shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the Contractor shall defend, indemnify and hold the Owner and the Engineers harmless from any and all liability, real or alleged, in connection with the performance of work on this project, except for liability arising from the sole negligence of the Owner or the Engineers.

3.0 TECHNICAL REQUIREMENTS: All compacted materials shall be densified to no less that 95 percent of relative compaction (90 percent for clay soils) based on ASTM D1557 Test Method (latest edition) or as specified in the technical portion of the Soil Engineer's report. The location and frequency of field density tests shall be determined by the Soils Engineer. The results of these tests and compliance with these specifications shall be the basis upon which satisfactory completion of work will be judged by the Soils Engineer.

4.0 SOILS AND FOUNDATION CONDITIONS: The Contractor is presumed to have visited the site and to have familiarized himself with existing site conditions and the contents of the data presented in the Geotechnical Engineering Report. The Contractor shall make his own interpretation of the data contained in the Geotechnical Engineering Report and the Contractor shall not be relieved of liability for any loss sustained as a result of any variance between conditions indicated by or deduced from said report and the actual conditions encountered during the progress of the work.

5.0 DUST CONTROL: The work includes dust control as required for the alleviation or prevention of any dust nuisance on or about the site or the borrow area, or off-site if caused by the Contractor's operation either during the performance of the earthwork or resulting from the conditions in which the Contractor leaves the site. The Contractor shall assume all liability, including court costs of codefendants, for all claims related to dust or wind-blown materials attributable to his work. Site preparation shall consist of site clearing and grubbing and preparation of foundation materials for receiving fill.

6.0 CLEARING AND GRUBBING: The Contractor shall accept the site in this present condition and shall demolish and/or remove from the area of designated project earthwork all structures, both surface and subsurface, trees, brush, roots, debris, organic matter and all other matter determined by the Soils Engineer to be deleterious. Such materials shall become the property of the Contractor and shall be removed from the site.

Tree root systems in proposed improvement areas should be removed to a minimum depth of 3 feet and to such an extent which would permit removal of all roots greater than 1 inch in diameter. Tree roots removed in parking areas may be limited to the upper 1½ feet of the ground surface. Backfill of tree root excavations is not permitted until all exposed surfaces have been inspected and the Soils Engineer is present for the proper control of backfill placement and compaction. Burning in areas which are to receive fill materials shall not be permitted.

7.0 SUBGRADE PREPARATION: Surfaces to receive Engineered Fill and/or building or slab loads shall be prepared as outlined above, scarified to a minimum of 12 inches, moisture-conditioned as necessary, and recompacted to 95 percent relative compaction (90 percent for clay soils).

Loose soil areas and/or areas of disturbed soil shall be moisture-conditioned as necessary and recompacted to 95 percent relative compaction (90 percent for clay soils). All ruts, hummocks, or other uneven surface features shall be removed by surface grading prior to placement of any fill materials. All areas which are to receive fill materials shall be approved by the Soils Engineer prior to the placement of any fill material.

8.0 EXCAVATION: All excavation shall be accomplished to the tolerance normally defined by the Civil Engineer as shown on the project grading plans. All over-excavation below the grades specified shall be backfilled at the Contractor's expense and shall be compacted in accordance with the applicable technical requirements.

9.0 FILL AND BACKFILL MATERIAL: No material shall be moved or compacted without the presence or approval of the Soils Engineer. Material from the required site excavation may be utilized for construction site fills, provided prior approval is given by the Soils Engineer. All materials utilized for constructing site fills shall be free from vegetation or other deleterious matter as determined by the Soils Engineer.

10.0 PLACEMENT, SPREADING AND COMPACTION: The placement and spreading of approved fill materials and the processing and compaction of approved fill and native materials shall be the responsibility of the Contractor. Compaction of fill materials by flooding, ponding, or jetting shall not be permitted unless specifically approved by local code, as well as the Soils Engineer. Both cut and fill shall be surface-compacted to the satisfaction of the Soils Engineer prior to final acceptance.

11.0 SEASONAL LIMITS: No fill material shall be placed, spread, or rolled while it is frozen or thawing, or during unfavorable wet weather conditions. When the work is interrupted by heavy rains, fill

operations shall not be resumed until the Soils Engineer indicates that the moisture content and density of previously placed fill is as specified.

12.0 DEFINITIONS - The term "pavement" shall include asphaltic concrete surfacing, untreated aggregate base, and aggregate subbase. The term "subgrade" is that portion of the area on which surfacing, base, or subbase is to be placed.

The term “Standard Specifications”: hereinafter referred to, is the most recent edition of the Standard Specifications of the State of California, Department of Transportation. The term "relative compaction" refers to the field density expressed as a percentage of the maximum laboratory density as determined by ASTM D1557 Test Method (latest edition).

13.0 PREPARATION OF THE SUBGRADE - The Contractor shall prepare the surface of the various subgrades receiving subsequent pavement courses to the lines, grades, and dimensions given on the plans. The upper 12 inches of the soil subgrade beneath the pavement section shall be compacted to a minimum relative compaction of 95 percent (90 percent for clay soils) based upon ASTM D1557. The finished subgrades shall be tested and approved by the Soils Engineer prior to the placement of additional pavement courses.

14.0 AGGREGATE BASE - The aggregate base material shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate base material shall conform to the requirements of Section 26 of the Standard Specifications for Class II material, ¾-inch or 1½-inches maximum size. The aggregate base material shall be compacted to a minimum relative compaction of 95 percent based upon ASTM D1557 Test Method. The aggregate base material shall be spread in layers not exceeding 6 inches and each layer of aggregate material course shall be tested and approved by the Soils Engineer prior to the placement of successive layers.

15.0 AGGREGATE SUBBASE - The aggregate subbase shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate subbase material shall conform to the requirements of Section 25 of the Standard Specifications for Class II Subbase material. The aggregate subbase material shall be compacted to a minimum relative compaction of 95 percent based upon ASTM D1557 Test Method, and it shall be spread and compacted in accordance with the Standard Specifications. Each layer of aggregate subbase shall be tested and approved by the Soils Engineer prior to the placement of successive layers.

16.0 ASPHALTIC CONCRETE SURFACING - Asphaltic concrete surfacing shall consist of a mixture of mineral aggregate and paving grade asphalt, mixed at a central mixing plant and spread and compacted on a prepared base in conformity with the lines, grades, and dimensions shown on the plans. The viscosity grade of the asphalt shall be PG 64-10, unless otherwise stipulated or local conditions warrant more stringent grade. The mineral aggregate shall be Type A or B, ½ inch maximum size, medium grading, and shall conform to the requirements set forth in Section 39 of the Standard Specifications. The drying, proportioning, and mixing of the materials shall conform to Section 39. The prime coat, spreading and compacting equipment, and spreading and compacting the mixture shall conform to the applicable chapters of Section 39, with the exception that no surface course shall be placed when the atmospheric temperature is below 50 degrees F. The surfacing shall be rolled with a combination steel-wheel and pneumatic rollers, as described in the Standard Specifications. The surface course shall be placed with an approved self-propelled mechanical spreading and finishing machine.

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

N/A

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

N/A

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	Albert A. Webb Associates	Date	6/23/2025
Designed by	EP	Case No	
Company Project Number/Name	22-0253 Northgate 6th & Main		

BMP Identification

BMP NAME / ID: DMA A

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMAs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
BLDG	*7215*	*Roofs*	*1*	*0.89*	*6435.8*			
CONC	*17641*	*Concrete or Asphalt*	*1*	*0.892*	*15735.8*			
LS	*2965*	*Ornamental Landscaping*	*0.1*	*0.11046*	*327.5*			
	27821	***Total***			**22499.1**	**0.20**	***0.1***	***0.1***

Notes:

4'X8' MWS

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Albert A. Webb Associates — Date: 6/23/2025

Designed by: EP — Case No:

Company Project Number/Name: 22-0253 Northgate 6th & Main

BMP Identification

BMP NAME / ID: DMA B

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity — I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMAs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
BLDG	*25251*	*Roofs*	*1*	*0.89*	*22523.9*			
CONC	*93400*	*Concrete or Asphalt*	*1*	*0.892*	*83312.8*			
LS	*16528*	*Ornamental Landscaping*	*0.1*	*0.11046*	*1825.6*			
	135179	***Total***			**107662.3**	**0.20**	***0.5***	***0.5***

Notes:

8'X20' MWS

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	Albert A. Webb Associates	Date	6/23/2025
Designed by	EP	Case No	
Company Project Number/Name	22-0253 Northgate 6th & Main		

BMP Identification

BMP NAME / ID: DMA C

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity: I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMAs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
BLDG	*20923*	*Roofs*	*1*	*0.89*	*18663.3*			
CONC	*25393*	*Concrete or Asphalt*	*1*	*0.892*	*22650.6*			
LS	*5524*	*Ornamental Landscaping*	*0.1*	*0.11046*	*610.2*			
	51840		*Total*		*41924.1*	*0.20*	*0.2*	*0.2*

Notes:

4'X17' MWS

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Albert A. Webb Associates

Date: 6/23/2025

Designed by: EP

Case No:

Company Project Number/Name: 22-0253 Northgate 6th & Main

BMP Identification

BMP NAME / ID: NE AREA

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity: I = 0.20 in/hr

Drainage Management Area Tabulation

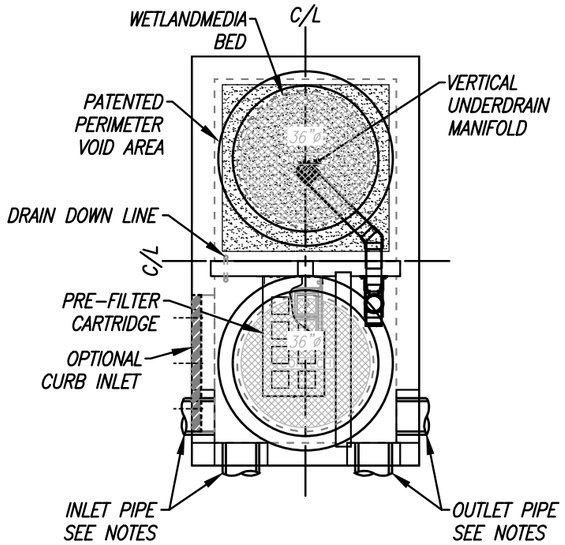
Insert additional rows if needed to accommodate all DMAs draining to the BMP

	DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
DMAs	*CONC*	*6020*	*Concrete or Asphalt*	*1*	*0.89*	*5369.8*			
	LS	*2306*	*Ornamental Landscaping*	*0.1*	*0.11046*	*254.7*			
		8326	**Total**			**5624.5**	**0.20**	***0***	***0***

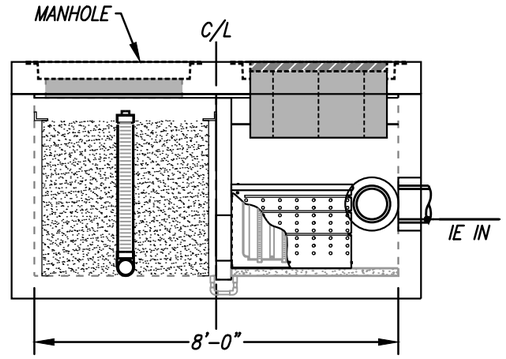
Notes: Approximately 0.2 acres of the northeast corner of the project site are proposed to be treated to the maximum extent practicable by LID principles before draining Washburn Avenue. This is due to grading constraints in the area to connect to the existing surface at the northeast boundary. The proposed condition of this area consists of less impervious area than the existing condition and the calculated QBMP is 0 cfs. Therefore, the overall site meets water quality treatment requirements by applying LID principles and DMA A, B & C treated with MWS units before discharging flows to Belle Avenue.

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
TREATMENT FLOW (CFS)			
PRETREATMENT LOADING RATE (GPM/SF)			2.1 GPM/SF
WETLAND MEDIA LOADING RATE (GPM/SF)			1.0
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			_____ (CFS)
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN		
NOTES:			

* PRELIMINARY ONLY - NOT FOR CONSTRUCTION



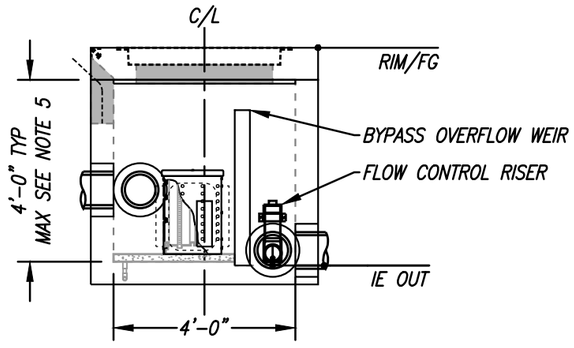
PLAN VIEW



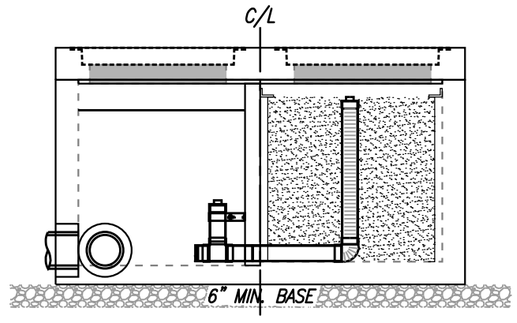
LEFT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
3. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
4. CONTRACTOR RESPONSIBLE FOR CONTACTING CONTECH FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A CONTECH REPRESENTATIVE.
5. VERTICAL HEIGHT VARIES BASED ON SITE SPECIFIC REQUIREMENTS.



ELEVATION VIEW

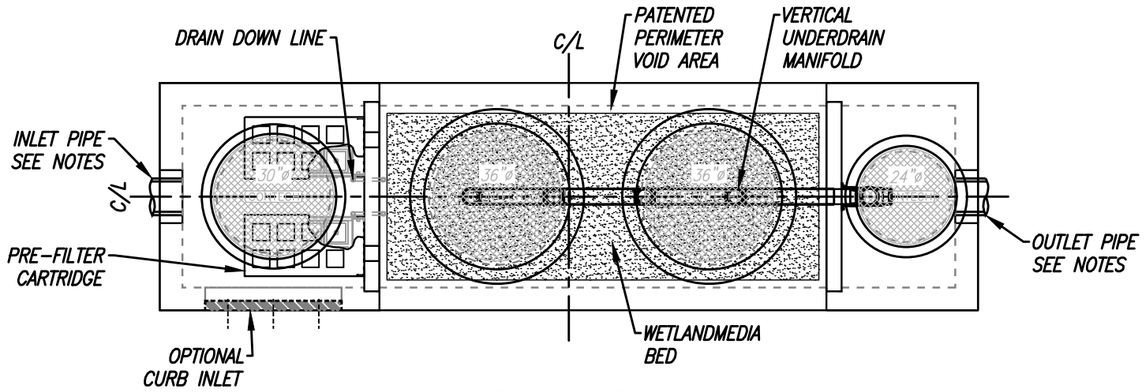


RIGHT END VIEW

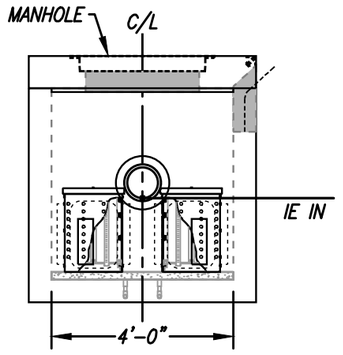
MWS-L-4-8-V-UG
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
TREATMENT FLOW (CFS)			
PRETREATMENT LOADING RATE (GPM/SF)			2.1 GPM/SF
WETLAND MEDIA LOADING RATE (GPM/SF)			1.0
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			_____ (CFS)
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN		
NOTES:			

* PRELIMINARY ONLY - NOT FOR CONSTRUCTION



PLAN VIEW



LEFT END VIEW

INSTALLATION NOTES

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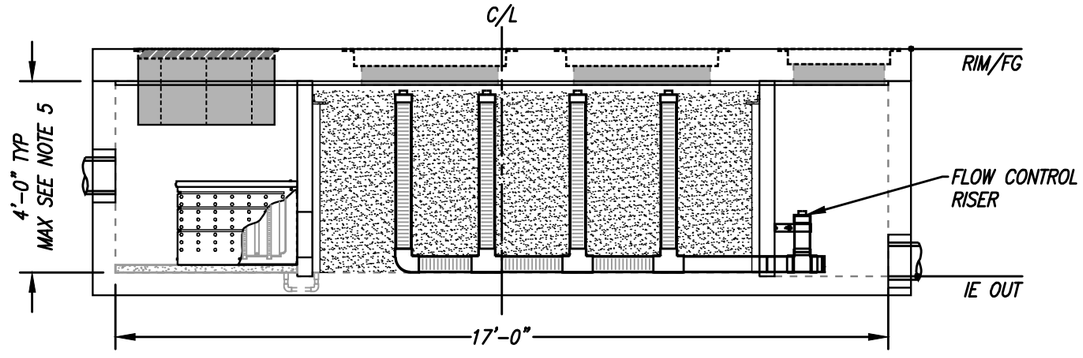
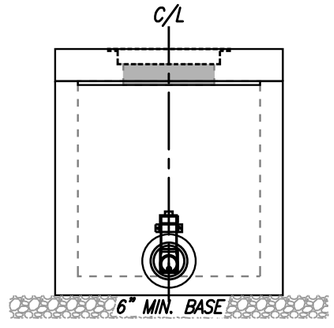


ELEVATION VIEW



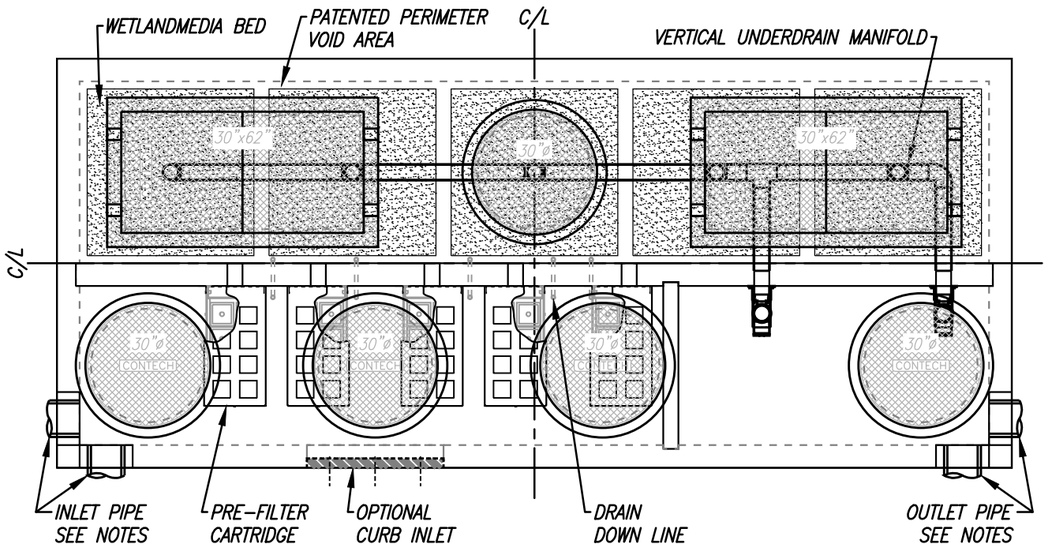
RIGHT END VIEW

MWS-L-4-17-V-UG
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

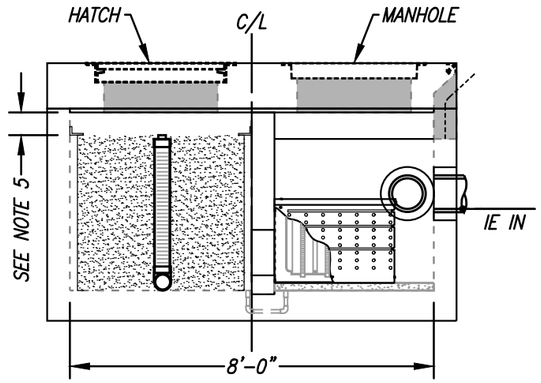
1/12/24TIM.GIRARD

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
TREATMENT FLOW (CFS)			
PRETREATMENT LOADING RATE (GPM/SF)			2.1 GPM/SF
WETLAND MEDIA LOADING RATE (GPM/SF)			1.0
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			_____ (CFS)
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN		
NOTES:			

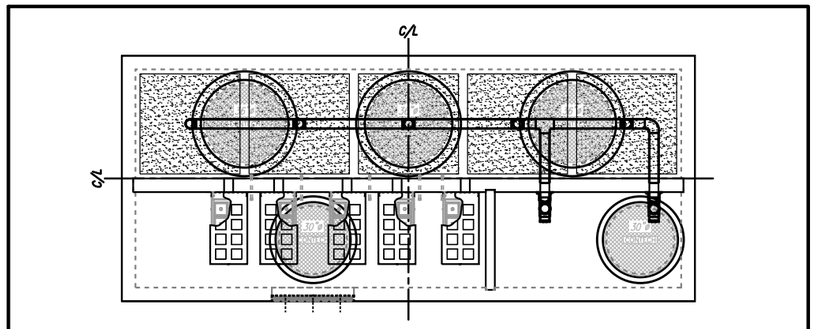
* PRELIMINARY ONLY - NOT FOR CONSTRUCTION



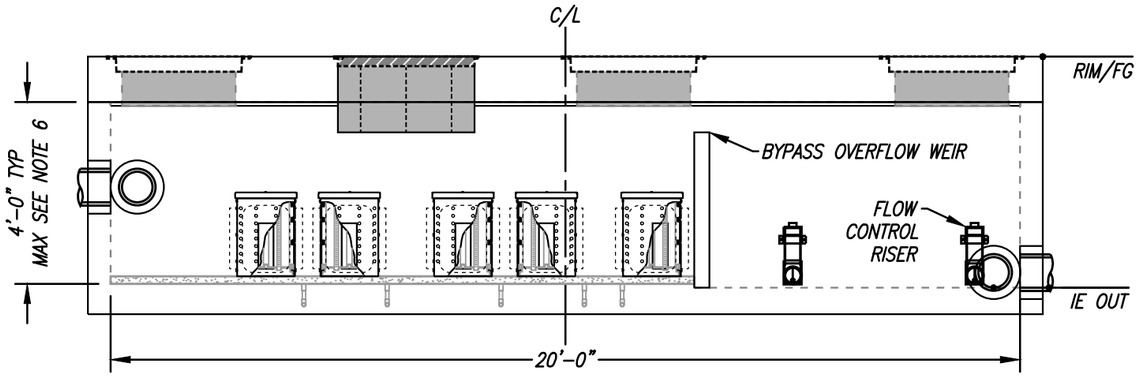
PLAN VIEW



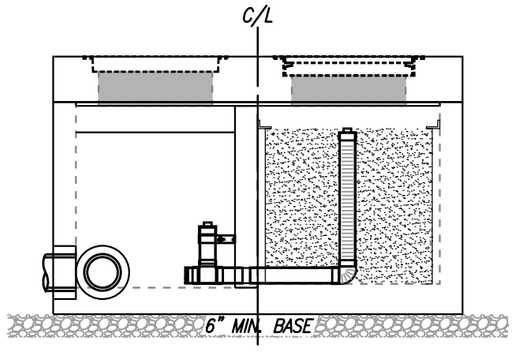
LEFT END VIEW



ALTERNATE DEEP ORIENTATION



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES

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4. CONTRACTOR RESPONSIBLE FOR CONTACTING CONTECH FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A CONTECH REPRESENTATIVE.
5. ALTERNATE DEEP FRAME & COVER ORIENTATION USED WHEN CEILING TO MEDIA DISTANCE IS 2.5' OR GREATER.
6. VERTICAL HEIGHT VARIES BASED ON SITE SPECIFIC REQUIREMENTS.

MWS-L-8-20-V-UG
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

CONTECH®
ENGINEERED SOLUTIONS

Modular Wetlands® Linear Stormwater Biofiltration

The experts you need to solve your stormwater challenges

Contech is the leader in stormwater solutions, helping engineers, contractors and owners with infrastructure and land development projects throughout North America.

With our responsive team of stormwater experts, local regulatory expertise and flexible solutions, Contech is the trusted partner you can count on for stormwater management solutions.

Your Contech Team

STORMWATER CONSULTANT

It's my job to recommend the best solution to meet permitting requirements.

STORMWATER DESIGN ENGINEER

I work with consultants to design the best approved solution to meet your project's needs.

REGULATORY MANAGER

I understand the local stormwater regulations and what solutions will be approved.

SALES ENGINEER

I make sure our solutions meet the needs of the contractor during construction.

Contech is your partner in stormwater management solutions

Restoring Nature's Presence in Urban Areas – Modular Wetlands® Linear

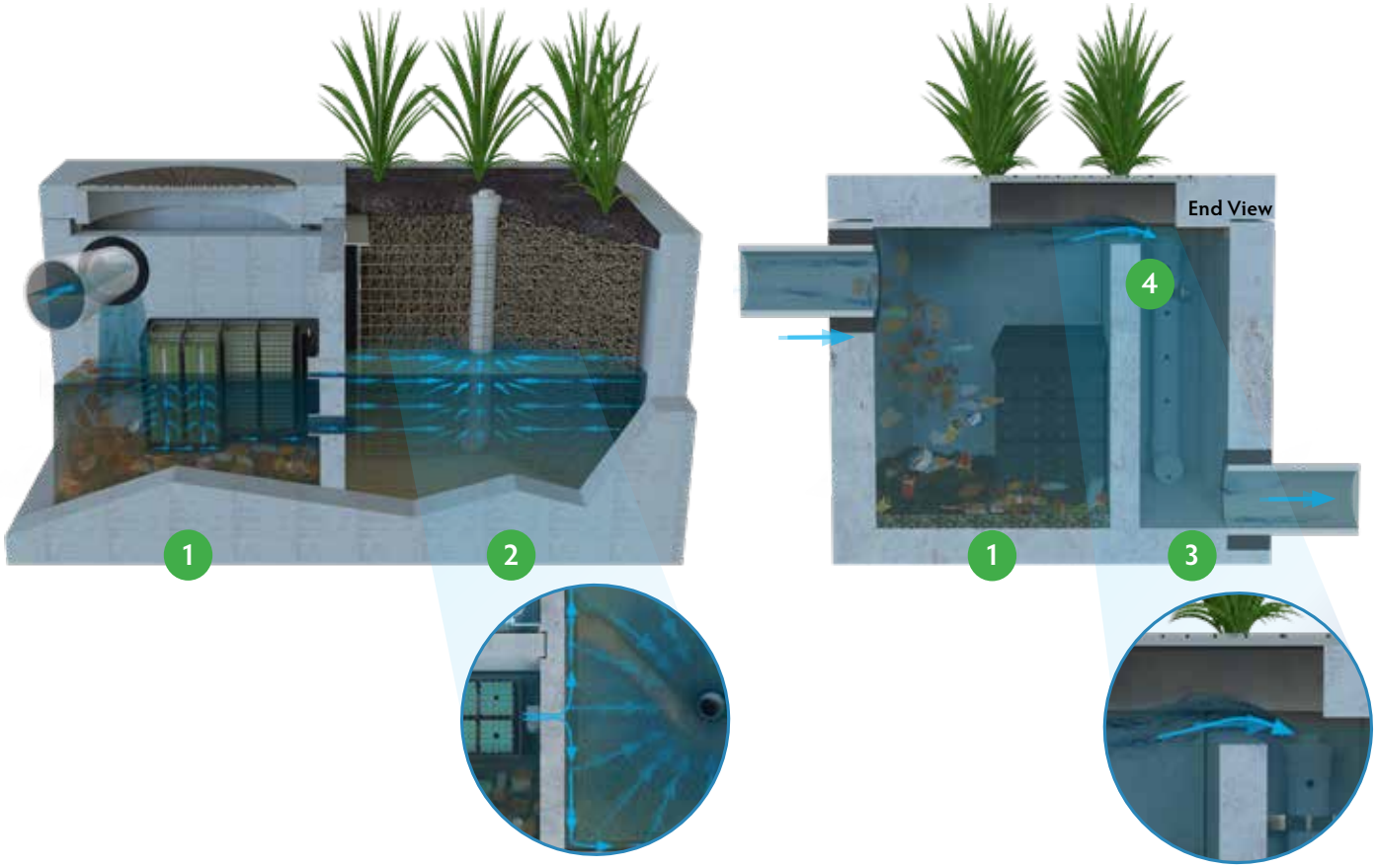
As cities grow, there is less space for natural solutions to treat stormwater. Contech understands this and is committed to providing compact, Low Impact Development (LID) solutions like the Modular Wetlands Linear to protect our nation's waterways.

The Modular Wetlands® Linear is the only biofiltration system to utilize patented horizontal flow, allowing for a small footprint, high treatment capacity, and design versatility. It is also the only biofiltration system that can be routinely installed downstream of storage for additional volume control and treatment.

With numerous regulatory approvals, the system's aesthetic appeal and superior pollutant removal make it the ideal solution for a wide range of stormwater applications, including urban development projects, commercial parking lots, residential streets, mixed-use developments, streetscapes, and more.

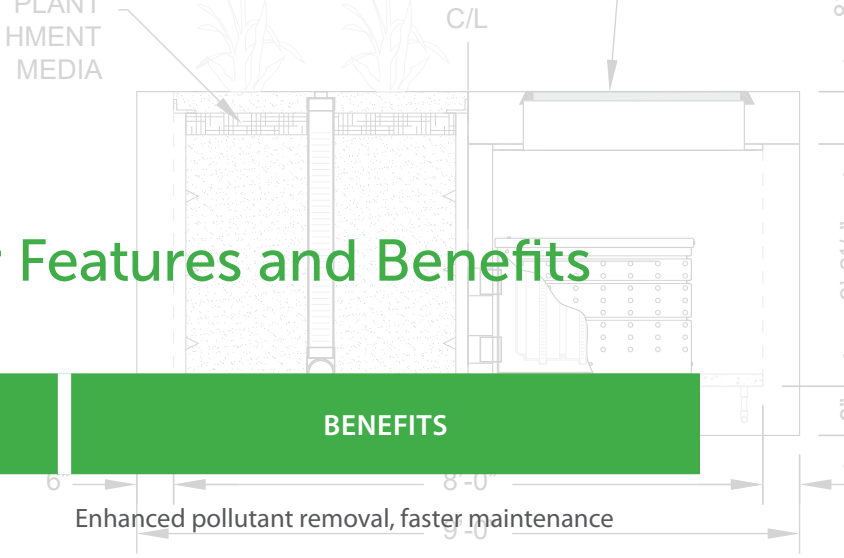
MODULAR WETLANDS®

How the Modular Wetlands® Linear Works



1. **PRETREATMENT** | Stormwater enters the pretreatment chamber where total suspended solids settle, and trash and debris are contained within the chamber. Stormwater then travels through the pretreatment filter boxes that provide additional treatment.
2. **BIOFILTRATION** | As water enters the biofiltration chamber, it fills the void space in the chamber's perimeter. Horizontal forces push the water inward through the biofiltration media, where nutrients and metals are captured. The water then enters the drain pipe to be discharged.
3. **DISCHARGE** | The specially designed vertical drain pipe and orifice control plate control the flow of water through the media to a level lower than the media's capacity, ensuring media effectiveness. The water then enters the horizontal drain pipe to be discharged.
4. **BYPASS** | During peak flows, an internal weir in the side-by-side configuration allows high flows to bypass treatment, eliminating flooding and the need for a separate bypass structure. Bypass is not provided in the end-to end configuration.

Using horizontal flow to improve performance



Modular Wetlands® Linear Features and Benefits

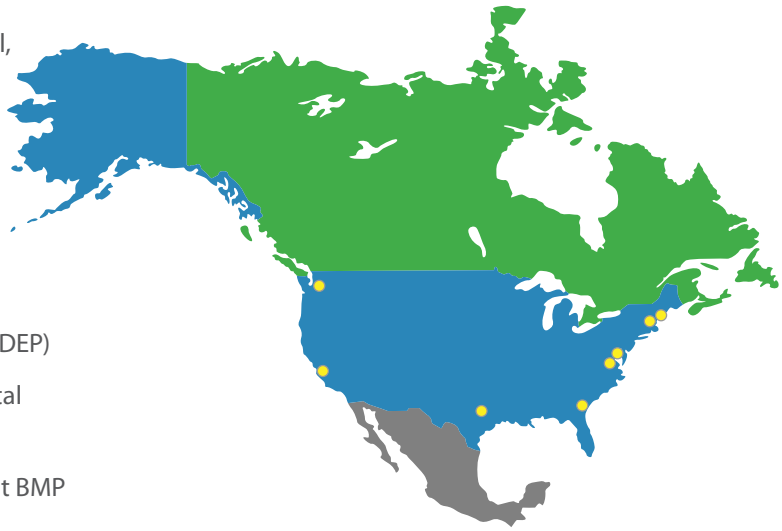
FEATURE	BENEFITS
Pretreatment chamber	Enhanced pollutant removal, faster maintenance
Horizontal flow biofiltration	Greater filter surface area
Performance verified by both the WA DOE and NJ DEP	Superior pollutant capture with confidence
Built-in high flow bypass	Eliminates flooding and the need for a separate bypass structure
Available in multiple configurations and sizes	Flexibility to meet site-specific needs

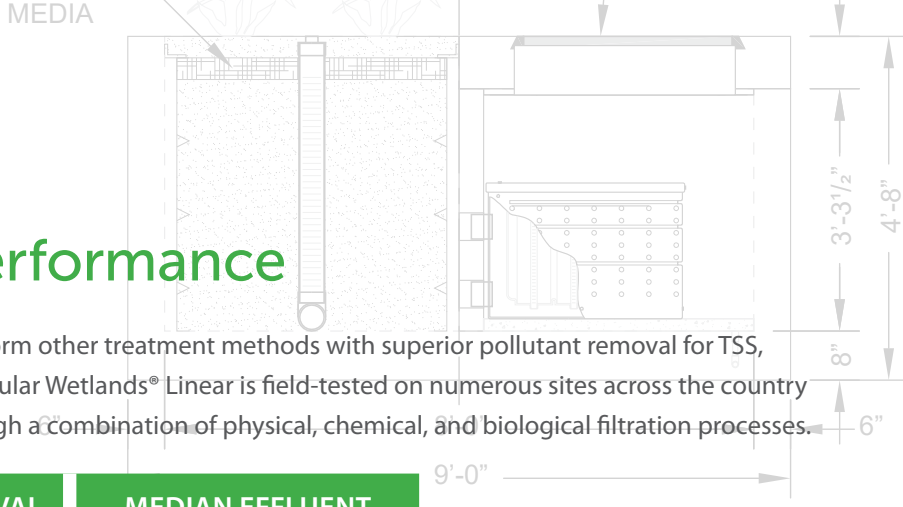
The Modular Wetlands system offers many different configurations.

Select Modular Wetlands® Linear Approvals

Modular Wetlands Linear is approved through numerous local, state and federal programs, including but not limited to:

- Washington State Department of Ecology TAPE
- California Water Resources Control Board, Full Capture Certification
- Virginia Department of Environmental Quality (VA DEQ)
- New Jersey Department of Environmental Protection (NJDEP)
- Maryland Department of the Environment - Environmental Site Design (ESD)
- Rhode Island Department of Environmental Management BMP
- Texas Commission on Environmental Quality (TCEQ)
- Atlanta Regional Commission Certification





Modular Wetlands® Performance

The Modular Wetlands® Linear continues to outperform other treatment methods with superior pollutant removal for TSS, heavy metals, nutrients, and hydrocarbons. The Modular Wetlands® Linear is field-tested on numerous sites across the country and is proven to effectively remove pollutants through a combination of physical, chemical, and biological filtration processes.

POLLUTANT OF CONCERN	MEDIAN REMOVAL EFFICIENCY	MEDIAN EFFLUENT CONCENTRATION (MG/L)
Total Suspended Solids (TSS)	89%	12
Total Phosphorus - TAPE (TP)	61%	0.041
Nitrogen (TN)	23%	1
Total Copper (TCu)	50%	0.006
Total Dissolved Copper	37%	0.006
Total Zinc (TZn)	66%	0.019
Dissolved Zinc	60%	0.0148
Motor Oil	79%	0.8

Sources:
TAPE Field Study - 2012
TAPE Field Study - 2013

Note: Some jurisdictions recognize higher removal rates. Contact your Contech Stormwater Consultant for performance expectations.

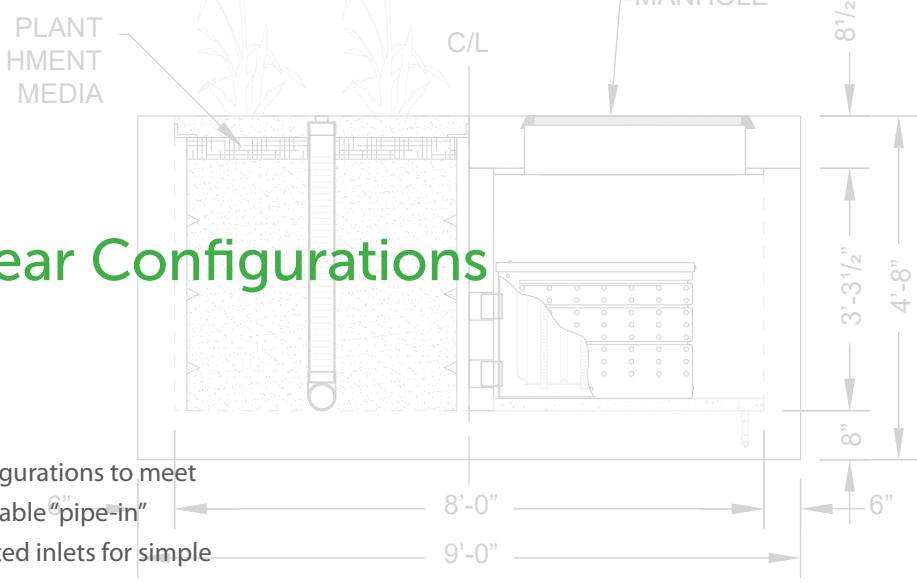
Modular Wetlands® Linear Maintenance

The Modular Wetlands® Linear is a self-contained treatment train. Maintenance requirements for the unit consist of five simple steps that can be completed using a vacuum truck. The system can also be cleaned by hand.

- Remove trash from the screening device
- Remove sediment from the separation chamber
- Periodically replace the pretreatment cartridge filter media
- Replace the drain down filter media
- Trim vegetation

Most Modular Wetland Linear systems can be cleaned in about thirty minutes.

Multiple configurations allow for easy site integration



Modular Wetlands® Linear Configurations

Multiple system configurations integrate with site hydraulic design and layout ...

The Modular Wetlands Linear is offered in multiple configurations to meet site specific needs. This highly versatile system has available "pipe-in" options on most models, along with built-in curb or grated inlets for simple integration into your storm drain design.

Curb Inlet

The Curb Inlet configuration accepts sheet flow through a curb opening and is commonly used along roadways and parking lots. It can be used in sump or flow-by conditions.

Vault

The Vault configuration can be used in end-of-the-line installations. Another benefit of the "pipe-in" design is the ability to install the system downstream of underground detention systems to meet water quality volume requirements, or for traffic-rated designs (no plants).

Downspout

The Downspout configuration is designed to accept a vertical downspout pipe from rooftop and podium areas. Some models have the option of utilizing an internal bypass, simplifying the overall design. The system can be installed as a raised planter, and the exterior can be stuccoed or covered with other finishes to match the look of adjacent buildings.

A partner you can rely on

STORMWATER SOLUTIONS

PIPE SOLUTIONS

STRUCTURES SOLUTIONS

Few companies offer the wide range of high-quality stormwater resources you can find with us — state-of-the-art products, decades of expertise, and all the maintenance support you need to operate your system cost-effectively.

THE CONTECH WAY

Contech® Engineered Solutions provides innovative, cost-effective site solutions to engineers, contractors, and developers on projects across North America. Our portfolio includes bridges, drainage, erosion control, retaining wall, sanitary sewer and stormwater management products.

TAKE THE NEXT STEP

For more information: www.ContechES.com

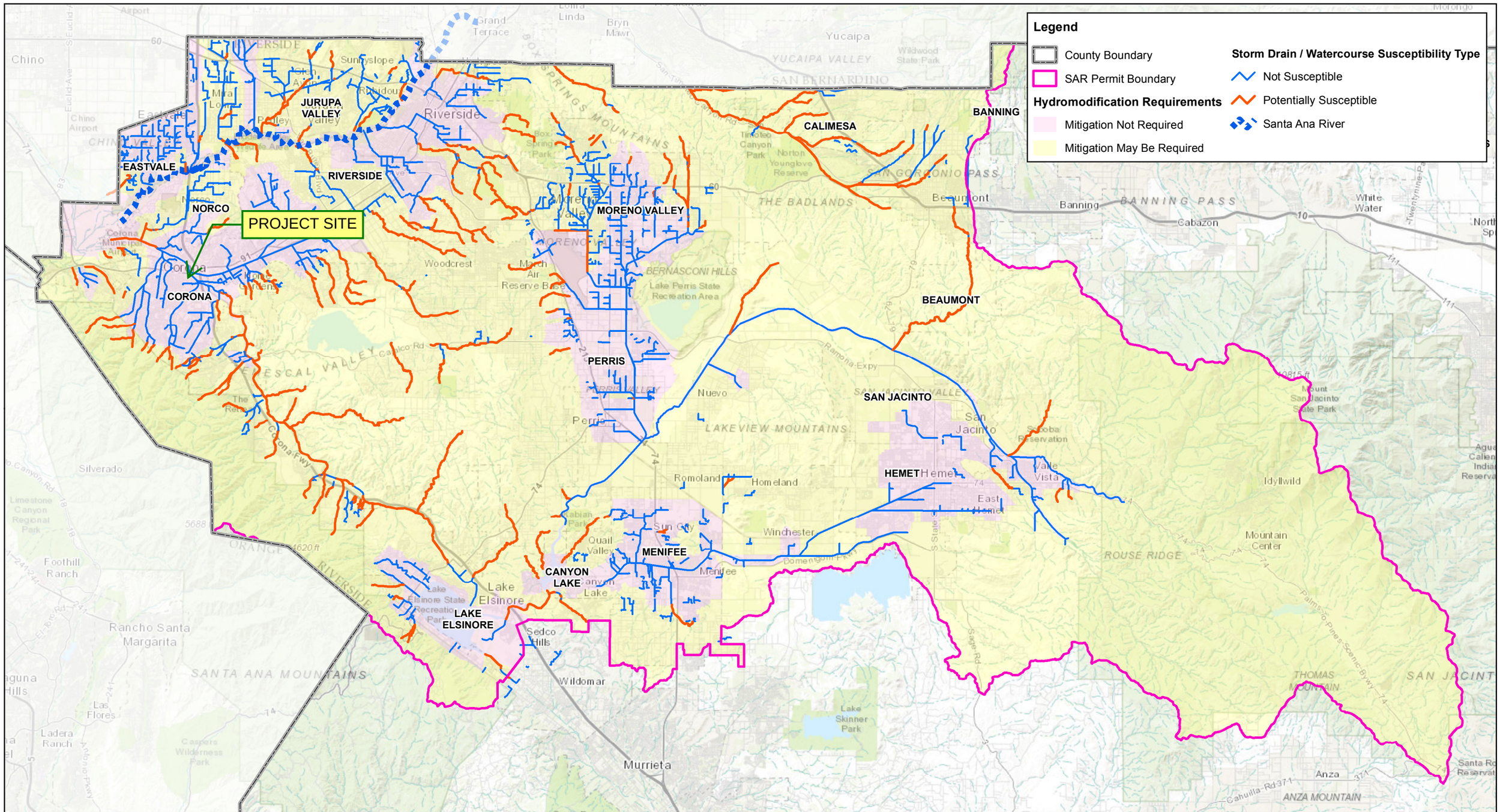
CONTECH® ENGINEERED SOLUTIONS

Get social with us:

800-338-1122 | www.ContechES.com

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern


Legend
County Boundary
SAR Permit Boundary
Hydromodification Requirements
Mitigation Not Required
Mitigation May Be Required
Storm Drain / Watercourse Susceptibility Type
Not Susceptible
Potentially Susceptible
Santa Ana River
PROJECT SITE
EASTVALE
JURUPA VALLEY
RIVERSIDE
NORCO
CORONA
MORENO VALLEY
PERRIS
CALIMESA
BANNING
BEAUMONT
SAN JACINTO
HEMET
MENIFEE
CANYON LAKE
LAKE ELSINORE
Riverside
Corona
Moreno Valley
Perris
Hemet
Menifee
Lake Elsinore
Canyon Lake
Murrieta
Wildomar
Beaumont
Banning
Calimesa
San Jacinto
Temecula
Lake Elsinore State Recreation Park
Lake Perris State Recreation Area
March Air Reserve Base
Lake Skinner Park
Cahuilla-Rd-371
Anza
ANZA MOUNTAIN
SAN JACINTO MOUNTAINS
SANTA ANA MOUNTAINS
LAKEVIEW MOUNTAINS
ROUSE RIDGE
THE BADLANDS
SAN GORGONIO PASS
BANNING PASS
BERNASCONI HILLS
N
0 2.5 5 10 Miles
Updated February 2017
HCOC Applicability Map
SAR Permittees
Map 2

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section G of the WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1on page 23 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ A. **On-site storm drain inlets**	☒ **Locations of inlets.**	☒ **Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.**	☒ **Maintain and periodically repaint or replace inlet markings.** ☒ **Provide stormwater pollution prevention information to new site owners, lessees, or operators.** ☒ **See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** ☒ **Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."**
☐ B. **Interior floor drains and elevator shaft sump pumps**		☐ **State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.**	☐ **Inspect and maintain drains to prevent blockages and overflow.**
☐ C. **Interior parking garages**		☐ **State that parking garage floor drains will be plumbed to the sanitary sewer.**	☐ **Inspect and maintain drains to prevent blockages and overflow.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ D1. **Need for future indoor & structural pest control**		☒ **Note building design features that discourage entry of pests.**	☒ **Provide Integrated Pest Management information to owners, lessees, and operators.**
☒ D2. **Landscape/ Outdoor Pesticide Use**	☐ **Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.** ☐ **Show self-retaining landscape areas, if any.** ☒ **Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)**	**State that final landscape plans will accomplish all of the following.** ☒ **Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.** ☒ **Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.** ☒ **Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.** ☒ **Consider using pest-resistant plants, especially adjacent to hardscape.** **To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.**	☒ **Maintain landscaping using minimum or no pesticides.** ☒ **See applicable operational BMPs in "What you should know for…..Landscape and Gardening"** at http://rcflood.org/stormwater/**Error! Hyperlink reference not valid.** ☒ **Provide IPM information to new owners, lessees and operators.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☐ E. **Pools, spas, ponds, decorative fountains, and other water features.**	☐ **Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)**	**If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.**	☐ **See applicable operational BMPs in** "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
☒ F. **Food service**	☒ **For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment.** ☒ **On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.**	☒ **Describe the location and features of the designated cleaning area.** ☒ **Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.**	☒ **See the brochure, "**The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ **Provide this brochure to new site owners, lessees, and operators.**
☒ G. **Refuse areas**	☒ **Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas.** ☒ **If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area.** ☒ **Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.**	☒ **State how site refuse will be handled and provide supporting detail to what is shown on plans.** ☒ **State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.**	☒ **State how the following will be implemented:** **Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at** www.cabmphandbooks.com

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ H. **Industrial processes.**	❑ **Show process area.**	❑ **If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."**	❑ **See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ I. **Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)**	❑ **Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.** ❑ **Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.** ❑ **Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.**	**Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.** **Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for:** ▪ **Hazardous Waste Generation** ▪ **Hazardous Materials Release Response and Inventory** ▪ **California Accidental Release (CalARP)** ▪ **Aboveground Storage Tank** ▪ **Uniform Fire Code Article 80 Section 103(b) & (c) 1991** ▪ **Underground Storage Tank** **www.cchealth.org/groups/hazmat/**	❑ **See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ J. **Vehicle and Equipment Cleaning**	❑ **Show on drawings as appropriate:** **(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.** **(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).** **(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.** **(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.**	❑ **If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.**	**Describe operational measures to implement the following (if applicable):** ❑ **Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.** Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/ ❑ **Car dealerships and similar may rinse cars with water only.**

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❑ K. **Vehicle/Equipment Repair and Maintenance**	❑ **Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.** ❑ **Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.** ❑ **Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.**	❑ **State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.** ❑ **State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.** ❑ **State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.**	**In the Stormwater Control Plan, note that all of the following restrictions apply to use the site:** ❑ **No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.** ❑ **No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.** ❑ **No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.** Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
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❑ L. **Fuel Dispensing Areas**	❑ **Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.** ❑ **Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.**		❑ **The property owner shall dry sweep the fueling area routinely.** ❑ **See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

[6] **The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.**

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☒ M. **Loading Docks**	☒ **Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer.** ☒ **Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.** ☒ **Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.**		☒ **Move loaded and unloaded items indoors as soon as possible.** ☒ **See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

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1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ N. **Fire Sprinkler Test Water**		☒ **Provide a means to drain fire sprinkler test water to the sanitary sewer.**	☒ **See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**
O. **Miscellaneous Drain or Wash Water or Other Sources** ☐ **Boiler drain lines** ☐ **Condensate drain lines** ☐ **Rooftop equipment** ☐ **Drainage sumps** ☐ **Roofing, gutters, and trim.** ☐ **Other sources**		☐ **Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.** ☐ **Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.** ☐ **Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment.** ☐ **Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.** ☐ **Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.** **Include controls for other sources as specified by local reviewer.**	

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ P. **Plazas, sidewalks, and parking lots.**			☒ **Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.**

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

To be provided during final engineering

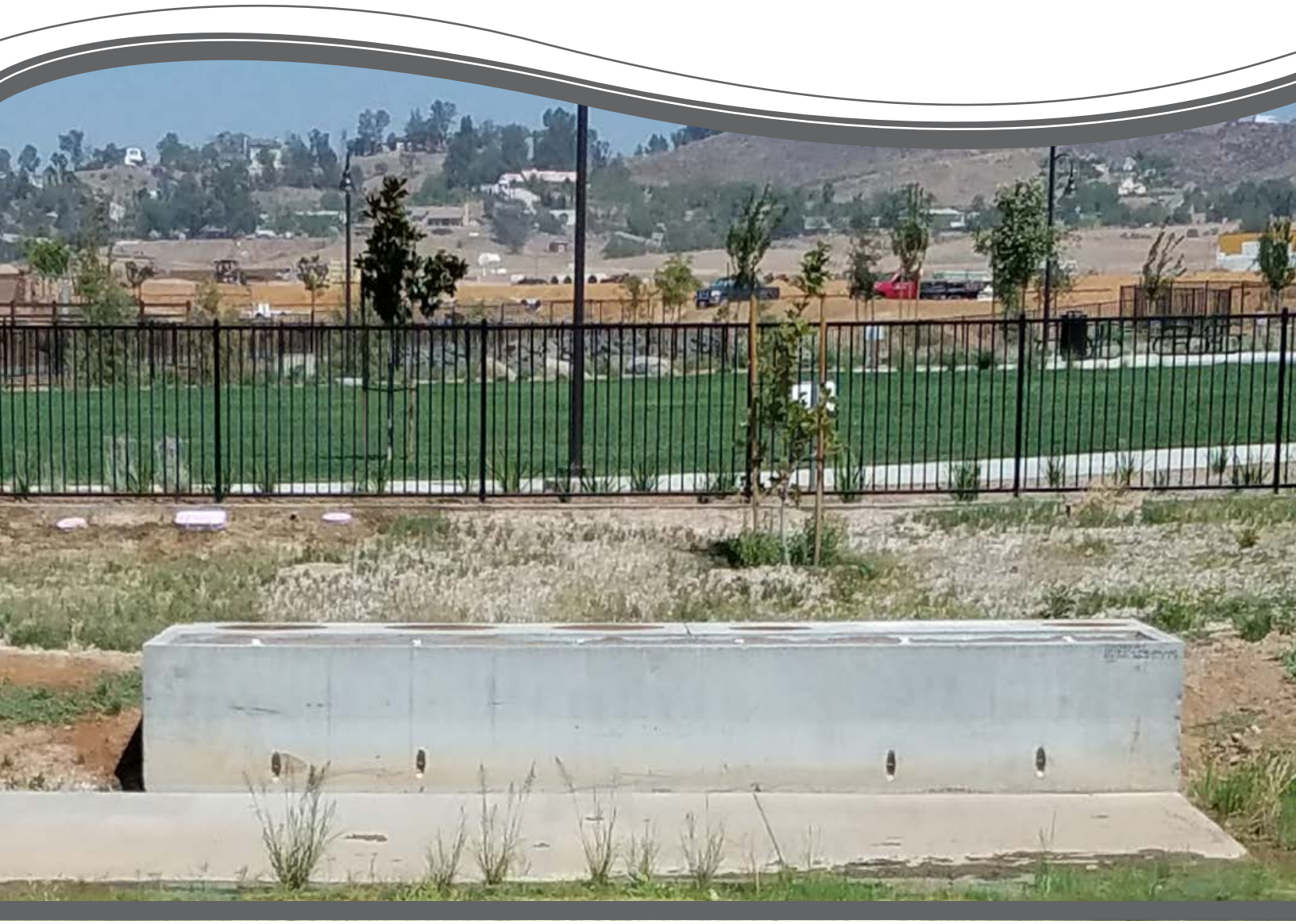
Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

To be provided during final engineering

CONTECH®
ENGINEERED SOLUTIONS

Modular Wetlands® Linear Operations & Maintenance Manual



MODULAR WETLANDS®

MODULAR WETLANDS LINEAR
OPERATION & MAINTENANCE MANUAL

TABLE OF CONTENTS

OVERVIEW

This operation and maintenance (O&M) manual is for the Modular Wetlands Linear Biofilter (MWL). Please read the instructions and equipment lists closely prior to starting. It is important to follow all necessary safety procedures associated with state and local regulations. Please contact Contech for more information on pre-authorized third-party service providers who can provide inspection and maintenance services in your area. For a list of service providers in your area, please visit www.conteches.com/maintenance.

WARNING

Confined space entry may be required. Contractor to obtain all equipment and training to meet applicable local and OSHA regulations regarding confined space entry. It is the Contractor's or entry personnel's responsibility to always proceed safely.

SAFETY NOTICE & PERSONAL SAFETY EQUIPMENT

Job site safety is a topic and a practice addressed comprehensively by others. The inclusions here are merely reminders to whole areas of Safety Practice that are the responsibility of the Owner(s), Manager(s), and Service Provider(s). OSHA and Canadian OSH, Federal, State/Provincial, and Local Jurisdiction Safety Standards apply on any given site or project. The knowledge and applicability of those responsibilities is the Service Provider's responsibility and outside the scope of Contech Engineered Solutions.

Safety Boots

Gloves

Hard Hat

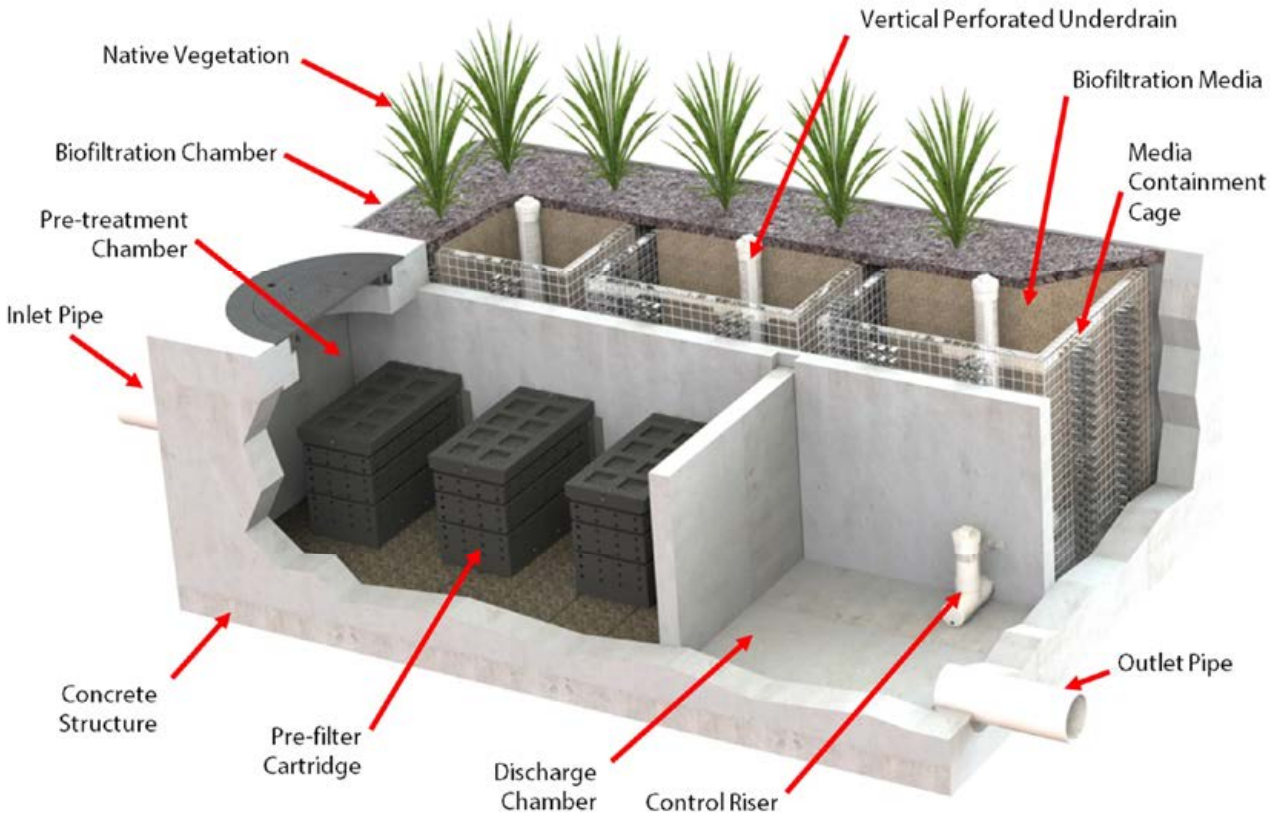
Eye Protection

Maintenance and Protection of Traffic Plan

MODULAR WETLANDS LINEAR COMPONENTS LIST

The MWL system comes in multiple sizes and configurations, including side by side or end to end layouts, both as open planters or underground systems. See shop drawings (plans) for project specific details.

The standard MWL system is comprised of the following components:



INSPECTION SUMMARY & EQUIPMENT LIST

Stormwater regulations require BMPs be inspected and maintained to ensure they are operating as designed to allow for effective pollutant removal and provide protection to receiving water bodies. It is recommended that inspections be performed multiple times during the first year to assess the site-specific loading conditions. The first year of inspections can be used to set inspection and maintenance intervals for subsequent years to ensure appropriate maintenance is provided.

- Inspect pre-treatment, biofiltration, and discharge chambers an average of once every six to twelve months. Varies based on site specific and local conditions.
- Average inspection time is approximately 15 minutes. Always ensure appropriate safety protocol and procedures are followed.

The following is a list of equipment required to allow for simple and effective inspection of the MWL:

Modular Wetlands Linear Inspection Form

Flashlight

Tape Measure

Access Cover Hook

Ratchet
& 7/16" Socket
(if required for older pre-filter cartridges that have two bolts holding the lids on)

INSPECTION & MAINTENANCE NOTES

1. Following maintenance and/or inspection, it is recommended that the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.
2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.
3. Transport all debris, trash, organics, and sediments to approved facility for disposal in accordance with local and state requirements.
4. Entry into chambers may require confined space training based on state and local regulations.
5. No fertilizer shall be used in the biofiltration chamber.
6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may not require irrigation after initial establishment.

INSPECTION PROCESS

1. Prepare the inspection form by writing in the necessary information including project name, location, date & time, unit number and other information (see inspection form).
2. Observe the inside of the system through the access covers. If minimal light is available and vision into the unit is impaired, utilize a flashlight to see inside the system and all chambers.
3. Look for any out of the ordinary obstructions in the inflow pipe, pre-treatment chamber, biofiltration chamber, discharge chamber or outflow pipe. Write down any observations on the inspection form.
4. Through observation and/or digital photographs, estimate the amount of trash, debris accumulated in the pre-treatment chamber. Utilizing a tape measure or measuring stick, estimate the amount of sediment in this chamber. Record this depth on the inspection form.
5. Through visual observation, inspect the condition of the pre-filter cartridges. Look for excessive build-up of sediment on the cartridges, any build-up on the tops of the cartridges, or clogging of the holes. Record this information on the inspection form. The pre-filter cartridges can be further inspected by removing the cartridge tops and assessing the color of the BioMediaGREEN filter cubes (requires entry into pre-treatment chamber - see notes previous notes regarding confined space entry). Record the color of the material. New material is a light green color. As the media becomes clogged, it will turn darker in color, eventually becoming dark brown or black. The closer to black the media is the higher percentage that the media is exhausted and in need of replacement.

6. The biofiltration chamber is generally maintenance-free due to the system's advanced pre-treatment chamber. For units which have open planters with vegetation, it is recommended that the vegetation be inspected. Look for any plants that are dead or showing signs of disease or other negative stressors. Record the general health of the plants on the inspection form and indicate through visual observation or digital photographs if trimming of the vegetation is required.

7. The discharge chamber houses the control riser (if applicable), drain down filter (only in California - older models), and is connected to the outflow pipe. It is important to check to ensure the orifice is in proper operating condition and free of any obstructions. It is also important to assess the condition of the drain down filter media which utilizes a block form of the BioMediaGREEN. Assess in the same manner as the cubes in the pre-filter cartridge as mentioned above.

8. Finalize the inspection report for analysis by the maintenance manager to determine if maintenance is required.

MAINTENANCE INDICATORS

Based upon the observations made during inspection, maintenance of the system may be required based on the following indicators:

- Missing or damaged internal components or cartridges.
- Obstructions in the system or its inlet and/or outlet pipes.
- Excessive accumulation of floatables in the pre-treatment chamber in which the length and width of the chamber is fully impacted more than 18".
- Excessive accumulation of sediment in the pre-treatment chamber of more than 6" in depth.
- Excessive accumulation of sediment on the BioMediaGREEN media housed within the pretreatment cartridges. When media is more than 85% clogged, replacement is required. The darker the BioMediaGREEN, the more clogged it is and in need of replacement.
- Excessive accumulation of sediment on the BioMediaGREEN media housed within the drain down filter (California only - older models).
- Overgrown vegetation.

MAINTENANCE SUMMARY & EQUIPMENT LIST

The time has come to maintain your MWL. All necessary pre-maintenance steps must be carried out before maintenance occurs. Once traffic control has been set up per local and state regulations and access covers have been safely opened, the maintenance process can begin. It should be noted that some maintenance activities require confined space entry. All confined space requirements must be strictly followed before entry into the system. In addition, the following is recommended:

- Prepare the maintenance form by writing in the necessary information including project name, location, date & time, unit number and other info (see maintenance form).
- Set up all appropriate safety and maintenance equipment.
- Ensure traffic control is set up and properly positioned.
- Prepared pre-checks (OSHA, safety, confined space entry) are performed.
    - A gas meter should be used to detect the presence of any hazardous gases prior to entering the system. If hazardous gases are present, do not enter the vault. Following appropriate confined space procedures, take steps such as utilizing a venting system to address the hazard. Once it is determined to be safe, enter the system utilizing appropriate entry equipment such as a ladder and tripod with harness.

The following is a list of equipment required for maintenance of the MWL:

Modular Wetlands Linear Maintenance Form

Flashlight

Access Cover Hook

Ratchet
& 7/16" Socket
(if required for older pre-filter cartridges that have two bolts holding the lids on)

Vacuum Assisted Truck with Pressure Washer

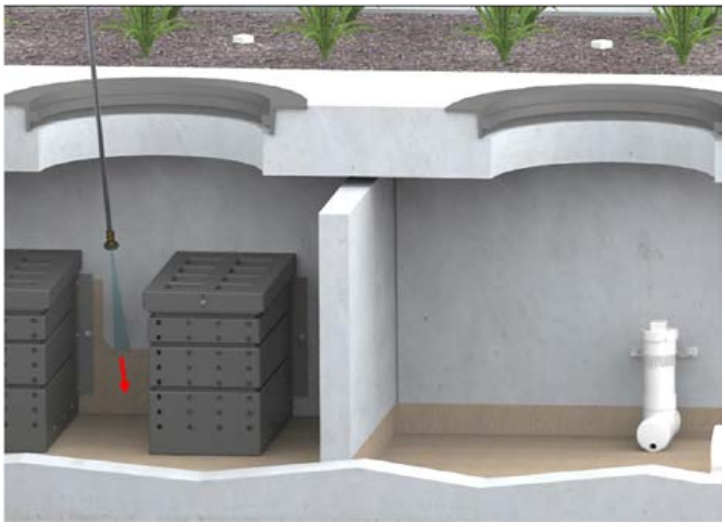
Replacement
BioMediaGREEN
(If Required)

(order BioMediaGREEN from Contech's Maintenance Team members at https://www.conteches.com/maintenance)

MAINTENANCE INSTRUCTIONS

1. ACCESS COVER REMOVAL

Upon determining that the vault is safe for entry, remove all access cover(s) and position the vacuum truck accordingly.



2. PRESSURE WASH SYSTEM CHAMBERS

With the pressure washer, spray down pollutants accumulated on the walls and floors of the pre-treatment and discharge chambers. Then wash any accumulated sediment from the pre-filter cartridge(s).

3. VACUUM SYSTEM CHAMBERS

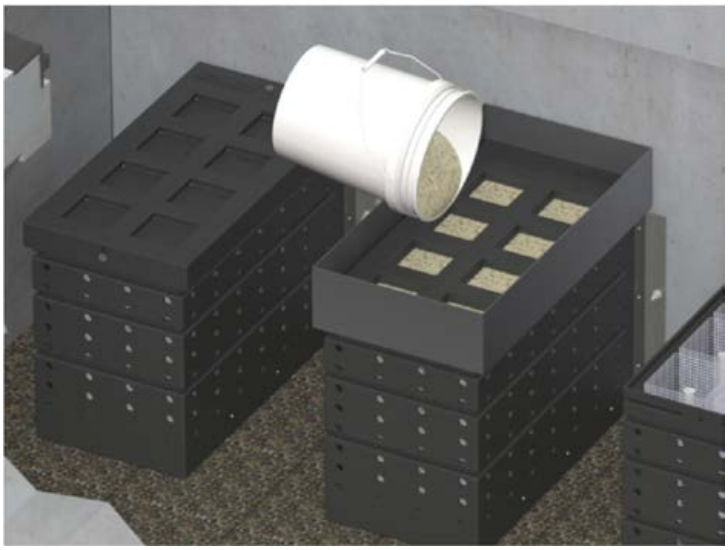
Vacuum out pre-treatment and discharge chambers and remove all accumulated pollutants including trash, debris, and sediments. Be sure to vacuum the pre-treatment floor until the pervious pavers are visible and clean. **(MWL systems outside of California may or may not have pervious pavers on the floor in the pre-treatment chamber)** If pre-filter cartridges require media replacement, proceed to **Step 4**. If not, replace the access cover(s) and proceed to **Step 7**.

4. PRE-FILTER CARTRIDGE LID REMOVAL

After successfully cleaning out the pre-treatment chamber, enter the chamber and remove the lid(s) from the pre-filter cartridge(s) by removing the two thumb screws. (Older pre-filter cartridges have two bolts holding the lids on that require a 7/16" socket to remove)

5. VACUUM EXISTING PRE-FILTER MEDIA

Utilize the vacuum truck hose or hose extension to remove the filter media from each of the individual media cages. Once filter media has been sucked out, use a pressure washer to spray down the inside of the cartridge and its media cages. Remove cleaned media cages and place to the side. Once removed, the vacuum hose can be inserted into the cartridge to vacuum out any remaining material near the bottom of the cartridge.



6. PRE-FILTER MEDIA REPLACEMENT

Reinstall media cages and fill with new media from the manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase. The easiest way to fill the media cages is to utilize a refilling tray that can also be sourced from the manufacturer. Place the refilling tray on top of the cartridge and fill with new bulk media shaking it down into the cages. Using your hands, lightly compact the media into each filter cage. Once the cages are full (each cartridge will hold five heaping 5gal buckets of bulk media), remove the refilling tray and replace the cartridge top, ensuring fasteners are properly tightened.

7. MAINTAINING VEGETATION

In general, the biofiltration chamber is maintenance-free with the exception of maintaining the vegetation. The MWL utilizes vegetation similar to surrounding landscape areas, therefore, trim vegetation to match surrounding vegetation. If any plants have died, replace them with new ones.

8. INSPECT UNDERDRAIN SYSTEM

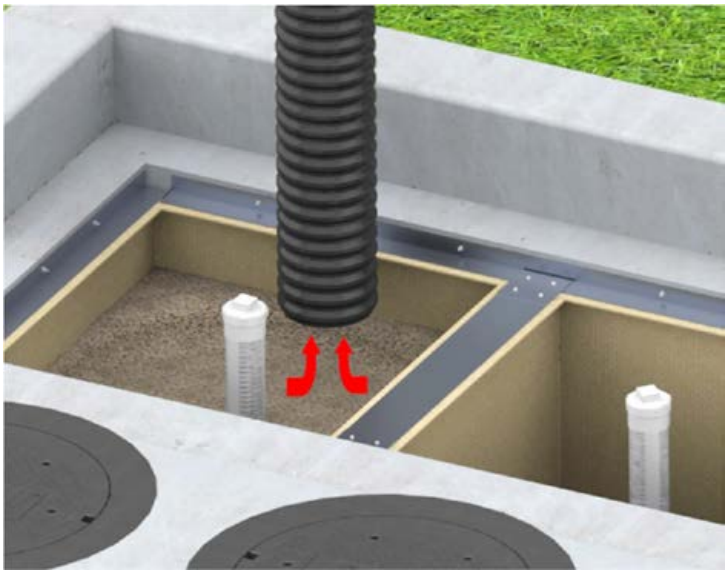
Each vertical under drain on the biofiltration chamber has a removable threaded cap that can be taken off to check for any blockages or root growth. Once removed, a jetting attachment to the pressure washer can be used to clean out the under drain and orifice riser if needed.

9. REPLACE ACCESS COVERS

Once maintenance is complete, replace all access cover(s)

REPLACING BIOFILTRATION MEDIA IF REQUIRED

As with all biofilter systems, at some point the biofiltration media will need to be replaced, either due to physical clogging or sorptive exhaustion (for dissolved pollutants) of the media ion exchange capacity (to remove dissolved metals and phosphorous). The general life of this media is 10 to 20 years based on site specific conditions and pollutant loading, so replacing the biofiltration media should not be a common occurrence. In the event that the biofiltration media requires replacement, contact one of Contech's Maintenance Team members at https://www.conteches.com/maintenance to order new biofiltration media. The quantity of media needed can be determined by providing the model number and unit depth. Media will be provided in super sacks for easy installation. Each sack will weigh between 1,000 and 2,000 lbs. Biofiltration media replacement can be done following the steps below:



1. VACUUM EXISTING BIOFILTRATION MEDIA

Remove the mulch and vegetation to access the biofiltration media, and then position the vacuum truck accordingly. Utilize the vacuum truck to vacuum out all the media. Once all media is removed, use the pressure washer to spray down all the netting and underdrain systems on the inside of the media containment cage. Vacuum out any remaining debris after spraying down netting. Inspect the netting for any damage or holes. If the netting is damaged, it can be repaired or replaced with guidance by the manufacturer.

2. INSTALLING NEW BIOFILTRATION MEDIA

Ensure that the chamber is fully cleaned prior to installation of new media into the media containment cage(s). Media will be provided in super sacks for easy installation. A lifting apparatus (forklift, backhoe, boom truck, or other) is recommended to position the super sack over the biofiltration chamber. Add media in lifts to ensure that the riser pipes remain vertical. Be sure to only fill the media cage(s) up to the same level as the old media.

3. REPLANT VEGETATION

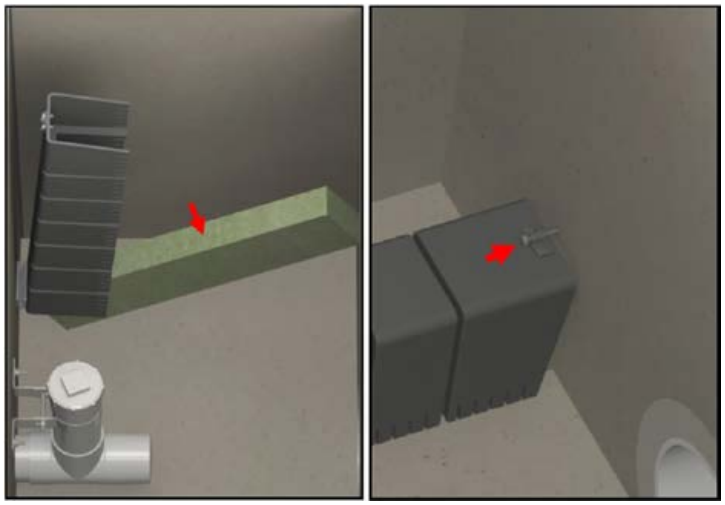
Once the media has been replaced, replant the vegetation and cover biofiltration chamber with approved mulch (if applicable). If the existing vegetation is not being reused, and new vegetation is being planted, you will need to acquire new plant establishment media that will be installed just below the mulch layer at each plant location. (see plan drawings for details). Contact one of Contech's Maintenance Team members at https://www.conteches.com/maintenance to order new plant establishment media.

REPLACING DRAIN DOWN FILTER MEDIA (ONLY ON OLDER CALIFORNIA MODELS)

NOTE: The drain down filter is only found on units installed in California prior to 2023
If during inspection it was determined that the drain down filter media requires replacement, contact one of Contech's Maintenance Team members at https://www.conteches.com/maintenance to order new media.

1. REMOVE EXISTING DRAIN DOWN MEDIA

Pull knob back to unlock the locking mechanism and lift the drain down filter housing to remove the used BioMediaGREEN filter block.



2. INSTALL NEW DRAIN DOWN MEDIA

Ensure that the chamber and housing are fully cleaned prior to installation of new media, and then insert the new BioMediaGREEN filter block. The media filter block should fit snugly between the chamber walls and be centered under the filter housing. Lower the housing over the filter block and secure the locking mechanism.

NOTES

CONTECH® ENGINEERED SOLUTIONS

Inspection Report
Modular Wetlands Linear

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

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Cleaning and Maintenance Report
Modular Wetlands Linear

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

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800-338-1122

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SUPPORT

DRAWINGS AND SPECIFICATIONS ARE AVAILABLE AT WWW.CONTECHES.COM

ModWetLinear OM Manual 03/24