

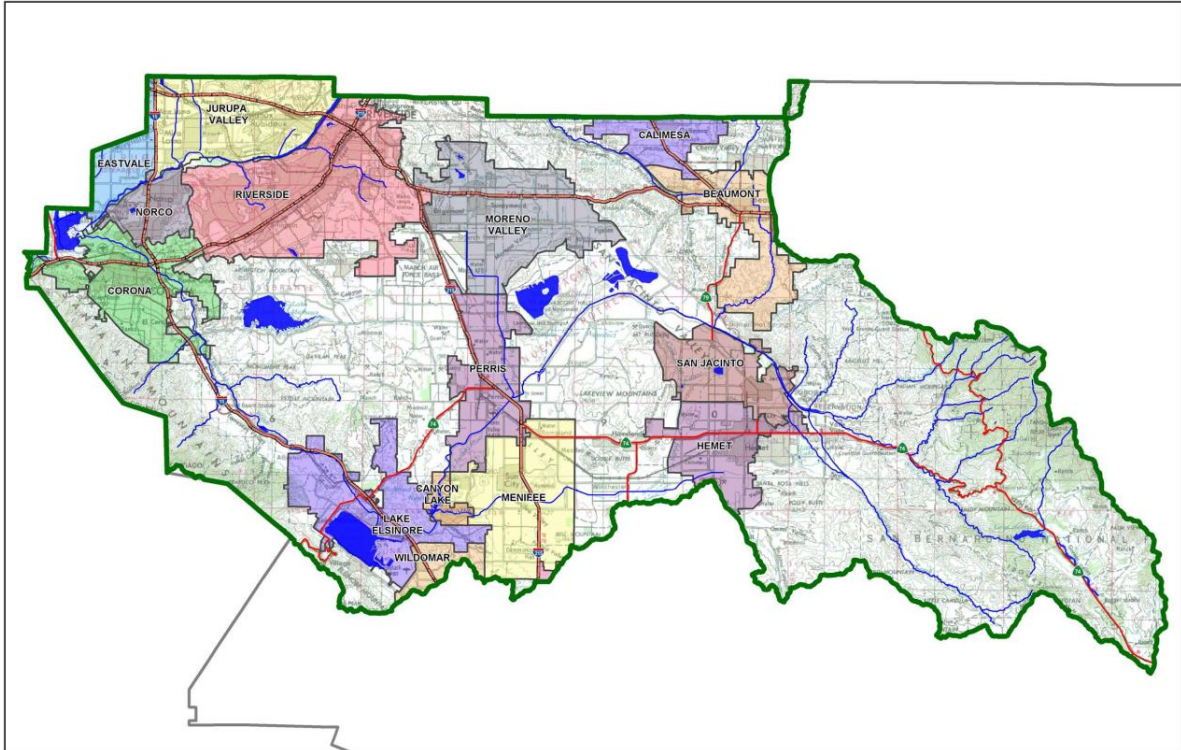
Project Specific Water Quality Management Plan

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

Project Title: 36-Apartment Complex

Development No: PPT 220032

Design Review/Case No: Entitlement Application



- ☒ Preliminary
☐ Final

Original Date Prepared: March 8, 2022

Revision Date(s): September 10, 2023

Prepared for Compliance with
Regional Board Order No. R8-2010-0033
Template revised June 30, 2016

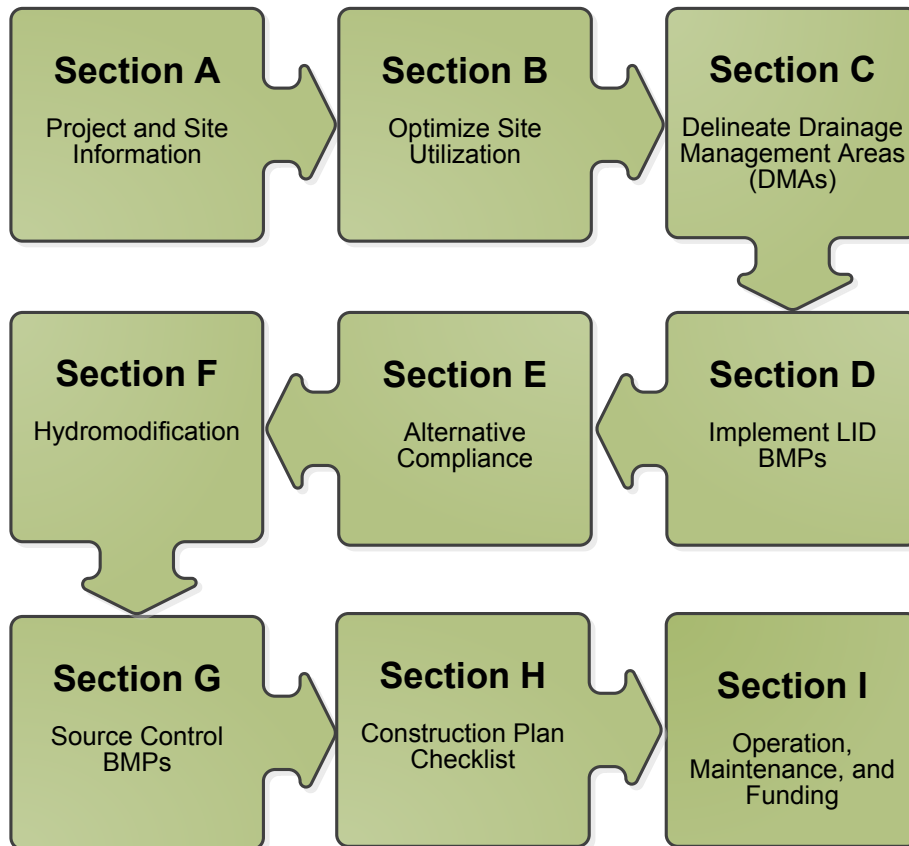
Contact Information:

Prepared for: Ascendant Development Group
P.O. Box 2021
San Jacinto, Ca. 92541
(951) 833-1283
keith@ascendantg.com

Prepared by: Henry Poquiz, P.E.
Project Engineer
HP Engineering, Inc.
1465 Crestview Road
Redlands, Ca. 92374
(909) 335-8239
hcpoquiz@aol.com

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 Ascendant Development Group by HP Engineering, Inc. for the 36-Apartment Complex project.

This WQMP is intended to comply with the requirements of Riverside County for Ordinance No. 754.2 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 Riverside County Water Quality Ordinance (Municipal Code Section 13.12.01).

"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

Keith Tolliver
Owner's Printed Name

Date

Owner
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

Henry C. Poquiz
Preparer's Printed Name

Preparer's Licensure:
RCE 37037, Exp. 6/30/24

9/10/23

Date

Project Engineer
Preparer's Title/Position



Table of Contents

Section A: Project and Site Information.....	6
A.1 Maps and Site Plans	6
A.2 Identify Receiving Waters	7
A.3 Additional Permits/Approvals required for the Project:	7
Section B: Optimize Site Utilization (LID Principles)	8
Section C: Delineate Drainage Management Areas (DMAs).....	10
Section D: Implement LID BMPs	12
D.1 Infiltration Applicability	12
D.2 Harvest and Use Assessment.....	13
D.3 Bioretention and Biotreatment Assessment	15
D.4 Feasibility Assessment Summaries	16
D.5 LID BMP Sizing	17
Section E: Alternative Compliance (LID Waiver Program)	18
E.1 Identify Pollutants of Concern	19
E.2 Stormwater Credits	20
E.3 Sizing Criteria.....	20
E.4 Treatment Control BMP Selection	21
Section F: Hydromodification	22
F.1 Hydrologic Conditions of Concern (HCOC) Analysis.....	22
F.2 HCOC Mitigation.....	23
Section G: Source Control BMPs.....	24
Section H: Construction Plan Checklist	26
Section I: Operation, Maintenance and Funding.....	27

List of Tables

Table A.1 Identification of Receiving Waters.....	7
Table A.2 Other Applicable Permits.....	7
Table C.1 DMA Classifications.....	10
Table C.2 Type 'A', Self-Treating Areas.....	10
Table C.3 Type 'B', Self-Retaining Areas.....	10
Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas.....	11
Table C.5 Type 'D', Areas Draining to BMPs.....	11
Table D.1 Infiltration Feasibility.....	12
Table D.2 LID Prioritization Summary Matrix.....	16
Table D.3 DCV Calculations for LID BMPs.....	17
Table E.1 Potential Pollutants by Land Use Type.....	19
Table E.2 Water Quality Credits.....	20
Table E.3 Treatment Control BMP Sizing.....	20
Table E.4 Treatment Control BMP Selection.....	21
Table F.1 Hydrologic Conditions of Concern Summary.....	22
Table G.1 Permanent and Operational Source Control Measures.....	24
Table H.1 Construction Plan Cross-reference.....	26

List of Appendices

Appendix 1: Maps and Site Plans.....	29
Appendix 2: Construction Plans.....	30
Appendix 3: Soils Information.....	31
Appendix 4: Historical Site Conditions.....	32
Appendix 5: LID Infeasibility.....	33
Appendix 6: BMP Design Details.....	34
Appendix 7: Hydromodification.....	35
Appendix 8: Source Control.....	36
Appendix 9: O&M.....	39
Appendix 10: Educational Materials.....	43

Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	Multiple Residential
Planning Area:	A-1-5, R-3
Community Name:	Hemet, Unincorporated area of Riverside County
Development Name:	36-Apartment Complex
PROJECT LOCATION	
Latitude & Longitude (DMS): Lat: = 33.745345, Long: = -116.944471	
Project Watershed and Sub-Watershed: Santa Ana Watershed	
Gross Acres: 105,650 SF	
APN(s): 438-220-002	
Map Book and Page No.: MB 1/14	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Apartment
Proposed or Potential SIC Code(s)	5521
Area of Impervious Project Footprint (SF)	64,770 SF
Total Area of <u>proposed</u> Impervious Surfaces within the Project Footprint (SF)/or Replacement	64,770 SF
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 <u>existing</u> Impervious Surfaces within the Project limits Footprint (SF)	3,220 SF
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)	A
What is the Water Quality Design Storm Depth for the project?	0.70

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
- BMP Locations (Lat/Long)

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
San Jacinto River – Reach 1 (4-0021)802.32 & 802.31	None	Intermittent Beneficial Uses, AGR, GWR, REC1, REC2, WARM, WILD	Not Classified as RARE
Canyon Lake 802.11 & 802.12	Nutrients, Pathogens	MUN, AGR, REC1, REC2, WARM, WILD	Not Classified as RARE – 28 miles
Lake Elsinore, 802.31	Nutrients, Organic Enrichment/Low Dissolved Oxygen, Sediment Toxicity, Unknown Toxicity	MUN, REC1, REC2, WARM, WILD	Not Classified as RARE – 35 miles

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)	☐ 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.

Consideration of "highest and best use" of the discharge should also be considered. For example, Lake Elsinore is evaporating faster than runoff from natural precipitation can recharge it. Requiring infiltration of 85% of runoff events for projects tributary to Lake Elsinore would only exacerbate current water quality problems associated with Pollutant concentration due to lake water evaporation. In cases where rainfall events have low potential to recharge Lake Elsinore (i.e. no hydraulic connection between groundwater to Lake Elsinore, or other factors), requiring infiltration of Urban Runoff from projects is counterproductive to the overall watershed goals. Project proponents, in these cases, would be allowed to discharge Urban Runoff, provided they used equally effective filtration-based BMPs.

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?

Yes, existing drainage pattern will remain the same which generally drains from east to west.

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

Yes, there are three fruit trees onsite and will be removed, they will be replaced with landscaping trees per landscaping plan. The rest of the site is covered with weeds. Proposed open areas are to be landscaped.

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

Yes, by utilization of underground chambers and landscaping of open areas..

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

Yes, it meets the County's requirement of green area ratio.

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

Yes, runoff from impervious areas drain into the landscaping area.

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) ¹²	Area (Sq. Ft.)	DMA Type
A	Landscaping	34,280	A
C	AC/PCC Paving	47,122	D
D	Building	17,648	D

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

²If multi-surface provide back-up

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

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
A	34,280	Drought Tolerant Vegetation	Drip Irrigation

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)	Storm Depth (inches)	DMA Name / ID	[C] from Table C.4 = [C]	Required Retention Depth (inches)
		[A]	[B]			

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

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	Impervious fraction	Product		Area (square feet)	Ratio
	[A]		[B]	[C] = [A] x [B]		[D]	[C]/[D]

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

DMA Name or ID	BMP Name or ID
C	Underground Chamber
D	Underground Chamber

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; proceed to section D.3

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:		
...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.

While the infiltration rates have tested below 1.6 inches per hour, we are handling the water quality volume entirely with self-retaining areas and areas draining to self retaining areas at a low impervious to pervious ratios (less than 2:1 – see Santa Ana Guidance Document page 51).

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).
- X 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 none 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: N/A

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

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: N/A

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: N/A

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: N/A

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)
N/A	N/A

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: N/A

*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: N/A

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

Enter your TUTIA factor: N/A

- 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: N/A

- 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)
N/A	N/A

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 2-4 in Chapter 2 to determine the minimum demand for non-potable uses per tributary impervious acre.

Enter the factor from Table 2-4: N/A

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 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 projected average daily use (Step 1) to the minimum required non-potable use (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 per Section 3.4.2 of the WQMP Guidance Document.

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	
C	☒	☐	☐	☐	☐
D	☒	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

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.

Since there is no run-on and the Q is minimal, and the pervious concrete has more than enough infiltration and storage capacity, no other LID BMP is needed.

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 Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	Enter BMP Name / Identifier Here		
	[A]		[B]	[C]	[A] x [C]	Bioretention Basin		
C	47,122	AC/PCC Paving	1.0	0.89	41,939	Design Storm Depth (in)	Design Capture Volume, V_{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
D	17,648	Building	1.0	0.89	15,707			
	$A_T = \Sigma[A]$ 64,770				$\Sigma = [D]57,646$	[E] 0.70	$[F] = \frac{[D] \times [E]}{12}$ 3,363	[G] 3,828

[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

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.

N/A

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 ft ²)	P	N	N	N	N	N	P	P
☐ Hillside Development (>5,000 ft ²)	P	N	P	P	N	P	P	P
☐ Parking Lots (>5,000 ft ²)	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	
<i>Total Credit Percentage¹</i>	

¹Cannot Exceed 50%

²Obtain 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] = $\frac{[D] \times [E]}{[G]}$	[F] X (1-[H])	[I]

[B], [C] is obtained as described in Section 2.3.1 from the WQMP Guidance Document

[E] is for Flow-Based Treatment Control BMPs [E] = .2, for Volume-Based Control Treatment BMPs, [E] 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
N/A		

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 concentration¹ 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	N/A	N/A	N/A
Volume (Cubic Feet)	N/A	N/A	N/A

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 Susceptibility 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:

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.
N/A
- b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters. N/A
- 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. The increased of flow due to the development is being mitigated by storing onsite. Storage volume of the pervious paving is more than the increased 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
Lead, ChromiumCopper, Mercury and Zinc – Generated from vehicles on uncovered Parking Lot. Lead and Chromium are used for corrosion inhibitors in primer coatings and cooling tower systems.	Regular Parking Lot sweeping SC-41, Bldg. & Grounds maint. SC-43 Parking/Sto. area maint. SC-60 Housekeeping practices	Schedule a Parking lot sweeping/vacuuming, and site maintenance every two weeks and/or before and after storm

Insecticides, herbicides and excess fertilizers – Minimal use, mainly Ants, Spiders when needed. Over-spraying/over-application of pesticides, herbicides, and fertilizers.	SC-41, Bldg. & Grounds maint., SC-43, Parking Sto. Area maint. SC-60, Housekeeping practices.	Schedule pesticides treatment to be applied only when necessary by a licensed applicator. Schedule for sweeping/vacuuming of parking lots and site maintenance.
Toxic Organic Compound Accidental or illegal spills or leaks of hazardous materials, pesticides, herbicides, and fertilizers.	SC-11 Spill Prevention Control, SC-41 Bldg. & Grounds Maint. SC-43 Parking/Storage area maintenance. SC-60 Good housekeeping pract. SC-73 Landscape maintenance	Schedule a Parking lot sweeping/vacuuming, and site maintenance every two weeks and/or before and after storm.
Sediments Sediments from Landscape areas during maintenance and irrigation erosion, and transported sediments that were brought into the site by vehicles.	SC-41 Bldg. & Grounds Maint. SC-43 Parking/Storage area maintenance. SC-60 Good housekeeping practices SC-73 Landscape maintenance	Schedule a Parking lot sweeping/vacuuming, and site maintenance every two weeks and/or before and after storm.
Trash and Debris Loose trash, debris, can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks	SD-32 Tash Enclosures SC-41 Bldg. & Grounds Maint. SC-43 Parking/Storage area maintenance. SC-60 Good housekeeping pract. SC-73 Landscape maintenance SC-11 Spill Prev. Cntrl.	Schedule a Parking lot sweeping/vacuuming, and site maintenance every two weeks and/or before and after storm.
Oil and Grease Oil and Grease leaks from motor vehicles using the parking and/or the facility	SC-11 Spill Prevention Control, SC-41 Bldg. & Grounds Maint. SC-43 Parking/Storage area maintenance. SC-60 Good housekeeping pract.	Schedule a Parking lot sweeping/vacuuming, and site maintenance every two weeks and/or before and after storm.
Oxygen Demanding Substances Biodegradable organic materials such as proteins, carbohydrates and fats. Compounds such as ammonia and hydrogen sulfide.	SC-41 Bldg. & Grounds Maint. SC-43 Parking/Storage area maintenance. SC-60 Good housekeeping practices	Schedule a Parking lot sweeping/vacuuming, and site maintenance every two weeks and/or before and after storm.

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)	BMP Location (Lat/Long)
B	Underground Chamber	Preliminary WQMP Exhibit Plan	33.745341/-116.944670

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 I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on your site are maintained and continue to operate as designed. To make this possible, your Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

Your local Co-Permittee will also require that you prepare and submit a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a Stormwater BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document.

Maintenance Mechanism: The property owner is responsible for long term maintenance of the WQMP stormwater facilities:

Owner: Ascendant Development Group

P.O. Box 2021

San Jacinto, Ca. 92541

(951) 833-1283

The inspection, monitoring and record keeping is the responsibility of the owner.

Owner: Ascendant Development Group

P.O. Box 2021

San Jacinto, Ca. 92541

(951) 833-1283

Funding source for the operation and maintenance within the WQMP is the responsibility of the owner.

Owner: Ascendant Development Group

P.O. Box 2021

San Jacinto, Ca. 92541

(951) 833-1283

The responsible party for each BMP and O & M is the owner.

Owner: Ascendant Development Group

P.O. Box 2021

San Jacinto, Ca. 92541

(951) 833-1283

Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

☐ Y

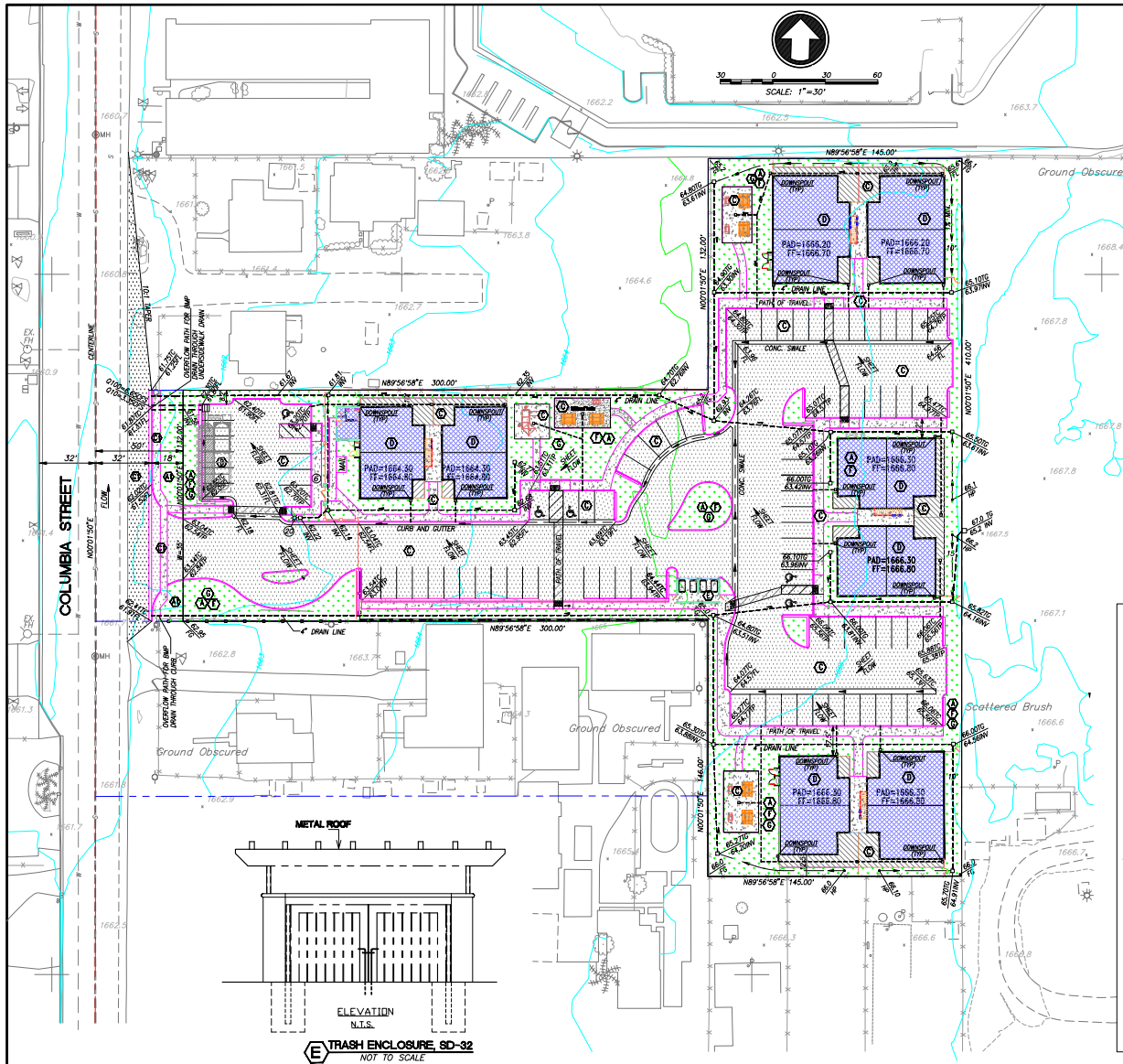
☒ N

Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9. Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

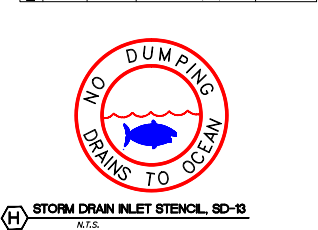
(See Attached Preliminary WQMP Exhibit)



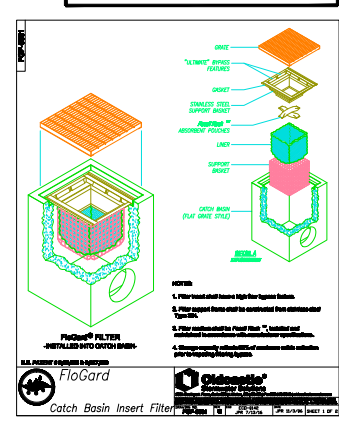
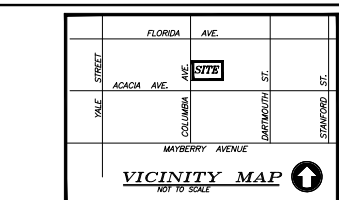
BMP SUMMARY				
SYM	BMP NO.	BMP AREA	BMP DESCRIPTION	VOL. PROVIDED
SD-10	34,280		LANDSCAPING	
TC-11			UNDERGROUND CHAMBER	3,828 CF
SD-12	47,122		AC PAVING/POC PAVING	
SD-13	17,648		BUILDING	
SD-32			COVERED TRASH STORAGE	
SD-10			LANDSCAPE PLANNING/DESIGN	
SD-12			EFFICIENT IRRIGATION	
SD-13			STORM DRAIN INLET STENCIL	
MP-52			CATCH BASIN INSERT FILTER	
TOTAL	99,050			3,828 CF

DCV(BMP) = 3,363 CF
PROVIDED VOL = 3,828 CF

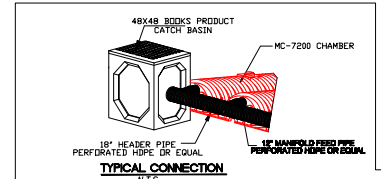
AREAS THAT ARE EXEMPT FROM APPLICABILITY PER TRANSPORTATION TGD, TABLE 1-1, SECTION 1		
SD-10	1,090	OFFSITE LANDSCAPING
SD-13	3,466	OFFSITE AC PAVING/POC/SIDEWALK



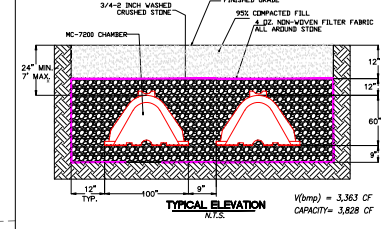
H STORM DRAIN INLET STENCIL, SD-13
N.T.S.



I CATCH BASIN INSERT FILTER, MP-52
N.T.S.



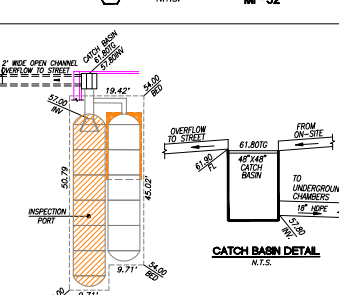
J TYPICAL CONNECTION
N.T.S.



K TYPICAL ELEVATION
N.T.S.

SPECIFIER CHART				
MODEL NO.	STANDARD & BOLLARD DEPTH	STANDARD & BOLLARD DEPTH	STANDARD & BOLLARD DEPTH	STANDARD & BOLLARD DEPTH
STANDARD & BOLLARD DEPTH	STANDARD & BOLLARD DEPTH	STANDARD & BOLLARD DEPTH	STANDARD & BOLLARD DEPTH	STANDARD & BOLLARD DEPTH
POP-48	48 X 48	48 X 48	48 X 48	48 X 48
POP-60	60 X 60	60 X 60	60 X 60	60 X 60
POP-72	72 X 72	72 X 72	72 X 72	72 X 72

L CATCH BASIN FILTER INSERT, MP-52
N.T.S.



M CATCH BASIN DETAIL
N.T.S.

E STORMTECH UNDERGROUND INFILTRATION SYSTEM
NOT TO SCALE

LEGEND:

- A.C. PAVING
- CONCRETE PAVING
- PATH OF TRAVEL
- DENOTES LANDSCAPING
- DENOTES BUILDING AREA

ONSITE AREA = 99,050 SF
OFFSITE AREA = 3,466 SF

HP ENGINEERING, INC.
CIVIL ENGINEERING • LAND SURVEYING
1465 CRISTVIEW ROAD, REDLANDS, CA. 92374
Tel. (909) 335-8239 Fax (909) 335-9940

SCALE: 1"=30'
DATE: SEPT. 10, 2023

BENCH MARK: DESCRIPTION
RIVERSIDE COUNTY BM 11-6-3
BRASS DISC ON TOP OF CONCRETE
ELEVATION = 1631.519

COUNTY OF RIVERSIDE
PRELIMINARY WOMP EXHIBIT MAP
25914 COLUMBIA STREET, HEMET
APN: 438-220-002

FOR: _____

DEVELOPMENT No. PPT220032

1
OF 1 SHEETS

PLAN No. _____

Appendix 2: Construction Plans

Grading and Drainage Plans

(Will be included in Final WQMP)

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

“SEE ATTACHED SOILS INFORMATION”

RODRIGUEZ CONSULTING AND ENGINEERING

Land Planning and Soil Engineering

Project No. RCE-2235-01

March 29, 2022

Engineer

TO: Ascendant Development Group
PO Box 2021
San Jacinto, CA 92581

Gene K. Luu, PE 53417
Project Engineer



ATTENTION: Keith Tolliver

SUBJECT: Soil Investigation and Liquefaction Evaluation Report, Proposed 36 Units, Two to Three-Story Apartment Complex, 25914 Columbia Street (APN 438-220-002), Hemet Area, Riverside County, California

In accordance with your authorization, Rodriguez Consulting and Engineering has performed a preliminary soil investigation and liquefaction evaluation for the subject site. The accompanying report presents a summary of our findings, with conclusions, recommendations and limitation of our investigation for construction of the proposed apartment complex.

Scope of Work

- Review soils, seismic, geologic, groundwater data, maps and nearby site reports in our files.
- Perform exploration of the site by means of five 8" diameter borings, 25 to 50 feet deep, at readily accessible locations.
- Field engineer (California Registered RCE) for logging of the excavations, sampling of select soils, observation of excavation resistance, record SPT blow counts and water seepage (if any).
- Perform basic laboratory testing on select soil samples, expected to include moisture, density, sieve analysis, expansion index and corrosion potential (pH, chlorides, resistivity and water soluble sulfates).
- Perform digitized search of known faults within a 50-mile radius of the site.
- Determine California Building Code (CBC) 2019 seismic parameters for the site.
- Consult with project architect/civil engineer.
- Prepare a report of our findings, conclusions and recommendations for site preparation, including overexcavation/removal depth, allowable bearing value, foundation/slab-on-grade depth/thickness recommendations, excavation characteristics, liquefaction evaluation, general earthwork and grading specifications, California Building Code (2019) seismic design coefficients and Cal/OSHA soil classification.

Existing Site Conditions

The 2.3 acres, T shape, relatively flat site is located on the east side of Columbia Street, north of Acacia Avenue, in the Hemet area, Riverside County, California. Columbia Street is paved road. Wire Fence borders the site on the west, chain link fence on the east, and block wall on the northeast. Two existing structures are noticed on the site. Existing houses are located on adjacent property lines to the north and south and vacant lot to east. Vegetation consists of dense weeds.

The approximate locations of other features are shown on Exploratory Boring and Infiltration Test Locations Map, plate 1. The base map site plan was prepared by Ascendant Development Group, LLC, of San Jacinto, California.

Proposed Development

We understand that the site will be used for construction 4 buildings, 36 unit apartment complex associated with driveway and parking stalls. Two existing structures are to be removed. The proposed

structures will be two to three-stories, wood frame construction with concrete slab supported on prepared subgrade. A grading plan is not available for review at this time; however considering the flat topography no cut or fill slopes are anticipated.

Field Work

Five exploratory borings were drilled at the site on March 14, 2022, utilizing a B-53 mobile drill rig equipped with an 8-inch diameter hollow stem auger. Locations of the exploratory borings were selected at readily accessible locations (see Exploratory Boring Location Map, Plate 1). In general, the exploratory excavations revealed the site surface soils primarily consist of silty sand, sand with silt, and sandy silt (USCS "SM", "SP-SM", and "ML").

Geologic map of the Hemet Quadrangle shows the site area is underlain with young alluvial fan deposits (see Figure 2).

Laboratory Testing

Laboratory tests were performed for selected soil samples. The tests consisted of moisture, density, sieve analysis and corrosion potential (pH, chlorides, resistivity and water soluble sulfates). The test results are presented in Appendix C and some with Geotechnical Boring Logs in Appendix B.

Groundwater

Groundwater was not encountered in our exploratory borings to maximum explored depth of 50 feet below ground surface. Please note that a groundwater study is not within the scope of this work. Groundwater data from well in the vicinity of the site (see Figure 1 for location) is tabulated as follows:

Well No.	WSE* (ft)	Date Measured	Distance/Location Relative to Site	Estimated Depth of Water Below Site (ft)
05S01W14P001S	1351.19	1/18/1991	1.19 miles/SW	293.27
	1328.56	3/15/1992		315.9
EMWD 14418	1356.59	11/7/2011	1.43 miles/NW	242.3
	1355.79	11/15/2021		243.1

* WSE = Water Surface Elevation

** GSE = Ground Surface Elevation at Subject Site

Liquefaction Evaluation

The potential for liquefaction in an area is a function of soil type and depth of groundwater. Poorly consolidated soils combine with groundwater during an earthquake, losing their shear strength and taking on the properties of a heavy liquid. This process, termed liquefaction, can result in the loss of foundation support, ground failure due to lateral spreading, and settlement of affected soils. Three general conditions must be met for liquefaction to occur: (1) strong ground shaking of relatively long duration; (2) loose, or unconsolidated, recently deposited sediments consisting primarily of silty sand and sand; and (3) water saturated sediments within about 50 feet of the surface.

Based on county map, the site is located within an area of moderate potential liquefaction (see Figure 3).

Liquefaction Analysis/Dynamic Settlement: LiquefyPro

Liquefaction susceptibility using Standard Penetration Test data and laboratory Grain size test results were analyzed using LiquefyPro software (Version 5.5g). A predominant earthquake magnitude of 7.12 (USGS Interactive Deaggregation, 10% probability of exceedance in 50 years) was used. An associated ground acceleration of 0.73g (equivalent to two-thirds of PGAM), and a depth to groundwater of 200 feet

below the existing ground surface were used in our liquefaction evaluation. The software output is presented in Appendix B.

The main observations of the results are as follows:

Boring No.	Total settlement (inch)	Differential Settlement (inch)
B-2	11.77	5.883 to 7.766

- Onsite soils at the site in general have a Safety Factor of 5.0 against liquefaction

Flooding

The flooding potential at the site should be evaluated by the design civil engineer and considered during planning and development.

Seismicity/Faulting

The site is not located within a currently designated Alquist-Priolo earthquake fault zone and Riverside County fault zone. A computer search of known Quaternary major faults within 50 miles of the site from USGS Earthquake Hazards Program is presented in Appendix D. Please note that it is probable that not all active or potentially active faults in the region have been identified. Furthermore, seismic potential of the smaller and less notable faults is not sufficiently developed for assignment of maximum earthquake magnitudes and associated levels of ground shaking that might occur at the site due to these faults.

Secondary Seismic Hazards

Considering the location, topography, and subsurface conditions, tsunamis, seiches, landslides and rock falls are not a potential hazard for this site. Flooding potential should be evaluated by the design civil engineer.

Conclusions

- All vegetation, existing structures, old foundations, buried structures and buried utilities/irrigation lines, seepage pits, leach lines and roots associated with the previous site use, etc. would require removals from the proposed building/grading areas.
- Overexcavation and recompaction of surficial soils should be anticipated to provide adequate and uniform support for the proposed structures and pavement.
- The onsite soils, exclusive of oversize rock (larger than 6-inches in diameter, if any), and deleterious materials, etc. may be used as compacted fill materials.
- It is anticipated that all earth materials can be excavated by conventional earthmoving equipment in good working condition.
- Based on soil classification and laboratory test results, the expansion potential of the near surface sandy soils is very low ($EI=0$).
- Based on our analysis, the site has a factor of safety of 5 against liquefaction, however total settlement of the dry sandy soils is 11.77 inches.
- The use of shallow spread and/or continuous footings appears feasible for the proposed wood frame building construction, subsequent to site modification by overexcavation/recompaction and geogrid reinforcement. As an alternate, structural design should require mitigation of differential settlement of 5.883 to 7.766 inches over a distance of 30 feet by means of mat foundation supported on site prepared

by overexcavation and recompaction.

- Site is located approximately 0.39 miles from the San Jacinto fault. The site is located in a region of generally high seismicity, as is all of Southern California. During its design life, the site is expected to be subject to moderate to strong ground motions from earthquakes on regional and/or nearby causative faults.
- There is a 2 percent probability in 50 years (2475 year return period) that site peak ground acceleration (PGA) at the site will exceed 0.991g (see Appendix D.)
- Groundwater and/or seepage were not encountered during subsurface investigation. Our experience indicates that surface or near-surface groundwater conditions can develop in areas where groundwater conditions did not exist prior to site development, especially in areas where a substantial increase in surface water infiltration results from landscape irrigation or other sources.

Recommendations

Site Preparation/Overexcavation and Grading

Site Preparation

Grading and backfill should be performed in compliance with the County of Riverside Grading Ordinance and our General Earthwork and Grading Specifications presented in Appendix E.

The new building/grading area should be cleared of all debris, weeds, old foundations, abandoned utility lines, irrigation appurtenances, underground structures, trees, tree root system, vegetable matter, deleterious materials, etc.

Overexcavation/Recompaction

Subsequent to site clearance as indicated above, the new building areas, extending at least 6 feet outside building lines, including walls and canopies, etc. (where practical), should be overexcavated to a depth of at least 6 feet below existing grade or pad elevation, whichever is deeper. Old fills or roots should be traced and completely removed if encountered in bottom of the overexcavated areas. After overexcavation, the exposed surfaces should be further scarified to a depth of at least 12 inches, thoroughly watered and recompacted to at least 90 percent of the maximum dry density, as determined by ASTM D1557-12 Test Method, prior to placement of fill. Deeper overexcavations, especially to remove loose soils, existing deep structures or clean the bottoms, etc., may be required depending upon field observations of excavations by the soil engineer or his representative.

Compacted Fills/Imported Soils

Any soil to be placed as fill, whether presently onsite or import, should be approved by the soil engineer or his representative prior to their placement. All onsite soils to be used as fill should be cleansed of any roots, oversize rock, or other deleterious materials. Although not anticipated, cobbles and boulders larger than 6-inches in diameter should not be placed in the vicinity of foundations and utility lines. All fills should be placed in 6- to -8 inch loose lifts, watered (or dried) to near or 2 percent above optimum moisture content, properly mixed and compacted to at least 90 percent relative compaction. This is relative to the maximum dry density determined by ASTM D1557-12 Test Method.

Any imported soils should be sandy (preferably USCS "SM" or "SW", and very low in expansion potential) and approved by the soil engineer. The soil engineer or his representative should observe the placement of all fill and take sufficient tests to verify the moisture content and the uniformity and degree of compaction obtained.

Foundation Design

Following site preparation and geogrid reinforcement, in accordance with the recommendations presented below this report, the use of shallow spread and/or continuous footings is feasible. An allowable bearing value of 1500 psf is recommended. This bearing value may be increased by one-third for temporary (wind or seismic) loads. Reinforcement and other requirements are presented on Plate 2 and may be designed for very low expansion category. Please note that the foundation design is under the purview of the structural engineer and structural considerations may have more restrictive requirements and the need for a mat foundation as an alternate in order to mitigate the differential settlement. A subgrade modulus (k) value of 150 pci may be used in the design.

Lateral Resistance

Lateral loads may be resisted by friction provided by the soil on the base of the foundation and by passive earth pressure. A coefficient of friction of 0.35 of dead load may be used. An allowable passive earth pressure of 250 psf per foot of depth to a maximum value of 2,500 psf may be used to establish lateral bearing resistance for footings. When combining passive and friction for lateral resistance, the passive component should be reduced by one third.

Slabs-on-Grade/Moisture Barrier

Slabs-on-grade should be at least 5 inches thick and should be reinforced with at least No. 4 bars at 18-inches on-center both ways, properly centered in mid-thickness of slabs. Slab reinforcement should be supported on concrete spacers (chairs) for proper positioning at mid-thickness. Slabs-on-grade should be provided with a 10-mil Visqueen moisture barrier underlain with four inches of ½ inch or larger clean aggregate in compliance with California Green Building Standards Code. Other recommendations are presented on Plate 2.

Soil Modification/Geogrid Reinforcement

As an alternate to design of mat foundations, geogrid reinforcement of the foundation soils may be a consideration. Existing soil in the building area should be overexcavated to a depth of at least 6 feet, extending 6 feet beyond the building lines in plan (where practical). The bottom of the overexcavation should be scarified to at least 12 inches, moisture conditioned and compacted to at least 90 percent relative compaction prior to placement of the geogrid and engineered fill. All fills should be compacted to at least 90 percent.

We recommend two layers of geogrid reinforcement, one at the bottom of overexcavation and the other 24 inches above. Geogrid should be at least Mirafi 20XT (or equivalent) and the joints should be overlapped a minimum distance of 3 feet during placement.

Concrete Joints

The joints spacing for concrete slabs should be determined by the project architect. Joints should be laid out to form approximately square panels (equal transverse and longitudinal joint spacing). Rectangular panels, with the long dimension no more than one-and-one-half times the short, may be used when square panels are not feasible. The depth of longitudinal and transverse joints should be one-fourth the depth of the slab thickness.

Joint layout should be adjusted so that the joints will line up with the corners of structures, small foundations and other built-in structures. Acute angles or small pieces of slab curves as a result of joints layout should not be permitted

Concrete Curing

Fresh concrete should be cured by protecting it against loss of moisture, rapid temperature change and mechanical injury for at least 3 days after placement. Moist curing, waterproof paper, white polyethylene sheeting, white liquid membrane compound, or a combination thereof may be used. After finishing operations have been completed, the entire surface of the newly place concrete should be covered by whatever curing medium is applicable to local conditions and approved by the engineer. The edges of concrete slabs exposed by the removal of forms should be protected immediately to provide these surfaces with continuous curing treatment equal to the method selected for curing the slab surfaces. The contractor should have at hand, and ready to install before actual placement begins, the equipment needed for adequate curing of the concrete. In hot or windy weather, the contractor should take appropriate concrete cooling and curing precautions during and after placement of concrete. The use of mechanically compacted low slump concrete (not exceeding 4 inches at the time of placement) is recommended.

Special Considerations

Excess soils generated from foundation excavations should not be placed on building pad and driveways and other settlement sensitive improvements areas without proper moisture and compaction. All slab subgrades should be verified to contain 1.2 times the soil optimum moisture content to a depth of 12 inches prior to placement of slab building materials. Moisture content should be tested in the field by the soil engineer. Slabs subgrade should be kept moist and the surface should not be allowed to desiccate. The addition of fiber mesh in the concrete and careful control of water/cement ratios may lessen the potential for slab cracking.

In hot or windy weather (80°F or 15mph), the contractor must take appropriate curing precautions after the placement of concrete. The use of mechanically compacted/dense low slump concrete (not exceeding 4 inches at the time of placement) is recommended. We recommend that a slipsheet (or equivalent) be utilized if grouted tiles or other crack sensitive flooring (such as marble tiles) is planned directly on concrete slabs.

Expansion Index/Soluble Sulfates

Based on soil classification and laboratory test results, the expansion potential of the near surface sandy soils is very low (EI=0).

Results of tests performed by Enviro - Chem of Pomona, California on a select soil samples are summarized as below:

Sample Location	Sample Depth (ft)	PH	Resistivity (ohm-cm)	Sulfate Content (%)	Chloride Content (ppm)
B-1	0-5.0	7.92	7520	0.00163	30.0

Based on test results, soil indicates negligible soluble sulfate exposure (less than 0.1 percent water soluble sulfates by weight). Therefore, there is no restriction on cement type. Based on resistivity test results, soil is moderately corrosive and ferrous metals/pipes/reinforcement should be protected. Concrete, mix, placement and curing for concrete should comply with ACI guidelines. If critical, these should be further verified by your structural or a corrosion engineer.

Surface Drainage

Positive drainage must be provided and maintained for the life of the project around the perimeter of the structures and all foundations toward streets or approved drainage devices to minimize water infiltrating into the underlying natural and engineered fill soils. In addition, finish subgrade adjacent to exterior footings should be sloped down and away (per CBC 1804.4) to facilitate surface drainage. Planter areas/large trees adjacent to the foundations are not recommended. Roof drainage should be collected and directed away

from foundations via nonerosive devices. Water, either natural or by irrigation, should not be permitted to pond or saturate the foundations soils.

Seismic Considerations

The site is located approximately 0.39 miles from the San Jacinto Fault. Moderate to strong ground shaking can be expected at the site and there is a 2 percent probability in 50 years (2475 year return period) that site peak ground acceleration (PGA) at the site will exceed 0.991g. The site soil profile is Class D (stiff soil). The structural engineer should consider City/County local codes, California Building Code (CBC 2019), seismic data presented in this report (Appendix D), the latest requirements of the Structural Engineers Association, and any other pertinent data in selecting design parameters.

Tentative Pavement Design

On the basis of laboratory classification and testing, we are of the opinion that the tentative new pavement design may be based on an R-value on the order of 40 (or better) corresponding to near surface soils. Considering this and based on typical traffic indices, the recommended pavement sections are outlined as follows:

AREA	TRAFFIC INDEX	ASPHALT CONCRETE (Inches)	AGGREGATE BASE (Inches)
Auto Parking	4 to 4.5	3	4
Driveways	5.5 to 6	3	6

The upper at least 18 inches of the subgrade soils below new pavements should be compacted to at least 90 percent relative compaction. Class 2 base should conform to Section 26 of Caltrans Standard Specifications and should be compacted to at least 95 percent of the maximum dry density. Maximum dry densities should be determined by the Standard Test Method designated ASTM D1557-12. Final pavement design may be based on laboratory sand equivalent test results of representative soils upon completion of grading.

Cal/OSHA Classification/Trench Excavations/Backfills

In general Cal/OSHA classification of onsite soils appears to be Type C.

Temporary trench excavations deeper than 5 feet should be shored or sloped at 1.5:1 or flatter in compliance with Cal/OSHA requirements:

- The shoring should be designed by a qualified engineer experienced in the shoring design.
- The tops of any temporary unshored excavations should be barricaded to prevent vehicle and storage loads within a 1:1 line projected upward from the bottom of the excavation or a minimum of 5 feet, whichever is greater. If the temporary construction embankments, including shored excavations, are to be maintained during the rainy season, berms are suggested along the tops of the excavations where necessary to prevent runoff from entering the excavation and eroding the slope faces.
- The soils exposed in the excavations should be inspected during excavation by the soils engineer so that modifications can be made if variations in the soil conditions occur.
- All unshored excavations should be stabilized within 30 days of initial excavation.

Foundation Plan Review/Construction Observations/Testing

The recommendations provided in this report are based on preliminary design information and subsurface conditions as interpreted from limited exploratory excavations at the site. Rodriguez Consulting and Engineering should review the foundation plans. Our preliminary conclusions and recommendations must

be reviewed and verified during site grading, and revised accordingly if exposed geotechnical conditions vary from our preliminary findings and interpretations.

Additional Observation and/or Testing

Rodriguez Consulting and Engineering should observe and/or test at the following stages of construction:

- During site clearance and removal of roots, old foundations and any underground obstructions.
- During all overexcavations and fill placement.
- Following footing excavations and prior to placement of forms and footing materials.
- Following presaturation of slab subgrade to a depth of at least 6 inches.
- During all trench backfills, subgrade and/or base compaction prior to paving.
- When any unusual conditions are encountered.

Report of Observations/Field Density Testing During Grading

A report of observations/field density tests should be prepared subsequent to the completion of rough grading. The report should include a summary of work performed, laboratory test results, and the results and locations of field density tests performed during grading.

Limitation of Investigation

Our investigation was performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable Geotechnical Engineers practicing in this or similar locations. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

The test pits, field and laboratory test data are believed representative of the project site; however, soil conditions can vary significantly between test pits. As in most major projects, conditions revealed by excavation may be at variance with preliminary findings. If this condition occurs, the possible variations must be evaluated by the Project Geotechnical Engineer and designs adjusted as required or alternate design recommended.

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

This firm does not practice or consult in the field of safety engineering. We do not direct the contractor's operations, and we cannot be responsible for other than our own personnel on the site; therefore, the safety of others is the responsibility of the contractor. The contractor should notify the owner if he considers any of the recommended actions presented herein to be unsafe.

The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In additions, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge.

Closure

If you should have any questions regarding this report, please do not hesitate to call this office. We appreciate this opportunity to be of service.

Very truly yours,
Rodriguez Consulting and Engineering



Gene K. Luu
Gene K. Luu, PE 53417
Project Engineer

Distribution: [3] Addressee

Attachments:	Figure 1	Site Location Map
	Figure 2	Geologic Map
	Figure 3	Riverside Co. RCIT GIS Map
	Figure 4	U.S. Geological Survey Quaternary Faults Map
	Plate 1	Exploratory Boring and Infiltration Test Location Map
	Plate 2	Minimum Foundation and Slab Recommendations for Expansive Soils
	Appendix A	References
	Appendix B	Geotechnical Boring Logs
	Appendix C	Laboratory Test Results
	Appendix D	USGS Earthquake Hazards Program-Source Parameters and CBC (2019) Seismic Parameters
	Appendix E	General Earthwork and Grading Specifications
	Appendix F	Liquefaction Analysis
	Appendix G	Infiltration Test Procedure and Test Results

Site Location Map

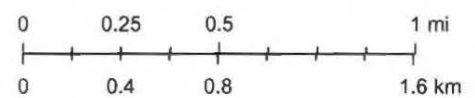
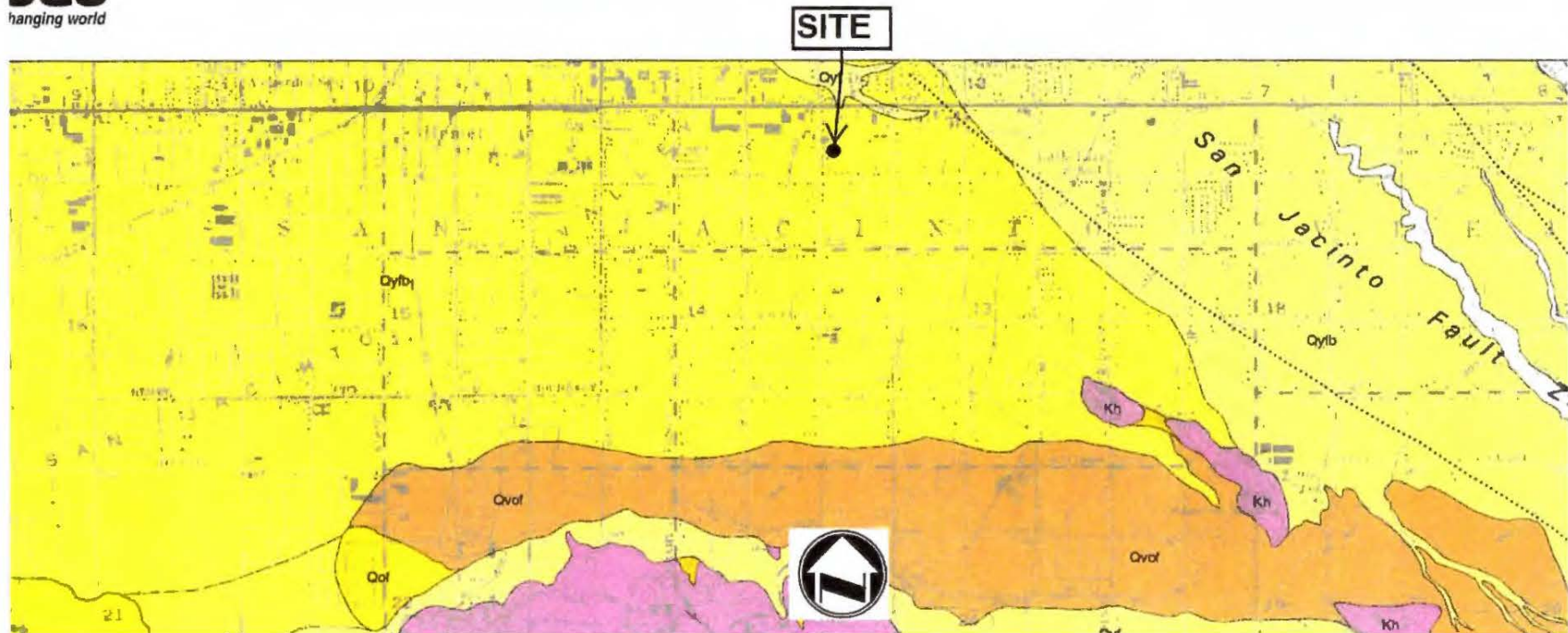


Figure 1



Base Map: USGS Geologic Map of the Hemet 7.5' Quadrangle, Riverside County, California.

LEGEND:

Qyfb1: Young alluvial fan deposits of Bautista Canyon, Unit 1 (Holocene and late Pleistocene)—Unconsolidated deposits of alluvial fans and headward drainages of fans. Consists predominately of gravel, sand, and silt.

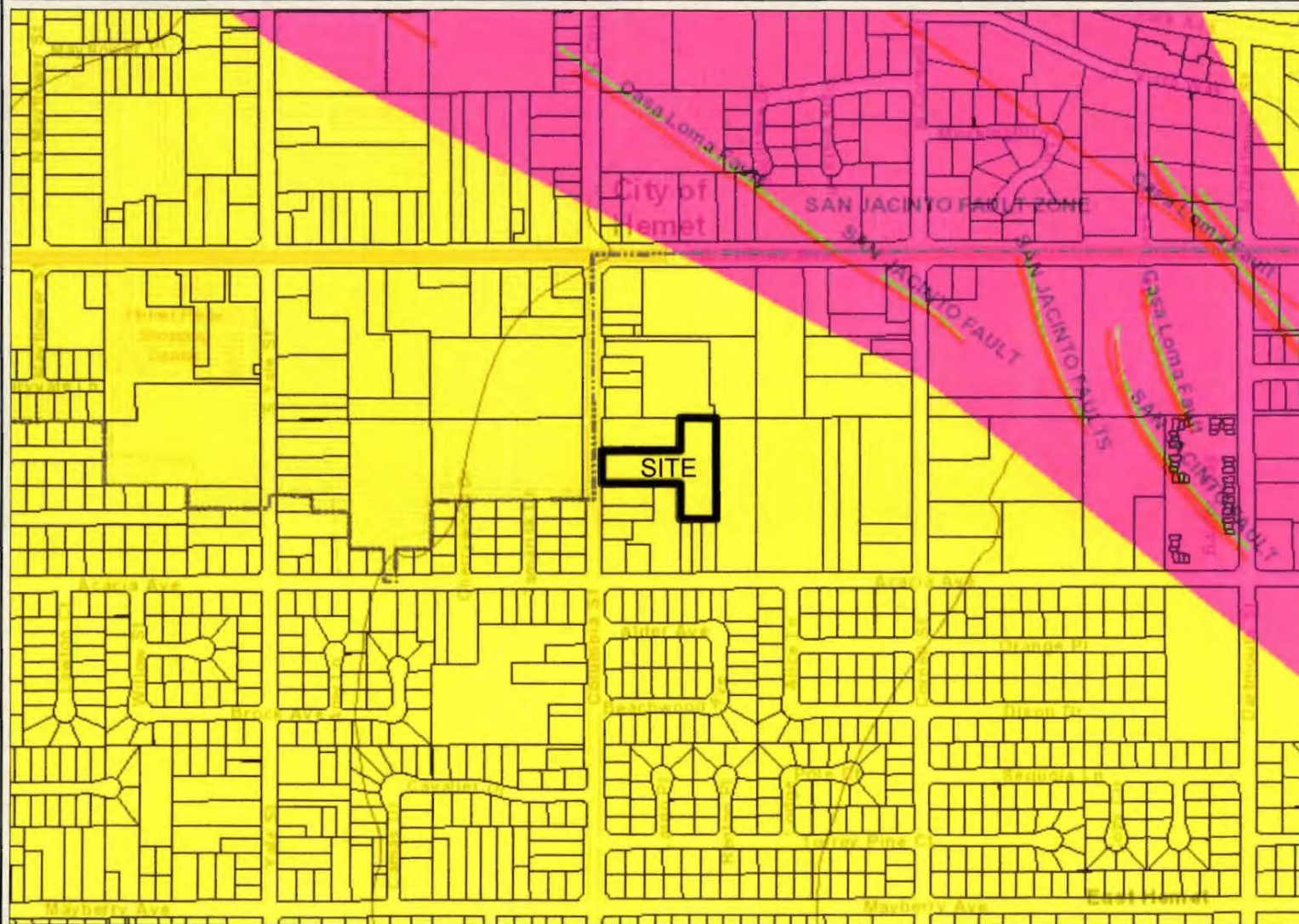
25914 Columbia St.
Hemet Area, Riverside County, California

Rodriguez Consulting and Engineering
Project No.: RCE-2235-01
Date: February 21, 2022

Figure: 2

Map My County Map

APN 438-220-002



Legend

- ☐ Parcels
- Contours 20 ft interval (with 10
 - 20' CONTOUR
 - 100' INDEX CONTOUR
- Faults**
 - OTHER AUTHORITY
 - ALQUIST-PRIOLO
 - RIVERSIDE COUNTY
- Fault Zones**
 - OTHER FAULT ZONE
 - COUNTY FAULT ZONE
 - ELSINORE FAULT ZONE
 - SAN ANDREAS FAULT ZONE
 - SAN JACINTO FAULT ZONE
- Liquefaction**
 - Other Susceptibility
 - High
 - Low
 - Moderate
 - Very High
 - Very low
- BlueLine Streams
- City Areas
- World Street Map



0 752 1,505 Feet

© Riverside County GIS

Notes

25914 Columbia St
Hemet Area, Riverside County
CA 92544

Figure 3

U.S. Geological Survey Quaternary Faults



2/19/2022, 9:08:37 PM

Fault Areas

- Class B
- historic
- late Quaternary
- latest Quaternary
- middle and late Quaternary

National Database

- Historic (< 150 years), well constrained location

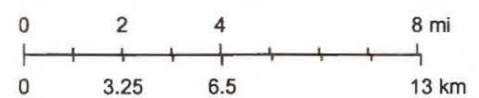
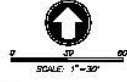


Figure 4

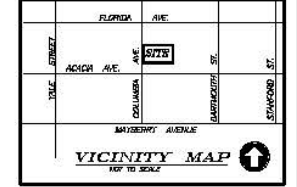
EXPLORATORY BORING & INFILTRATION TEST LOCATION MAP PLATE 1

LEGEND
B-5 • Approximate Location of Boring
I-2 ▲ Approximate Location of Infiltration Test

Rodriguez Consulting and Engineering
Project No. 2235-01 March 29, 2022



- LEGEND:**
- TD = TOP OF CURB
 - FL = FLOWLINE
 - TP = TOP OF PAVEMENT
 - FS = FINISHED SURFACE
 - FF = FINISHED FLOOR
 - PAO = PAO ELEVATION
 - NG = NATURAL GROUND
 - S = SCHEDULE
 - W = WATERLINE
 - G = GAS LINE
 - PP = POWER POLE
 - Q/W = DRAINAGE
 - UM = WATER METER
 - CL = CENTERLINE
 - PH = FIRE HYDRANT
 - TD = TOP OF GRATE
- AS. PAVING
 - CONCRETE PAVING
 - PAV. OF TRAIL
 - DENOTES DECORATIVE PAVING
 - DENOTES LANDSCAPING
 - DENOTES BUILDING AREA



SECTION 12
TOWNSHIP 5 SOUTH, RANGE 1 WEST

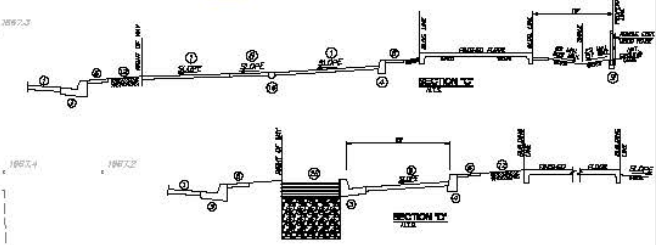
B-1
I-1
I-2
B-2

B-3

B-4

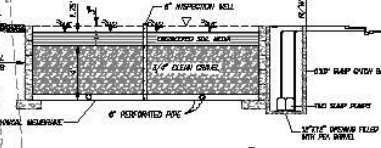
B-5

**TYPICAL
STREET CROSS-SECTION
COLUMBIA AVENUE
NOT TO SCALE**



KEY NOTES

- ASPHALT CONCRETE OVER APPROPRIATE BASE, SECTION PER SO'S REPORT
- CONCRETE PER RIL COUNTY STD. NO. 207A
- 6" CURB AND GUTTER PER RIL COUNTY STD. NO. 200
- 6" CONC. CURB PER RIL COUNTY STD. NO. 200
- 36" WIDE CONC. OPENING
- 4" THICK CONC. BALCONY
- LANDSCAPING PER ARCH. PLAN
- CONCRETE PAVING PER ARCH. PLAN
- 6" FISH WIRE PERIMETER FENCE
- PAVEMENT STRIPPING
- 6" FIRE LINE
- LANDSCAPING PER LANDSCAPE PLAN
- TRASH ENCLOSURE PER RIL CO. STANDARDS
- EXISTING POWER POLE TO REMAIN (40 KVA)
- 6" SEWER LINE
- CONCRETE STABLE
- WATER SERVICE PER RIL STANDARDS
- CONCRETE FIRE HYDRANT
- HANDICAP RAMP PER ADA STANDARDS
- SITE LIGHTING PER ARCHITECT'S PLAN
- REMOVE EXISTING BUILDING
- HANDICAP TRIANGLED DOME
- REMOVE EXISTING SEPTIC TANK AND LEACH BOX
- 4" PAO DRAIN LINE
- 12"x12" WOOD DRAIN
- WAMP BORESTATION SYSTEM
- PIPE DRAIN THROUGH CURB PER COUNTY STD. 310
- 6" FISH WIRE DRAIN FENCE



BORESTATION DETAIL
ALTS.
① 12"x12" WOOD DRAIN
② 4" PAO DRAIN LINE
③ 12"x12" WOOD DRAIN
④ 4" PAO DRAIN LINE
⑤ 12"x12" WOOD DRAIN
⑥ 4" PAO DRAIN LINE
⑦ 12"x12" WOOD DRAIN
⑧ 4" PAO DRAIN LINE
⑨ 12"x12" WOOD DRAIN
⑩ 4" PAO DRAIN LINE
⑪ 12"x12" WOOD DRAIN
⑫ 4" PAO DRAIN LINE
⑬ 12"x12" WOOD DRAIN
⑭ 4" PAO DRAIN LINE
⑮ 12"x12" WOOD DRAIN
⑯ 4" PAO DRAIN LINE
⑰ 12"x12" WOOD DRAIN
⑱ 4" PAO DRAIN LINE
⑲ 12"x12" WOOD DRAIN
⑳ 4" PAO DRAIN LINE
㉑ 12"x12" WOOD DRAIN
㉒ 4" PAO DRAIN LINE
㉓ 12"x12" WOOD DRAIN
㉔ 4" PAO DRAIN LINE
㉕ 12"x12" WOOD DRAIN
㉖ 4" PAO DRAIN LINE
㉗ 12"x12" WOOD DRAIN
㉘ 4" PAO DRAIN LINE
㉙ 12"x12" WOOD DRAIN
㉚ 4" PAO DRAIN LINE
㉛ 12"x12" WOOD DRAIN
㉜ 4" PAO DRAIN LINE
㉝ 12"x12" WOOD DRAIN
㉞ 4" PAO DRAIN LINE
㉟ 12"x12" WOOD DRAIN
㊱ 4" PAO DRAIN LINE
㊲ 12"x12" WOOD DRAIN
㊳ 4" PAO DRAIN LINE
㊴ 12"x12" WOOD DRAIN
㊵ 4" PAO DRAIN LINE
㊶ 12"x12" WOOD DRAIN
㊷ 4" PAO DRAIN LINE
㊸ 12"x12" WOOD DRAIN
㊹ 4" PAO DRAIN LINE
㊺ 12"x12" WOOD DRAIN
㊻ 4" PAO DRAIN LINE
㊼ 12"x12" WOOD DRAIN
㊽ 4" PAO DRAIN LINE
㊾ 12"x12" WOOD DRAIN
㊿ 4" PAO DRAIN LINE

NOTE

- THE PROJECT IS LOCATED WITHIN THE HEMET ENVIRONMENTAL JUSTICE COMMUNITY.
- THE PROJECT IS LOCATED IN HIGH PALEONTOLOGICAL SENSITIVITY, MODERATE LIQUIDATION POTENTIAL AND SUSCEPTIBLE TO SUBSIDENCE.
- THE PROJECT IS LOCATED IN HIGH HEMET STREET LIGHTING.
- DRAWINGS ON THE PROPERTY WILL BE OBTAINED.
- NO HAZARDOUS MATERIALS WILL BE USED/STORED ON-SITE.
- ALL EXISTING SEPTIC TANK AND LEACH LINES WILL BE REMOVED PRIOR TO GRADING PER SEPTICATE PERMIT.
- PERCESSION RAMP OF TRAIL TO BE 4' MINIMUM.

TOTAL AREA=90,050 SF; 2.27 AC.(NET)



HP ENGINEERING, INC.
CIVIL ENGINEERING • LAND SURVEYING
1405 CRESTVIEW ROAD, REDLANDS, CA. 92374
Tel: (909) 335-8238 Fax: (909) 335-9940

COUNTY OF RIVERSIDE
CONCEPTUAL GRADING PLAN
25914 COLUMBIA STREET, HEMET
PLOT PLAN 220352

1
OF 1 SHEETS

PLAN No.

	EXPANSION INDEX (ASTM D 4829) 0-20 VERY LOW EXPANSION
1- & 2-Story Footings (See Note 1)	All footings 18" deep. Reinforcement for continuous footings: two No. 4 bars top and two No. 4 bars at bottom
3-Story Footings (See Note 1)	All footings at least 24" deep. Reinforcement for continuous footings: Two No. 4 bars top and two No. 4 bars at bottom
Minimum Footing Width	Continuous: 15" for 2-story Continuous: 18" for 3-story
Pad Footings	Isolated column: 24" wide and 24" deep, tied to continuous footings in two directions
Garage Door Grade Beam (See Note 2)	A grade beam 18" deep by 15" wide for 2-story and 24" deep by 18" wide for 3-story should be provided across the garage entrance and other large openings.
Living Area Floor Slabs* (See Notes 3, 4 and 5)	5" thick slab. No. 4 rebar at 18 inches on-center reinforcement at mid-height, 10-mil Visqueen moisture barrier above 2" sand base with 2" sand above Visqueen
Garage Floor Slabs* (See Notes 4 and 6)	5" thick slab. No. 4 rebar at 18 inches on-center with 2" sand base above and below a 10-mil Visqueen moisture barrier. Garage slabs should be quarter-sawn.
Presoaking of Living Areas & Garage Slabs Subgrade**	(1.2) times optimum moisture to a depth of at least 6"

The Above Are Minimum Recommendations.

All Work Should Comply with Applicable/Governing Agency Codes and Requirements

* Based on California Green Code, a 4" thick base of ½ inch or larger clean aggregate shall be used below the Visqueen.

**Presoaking of living areas and garage slabs should be observed and tested by the project geotechnical engineer.

NOTES:

1. Depth of interior or exterior footings to be measured from lowest adjacent finish grade.
2. The base of the grade beam should be at the same elevation as that of the adjoining footings.
3. Living areas slabs may be tied to the footings as directed by the structural engineer.
4. We recommend the use of at least No. 3 bars at 18 inches on-center, each way, for all slabs.
5. 10-mil Visqueen sheeting welded at laps has proved successful. Equivalents are acceptable.
6. Garage slabs should be isolated from stem wall footings with a minimum 3/8" felt expansion joint.
7. Sand base should have a Sand Equivalent (SE) of 30 or greater (e.g., washed concrete sand).

Post-Tensioned Slabs

As an alternative to conventional foundations, building may be supported on post-tensioned slabs, to be designed by a structural engineer in consultation with the geotechnical consultant. In addition, a post-tensioned slab is also recommended for VERY HIGH expansion potential (Expansion Index greater than 130), if encountered. Post-tensioned slabs should have perimeter footings embedded a minimum of 12 inches below the adjacent grade. The slabs should be designed such that they can be deformed approximately 1-inch vertically over a width of 30 feet without distress in the event of shrinkage or swelling of the supporting soils. Living area slabs should be underlain by a 10-mil Visqueen moisture barrier covered by a 2-inch layer of sand. Presoaking is recommended for post tensioned slabs: (1.2) x optimum to a depth of 12 inches, (1.3) x optimum to a depth of 18 inches, and (1.4) x optimum to a depth of 24 inches for LOW, MEDIUM, and HIGH expansion potential soils, respectively. LOW and MEDIUM expansive soil lots using conventional foundation should comply with 2019 CBC. For very high expansion potential (Expansion Index greater than 130), specific recommendations by the geotechnical consultant will be required. Placement of 4 inches of sand base is also suggested for post-tensioned slab systems. Unless stated in the attached report, for EI=21-50 use PI=25, and EI=51-90 use PI=35.

**Minimum Foundation and Slab Recommendations
For Expansive Soils**

TWO- AND THREE-STORY RESIDENTIAL BUILDINGS

Rodriguez Consulting and Engineering

Plate: 2

REFERENCES

Site Location Map, OpenStreetMap Contributors, Map Layer by Esri

Preliminary Geologic Map of the Hemet 7.5' Quadrangle, Riverside County, California

Riverside Co. RCIT GIS Map

State of California Special Studies Zones, Hemet Quadrangle, California, Riverside Co., Topographic Base Map by US Geological Survey

U.S. Geological Survey Quaternary Faults Map

UNIFIED SOIL CLASSIFICATION SYSTEM

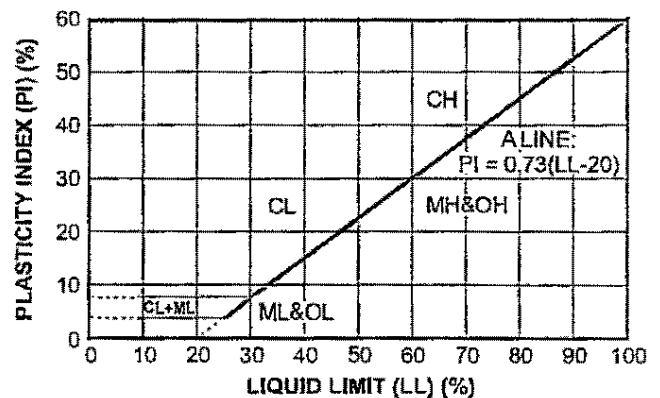
COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)			FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)		
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)		SILTS AND CLAYS Liquid limit less than 50%	ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
	GW	Well-graded gravels, gravel-sand mixtures, little or no fines		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines		OL	Organic silts and organic silty clays of low plasticity
	Gravels with fines (More than 12% fines)		SILTS AND CLAYS Liquid limit 50% or greater	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	GM	Silty gravels, gravel-sand-silt mixtures		CH	Inorganic clays of high plasticity, fat clays
	GC	Clayey gravels, gravel-sand-clay mixtures		OH	Organic clays of medium to high plasticity, organic silts
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)		HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils
	SW	Well-graded sands, gravelly sands, little or no fines			
	SP	Poorly graded sands, gravelly sands, little or no fines			
	Sands with fines (More than 12% fines)				
	SM	Silty sands, sand-silt mixtures			
	SC	Clayey sands, sand-clay mixtures			

CLASSIFICATION CHART

GRAIN SIZE CHART

Classification		RANGE OF GRAIN SIZES	
		U.S Standard Sieve Size	Grain Size in Millimeters
Boulder Size		Above 12"	> 300 mm
Cobbles		3" - 12"	80 - 300 mm
Gravel	Coarse	3" - 3/4"	20 - 80 mm
	Fine	3/4" - No. 4	4.75 - 20 mm
Sand	Coarse	No. 4 - No. 10	2 - 4.75 mm
	Medium	No. 10 - No. 40	0.425 - 2 mm
	Fine	No. 40 - No. 200	0.075 - 0.425 mm
Silt & Clay		< No. 200	< 0.075 mm

PLASTICITY CHART



	SPT Sample		Bag Sample	NR No Recovery	Classification in accordance with ASTM D2487 Description and visual observation in accordance with ASTM D2488 All Sieve Sizes shown are US Standard 10 Blows for no apparent displacement 50 Blows for less than 6 inches advancement 100 Blows for 6 to 18 inches advancement
	Ring Sample		Seepage		

GEOTECHNICAL BORING LOGS

Drill Hole No. B-1

Date: 3/24/2022

Project No. RCE-2235-01

Drilling Company: Larry Harklerode

Type of Rig: B-53

Hole Diameter: 8" Drive Weight: 140 lbs. Drop: 30"

Elevation: 1662.5±

DEPTH (feet)	TYPE OF TEST	SAMPLE TEST	BLOWS PER 6 INCH	DRY DENSITY (%)	MOISTURE (%)	SOIL CLASSIFICATION USCS	GEOTECHNICAL DESCRIPTION LOGGED BY: <u>GL</u> SAMPLED BY: <u>GL</u>
1						SM	Silty Sand: Light gray, fine to medium grained, dry, loose
2							
3			2 2 5		2.6		Loose
4							
5							
6			4 5 9		2.8		Medium dense
7							
8							
9							
10							
11			3 5 5				loose
12							
13							
14							
15							
16			4 4 4				Loose
17							
18							
19							
20			4 5 8				Medium dense
21							Total Depth = 20' No Ground, No Caving
22							
23							
24							
25							

GEOTECHNICAL BORING LOGS

Drill Hole No. B-2

Date: 3/24/2022

Drilling Company: Larry Harklerode

Project No. RCE-2235-01

Type of Rig: B-53

Hole Diameter: 8" Drive Weight: 140 lbs. Drop: 30"

Elevation: 1664±

DEPTH (feet)	TYPE OF TEST	SAMPLE TEST	BLOWS PER 6 INCH	DRY DENSITY (%)	MOISTURE (%)	SOIL CLASSIFICATION USCS	GEOTECHNICAL DESCRIPTION LOGGED BY: <u>GL</u> SAMPLED BY: <u>GL</u>
1						SM	Silty Sand: Pale brown, fine to medium grained, dry, loose
2							
3		X	3 4 5		3.1		
4							
5							
6		X	3 3 5		3.2		Dry, loose
7							
8							
9							
10							
11		X	2 2 3			ML	Sandy Silt: Pale brown, lightly moist, loose
12							%passing #200 = 52
13							
14							
15							
16		X	2 3 3				Loose
17							
18							
19							
20							
21		X	5 6 7		3.6	SP-SM	Sand with Silt: Pale brown, fine to medium grained, dry, medium dense
22							%passing #200 = 10
23							
24							
25							

GEOTECHNICAL BORING LOGS

Drill Hole No. B-2

Date: 3/24/2022

Drilling Company: Larry Harklerode

Project No. RCE-2235-01

Type of Rig: B-53

Hole Diameter: 8" Drive Weight: 140 lbs. Drop: 30"

Elevation: 1664±

DEPTH (feet)	TYPE OF TEST	SAMPLE TEST	BLOWS PER 6 INCH	DRY DENSITY (%)	MOISTURE (%)	SOIL CLASSIFICATION USCS	GEOTECHNICAL DESCRIPTION LOGGED BY: <u>GL</u> SAMPLED BY: <u>GL</u>
26		X	6 8 6			SM	Silty Sand: Light greenish gray, fine to medium grained, slightly moist, medium dense
27							
28							
29							
30							
31		X	9 9 10			SP-SM	Sand with Silt: Light gray, fine to medium grained, dry, medium
32							
33							
34							
35							
36		X	5 5 6				Gray olive, slightly moist, medium dense
37							
38							
39							
40							
41		X	3 4 6		1.9	ML	Sandy Silt: Light grayish olive, dry loose
42							% passing #200 sieve = 63
43							
44							
45							
46		X	8 5 5		2.5	SM	Silty Sand: Light grayish olive, fine to medium grained, dry, loose
47							% passing # 200 Sieve = 40
48							
49							Sand with Silt: Light brown , fine to medium grained, slight moist, dense
50		X	12 15 20			SP-SM	Total Depth = 50' No Ground, No Caving

GEOTECHNICAL BORING LOGS

Drill Hole No. B-3

Date: 3/24/2022

Project No. RCE-2235-01

Drilling Company: Larry Harklerode

Type of Rig: B-53

Hole Diameter: 8" Drive Weight: 140 lbs. Drop: 30"

Elevation: 1665.5±

DEPTH (feet)	TYPE OF TEST	SAMPLE TEST	BLOWS PER 6 INCH	DRY DENSITY (%)	MOISTURE (%)	SOIL CLASSIFICATION USCS	GEOTECHNICAL DESCRIPTION LOGGED BY: <u>GL</u> SAMPLED BY: <u>GL</u>
1						SM	Silty Sand: Pale brown, fine to medium grained, dry, medium dense
2							
3			8 9 12	101.8	1.5		
4							
5							
6			6 10 15		1.4	SP-SM	Sand with silt: Light brown, fine to medium grained, dry, medium dense
7							
8							
9							
10							
11			3 5 5			SM	Silty Sand: Tan, fine to medium dense, dry, loose
12							
13							
14							
15							
16			6 6 6				Light Grayish olive, dry, medium dense
17							
18							
19							
20							
21			6 7 7				Light brown, slightly moist, medium dense
22							
23							
24							
25			6 7 7				
							Total Depth = 25' No Ground, No Caving

GEOTECHNICAL BORING LOGS

Drill Hole No. B-4

Date: 3/24/2022

Project No. RCE-2235-01

Drilling Company: Larry Harklerode

Type of Rig: B-53

Hole Diameter: 8" Drive Weight: 140 lbs. Drop: 30"

Elevation: 1666±

DEPTH (feet)	TYPE OF TEST	SAMPLE TEST	BLOWS PER 6 INCH	DRY DENSITY (%)	MOISTURE (%)	SOIL CLASSIFICATION USCS	GEOTECHNICAL DESCRIPTION LOGGED BY: <u>GL</u> SAMPLED BY: <u>GL</u>
1						SM	Silty Sand: Pale brown, fine to medium grained, dry, medium dense
2							
3			5 5 6		3.7		
4							
5							
6			4 5 6		2.6		
7							
8							
9							
10							
11			3 3 4				Dry, loose
12							
13							
14							
15							
16			4 5 5				
17							
18							
19							
20			5 5 5				
21							Total Depth = 20' No Ground, No Caving
22							
23							
24							
25							

GEOTECHNICAL BORING LOGS

Drill Hole No. B-5

Project No. RCE-2235-01

Date: 3/24/2022

Drilling Company: Larry Harklerode

Type of Rig: B-53

Hole Diameter: 8" Drive Weight: 140 lbs. Drop: 30"

Elevation: 1665.5±

DEPTH (feet)	TYPE OF TEST	SAMPLE TEST	BLOWS PER 6 INCH	DRY DENSITY (%)	MOISTURE (%)	SOIL CLASSIFICATION USCS	GEOTECHNICAL DESCRIPTION LOGGED BY: <u>GL</u> SAMPLED BY: <u>GL</u>
1						SM	Silty Sand: Pale brown, fine to medium grained, dry, loose
2							
3		X	3 4 5		2.6		
4							
5							
6		X	4 6 8				Dry, loose
7							
8							
9							
10							
11		X	3 4 4				
12							
13							
14							
15							
16		X	4 5 4				Light Grayish olive, dry, loose
17							
18							
19							
20							
21		X	4 5 5				
22							
23							
24							
25		X	4 4 6				Total Depth = 25' No Ground, No Caving

25914 Columbia Street (APN 438-220-002)
Hemet Area, Riverside County, California

LABORATORY TEST RESULTS

Expansion Index: The expansion potential of representative samples was evaluated using the guidelines of ASTM D 4829. The test results are presented in the table below.

LOCATION	COMPACTED MOISTURE (%)	COMPACTED DRY DENSITY (PCF)	FINAL MOISTURE (%)	EXPANSION INDEX	EXPANSION CLASSIFICATION
B-2@0-5'	10.8	105.7	18.3	0	Very Low

Sieve Analysis: Select samples were tested using the guidelines of ASTM D6913-17. The test results are presented in the table below

SIEVE SIZE	B-2 @ 10' % PASSING	B-2 @ 20' % PASSING	B-2 @ 40' % PASSING	B-2@45' % PASSING
3/8"				
No. 4		100		
No. 8	100	99.9	100	100
No. 16	99.9	97	99.8	99.8
No. 30	99.4	74	99.2	99
No. 50	96	40	97	94
No. 100	79	20	87	71
No. 200	52	10	63	40

Enviro - Chem, Inc.

1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: **Rodriguez Consulting & Engineering**
17405 Tullock St.
Bloomington, CA 92316
Tel: (909) 258-0358
E-Mail: RodriguezConsultingEngineering@yahoo.com

PROJECT: **Ascendant Devel /RCE-2235-01**

MATRIX: SOIL DATE RECEIVED: 03/24/22
SAMPLING DATE: 03/14/22 DATE ANALYZED: 03/24&25/22
REPORT TO: MR. EDMUND RODRIGUEZ DATE REPORTED: 03/25/22

SAMPLE I.D.: B-2 @ 0-5' LAB I.D.: 220324-4

PARAMETER	SAMPLE RESULT	UNIT	PQL	DF	TEST METHOD
RESISTIVITY	7520	OHMS-CM	100000*	--	CALTRANS
SULFATE	16.3	mg/Kg	10	1	EPA 9038
CHLORIDE	30.0	mg/Kg	10	1	EPA 9253
pH	7.92	pH/UNIT	--	--	EPA 9045C

COMMENTS

DF = DILUTION FACTOR

PQL = PRACTICAL QUANTITATION LIMIT

ACTUAL DETECTION LIMIT = DF X PQL

mg/Kg = MILLIGRAM PER KILOGRAM = PPM

OHMS-CM = OHMS-CENTIMETER

RESISTIVITY = 1/CONDUCTIVITY

* = HIGH LIMIT

pH ANALYSIS CONDUCTED ON 1:1 SOIL/DEIONIZED WATER EXTRACTION

pH ANALYZED AT TEMPERATURE OF 21.1 DEGREE CELSIUS

DATA REVIEWED AND APPROVED BY: h

CAL-DHS ELAP CERTIFICATE No.: 1555

2008 National Seismic Hazard Maps - Source Parameters



Source ID	Source Name	State	Plate Slip Rate (mm/yr)	Dip (degrees)	Strike Slip	Slip	Length	Width	Area
0.39	<u>San Jacinto;A</u>	CA	9	90	V	strike slip	0	17	71
0.39	<u>San Jacinto;A+C</u>	CA	n/a	90	V	strike slip	0	17	118
0.39	<u>San Jacinto;A+CC+B+SM</u>	CA	n/a	90	V	strike slip	0.1	15	176
0.39	<u>San Jacinto;A+CC+B</u>	CA	n/a	90	V	strike slip	0.1	15	152
0.39	<u>San Jacinto;A+CC</u>	CA	n/a	90	V	strike slip	0	16	118
0.87	<u>San Jacinto;SBV+SJV+A</u>	CA	n/a	90	V	strike slip	0	16	134
0.87	<u>San Jacinto;SJV+A+CC+B</u>	CA	n/a	90	V	strike slip	0.1	15	170
0.87	<u>San Jacinto;SJV+A+CC+B+SM</u>	CA	n/a	90	V	strike slip	0.1	15	196
0.87	<u>San Jacinto;SBV+SJV+A+CC+B</u>	CA	n/a	90	V	strike slip	0.1	15	215
0.87	<u>San Jacinto;SJV+A</u>	CA	n/a	90	V	strike slip	0	17	89
0.87	<u>San Jacinto;SJV+A+C</u>	CA	n/a	90	V	strike slip	0	17	136
0.87	<u>San Jacinto;SBV+SJV+A+CC</u>	CA	n/a	90	V	strike slip	0	16	181
0.87	<u>San Jacinto;SJV+A+CC</u>	CA	n/a	90	V	strike slip	0	16	136
0.87	<u>San Jacinto;SBV+SJV+A+CC+B+SM</u>	CA	n/a	90	V	strike slip	0.1	15	241
0.87	<u>San Jacinto;SBV+SJV+A+C</u>	CA	n/a	90	V	strike slip	0	17	181
2.37	<u>San Jacinto;SJV</u>	CA	18	90	V	strike slip	0	16	43
2.37	<u>San Jacinto;SBV+SJV</u>	CA	n/a	90	V	strike slip	0	16	88

16.30	<u>S. San Andreas;NSB+SSB+BG+CO</u>	CA	n/a	79		strike slip	0.2	12	206
16.30	<u>S. San Andreas;BG+CO</u>	CA	n/a	72		strike slip	0.3	12	125
16.30	<u>S. San Andreas;BB+NM+SM+NSB+SSB+BG+CO</u>	CA	n/a	85		strike slip	0.1	13	390
16.30	<u>S. San Andreas;BB+NM+SM+NSB+SSB+BG</u>	CA	n/a	84		strike slip	0	14	321
16.30	<u>S. San Andreas;SSB+BG+CO</u>	CA	n/a	77		strike slip	0.2	12	170
16.30	<u>S. San Andreas;SM+NSB+SSB+BG+CO</u>	CA	n/a	83		strike slip	0.1	13	303
16.30	<u>S. San Andreas;SM+NSB+SSB+BG</u>	CA	n/a	81		strike slip	0	13	234
16.30	<u>S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB+BG+CO</u>	CA	n/a	86		strike slip	0.1	13	548
16.30	<u>S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB+BG</u>	CA	n/a	86		strike slip	0.1	13	479
16.30	<u>S. San Andreas;NSB+SSB+BG</u>	CA	n/a	75		strike slip	0	14	136
16.30	<u>S. San Andreas;NM+SM+NSB+SSB+BG+CO</u>	CA	n/a	84		strike slip	0.1	13	340
16.30	<u>S. San Andreas;NM+SM+NSB+SSB+BG</u>	CA	n/a	83		strike slip	0	14	271
16.30	<u>S. San Andreas;BG</u>	CA	n/a	58		strike slip	0	13	56
16.30	<u>S. San Andreas;CH+CC+BB+NM+SM+NSB+SSB+BG</u>	CA	n/a	86		strike slip	0	14	442
16.30	<u>S. San Andreas;CC+BB+NM+SM+NSB+SSB+BG+CO</u>	CA	n/a	86		strike slip	0.1	13	449
16.30	<u>S. San Andreas;CC+BB+NM+SM+NSB+SSB+BG</u>	CA	n/a	85		strike slip	0	14	380
16.30	<u>S. San Andreas;CH+CC+BB+NM+SM+NSB+SSB+BG+CO</u>	CA	n/a	86		strike slip	0.1	13	512
16.30	<u>S. San Andreas;SSB+BG</u>	CA	n/a	71		strike slip	0	13	101
16.37	<u>S. San Andreas;CC+BB+NM+SM+NSB+SSB</u>	CA	n/a	90	V	strike slip	0	14	322
16.37	<u>S. San Andreas;CH+CC+BB+NM+SM+NSB+SSB</u>	CA	n/a	90	V	strike slip	0	14	384
16.37	<u>S. San Andreas;NM+SM+NSB+SSB</u>	CA	n/a	90	V	strike slip	0	13	213

16.37	<u>S. San Andreas;NSB+SSB</u>	CA	n/a	90	V	strike slip	0	13	79
16.37	<u>S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB</u>	CA	n/a	90	V	strike slip	0.1	13	421
16.37	<u>S. San Andreas;SM+NSB+SSB</u>	CA	n/a	90	V	strike slip	0	13	176
16.37	<u>S. San Andreas;SSB</u>	CA	16	90	V	strike slip	0	13	43
16.37	<u>S. San Andreas;BB+NM+SM+NSB+SSB</u>	CA	n/a	90	V	strike slip	0	14	263
19.76	<u>Elsinore;GI+T</u>	CA	5	90	V	strike slip	0	14	78
19.76	<u>Elsinore;T</u>	CA	5	90	V	strike slip	0	14	52
19.76	<u>Elsinore;T+J</u>	CA	n/a	86	NE	strike slip	0	17	127
19.76	<u>Elsinore;T+J+CM</u>	CA	n/a	85	NE	strike slip	0	16	169
19.76	<u>Elsinore;W+GI+T</u>	CA	n/a	84	NE	strike slip	0	14	124
19.76	<u>Elsinore;W+GI+T+J</u>	CA	n/a	84	NE	strike slip	0	15	199
19.76	<u>Elsinore;W+GI+T+J+CM</u>	CA	n/a	84	NE	strike slip	0	16	241
19.76	<u>Elsinore;GI+T+J</u>	CA	n/a	86	NE	strike slip	0	17	153
19.76	<u>Elsinore;GI+T+J+CM</u>	CA	n/a	86	NE	strike slip	0	16	195
20.75	<u>Elsinore;GI</u>	CA	5	90	V	strike slip	0	13	37
20.75	<u>Elsinore;W+GI</u>	CA	n/a	81	NE	strike slip	0	14	83
24.90	<u>Pinto Mtn</u>	CA	2.5	90	V	strike slip	0	16	74
25.21	<u>San Jacinto;SBV</u>	CA	6	90	V	strike slip	0	16	45
28.12	<u>Elsinore;J</u>	CA	3	84	NE	strike slip	0	19	75
28.12	<u>Elsinore;J+CM</u>	CA	3	84	NE	strike slip	0	17	118
29.94	<u>San Jacinto;CC+B</u>	CA	n/a	90	V	strike slip	0.2	14	77

29.94	<u>San Jacinto;CC+BB+SM</u>	CA	n/a	90	V	strike slip	0.2	14	103
29.94	<u>San Jacinto;CC</u>	CA	4	90	V	strike slip	0	16	43
30.43	<u>San Jacinto;C</u>	CA	14	90	V	strike slip	0	17	47
32.16	<u>S. San Andreas;BB+NM+SM+NSB</u>	CA	n/a	90	V	strike slip	0	14	220
32.16	<u>S. San Andreas;SM+NSB</u>	CA	n/a	90	V	strike slip	0	13'	133
32.16	<u>S. San Andreas;CC+BB+NM+SM+NSB</u>	CA	n/a	90	V	strike slip	0	14	279
32.16	<u>S. San Andreas;NSB</u>	CA	22	90	V	strike slip	0	13	35
32.16	<u>S. San Andreas;CH+CC+BB+NM+SM+NSB</u>	CA	n/a	90	V	strike slip	0	14	341
32.16	<u>S. San Andreas;PK+CH+CC+BB+NM+SM+NSB</u>	CA	n/a	90	V	strike slip	0.1	13	377
32.16	<u>S. San Andreas;NM+SM+NSB</u>	CA	n/a	90	V	strike slip	0	13	170
34.39	<u>Burnt Mtn</u>	CA	0.6	67	W	strike slip	0	16	21
36.21	<u>Chino, alt 2</u>	CA	1	65	SW	strike slip	0	14	29
37.64	<u>Eureka Peak</u>	CA	0.6	90	V	strike slip	0	15	19
37.65	<u>Elsinore;W</u>	CA	2.5	75	NE	strike slip	0	14	46
38.31	<u>Chino, alt 1</u>	CA	1	50	SW	strike slip	0	9	24
39.97	<u>Cleghorn</u>	CA	3	90	V	strike slip	0	16	25
40.25	<u>S. San Andreas;CO</u>	CA	20	90	V	strike slip	0.6	11	69
40.62	<u>Helendale-So Lockhart</u>	CA	0.6	90	V	strike slip	0	13	114
41.44	<u>Cucamonga</u>	CA	5	45	N	thrust	0	8	28
41.60	<u>North Frontal (East)</u>	CA	0.5	41	S	thrust	0	16	27
41.84	<u>Landers</u>	CA	0.6	90	V	strike slip	0	15	95
42.72	<u>North Frontal (West)</u>	CA	1	49	S	reverse	0	16	50

2/19/22, 9:11 PM

2008 National Seismic Hazard Maps - Source Parameters

43.32	<u>San Joaquin Hills</u>	CA	0.5	23	SW	thrust	2	13	27
44.07	<u>Earthquake Valley</u>	CA	2	90	V	strike slip	0	19	20
45.10	<u>Lenwood-Lockhart-Old Woman Springs</u>	CA	0.9	90	V	strike slip	0	13	145
48.05	<u>Johnson Valley (No)</u>	CA	0.6	90	V	strike slip	0	16	35
48.10	<u>Newport Inglewood Connected alt 1</u>	CA	1.3	89		strike slip	0	11	208
48.10	<u>Newport Inglewood Connected alt 2</u>	CA	1.3	90	V	strike slip	0	11	208
48.10	<u>Newport-Inglewood (Offshore)</u>	CA	1.5	90	V	strike slip	0	10	66
49.85	<u>San Jose</u>	CA	0.5	74	NW	strike slip	0	15	20

CBC (2019) Seismic Parameters

The CBC 2019 update is tabulated as follows:

2019 CBC – SEISMIC PARAMETERS		
Site Coordinates	Latitude	Longitude
	34.7453	-116.9444
Mapped Spectral Response Acceleration	$S_s = 2.22$	$S_1 = 0.901$
Site Coefficients (Class “C”)	$F_a = 1.0$	$F_v = 1.7$
Maximum Considered Earthquake (MCE) Spectral Response Acceleration	$S_{MS} = 2.22$	$S_{M1} = 1.53$
Design Spectral Response Acceleration Parameters	$S_{DS} = 1.48$	$S_{D1} = 1.021$
Seismic Design Category	E	
Peak Ground Acceleration (PGA)	0.991	
Site amplification factor at PGA	1.1	
Site modified peak ground acceleration (PGAM)	1.09	

- [Earthquake.usgs.gov/research/hazmaps/design](https://earthquake.usgs.gov/research/hazmaps/design)
- 2019 California Building Code, California Code of Regulations, Title 24, Part 2, Volume 2 of 2, Section 1613, Earthquake Loads

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

1.0 GENERAL INTENT

These specifications present general procedures and requirements for grading and earthwork as shown on the approved grading plans, including preparation of areas to be filled, placement of fill, installations of subdrains, and excavations. The recommendations contained in the geotechnical report are a part of the earthwork and grading specifications and shall supersede the provisions contained hereinafter in the case of conflict. Evaluations performed by the consultant during the course of grading may result in new recommendations which could supersede these specifications or the recommendations of the geotechnical report.

2.0 EARTHWORK OBSERVATIONS AND TESTING

Prior to the commencement of grading, a qualified geotechnical consultant (soils engineer and engineering geologist, and their representatives) shall be employed for the purpose of observing earthwork procedures and testing the fills for conformance with the recommendations of the geotechnical report and these specifications. It will be necessary that the consultant provide adequate testing and observations so that he may determine that the work was accomplished as specified. It shall be the responsibility of the contractor to assist the consultant and keep him apprised of work schedules and changes so that he may schedule his personnel accordingly.

It shall be the sole responsibility of the contractor to provide adequate equipment and methods to accomplish the work in accordance with applicable grading codes or agency ordinances, these specifications and approved grading plans. If, in the opinion of the consultant, unsatisfactory conditions, such as questionable soil, poor moisture conditions, inadequate compaction, adverse weather, etc., are resulting in a quality of work less than required in these specifications, the consultant will be empowered to reject the work and recommend that construction be stopped until the unsatisfactory conditions are rectified.

Maximum dry density tests used to determine the degree of compaction will be performed in accordance with the American Society of Testing and Materials, test method ASTM D1557-09.

3.0 PREPARATION OF AREAS TO BE FILLED

3.1 Clearing and Grubbing

All brush, vegetation, and debris shall be removed or piled and otherwise disposed of.

3.2 Processing

The existing ground which is determined to be satisfactory for support of fill shall be scarified to a minimum depth of 6 inches. Existing ground which is not satisfactory shall be overexcavated as specified in the following section. Scarification shall continue until the soils are broken down and free of large clay lumps or clods and until the working surface is reasonably uniform and free of uneven features which would inhibit uniform compaction.

3.3 Overexcavation

Soft, dry, spongy, highly fractured or otherwise unsuitable ground, extending to such depth that surface processing cannot adequately improve the condition, shall be overexcavated down to firm ground, approved by the consultant.

3.4 Moisture Conditioning

Overexcavated and processed soils shall be watered, dried-back, blended, and/or mixed, as required to attain a uniform moisture content near optimum.

3.5 Recomposition

Overexcavation and processed soils which have been properly mixed and moisture-conditioned shall be recompacted to a minimum relative compaction of 90 percent.

3.6 Benching

Where fills are to be placed on ground with slopes steeper than 5:1 (horizontal : vertical), the ground shall be stepped or benched. The lowest bench shall be a minimum of 15 feet wide, shall be at least 2 feet deep, shall expose firm materials, and shall be approved by the consultant. Other benches shall be excavated in firm materials for a minimum width of 4 feet. Ground sloping flatter than 5:1 (horizontal : vertical) shall be benched or otherwise overexcavated when considered necessary by the consultant.

3.7 Approval

All areas to receive fill, including processed areas, removal areas and toe-of-fill benches shall be approved by the consultant prior to fill placement.

4.0 FILL MATERIAL

4.1 General

Material to be placed as fill shall be free of organic matter and other deleterious substances, and shall be approved by the consultant. Soils of poor gradation, expansion, or strength characteristics shall be placed in areas designated by consultant or shall be mixed with other soils to serve as satisfactory fill material.

4.2 Oversize

Oversize materials defined as rock, or other irreducible material with maximum dimension greater than 12 inches, shall not be buried or placed in fills, unless the location, materials, and disposal methods are specifically approved by the consultant. Oversize disposal operations shall be such that nesting of oversize material does not occur, and such that the oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 feet vertically of finish grade or within the range of future utilities or underground construction, unless specifically approved by the consultant.

4.3 Import

If importing of fill material is required for grading, the import material shall meet the requirements of Section 4.1.

5.0 FILL PLACEMENT and COMPACTION

5.1 Fill Lifts

Approved fill material shall be placed in areas prepared to receive fill in near-horizontal layers not exceeding 6 inches in compacted thickness. The consultant may approve thicker lifts if testing indicates the grading procedures are such that adequate compaction is being achieved with lifts of greater thickness. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to attain uniformity of material and moisture in each layer.

5.2 Fill Moisture

Fill layers at a moisture content less than optimum shall be watered and mixed, and wet fill layers shall be aerated by scarification or shall be blended with drier material. Moisture conditioning and mixing of fill layers shall continue until the fill material is at a uniform moisture content at or near optimum.

5.3 Compaction of Fill

After each layer has been evenly spread, moisture-conditioned, and mixed, it shall be uniformly compacted to not less than 90 percent of maximum dry density. Compaction equipment shall be adequately sized and shall be either specifically designed for soil compaction or of proven reliability, to efficiently achieve the specified degree of compaction.

5.4 Fill Slopes

Compacting of slopes shall be accomplished, in addition to normal compacting procedures, by backrolling of slopes with sheepfoot

rollers at frequent increments of 2 to 3 feet in fill elevation gain, or by other methods producing satisfactory results. At the completion of grading, the relative compaction of the slope out to the slope face shall be at least 90 percent.

5.5 Compaction Testing

Field-tests to check the fill moisture and degree of compaction will be performed by the consultant. The location and frequency of tests shall be at the consultant's discretion. In general, the tests will be taken at intervals not exceeding 2 feet in vertical rise and/or 1,000 cubic yards of embankment.

6.0 SUBDRAIN INSTALLATION

Subdrain systems, if required, shall be installed in approved ground to conform to the approximate alignment and details shown on the plans or herein. The subdrain location or materials shall not be changed or modified without the approval of the consultant. The consultant, however, may recommend and upon approval, direct changes in subdrain line, grade or material. All subdrains should be surveyed for line and grade after installation and sufficient time shall be allowed for the surveys, prior to commencement of filling over the subdrain.

7.0 EXCAVATION

Excavations and cut slopes will be examined during grading. If directed by the consultant, further excavation or overexcavation and refilling of cut areas shall be performed, and/or remedial grading of cut slopes shall be performed. Where fill-over-cut slopes are to be graded, unless otherwise approved, the cut portion of the slope shall be made and approved by the consultant prior to placement of materials for construction of the fill portion of the slope.

8.0 TRENCH BACKFILLS

Trench excavations for utility pipes shall be backfilled under engineering supervision.

After the utility pipe has been laid, the space under and around the pipe shall be backfilled with clean sand or approved granular soil to a depth of at least one foot over the top of the pipe. The sand backfill shall be uniformly jetted into place before the controlled backfill is placed over the sand.

The onsite materials, or other soils approved by the soil engineer, shall be watered and mixed as necessary prior to placement in lifts over the sand backfill.

The controlled backfill shall be compacted to at least 90 percent of the maximum dry density as determined by the ASTM D1557-09 test method.

Field density tests and inspection of the backfill procedures shall be made by the soil engineer during backfilling to see that proper moisture content and uniform compaction is being maintained. The contractor shall provide test holes and exploratory pits as required by the soil engineer to enable sampling and testing.

LIQUEFACTION ANALYSIS SUMMARY

Copyright by CivilTech Software
www.civiltechsoftware.com

Font: Courier New, Regular, Size 8 is recommended for this report.
Licensed to , 3/29/2022 6:35:28 PM

Input File Name: UNTITLED
Title: PROJECT Name: Ascendant Devel Group
Subtitle: Proj No. RCE-2235-01

Surface Elev.=1164
Hole No.=B-2
Depth of Hole= 50.00 ft
Water Table during Earthquake= 200.00 ft
Water Table during In-Situ Testing= 200.00 ft
Max. Acceleration= 0.73 g
Earthquake Magnitude= 7.12

Input Data:

Surface Elev.=1164
Hole No.=B-2
Depth of Hole=50.00 ft
Water Table during Earthquake= 200.00 ft
Water Table during In-Situ Testing= 200.00 ft
Max. Acceleration=0.73 g
Earthquake Magnitude=7.12

1. SPT or BPT Calculation.
 2. Settlement Analysis Method: Ishihara / Yoshimine
 3. Fines Correction for Liquefaction: Idriss/Seed
 4. Fine Correction for Settlement: During Liquefaction*
 5. Settlement Calculation in: All zones*
 6. Hammer Energy Ratio,
 7. Borehole Diameter,
 8. Sampling Method,
 9. User request factor of safety (apply to CSR) , User= 1
Plot two CSR (fs1=1, fs2=User)
 10. Use Curve Smoothing: Yes*
- * Recommended Options

Ce = 0.89
Cb= 1
Cs= 1

In-Situ Test Data:
Depth SPT gamma Fines

ft		pcf	%
0.00	40.00	120.00	40.00
5.00	40.00	120.00	40.00
10.00	5.00	120.00	52.00
15.00	5.00	120.00	52.00
20.00	18.00	120.00	10.00
25.00	12.00	120.00	40.00
30.00	19.00	120.00	10.00
35.00	11.00	120.00	10.00
40.00	10.00	120.00	63.00
45.00	10.00	120.00	40.00
50.00	35.00	120.00	10.00

Output Results:

Settlement of Saturated Sands=0.00 in.

Settlement of Unsaturated Sands=11.77 in.

Total Settlement of Saturated and Unsaturated Sands=11.77 in.

Differential Settlement=5.883 to 7.766 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.28	0.47	5.00	0.00	11.77	11.77
5.00	2.28	0.47	5.00	0.00	11.76	11.76
10.00	0.13	0.46	5.00	0.00	11.50	11.50
15.00	0.13	0.46	5.00	0.00	9.13	9.13
20.00	0.19	0.45	5.00	0.00	7.56	7.56
25.00	0.18	0.45	5.00	0.00	6.98	6.98
30.00	0.17	0.44	5.00	0.00	6.01	6.01
35.00	0.09	0.42	5.00	0.00	3.43	3.43
40.00	0.14	0.40	5.00	0.00	1.47	1.47
45.00	0.13	0.38	5.00	0.00	0.48	0.48
50.00	0.21	0.36	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone

(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Depth = ft, Stress or Pressure = atm (tsf), Unit Weight = pcf,
Settlement = in.

1 atm (atmosphere) = 1 tsf (ton/ft²)

CRRm Cyclic resistance ratio from soils

CSRsf Cyclic stress ratio induced by a given earthquake (with user
request factor of safety)

F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRsf

S_sat Settlement from saturated sands

S_dry Settlement from Unsaturated Sands

Infiltration Test (Percolation Test Procedure)

The percolation test data from I-1 and I-2 was used to estimate infiltration rates using the Porchet Inverse Borehole Method, in accordance with Riverside County, Low-impact development BMP design handbook, Appendix A-Infiltration Testing, June 2018.

Two 8-inch diameter, 9-feet deep test holes (I-1 and I-2) were drilled at the suggested locations. The soil at the test locations was visually classified as silty sand (USCS "SM"). To mitigate any possible caving or sloughing of the test holes, a 6-inch diameter perforated pipe was placed in the hole. The bottom of the hole was covered with 2 inches of gravel.

The testing was conducted after presoaking. Two consecutive measurements showed that 6 inches of water seeped away in less than 25 minutes for I-1 and I-2. The tests were therefore run an additional one hour with measurements taken at 10 minute intervals for I-1 and I-2. Water level was adjusted to at least 20 inches above the bottom of the test hole after each measurement. The drop that occurred during the final reading was used for design rate purposes.

Infiltration Test/Tabulated Test Results

Test No.	Depth of Test (feet)	Earth Material	In-Situ Infiltration Rate (in/hr)
I-1	9	Silty Sand ("SM")	3.07
I-2	9	Silty Sand ("SM")	4.10

Based on the test results, the In-situ infiltration rate obtained from the field is greater than 1.6 inches per hour. Therefore, infiltration BMPs (Best Management Practices) can be used for those DMAs (Drainage Management Areas).

A suitable factor of safety should be applied to the above rate per County guidelines.

INFILTRATION TEST DATA

(Boring Percolation Test Procedure)

Project: Ascendant Devel. Group Project No.: RCT-22350
 Test Hole No.: I-1 Date Excavated: 3/14/22
 Depth of Test Hole, D_T: 91 Diameter: 8" USCS Soil Classification: SM
 Presoak: _____ Tested By: Ed Date: 3/22/22

SANDY SOIL CRITERIA TEST

Trial No.	Time	Time Interval (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)	Greater Than or Equal to 6" (Y/N)
1	11:29 25	25	36	105.6	69.6	Y
	11:54 33					
2	11:58 33	25	24	99.6	75.6	Y
	12:23 33					

Use Normal Sandy (Circle One) Soil Criteria

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D ₀ Initial Depth to Water(in.)	D _f Final Depth to Water(in.)	ΔD Change in Water Level (in.)	Infiltration Rate (in./hr.)
1	12:2843	12:3843	10	36	56.4		
2	12:4019	12:5019	10	36	54		
3	12:5539	1:0539	10	36	52.8		
4	1:0724	1:1724	10	36	52.8		
5	1:2052	1:3052	10	36	52.8		
6	1:3404	1:4404	10	36	52.8	16.8	3.07
7							1
8							
9							
10							
11							
12							

COMMENTS:

$$\begin{aligned}
 H_0 &= D_T - D_0 = 108 - 36 = 72" \\
 H_f &= D_T - D_f = 108 - 52.8 = 55.2" \\
 H_{avg} &= (H_0 + H_f) / 2 = 63.6
 \end{aligned}$$

$$I_s = \frac{4 \times 60 \times 16.8}{10 (4 + 2(63.6))} = 3.07 \text{ in/hr}$$

INFILTRATION TEST DATA

(Boring Percolation Test Procedure)

Project: Ascendant Canal Project No.: PCB-225
 Test Hole No.: I2 Date Excavated: 3/14/81
 Depth of Test Hole, D_T: 9' Diameter: 8" USCS Soil Classification: SM
 Presoak: _____ Tested By: fd Date: 3-22-82

SANDY SOIL CRITERIA TEST

Trial No.	Time	Time Interval (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)	Greater Than or Equal to 6" (Y/N)
1	11:3518	25	36	97.2	61.2	Y
	12:0018					
2	12:1815	25	36	92.4	56.4	Y
	12:4315					

Use Normal Sandy (Circle One) Soil Criteria

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D ₀ Initial Depth to Water(in.)	D _f Final Depth to Water(in.)	ΔD Change in Water Level (in.)	Infiltration Rate (in./hr.)
1	1:4901	1:0001	10	36	58.8	22.8	
2	1:1509	1:2509	10	36	57.6	21.6	
3	1:2912	1:3912	10	36	57.6	21.6	
4	1:4349	1:5349	10	36	57.6	21.6	
5	1:5453	2:0453	10	36	57.6	21.6	
6	2:0924	2:1924	10	36	57.6	21.6	4.10
7							
8							
9							
10							
11							
12							

COMMENTS:

$H_0 = D_1 - D_0 = 108 - 36 = 72"$
 $H_{avg} = \frac{D_1 - D_f}{2} = \frac{108 - 57.6}{2} = 61.2$

$$I_{avg} = \frac{4 \times 6.0 \times 21.6}{10 (4 + 2(61.2))} = 4.10 \text{ in./hr}$$

Appendix 4: Historical Site Conditions

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

“SEE ATTACHED INFORMATION”

Appendix 5: LID Infeasibility

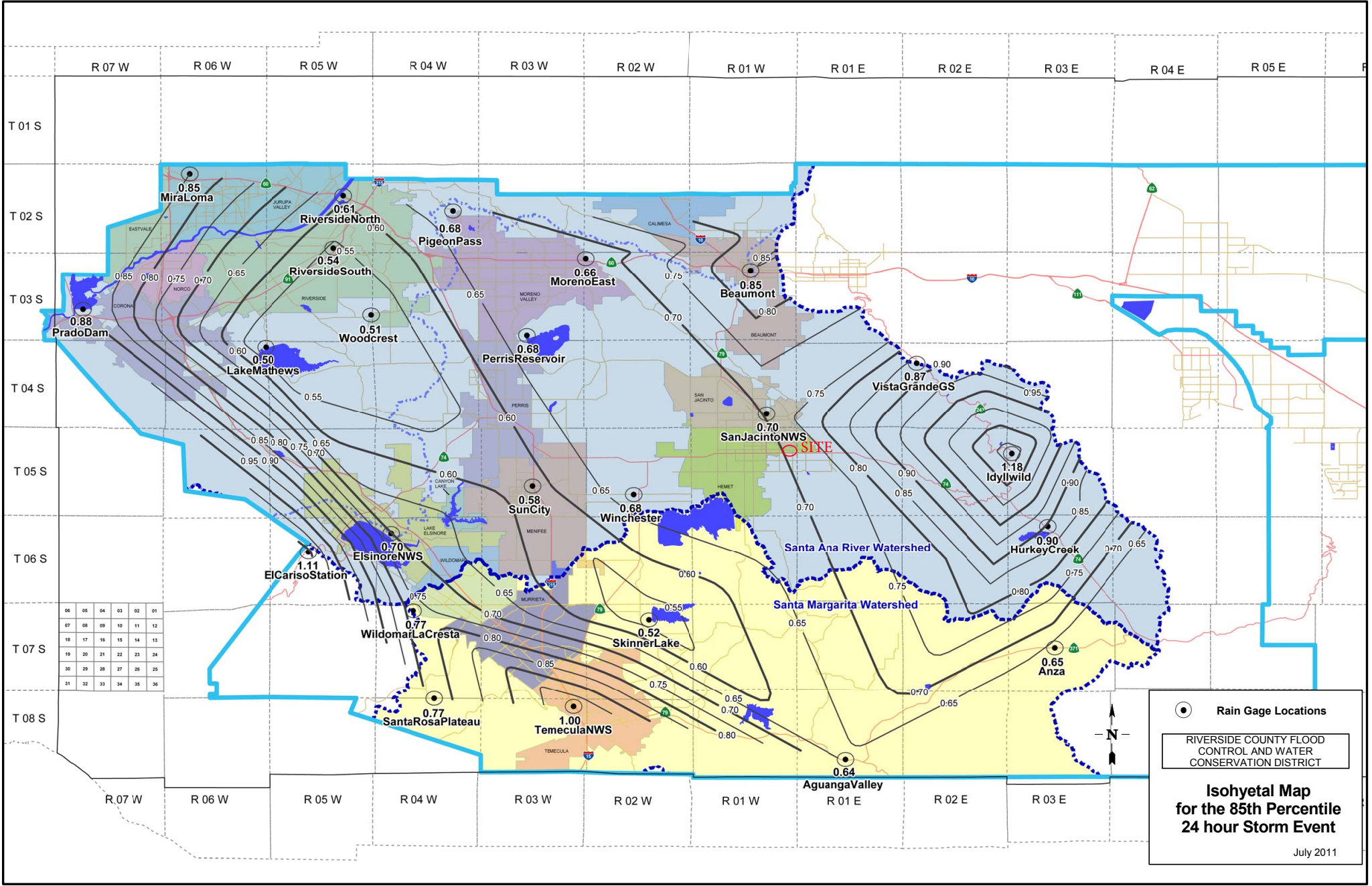
LID Technical Infeasibility Analysis

NOT APPLICABLE

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

(See Attached Next Pages)



User Inputs

Chamber Model:	MC-7200
Outlet Control Structure:	No
Project Name:	COLUMBIA
Engineer:	Henry Poquiz
Project Location:	California
Measurement Type:	Imperial
Required Storage Volume:	3364 cubic ft.
Stone Porosity:	40%
Stone Foundation Depth:	9 in.
Stone Above Chambers:	12 in.
Average Cover Over Chambers:	24 in.
Design Constraint Dimensions:	(23 ft. x 50 ft.)

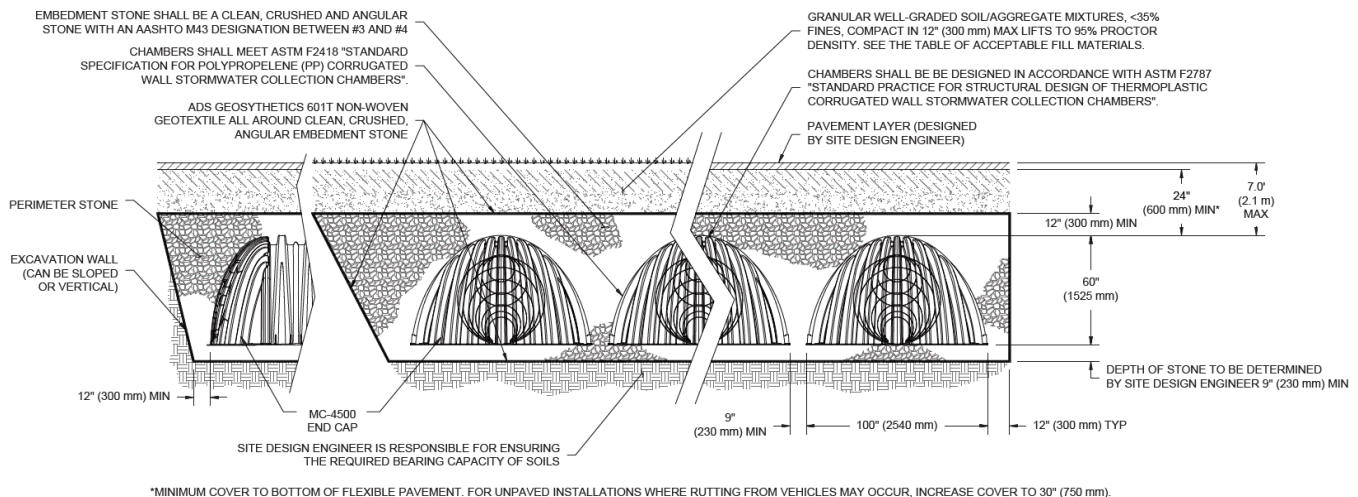
Results

System Volume and Bed Size

Installed Storage Volume:	3828.10 cubic ft.
Storage Volume Per Chamber:	175.90 cubic ft.
Number Of Chambers Required:	11
Number Of End Caps Required:	4
Chamber Rows:	2
Maximum Length:	50.79 ft.
Maximum Width:	20.02 ft.
Approx. Bed Size Required:	952.73 square ft.

System Components

Amount Of Stone Required:	161 cubic yards
Volume Of Excavation (Not Including Fill):	239 cubic yards
Total Non-woven Geotextile Required:	382 square yards
Woven Geotextile Required (excluding Isolator Row):	22 square yards
Woven Geotextile Required (Isolator Row):	106 square yards
Total Woven Geotextile Required:	127 square yards
Impervious Liner Required:	0 square yards



PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	



COLUMBIA

HEMET, CA

MC-7200 STORMTECH CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH MC-7200.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT³. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
 - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
 - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
 - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-7200 CHAMBER SYSTEM

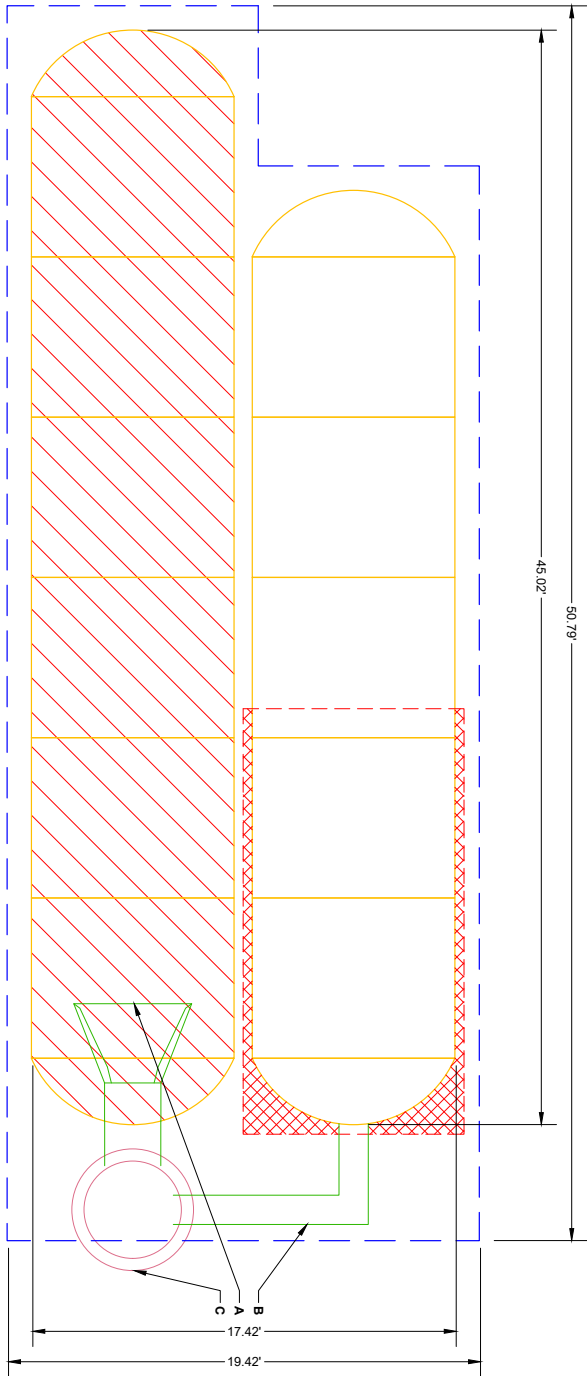
- STORMTECH MC-7200 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
 - STONESHOOTER LOCATED OFF THE CHAMBER BED.
 - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
 - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
- INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
- STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
- STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

- STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
 - THE USE OF EQUIPMENT OVER MC-7200 CHAMBERS IS LIMITED:
 - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
 - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-7200 CONSTRUCTION GUIDE".
 - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
 - FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.
- USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.**

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT		CONCEPTUAL ELEVATIONS		PART TYPE		ITEM ON LAYOUT		DESCRIPTION		*INVERT ABOVE BASE OF CHAMBER	
11	STORMTECH MC-7200 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	12.75'								
4	STONE ABOVE MC-7200 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	8.25'	FLAMP	A	INSTALL FLAMP ON 24" ACCESS PIPE / PART#: MC720024RAMP					
12	STONE ABOVE (IN)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	7.75'	MANIFOLD	B	12" x 12" TOP MANIFOLD, ADS N-12				INVERT	MAX FLOW
9	STONE BELOW (IN)	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	7.75'	CONCRETE STRUCTURE	C	DESIGN BY ENGINEER / PROVIDED BY OTHERS)				35.69"	2.5 CFS IN
40	STONE VOLUME (CU)	TOP OF STONE:	6.75'								
3757	(PERMETER STONE INCLUDED)	TOP OF MC-7200 CHAMBER:	5.75'								
	(COVER STONE INCLUDED)	12" x 12" TOP MANIFOLD INVERT:	3.72'								
	(BASE STONE INCLUDED)	24" ISOLATOR ROW PLUS INVERT:	0.94'								
926	SYSTEM AREA (SF)	BOTTOM OF MC-7200 CHAMBER:	0.75'								
140.4	SYSTEM PERIMETER (ft)	BOTTOM OF STONE:	0.00'								



	ISOLATOR ROW PLUS (SEE DETAIL)
	PLACE MINIMUM 17.50' OF ASPHALT/ST. WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS
	CHAMBER INLET ROWS
	BED LIMITS

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #8 32 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS SYSTEM WAS DESIGNED WITHOUT SITE SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE IN-SITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

StormTech®
Chamber System

888-892-2694 | WWW.STORMTECH.COM

COLUMBIA
HEMET, CA

DATE: _____ DRAWN: HP

PROJECT #: _____ CHECKED: N/A

DATE	DRW	CHK	DESCRIPTION

SHEET
2 OF 5

0 5' 10'

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIAL'S NATIVE SOLUS. OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE BOTTOM OF THE EMBEDEDMENT STONE (B LAYER) TO 24" (600 mm) ABOVE THE FINISHED GRADE. THE REMAINING PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER	AASHTO M45 ¹ A-1, A-2-4, A-3 OR AASHTO M43 ¹ 3, 3S7, 4, 4S7, 5, 5S, 57, 6, 67, 6S, 7, 7S, 8, 8S, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBEDEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED ANGULAR STONE	AASHTO M43 ¹ 3, 4	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED ANGULAR STONE	AASHTO M43 ¹ 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE ^{2,3}

1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR AND #4 (AASHTO M3) STONE".
2. STORMWATER COMPACTION REQUIREMENTS ARE MET FOR A LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) MAX LIFTS USING TWO FULL COVERAGE WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOLID MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOLIDS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

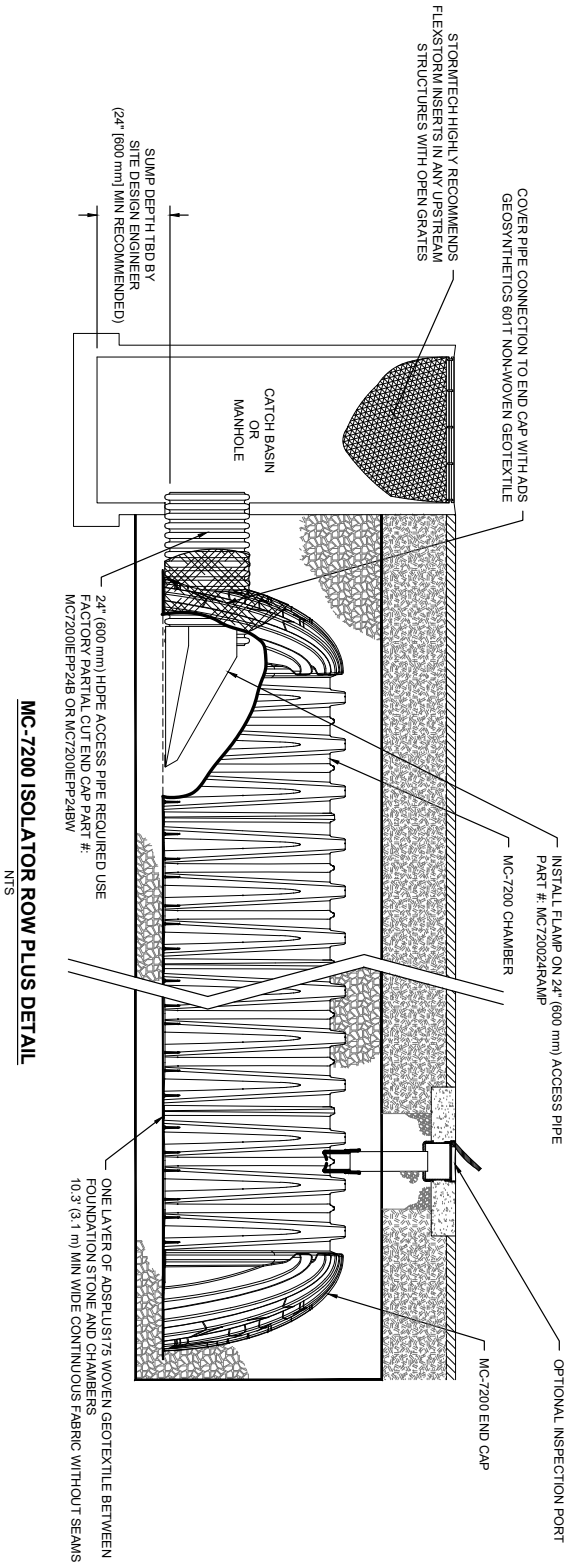


- 

DATE	DRW	CHK	DESCRIPTION

DATE:
PROJECT #:

CHECKED: N/A



INSPECTION & MAINTENANCE

- STEP 1)
- A. INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A.1. REMOVE/OPEN UP ON NYLOPLAST INLINE DRAIN
- A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
- A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
- A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
- A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
- B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
- B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
- B.2. i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
- B.2. ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
- B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2)
- A. CLEAN OUT ISOLATOR ROW PLUS USING THE JET/VAC PROCESS
- A.1. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JET/VAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SLUMP AS REQUIRED
- STEP 3)
- REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS. RECORD OBSERVATIONS AND ACTIONS.
- STEP 4)
- INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACUUMING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

StormTech®
Chamber System

888-892-2694 | WWW.STORMTECH.COM

DATE	DRW	CHK	DESCRIPTION

COLUMBIA
HEMET, CA

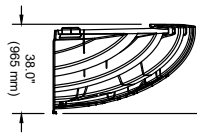
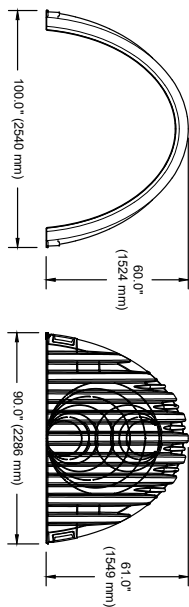
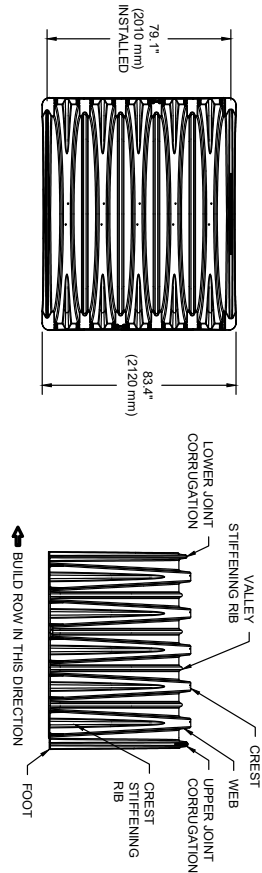
DATE: DRAWN: HP

PROJECT #: CHECKED: N/A

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

MC-7200 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS
 SIZE (W X H X INSTALLED LENGTH)
 CHAMBER STORAGE
 MINIMUM INSTALLED STORAGE*
 WEIGHT (NOMINAL)

100.0' X 60.0' X 79.1"	(2540 mm X 1524 mm X 2010 mm)	175.9 CUBIC FEET (4.98 m ³)	267.3 CUBIC FEET (7.56 m ³)	205 lbs. (92.9 kg)
------------------------	-------------------------------	--	--	-----------------------

NOMINAL END CAP SPECIFICATIONS
 SIZE (W X H X INSTALLED LENGTH)
 END CAP STORAGE
 MINIMUM INSTALLED STORAGE*
 WEIGHT (NOMINAL)

90.0' X 61.0' X 32.8"	(2286 mm X 1549 mm X 833 mm)	39.5 CUBIC FEET (1.12 m ³)	115.3 CUBIC FEET (3.26 m ³)	90 lbs. (40.8 kg)
-----------------------	------------------------------	---	--	----------------------

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B" PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

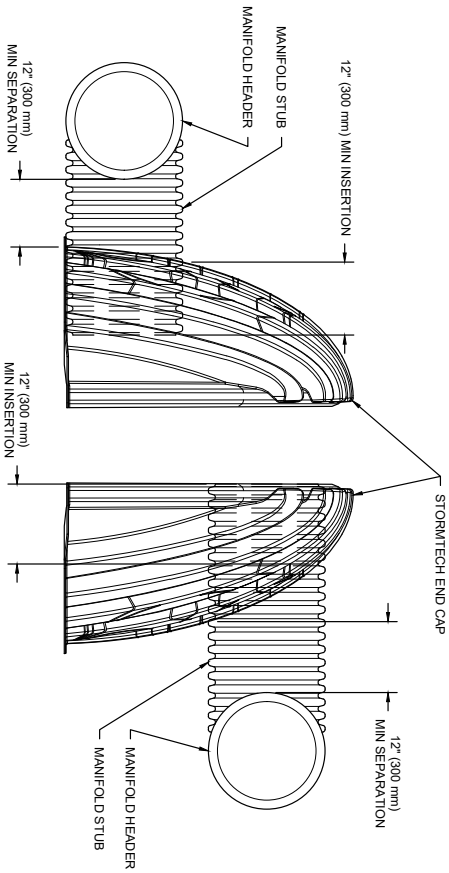
PART #	STUB	B	C
MC7200IEP06T	6" (150 mm)	42.54" (1081 mm)	0.86" (22 mm)
MC7200IEP08B	8" (200 mm)	40.50" (1029 mm)	1.01" (26 mm)
MC7200IEP10T	10" (250 mm)	38.37" (975 mm)	1.33" (34 mm)
MC7200IEP10B	12" (300 mm)	35.69" (907 mm)	1.55" (38 mm)
MC7200IEP12T	15" (375 mm)	32.72" (831 mm)	1.70" (43 mm)
MC7200IEP15T	18" (450 mm)	29.36" (746 mm)	---
MC7200IEP18T	24" (600 mm)	23.05" (585 mm)	---
MC7200IEP24T	30" (750 mm)	2.25" (57 mm)	---
MC7200IEP24B	36" (900 mm)	2.95" (75 mm)	---
MC7200IEP30B	42" (1060 mm)	3.55" (90 mm)	---

NOTE: ALL DIMENSIONS ARE NOMINAL

CUSTOM PREFABRICATED INVERTS ARE AVAILABLE UPON REQUEST. INVENTED MANIFOLD DS. CUSTOM INVERT LOCATIONS ON THE MC-7200 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

MC-SERIES END CAP INSERTION DETAIL

NTS



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.



4640 TRUEMAN BLVD
 HILLIARD, OH 43026
 1-800-733-7473

StormTech®
 Chamber System

888-892-2694 | WWW.STORMTECH.COM

COLUMBIA
 HEMET, CA

DATE: DRAWN: HP
 PROJECT #: CHECKED: N/A

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

“The project is exempt from Hydromodification”

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

(See Attached Next Pages)

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.1 on 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.

... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE			
1	2	3	4
Potential Sources of Runoff Pollutants	Permanent Controls—Show on WQMP Drawings	Permanent Controls—List in WQMP Table and Narrative	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 ☐ C. Interior parking garages		☐ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer. ☐ State that parking garage floor drains will be plumbed to the sanitary sewer.	☐ Inspect and maintain drains to prevent blockages and overflow. ☐ Inspect and maintain drains to prevent blockages and overflow.

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE			
1	2	3	4
IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	Potential Sources of Runoff Pollutants	Permanent Controls—Show on WQMP Drawings	Permanent Controls—List in WQMP Table and Narrative
			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.

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE				
1	2	3	4	
IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	Permanent Controls—Show on WQMP Drawings	Permanent Controls—List in WQMP Table and Narrative	Operational BMPs—Include in WQMP Table and Narrative	
Potential Sources of Runoff Pollutants ☐ 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 runoff 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	

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE			
1	2	3	4
Potential Sources of Runoff Pollutants	Permanent Controls—Show on WQMP Drawings	Permanent Controls—List in WQMP Table and Narrative	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/

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE				
IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	1	2	3	4
Potential Sources of Runoff Pollutants	Permanent Controls—Show on WQMP Drawings	Permanent Controls—List in WQMP Table and Narrative	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 runoff 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.ccchealth.org/groups/hazmat/ www.cabmphandbooks.com	☐ 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	

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE			
1	2	3	4
IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	Potential Sources of Runoff Pollutants	Permanent Controls—Show on WQMP Drawings	Permanent Controls—List in WQMP Table and Narrative
			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.	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.

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE			
1	2	3	4
Potential Sources of Runoff Pollutants	Permanent Controls—Show on WQMP Drawings	Permanent Controls—List in WQMP Table and Narrative	Operational BMPs—Include in WQMP Table and Narrative
☐ 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/

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE			
1	2	3	4
Potential Sources of Runoff Pollutants	Permanent Controls—Show on WQMP Drawings	Permanent Controls—List in WQMP Table and Narrative	Operational BMPs—Include in WQMP Table and Narrative
☐ 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.

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

... 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
☐ 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

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

... 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
☐ 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

... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE			
1	2	3	4
Potential Sources of Runoff Pollutants	Permanent Controls—Show on WQMP Drawings	Permanent Controls—List in WQMP Table and Narrative	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.

Table I.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
SD-13, 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. Install shut-off valves and double containment container for liquid car wash cleaners to contain spills for clean-up. Sizes of double containment containers shall be coordinated with Mechanical Engineer’s and Architect’s design.	Maintain and periodically repaint or replace inlet markings. Provide stormwater pollution prevention information to new site owners, lessees, or operators. Clean catch basins, storm drain inlets before the wet season to remove sediments and debris accumulated during summer. Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed. Include the following in lease agreements: “Tenants 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.”
Sd-10, Landscape/Outdoor Pesticide Use	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.	Maintain landscaping using minimum or no pesticides. Provide IPM information to new owners, lessees and operators.
Sc-43, Parking lots and sidewalks	Regularly inspect parking lots and sidewalks for trash and debris that can contribute to stormwater pollution.	Sweep parking lots and sidewalks 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.
SD-32, Refuse Areas	Trash containers (Dumpster) areas shall have drainage from the adjoining roof and pavements diverted around the areas. Dumpsters shall be leak proof and have attached workable covers.	Provide adequate number of receptacles, Inspect receptacles regularly. Repair or replace leaky receptacles. Keep receptacles covered. 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 on-site. Keep Fact Sheet SC-34, “waste Handling and Disposal” in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
TC – 11, Underground Chamber	Regularly inspect Underground chambers for trash and debris that can contribute to stormwater pollution.	Maintenance is accomplished with the Jetvac process. The Jetvac process utilizes a high pressure water nozzle to propel itself down the riser pipe while scouring and suspending sediments mimicking the raking process. As the nozzle is retrieved, the captured pollutants such as sediments, etc., are flushed back into the manhole for vacuuming.

Appendix 9: O&M

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

(To be submitted during Final WQMP Submittal)

Operation and maintenance (O&M) requirements for all Source Control, Site Design, and Treatment Control BMPs

1. Education for Property Owners, Tenants, and Occupants – Practical information materials will be provided to every occupants/tenants. These materials shall include general good housekeeping practices that contribute to the protection of stormwater quality. Distribution of information materials shall commence immediately after obtaining final County inspection. The owners, tenants or occupants will be updated of new information and training materials annually or as new information or training materials become available. The owner is responsible for distributing these information materials.
2. Activity Restrictions – Pesticides to be applied by licensed applicator. Car maintenance onsite is not allowed. Restrictions information shall be given immediately after obtaining final County inspection. Restriction information materials shall be distributed every six months to every tenants and occupants to prevent pollutant loading onsite runoff.
3. Employee Training/Education – Every manager will be given orientation and training regarding general and good housekeeping practices at the start of employment. Existing employees will be required to attend orientation every four months and/or at the start of the policy. Copies of the training or orientation attendance will be retained for five years.
4. Sweeping Parking Lots – The parking lots must be swept at least four times annually (quarterly basis), prior to the storm season and in the late summer or early fall, to reduce the amount of sediment, garden waste, and trash entering the storm drain system. Sweeping of parking lots shall commence immediately after obtaining final County inspection. Inspection of the parking lots and drive aisles shall be done at least in a monthly basis and remove trash, debris and immediately as it becomes necessary.
5. Landscape Planning – Landscape planning should couple consideration of land suitability for urban uses. Landscaping shall correlate to the climate, soils, related natural resources and existing vegetation of the site, as well as the type of development. Landscape operation and maintenance shall commence immediately after obtaining final County inspection. Inspection and maintenance of landscape areas shall be done at least twice a year.
6. Efficient Irrigation – Irrigation methods should be utilized to minimize runoff of excess irrigation water across impervious surfaces and into the stormwater conveyance system. Such method include employing rain-triggered shutoff devices to eliminate or reduce irrigation during and after

precipitation. Water conservation devices such as programmable irrigation timers and soils sensors will be considered. Provide self inspection at least 4 times annually. This measure will commence immediately after installation of landscaping and obtaining of final County inspection.

7. Trash Storage – Trash containers (Dumpster) areas shall have drainage from the adjoining roof and pavements diverted around the areas. Dumpsters shall be leak proof and have attached workable covers. Maintenance include implementation of trash management and litter control procedures aimed at reducing pollution of stormwater. Inspection and regularly scheduled litter patrol, proper disposal of pet litter, emptying of trash receptacles in common areas shall be done in a weekly basis at minimum. This measure shall commence immediately after obtaining building occupancy. Inspection and maintenance of trash storage shall be done at least twice a year.

8. Underground Chamber – Underground infiltration use the natural filtering ability of the soil to remove pollutants in stormwater runoff until it gradually infiltrates into the soil and eventually into the water table.. This measure starts immediately after completion of construction. Inspection, and maintenance of the underground chamber for any accumulation of debris, trash, and sediment shall be done at least in a semi-annual basis.

9. Vegetated Swale – Vegetated swales are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. They are designed to treat runoff through filtering by the vegetation in the channel, filtering

through a subsoil matrix, and/or manmade. They trap particulate pollutants, promote infiltration, and reduce the flow velocity of stormwater runoff. Inspection and maintenance activities shall be done at least in a bi-weekly basis to include mowing (with grass never cut shorter than the design flow depth), weed control, watering during drought conditions, reseeding of bare areas, and clearing of debris and blockages. Accumulated sediment should be removed manually to avoid concentrated flows in the swale. The application of fertilizers and pesticides should be minimal. Operation and maintenance shall commence immediately after obtaining building occupancy.

- The inspection and monitoring, and record keeping requirements for the BMP's mentioned in Section 4.1.1 is the responsibility of the owner.

Owner:
Ascendant Development Group
P.O. Box 2021
San Jacinto, Ca. 92541
(951) 833-1283

The responsible party of each BMP and O&M is listed below:

Owner:
Ascendant Development Group
P.O. Box 2021
San Jacinto, Ca. 92541
(951) 833-1283

Funding:

The Permit requires that for all Treatment Control BMPs, a funding source or sources for operation and maintenance of each BMP be identified within the WQMP. Project proponents must:

- Funding source for the operation and maintenance of each BMP within the WQMP is listed below:
- Owner:
- Ascendant Development Group
- P.O. Box 2021
- San Jacinto, Ca. 92541
- (951) 833-1283

Appendix 10: Educational Materials

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

(See Attached Next Pages)

Employee Training

Facility Information

Project Name: Zipline Carwash

Location: N/E Corner Van Buren Blvd., and Gardner Avenue

Design Review/Case No. : C.U.P. Application

Owner: Karl Kaiser, 2872 Tigertail Drive, Los Alamitos, Ca. 90720

Conduct an annual Water Quality Management Plan training program for employees on topics identified in the WQMP. Record all training sessions below. Attach additional pages as necessary.

[illegible]