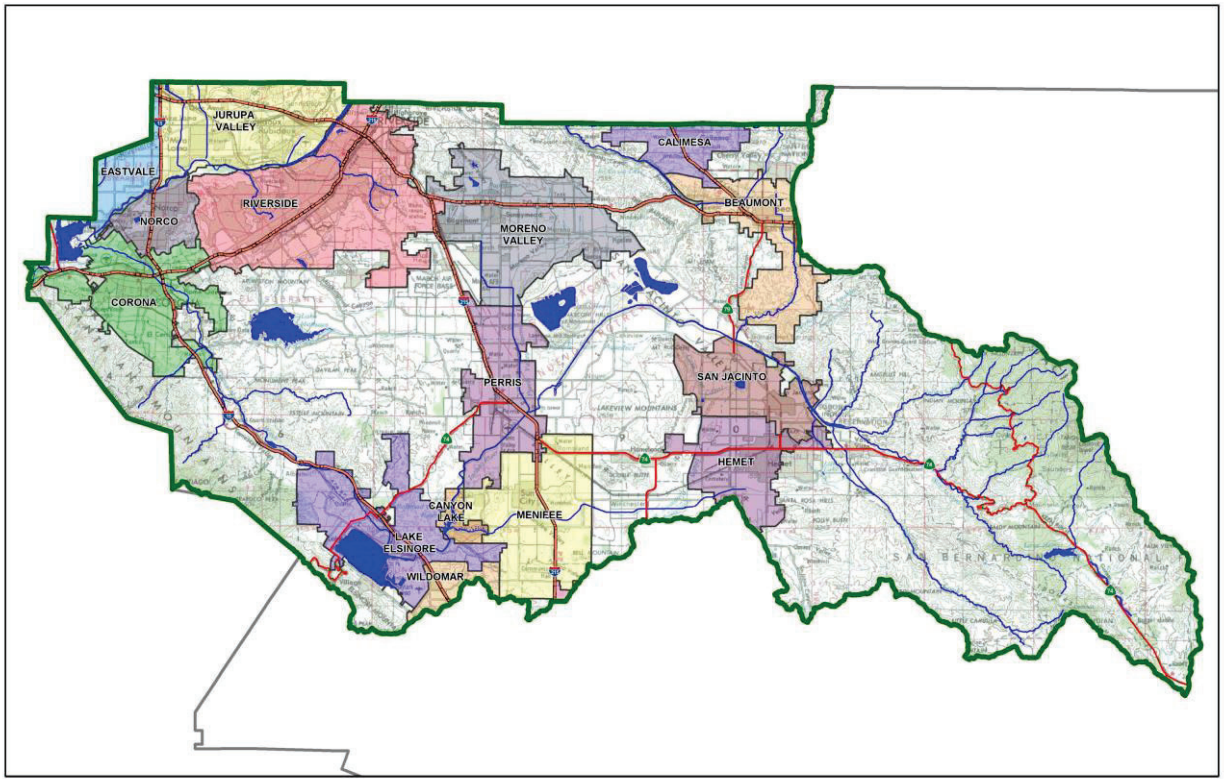
Project Specific Water Quality Management Plan

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

Project Title: The Ivy Mountain Gate Senior Living Project

Public Works No: DPR2023-0016

Design Review/Case No: WQ23-008P/ PWWQ2023-0010



☒ **Preliminary**
☐ **Final**

Original Date Prepared: 1/3/2024

Revision Date(s):

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

Contact Information:

Prepared for:
O&I Development
3 Park Plaza, Suite 1920
Irvine, CA 92614
(949) 744-5200

Prepared by:
BKF Engineers
4675 MacArthur Court, Suite 400
Newport Beach, CA 92660
(949) 526-8460

OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for O&I Development by BKF Engineers for the Ivy Mountain Gate project.

This WQMP is intended to comply with the requirements of the City of Corona for the proposed senior living facility Ivy Mountain Gate, Planning Case No. DPR2023-0016 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 the City of Corona Water Quality Ordinance (Municipal Code Section 14.12.315).

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

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

PREPARER'S CERTIFICATION

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

Preparer's Signature	Date
Bruce W. Kirby	Associate
Preparer's Printed Name	Preparer's Title/ Position

Preparer's Licensure:

Insert Bruce's Stamp

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Section A: Project and Site Information

The project proposes to develop 4.5 acres of undeveloped lot into a 2-story senior living facility with parking and outdoor patio areas.

PROJECT INFORMATION	
Type of Project:	Senior multi-family residential
Planning Area:	Mountain Gate
Community Name:	N/A
Development Name:	The Ivy Mountain Gate
PROJECT LOCATION	
Latitude & Longitude (DMS): (33°50'42.1"N 117°34'31.1"W)	
Project Watershed and Sub-Watershed: Santa Ana; Santa Ana River, Reach 3/4	
APN(s): 114-070-020; 114-070-021; 114-070-022	
Map Book and Page No.: PM 192/86	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Senior Living
Proposed or Potential SIC Code(s)	8059
Area of Impervious Project Footprint (SF)	162,944.5 SF
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	156,466.3 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 existing Impervious Surfaces within the project limits (SF)	6,478.2 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)	B
What is the Water Quality Design Storm Depth for the project?	0.82 inches

A.1 Maps and Site Plans

Appendix 1 includes a map of the local vicinity and existing site. In addition, WQMP Site Plan, located in Appendix 1, includes 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

A.2 Receiving Waters

In order of upstream to downstream, the receiving waters that the project site is tributary to are as follows. A map of the receiving waters can be viewed in Santa Ana River Watershed Basin Plan Reaches within the City of Corona in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	Hydrologic Unit	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Temescal Creek – Reach 1	18070203	No	REC2, WARM, WILD	No
Prado Basin Management Zone	801.11	pH	REC1, REC2, WARM, WILD, RARE	4.9 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)*		
City of Corona Conditional Use Permit	☒ Y	☒ N
City of Corona Design Review	☒ Y	☐ N
City of Corona Building Permit	☒ Y	☐ N
City of Corona Grading Permit	☒ Y	☐ N
City of Corona Construction Permit	☒ Y	☐ N

Section B: Optimize Site Utilization (LID Principles)

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.

Does the project identify and preserve existing drainage patterns? If so, how? If not, why?

> *Yes, the existing site naturally drains from south to north and the proposed drainage maintains those patterns through the stormdrain network. There are existing offsite flows that run on to the project site that are collected in an area drain and diverted back to an existing pipe on the adjacent property.*

Does the project identify and protect existing vegetation? If so, how? If not, why?

> *No, the site will be clear and grubbed but then replanted with new planting.*

Does the project identify and preserve natural infiltration capacity? If so, how? If not, why?

> *Yes, the existing site is unable to infiltrate and there is no infiltration being proposed.*

Does the project identify and minimize impervious area? If so, how? If not, why?

> *Yes, the site has proposed landscaping where possible.*

Does the project identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

> *No, the site captures all stormwater to prevent runoff and is collected in pipes then connects to the existing stormdrain system.*

Section C: Delineate Drainage Management Areas (DMAs)

The project site is broken up into two separate DMAs, as seen in the WQMP Post-Construction Site Plan in Appendix 1. Both DMAs are classified as Type D Areas Draining to BMPs because they are not self-retaining and runoff connects to the existing storm drain system and there is no upstream runon from other DMAs. The proposed DMAs are not classified as Types A, B, or C.

A portion (approximately 0.15 acres) of the adjacent property to the east flows on to the project site in order to maintain existing drainage patterns. The runon will be captured by an area drain and then conveyed through the stormwater pipes to the proprietary treatment system where it will ultimately join an existing stormwater pipe that runs across West Foothill Parkway.

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)	Area (Sq. Ft.)	DMA Type
DMA 1	Asphalt, concrete, ornamental landscaping, and roof	83,153.3	Type D
DMA 1A	Ornamental landscaping	6,288.6	
DMA 1B	Asphalt, concrete, ornamental landscaping, and roof	49,013.8	
DMA 1C	Asphalt and ornamental landscaping	8,139.8	
DMA 1D	Asphalt	4,066.0	
DMA 1E	Concrete and ornamental landscaping	4,672.2	
DMA 1F	Concrete and ornamental landscaping	10,972.9	
DMA 2	Asphalt, concrete, ornamental landscaping, and roof	116,737.3	Type D
DMA 2A	Asphalt, concrete, ornamental landscaping, and roof	88,381.9	
DMA 2B	Concrete and ornamental landscaping	14,242.3	
DMA 2C	Concrete and ornamental landscaping	7,634.9	
DMA 2D	Asphalt	6,478.2	

Table C.2 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
DMA 1	BMP 1
DMA 2	BMP 2

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (ref: Chapter 2.4.4 of the WQMP Guidance Document)?

☐ Y ☒ N

Geotechnical Report

A Geotechnical Report is required by the City of Corona to confirm present and past site characteristics that may affect the use of Infiltration BMPs, see Appendix 3.

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 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?	☐	☒
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?	☐	☒
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?	☐	☒
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?	☒	☐
If Yes, list affected DMAs: DMA 1, DMA 2		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?	☐	☒
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?	☐	☒
Describe here:		

D.2 Harvest and Use Assessment

The following conditions apply*:*

☐ 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 (verified with the City of Corona).

☐ The Design Capture Volume will be addressed using Infiltration Only BMPs. (Harvest and Use BMPs are still encouraged, but are not required as the Design Capture Volume will be infiltrated or evapotranspired).

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

Irrigation Use Feasibility

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

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

Total Area of Irrigated Landscape: 0.90 Acres

Type of Landscaping (Conservation Design or Active Turf): Conservation 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: 3.5 Acres

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).

Design Capture Storm Depth, in: 0.82

The project EIATIA factor: 1.96

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: 3.5 Acres x 1.96 = 6.86 Acres

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)
6.86 Acres	0.9 Acres

Toilet Use Feasibility

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

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

Projected Number of Daily Toilet Users: 75 du/ac

Project Type: Senior multi-family residential

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: 3.5 Acres

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 number or toilet users per tributary impervious acre (TUTIA).

The project TUTIA factor: 1226 wet season demand required for minimum partial capture, gdp per impervious acre

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: 3.5 Acres x 1226 GDP/ Acre = 4291 GDP

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)**
4,291 GDP	75 du/ac

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: Projected Average Daily Use (gpd)

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: Insert Area (Acres)

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

The project factor: Enter Value from Table 2-3

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

Minimum required use: Minimum use required (gpd)

Step 5: Determine if harvesting stormwater runoff for other non-potable use is feasible for the project by comparing the Average Daily non-potable demand (Step 1) to the minimum required non-potable use (Step 4).

Minimum required non-potable use (Step 4)	**Projected average daily use (Step 1)**
Minimum use required (gpd)	Projected Average Daily Use (gpd)

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

D.3 Bioretention and Biotreatment Assessment

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

For the project, the following applies:

☒ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4.

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5.

☐ None of the above.

D.4 Feasibility Assessment Summaries

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

Table D.2 LID Prioritization Summary Matrix

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

As seen in section D.2 Harvest and Use Assesment, for all DMAs only bioretention and biotreatment are feasible for this project. Infiltration is infeasible for the project site due to the in-situ infiltration rates from percolation tests resulting in less than 0.1 in/hr for a majority of the test locations, as seen in the Geotechnical Report in Appendix 3. The percolation test that resulted in 1.8 in/hr has been disregarded as the boring site does not match any proposed BMP locations. Harvest and use area also infeasible for both irrigation and toilet use due to the anticipated demands being less than the applicable minimum values.

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 City of Corona. Utilize the worksheets found in the LID BMP Design Handbook or consult with the City of Corona 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.

Two flow-through planter boxes were specified to treat the stormwater for DMA 1 and DMA 2 due to the infeasibility to infiltrate. Stormwater in DMA 1 is roughly 1.9 acres and is located on the northern half of the project. Stormwater will sheet flow into one of several area drains or catch basins on the site and a pipe network will convey it to a flow through planter, labeled as BMP 1 in the WQMP Post-Construction Site Plan in Appendix 1. Similarly, DMA 2 is 2.6 acres and located on the southern half of the project. Stormwater will either flow into area drains or the curb inlet style flow through planter, labeled as BMP 2.

Due to the proposal of flow through planters for water quality treatment, the necessary calculations were done by finding the design flow instead of the design capture volume. This process was completed by following the BMP Design Flow Rate for Santa Ana Watershed in Appendix F of the Design Handbook for Low Impact Development Best Management Practices for Riverside County.

Table D.3 Summary of Design Flow Rate Calculations for LID BMPs

DMA Name or ID	BMP Name or ID	Q	Q Provided
DMA 1	BMP 1	0.3 cfs	0.305 cfs
DMA 2	BMP 2	0.4 cfs	0.433 cfs

Note: See Appendix 6 for completed BMP Design Flow Rate, Q_{BMP} worksheet from Appendix F of the WQMP Guidance Document.

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 Co-Permittee). 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.

See Section D.4 for complete list of DMAs and their respective LID BMPs.

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.

The project does not create a Hydrologic Condition of Concern, and meets the criteria for HCOC Exemption as shown below:

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The City of Corona 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

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

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

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

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

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

F.2 HCOC Mitigation

As an alternative to the HCOC Exemption Criteria above, HCOC criteria is considered mitigated if the project meets one of the following conditions, as indicated:

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

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

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

☐ d. None of the above.

The project is located in a "Not Applicable Area" as indicated on the HCOC Applicability Map in Appendix 7, meaning it is not applicable for hydromodification because the project site ultimately discharges into the Prado Basin Management Zone.

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. (REMOVE INSTRUCTIONS)

The following table identifies the potential sources of runoff pollutants for this project and specifies how they are addressed through permanent controls and operational BMPs (as listed in the Stormwater Pollutant Sources/ Source Control Checklist provided by the City of Corona):

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
A. On-site storm drain inlets	▪ Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.	▪ Maintain and periodically repaint or replace inlet markings. ▪ Provide stormwater pollution prevention information to new site owners, lessees, or operators. ▪ See BMP fact sheet SC-44 "Drainage System Maintenance" in Appendix 10. ▪ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
B. Interior floor drains and elevator shaft sump pumps	▪ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	▪ Inspect and maintain drains to prevent blockages and overflow.
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	The final landscape plans will accomplish 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	▪ Maintain landscaping using minimum or no pesticides. ▪ See applicable operational BMPs in "What you should know for… Landscape and Gardening" in Appendix 10. ▪ Provide IPM information to new owners, lessees and operators.

	appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	
E. Pools, spas, ponds, decorative fountains, and other water features	▪ 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://www.rcflood.org/stormwater/Downloads/poolsandspas.pdf
F. Food service	▪ 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://www.rcflood.org/stormwater/downloads/FoodServ.pdf Provide this brochure to new site owners, lessees, and operators.
G. Refuse areas	▪ 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.	▪ 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 BMP Fact Sheet SC-34 "Waste Handling and Disposal" in Appendix 10.
N. Fire sprinkler Test Water	▪ Provide a means to drain fire sprinkler test water to the sanitary sewer.	▪ See BMP Fact Sheet SC-41 "Building and Grounds Maintenance" in Appendix 10.
O. Miscellaneous Drain or Wash Water or Other Sources: ▪ Rooftop equipment ▪ Roofing, gutters, and trim	▪ Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ▪ Avoid roofing, gutters, and trim made of copper or	N/A

	other unprotected metals that may leach into runoff.	
P. Plazas, sidewalks, and parking lots.	N/A	▪ Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Section H: Construction Plan Checklist

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Plan Sheet Number(s)	Latitude / Longitude
BMP 1	Proprietary treatment system	C5.1	(33.845070, -117.575101)
BMP 2	Proprietary treatment system	C5.2	(33.843883, -117.575785)

Section I: Operation, Maintenance and Funding

As required by the City of Corona, the following Operation, Maintenance and Funding details are provided as summarized:

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.
3. An outline of general maintenance requirements for the Stormwater BMPs 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.
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.

See Appendix 9 for a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on site, and an agreement assigning responsibility for maintenance and providing for inspections and certification.

Maintenance Mechanism:

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

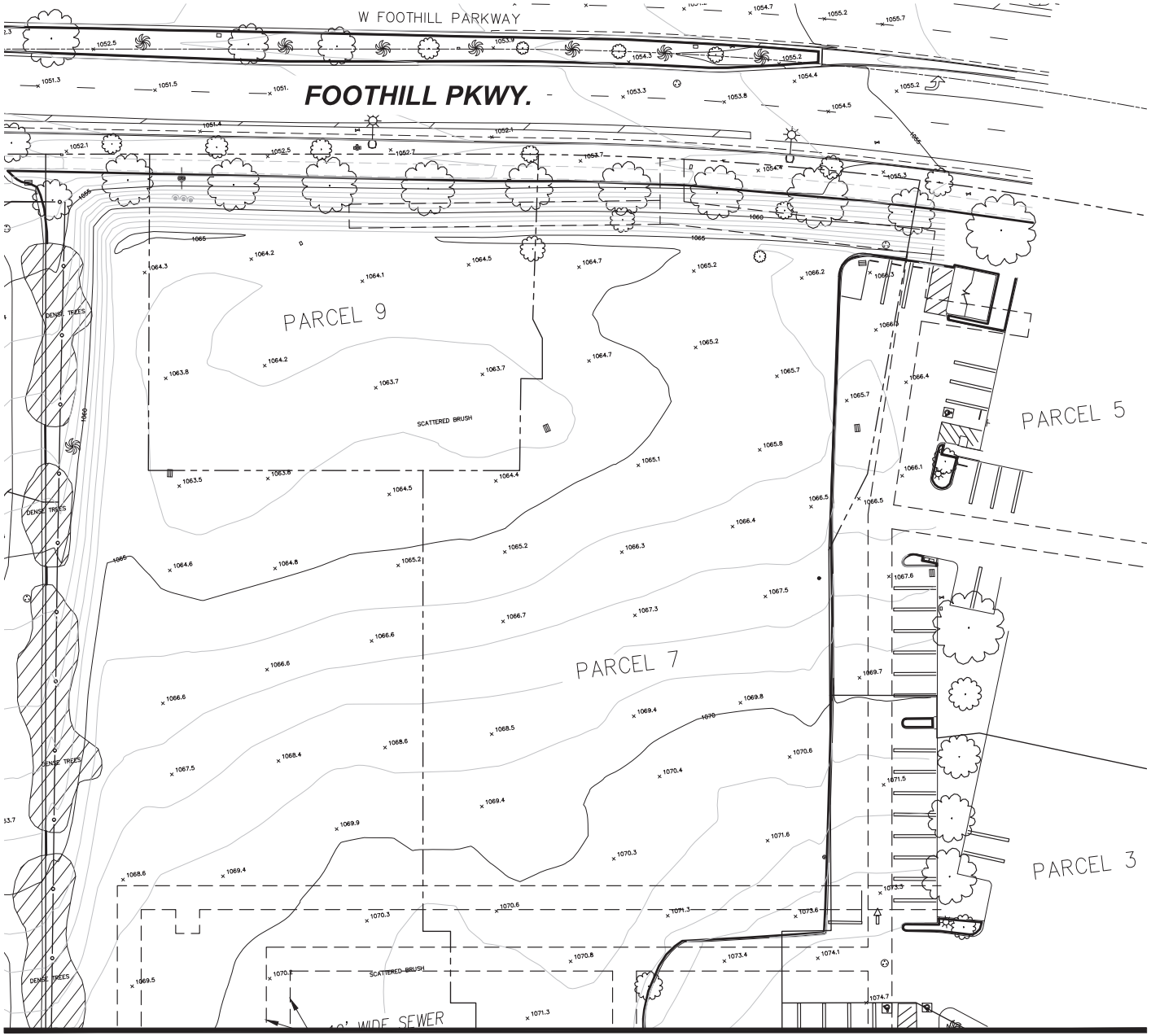
☐ Y ☒ N

There will be a maintenance team dedicated to the operations and maintenance of the proposed BMPs as well as the rest of the property.

Operation and Maintenance Plan and Maintenance Mechanism is included in Appendix 9. Educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP are included in Appendix 10.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map



MATCHLINE - SEE SHEET 2 FOR CONTINUATION

N

GRAPHIC SCALE

(IN FEET)
1 inch = 80 ft.

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FIRST M. LASTNAME
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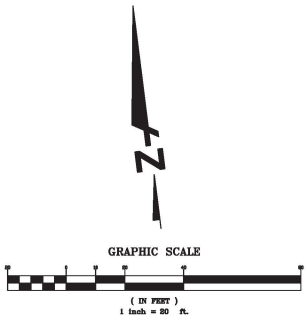
APN 000-000-000

WQMP PRE CONSTRUCTION PLAN

No.	Revisions

Date: DATE
Scale: AS SHOWN
Design: DESN
Drawn: DRWN
Approved: APRV
Job No: JOB NO

Drawing Number:
C0.0
1 OF 2



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No.	Revisions

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Design: DSN
Drawn: DRN
Approved: APRV
Job No: JOB NO

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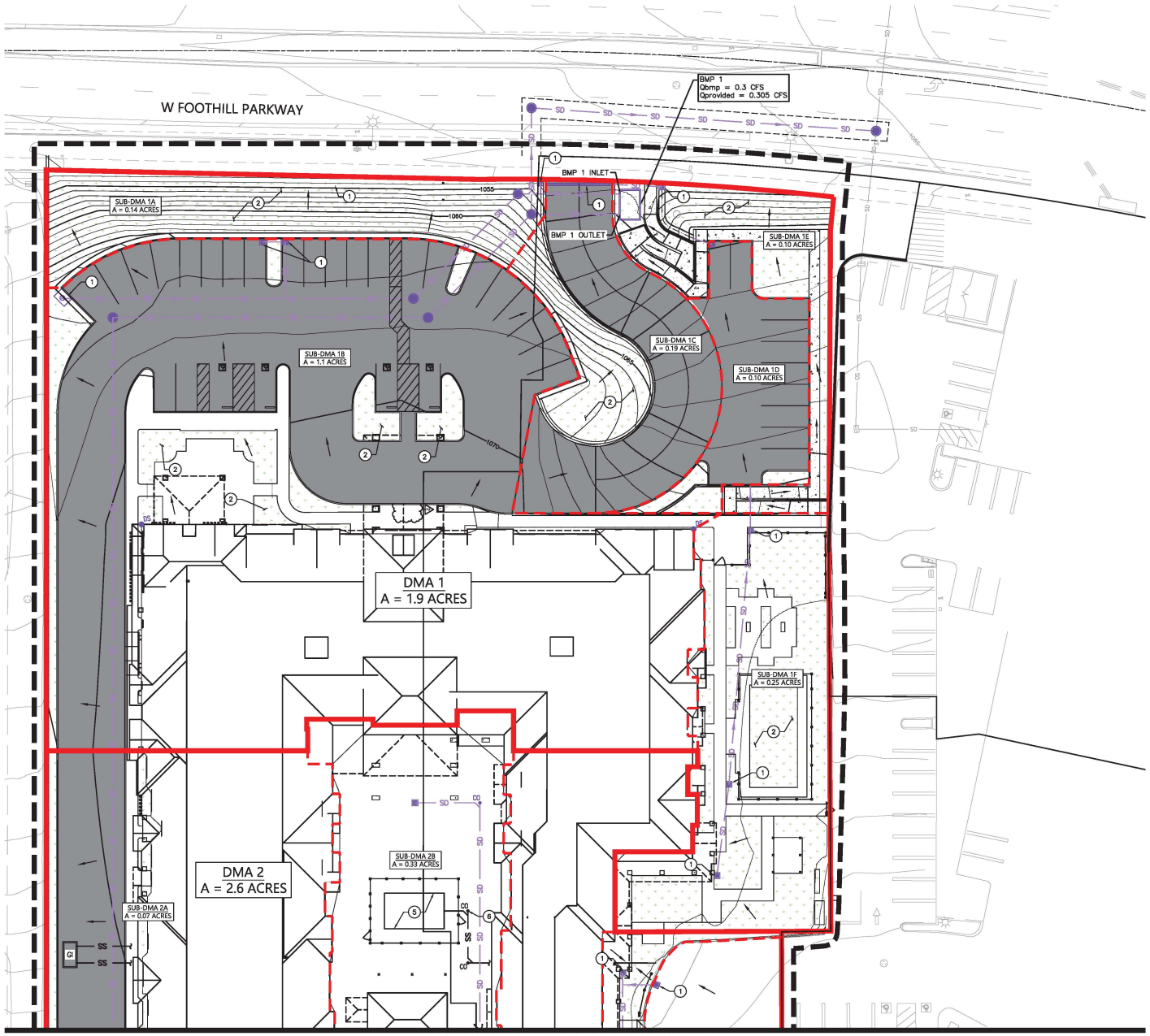
2 OF 2



SOURCE CONTROL BMPS:

1. STORM DRAIN DRAINAGE INLET
   - 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.
2. LANDSCAPING
3. COVERED REFUSE AREA
   - SIGNS WILL BE POSTED ON OR NEAR DUMPSTERS WITH THE WORDS "DO NOT DUMP HAZARDOUS MATERIALS HERE" OR SIMILAR
4. AREA DRAIN TO SEWER
5. POOL
6. SEWER CLEANOUT

LEGEND:

- PROPERTY LINE
- CENTERLINE
- DMA BOUNDARY
- SUB-DMA BOUNDARY
- PROPOSED PCC
- PROPOSED AC
- PROPOSED BUILDING
- PROPOSED LANDSCAPE
- DIRECTION OF STORMDRAIN PIPE ARROW
- DIRECTION OF SURFACE FLOW ARROW
- EXISTING STORMDRAIN
- PROPOSED STORMDRAIN
- PROPOSED SEWER
- AREA DRAIN
- STORMDRAIN MANHOLE
- GREASE INTERCEPTOR
- SEWER CLEANOUT
- STORMDRAIN CLEANOUT
- DOWNSPOUT

AREA TABLE

	PRE-CONSTRUCTION	POST-CONSTRUCTION	
	AREA (SF)	AREA (SF)	RECOMMENDED EFFECTIVE AREA (SF)
PARKING	0.0	69,078	9,995
MF RESIDENTIAL>18 DU/AC	0.0	130,812.6	9,995
COMPACTED SOIL	199,890.6	0.0	N/A
TOTAL	199,890.6	199,890.6	N/A

N

GRAPHIC SCALE

(IN FEET)
1 inch = 80 ft.

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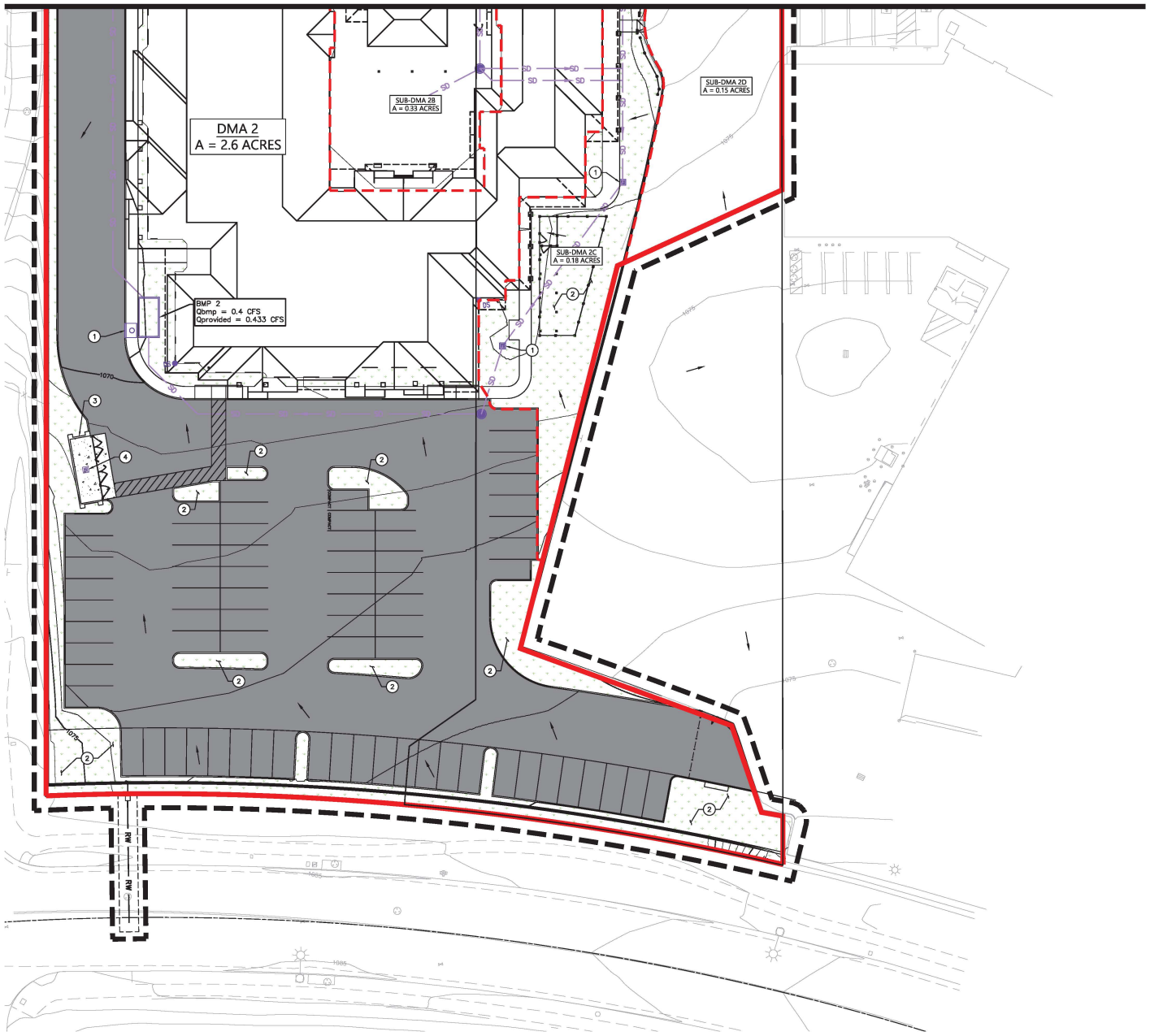
WQMP POST CONSTRUCTION SITE PLAN

No.	Revisions

Date: 1/3/2024
Scale: AS SHOWN
Design: VL
Drawn: RL
Approved: BK
Job No: 20221001

Drawing Number:
C1.0
1 OF 3



SOURCE CONTROL BMPS:

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   - 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.
2. LANDSCAPING
3. COVERED REFUSE AREA
   - SIGNS WILL BE POSTED ON OR NEAR DUMPSTERS WITH THE WORDS "DO NOT DUMP HAZARDOUS MATERIALS HERE" OR SIMILAR
4. AREA DRAIN TO SEWER
5. POOL
6. SEWER CLEANOUT

LEGEND:

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- CENTERLINE
- DMA BOUNDARY
- SUB-DMA BOUNDARY
- PROPOSED PCC
- PROPOSED AC
- PROPOSED BUILDING
- PROPOSED LANDSCAPE
- DIRECTION OF STORMDRAIN PIPE ARROW
- DIRECTION OF SURFACE FLOW ARROW
- SD — EXISTING STORMDRAIN
- SD — PROPOSED STORMDRAIN
- SS — PROPOSED SEWER
- AREA DRAIN
- STORMDRAIN MANHOLE
- GI — GREASE INTERCEPTOR
- CO — SEWER CLEANOUT
- CO — STORMDRAIN CLEANOUT
- DS — DOWNSPOUT

AREA TABLE

	PRE-CONSTRUCTION	POST-CONSTRUCTION	
	AREA (SF)	AREA (SF)	RECOMMENDED EFFECTIVE AREA (SF)
PARKING	0.0	69,078	9,995
MF RESIDENTIAL>18 DU/AC	0.0	130,812.6	9,995
COMPACTED SOIL	199,890.6	0.0	N/A
TOTAL	199,890.6	199,890.6	N/A

N

GRAPHIC SCALE

30 0 15 30 60 90

(IN FEET)
1 inch = 80 ft.

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No.	Revisions

Date: 1/3/2024
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Design: XL
Drawn: RL
Approved: BK
Job No: 20221001

Drawing Number:
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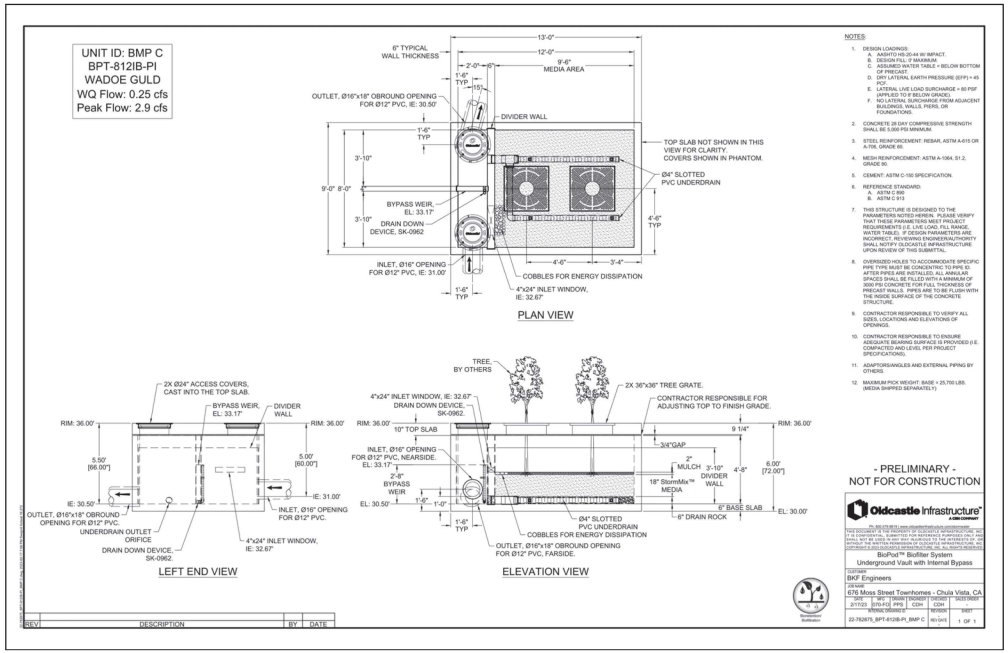
2 OF 3



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Drawn: RL
Approved: BK
Job No: 20221001

Drawing Number:
C1.1
3 OF 3

Plot Jan 03, 2024 at 4:08pm
APPENDIX 1 - 2 - POST.dwg

Santa Ana River Watershed Basin Plan Reaches within the City of Corona

Legend

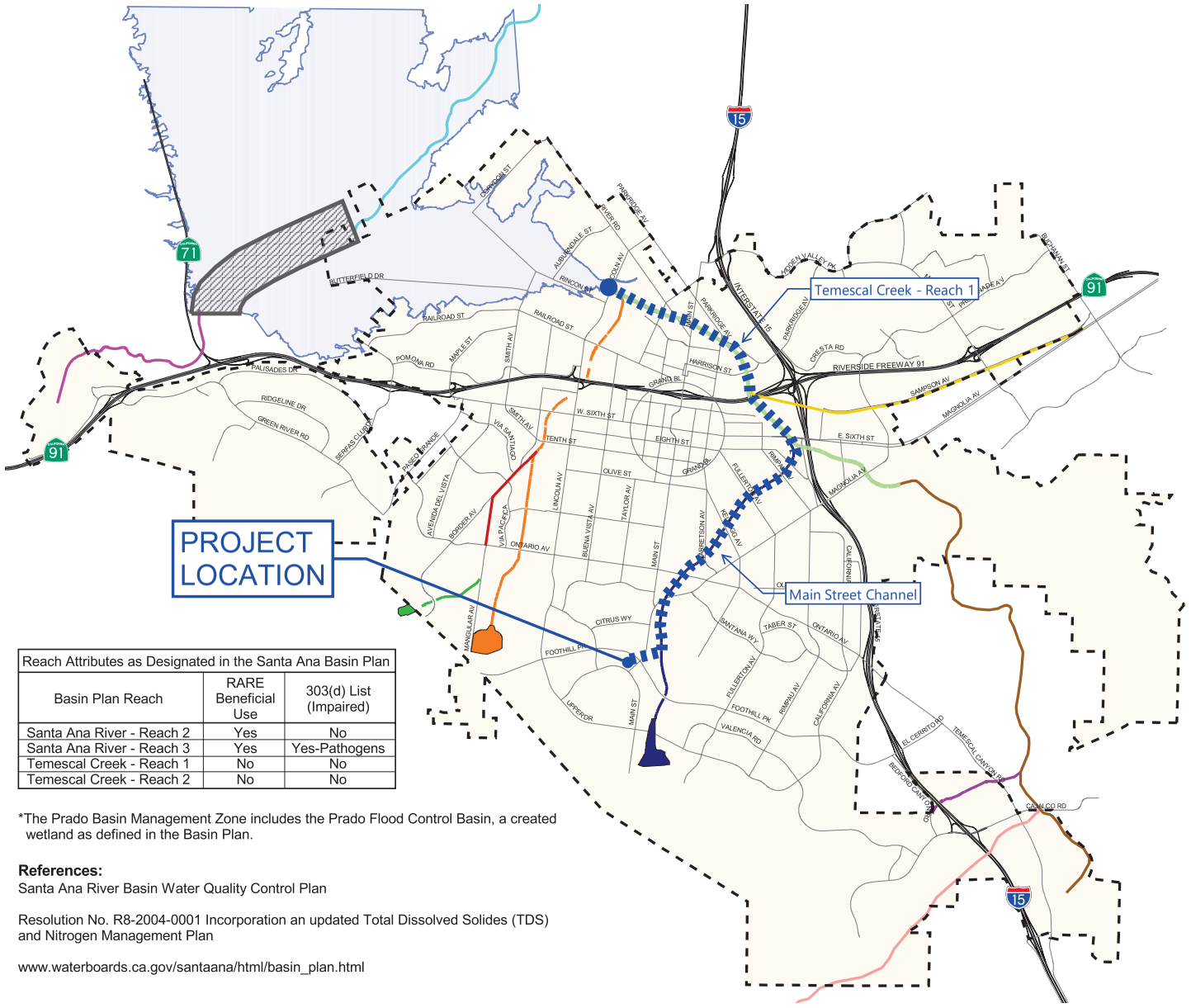
Basin Plan Reaches
- Santa Ana River - Reach 2
- Santa Ana River - Reach 3
- Approximate Extent of Santa Ana River - Reach 3
- Temescal Creek - Reach 1
- Temescal Creek - Reach 2
- Bedford Canyon Wash
- Joseph Canyon Wash

Other Tributaries
- Arlington Channel
- Mangular/Oak Street Channel
- Mabey Canyon Debris Basin
- Mabey Channel
- Main Street Debris Basin
- Main Street Channel
- Oak Street Debris Basin
- Oak Street Channel

Wetlands (Inland)
- Prado Basin Management Zone*

- City Boundary
- Street Centerline
- FLOW PATH

N



Reach Attributes as Designated in the Santa Ana Basin Plan		
Basin Plan Reach	RARE Beneficial Use	303(d) List (Impaired)
Santa Ana River - Reach 2	Yes	No
Santa Ana River - Reach 3	Yes	Yes-Pathogens
Temescal Creek - Reach 1	No	No
Temescal Creek - Reach 2	No	No

*The Prado Basin Management Zone includes the Prado Flood Control Basin, a created wetland as defined in the Basin Plan.

References:

Santa Ana River Basin Water Quality Control Plan

Resolution No. R8-2004-0001 Incorporation an updated Total Dissolved Solides (TDS) and Nitrogen Management Plan

www.waterboards.ca.gov/santaana/html/basin_plan.html

VICINITY MAP

FOR

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430 W FOOTHILL PKWY
CORONA. CA 92882

SCALE

NOT TO SCALE

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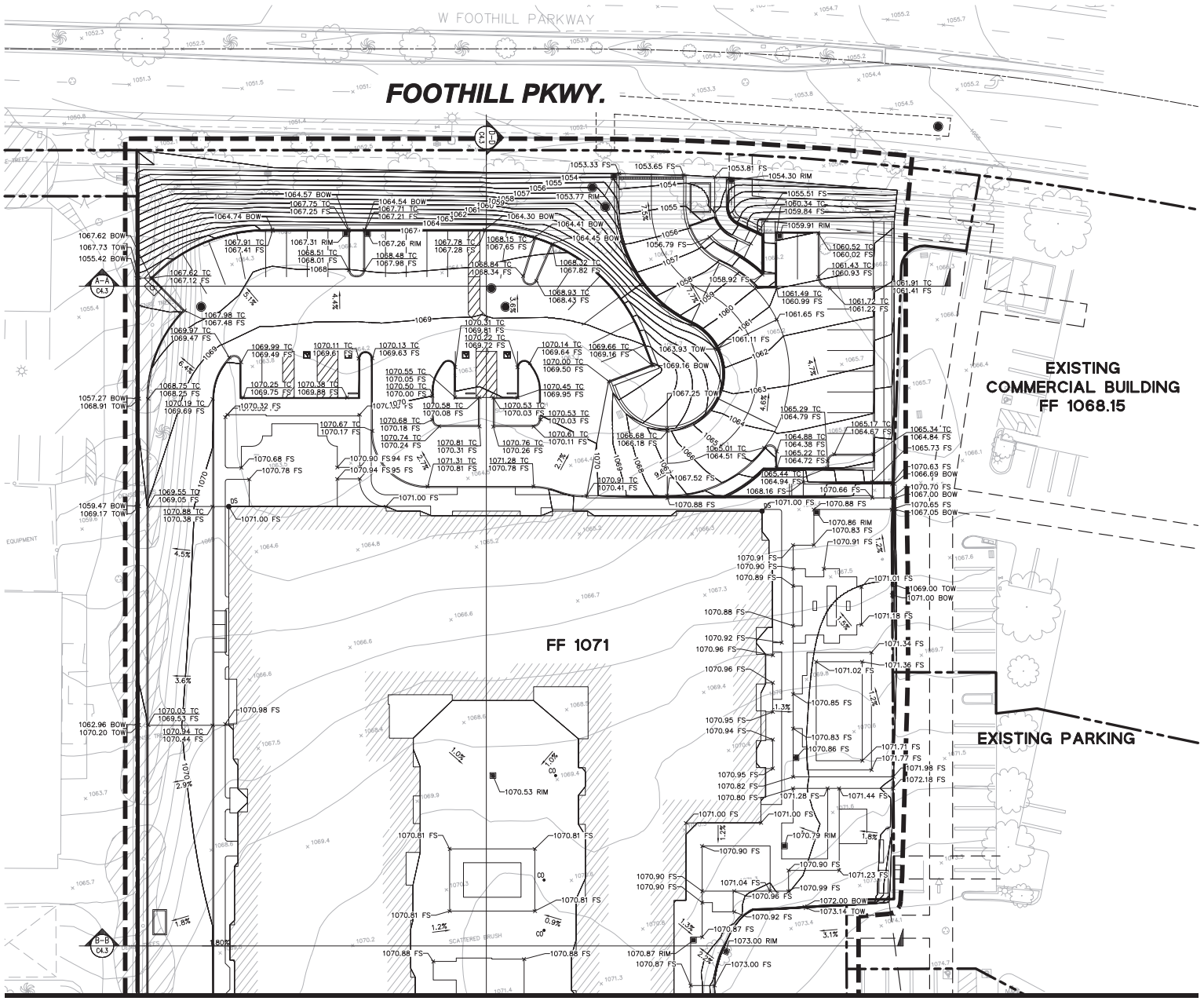
Appendix 2: Construction Plans

Grading and Drainage Plans



MATCHLINE - SEE SHEET C4.2 FOR CONTINUATION

LEGEND:

- LIMIT OF WORK
- PROPOSED PROPERTY LINE
- MATCH LINE
- GB — GRADE BREAK
- XXX — EXISTING CONTOUR LINE
- XXX — PROPOSED CONTOUR LINE
- XXX.XX TC / XXX.XX FS — PROPOSED GRADE ELEVATION
- X.X% — PROPOSED GRADE SLOPE
- STORM DRAIN CURB INLET
- STORM DRAIN MANHOLE
- STORM DRAIN DROP INLET

NOTES:

1. ALL DESIGN ELEVATIONS SHOWN ON THE GRADING SHEETS ARE TO FINISHED GRADE, UNLESS OTHERWISE NOTED.
2. ALL EXISTING UTILITY STRUCTURES WITHIN GRADING LIMITS SHALL BE ADJUSTED TO NEW PROPOSED GRADES.
3. GRADING SHALL NOT EXCEED A 2:1 MAXIMUM SLOPE.

EARTHWORK CALCULATIONS
TOTAL AREA = 194,200 SF

CUT VOLUME = 5,500 CY
FILL VOLUME = 12,800 CY
NET FILL VOLUME = 7,300 CY

N

GRAPHIC SCALE
20 0 10 20 40 60
(IN FEET)
1 inch = 20 ft.

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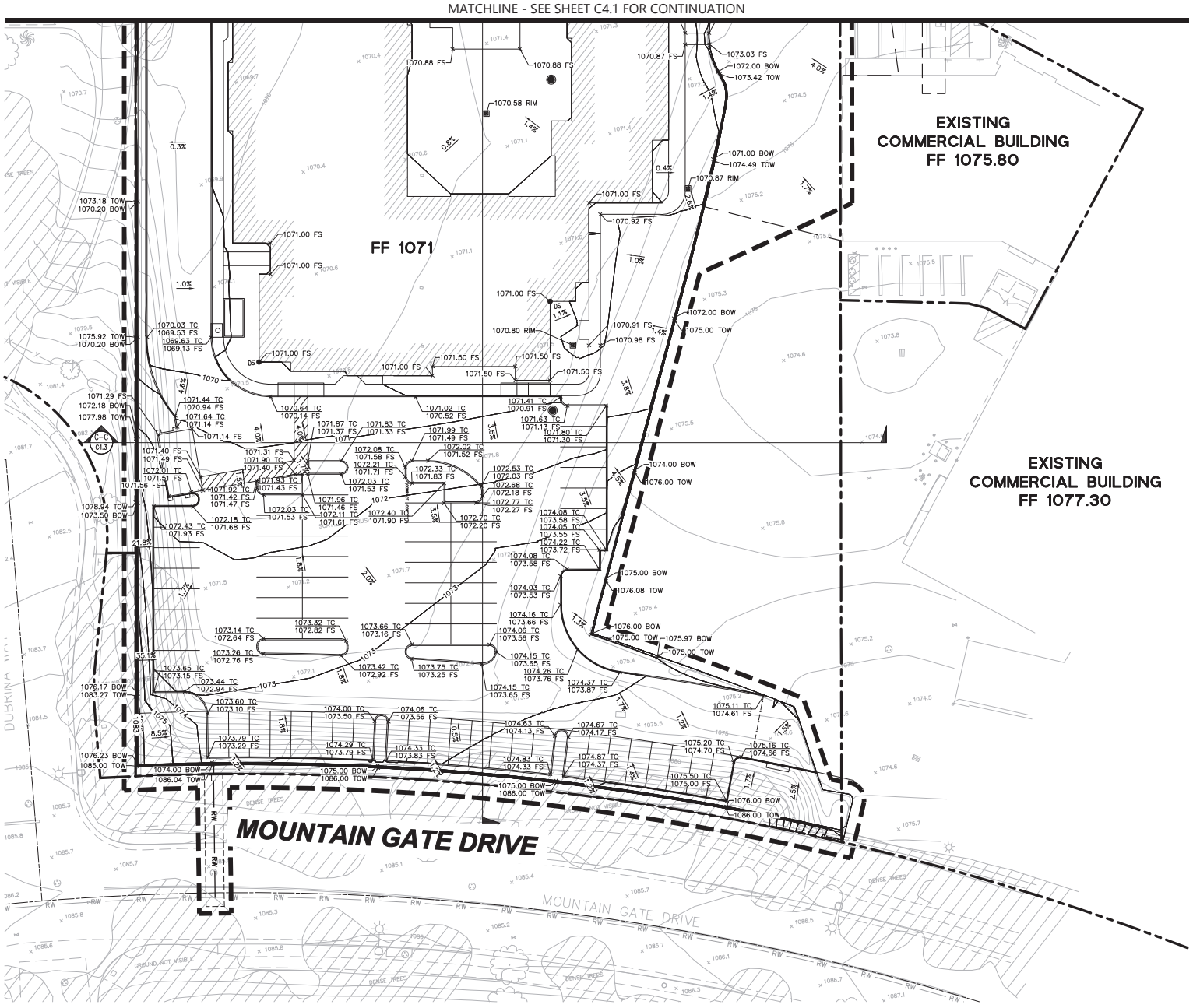
APN 114-070-020, 114-070-021, 114-070-022
CORONA

CONCEPTUAL GRADING & DRAINAGE PLAN

No.	Revisions

Date: 1/3/2024
Scale: AS SHOWN
Design: VL
Drawn: RL
Approved: BK
Job No: 20221001

Drawing Number:
C4.1



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- STORM DRAIN MANHOLE
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CUT VOLUME = 5,500 CY
FILL VOLUME = 12,800 CY
NET FILL VOLUME = 7,300 CY

N

GRAPHIC SCALE
20 0 10 20 40 60
(IN FEET)
1 inch = 20 ft.

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C 42393

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No.	Revisions

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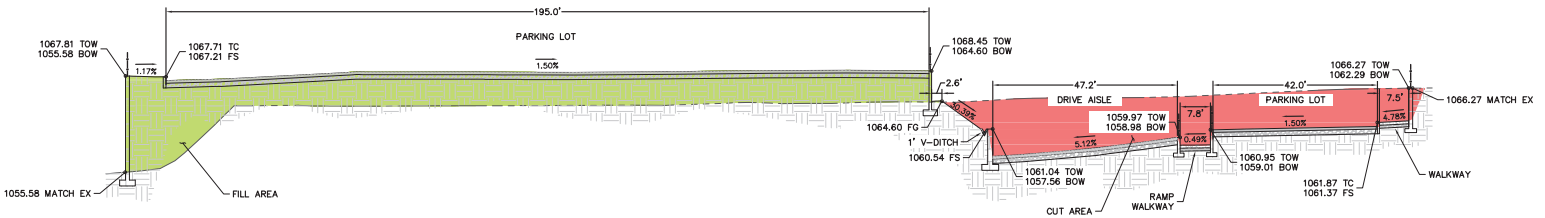
Scale: AS SHOWN
Design: VL
Drawn: RL
Approved: BK
Job No: 20210061

Drawing Number:
C4.2



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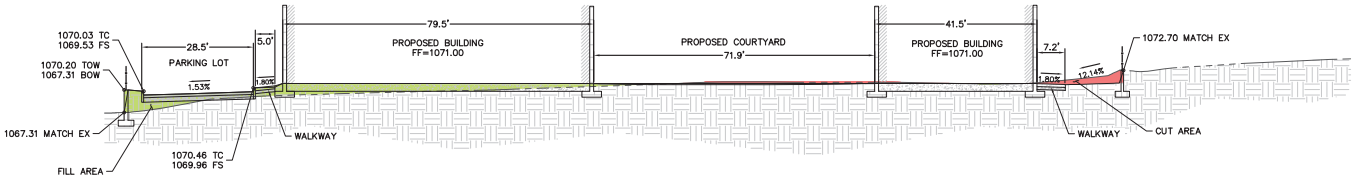

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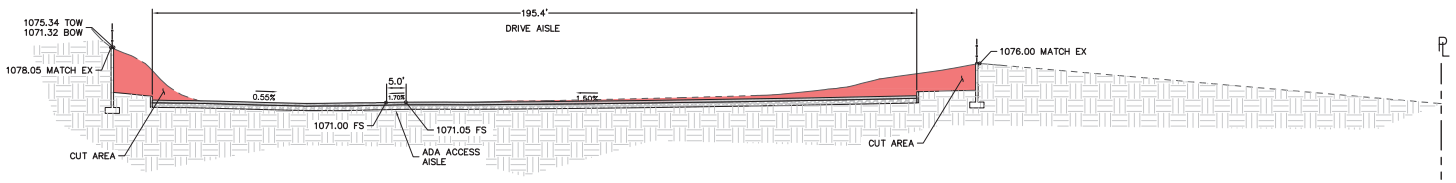

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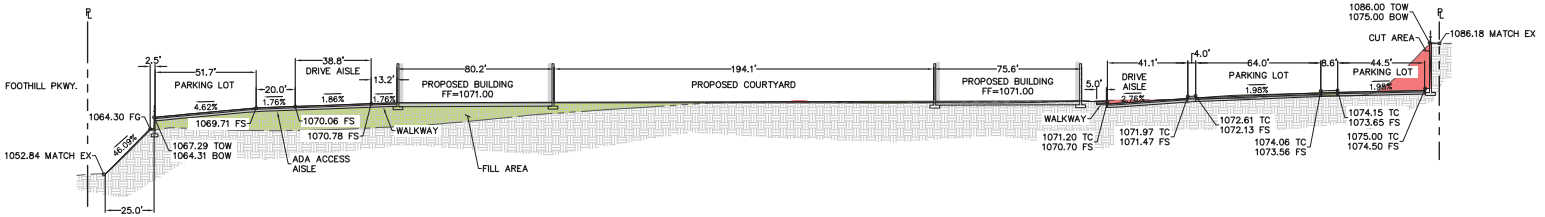

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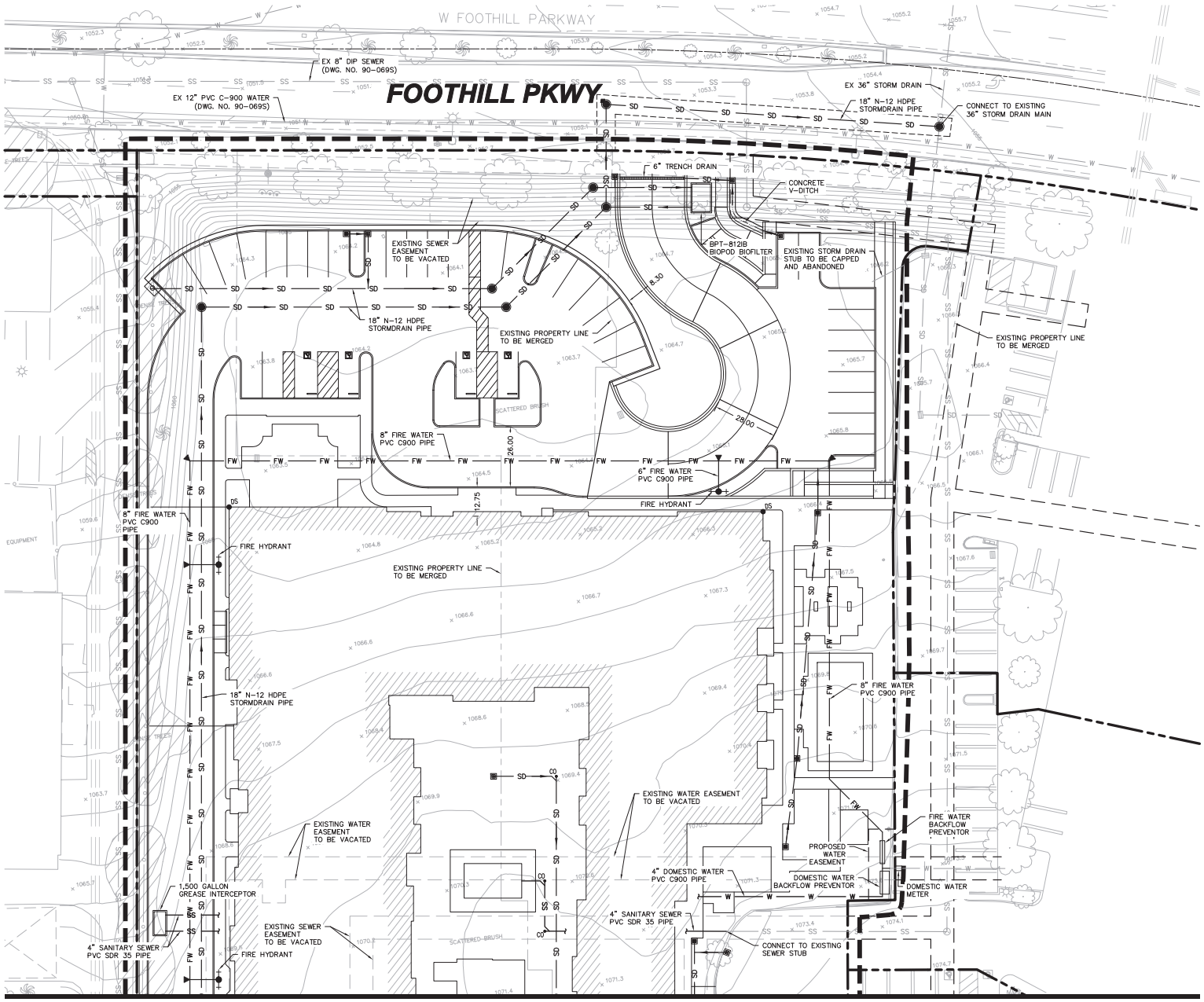
No.	Revisions

Date: 1/3/2024
Scale: AS SHOWN
Designed: VL
Drawn: RL
Approved: BK
Job No: 20221061

Drawing Number:
C4.3



MATCHLINE - SEE SHEET C5.2 FOR CONTINUATION

LEGEND:

- LIMIT OF WORK
- PROPOSED PROPERTY LINE
- SS — PROPOSED SANITARY SEWER LINE
- SD — PROPOSED STORM DRAIN LINE
- W — PROPOSED DOMESTIC WATER LINE
- FW — PROPOSED FIRE WATER LINE
- STORM DRAIN CURB INLET
- UTILITY MANHOLE
- STORM DRAIN DROP INLET
- FIRE HYDRANT
- THRUST BLOCK

NOTES:

1. UNDERGROUND UTILITIES OR STRUCTURES ARE SHOWN IN THEIR APPROXIMATE LOCATION. LOCATIONS MAY NOT HAVE BEEN VERIFIED IN THE FIELD AND NO GUARANTEE IS MADE TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.
2. CONTRACTOR SHALL VERIFY ALL EX INV ELEVATIONS AND LATERAL LOCATIONS FOR STORM DRAIN AND SANITARY SEWER CONSTRUCTION PRIOR TO COMMENCEMENT OF ANY WORK. ALL WORK FOR STORM AND SANITARY SEWER INSTALLATION SHALL BEGIN AT THE DOWNSTREAM CONNECTION POINT. THIS WILL ALLOW FOR NECESSARY ADJUSTMENTS TO BE MADE PRIOR TO THE INSTALLATION OF THE ENTIRE LINE. IF THE CONTRACTOR FAILS TO BEGIN AT THE DOWNSTREAM CONNECTION POINT, AND WORKS UPSTREAM, HE SHALL PROCEED AT HIS OWN RISK AND BE RESPONSIBLE FOR ANY ADJUSTMENTS NECESSARY.
3. VERTICAL SEPARATION REQUIREMENTS:

   A MIN OF 6 INCHES VERTICAL CLEARANCE SHALL BE PROVIDED BETWEEN CROSSING UTILITY PIPES, EXCEPT THAT THE MIN VERTICAL CLEARANCE BETWEEN WATER AND SANITARY SEWER PIPELINES SHALL BE 12 INCHES AND ALL NEW WATER PIPES SHALL BE TYP INSTALLED TO CROSS ABOVE/OVER EX SANITARY SEWER PIPELINES.

   WHERE NEW WATER PIPELINES ARE REQUIRED TO CROSS UNDER EX AND/OR NEW SANITARY SEWER PIPELINES, THE MIN VERTICAL SEPARATION SHALL BE 12 INCHES. WATER LINE PIPE ENDS SHALL BE INSTALLED NO CLOSER THAN 10' MIN HORIZONTAL DISTANCE FROM THE CENTERLINE OF UTILITY CROSSINGS, WHERE FEASIBLE.
4. HORIZONTAL SEPARATION REQUIREMENTS:

   A MIN HORIZONTAL SEPARATION BETWEEN NEW PIPELINES AND ANY EX UTILITIES SHALL BE 5', EXCEPT THAT THE MIN HORIZONTAL SEPARATION FOR WATER AND SANITARY SEWER PIPELINES SHALL BE 10' MIN, UNLESS OTHERWISE NOTED.

   A MIN HORIZONTAL SEPARATION BETWEEN NEW PIPELINES AND JOINT TRENCH SHALL BE 5'.

N

GRAPHIC SCALE

20 0 10 20 40 60

(IN FEET)
1 inch = 20 ft.

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CORONA

CONCEPTUAL UTILITY PLAN

No.	Revisions

Date: 1/3/2024
Scale: AS SHOWN
Design: M.
Drawn: RL
Approved: BK
Job No: 20221061

Drawing Number:
C5.1

IVY - C5.0 Utility Plan.dwg
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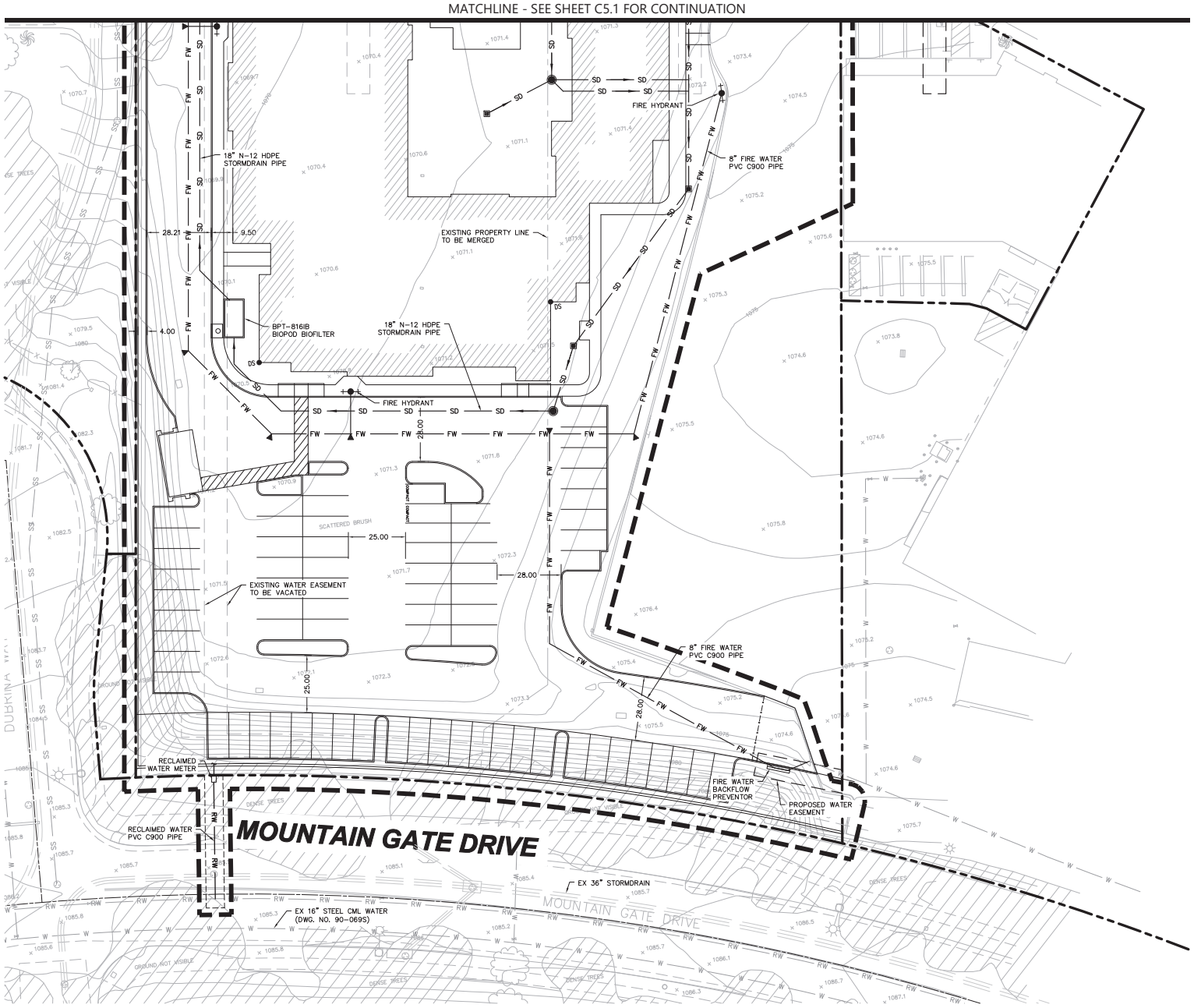

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NOTES:

1. UNDERGROUND UTILITIES OR STRUCTURES ARE SHOWN IN THEIR APPROXIMATE LOCATION. LOCATIONS MAY NOT HAVE BEEN VERIFIED IN THE FIELD AND NO GUARANTEE IS MADE TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.
2. CONTRACTOR SHALL VERIFY ALL EX INV ELEVATIONS AND LATERAL LOCATIONS FOR STORM DRAIN AND SANITARY SEWER CONSTRUCTION PRIOR TO COMMENCEMENT OF ANY WORK. ALL WORK FOR STORM AND SANITARY SEWER INSTALLATION SHALL BEGIN AT THE DOWNSTREAM CONNECTION POINT. THIS WILL ALLOW FOR NECESSARY ADJUSTMENTS TO BE MADE PRIOR TO THE INSTALLATION OF THE ENTIRE LINE. IF THE CONTRACTOR FAILS TO BEGIN AT THE DOWNSTREAM CONNECTION POINT, AND WORKS UPSTREAM, HE SHALL PROCEED AT HIS OWN RISK AND BE RESPONSIBLE FOR ANY ADJUSTMENTS NECESSARY.
3. VERTICAL SEPARATION REQUIREMENTS:

   A MIN OF 6 INCHES VERTICAL CLEARANCE SHALL BE PROVIDED BETWEEN CROSSING UTILITY PIPES, EXCEPT THAT THE MIN VERTICAL CLEARANCE BETWEEN WATER AND SANITARY SEWER PIPELINES SHALL BE 12 INCHES AND ALL NEW WATER PIPES SHALL BE TYP INSTALLED TO CROSS ABOVE/OVER EX SANITARY SEWER PIPELINES.

   WHERE NEW WATER PIPELINES ARE REQUIRED TO CROSS UNDER EX AND/OR NEW SANITARY SEWER PIPELINES, THE MIN VERTICAL SEPARATION SHALL BE 12 INCHES. WATER LINE PIPE ENDS SHALL BE INSTALLED NO CLOSER THAN 10' MIN HORIZONTAL DISTANCE FROM THE CENTERLINE OF UTILITY CROSSINGS, WHERE FEASIBLE.
4. HORIZONTAL SEPARATION REQUIREMENTS:

   A MIN HORIZONTAL SEPARATION BETWEEN NEW PIPELINES AND ANY EX UTILITIES SHALL BE 5', EXCEPT THAT THE MIN HORIZONTAL SEPARATION FOR WATER AND SANITARY SEWER PIPELINES SHALL BE 10' MIN, UNLESS OTHERWISE NOTED.

   A MIN HORIZONTAL SEPARATION BETWEEN NEW PIPELINES AND JOINT TRENCH SHALL BE 5'.

N

GRAPHIC SCALE

20 0 10 20 40 60

(IN FEET)
1 inch = 20 ft.

RESISTERED PROFESSIONAL ENGINEER — BRUCE W. KIRBY — No. C-42393 — STATE OF CALIFORNIA

PRELIMINARY
NOT FOR CONSTRUCTION
DATE: 01/03/2024
BRUCE W. KIRBY
C 42393

BKF ENGINEERS
4673 MACARTHUR CT.
SUITE 550
NEWPORT BEACH, CA 92660
(949) 526-8460
www.bkf.com

THE IVY MOUNTAIN GATE SENIOR LIVING PROJECT
APN 114-070-020, 114-070-021, 114-070-022
CORONA

CONCEPTUAL UTILITY PLAN

No.	Revisions

Date: 1/3/2024
Scale: AS SHOWN
Design: VL
Drawn: RL
Approved: BK
Job No: 20221001

Drawing Number:
C5.2

IVY - C5.2 Utility Plan.dwg
Plot: Jan 03, 2024 at 4:14pm

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

Geotechnical Engineering Report

Ivy at Mountain Gate Senior Living Facility
Corona, California
November 15, 2022
Terracon Project No. 60225085

Prepared for:
Oakmont Management Group
Irvine, CA

Prepared by:
Terracon Consultants, Inc.
Colton, California

November 15, 2022

Oakmont Management Group
3 Park Plaza, Suite 1920
Irvine, CA 90048

Attn: Ms. Carissa Savant –Vice President of Development
P: (949) 744-5200
E: csavant@oakmontmg.com

Re: Geotechnical Engineering Report
Ivy at Mountain Gate Senior Living Facility
430 W Foothill Parkway
Corona, California
Terracon Project No. 60225085

Dear Ms. Savant:

We have completed our Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. P60225085 dated May 24, 2022. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations, floor slabs, pavements, and infiltration systems for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Smriti Dhital, P.E.*
Senior Staff Engineer
*Registered in North Carolina

Scott G. Lawson, P.E., G.E.
Senior Engineer

REGISTERED PROFESSIONAL ENGINEER
SCOTT G. LAWSON
No. GE 2829
Exp. 9/30/23
GEOTECHNICAL
STATE OF CALIFORNIA

REPORT TOPICS

Note: This report was originally delivered in a web-based format. Orange Bold text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the *GeoReport* logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

Geotechnical Engineering Report

Ivy at Mountain Gate Senior Living Facility
430 W Foothill Parkway
Corona, California

Terracon Project No. 60225085
November 15, 2022

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed Ivy at Mountain Gate Senior Living Facility to be located at 430 W Foothill Parkway, Corona, California. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Foundation design and construction
- Pavement design and construction
- Seismic site classification per CBC

The geotechnical engineering Scope of Services for this project included the advancement of eleven (11) test borings to depths ranging from approximately 6½ to 51½ feet below existing site ground surface (bgs). Four (4) of these borings (P-1 to P-4) were used for percolation testing at approximate depths of 6½ to 21½ feet bgs.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs and as separate graphs in the **Exploration Results** section.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project site is located at 430 W Foothill Parkway in Corona, California. The site is bounded by West Foothill Parkway on the north and Mountain Gate Drive on the south. Based on our review of a site plan provided to Terracon, the project site covers approximately 5 acres. The coordinates for the approximate center of the site are 33.84440N, 117.57540W.
Existing Improvements	The site is currently an empty lot.

Item	Description
Current Ground Cover	Site groundcover consists of exposed soil and light vegetation.
Existing Topography	The overall elevation of the site slopes gradually down towards the north. The majority of the site ranges from an approximate elevation of 1065 feet in the north to 1075 feet in the south. The northern boundary of the site has an approximate 12-foot slope ranging from 1065 to 1053 descending to W Foothill Parkway. The southern boundary of the site also has an approximate 12-foot slope ranging from 1087 to 1075 ascending up to Mountain Gate Drive. It appears as though the site may have previously been rough-graded to it's current elevation, possibly during construction of the existing shopping center development to the east. Documentation regarding previous earthwork at the site (if any) was not provided to Terracon.

PROJECT DESCRIPTION

Item	Description
Proposed Structures	The proposed residential care facility building will be a 2-story structure with approximately 102,000 square-feet of floor space across both stories. The structure will have an at-grade courtyard in the center of the building footprint. Appurtenant construction will include a swimming pool and spa, recreational areas, picnic areas, landscaping, and hardscape.
Construction	Wood- or steel-framed building supported on reinforced concrete foundation system with a concrete slab-on-grades.
Finished Floor Elevation	Assumed to be within two feet of existing grade.
Maximum Loads (assumed)	■ Columns: 80-200 kips ■ Walls: 2 to 4 kips per linear foot (klf) ■ Slabs: 150 pounds per square foot (psf)
Grading	Cut/fill – assumed to be 5 feet or less (excluding remedial grading) with the exception of the pool area which has an anticipated cut of 10 feet below existing ground surface.
Below Grade Structures	It is our understanding that no below-grade structures are proposed at the besides the swimming pool.
Infiltration Systems	We have anticipated that a shallow infiltration system is proposed on site.
Pavements	It is our understanding that new pavements will be constructed and are included in this project.

Item	Description
Traffic Loading	We assume both rigid (concrete) and flexible (asphalt) pavement sections should be considered. Anticipated traffic is as follows: ■ Automobile Parking Area: Traffic Index of 4.5 ■ Driving Lanes: Traffic Index of 5.5 ■ Truck Loading Area/Fire Lane Access: Traffic Index of 7.5

GEOTECHNICAL CHARACTERIZATION

We have developed a general characterization of the subsurface soil and groundwater conditions based upon our review of the data and our understanding of the geologic setting and planned construction.

Based on our field observations and review of historical topographic maps, the site appears to have been previously rough graded. Fill was observed in borings near the northern border of the site to depths of 10 to 13 feet below existing grade. Fill was encountered in borings advanced within the footprint of the proposed building to depths ranging from approximately 1½ to 2½ feet below existing grade. The fill soil consisted of medium dense to dense silty clayey sand with varying amounts of gravel. Terracon does not have any documentation to show if the grading operations were monitored or the fill materials have been compacted and tested. Native soils underlying the fill and across the remainder of the site generally consisted of medium dense to very dense clayey sand with varying amount of silt, medium dense to very dense gravel with varying amount of sand and clay, and very stiff to hard lean clay with varying amount of gravel.

The geotechnical characterization forms the basis of our geotechnical calculations and evaluation of site preparation, foundation options and pavement options. As noted in **General Comments**, the characterization is based upon widely spaced exploration points across the site, and variations are likely.

Conditions encountered at each boring location are indicated on the individual boring logs shown in the **Exploration Results** section and are attached to this report. Stratification boundaries on the boring logs represent the approximate location of changes in native soil types; in situ, the transition between materials may be gradual.

Lab Results

Laboratory tests were conducted on selected soil samples and the test results are presented in the **Exploration Results** section and on the boring logs. Atterberg limit test results indicate that the on-site soils generally have low plasticity. Consolidation tests indicate that the silty clayey soils encountered at approximate depths of 2.5 and 5 feet bgs have a moderate collapse potential saturated under normal footing loads of 2,000 psf. Direct Shear testing performed on a sample

taken at a depth of 5 feet bgs indicates the soil sample tested has a cohesion of approximately 140 psf and effective friction angle of 41°. An Expansion Index (EI) test performed on a near surface soil sample resulted in an EI value of 24, indicating a "low" potential for expansion.

Groundwater

Groundwater was not observed in the borings while drilling, or for the short duration the boring remained open, to the maximum depth explored of 51½ feet bgs. These observations represent groundwater conditions at the time of the field exploration and may not be indicative of other times, or at other locations.

According to data collected from the Water Data Library for the State of California from a nearby well, located approximately 1.4-miles northwest of the site in State Well number 03S07W01A001S[1], the highest groundwater level, between March 1, 2003 and June 17, 2022, was recorded at greater than 44 feet below a ground surface elevation of 954 feet at the well location. Based on the elevation of the Ivy at Mountain Gate site, groundwater at the site is assumed to be greater than 50 feet.

SEISMIC CONSIDERATIONS

The 2019 California Building Code (CBC) Seismic Design Parameters have been generated using the SEAOC/OSHPD Seismic Design Maps Tool. This web-based software application calculates seismic design parameters in accordance with ASCE 7-16 and 2019 CBC. The 2019 CBC requires that a site-specific ground motion study be performed in accordance with Section 11.4.8 of ASCE 7-16 for Site Class D sites with a mapped S_1 value greater than or equal 0.2.

However, Section 11.4.8 of ASCE 7-16 includes an exception from such analysis for specific structures on Site Class D sites. The commentary for Section 11 of ASCE 7-16 (Page 534 of Section C11 of ASCE 7-16) states that "In general, this exception effectively limits the requirements for site-specific hazard analysis to very tall and or flexible structures at Site Class D sites." Based on our understanding of the proposed structures, it is our assumption that the exception in Section 11.8.4 applies to the proposed structure. However, the structural engineer should verify the applicability of this exception.

Based on this exception, the spectral response accelerations presented below were calculated using the site coefficients (F_a and F_v) from Tables 1613.2.3(1) and 1613.2.3(2) presented in Section 16.4.4 of the 2019 CBC.

[1] *California Department of Water Resources, https://wdl.water.ca.gov/waterdatalibrary/Map.aspx.*

Description	Value
2019 California Building Code Site Classification (CBC) [1]	D [2]
Site Latitude (°N)	33.8444
Site Longitude (°W)	117.5754
S_s Spectral Acceleration for a 0.2-Second Period	2.424
S_1 Spectral Acceleration for a 1-Second Period	0.916
F_a Site Coefficient for a 0.2-Second Period	1.0
F_v Site Coefficient for a 1-Second Period	1.7

1. Seismic site classification in general accordance with the *2019 California Building Code*.
2. The 2019 California Building Code (CBC) requires a site soil profile determination extending to a depth of 100 feet for seismic site classification. The current scope does not include the required 100-foot soil profile determination. Borings were extended to a maximum depth of 51½ feet, and this seismic site class definition considers that similar or denser soils continue below the maximum depth of the subsurface exploration. Additional exploration to deeper depths would be required to confirm the conditions below the current depth of exploration.

A site-specific ground motion study may reduce design values and consequently construction costs. We recommend consulting with a structural engineer to evaluate the need for such study and its potential impact on construction costs. Terracon should be contacted if a site-specific ground motion study is desired.

Faulting and Estimated Ground Motions

The site is located in southern California, which is a seismically active area. The type and magnitude of seismic hazards affecting the site are dependent on the distance to causative faults, the intensity, and the magnitude of the seismic event. As calculated using the USGS Unified Hazard Tool, the Elsinore Glen Ivy Fault, which is considered to have the most significant effect at the site from a design standpoint, has a maximum credible earthquake magnitude of 6.49 and is located approximately 2.5 kilometers from the site.

Based on the USGS Design Maps Summary Report, using the American Society of Civil Engineers (ASCE 7-16) standard, the peak ground acceleration (PGA_M) at the project site is expected to be 1.12 g. Based on the USGS Unified Hazard Tool, the project site has a mean magnitude of 6.62. Furthermore, the site is not located within an Alquist-Priolo Earthquake Fault Zone based on our review of the State Fault Hazard Maps.[2]

[2] California Geological Survey (CGS), https://maps.conservation.ca.gov/cgs/informationwarehouse/regulatorymaps/.

LIQUEFACTION

Liquefaction is a mode of ground failure that results from the generation of high pore water pressures during earthquake ground shaking, causing loss of shear strength. Liquefaction is typically a hazard where loose sandy soils exist below groundwater. The California Geological Survey (CGS) has designated certain areas as potential liquefaction hazard zones. These are areas considered at a risk of liquefaction-related ground failure during a seismic event, based upon mapped surficial deposits and the presence of a relatively shallow water table.

The project site is located in an area not yet mapped for liquefaction hazard by the CGS. Based on Riverside County liquefaction hazard maps, the site is located in an area of low liquefaction susceptibility. Based on the anticipated depth to groundwater and density of the on-site soils, liquefaction potential at the site is considered low. Other geologic hazards related to liquefaction, such as lateral spreading, are therefore also considered low.

CORROSIVITY

The table below lists the results of laboratory soluble sulfate, soluble chloride, electrical resistivity, and pH testing. The values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Corrosivity Test Results Summary						
Boring	**Sample Depth (ft)**	**Soil Description**	**Soluble Sulfate (%)**	**Chlorides (ppm)**	**Electrical Resistivity (Ω-cm)**	**pH**
B-5	0 - 5	Poorly graded sand with silty clay and gravel	0.02	45	6014	8.09

Results of soluble sulfate testing indicate samples of the on-site soils tested possess negligible sulfate concentrations when classified in accordance with Table 19.3.1.1 of the ACI Design Manual. Concrete should be designed in accordance with the exposure class S0 provisions of the ACI Design Manual, Section 318, Chapter 19.

STORMWATER MANAGEMENT

Four (4) in-situ percolation tests were performed to approximate depths of 6.5 and 21.5 feet bgs. A 2-inch thick layer of gravel was placed in the bottom of each boring after the borings were drilled to investigate the soil profile. A 3-inch diameter perforated pipe was installed on top of the gravel layer in each boring. Gravel was used to backfill between the perforated pipes and the boring sidewall. The borings were then filled with water for a pre-soak period of 24 hours. Testing began

after a pre-soak period. At the beginning of the test, the pipes were refilled with water and readings were taken at standardized time intervals. Percolation rates are provided in the following table:

TEST RESULTS			
Test Location (depth, feet bgs)	**Soil Classification**	**Slowest Measured Percolation Rate (in/hr.)**	**Correlated Infiltration Rate[1] (in/hr.)**
P-1 (0 to 6.5 ft)	Clayey sand	2.1	< 0.1
P-2 (10 to 21.5 ft)	Silty clayey sand with gravel	73.4	1.8
P-3 (0 to 6.5 ft)	Clayey sand with gravel	2.3	< 0.1
P-4 (10 to 21.5 ft)	Clayey sand with gravel	1.7	< 0.1

[1]If proposed infiltration system will mainly rely on vertical downward seepage, the correlated infiltration rates should be used. The infiltration rates were correlated using the Porchet method.

With time, the bottoms of infiltration systems tend to plug with organics, sediments, and other debris. Long term maintenance will likely be required to remove these deleterious materials to help reduce decreases in actual percolation rates.

The percolation tests were performed with clear water, whereas the storm water will likely not be clear, but may contain organics, fines, and grease/oil. The presence of these deleterious materials will tend to decrease the rate that water percolates from the infiltration systems. Design of the stormwater infiltration systems should account for the presence of these materials and should incorporate structures/devices to remove these deleterious materials. A safety factor should be applied to these measured rates.

Based on the soils encountered in our borings, we expect the percolation rates of the soils could be different than measured in the field due to variations in fines and gravel content. The design elevation and size of the proposed infiltration system should account for this expected variability in infiltration rates.

Infiltration testing should be performed after construction of the infiltration system to verify the design infiltration rates. It should be noted that siltation and vegetation growth along with other factors may affect the infiltration rates of the infiltration areas. The actual infiltration rate may vary from the values reported here. Infiltration systems should be located a minimum of 10 feet from any existing or proposed foundation system.

GEOTECHNICAL OVERVIEW

The site appears suitable for the proposed construction based upon geotechnical conditions encountered in the test borings, provided that the recommendations provided in this report are implemented in the design and construction phases of this project.

Based on our field observations and review of historical topographic maps, the site appears to have been previously rough graded. Fill was observed in borings near the northern border of the site to depths of 10 to 13 feet below existing grade. Fill was encountered in borings advanced within the footprint of the proposed building to depths ranging from approximately 1½ to 2½ feet below existing grade. Terracon does not have any documentation to show if the grading operations were monitored or the fill materials have been compacted and tested. Structures that are classified as “occupied structures” in accordance with California Code of Regulations Section 3601 should not be constructed on undocumented fill. We recommend that all fill soils beneath the proposed building area be removed, and the excavation thoroughly cleaned prior to backfill placement and/or construction.

Estimated movements described in this report are based on effective drainage for the life of the structure and cannot be relied upon if effective drainage is not maintained. Exposed ground, extending at least 10 feet from the perimeter, should be sloped a minimum of 5% away from the building to provide positive drainage away from the structure. Grades around the structure should be periodically inspected and adjusted as part of the structure’s maintenance program.

Based on the findings summarized in this report, it is our professional opinion that the proposed construction will not be subjected to a hazard from settlement, slippage, or landslide, provided the recommendations of our report are incorporated into the proposed construction. It is also our opinion that the proposed construction will not adversely affect the geologic stability of the site or adjacent properties provided the recommendations contained in our report are incorporated into the proposed construction.

The recommendations contained in this report are based upon the results of field and laboratory testing (presented in the **Exploration Results** section), engineering analyses, and our current understanding of the proposed project.

The **General Comments** section provides an understanding of the report limitations.

EARTHWORK

The following recommendations include site preparation, excavation, subgrade preparation and placement of engineered fills on the project. The recommendations presented for design and construction of earth supported elements including foundations, slabs, and pavements are contingent upon following the recommendations outlined in this section.

Earthwork on the project should be observed and evaluated by Terracon. The evaluation of earthwork should include observation and testing of engineered fill, subgrade preparation, foundation bearing soils, and other geotechnical conditions exposed during the construction of the project.

Site Preparation

Strip and remove existing vegetation, debris, pavements, and other deleterious materials from proposed building and pavement areas. Exposed surfaces should be free of mounds and depressions which could prevent uniform compaction. The site should be initially graded to create a relatively level surface to receive fill and provide for a relatively uniform thickness of fill beneath proposed building structures.

Fill was observed in borings at the site to depths of 1½ to 13 feet below existing grade. Terracon does not have any documentation to show if the grading operations were monitored or the fill materials have been compacted and tested. Structures that are classified as “occupied structures” in accordance with California Code of Regulations Section 3601 should not be constructed on undocumented fill. We recommend that all fill soils be removed within the proposed building area and the excavation thoroughly cleaned prior to backfill placement and/or construction. If such documentation exists, Terracon should be notified and the recommendations in this report may be appropriately modified.

Although no evidence of underground facilities such as septic tanks, cesspools, or basements was observed during the site reconnaissance, such features could be encountered during construction. If underground facilities are encountered, such features should be removed, and the excavation thoroughly cleaned prior to backfill placement and/or construction.

Subgrade Preparation

The proposed building may be supported by a shallow foundation system bearing on engineered fill extending to a minimum depth of 3 feet below the bottom of foundations, 5 feet below existing grade, or the depth of undocumented fill, whichever is greater. Grading for the proposed structure should incorporate the limits of the structure plus a lateral distance of 3 feet beyond the outside edge of perimeter footings, where space is available.

Support of pavements on or above existing fill materials is discussed in this report. However, even with the recommended construction testing services, there is an inherent risk for the owner that compressible fill or unsuitable material within or buried by the fill will not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill, but can be reduced by performing additional testing and evaluation.

Subgrade soils beneath exterior slabs and pavements should be scarified, moisture conditioned, and compacted to a minimum depth of 10 inches. The moisture content and compaction of subgrade soils should be maintained until slab or pavement construction.

Exposed areas which will receive fill, once properly cleared and benched where necessary, should be scarified to a minimum depth of 10 inches, moisture conditioned, and compacted per the compaction requirements in this report.

Based upon the subsurface conditions determined from the geotechnical exploration, subgrade soils exposed during construction are anticipated to be relatively workable. However, the workability of the subgrade may be affected by precipitation, repetitive construction traffic or other factors. If unworkable conditions develop, workability may be improved by scarifying and drying.

Excavation

Excavations may encounter gravel and oversize materials such as cobbles which may require the use of specialized heavy-duty equipment, or material handling and processing. Some additional effort may be necessary to extract cobble sized materials, particularly in deep narrow excavations such as utility trenches. Consideration should be given to obtaining a unit price for difficult excavation or material processing in the contract documents for the project.

The bottom of excavations should be thoroughly cleaned of loose soils and disturbed materials prior to backfill placement and/or construction.

We recommend that the swimming pool be over-excavated by about 2 feet in plan area to provide adequate access around the excavation for pool construction. The walls of the proposed excavation should be shored or sloped in conformance with OSHA excavation and trench safety standards. If any excavation is extended to a depth of more than 20 feet, it will be necessary to have the side slopes designed by a professional engineer.

Soils from the excavation should not be stockpiled higher than six (6) feet or within ten (10) feet of the edge of an open trench. Construction of open cuts adjacent to existing structures, including underground pipes, is not recommended within a 1½ H:1V plane extending beyond and down from the perimeter of the structure. Cuts that are proposed within five 5 feet of light standards, other utilities, underground structures, and pavement should be provided with temporary shoring.

It may be necessary for the contractor to retain a geotechnical engineer to monitor the soils exposed in all excavations and provide engineering services for slopes. This will provide an opportunity to monitor the soils encountered and to modify the excavation slopes as necessary. It also offers an opportunity to verify the stability of the excavation slopes during construction.

Individual contractors are responsible for designing and constructing stable, temporary excavations. Excavations should be sloped or shored in the interest of safety following local, and federal regulations, including current OSHA excavation and trench safety standards.

Fill Materials and Placement

All fill materials should be inorganic soils free of vegetation, debris, and fragments larger than 6 inches in size. Pea gravel or other similar non-cementatious, poorly graded materials should not be used as fill or backfill without the prior approval of the geotechnical engineer.

Clean on-site soils or approved imported materials may be used as fill material for the following:

- general site grading
- foundation areas
- interior floor slab areas
- foundation backfill
- pavement areas
- exterior slab areas

Imported soils for use as fill material within proposed building and structure areas should conform to low volume change materials as indicated in the following specifications:

Gradation	Percent Finer by Weight (ASTM C 136)
3”	100
No. 4 Sieve	50-100
No. 200 Sieve	10-40

- Liquid Limit ..... 30 (max)
- Plasticity Index ..... 15 (max)
- Maximum expansion index* ..... 20 (max)

*ASTM D 4829

The contractor shall notify the Geotechnical Engineer of import sources sufficiently ahead of their use so that the sources can be observed and approved as to the physical characteristic of the import material. For all import material, the contractor shall also submit current verified reports from a recognized analytical laboratory indicating that the import has a "not applicable" (Class S0) potential for sulfate attack based upon current ACI criteria and is "mildly corrosive" to ferrous metal and copper. The reports shall be accompanied by a written statement from the contractor that the laboratory test results are representative of all import material that will be brought to the job.

Rock fragments generated from excavations may be incorporated into the fill soils; however, they should be no larger 6-inches maximum dimension and they must be embedded within a compacted fill soil matrix. Point to point contact of the rock fragments should be avoided. Additionally, consideration should be given to a placement depth below finish grade that will avoid conflict with foundation and utility excavations.

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift. Fill lifts should not exceed 10 inches loose thickness.

Compaction Requirements

Recommended compaction and moisture content criteria for engineered fill materials are as follows:

Material Type and Location	Per the Modified Proctor Test (ASTM D 1557)		
	Minimum Compaction Requirement	Range of Moisture Contents for Compaction Above Optimum	
		Minimum	Maximum
On-site soils and low volume change imported fill: Beneath foundations:	90	0%	+3%
Beneath interior slabs:	90	0%	+3%
Fill greater than 5 feet in depth	95	0%	+3%
Miscellaneous backfill:	90	0%	+3%
Beneath pavements:	95	0%	+3%
Utility Trenches*:	90	0%	+3%
Bottom of excavation receiving fill:	90	0%	+3%
Aggregate base (beneath pavements):	95	0%	+3%

* Upper 12 inches should be compacted to 95% within pavement and structural areas.

Grading and Drainage

Positive drainage should be provided during construction and maintained throughout the life of the development. Infiltration of water into utility trenches or foundation excavations should be prevented during construction. Planters and other surface features which could retain water in areas adjacent to the building or pavements should be sealed or eliminated. In areas where sidewalks or paving do not immediately adjoin the structure, we recommend that protective slopes be provided with a minimum grade of approximately 5 percent for at least 10 feet from perimeter walls. Backfill against footings, exterior walls, and in utility and sprinkler line trenches should be well compacted and free of all construction debris to reduce the possibility of moisture infiltration.

We recommend a minimum horizontal setback distance of 10 feet from the perimeter of any building and the high-water elevation of the nearest storm-water retention basin.

Roof drainage should discharge into splash blocks or extensions when the ground surface beneath such features is not protected by exterior slabs or paving. Sprinkler systems and landscaped irrigation should not be installed within 5 feet of foundation walls.

We recommend construction activities minimize soil compaction at the bottom of infiltration systems. Soil compaction damages soil structure, reduces infiltration rates, limits root growth and plant survivability, and destroys soil organisms. For these reasons site planning, design, and execution, where appropriate, should restrict compaction to infiltration areas.

Exterior Slab Design and Construction

Compacted subgrade composed of on-site clayey soils will expand with increasing moisture content; therefore, exterior concrete slabs may heave, resulting in cracking or vertical offsets. The potential for damage would be greatest where exterior slabs are constructed adjacent to the building or other structural elements. To reduce the potential for damage caused by movement, we recommend:

- exterior slabs should be supported directly on subgrade fill (not ABC) with no, or very low expansion potential;
- strict moisture-density control during placement of subgrade fills;
- maintain proper subgrade moisture until placement of slabs;
- placement of effective control joints on relatively close centers and isolation joints between slabs and other structural elements;
- provision for adequate drainage in areas adjoining the slabs;
- use of designs which allow vertical movement between the exterior slabs and adjoining structural elements.

Utility Trenches

It is anticipated that the on-site soils and fill materials will provide suitable support for underground utilities and piping that may be installed. Any soft and/or unsuitable material encountered at the bottom of excavations should be removed and be replaced with an adequate bedding material. A non-expansive granular material with a sand equivalent greater than 30 should be used for bedding and shading of utilities, unless allowed or specified otherwise by the utility manufacturer.

On-site materials are considered suitable for backfill of utility and pipe trenches from one foot above the top of the pipe to the final ground surface, provided the material is free of organic matter and deleterious substances. Imported low volume change soils should be used for trench backfill in structural areas.

Trench backfill should be mechanically placed and compacted as discussed earlier in this report. Compaction of initial lifts should be accomplished with hand-operated tampers or other lightweight compactors. Where trenches are placed beneath slabs or footings, the backfill should satisfy the gradation and expansion index requirements of engineered fill discussed in this report. Flooding or jetting for placement and compaction of backfill is not recommended.

Construction Considerations

Upon completion of filling and grading, care should be taken to maintain the subgrade moisture content prior to construction of floor slabs and pavements. Construction traffic over the completed subgrade should be avoided to the extent practical. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. If the subgrade should become desiccated, saturated, or disturbed, the affected material should be removed, or these materials should be scarified, moisture conditioned, and recompacted prior to floor slab and pavement construction.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety, or the contractor's activities; such responsibility shall neither be implied nor inferred.

On-site clay and silt soils may pump and unstable subgrade conditions could develop during general construction operations, particularly if the soils are wetted and/or subjected to repetitive construction traffic. The use of light construction equipment would aid in reducing subgrade disturbance. The use of remotely operated equipment, such as a backhoe, would be beneficial to perform cuts and reduce subgrade disturbance.

Should unstable subgrade conditions develop stabilization measures will need to be employed. Stabilization measures may include placement of aggregate base and multi-axial geogrid. Use of lime, fly ash, kiln dust or cement could also be considered as a stabilization technique. Laboratory evaluation is recommended to determine the effect of chemical stabilization on subgrade soils prior to construction.

We recommend that the earthwork portion of this project be completed during extended periods of dry weather if possible. If earthwork is completed during the wet season (typically November through April) it may be necessary to take extra precautionary measures to protect subgrade soils. Wet season earthwork operations may require additional mitigative measures beyond that which would be expected during the drier summer and fall months. This could include diversion of surface runoff around exposed soils and draining of ponded water on the site. Once subgrades are established, it may be necessary to protect the exposed subgrade soils from construction traffic.

As a safety measure, no equipment should be operated within 5 feet of the edge of the excavation and no materials should be stockpiled within 10 feet of the excavation. Excavations should not approach closer than a distance equal to the depth of excavation from existing structures/facilities without some form of protection for the facilities. Proper berming or ditching should be performed to divert any surface runoff away from the excavation.

Construction Observation and Testing

The geotechnical engineer should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation, proof-rolling, placement and compaction of controlled compacted fills, backfilling of excavations to the completed subgrade.

The exposed subgrade and each lift of compacted fill should be tested, evaluated, and reworked as necessary until approved by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the building areas and 5,000 square feet in pavement areas. One density and water content test for every 50 linear feet of compacted utility trench backfill. This testing frequency criteria may be adjusted during construction as specified by the geotechnical engineer of record.

In areas of foundation excavations, the bearing subgrade should be evaluated under the direction of the Geotechnical Engineer. In the event that unanticipated conditions are encountered, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

SHALLOW FOUNDATIONS

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for shallow foundations.

Shallow Foundation Design Recommendations

DESCRIPTION	RECOMENDATION
Foundation Type	Spread and strip footing foundations
Bearing Material	Engineered fill extending to a minimum depth of 3 feet below the bottom of foundations, 5 below existing grade, or the depth of undocumented fill, whichever is greater.
Allowable Bearing Pressure	Spread Footings ■ 3,000 psf (up to 11 feet wide) Strip Footings ■ 2,500 psf (up to 8 feet wide)
Minimum Dimensions	Columns: 24 inches

DESCRIPTION	RECOMENDATION
	Continuous: 18 inches wide
Minimum Embedment Depth Below Finished Grade	18 inches
Total Estimated Settlement	1 inch
Estimated Differential Settlement	½ inch across 40 feet

Finished grade is defined as the lowest adjacent grade within five feet of the foundation for perimeter (or exterior) footings.

The allowable foundation bearing pressure applies to dead loads plus design live load conditions. The design bearing pressure may be increased by one-third when considering total loads that include wind or seismic conditions. The weight of the foundation concrete below grade may be neglected in dead load computations.

Foundations should be reinforced as necessary to reduce the potential for distress caused by differential foundation movement. Foundation excavations should be observed by the geotechnical engineer. If the soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

FLOOR SLABS

DESCRIPTION	RECOMMENDATION
Interior floor system	Slab-on-grade concrete
Floor slab support	Engineered fill extending to a minimum depth of 3 feet below the bottom of foundations, 5 below existing grade, or the depth of undocumented fill, whichever is greater.
Subbase	Minimum 4-inches of Aggregate Base
Modulus of subgrade reaction	140 pounds per square inch per inch (psi/in) (The modulus was obtained based on estimates obtained from NAVFAC 7.1 design charts). This value is for a small loaded area (1 Sq. ft or less) such as for forklift wheel loads or point loads and should be adjusted for larger loaded areas.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut control joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual. Joints or cracks should

be sealed with a water-proof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

LATERAL EARTH PRESSURES

Design Parameters

For engineered fill comprised of on-site soils or imported low volume change materials above any free water surface, recommended equivalent fluid pressures for unrestrained foundation elements are:

ITEM	VALUE[a, b]
Active Case	35 psf/ft
Passive Case	400 psf/ft
At-Rest Case	55 psf/ft
Coefficient of Friction	0.30

[a]Note: The values are based on low volume change engineered fill materials used as backfill.
[b]Note: Uniform, horizontal backfill, compacted to at least 90% of the ASTM D 1557 maximum dry density, rendering a maximum unit weight of 125 pcf.

The lateral earth pressures herein do not include any factor of safety and are not applicable for submerged soils/hydrostatic loading. Additional recommendations may be necessary if such conditions are to be included in the design.

Fill against foundation and retaining walls should be compacted to densities specified in the Earthwork section of this report. Compaction of each lift adjacent to walls should be accomplished with hand-operated tampers or other lightweight compactors.

PAVEMENTS

General Pavement Comments

Pavement designs are provided for the traffic conditions and pavement life conditions as noted in **Project Description** and in the following sections of this report. A critical aspect of pavement

performance is site preparation. Pavement designs noted in this section must be applied to the site which has been prepared as recommended in the **Earthwork** section.

Pavement Design Parameters

An estimated design R-Value was used to calculate the asphalt concrete pavement thickness sections and the Portland cement concrete pavement sections. R-value testing should be completed prior to pavement construction to verify the design R-value.

Assuming the pavement subgrades will be prepared as recommended within this report, the following pavement sections should be considered minimums for this project for the traffic indices assumed in the table below. As more specific traffic information becomes available, we should be contacted to reevaluate the pavement calculations.

Pavement Section Thicknesses

The following table provides options for Asphalt Concrete (AC) and Portland Cement Concrete (PCC) pavement sections for the assumed Traffic Indices (TI):

	Recommended Pavement Section Thickness (inches) [1]		
	Light (Automobile) Parking TI = 4.5	**Driving Lanes TI = 5.5**	**Truck Loading/Fire Lane TI = 7.5**
PCC Section[2]	5.0-inches PCC over 4-inches Class II Aggregate Base	6.0-inches PCC over 4-inches Class II Aggregate Base	7.0-inches PCC over 4-inches Class II Aggregate Base
AC Section	4-inches AC over 4-inches Class II Aggregate Base	4-inches AC over 7-inches Class II Aggregate Base	4-inches AC over 14-inches Class II Aggregate Base

1. All materials should meet the Caltrans Standard Specifications for Highway Construction.
2. 600 psi Flexural Strength or 4,250 psi compressive strength

These pavement sections are considered minimal sections based upon the expected traffic and the existing subgrade conditions. However, they are expected to function with periodic maintenance and overlays if good drainage is provided and maintained.

Subsequent to clearing, grubbing, and removal of topsoil, subgrade soils beneath all pavements should be scarified, moisture conditioned, and compacted to a minimum depth of 10 inches. All materials should meet the Caltrans Standard Specifications for Highway Construction. Aggregate base materials should meet the gradation and quality requirement of Class 2 Aggregate Base (¾ inch maximum) in Caltrans Standard Specifications, latest edition, Sections 25 through 29.

All concrete for rigid pavements should have a minimum flexural strength of 600 psi (4,250 psi Compressive Strength) and be placed with a maximum slump of four inches. Proper joint spacing

will also be required to prevent excessive slab curling and shrinkage cracking. All joints should be sealed to prevent entry of foreign material and dowelled where necessary for load transfer.

Preventative maintenance should be planned and provided for through an on-going pavement management program to enhance future pavement performance. Preventative maintenance activities are intended to slow the rate of pavement deterioration, and to preserve the pavement investment.

Preventative maintenance consists of both localized maintenance (e.g. crack sealing and patching) and global maintenance (e.g. surface sealing). Preventative maintenance is usually the first priority when implementing a planned pavement maintenance program and provides the highest return on investment for pavements.

Pavement Construction Considerations

Materials and construction of pavements for the project should be in accordance with the requirements and specifications of the State of California Department of Transportation, or other approved local governing specifications.

Base course or pavement materials should not be placed when the surface is wet. Surface drainage should be provided away from the edge of paved areas to minimize lateral moisture transmission into the subgrade.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and

are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. The findings and recommendations presented in this report were prepared in a manner consistent with the standards of care and skill ordinarily exercised by members of its profession completing similar studies and practicing under similar conditions in the geographic vicinity and at the time these services have been performed. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Number of Borings	Boring Depth (feet)[1]	Planned Location
6	21½ to 51½	Proposed building and swimming pool area
5	6½ to 21½	Pavement/infiltration areas

1. Below ground surface.

Boring Layout and Elevations: Boring layout was prepared by Terracon personnel. The borings were located in the field by using the proposed site plan, an aerial photograph of the site, and handheld GPS. The accuracy of boring locations should only be assumed to the level implied by the method used.

Subsurface Exploration Procedures: We advanced the borings with a truck-mounted drill rig using continuous hollow stem flight augers. Four samples were obtained in the upper 10 feet and at intervals of five feet thereafter. Soil sampling was performed using split-barrel and Modified California sampling spoon procedures. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon is driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. The Modified California split-barrel sampling procedures are similar to standard split spoon sampling procedure; however, blow counts are typically recorded for 6-inch intervals for a total of 18 inches of penetration. The samples were placed in appropriate containers, taken to our soil laboratory for testing, and classified by a geotechnical engineer. In addition, we observed and recorded groundwater levels during drilling and sampling.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests to understand the engineering properties of the various soil strata, as necessary, for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods were applied because of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D7263 Standard Test Methods for Laboratory Determination of Dry Density (Unit Weight) of Soil Specimens
- ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D1140 Standard Test Methods for Determining the Amount of Material Finer than 75-µm (No. 200) Sieve in Soils by Washing
- ASTM D422 Standard Test Method for Particle-Size Analysis of Soils
- ASTM D4546 Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading
- ASTM D3080 Standard Test Method for Direct Shear Test of Soils
- ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort
- Corrosivity Testing included pH, chlorides, sulfates, sulfides, Redox potential, and electrical lab resistivity

The laboratory testing program included examination of soil samples by an engineer. Based on the material's texture and plasticity, we described and classified the soil samples in accordance with the Unified Soil Classification System.

SITE LOCATION AND EXPLORATION PLANS

SITE LOCATION

Ivy at Mountain Gate ■ Corona, CA
November 10, 2022 ■ Terracon Project No. 60225085

Terracon GeoReport

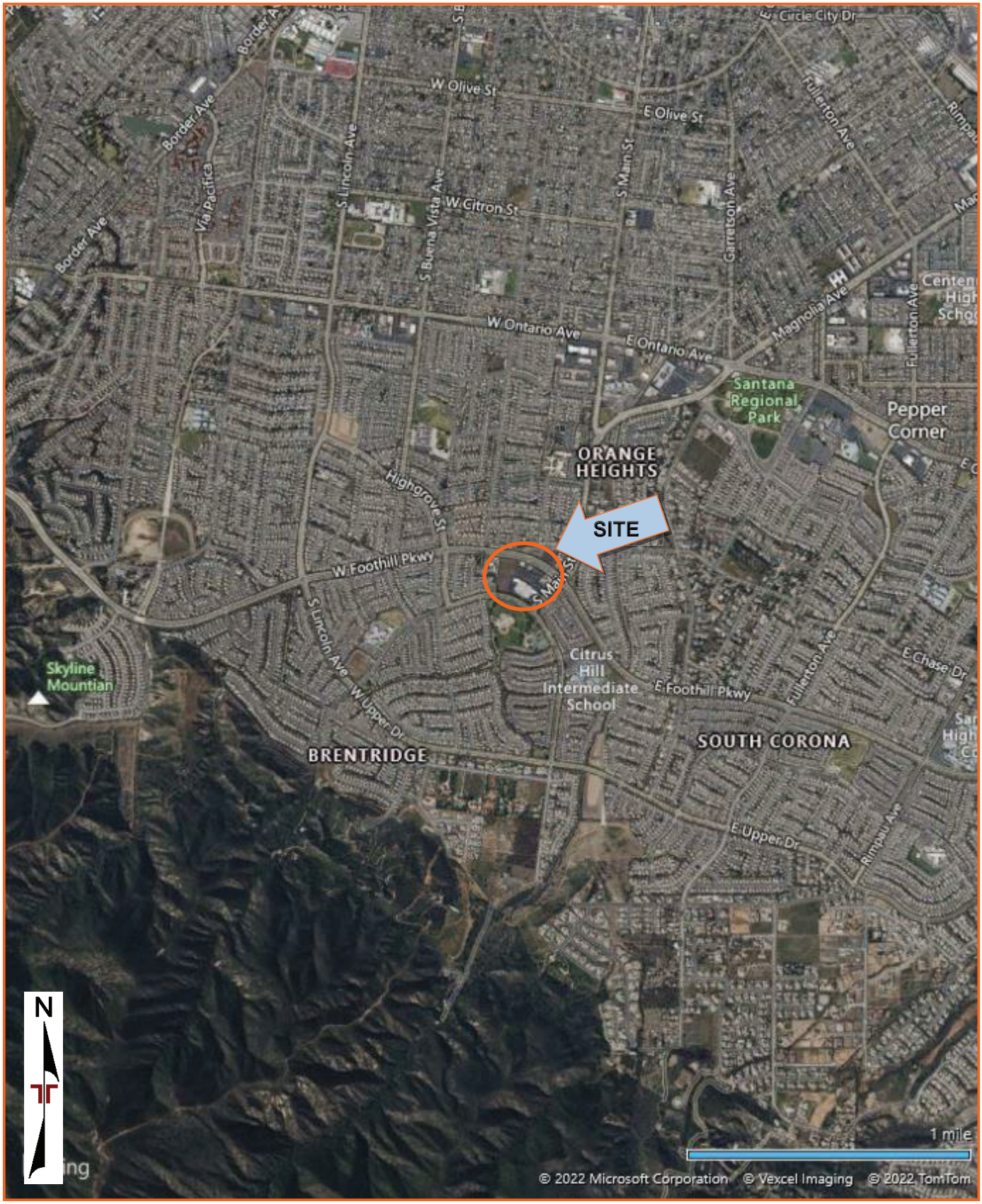


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: CORONA SOUTH, CA (1/1/1997).

EXPLORATION PLAN

Ivy at Mountain Gate ■ Corona, CA
November 10, 2022 ■ Terracon Project No. 60225085

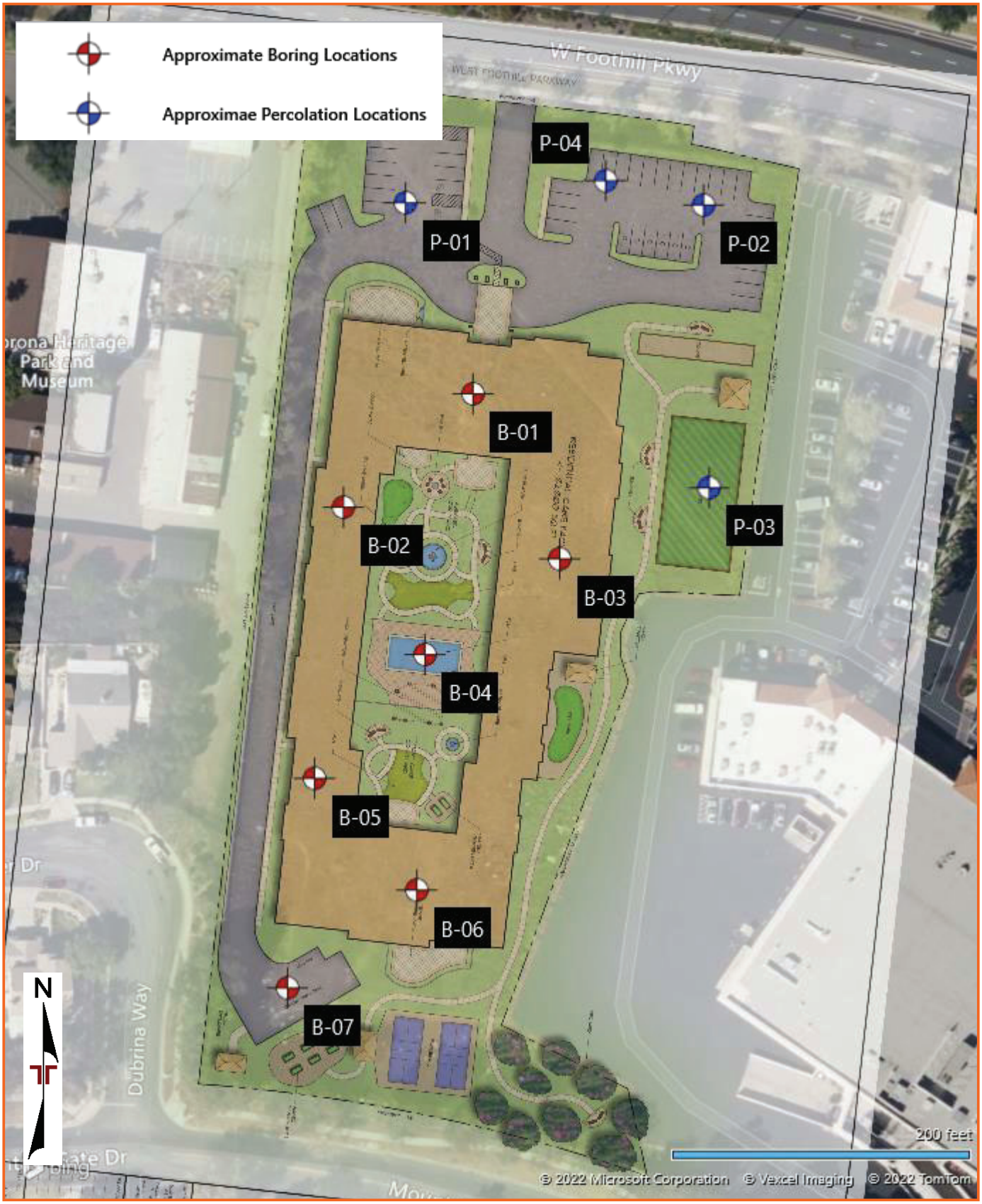


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

EXPLORATION RESULTS

BORING LOG NO. B-1

PROJECT: Ivy at Mountain Gate

CLIENT: Oakmont Senior Living
Irvine, CA

SITE: 430 W Foothill Plwy
Corona, CA

LOCATION See Exploration Plan

Latitude: 33.8446° Longitude: -117.5755°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		FILL - SILTY CLAYEY SAND WITH GRAVEL (SC-SM), trace gravel, brown									
2.5		**SILTY CLAYEY SAND WITH GRAVEL (SC-SM)**, brown, medium dense				14-18-27	24	4.5	118	22-16-6	
			5			13-19-21		5.1	115		
						8-12-18		3.6	105		
10.0		**POORLY GRADED GRAVEL WITH SILT (GP-GM)**, brown, medium dense	10			18-18-24		3.3	113		6
15.0		**SILTY CLAY (CL-ML)**, trace sand and gravel, brown, very stiff	15			4-8-12 N=20				21-15-6	
20.0		**SANDY LEAN CLAY WITH GRAVEL (CL)**, brown, hard	20			4-18-45		9.5	123		
25.0		**SILTY CLAYEY SAND WITH GRAVEL (SC-SM)**, brown, dense	25			8-13-30 N=43					
		very dense	30			34-40-50/2"					
			35								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

Boring Started: 10-04-2022 | Boring Completed: 10-04-2022

Drill Rig: B-61 | Driller: Cal-Pac

Project No.: 60225085

BORING LOG NO. B-1

PROJECT: Ivy at Mountain Gate

CLIENT: Oakmont Senior Living
Irvine, CA

SITE: 430 W Foothill Plwy
Corona, CA

LOCATION See Exploration Plan

Latitude: 33.8446° Longitude: -117.5755°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY CLAYEY SAND WITH GRAVEL (SC-SM), brown, dense *(continued)* dense				19-21-23 N=44					
40.0		**POORLY GRADED GRAVEL WITH SAND (GP)**, trace clay, brown to black, very dense	40			18-50/6"					
45.0		**CLAYEY SAND WITH GRAVEL (SC)**, light brown, dense	45			12-17-28 N=45					
50.0		**POORLY GRADED GRAVEL WITH SAND (GP)**, trace clay, brown, dense	50			7-30-49					
51.5		***Boring Terminated at 51.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

Boring Started: 10-04-2022 | Boring Completed: 10-04-2022

Drill Rig: B-61 | Driller: Cal-Pac

Project No.: 60225085

BORING LOG NO. B-2

PROJECT: Ivy at Mountain Gate

CLIENT: Oakmont Senior Living
Irvine, CA

SITE: 430 W Foothill Plwy
Corona, CA

LOCATION See Exploration Plan

Latitude: 33.8444° Longitude: -117.5758°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		FILL - SILTY CLAYEY SAND (SC-SM), brown									
1.5		**SILTY CLAYEY SAND (SC-SM)**, brown, dense									
						20-30-34		3.5	116		40
		medium dense	5			12-13-16		3.7	108	21-15-6	
						12-18-38		4.4	116		
		very dense	10			24-50/6"		5.1	87		
			15			16-50/3"					
20.0		**LEAN CLAY WITH GRAVEL (CL)**, brown, hard	20			10-21-46		10.7	126		
21.5		***Boring Terminated at 21.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

Boring Started: 10-04-2022 | Boring Completed: 10-04-2022

Drill Rig: B-61 | Driller: Cal-Pac

Project No.: 60225085

BORING LOG NO. B-3

PROJECT: Ivy at Mountain Gate

CLIENT: Oakmont Senior Living
Irvine, CA

SITE: 430 W Foothill Plwy
Corona, CA

LOCATION See Exploration Plan

Latitude: 33.8443° Longitude: -117.5753°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		FILL - CLAYEY SAND WITH GRAVEL (SC), light brown									
2.5		**CLAYEY SAND WITH GRAVEL (SC)**, light brown									25
5.0		**POORLY GRADED SAND WITH CLAY AND GRAVEL (SP-SC)**, light brown, medium dense	5			10-13-17		3.2	121		12
7.5		**POORLY GRADED GRAVEL WITH SAND (GP)**, trace clay, brown and dark gray, very dense				30-50/6"		2.3	115		
		medium dense	10			15-19-31		3.5	106		
			15			6-10-17 N=27					
20.0		**CLAYEY SAND WITH GRAVEL (SC)**, brown, dense	20			18-35-35					
21.5		***Boring Terminated at 21.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

Boring Started: 10-04-2022 | Boring Completed: 10-04-2022

Drill Rig: B-61 | Driller: Cal-Pac

Project No.: 60225085

BORING LOG NO. B-4

PROJECT: Ivy at Mountain Gate

CLIENT: Oakmont Senior Living
Irvine, CA

SITE: 430 W Foothill Plwy
Corona, CA

LOCATION See Exploration Plan

Latitude: 33.8439° Longitude: -117.5758°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		CLAYEY SAND WITH GRAVEL (SC), brown									
		medium dense				12-11-16		4.1	109		18
			5			10-17-21		3.4	116		
7.5		**CLAYEY GRAVEL WITH SAND (GC)**, brown, medium dense				15-31-21		3.1	125		
			10			14-14-15		5.0	113		19
15.0		**CLAYEY SAND WITH GRAVEL (SC)**, brown, dense	15			5-14-22 N=36					
20.0		**SANDY LEAN CLAY WITH GRAVEL (CL)**, brown, very stiff	20			10-17-21		6.7	119		
25.0		**CLAYEY SAND WITH GRAVEL (SC)**, brown, dense	25			18-23-22 N=45					
31.0		very dense	30			14-50/6"					
		Boring Terminated at 31 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

Boring Started: 10-04-2022 | Boring Completed: 10-04-2022

Drill Rig: B-61 | Driller: Cal-Pac

Project No.: 60225085

BORING LOG NO. B-5

PROJECT: Ivy at Mountain Gate

CLIENT: Oakmont Senior Living
Irvine, CA

SITE: 430 W Foothill Plwy
Corona, CA

LOCATION See Exploration Plan

Latitude: 33.8437° Longitude: -117.5756°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		POORLY GRADED SAND WITH SILTY CLAY AND GRAVEL (SP-SC), brown									
		medium dense				10-16-20		4.8	115		11
5.0		**POORLY GRADED GRAVEL WITH SILTY CLAY (GP-GC)**, trace gravel, brown, medium dense	5			7-11-13		5.4	119		
						6-14-17		5.8	116	22-16-6	
10.0		**LEAN CLAY WITH GRAVEL (CL)**, trace sand, brown, very stiff	10			5-10-15		8.8	124		
15.0		**CLAYEY SAND WITH GRAVEL (SC)**, brown, dense	15			10-16-20 N=36					
		medium dense	20			18-25-25		7.3	122		
21.5		***Boring Terminated at 21.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

Boring Started: 10-05-2022 | Boring Completed: 10-05-2022

Drill Rig: B-61 | Driller: Cal-Pac

Project No.: 60225085

BORING LOG NO. B-6

PROJECT: Ivy at Mountain Gate

CLIENT: Oakmont Senior Living
Irvine, CA

SITE: 430 W Foothill Plwy
Corona, CA

LOCATION See Exploration Plan

Latitude: 33.8441° Longitude: -117.5756°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		POORLY GRADED GRAVEL WITH CLAY AND SAND (GP-GC), gray and brown									
		brown, medium dense				16-20-27		4.5	116		9
			5			17-24-22		5.6	119		
		gray to dark gray, medium dense				13-16-19		5.2	129		
			10			13-21-36		3.6	119		
15.0		**SANDY LEAN CLAY (CL)**, brown, hard	15			17-12-20 N=32					
20.0		**CLAYEY SAND WITH GRAVEL (SC)**, brown, medium dense	20			5-22-32					
		very dense	25			17-24-28 N=52					
		medium dense	30			22-28-21					
31.5		***Boring Terminated at 31.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

Boring Started: 10-05-2022 | Boring Completed: 10-05-2022

Drill Rig: B-61 | Driller: Cal-Pac

Project No.: 60225085

BORING LOG NO. B-7

PROJECT: Ivy at Mountain Gate

CLIENT: Oakmont Senior Living
Irvine, CA

SITE: 430 W Foothill Plwy
Corona, CA

LOCATION See Exploration Plan

Latitude: 33.8435° Longitude: -117.5759°

DEPTH	GRAPHIC LOG	DESCRIPTION	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY CLAYEY SAND WITH GRAVEL (SC-SM), light brown								
		dense			28-31-34		4.9	126		
5					13-24-38		3.4	120	21-15-6	
7.5		**CLAYEY SAND WITH GRAVEL (SC)**, brown, medium dense			8-17-26		6.9	119		40
10		dense			25-43-42		6.8	124		
15		light brown			15-21-20 N=41					
16.5		***Boring Terminated at 16.5 Feet***								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

Boring Started: 10-05-2022 | Boring Completed: 10-05-2022

Drill Rig: B-61 | Driller: Cal-Pac

Project No.: 60225085

BORING LOG NO. P-1

PROJECT: Ivy at Mountain Gate

CLIENT: Oakmont Senior Living
Irvine, CA

SITE: 430 W Foothill Plwy
Corona, CA

LOCATION See Exploration Plan

Latitude: 33.8450° Longitude: -117.5756°

GRAPHIC LOG	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	FILL - CLAYEY SAND (SC), brown medium dense				8-11-12 N=23					
		5			5-7-11 N=18					29
	6.5 ***Boring Terminated at 6.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

Boring Started: 10-04-2022 | Boring Completed: 10-04-2022

Drill Rig: B-61 | Driller: Cal-Pac

Project No.: 60225085

BORING LOG NO. P-2

PROJECT: Ivy at Mountain Gate

CLIENT: Oakmont Senior Living
Irvine, CA

SITE: 430 W Foothill Plwy
Corona, CA

LOCATION See Exploration Plan

Latitude: 33.8449° Longitude: -117.5750°

DEPTH	GRAPHIC LOG	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		FILL - SILTY CLAYEY SAND WITH GRAVEL (SC-SM), brown									
		dense				11-22-27 N=49					
			5			14-11-25 N=36				22-15-7	
		medium dense				5-6-9 N=15					
			10			5-5-14 N=19					
13.0		**SILTY CLAYEY SAND WITH GRAVEL (SC-SM)**, brown, very dense									
			15			22-23-35 N=58					15
		loose	20			8-2-6 N=8					
21.5		***Boring Terminated at 21.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

Boring Started: 10-04-2022 | Boring Completed: 10-04-2022

Drill Rig: B-61 | Driller: Cal-Pac

Project No.: 60225085

BORING LOG NO. P-3

PROJECT: Ivy at Mountain Gate

CLIENT: Oakmont Senior Living
Irvine, CA

SITE: 430 W Foothill Plwy
Corona, CA

LOCATION See Exploration Plan

Latitude: 33.8444° Longitude: -117.5750°

GRAPHIC LOG	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	FILL - CLAYEY SAND WITH GRAVEL (SC), brown									
	2.5									
	CLAYEY SAND WITH GRAVEL (SC), brown, medium dense				8-12-16 N=28					39
		5			10-8-7 N=15					
	6.5									
	Boring Terminated at 6.5 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

Boring Started: 10-04-2022 | Boring Completed: 10-04-2022

Drill Rig: B-61 | Driller: Cal-Pac

Project No.: 60225085

BORING LOG NO. P-4

PROJECT: Ivy at Mountain Gate

CLIENT: Oakmont Senior Living
Irvine, CA

SITE: 430 W Foothill Plwy
Corona, CA

LOCATION See Exploration Plan

Latitude: 33.8450° Longitude: -117.5752°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		FILL - CLAYEY SAND WITH GRAVEL (SC), brown									
		dense				21-25-14 N=39					
			5			7-14-26 N=40					
		medium dense				10-9-8 N=17					
10.0		**CLAYEY SAND WITH GRAVEL (SC)**, brown, medium dense	10			5-6-8 N=14					
			15			10-9-8 N=17					32
20.0		**SILTY CLAY WITH GRAVEL (CL-ML)**, brown, hard	20			4-6-9 N=15				22-15-7	
21.5		***Boring Terminated at 21.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

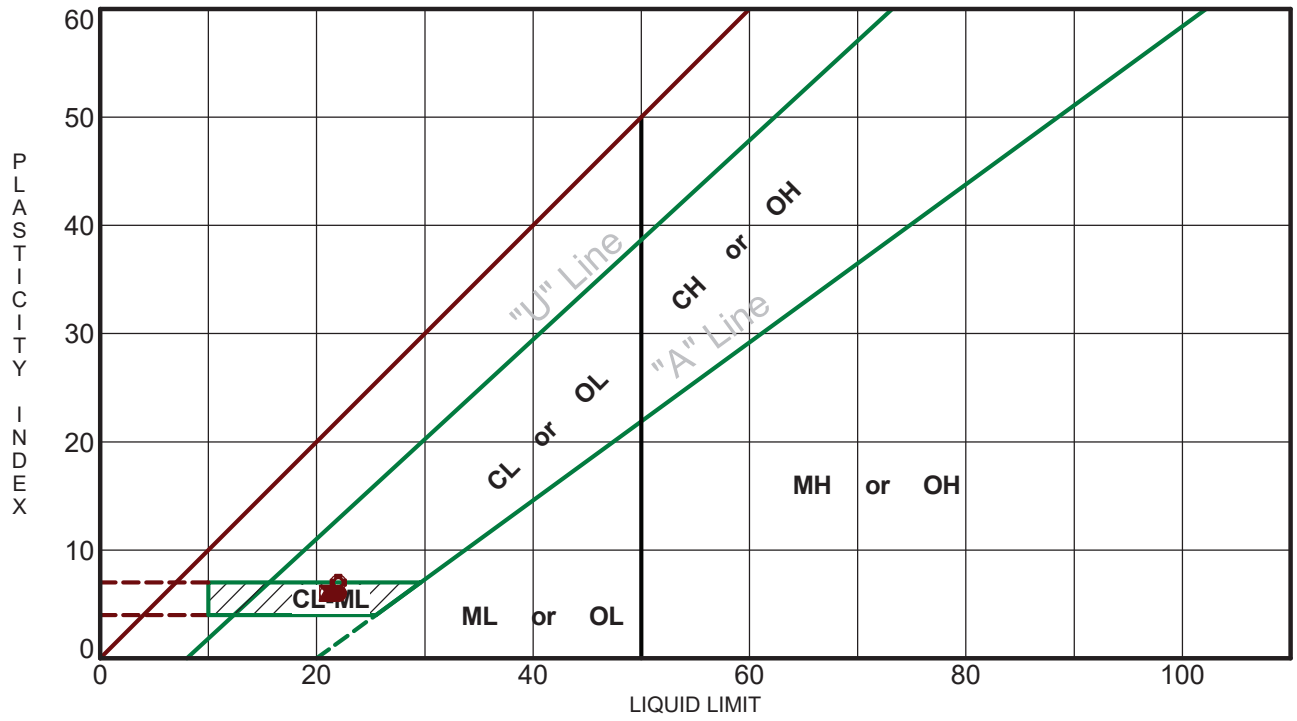
Boring Started: 10-04-2022 | Boring Completed: 10-04-2022

Drill Rig: B-61 | Driller: Cal-Pac

Project No.: 60225085

ATTERBERG LIMITS RESULTS

ASTM D4318



Boring ID		Depth (Ft)	LL	PL	PI	Fines	USCS	Description
●	B-1	2.5 - 4	22	16	6		SC-SM	SILTY CLAYEY SAND WITH GRAVEL
⊠	B-1	15 - 16.5	21	15	6		CL-ML	SILTY CLAY
▲	B-2	5 - 6.5	21	15	6		SC-SM	SILTY CLAYEY SAND
★	B-5	7.5 - 9	22	16	6		GP-GC	POORLY GRADED GRAVEL WITH SILTY CLAY
⊙	B-7	5 - 6.5	21	15	6		SC-SM	SILTY CLAYEY SAND WITH GRAVEL
✿	P-2	5 - 6.5	22	15	7		SC-SM	SILTY CLAYEY SAND WITH GRAVEL
○	P-4	20 - 21.5	22	15	7		CL-ML	SILTY CLAY WITH GRAVEL

PROJECT: Ivy at Mountain Gate

PROJECT NUMBER: 60225085

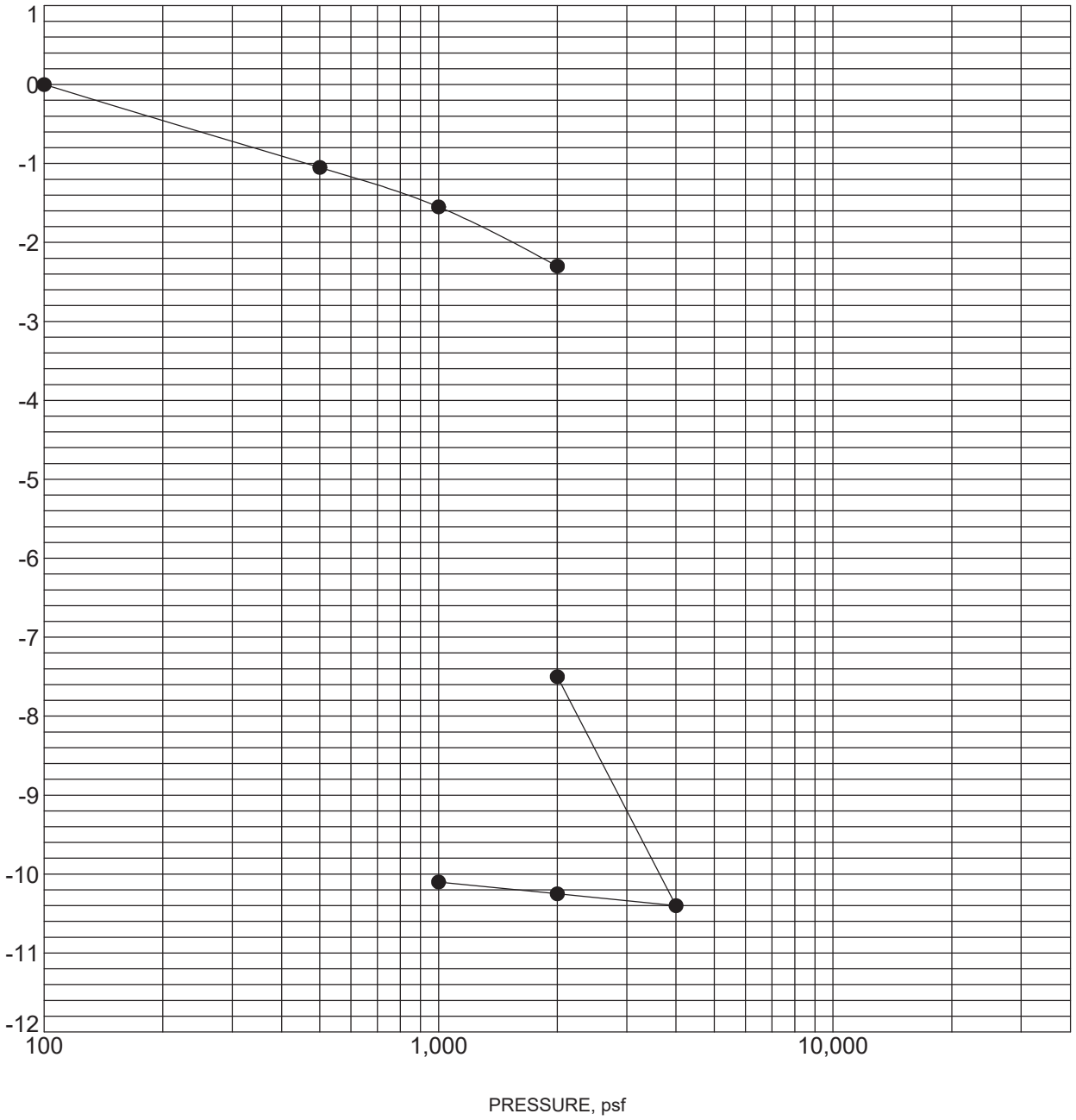
SITE: 430 W Foothill Plwy
Corona, CA

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

CLIENT: Oakmont Senior Living
Irvine, CA

SWELL CONSOLIDATION TEST

ASTM D2435



Specimen Identification			Classification	γ_d, pcf	WC, %
●	B-1	5 - 6.5 ft	SILTY CLAYEY SAND WITH GRAVEL	115	5.1

NOTES: water added at 2000 psf

PROJECT: Ivy at Mountain Gate

PROJECT NUMBER: 60225085

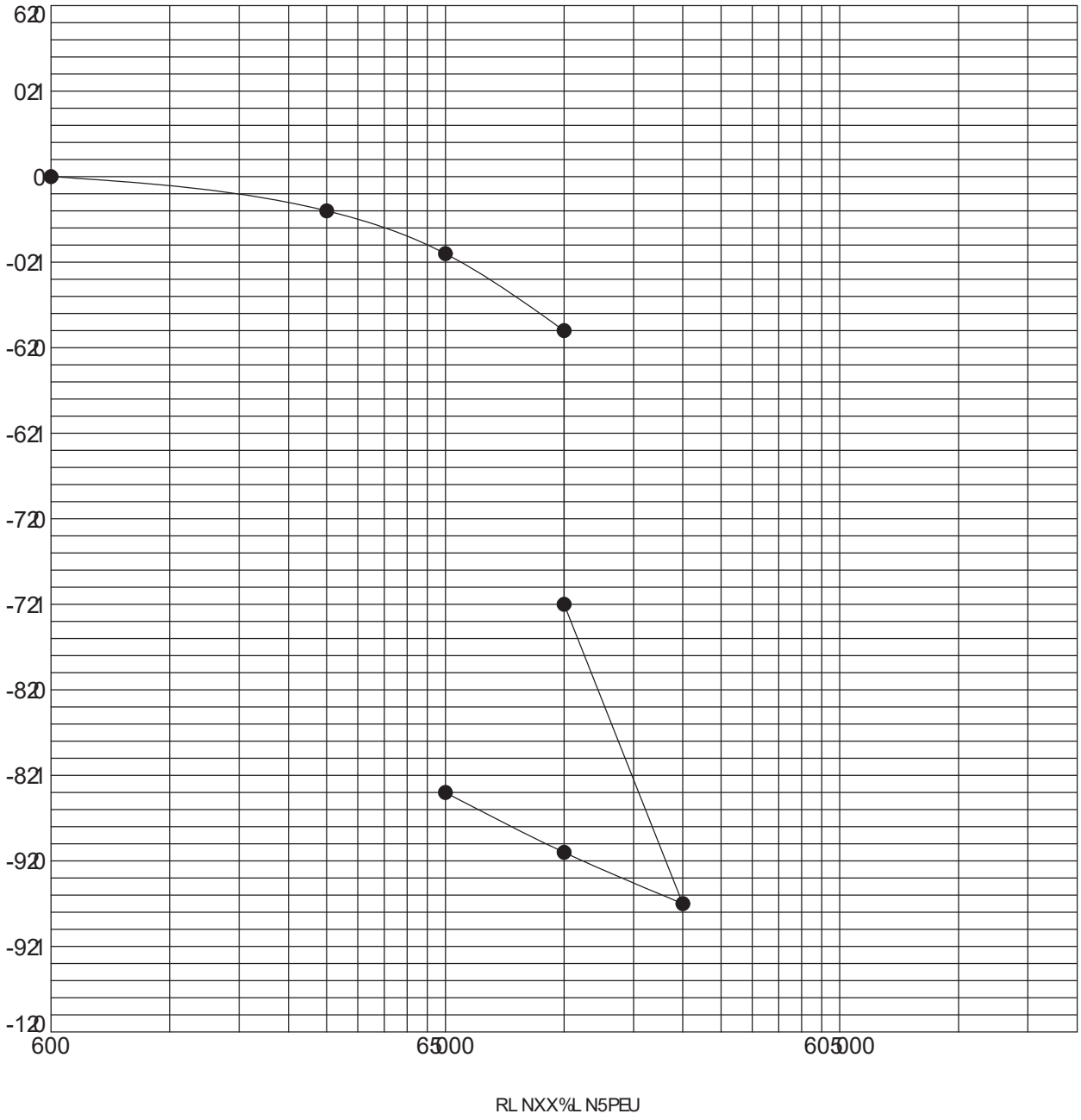
SITE: 430 W Foothill Plwy
Corona, CA

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

CLIENT: Oakmont Senior Living
Irvine, CA

SWELL CONSOLIDATION TEST

ASTM D2435



XPwcHk wy ,t wy:hUtcOthFy		r iCEEHUtcOthFy	γ_d, pcf	WC, %
●	J-_ 721 - 9 U	X,AI Hr A4HNH X4Sg B ,I D uL4YNA	67C	921

Sp I NXsf OwaOt t wt O 7000 PEU

RLpeNr I s ,nl O d Fvy:Oty u Ow

X,I Ns 980 B WFF:ohii Rif I
r FaFyO5r 4

Terracon
78096 4nwyht OgwAOr OaF:OX:w810
AOmyODhiiE5r 4

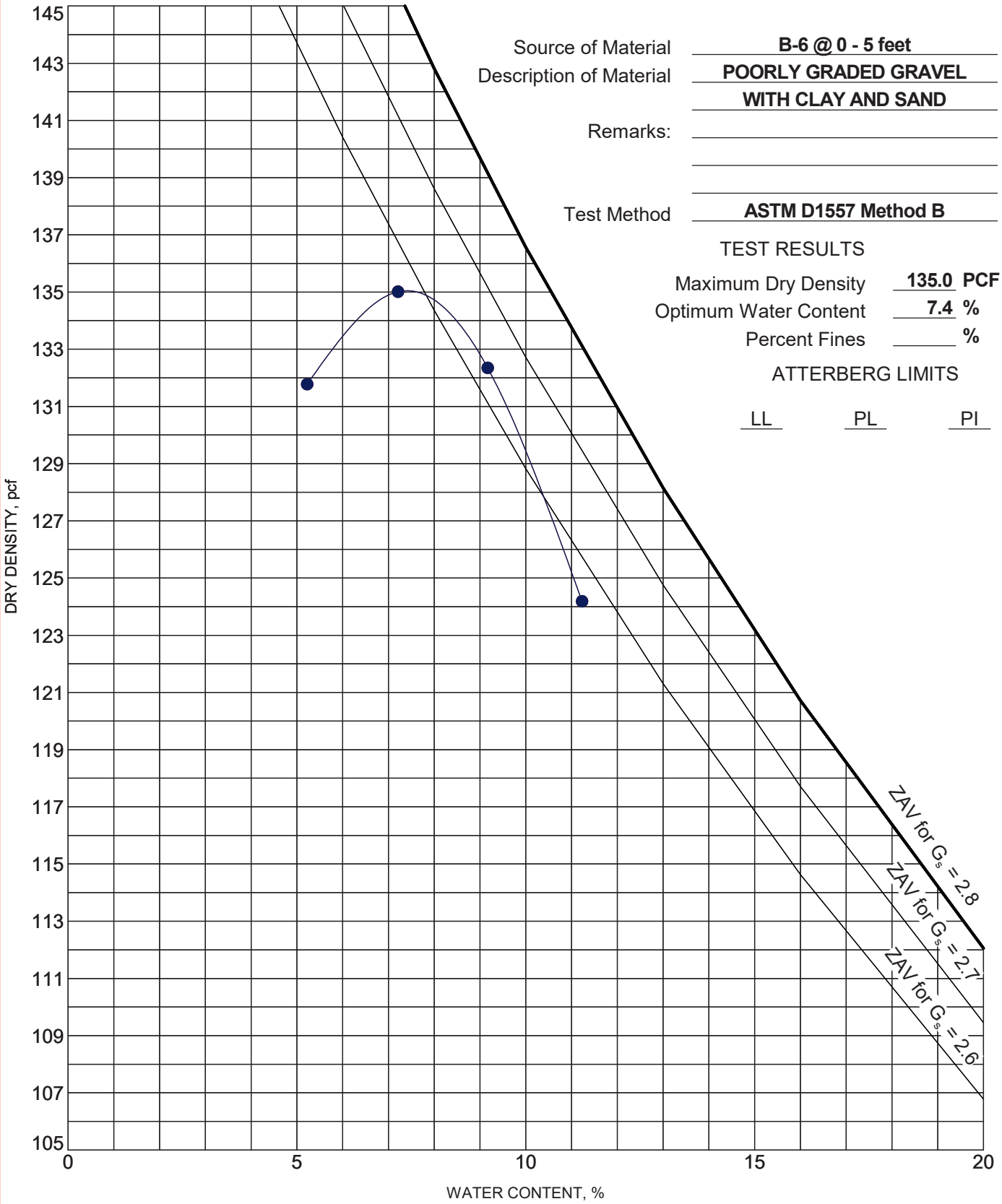
RLpeNr I S%d JNLs C07710Mfl

r A,NSI s p OGk Fy: XwyhFaAhnlym
,anlyw5r 4

A4JpL4I pLH I NXI X4L N Sp I Y4Ag ,WXNR4L4I Ng WLpd pL,u,S4ALNRp LI 2 I r Vr p SXp AVXI L4,S-%Xr X C07710Mf ,YH4I d p %SI 4,S u 2u Re I NLL4r p SVg4I 4I Nd RA4I N2ug I 60.70.77

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material	**B-6 @ 0 - 5 feet**
Description of Material	**POORLY GRADED GRAVEL WITH CLAY AND SAND**
Remarks:	
Test Method	**ASTM D1557 Method B**

TEST RESULTS

Maximum Dry Density	**135.0**	**PCF**
Optimum Water Content	**7.4**	**%**
Percent Fines		**%**

ATTERBERG LIMITS

LL	PL	PI

PROJECT: Ivy at Mountain Gate

PROJECT NUMBER: 60225085

SITE: 430 W Foothill Plwy
Corona, CA

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

CLIENT: Oakmont Senior Living
Irvine, CA

750 Pilot Road, Suite F
Las Vegas, Nevada 89119
(702) 597-9393

Client
Oakmont Senior Living

Project
Ivy at Mountain Gate

Sample Submitted By: Terracon (60) **Date Received:** 10/11/2022 **Lab No.: 22-0711**

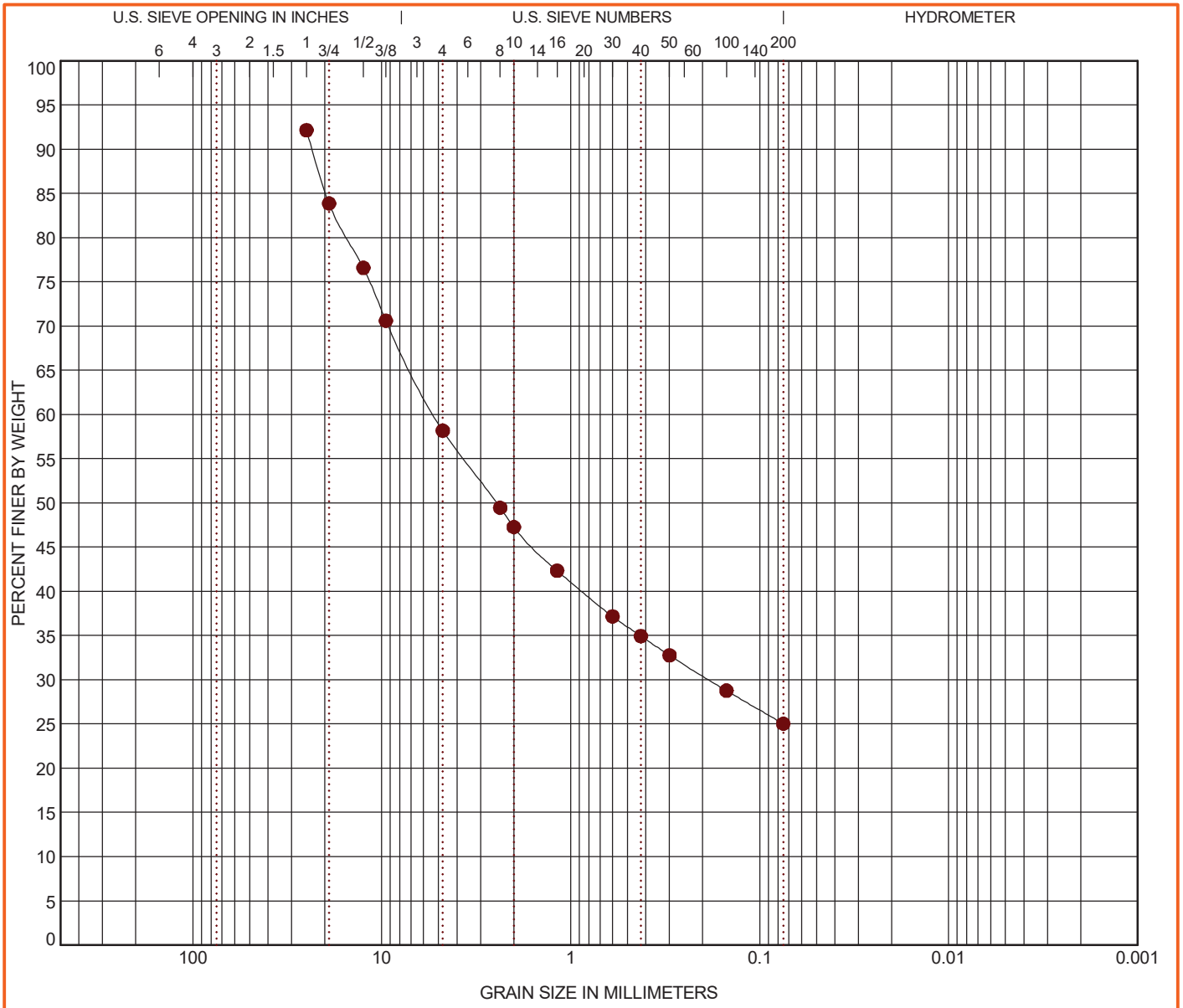
Results of Corrosion Analysis

Sample Number	--
Sample Location	B-5
Sample Depth (ft.)	0.0-5.0
pH Analysis, ASTM G 51	8.09
Water Soluble Sulfate (SO4), ASTM C 1580 (percent %)	0.02
Sulfides, AWWA 4500-S D, (mg/kg)	Nil
Chlorides, ASTM D 512, (mg/kg)	45
Red-Ox, ASTM G 200, (mV)	+735
Total Salts, AWWA 2540, (mg/kg)	131
Resistivity, ASTM G 57, (ohm-cm)	6014

Analyzed By:
Nathan Campo
Engineering Technician II

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring ID	Depth (Ft)	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
B-3	0 - 5	CLAYEY SAND WITH GRAVEL (SC)						

Boring ID	Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Silt	%Fines	%Clay
B-3	0 - 5	25	5.259	0.186			34.0	33.1		25.0	

PROJECT: Ivy at Mountain Gate

SITE: 430 W Foothill Plwy
Corona, CA

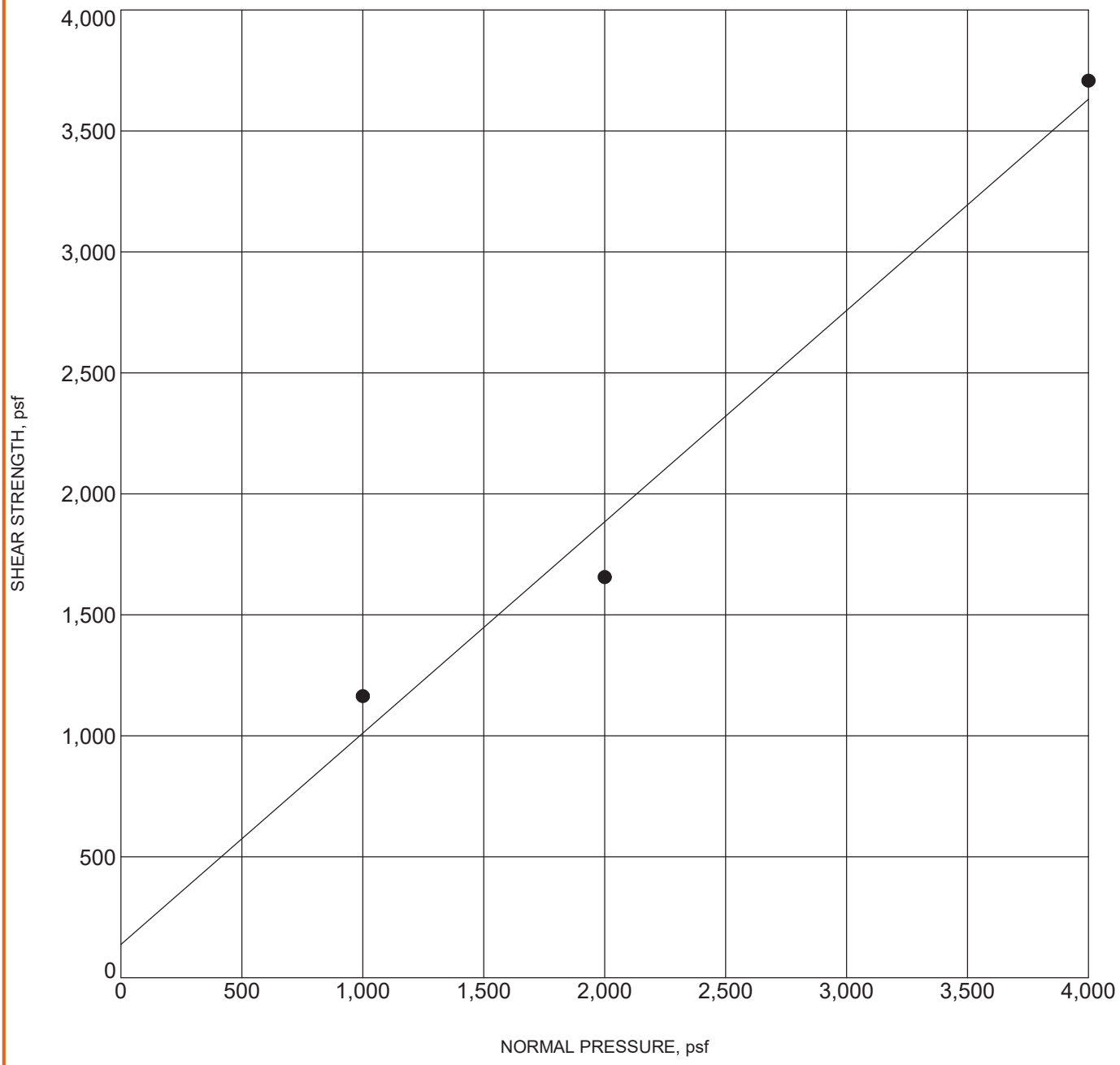
Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

PROJECT NUMBER: 60225085

CLIENT: Oakmont Senior Living
Irvine, CA

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 60225085 IVY AT MOUNTAIN G.GPJ TERRACON_DATATEMPLATE.GDT 11/9/22

DIRECT SHEAR TEST ASTM D3080



Specimen Identification	Classification	γ_d, pcf	WC,%	c, psf	$\phi°$
● B-5 5.0ft	POORLY GRADED GRAVEL WITH SILTY CLAY (GP-GC)	119	5	138	41

PROJECT: Ivy at Mountain Gate

PROJECT NUMBER: 60225085

SITE: 430 W Foothill Plwy
Corona, CA

Terracon
23041 Avenida De La Carlota Ste 350
Laguna Hills, CA

CLIENT: Oakmont Senior Living
Irvine, CA

SUPPORTING INFORMATION

UNIFIED SOIL CLASSIFICATION SYSTEM

Terracon GeoReport

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or [Cc<1 or Cc>3.0] [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or [Cc<1 or Cc>3.0] [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G, H, I]
			Fines classify as CL or CH		SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A"		CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K, L, M, N]
			Liquid limit - not dried			Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K, L, M]
			PI plots below "A" line		MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K, L, M, P]
			Liquid limit - not dried			Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

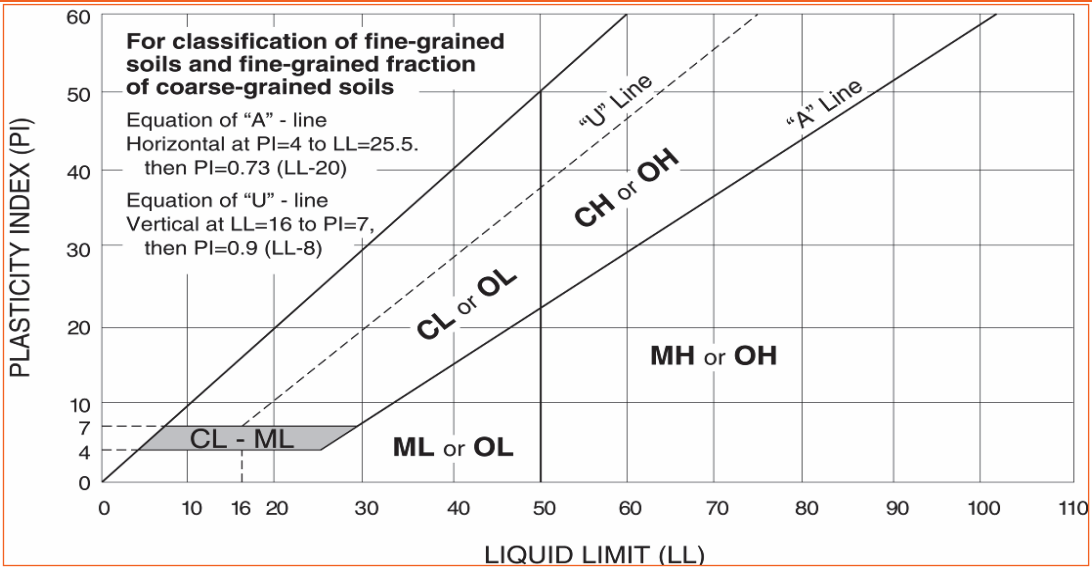
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.

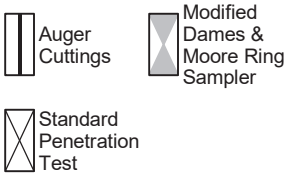


GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS
Ivy at Mountain Gate ■ Corona, CA
Terracon Project No. 60225085

Terracon GeoReport

SAMPLING



WATER LEVEL

Water Initially Encountered

Water Level After a Specified Period of Time

Water Level After a Specified Period of Time

Cave In Encountered

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

N	**Standard Penetration Test Resistance (Blows/Ft.)**
(HP)	**Hand Penetrometer**
(T)	**Torvane**
(DCP)	**Dynamic Cone Penetrometer**
UC	**Unconfined Compressive Strength**
(PID)	**Photo-Ionization Detector**
(OVA)	**Organic Vapor Analyzer**

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

LOCATION AND ELEVATION NOTES

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		**CONSISTENCY OF FINE-GRAINED SOILS** (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (tsf)**	**Standard Penetration or N-Value Blows/Ft.**
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

RELEVANCE OF SOIL BORING LOG

The soil boring logs contained within this document are intended for application to the project as described in this document. Use of these soil boring logs for any other purpose may not be appropriate.

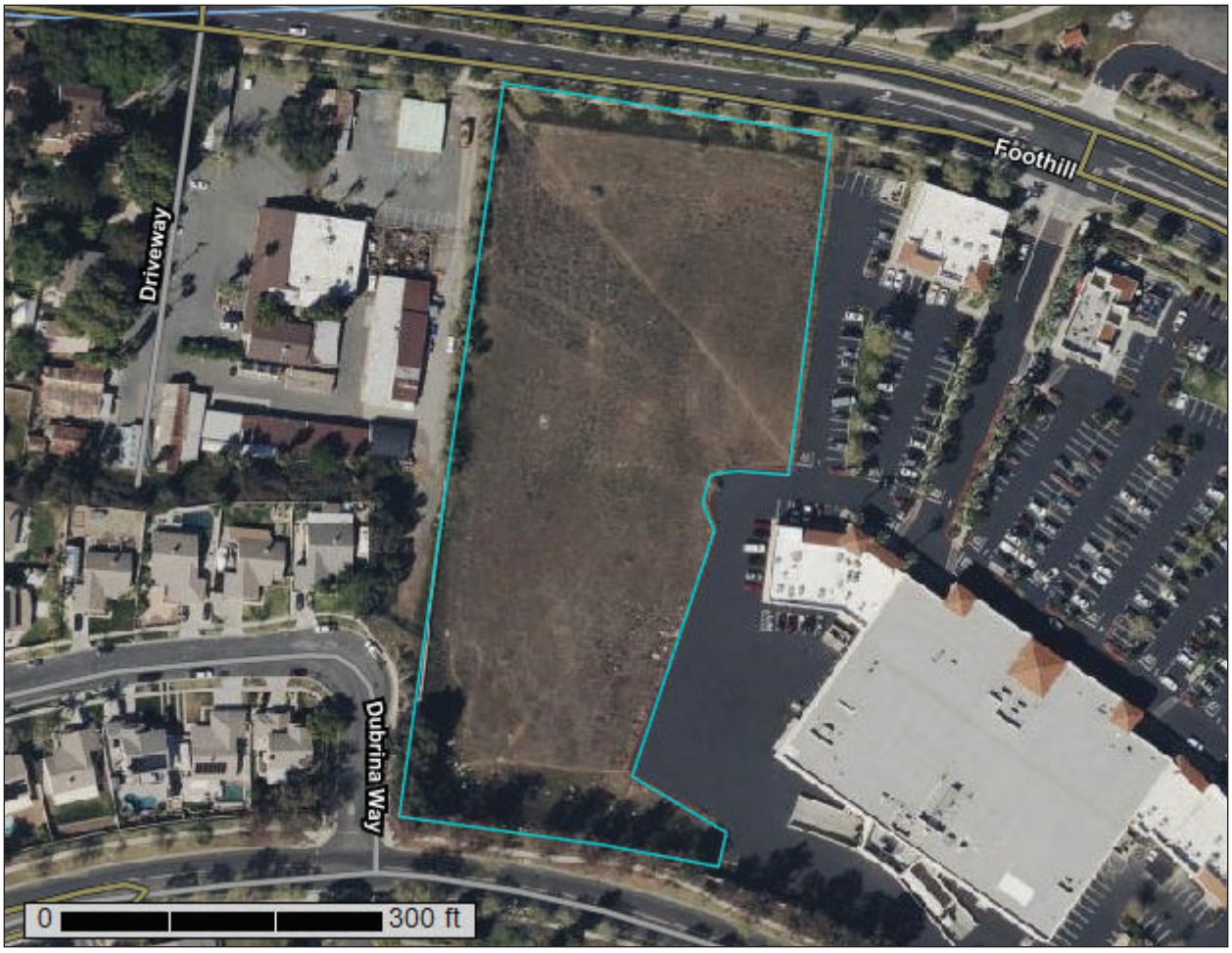
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Western Riverside Area, California



April 19, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

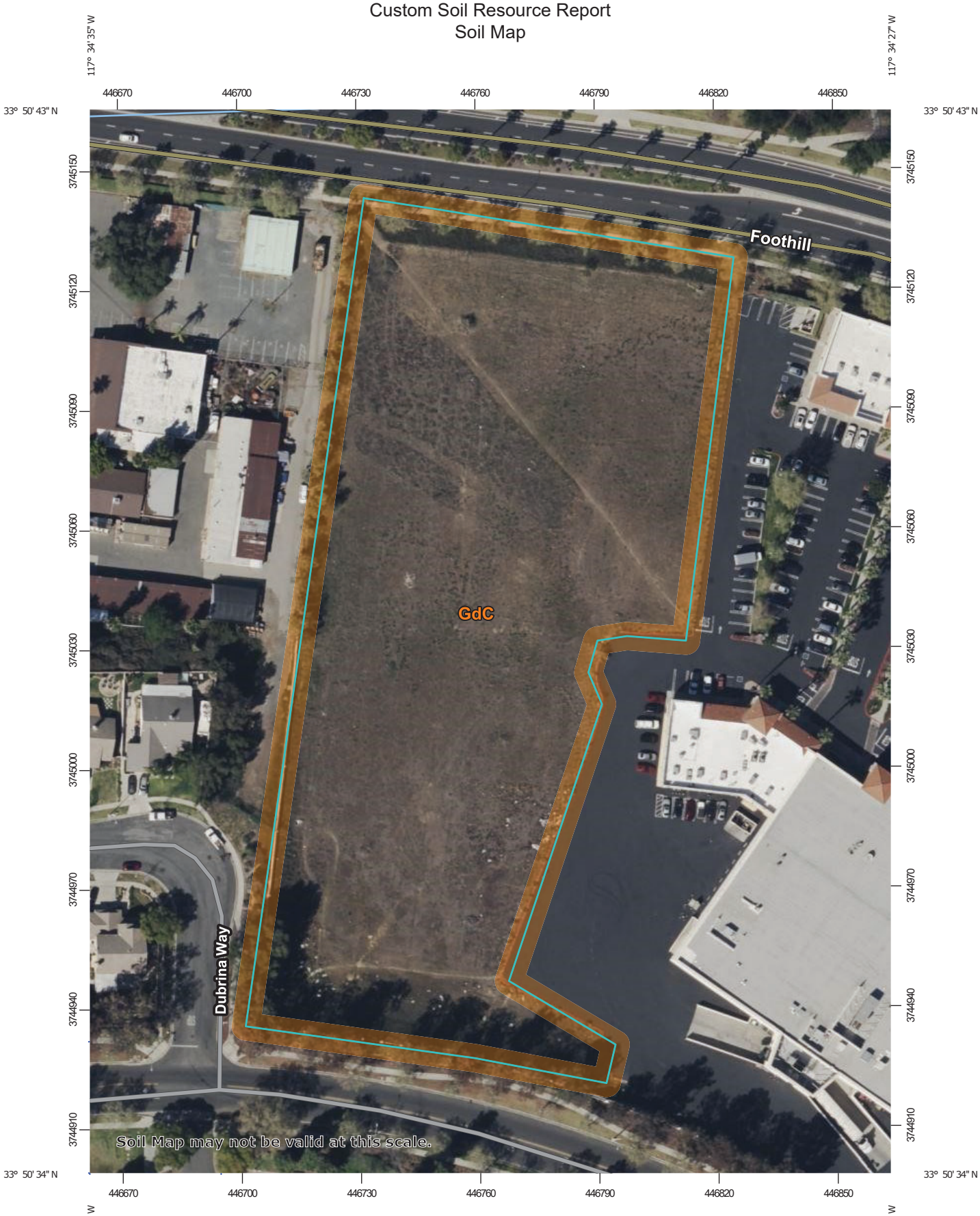
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:1,300 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 15, Sep 6, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 14, 2022—Mar 17, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GdC	Garretson gravelly very fine sandy loam, 2 to 8 percent slopes	4.3	100.0%
Totals for Area of Interest		**4.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Western Riverside Area, California

GdC—Garretson gravelly very fine sandy loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: hcv5
Elevation: 50 to 3,000 feet
Mean annual precipitation: 12 to 25 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 250 to 350 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Garretson and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Garretson

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from metasedimentary rock

Typical profile

H1 - 0 to 10 inches: gravelly very fine sandy loam
H2 - 10 to 53 inches: gravelly loam
H3 - 53 to 72 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Minor Components

Perkins

Percent of map unit: 5 percent
Hydric soil rating: No

Arbuckle

Percent of map unit: 5 percent
Hydric soil rating: No

Cortina

Percent of map unit: 5 percent
Hydric soil rating: No

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Appendix 4: Historical Site Conditions

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

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

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

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

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

Company Name	BKF Engineers	Date	11/15/2023
Designed by	RL	Case No	
Company Project Number/Name	20221001 The Ivy Mountain Gate		

BMP Identification

BMP NAME / ID: BMP 1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity: I = 0.20 in/hr

Drainage Management Area Tabulation

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

DMAs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
DMA 1	*42419*	*Concrete or Asphalt*	*1*	*0.89*	*37837.7*			
DMA 1	*20257.5*	*Ornamental Landscaping*	*0.1*	*0.11046*	*2237.6*			
DMA 1	*20476.8*	*Roofs*	*1*	*0.892*	*18265.3*			
	83153.3		***Total***		**58340.6**	**0.20**	***0.3***	***0.305***

Notes:

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

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

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

Company Name	BKF Engineers	Date	11/15/2023
Designed by	RL	Case No	
Company Project Number/Name	20221001 The Ivy Mountain Gate		

BMP Identification

BMP NAME / ID: BMP 2

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity I = 0.20 in/hr

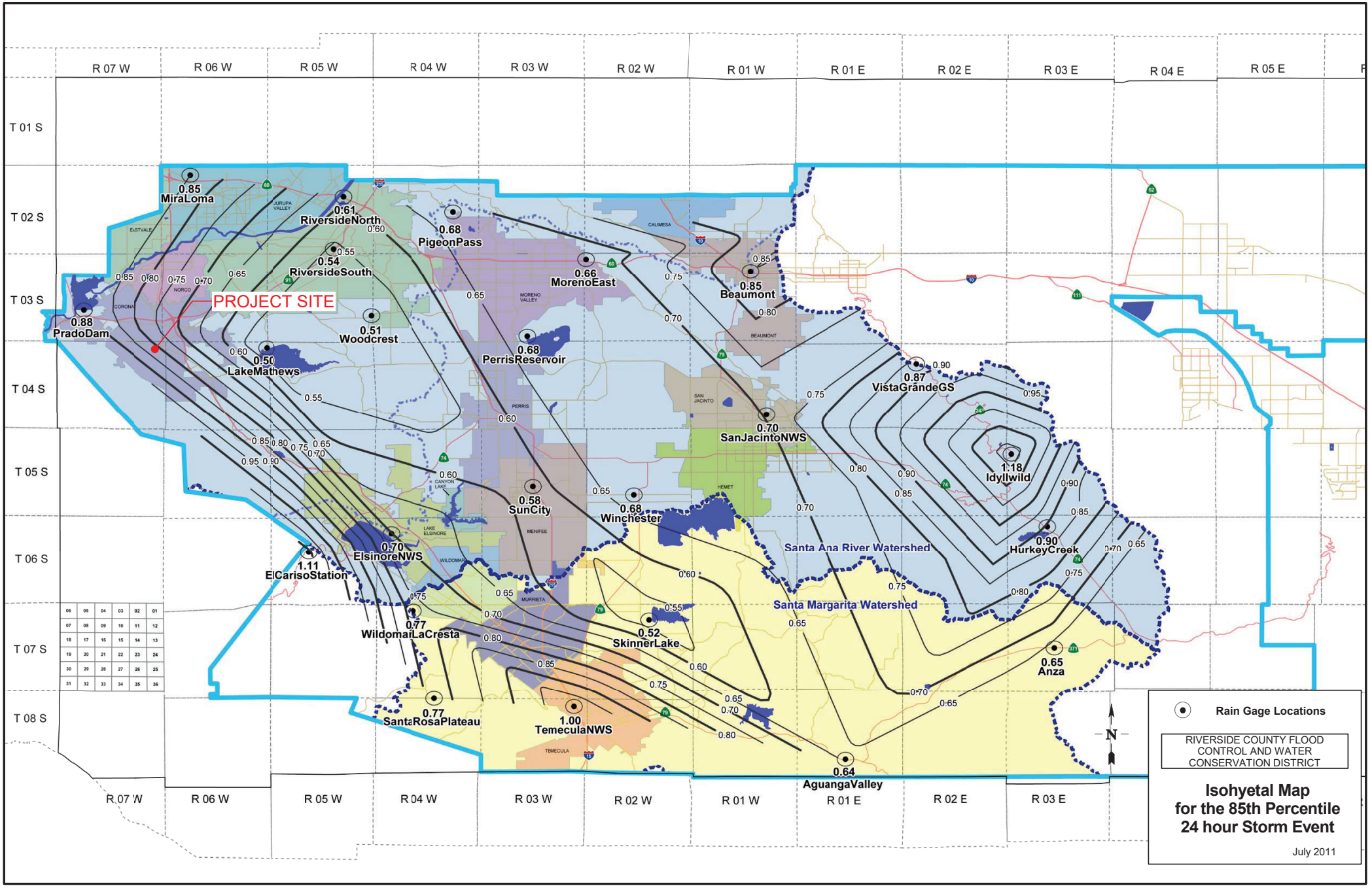
Drainage Management Area Tabulation

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

DMAs

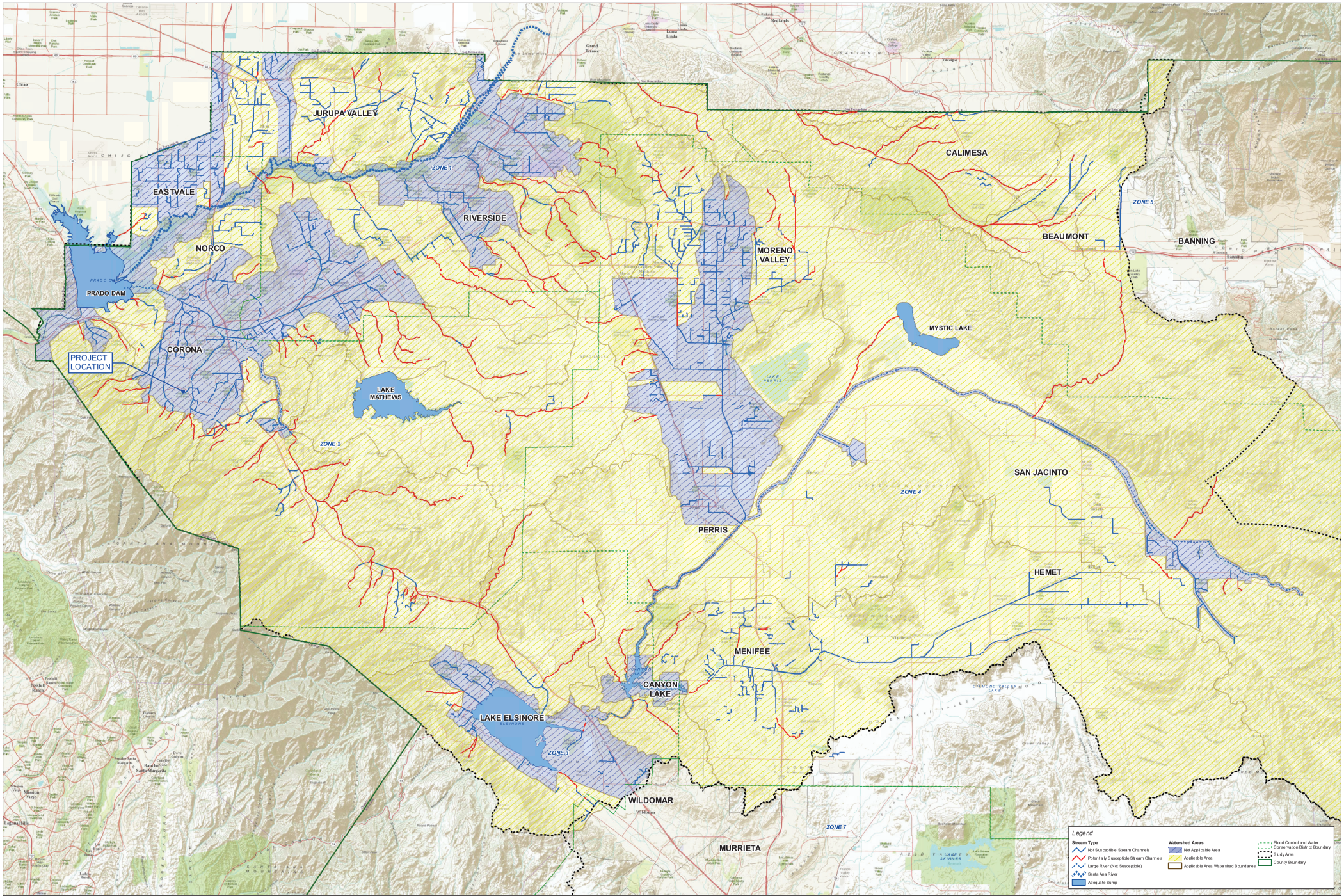
DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
DMA 1	*65628.5*	*Concrete or Asphalt*	*1*	*0.89*	*58540.6*			
DMA 1	*16674.9*	*Ornamental Landscaping*	*0.1*	*0.11046*	*1841.9*			
DMA 1	*34433.9*	*Roofs*	*1*	*0.892*	*30715*			
	116737.3	**Total**			**91097.5**	**0.20**	***0.4***	***0.433***

Notes:


R 07 W
R 06 W
R 05 W
R 04 W
R 03 W
R 02 W
R 01 W
R 01 E
R 02 E
R 03 E
R 04 E
R 05 E
T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S
PROJECT SITE
0.85 MiraLoma
0.61 RiversideNorth
0.54 RiversideSouth
0.68 PigeonPass
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.50 LakeMathews
0.68 PerrisReservoir
0.87 VistaGrandeGS
0.70 SanJacintoNWS
1.18 Idyllwild
0.58 SunCity
0.68 Winchester
0.70 ElsinoreNWS
1.11 ElCarisoStation
0.90 HurkeyCreek
Santa Ana River Watershed
Santa Margarita Watershed
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley
N
Rain Gage Locations
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
Isohyetal Map for the 85th Percentile 24 hour Storm Event
July 2011

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern



HCOC Applicability Map

Hydromodification Susceptibility Documentation Report and Mapping
Riverside County Flood Control and Water Conservation District

Map 2

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

Appendix 8
STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section G of the 2014 SMR WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1on page 31 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

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

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1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☑ **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. N/A Show self-retaining landscape areas, if any. N/A 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://www.rcflood.org/stormwater/Downloads/LandscapeGardenBrochure.pdf ☑ Provide IPM information to new owners, lessees and operators.

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

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❑ **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://www.rcflood.org/stormwater/Downloads/IndustrialCommercialFacilities.pdf
❑ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	❑ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area. ❑ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ❑ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	❑ Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for: ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release (CalARP) ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank www.cchealth.org/groups/hazmat/	❑ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

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

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

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

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

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

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☑ **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.	

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☑ **P.** Plazas, sidewalks, and parking lots.			☑ Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Appendix 9: O&M

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

OPERATIONS & MAINTENANCE CHECKLIST

Date of Inspection: _____ Time: _____

Inspected By: _____
Print Name

Signature: _____

The designated Site Inspector shall use the following guidelines, Section H of the WQMP and sheets in Appendix 9 for maintenance, inspection, and repair of BMPs identified in the WQMP. Include any comments in the box to the right, including reparations made or needed. If reparations are needed, please provide a follow up date. The completed checklist shall be filed in order to keep a record of what was inspected and maintained.

SOURCE CONTROL BMP INSPECTION AND MAINTENANCE LOG			
BMP	Inspection Frequency	Maintenance Activity and Frequency	Observations/ Comments
On-site storm drain inlets	Annually	Stencils will be re-stencilled **as needed** to maintain legibility but at a **minimum of once every five years**	
Interior floor drains and elevator shaft sump pumps	Semi-annually	**Semi-annually or as needed.** Inspect and maintain drains to prevent blockages and overflow	
Need for future indoor & structural pest control	Weekly, Ongoing	**Weekly.** Maintain landscaping using minimum or no pesticides. **Ongoing.** Provide IPM information to new owners, leesees and operators.	
Landscape/ Outdoor Pesticide Use	Weekly, Ongoing	**Weekly.** Maintain landscaping using minimum or no pesticides. **Ongoing.** Provide IPM information to new owners, leesees and operators.	

Refuse areas	Ongoing	**Ongoing.** Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. With “no hazardous materials” signs. Inspect and pick up litter **daily** and clean up spills immediately.	
Fire sprinkler Test Water	Annually	**Annually.** Fire Sprinkler line flush water shall be disposed into the sanitary sewer. Discharge shall not enter the storm drain system.	
Plazas, sidewalks, and parking lots.	Regularly	Sweep plazas, sidewalks, and parking lots **regularly** to prevent accumulation of litter and debris.	

For treatment control maintenance of the modular wetland, adhere to the Maintenance Guidelines for Modular Wetland System – Linear.

Appendix 10: Educational Materials

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

RIVERSIDE COUNTY
WATERSHED PROTECTION

Prevent Water Pollution:

Landscape & Gardening Maintenance Guide

Be the Solution.
Prevent Runoff Pollution.

The water that flows into storm drains is not treated before flowing into Riverside County's creeks, rivers, lakes, and eventually the ocean (unlike the sanitary sewer system). It should never contain washwater or pollutants like pesticides, fertilizer, dirt, leaves, and other hazardous substances generated by landscape and gardening maintenance. If these pollutants are not properly contained, they can runoff into the storm drain and harm our waterways.

Preventing runoff pollution while maintaining your property protects aquatic life, water quality, and keeps our waterways thriving. While taking care of your lawn and garden, make sure to only use pesticides and fertilizers when absolutely necessary and never before rain, clean up spills immediately, and sweep debris regularly.

Landscape & Gardening Pollutant Sources

Overwatering

Dirt, pesticides, fertilizers, pet waste, and organic waste can run off into the storm drain when overwatering occurs.

Lack of Maintenance Before Rain

Pet waste, leaves, grass clippings, and chemicals left on the ground (from property neglect or landscape maintenance) before or during rain can be washed into the storm drain.

Pesticide, Fertilizer, or Herbicide Use Before Rain

Using pesticides, fertilizers, or herbicides 48 hours before or during rain can cause these chemicals to go untreated into our waterways.

Best Management Practices for Landscape & Gardening Maintenance

Protect our waterways while maintaining your lawn and garden by implementing these BMPs (best management practices):

Who We Are

Riverside County Watershed Protection is a partnership program between Riverside County, the Flood Control & Water Conservation District, Coachella Valley Water District, and 27 cities that manage watershed programs which protect, preserve, and enhance the quality of the water and the natural environment of our watersheds.

What We Do

The partnership uses a combination of public education, best management practices, evaluation, and water quality monitoring to eliminate stormwater pollution in our waterways and comply with all federal, state, and local regulations. Our aim is to empower residents with information about pollution prevention and implement tactics that keep our watersheds healthy.

Contact Us

To report pollution:

Call **(800) 506-2555**

Visit **rcwatershed.org/get-involved/report-pollution**

For emergencies, dial **911**

Maintain Your Property

- Prevent overwatering/runoff by only giving your lawn and garden the amount of water it needs. Do not water when it's raining and if you find a leak in your sprinkler system, fix it right away.
- Use a broom (not a hose) to clean regularly. Collect leaves, clippings, and pruning waste and compost them or dispose of them in your organic waste bin.
- Pick up dog waste and dispose of it in a trash can before it rains.
- Schedule large projects for dry weather and do not apply pesticides, herbicides, fungicides or fertilizers before rain events.
- Prevent erosion and runoff pollution during projects by covering piles of soil and stockpiled materials with tarps.

Sweep and Absorb Spills

- Clean solid material spills (i.e., mulch, soils, fertilizer) by sweeping or using a vacuum before disposing in the proper receptacle.
- Clean liquid spills (i.e., pesticides or herbicides) by using absorbents like rags.
- Dispose of hazardous waste (pesticides, garden chemicals, chemical-soaked rags) at collection centers. Visit rcwaste.org/hhw for more information.
- Report any spills that have entered the street, gutter, or storm drain by calling 800-506-2555 or going to rcwatershed.org/get-involved/report-pollution/.

Plan Ahead & Use Less-Toxic Alternatives

- Only use pesticides, fertilizers, or herbicides when absolutely necessary and always follow the instructions on the label. Use less-toxic alternatives, like predatory insects and mulch, whenever possible.
- If chemical use is necessary, check the weather before and only apply them to your lawn or garden when it's not windy and rain is not predicted in the next 48 hours.

For more information about stormwater-safe gardening and landscape maintenance, visit: **rcwatershed.org/residents/at-home/gardening**.

RIVERSIDE COUNTY
WATERSHED PROTECTION

Prevent Water Pollution:

Proper Pool & Spa Maintenance Guide

Be the Solution.
Prevent Runoff Pollution.

The water that flows into storm drains is not treated before flowing into Riverside County's creeks, rivers, lakes, and eventually the ocean (unlike the sanitary sewer system). It should never contain washwater or pollutants like chlorine, salt water, diatomaceous earth, debris, and other hazardous substances generated by pools and spas. If these pollutants are not properly contained and cleaned up right away, they can runoff into the storm drain and harm our waterways.

Preventing runoff pollution while maintaining your pool and spa protects aquatic life, water quality, and keeps our waterways thriving. While taking care of your pool and spa, make sure to follow drainage requirements, clean up chemical spills immediately, and conduct proper maintenance.

Pool & Spa Pollutant Sources

Improper Drainage

Improperly draining pool or spa water in the storm drain or over landscaped areas can cause chlorine, sodium bromide, algae, diatomaceous earth, filter media, dirt, pesticides, pet waste, and other harmful substances to go into our waterways.

Cleaning

Cleaning your pool or spa can produce toxic chemicals, acid, debris, and other harmful substances.

Chemical Spills

Chemical spills that are not cleaned up immediately can leave behind chlorine, sodium bromide, hydrogen peroxide-based products, filter media, and other harmful substances.

Construction

Pool and spa construction without proper containment and disposal methods in place can cause plaster, sediment, and other debris to run off into the storm drain.

Best Management Practices for Pool & Spa Maintenance

Protect our waterways while maintaining your pool and spa by implementing these BMPs (best management practices):

Who We Are

Riverside County Watershed Protection is a partnership program between Riverside County, the Flood Control & Water Conservation District, Coachella Valley Water District, and 27 cities that manage watershed programs which protect, preserve, and enhance the quality of the water and the natural environment of our watersheds.

What We Do

The partnership uses a combination of public education, best management practices, evaluation, and water quality monitoring to eliminate stormwater pollution in our waterways and comply with all federal, state, and local regulations. Our aim is to empower residents with information about pollution prevention and implement tactics that keep our watersheds healthy.

Contact Us

To report pollution:

Call **(800) 506-2555**

Visit **rcwatershed.org/get-involved/report-pollution**

For emergencies, dial **911**

Proper Drainage

PREFERRED OPTION: Pool and spa water should be disposed of in the sanitary sewer.

SECOND OPTION: Gradually release pool water over landscaped areas. Ensure water can be absorbed by soil without runoff, erosion, or flowing into yard drains.

THIRD OPTION: If the first two drainage methods are not possible, draining pool water into the street or storm drain is allowed only if water:

- ✓ pH is between 6.5 and 8.5 and residual chlorine does not exceed 0.1mg/L (parts per million).
- ✓ is clean, clear, and free of algae, algaecides, unusual coloration, and dirt.
- ✓ does not contain any filter media discharge, hydrogen peroxide-based products, or acid cleaning wastes.
- ✓ is at an ambient temperature and free of saline.

All trash and debris must be removed from the flow path between the pool (or spa) and storm drain. Make sure drain hose is not leaking and attentively monitor the drainage flow rate to prevent landscape erosion and runoff.

Some cities in Riverside County have ordinances that ban all pool water disposal into a storm drain. Check your city's stormwater page for more information.

Maintenance

- ✓ Prevent mosquitos and algae by not letting dechlorinated water sit for over 72 hours.
- ✓ Conduct regular pool cleanings, maintain proper chlorine or sodium bromide levels, monitor pH levels, and take care of your pool's filtration and circulation systems.
- ✓ Store chemicals indoors and toss used diatomaceous earth into the garbage.
- ✓ Rinse pool and diatomaceous earth filters over landscaped areas where water and debris can easily soak into the ground.
- ✓ Cover landscape drains while draining pools or rinsing filters over a landscaped area.

For more information about stormwater-safe pool maintenance methods, visit: **rcwatershed.org/residents/at-home/swimming-pools.**

We ♥ our Watershed!

A clean and healthy watershed is important to all of us.

Trash, debris, chemicals and other contaminants from business activities often make their way into the Riverside County storm drain system. This pollutes our drinking water and contaminates waterways, making them unsafe for people and wildlife.

Did you know?

There is a difference between storm drains and sewers.

Storm drains capture rainwater and flow directly to our rivers, lakes and streams – untreated.

Sewers capture and collect water from sinks, toilets and floor drains, and then it is processed and treated before it is released into the environment.

For more information about how you can protect our watershed, please visit:
www.rcwatershed.org

Questions?

If you have questions about Best Management Practices, or if you have questions about illicit dumping and stormwater pollution visit the Pollution Prevention website: rcwatershed.org.

For more information on requirements for all retail food facilities go to Riverside County Environmental Health's website: rivcoeh.org

RIVERSIDE COUNTY
WATERSHED PROTECTION

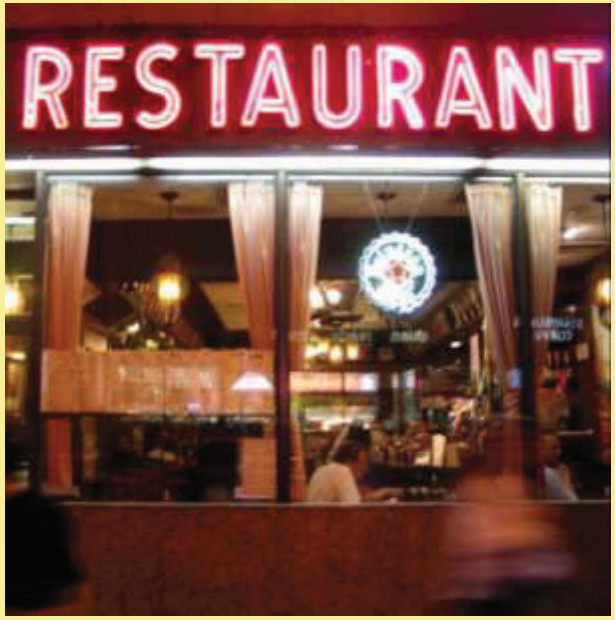
Riverside County Watershed Protection Program is managed by Riverside County Flood Control & Water Conservation District in partnership with 27 Cities, the County of Riverside and the Coachella Valley Water District.

OUR MISSION

"To protect, preserve and enhance the quality of Riverside County watersheds by fostering a community-wide commitment to clean water."

Watershed Protection

Food Service Industry Best Practices



Restaurants
Mobile Food Trucks
Grocery Stores
Bakeries
Delicatessens

Best Kitchen Practices

Recycle Oil & Grease

- Never put oil or grease down the drain. Contain grease and oil by using covered grease storage containers or installing a grease interceptor.
- Never overfill your grease storage container or transport it without a cover.
- Grease control devices must be emptied and cleaned by permitted companies and according to manufacturer's specifications.
- Keep maintenance records on site.
- For a list of oil/grease recycling companies, contact CalRecycle www.calrecycle.ca.gov or contact your local sanitation district.

Managing Spills

- Clean food spills in loading and trash areas by using absorbent materials and sweeping then mopping.
- Discharge mop water into the sewer through a grease interceptor.
- Have spill containment and cleanup kits available.
- To report serious toxic spills, call 911.

Handling Toxic Chemicals

- Dispose of all unwanted toxics materials like cleaners, solvents and detergents through a hazardous waste hauler. These items are not trash!
- Use non-toxic cleaning products whenever possible.
- For information on hazardous waste transporters, call (888) 722-4234.

Dumpster Areas

- Keep dumpster lids closed and the areas around them clean.
- Do not fill with liquid waste or hose them out.
- Call your trash hauler to replace any dumpsters that are damaged or leaking.

Cleaning & Maintenance

- Clean equipment, floor mats, filters and garbage cans in a mop sink, wash rack or floor drain connected to a sanitary sewer.
- Sweep outside areas and put the debris in trash containers DO NOT hose down or sweep into the parking lot or street.
- Outside eating areas and sidewalks may not be hosed down or pressure washed UNLESS the following standards are met:
  - ✓ Use dry cleanup methods prior to any pressure washing – absorbing with kitty litter, sweeping, vacuuming, scraping off dried debris.
  - ✓ Wash waters must be captured for proper disposal: collected waters should be discharged to a sanitary drain.
  - ✓ DO NOT use any chemicals or detergents.
  - ✓ DO NOT wash or pour water in a parking lot, alley, sidewalk or street.

Mobile Food Trucks

- The potential for generating stormwater pollution as part of a mobile food business requires special attention. Cleaning activities are required to be conducted at an approved fixed location with a connection to a sanitary sewer. For more information contact Riverside County Environmental Health at (888) 722-4234.
- Do not discharge wash water into storm drains.
- Clean on a properly equipped wash pad and drain wastewater to a sanitary sewer system.

Food Waste Disposal

- Scrape food waste off of plates, pots and food prep areas and dispose of in the trash.
- Food scraps often contain grease, which can clog sewer pipes and result in costly sewer backups and overflows.
- Never put food waste down the drain.

RECYCLE
USED OIL

Bio Clean

A Forterra Company

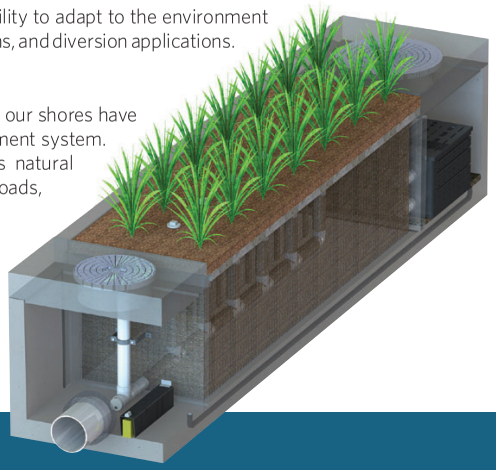
Modular Wetlands® System Linear

A Stormwater Biofiltration Solution

OVERVIEW

The Bio Clean Modular Wetlands® System Linear (MWS Linear) represents a pioneering breakthrough in stormwater technology as the only biofiltration system to utilize patented horizontal flow, allowing for a smaller footprint, higher treatment capacity, and a wide range of versatility. While most biofilters use little or no pretreatment, the Modular Wetlands System Linear incorporates an advanced pretreatment chamber that includes separation and pre-filter cartridges. In this chamber, sediment and hydrocarbons are removed from runoff before entering the biofiltration chamber, reducing maintenance costs and improving performance.

Horizontal flow also gives the system the unique ability to adapt to the environment through a variety of configurations, bypass orientations, and diversion applications.



The Urban Impact

For hundreds of years, natural wetlands surrounding our shores have played an integral role as nature's stormwater treatment system. But as cities grow and develop, our environment's natural filtration systems are blanketed with impervious roads, rooftops, and parking lots.

Bio Clean understands this loss and has spent years re-establishing nature's presence in urban areas, and rejuvenating waterways with the MWS Linear.

PERFORMANCE

The Modular Wetlands® System Linear continues to outperform other treatment methods with superior pollutant removal for TSS, heavy metals, nutrients, hydrocarbons, and bacteria. Since 2007 the MWS Linear has been field tested on numerous sites across the country and is proven to effectively remove pollutants through a combination of physical, chemical, and biological filtration processes. In fact, the MWS Linear harnesses some of the same biological processes found in natural wetlands in order to collect, transform, and remove even the most harmful pollutants.

66% REMOVAL OF DISSOLVED ZINC	**69%** REMOVAL OF TOTAL ZINC	**38%** REMOVAL OF DISSOLVED COPPER	**64%** REMOVAL OF TOTAL PHOSPHORUS	
45% REMOVAL OF NITROGEN	**50%** REMOVAL OF TOTAL COPPER	**95%** REMOVAL OF MOTOR OIL	**67%** REMOVAL OF ORTHO PHOSPHORUS	**85%** REMOVAL OF TSS

APPROVALS

The Modular Wetlands® System Linear has successfully met years of challenging technical reviews and testing from some of the most prestigious and demanding agencies in the nation and perhaps the world. Here is a list of some of the most high-profile approvals, certifications, and verifications from around the country.

Washington State Department of Ecology TAPE Approved
The MWS Linear is approved for General Use Level Designation (GULD) for Basic, Enhanced, and Phosphorus treatment at 1 gpm/ft^2 loading rate. The highest performing BMP on the market for all main pollutant categories.

California Water Resources Control Board, Full Capture Certification
The Modular Wetlands® System is the first biofiltration system to receive certification as a full capture trash treatment control device.

Virginia Department of Environmental Quality, Assignment
The Virginia Department of Environmental Quality assigned the MWS Linear the highest phosphorus removal rating for manufactured treatment devices to meet the new Virginia Stormwater Management Program (VSMP) regulation technical criteria.

Maryland Department of the Environment, Approved ESD
Granted Environmental Site Design (ESD) status for new construction, redevelopment, and retrofitting when designed in accordance with the design manual.

MASTEP Evaluation
The University of Massachusetts at Amherst – Water Resources Research Center issued a technical evaluation report noting removal rates up to 84% TSS, 70% total phosphorus, 68.5% total zinc, and more.

Rhode Island Department of Environmental Management, Approved BMP
Approved as an authorized BMP and noted to achieve the following minimum removal efficiencies: 85% TSS, 60% pathogens, 30% total phosphorus, and 30% total nitrogen.

Texas Commission on Environmental Quality

Atlanta Regional Commission

ADVANTAGES

- HORIZONTAL FLOW BIOFILTRATION
- GREATER FILTER SURFACE AREA
- PRETREATMENT CHAMBER
- PATENTED PERIMETER VOID AREA
- FLOW CONTROL
- NO DEPRESSED PLANTER AREA
- AUTO DRAINDOWN MEANS NO MOSQUITO VECTOR

OPERATION

The Modular Wetlands® System Linear is the most efficient and versatile biofiltration system on the market, and it is the only system with horizontal flow which:

- Improves performance
- Reduces footprint
- Minimizes maintenance

Figure 1 & Figure 2 illustrate the invaluable benefits of horizontal flow and the multiple treatment stages.

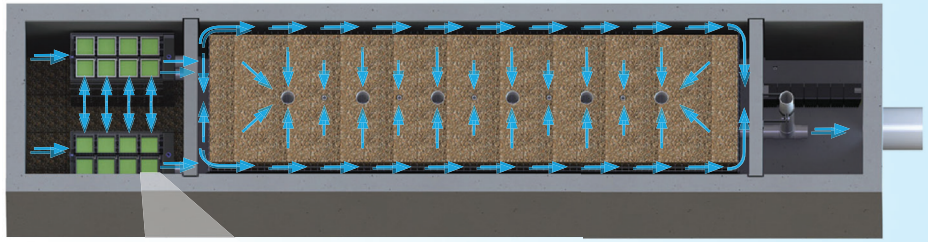


Figure 2,
Top View

2x to 3x more surface area than traditional downward flow bioretention systems.

1 PRETREATMENT

SEPARATION

- Trash, sediment, and debris are separated before entering the pre-filter boxes
- Designed for easy maintenance access

PRE-FILTER BOXES

- Over 25 sq. ft. of surface area per box
- Utilizes BioMediaGREEN™ filter material
- Removes over 80% of TSS and 90% of hydrocarbons
- Prevents pollutants that cause clogging from migrating to the biofiltration chamber

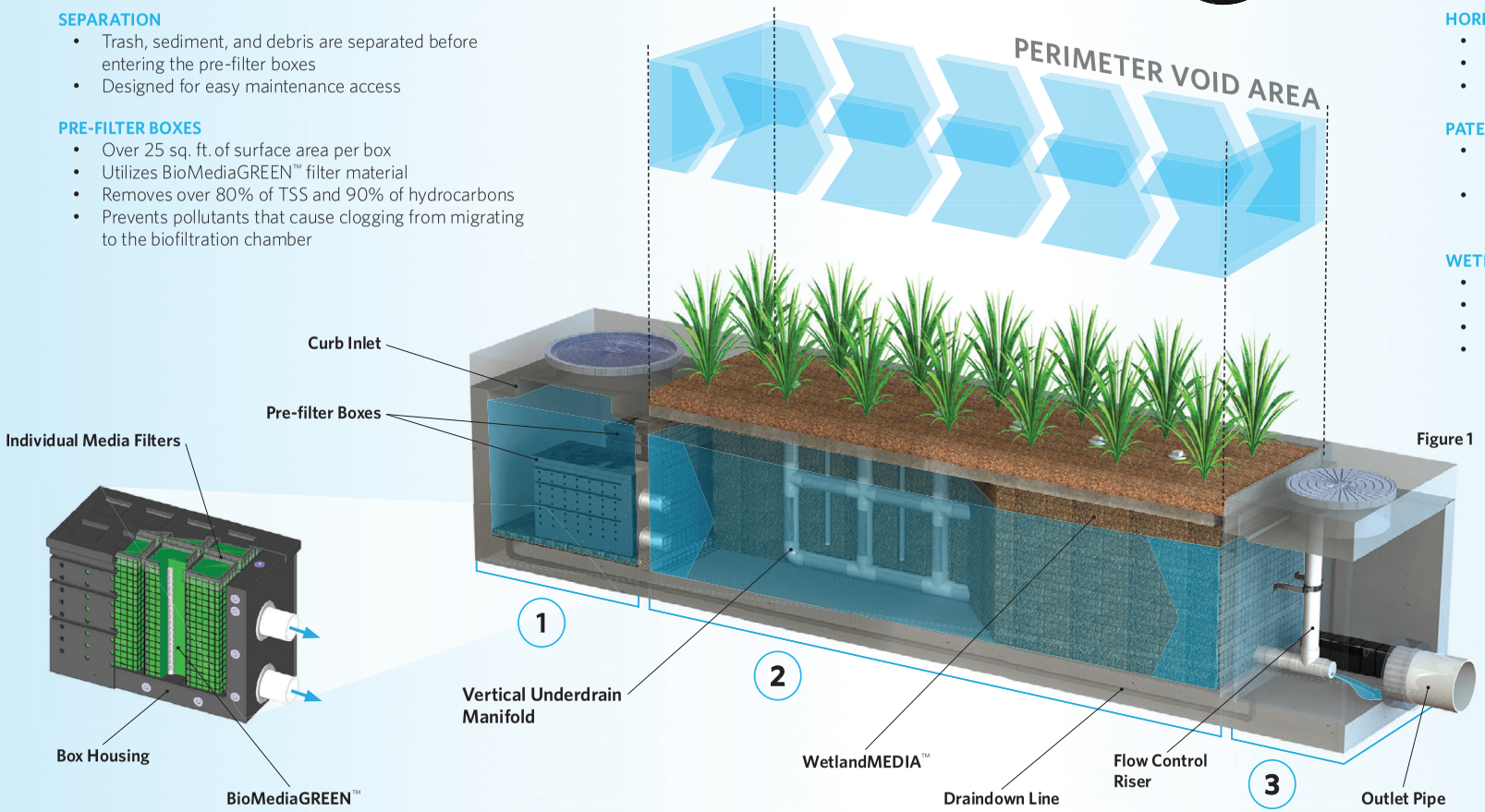


Figure 1

2 BIOFILTRATION

HORIZONTAL FLOW

- Less clogging than downward flow biofilters
- Water flow is subsurface
- Improves biological filtration

PATENTED PERIMETER VOID AREA

- Vertically extends void area between the walls and the WetlandMEDIA™ on all four sides
- Maximizes surface area of the media for higher treatment capacity

WETLANDMEDIA

- Contains no organics and removes phosphorus
- Greater surface area and 48% void space
- Maximum evapotranspiration
- High ion exchange capacity and lightweight

3 DISCHARGE

FLOW CONTROL

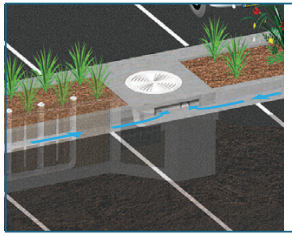
- Orifice plate controls flow of water through WetlandMEDIA™ to a level lower than the media's capacity
- Extends the life of the media and improves performance

DRAINDOWN FILTER

- The draindown is an optional feature that completely drains the pretreatment chamber
- Water that drains from the pretreatment chamber between storm events will be treated

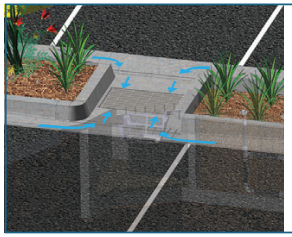
CONFIGURATIONS

The Modular Wetlands® System Linear is the preferred biofiltration system of civil engineers across the country due to its versatile design. This highly versatile system has available "pipe-in" options on most models, along with built-in curb or grated inlets for simple integration into your storm drain design.



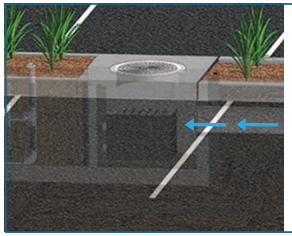
CURB TYPE

The Curb Type configuration accepts sheet flow through a curb opening and is commonly used along roadways and parking lots. It can be used in sump or flow-by conditions. Length of curb opening varies based on model and size.



GRATE TYPE

The Grate Type configuration offers the same features and benefits as the Curb Type but with a grated/drop inlet above the systems pretreatment chamber. It has the added benefit of allowing pedestrian access over the inlet. ADA-compliant grates are available to assure easy and safe access. The Grate Type can also be used in scenarios where runoff needs to be intercepted on both sides of landscape islands.



VAULT TYPE

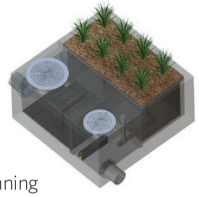
The system's patented horizontal flow biofilter is able to accept inflow pipes directly into the pretreatment chamber, meaning the Modular Wetlands® can be used in end-of-the-line installations. This greatly improves feasibility over typical decentralized designs that are required with other biofiltration/ bioretention systems. Another benefit of the "pipe-in" design is the ability to install the system downstream of underground detention systems to meet water quality volume requirements.

DOWNSPOUT TYPE

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

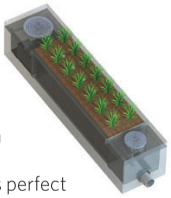
ORIENTATIONS

SIDE-BY-SIDE



The Side-By-Side orientation places the pretreatment and discharge chamber adjacent to one another with the biofiltration chamber running parallel on either side. This minimizes the system length, providing a highly compact footprint. It has been proven useful in situations such as streets with directly adjacent sidewalks, as half of the system can be placed under that sidewalk. This orientation also offers internal bypass options as discussed below.

END-TO-END



The End-To-End orientation places the pretreatment and discharge chambers on opposite ends of the biofiltration chamber, therefore minimizing the width of the system to 5 ft. (outside dimension). This orientation is perfect for linear projects and street retrofits where existing utilities and sidewalks limit the amount of space available for installation. One limitation of this orientation is that bypass must be external.

BYPASS

INTERNAL BYPASS WEIR (SIDE-BY-SIDE ONLY)

The Side-By-Side orientation places the pretreatment and discharge chambers adjacent to one another allowing for integration of internal bypass. The wall between these chambers can act as a bypass weir when flows exceed the system's treatment capacity, thus allowing bypass from the pretreatment chamber directly to the discharge chamber.

EXTERNAL DIVERSION WEIR STRUCTURE

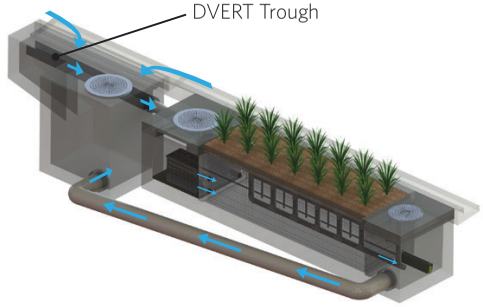
This traditional offline diversion method can be used with the Modular Wetlands® System Linear in scenarios where runoff is being piped to the system. These simple and effective structures are generally configured with two outflow pipes. The first is a smaller pipe on the upstream side of the diversion weir - to divert low flows over to the MWS Linear for treatment. The second is the main pipe that receives water once the system has exceeded treatment capacity and water flows over the weir.

FLOW-BY-DESIGN

This method is one in which the system is placed just upstream of a standard curb or grate inlet to intercept the first flush. Higher flows simply pass by the MWS Linear and into the standard inlet downstream.

DVERT LOW FLOW DIVERSION

This simple yet innovative diversion trough can be installed in existing or new curb and grate inlets to divert the first flush to the Modular Wetlands® System Linear via pipe. It works similar to a rain gutter and is installed just below the opening into the inlet. It captures the low flows and channels



them over to a connecting pipe exiting out the wall of the inlet and leading to the MWS Linear. The DVERT is perfect for retrofit and green street applications that allow the system to be installed anywhere space is available.

SPECIFICATIONS

FLOW-BASED DESIGNS

The Modular Wetlands® System Linear can be used in stand-alone applications to meet treatment flow requirements, and since it is the only biofiltration system that can accept inflow pipes several feet below the surface, it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

MODEL #	DIMENSIONS	WETLANDMEDIA SURFACE AREA (sq. ft.)	TREATMENT FLOW RATE (cfs)
MWS-L-4-4	4′ x 4′	23	0.052
MWS-L-4-6	4′ x 6′	32	0.073
MWS-L-4-8	4′ x 8′	50	0.115
MWS-L-4-13	4′ x 13′	63	0.144
MWS-L-4-15	4′ x 15′	76	0.175
MWS-L-4-17	4′ x 17′	90	0.206
MWS-L-4-19	4′ x 19′	103	0.237
MWS-L-4-21	4′ x 21′	117	0.268
MWS-L-6-8	7′ x 9′	64	0.147
MWS-L-8-8	8′ x 8′	100	0.230
MWS-L-8-12	8′ x 12′	151	0.346
MWS-L-8-16	8′ x 16′	201	0.462
MWS-L-8-20	9′ x 21′	252	0.577
MWS-L-8-24	9′ x 25′	302	0.693
MWS-L-10-20	10′ x 20′	302	0.693

VOLUME-BASED DESIGNS

HORIZONTAL FLOW BIOFILTRATION ADVANTAGE

MODULAR WETLANDS® SYSTEM LINEAR WITH URBANPOND™ PRESTORAGE

In the example above, the Modular Wetlands® System Linear is installed downstream of the UrbanPond storage system. The MWS Linear is designed for the water quality volume and will treat and discharge the required volume within local draindown time requirements. The MWS Linear's unique horizontal flow design, gives it benefits no other biofilter has - the ability to be placed downstream of detention ponds, extended dry detention basins, underground storage systems and permeable paver reservoirs. The system's horizontal flow configuration and built-in orifice control allows it to be installed with just 6" of fall between inlet and outlet pipe for a simple connection to projects with shallow downstream tie-in points.

UrbanPond
Single and Double Modules

DESIGN SUPPORT

Bio Clean engineers are trained to provide you with superior support for all volume sizing configurations throughout the country. Our vast knowledge of state and local regulations allow us to quickly and efficiently size a system to maximize feasibility. Volume control and hydromodification regulations are expanding the need to decrease the cost and size of your biofiltration system. Bio Clean will help you realize these cost savings with the MWS Linear, the only biofilter than can be used downstream of storage BMPs.

ADVANTAGES

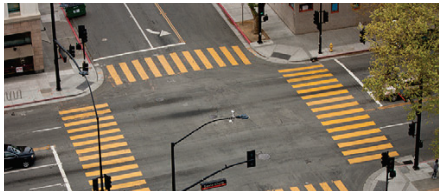
- LOWER COST THAN FLOW-BASED DESIGN
- MEETS LID REQUIREMENTS
- BUILT-IN ORIFICE CONTROL STRUCTURE
- WORKS WITH DEEP INSTALLATIONS

APPLICATIONS

The Modular Wetlands® System Linear has been successfully used on numerous new construction and retrofit projects. The system's superior versatility makes it beneficial for a wide range of stormwater and waste water applications - treating rooftops, streetscapes, parking lots, and industrial sites.

INDUSTRIAL
Many states enforce strict regulations for discharges from industrial sites. The MWS Linear has helped various sites meet difficult EPA-mandated effluent limits for dissolved metals and other pollutants.

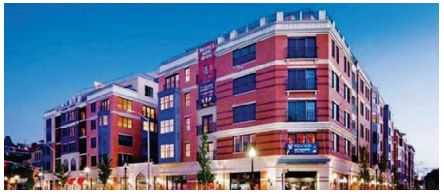
RESIDENTIAL
Low to high density developments can benefit from the versatile design of the MWS Linear. The system can be used in both decentralized LID design and cost-effective end-of-the-line configurations.



STREETS
Street applications can be challenging due to limited space. The MWS Linear is very adaptable, and it offers the smallest footprint to work around the constraints of existing utilities on retrofit projects.

PARKING LOTS
Parking lots are designed to maximize space and the Modular Wetlands'® 4 ft. standard planter width allows for easy integration into parking lot islands and other landscape medians.

COMMERCIAL
Compared to bioretention systems, the MWS Linear can treat far more area in less space, meeting treatment and volume control requirements.



MIXED USE
The MWS Linear can be installed as a raised planter to treat runoff from rooftops or patios, making it perfect for sustainable "live-work" spaces.

More applications include:

• Agriculture • Reuse • Low Impact Development • Waste Water

PLANT SELECTION

Abundant plants, trees, and grasses bring value and an aesthetic benefit to any urban setting, but those in the Modular Wetlands® System Linear do even more - they increase pollutant removal. What's not seen, but very important, is that below grade, the stormwater runoff/flow is being subjected to nature's secret weapon: a dynamic physical, chemical, and biological process working to break down and remove non-point source pollutants. The flow rate is controlled in the MWS Linear, giving the plants more contact time so that pollutants are more successfully decomposed, volatilized, and incorporated into the biomass of the Modular Wetlands'® micro/macro flora and fauna.

A wide range of plants are suitable for use in the Modular Wetlands®, but selections vary by location and climate. View suitable plants by visiting biocleanenvironmental.com/plants.

INSTALLATION

The Modular Wetlands® System Linear is simple, easy to install, and has a space-efficient design that offers lower excavation and installation costs compared to traditional tree-box type systems. The structure of the system resembles precast catch basin or utility vaults and is installed in a similar fashion.

The system is delivered fully assembled for quick installation. Generally, the structure can be unloaded and set in place in 15 minutes. Our experienced team of field technicians is available to supervise installations and provide technical support.

MAINTENANCE

Reduce your maintenance costs, man hours, and materials with the Modular Wetlands® System Linear. Unlike other biofiltration systems that provide no pretreatment, the MWS Linear is a self-contained treatment train which incorporates simple and effective pretreatment.

Maintenance requirements for the biofilter itself are almost completely eliminated, as the pretreatment chamber removes and isolates trash, sediments, and hydrocarbons. What's left is the simple maintenance of an easily accessible pretreatment chamber that can be cleaned by hand or with a standard vac truck. Only periodic replacement of low-cost media in the pre-filter boxes is required for long-term operation, and there is absolutely no need to replace expensive biofiltration media.

Bio Clean
A Forterra Company

5796 Armada Drive Suite 250
Carlsbad, CA 92008
855.566.3938
stormwater@forterrabp.com
biocleanenvironmental.com

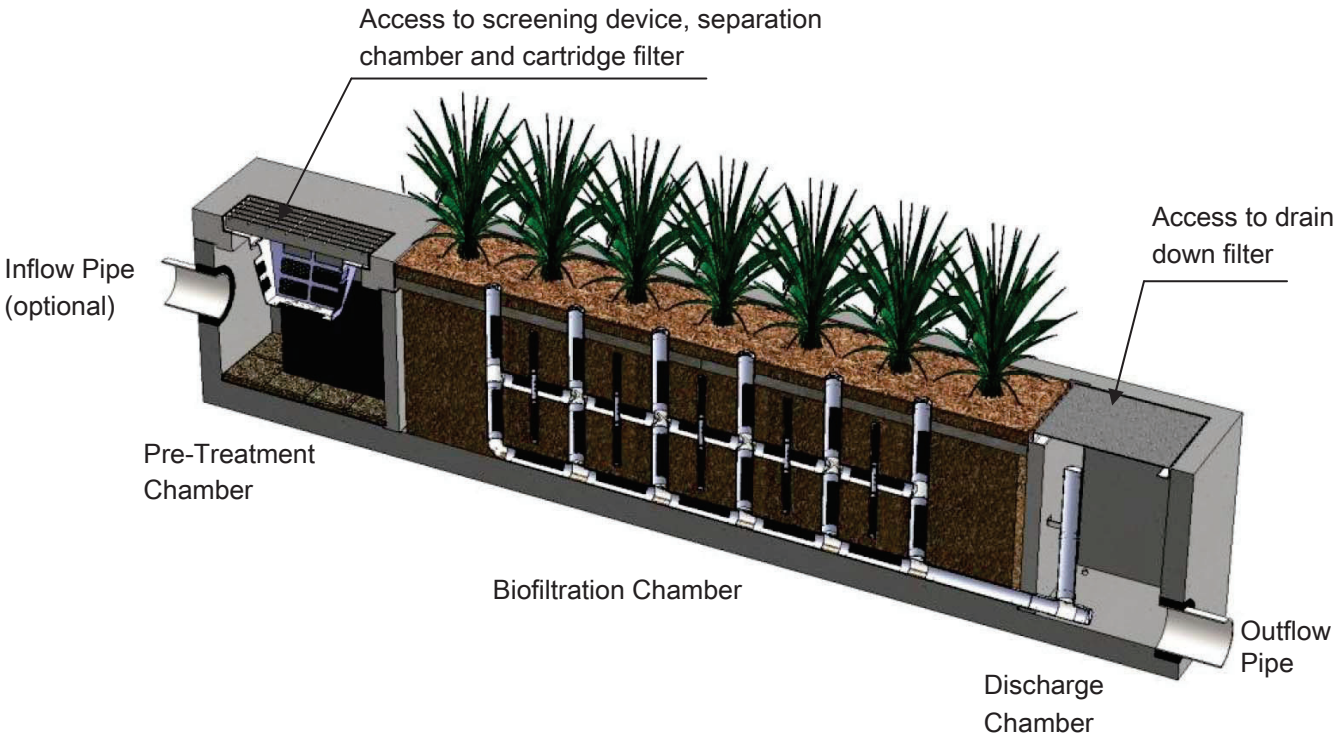
01172020

Maintenance Guidelines for Modular Wetland System - Linear

Maintenance Summary

- Remove Trash from Screening Device – average maintenance interval is 6 to 12 months.
  - (*5 minute average service time*).
- Remove Sediment from Separation Chamber – average maintenance interval is 12 to 24 months.
  - (*10 minute average service time*).
- Replace Cartridge Filter Media – average maintenance interval 12 to 24 months.
  - (*10-15 minute per cartridge average service time*).
- Replace Drain Down Filter Media – average maintenance interval is 12 to 24 months.
  - (*5 minute average service time*).
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - (*Service time varies*).

System Diagram



Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

5. No fertilizer shall be used in the Biofiltration Chamber.

6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

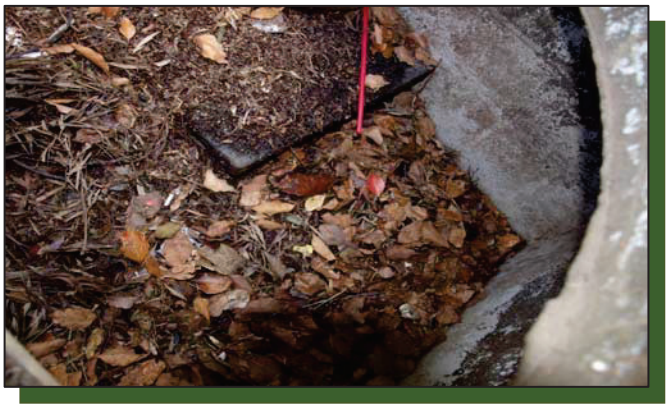
Maintenance Procedure Illustration

Screening Device

The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.

Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.



Cartridge Filters

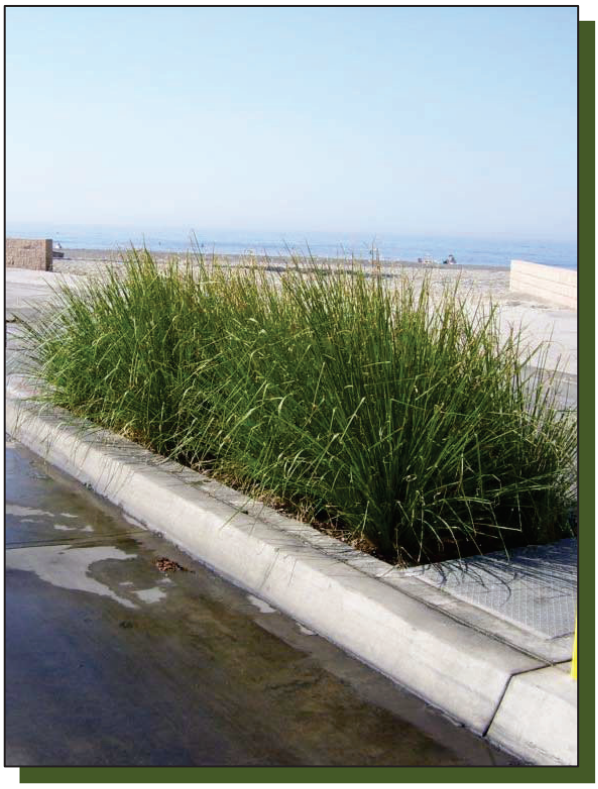
The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.

Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.

Trim Vegetation

Vegetation should be maintained in the same manner as surrounding vegetation and trimmed as needed. No fertilizer shall be used on the plants. Irrigation per the recommendation of the manufacturer and or landscape architect. Different types of vegetation requires different amounts of irrigation.



Inspection Form

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Inspection Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

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

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

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

Weather Condition _____ Additional Notes _____

Inspection Checklist

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

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

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

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

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes:

2972 San Luis Rey Road, Oceanside, CA 92058 P (760) 433-7640 F (760) 433-3176

Maintenance Report

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Cleaning and Maintenance Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

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

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

Weather Condition _____ Additional Notes _____

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

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

Comments:

2972 San Luis Rey Road, Oceanside, CA 92058 P. 760.433.7640 F. 760.433.3176