Mission Grove Apartments Project

Draft Environmental Impact Report
SCH#2022100610

Appendix G: Project Specific Water Quality Management Plan

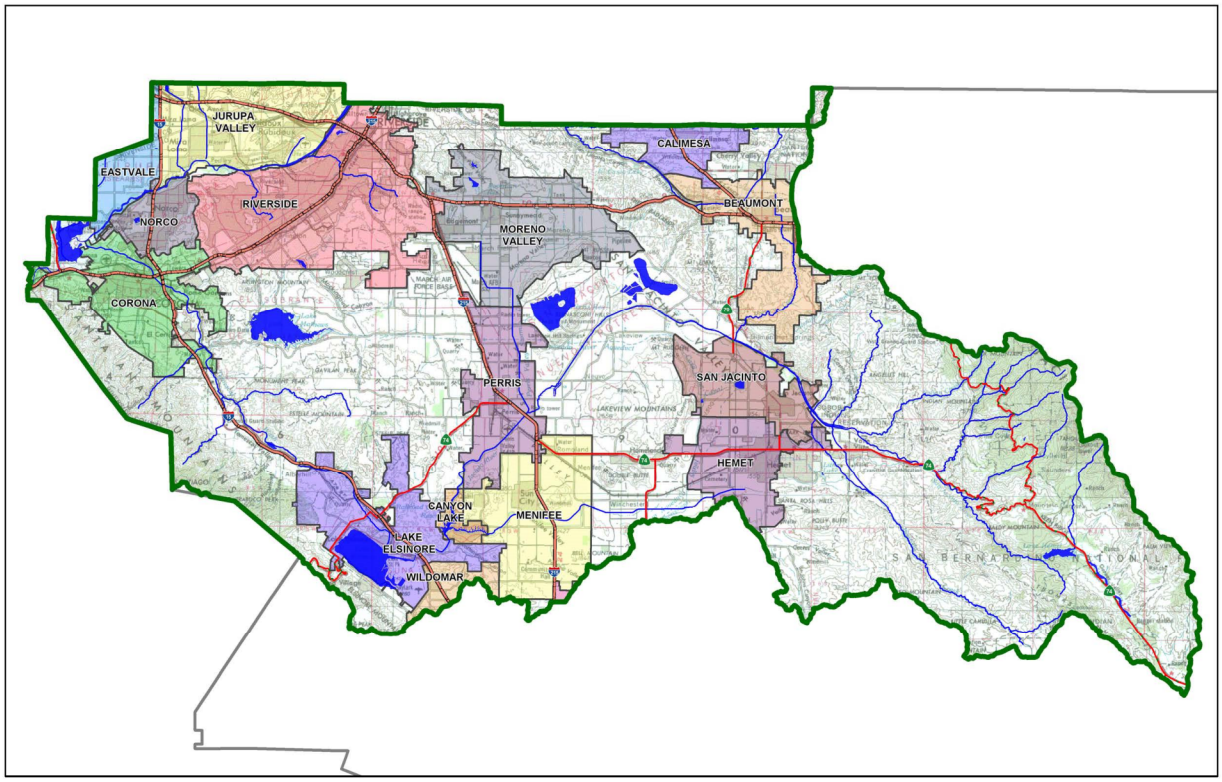
Project Specific Water Quality Management Plan

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

Project Title: 375 Alessandro Boulevard

Development No: GP-2022-11040

Design Review/Case No: PR-2022-001359



☒ **Preliminary**
☐ **Final**

Original Date Prepared: 6/3/2022

Revision Date(s): 8/25/2022

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

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OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for Anton Mission Grove, LLC by Rick Engineering Company for the Mission Grove Apartments project.

This WQMP is intended to comply with the requirements of the City of Riverside for Design Review, Planning Case No. PR-2022-001359 which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

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

November 30, 2022
Date

Michelle Rubin
Owner's Printed Name

President
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."

Kristin Werksman
Preparer's Signature

11/30/2022
Date
Associate

Kristin Werksman
Preparer's Printed Name

Associate
Preparer's Title/Position

Preparer's Licensure:

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Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	Multi-Family Residential
Planning Area:	Ward 4
Community Name:	Mission Grove
Development Name:	375 Alessandro Boulevard

PROJECT LOCATION
Latitude & Longitude (DMS): 33°54'48.86"N, 117°19'31.59"W
Project Watershed and Sub-Watershed: Santa Ana; Santa Ana River, Reach 3
Gross Acres: 9.9 Acres APN(s): 276-110-018
Map Book and Page No.: Book 173, Page 46-50

PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Multi-Family Residential
Proposed or Potential SIC Code(s)	1522
Area of Impervious Project Footprint (SF)	475,191 SF
Total Area of proposed Impervious Surfaces within the Project Footprint (SF)/or Replacement	437,965 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 Footprint (SF)	437
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)	Types C and D
What is the Water Quality Design Storm Depth for the project?	0.57 in

A.1 Maps and Site Plans

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

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling
- BMP Locations (Lat/Long)

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

A.2 Identify Receiving Waters

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

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Santa Ana River, Reach 3	Copper, Lead, Pathogens	AGR, GWR, REC1, REC2, WARM, WILD, RARE	6.3 Miles

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

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N
US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)*	☐ Y	☒ N

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

Section B: Optimize Site Utilization (LID Principles)

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

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

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

Site Optimization

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

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

Yes, the current site flows in a southwesterly direction. The proposed site will maintain the current drainage pattern.

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

Yes, the existing vegetation along the existing street frontage has been preserved where feasible. Landscape areas have been proposed on site throughout the parking lot and adjacent to buildings where possible.

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

Yes, however the existing site has minimal infiltration capacity. This is due to the existing site consisting mostly of a paved parking lot and roof of existing buildings.

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

Yes, landscaped areas have been utilized wherever possible on the site.

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

Yes, site runoff in the parking lot and roof runoff will be directed to the proposed Modular Wetlands Biofiltration systems.

Section C: Delineate Drainage Management Areas (DMAs)

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

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1][2]	Area (Sq. Ft.)	DMA Type
A-1	Landscape	8,321	Type A
A-2	Landscape	37,754	Type A
D-1	Pavement, landscape	57,907	Type D
D-2	Roofs, pavement, landscape	78,919	Type D
D-3	Roofs, pavement, landscape	110,588	Type D
D-4	Roofs, pavement, landscape	83,572	Type D

[1]Reference Table 2-1 in the WQMP Guidance Document to populate this column
[2]If multi-surface provide back-up

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

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
A-1	8,321	Landscape	Sprinkler
A-2	37,754	Landscape	Sprinkler

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

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

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

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

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

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

DMA Name or ID	BMP Name or ID
D-1	MWL-1
D-2	MWL-2
D-3	MWL-3
D-4	MWL-4

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

Section D: Implement LID BMPs

D.1 Infiltration Applicability

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

If yes has been checked, Infiltration BMPs shall not be used for the site; proceed to section D.3

If no, continue working through this section to implement your LID BMPs. It is recommended that you contact your Co-Permittee to verify whether or not your project discharges to an approved downstream 'Highest and Best Use' feature.

Geotechnical Report

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

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

Infiltration Feasibility

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

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		X
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		X
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?	X	
If Yes, list affected DMAs: **D-2 & D-4**		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		X
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?	X	
Describe here:		

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

D.2 Harvest and Use Assessment

Please check what applies*:*

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

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

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

☒None of the above

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If none of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

Irrigation Use Feasibility

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

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

Total Area of Irrigated Landscape: 1.45 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: 8.46 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).

Enter your EIATIA factor: 0.52

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

Minimum required irrigated area: 4.40 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).

Harvesting stormwater runoff is infeasible by steps 1-5 above.

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
4.40 Acres	1.45 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: 694

Project Type: 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: 8.46 Acres

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

Enter your TUTIA factor: 93

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: 787

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).

Harvesting stormwater runoff is infeasible by steps 1-5 above.

Minimum required Toilet Users (Step 4)	Projected number of toilet users (Step 1)
787	694

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: 0

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: 8.46 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 demand for non-potable uses per tributary impervious acre.

Enter the factor from Table 2-4: 869

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of gallons per day of non-potable use that would be required.

Minimum required use: 7,352

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

Minimum required non-potable use (Step 4)	**Projected average daily use (Step 1)**
7,352	0

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment per Section 3.4.2 of the WQMP Guidance Document.

D.3 Bioretention and Biotreatment Assessment

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

Select one of the following:

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

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

D.4 Feasibility Assessment Summaries

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

Table D.2 LID Prioritization Summary Matrix

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

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

Insert narrative description here.

D.5 LID BMP Sizing

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

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*MWS Linear / MWL-1*		
	[A]		[B]	[C]	[A] x [C]			
D-1	*57907*	*Mixed Surface Types*	*1*	*0.89*	*51,653*	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate, **CFS** (cubic feet per second)*	*Proposed Flow Rate (cubic feet per second)*
	57,907				51,653	0.20	0.2	**0.462**

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*MWS Linear / MWL-2*		
	[A]		[B]	[C]	[A] x [C]			
D-2	*78919*	*Mixed Surface Types*	*1*	*0.89*	*70395.7*	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate, **CFS** (cubic feet per second)*	*Proposed Flow Rate (cubic feet per second)*
	78919				70395.7	0.20	0.3	**0.346**

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*MWS Linear / MWL-3*		
	[A]		[B]	[C]	[A] x [C]			
D-3	*110,588*	*Mixed Surface Types*	*0.9*	*0.73*	*80760.4*	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate, **CFS** (cubic feet per second)*	*Proposed Flow Rate (cubic feet per second)*
	110588				80760.4	0.20	0.4	**0.462**

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*MWS Linear / MWL-4*		
	[A]		[B]	[C]	[A] x [C]			
D-4	*83,572*	*Mixed Surface Types*	*1*	*0.89*	*7456.2*	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate, **CFS** (cubic feet per second)*	*Proposed Flow Rate (cubic feet per second)*
	83572				74546.2	0.20	0.3	**0.462**

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

Section E: Alternative Compliance (LID Waiver Program)

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

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

- *Or* -

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

List DMAs here.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

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

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

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

If Yes, HCOC criteria do not apply.

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

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

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

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

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration	INSERT VALUE	INSERT VALUE	INSERT VALUE
Volume (Cubic Feet)	26,782	26,782	0%

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

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

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

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

F.2 HCOC Mitigation

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

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

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

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

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

Section G: Source Control BMPs

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

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

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

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

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

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
Interior floor drains and elevator shaft sump pumps	Parking garage floor drains to be conveyed to storm drain per City direction	Inspect and maintain drains to prevent blockages and overflow.
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
Landscape/Outdoor Pesticide Use	All 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 appropriate to site soils, slopes, climate, sun, wind, rain, and use, air movement, ecological consistency, and plant interactions.	Maintain landscaping using minimum or no pesticides. See applicable operational BMPs in "What you should know for…Landscape and Gardening" at http://rcflood.org/stormwater/. Provide IPM information to new owners, lessees, and operators. Only nitrogen stabilized liquid fertilizers shall be used. Use of irrigation and pesticides shall be kept to a minimum.
Outdoor storage of equipment or materials	No outdoor storage is anticipated for this site	N/A
Vehicle and Equipment Cleaning	Car wash areas are not provided and on-site car washing shall be prohibited and monitored by the property owner	N/A
Vehicle and Equipment Repair and Maintenance	No vehicle repair or maintenance will be done	N/A

	outdoors and this shall be monitored by the property owner	
Condensation Drain Lines Roofing, gutters, and trim	No condensation lines are proposed in this project Avoid roofing, gutters and trim made of copper or other unprotected metals that may leach into runoff	
Plazas, Sidewalks, and Parking Lots	It is the responsibility of the property owner to clean common areas and prohibit littering	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.
Fire Sprinkler	Fire sprinkler test water to drain to sanitary sewer	

Section H: Construction Plan Checklist

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

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)	BMP Location (Lat/Long)
MWL-1	Bioclean Modular Wetland	PWQMP Exhibit	33°54'50.94"N, 117°19'34.17"W
MWL-2	Bioclean Modular Wetland	PWQMP Exhibit	33°54'50.96"N, 117°19'33.75"W
MWL-3	Bioclean Modular Wetland	PWQMP Exhibit	33°54'47.24"N, 117°19'35.48"W
MWL-4	Bioclean Modular Wetland	PWQMP Exhibit	33°54'47.25"N, 117°19'35.38"W

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

Section I: Operation, Maintenance and Funding

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

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

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

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

Maintenance Mechanism: Property owner will maintain

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

☒ Y ☐ N

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

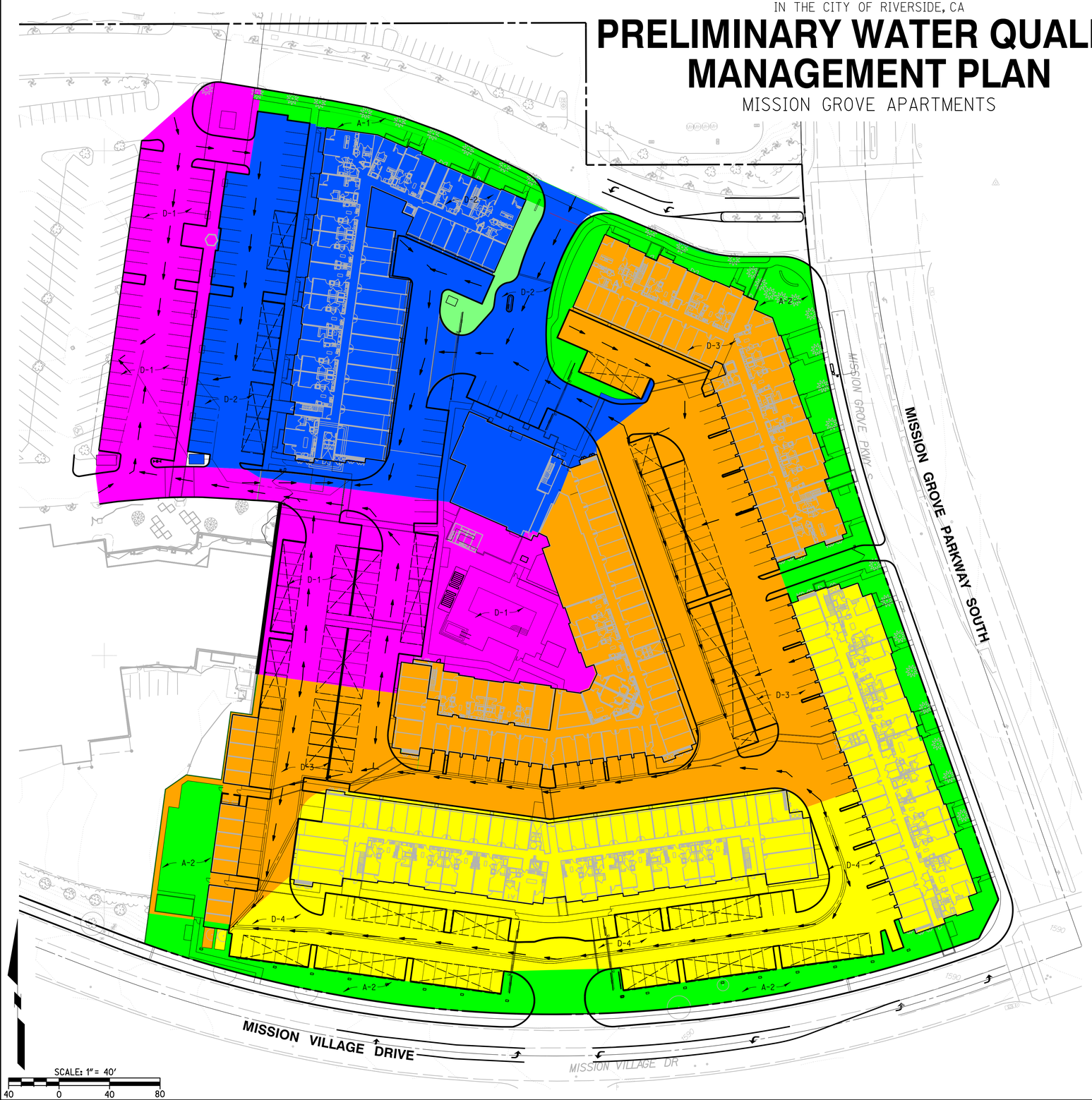
Appendix 1: Maps and Site Plans

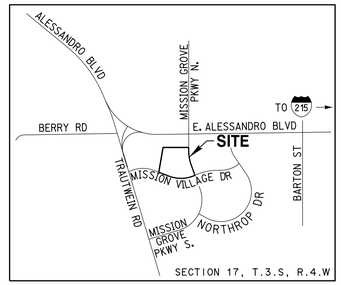
Location Map, WQMP Site Plan and Receiving Waters Map

IN THE CITY OF RIVERSIDE, CA

PRELIMINARY WATER QUALITY MANAGEMENT PLAN

MISSION GROVE APARTMENTS





VICINITY MAP

N.T.S.

DMA TABLE	
DMA	AREA (SF)
A-1	8,321
A-2	37,754
D-1	57,907
D-2	78,919
D-3	110,588
D-4	83,572

DMA ROUTING LEGEND

- DMA BOUNDARY
- DIRECTION OF FLOW
- A-1 & A-2 (LANDSCAPE)
- D-1 (IMPERVIOUS/MIXED)
- D-2 (IMPERVIOUS/MIXED)
- D-3 (IMPERVIOUS/MIXED)
- D-4 (IMPERVIOUS/MIXED)

TOTAL AREAS

IMPERVIOUS AREA	317,942 SF
PERVIOUS AREA	59,119 SF
TOTAL AREA	377,061 SF

D-11
DMA NUMBER
DMA TYPE

DMA TYPES:
- A: SELF TREATING
- B: SELF RETAINING
- C: AREAS THAT DRAIN TO SELF RETAINING
- D: AREAS THAT DRAIN TO BMPS

LEGEND

- EXISTING FIRE HYDRANT
- EXISTING LIGHT
- EXISTING SEWER MANHOLE
- EXISTING SIGN
- EXISTING WATER METER
- EXISTING WALL
- EXISTING TREE
- EXISTING OVERHEAD POWER — OHE —
- PROPOSED WROUGHT IRON FENCE
- PROPOSED CONCRETE
- PROPOSED PERMEABLE PAVERS
- PROPOSED RIBBON GUTTER
- PROPOSED CURB
- PROJECT BOUNDARY

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ARCHITECT

AO ARCHITECTS
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ORANGE CA, 92866
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PROJECT ACREAGE

9.97 AC - 434,223 SF

ASSESSOR'S PARCEL NUMBER

276-110-018

SITE ADDRESS

375 E ALESSANDRO BLVD
RIVERSIDE CA, 92508

PRELIMINARY WQMP EXHIBIT
MISSION GROVE APARTMENTS

CITY OF RIVERSIDE
IN THE COUNTY OF RIVERSIDE, CALIFORNIA

DATE PREPARED: JUNE 7, 2022

SHEET 4 OF 4

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VICINITY MAP

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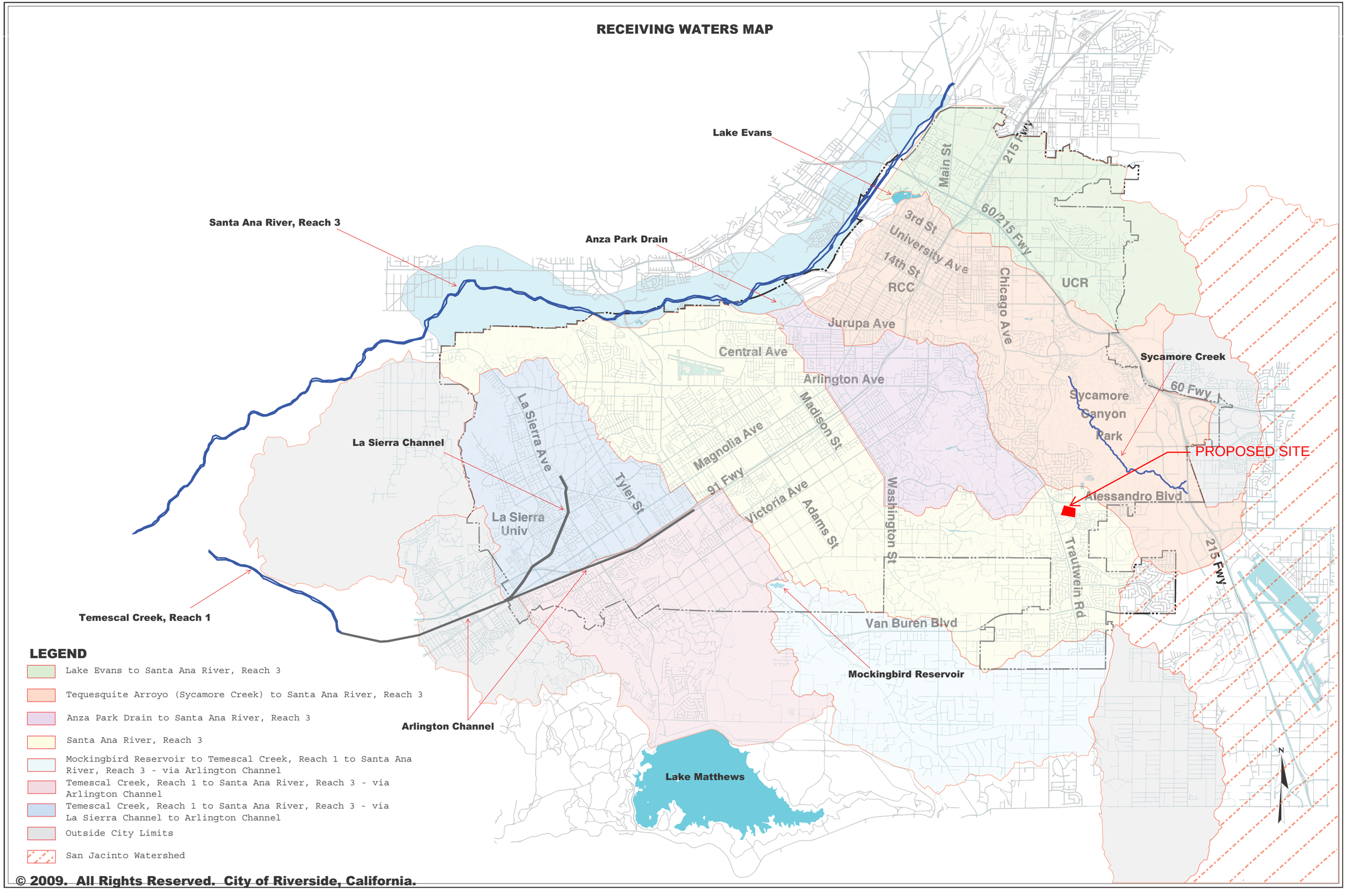
RECEIVING WATERS MAP



LEGEND

- Lake Evans to Santa Ana River, Reach 3
- Tequesquite Arroyo (Sycamore Creek) to Santa Ana River, Reach 3
- Anza Park Drain to Santa Ana River, Reach 3
- Santa Ana River, Reach 3
- Mockingbird Reservoir to Temescal Creek, Reach 1 to Santa Ana River, Reach 3 - via Arlington Channel
- Temescal Creek, Reach 1 to Santa Ana River, Reach 3 - via Arlington Channel
- Temescal Creek, Reach 1 to Santa Ana River, Reach 3 - via La Sierra Channel to Arlington Channel
- Outside City Limits
- San Jacinto Watershed

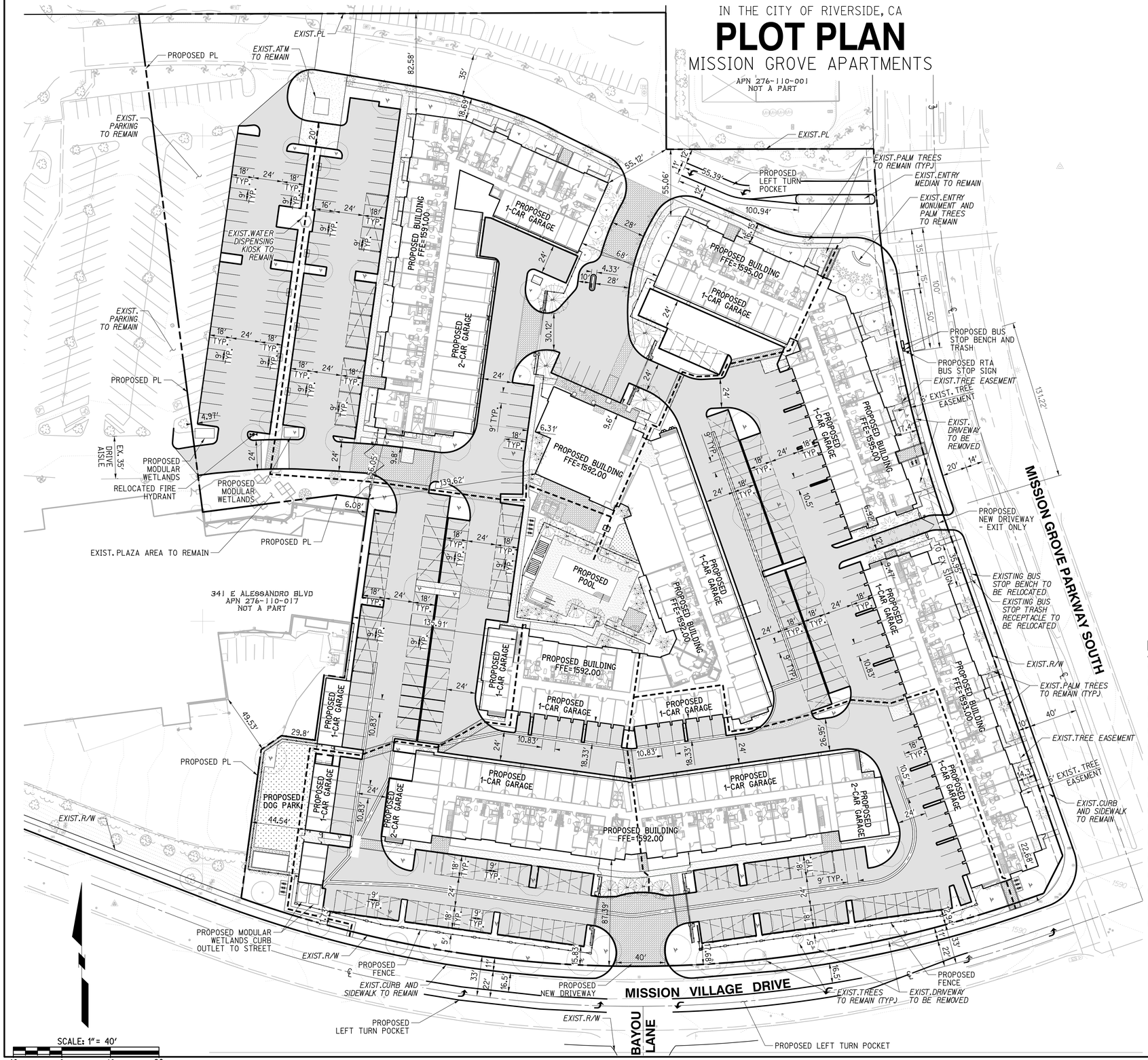
Appendix 2: Construction Plans

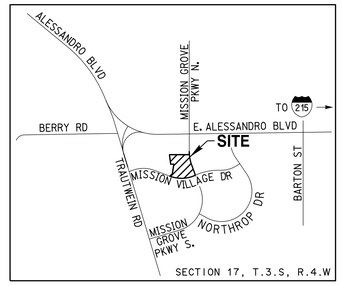
Grading and Drainage Plans

IN THE CITY OF RIVERSIDE, CA

PLOT PLAN

MISSION GROVE APARTMENTS





VICINITY MAP

N.T.S.

LEGEND

- EXISTING FIRE HYDRANT
- EXISTING LIGHT
- EXISTING SEWER MANHOLE
- EXISTING SIGN
- EXISTING WATER METER
- EXISTING WALL
- EXISTING PALM TREE
- EXISTING TREE
- PROPOSED SITE LIGHT
- PROPOSED WROUGHT IRON FENCE
- PROPOSED CONCRETE
- PROPOSED AC PAVEMENT
- PROPOSED DECORATIVE PAVERS
- PROPOSED RIBBON GUTTER
- PROPOSED CURB
- PROPOSED PATH OF TRAVEL
- PROJECT BOUNDARY

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PROJECT ACREAGE

9.92 AC - 432,115 SF

ASSESSOR'S PARCEL NUMBER

276-110-018

SITE ADDRESS

375 E ALESSANDRO BLVD
RIVERSIDE CA, 92508

PLOT PLAN
MISSION GROVE APARTMENTS

CITY OF RIVERSIDE
IN THE COUNTY OF RIVERSIDE, CALIFORNIA

DATE PREPARED: JUNE 7, 2022
DATE REVISED: AUGUST 5, 2022

SHEET 1 OF 5

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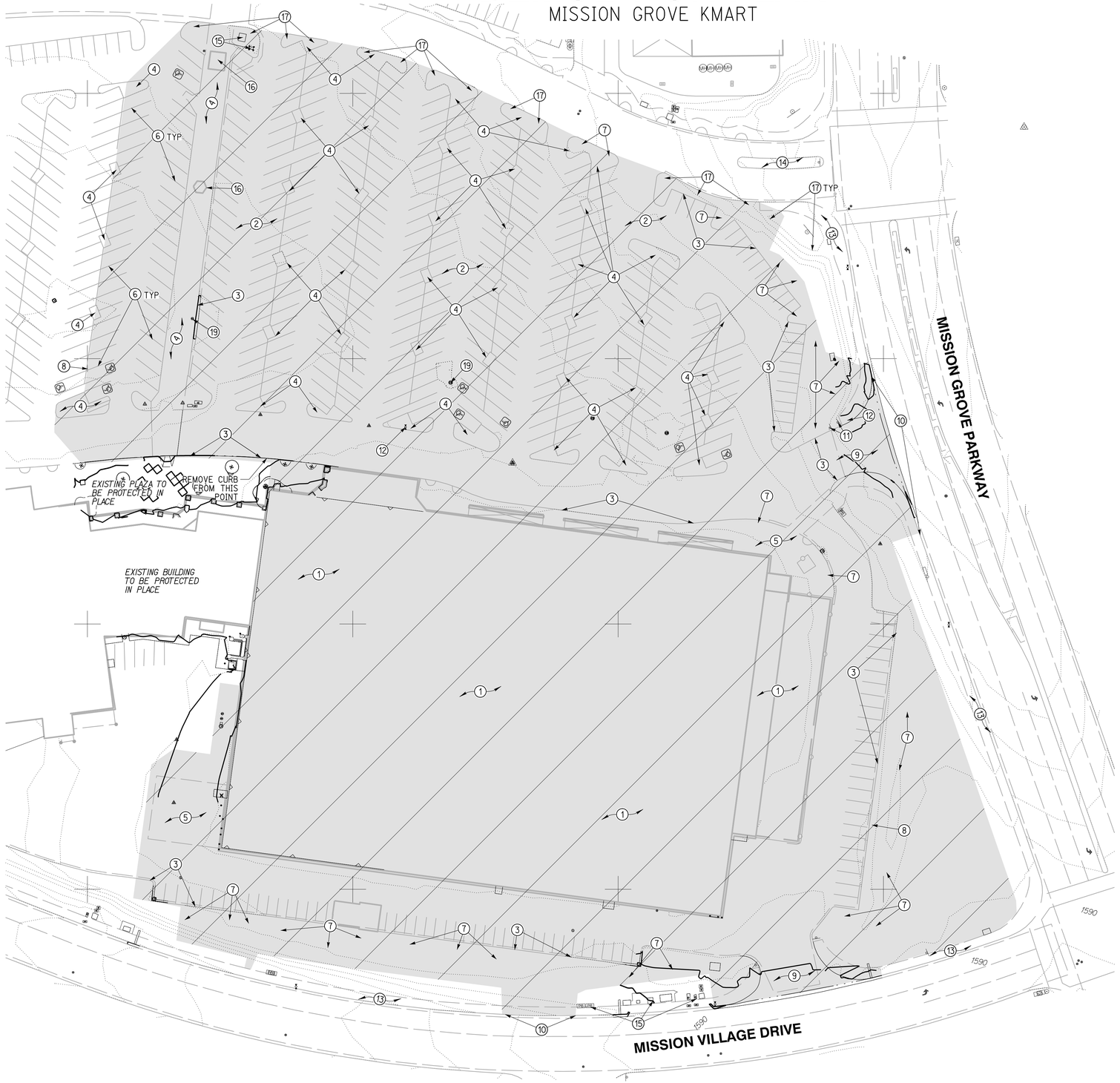
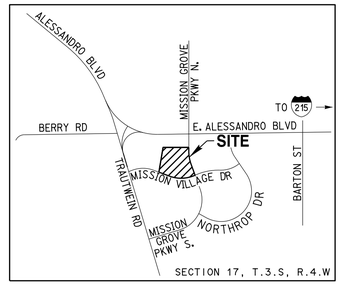
IN THE CITY OF RIVERSIDE, CA

DEMOLITION PLAN

MISSION GROVE KMART





VICINITY MAP

N.T.S.

DEMOLITION LEGEND

LIMITS OF DEMOLITION

EXISTING TOPO LEGEND

- EXISTING TREE
- EXISTING FIRE HYDRANT
- EXISTING ELECTRICAL
- EXISTING SIGN
- EXISTING ELECTRICAL VAULT
- EXISTING GAS VALVE
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING IRRIGATION VALVE
- EXISTING POWER POLE
- EXISTING OVERHEAD POWER — OHE —
- EXISTING SEWER MANHOLE
- EXISTING WATER — W —
- EXISTING SEWER — S —
- EXISTING ELECTRICAL — E —
- EXISTING GAS — G —
- EXISTING TELEPHONE — T —
- EXISTING WALL
- EXISTING R/W

SCALE: 1" = 40'

40 0 40 80

DEMOLITION NOTES

1. REMOVE EXISTING BUILDING
2. REMOVE EXISTING ASPHALT CONCRETE
3. REMOVE EXISTING CURB
4. REMOVE EXISTING PLANTER ISLAND CURB AND TREES
5. REMOVE EXISTING CONCRETE
6. REMOVE EXISTING PARKING LOT STRIPING
7. REMOVE EXISTING TREE
8. REMOVE EXISTING LIGHT POLE
9. REMOVE EXISTING DRIVEWAY
10. REMOVE EXISTING CURB AND GUTTER
11. REMOVE EXISTING SIGN
12. RELOCATE EXISITNG UTILITY
13. EXISTING SIDEWALK TO BE PROTECTED IN PLACE
14. EXISTING MEDIAN TO BE PROTECTED IN PLACE
15. EXISTING UTILITY TO BE PROTECTED IN PLACE
16. EXISTING BUILDING TO BE PROTECTED IN PLACE
17. EXISTING TREE TO BE PROTECTED IN PLACE
18. EXISTING CURB TO BE PROTECTED IN PLACE
19. EXISTING STORM DRAIN TO BE PROTECTED IN PLACE

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PROJECT ACREAGE

9.97 AC - 434,223 SF

ASSESSOR'S PARCEL NUMBER

276-110-018

SITE ADDRESS

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DEMOLITION PLAN
MISSION GROVE KMART

CITY OF RIVERSIDE
IN THE COUNTY OF RIVERSIDE, CALIFORNIA

DATE PREPARED: MAY 24, 2022

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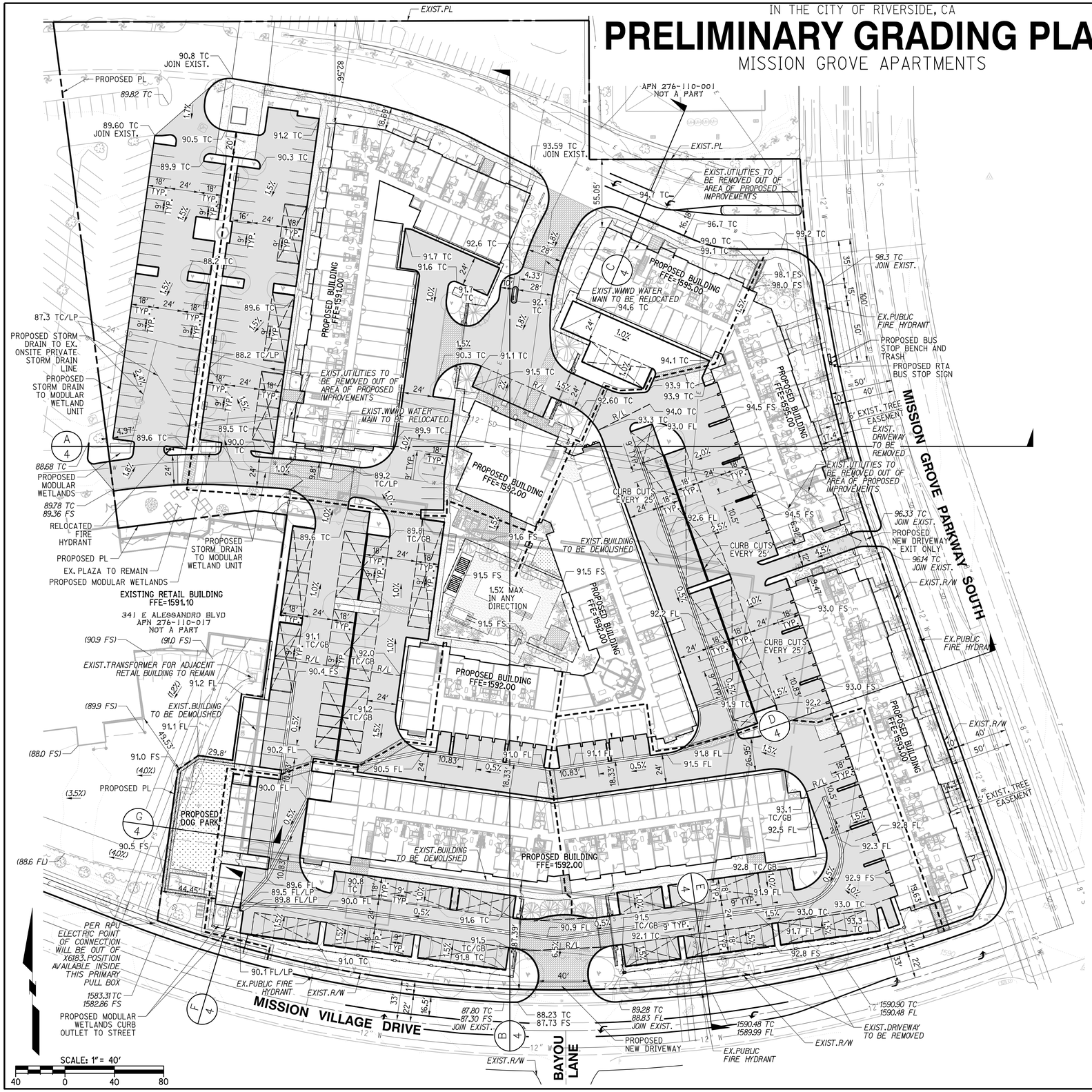
IN THE CITY OF RIVERSIDE, CA

PRELIMINARY GRADING PLAN

MISSION GROVE APARTMENTS



ABBREVIATIONS

C&G	CURB AND GUTTER
℄	CENTERLINE
EX	EXISTING
FFE	FINISHED FLOOR ELEVATION
FG	FINISHED GRADE ELEVATION
FL	FLOW LINE ELEVATION
FS	FINISHED SURFACE ELEVATION
IE	INVERT ELEVATION
PL	PROPERTY LINE
R/L	RIDGELINE
R/W	RIGHT-OF-WAY
S/W	SIDEWALK
TC	TOP OF CURB ELEVATION
TG	TOP OF GRATE ELEVATION
TW	TOP OF WALL ELEVATION
TYP	TYPICAL

LEGEND

EXISTING ELECTRICAL
EXISTING ELECTRICAL VAULT
EXISTING GAS VALVE
EXISTING IRRIGATION VALVE
EXISTING LIGHT
EXISTING POWER POLE
EXISTING SEWER MANHOLE
EXISTING SIGN
EXISTING TREE
EXISTING WATER METER
EXISTING WALL
EXISTING WATER VALVE
EXISTING PALM TREE
EXISTING TREE
PROPOSED SITE LIGHT
PROPOSED WROUGHT IRON FENCE
PROPOSED CONCRETE
PROPOSED AC PAVEMENT
PROPOSED DECORATIVE PAVERS
PROPOSED RIBBON GUTTER
PROPOSED CURB
PROPOSED PATH OF TRAVEL
PROJECT BOUNDARY

ESTIMATED GRADING QUANTITIES

ESTIMATED EXCAVATION: 5,118 C.Y.
ESTIMATED EMBANKMENT: 5,950 C.Y.

NOTE: THE GRADING QUANTITIES SHOWN HEREON ARE RAW QUANTITIES FOR PERMIT PURPOSES ONLY AND ARE NOT TO BE USED FOR FINAL PAY QUANTITIES. THIS PROJECT IS DESIGNED TO BALANCE.

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PROJECT ACREAGE

9.92 AC ± 432,115 SF

ASSESSOR'S PARCEL NUMBER

276-110-018

SITE ADDRESS

375 E ALESSANDRO BLVD
RIVERSIDE CA, 92508

PRELIMINARY GRADING PLAN
MISSION GROVE APARTMENTS
CITY OF RIVERSIDE
IN THE COUNTY OF RIVERSIDE, CALIFORNIA
DATE PREPARED: JUNE 7, 2022
DATE REVISED: AUGUST 5, 2022
SHEET 3 OF 5

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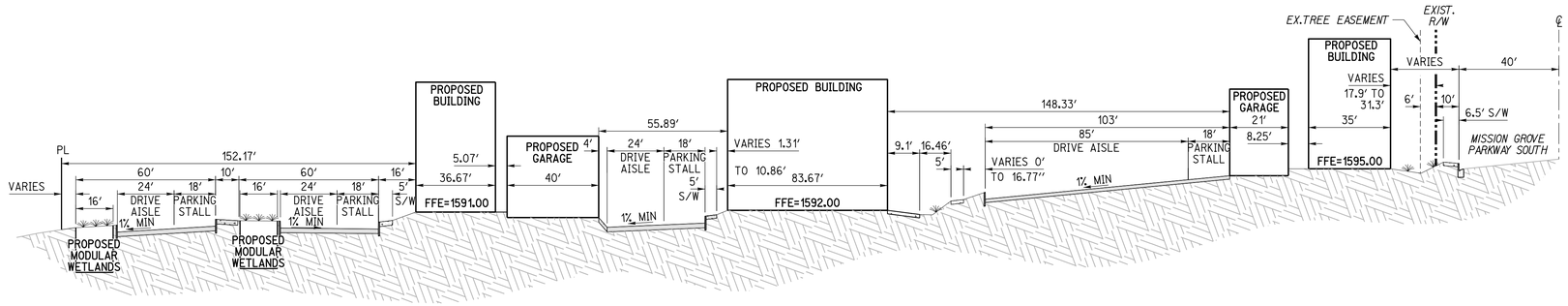

A
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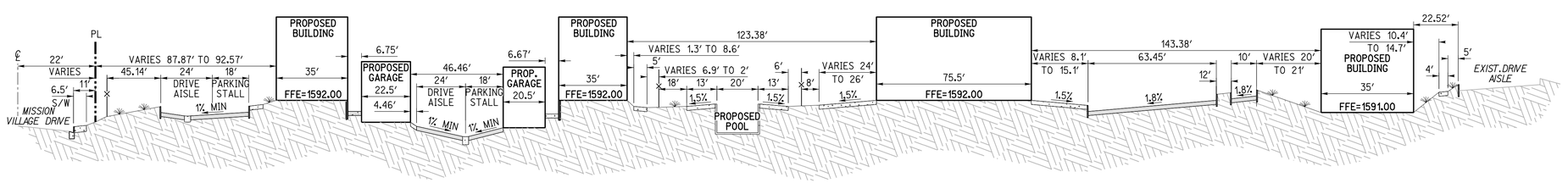
NOT TO SCALE



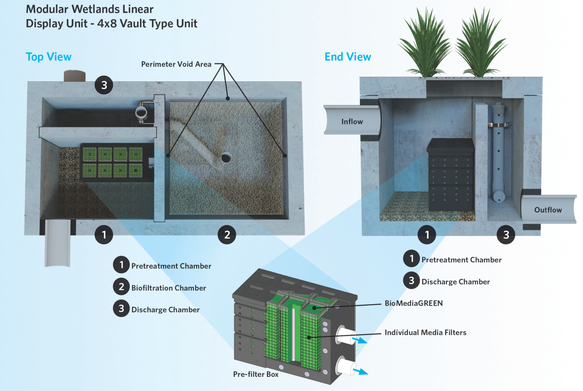
B
—

NOT TO SCALE

DIAGRAMS

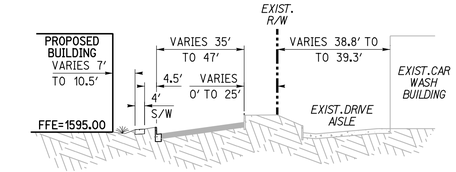
The Modular Wetlands® Linear biofilter supports superior root penetration and plant uptake of metals and nutrients with treatment that includes both aerobic and anaerobic zones.

Modular Wetlands Linear
Display Unit - 4x8 Vault Type Unit



MODULAR WETLANDS DETAILS

NOTE: SEE MODULAR WETLANDS LINEAR BROCHURE FOR FURTHER INFORMATION



C
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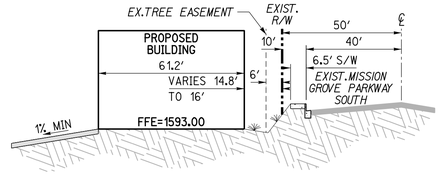
NOT TO SCALE



D
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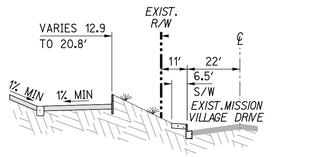
NOT TO SCALE



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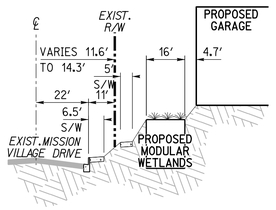

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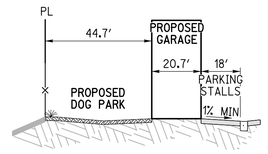

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SECTIONS & DETAILS
MISSION GROVE APARTMENTS

CITY OF RIVERSIDE
IN THE COUNTY OF RIVERSIDE, CALIFORNIA

DATE PREPARED: JUNE 7, 2022
DATE REVISED: AUGUST 5, 2022

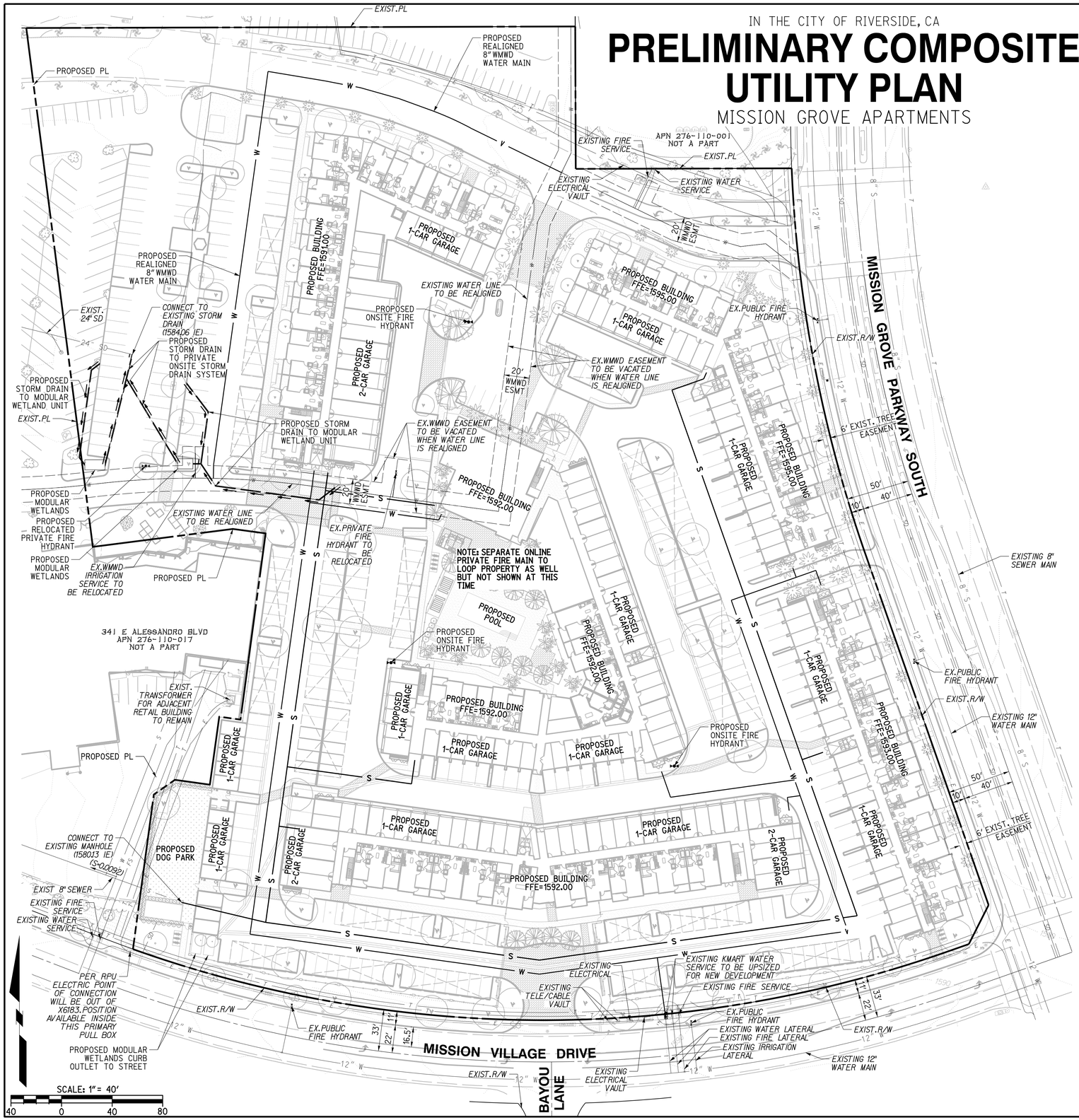
SHEET 4 OF 5

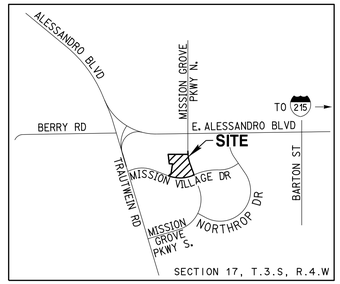
RICK ENGINEERING COMPANY
Riverside
1770 IOWA AVENUE • SUITE 100
RIVERSIDE, CA 92507
951.782.0707
(FAX)951.782.0723
rickengineering.com
San Diego • Orange • San Luis Obispo • Bakersfield • Sacramento • Phoenix • Tucson

IN THE CITY OF RIVERSIDE, CA

PRELIMINARY COMPOSITE UTILITY PLAN

MISSION GROVE APARTMENTS





VICINITY MAP

N.T.S.

PROPOSED LEGEND

PROPOSED FIRE SERVICE	FS
PROPOSED DOMESTIC SERVICE	W
PROPOSED SEWER LATERAL	S
PROPOSED FIRE HYDRANT	
PROPOSED STORM DRAIN	
PROJECT BOUNDARY	
PROPOSED ELECTRICAL	E

TOPOGRAPHY LEGEND

EXISTING BOLLARD	
EXISTING CATCH BASIN	CB
EXISTING ELECTRICAL MANHOLE	E
EXISTING FIRE HYDRANT	
EXISTING LIGHT	
EXISTING PALM TREE	
EXISTING SEWER MANHOLE	S
EXISTING STORM DRAIN MANHOLE	SD
EXISTING SIGN	
EXISTING WATER METER	WM
EXISTING WALL	
EXISTING TREE	
EXISTING WATER	W
EXISTING SEWER	S
EXISTING STORM DRAIN	SD
EXISTING OVERHEAD POWER	OHE

CIVIL ENGINEER

RICK ENGINEERING COMPANY
1770 IOWA AVENUE, SUITE 100
RIVERSIDE, CA 92507
PHONE: (951) 782-0707
ATTN: KRISTIN WERKSMAN, RCE 69317

DEVELOPER

ANTON MISSION GROVE, LLC
1676 N CALIFORNIA BLVD, SUITE 250
WALNUT CREEK, CA 94596
PHONE: (650) 549-1613

ARCHITECT

AO ARCHITECTS
144 N ORANGE STREET
ORANGE CA, 92866
(714) 639-9860

OWNER

REGIONAL PROPERTIES
9201 WILSHIRE BLVD, SUITE 103
BEVERLY HILLS, CA 90210
ATTN: MICHELLE RUBIN
PHONE: (310) 513-1776

PROJECT ACREAGE

9.97 AC - 434,223 SF

ASSESSOR'S PARCEL NUMBER

276-110-018

SITE ADDRESS

375 E ALESSANDRO BLVD
RIVERSIDE CA, 92508

PRELIMINARY COMPOSITE UTILITY PLAN
MISSION GROVE APARTMENTS

CITY OF RIVERSIDE
IN THE COUNTY OF RIVERSIDE, CALIFORNIA

DATE PREPARED: JUNE 7, 2022
DATE REVISED: AUGUST 5, 2022

SHEET 5 OF 5

RICK ENGINEERING COMPANY
Riverside
1770 IOWA AVENUE • SUITE 100
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rickengineering.com

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

Project No. T2979-22-01
May 24, 2022

Anton Mission Grove, LLC.
1676 N California Boulevard, Suite 250
Walnut Creek, California 94596

Attention: Ms. Vanessa Garza, Development Manager

Subject: DUE DILIGENCE GEOTECHNICAL INVESTIGATION
AND PERCOLATION TESTING
MISSION GROVE REDEVELOPMENT
375 EAST ALESSANDRO BOULVARD
RIVERSIDE, CALIFORNIA

Dear Ms. Garza:

In accordance with your request, Geocon West, Inc. (Geocon) herein submits the results of our percolation testing at 375 East Alessandro Boulevard in Riverside, California.

The geologic conditions at the site include 1 to 2 feet of previously placed artificial fill over quartz diorite bedrock. The quartz diorite is completely to highly weathered and excavates as silty sand. These deposits were encountered in each boring to the maximum depth explored of 26.25 feet.

Perched groundwater was encountered at depths of 11.5 and 16.5 feet near percolation tests P-1 and P-2, at 15 feet near P-3 and P-4, and was not encountered to a depth of 15 feet near P-5 and P-6.

Percolation testing was performed in accordance with *Riverside County Flood Control and Water Conservation District, LID BMP Manual, Appendix A* (Handbook). The test locations are shown on Figure 1, *Boring Location Map,* that uses *Infiltration Testing Locations* prepared by Rick Engineering as a base. Logs of the geotechnical and percolation test borings and percolation data sheets are presented on Figures A-1 through A-19.

The 8-inch-diameter percolation test borings were drilled to 2 to 4.5 feet below the existing ground surface as indicated by the project civil engineer. Approximately two inches of gravel was placed at the bottom of each test boring and a perforated pipe was placed atop the gravel to prevent caving. Gravel was placed around the bottom of the test hole to support the test pipe. The test locations were pre-saturated prior to testing. Results of the converted percolation test rates to infiltration test rates are presented in the table below. Note that the Handbook requires a factor of safety of 3 be applied to the values below based on the test method used.

INFILTRATION TEST RESULTS

Parameter	P-1	P-2	P-3	P-4	P-5	P-6
Test Type	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy
Change in head over time: ΔH (inches)	28.9	28.8	14.6	12.6	25.1	13.4
Average head: Havg (inches)	21.5	21.6	28.7	29.7	23.5	29.3
Time Interval Δt (minutes)	10	10	10	10	10	10
Test Hole Radius: r (in)	4	4	4	4	4	4
Infiltration Rate: It (inches/hour)	14.7	14.6	5.7	4.8	11.8	5.2

The results of the percolation testing, per the Handbook, indicate that infiltration is between 4.8 and 14.7 inches per hour at the locations tested.

The in-situ field percolation tests performed provide short-term infiltration rates, which apply mainly to the initiation of the infiltration process due to the short time of the test (hours instead of days) and the amount of water used. Where appropriate the short-term infiltration rates shall be converted to long-term infiltration rates using reduction factors depending upon the degree of infiltrate quality, maintenance access and frequency, site variability, subsurface stratigraphy variation, and other factors. The small-scale percolation testing cannot model the complexity of the effect of interbedded layers of different soil composition, and our test results should be considered only as index values of infiltration rates.

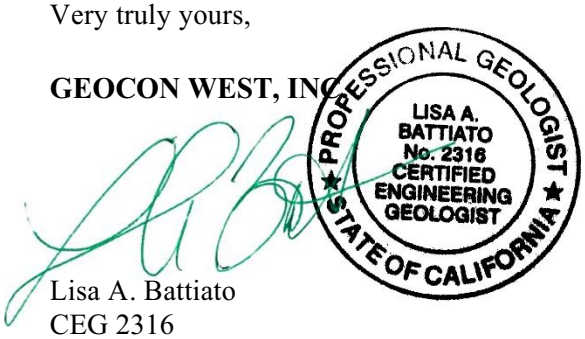
The grading contractor should take care not to compact the soil in the basin bottom during construction which will reduce the infiltration rate of the basin. If compaction of the basin bottom does occur, the basin bottom should be deep ripped with equipment as it moves out of the basin to loosen the soil and avoid recompacting it.

An on-going maintenance program for the infiltration systems should be implemented to remove silt build-up within the system, as the migration of silt particles into the system over time can reduce the effectiveness of the system.

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

Very truly yours,

GEOCON WEST, INC.



Lisa A. Battiato
CEG 2316

LAB:hd

Attachments: Figure 1, Boring Location Map
Figures A-1 through A-7, Logs of Geotechnical Borings
Figures A-8 through A-13, Logs of Percolation Borings
Figures A-14 through A-19, Percolation Test Report Data

GEOCON LEGEND

Locations are approximate

B-7 ..... GEOTECHNICAL BORING LOCATION

P-6 ..... PERCOLATION TEST LOCATION

..... LIMITS OF THIS STUDY

Source: Rick Engineering Company, Infiltration Testing Locations, Plot Date April 27, 2022

GEOCON WEST, INC.
GEOTECHNICAL, ENVIRONMENTAL, MATERIALS
41571 CORNING PLACE #101, MURRIETA, CALIFORNIA 92562
PHONE 951-304-2300 FAX 951-304-2392

BORING LOCATION MAP

MISSION GOVE REDEVELOPMENT
375 EAST ALESSANDRO BOULEVARD
RIVERSIDE, CALIFORNIA

HD			MAY 2022	PROJECT NO. T2979-22-01	FIG. 1

PROJECT NO. T2979-22-01

BORING B-1

ELEV. (MSL.) **1584** DATE COMPLETED **5/13/2022**

EQUIPMENT **CME 75 HSA** BY: **L. WEIDMAN**

DEPTH IN FEET	SAMPLE NO.	BULK	DR/SPT	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0	B-1@0-5'					SP	**PAVEMENT SECTION** 3" AC, 4" BASE			
2	B-1@2.5'						**UNDOCUMENTED FILL (afu)** Poorly-graded SAND, medium dense, slightly moist, golden brown; medium sand; some coarse sand	50-3.5"		
4							**QUARTZ DIORITE BEDROCK (qdi)** White black brown; mica rich; excavates as Well-graded SAND with Silt; dry; friable; slightly oxidized; coarse grained			
6	B-1@20'							50-3"		
8	B-1@7.5'						-Becomes fine grained; hornblend rich	50-3"		
10	B-1@10'							50-4"		
12										
14										
16	B-1@15'				▼		-Becomes more flesic	88-9"		
18										
20	B-1@20'						-Becomes wet	50-2"		
22										
24										
26	B-1@25'							50-3"		

Total Depth = 26'3"
Groundwater encountered at 16'6"
Penetration resistance for 140-lb hammer falling 30 inches by auto hammer
Backfilled with cuttings 5/13/2022

Figure A-1,
Log of Boring B-1, Page 1 of 1

T2979-22-01 BORING LOGS.GPJ

SAMPLE SYMBOLS

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

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

GEOCON

PROJECT NO. T2979-22-01

BORING B-2

ELEV. (MSL.) **1583** DATE COMPLETED **5/13/2022**

EQUIPMENT **CME 75 HSA** BY: **L. WEIDMAN**

DEPTH IN FEET	SAMPLE NO.	BULK	DR/SPT	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0							**PAVEMENT SECTION** 4" AC, 6" BASE			
2	B-2@2.5'						**QUARTZ DIORITE BEDROCK (qdi)** White black brown; mica rich; excavates as Well-graded SAND with Silt; slightly moist; friable; coarse grained; slightly oxidized	50-3"		
4										
6	B-2@20' B-2@5-10'						-Becomes moist; fine to coarse grained	50-2"		
8	B-2@7.5'						-Becomes wet	50-5"		
10	B-2@10'				▼			50-4"		
12	B-2@12.5'							50-3.5"		
14										
16	B-2@15'							50-5"		
18	B-2@17.5'							50-4.5"		
20	B-2@20'						-NO RECOVERY	50-1"		

Total Depth = 20'1"
Groundwater encountered at 11'6"
Penetration resistance for 140-lb hammer falling 30 inches by auto hammer
Backfilled with cuttings 5/13/2022

Figure A-2,
Log of Boring B-2, Page 1 of 1

T2979-22-01 BORING LOGS.GPJ

SAMPLE SYMBOLS

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

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

GEOCON

PROJECT NO. T2979-22-01

BORING B-3

ELEV. (MSL.) **1588** DATE COMPLETED **5/13/2022**

EQUIPMENT **CME 75 HSA** BY: **L. WEIDMAN**

DEPTH IN FEET	SAMPLE NO.	BULK	DR/SPT	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0							**PAVEMENT SECTION** 3.5" AC, 4" BASE			
2	B-3@2.5'		■				**QUARTZ DIORITEBEDROCK (qdi)** White black brown; mica rich; excavates as Well-graded SAND with Silt; moist; friable; slightly oxidized; micaceous	50-3"		
4										
6	B-3@20' B-3@5-10'	▒	■				-Becomes moist; fine to coarse grained	50-3"		
8	B-3@7.5'	▒	■				-Becomes wet	50-3"		
10	B-3@10'	▒	■		▼			50-2"		
12										
14										
	B-3@15'		■				-NO RECOVERY	50-2"		

Total Depth = 15'2"
Groundwater encountered at 11'
Penetration resistance for 140-lb hammer falling 30 inches by auto hammer
Backfilled with cuttings 5/13/2022

Figure A-3,
Log of Boring B-3, Page 1 of 1

T2979-22-01 BORING LOGS.GPJ

SAMPLE SYMBOLS

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

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

GEOCON

PROJECT NO. T2979-22-01

BORING B-4

ELEV. (MSL.) **1584** DATE COMPLETED **5/13/2022**

EQUIPMENT **CME 75 HSA** BY: **L. WEIDMAN**

DEPTH IN FEET	SAMPLE NO.	BULK	DR/SPT	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0	B-4@0-5'					SM	**PAVEMENT SECTION** 6" AC, 4" BASE			
2	B-4@2.5'						**UNDOCUMENTED FILL (afu)** Silty SAND, medium dense, slightly moist, brown; medium to coarse sand; some mica	50-3"		
4							**QUARTZ DIORITE BEDROCK (qdi)** White black brown; mica rich; excavates as Well-graded SAND with Silt; medium to coarse sand; slightly oxidized; micaceous; friable			
6	B-4@20'							50-2"		
8	B-4@7.5'						-Becomes hornblend rich	50-5"		
10	B-4@10'						-Becomes wet	50-5"		
12										
14					▼					
	B-4@15'						-NO RECOVERY	50-4"		
							Total Depth = 15'4" Groundwater encountered at 13'6" Penetration resistance for 140-lb hammer falling 30 inches by auto hammer Backfilled with cuttings 5/13/2022			

Figure A-4,
Log of Boring B-4, Page 1 of 1

T2979-22-01 BORING LOGS.GPJ

SAMPLE SYMBOLS

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

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

GEOCON

PROJECT NO. T2979-22-01

BORING B-5

ELEV. (MSL.) **1585** DATE COMPLETED **5/13/2022**

EQUIPMENT **CME 75 HSA** BY: **L. WEIDMAN**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0	B-5@0-5'			SM	**PAVEMENT SECTION** 4" AC, 4" BASE			
2	B-5@2.5'				**UNDOCUMENTED FILL (afu)** Silty SAND, medium dense, slightly moist, golden brown; fine to coarse sand; little mica	50-5"		
4					**QUARTZ DIORITE BEDROCK (qdi)** White black brown; mica rich; excavates as Well-graded SAND with Silt; coarse grained; slightly oxidized; micaceous; friable			
6	B-5@20'					50-4"		
8	B-5@7.5'				-Becomes fine grained; felsic	50-4"		
10	B-5@10'				-Becomes wet	50-3"		
12								
14	B-5@15'		▼		-NO RECOVERY	50-4"		
					Total Depth = 15'4" Groundwater encountered at 15' Penetration resistance for 140-lb hammer falling 30 inches by auto hammer Backfilled with cuttings 5/13/2022			

Figure A-5,
Log of Boring B-5, Page 1 of 1

T2979-22-01 BORING LOGS.GPJ

SAMPLE SYMBOLS

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

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

GEOCON

PROJECT NO. T2979-22-01

BORING B-6

ELEV. (MSL.) **1584** DATE COMPLETED **5/13/2022**

EQUIPMENT **CME 75 HSA** BY: **L. WEIDMAN**

DEPTH IN FEET	SAMPLE NO.	BULK	DR/SPT	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0							**PAVEMENT SECTION**			
						SM	5" AC, 4" BASE			
2							**UNDOCUMENTED FILL (afu)**			
	B-6@2.5'		■				Silty SAND, medium dense, moist, dark yellow brown; fine to coarse sand; little mica	50-6"		
4							**QUARTZ DIORITE BEDROCK (qdi)**			
	B-6@20'		■				White black brown; mica rich; excavates as Well-graded SAND with Silt; slightly oxidized; micaceous; friable			
6	B-6@5-10'	▨					-Becomes moist	50-5"		
	B-6@7.5'		■				-Becomes fine grained	50-4"		
10	B-6@10'		■				-Becomes wet	50-4"		
12										
14										
	B-6@15'		■		▼			50-4.5"		

Total Depth = 15'4"
Groundwater encountered at 15'
Penetration resistance for 140-lb hammer falling 30 inches by auto hammer
Backfilled with cuttings 5/13/2022

Figure A-6,
Log of Boring B-6, Page 1 of 1

T2979-22-01 BORING LOGS.GPJ

SAMPLE SYMBOLS

- □ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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

GEOCON

PROJECT NO. T2979-22-01

BORING B-7

ELEV. (MSL.) **1585** DATE COMPLETED **5/13/2022**

EQUIPMENT **CME 75 HSA** BY: **L. WEIDMAN**

DEPTH IN FEET	SAMPLE NO.	BULK	DR/SPT	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0							**PAVEMENT SECTION** 4" AC, 8" BASE			
						SM	**UNDOCUMENTED FILL (afu)** Silty SAND, medium dense, moist, dark red brown; fine to coarse sand; little mica			
2	B-7@2-7'									
	B-7@2.5'							61-8"		
4							**QUARTZ DIORITE BEDROCK (qdi)** White black brown; mica rich; excavates as Well-graded SAND with Silt; slightly oxidized; micaceous; friable -Becomes fine grained			
	B-7@20'							50-3"		
6										
8	B-7@7.5'						-Poor recovery	50-2"		
10	B-7@10'							50-2"		
12										
14										
	B-7@15'						-Poor recovery	50-2"		

Total Depth = 15'2"
Groundwater not encountered
Penetration resistance for 140-lb hammer falling 30 inches by auto hammer
Backfilled with cuttings 5/16/2022

T2979-22-01 BORING LOGS.GPJ

Figure A-7,
Log of Boring B-7, Page 1 of 1

SAMPLE SYMBOLS

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

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

GEOCON

PROJECT NO. T2979-22-01

DEPTH IN FEET	SAMPLE NO.	BULK	DR/SPT	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**BORING P-1** ELEV. (MSL.) **1582** DATE COMPLETED **5/13/2022** EQUIPMENT **CME 75 HSA** BY: **L. WEIDMAN**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
							MATERIAL DESCRIPTION			
0							**PAVEMENT SECTION** 3" AC, 4" BASE			
						SP	**UNDOCUMENTED FILL (afu)** Poorly-graded SAND, medium dense, slightly moist, golden brown; medium sand; some coarse sand; few mica			
2	P-1@3'									
4							**QUARTZ DIORITE BEDROCK (qdi)** White black brown; mica rich; excavates as Well-graded SAND with Silt; dry; friable; slightly oxidized			
							Total Depth = 4.5' No Groundwater encountered Percolation Test Equipment set Presaturated with 5 gallons of water Backfilled with cuttings 5/16/2022			

Figure A-8,
Log of Boring P-1, Page 1 of 1

T2979-22-01 BORING LOGS.GPJ

SAMPLE SYMBOLS

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

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

GEOCON

PROJECT NO. T2979-22-01

BORING P-2

ELEV. (MSL.) **1582** DATE COMPLETED **5/13/2022**

EQUIPMENT **CME 75 HSA** BY: **L. WEIDMAN**

DEPTH IN FEET	SAMPLE NO.	BULK	DR/SPT	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0							**PAVEMENT SECTION**			
						SP	3" AC, 4" BASE			
2	P-2@2'						**UNDOCUMENTED FILL (afu)** Poorly-graded SAND, medium dense, slightly moist, golden brown; medium sand; some coarse sand; few mica			
							QUARTZ DIORITE BEDROCK (qdi) White black brown; mica rich; excavates as Well-graded SAND with Silt; dry; friable; slightly oxidized			

Total Depth = 3.5'
No Groundwater encountered
Percolation Test Equipment set
Presaturated with 5 gallons of water
Backfilled with cuttings 5/16/2022

Figure A-9,
Log of Boring P-2, Page 1 of 1

T2979-22-01 BORING LOGS.GPJ

SAMPLE SYMBOLS

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

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

GEOCON

PROJECT NO. T2979-22-01

DEPTH IN FEET	SAMPLE NO.	BULK	DR/SPT	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**BORING P-3** ELEV. (MSL.) **1585** DATE COMPLETED **5/13/2022** EQUIPMENT **CME 75 HSA** BY: **L. WEIDMAN**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
							MATERIAL DESCRIPTION			
0							**PAVEMENT SECTION** 4" AC, 5" BASE			
2							**QUARTZ DIORITE BEDROCK (qdi)** White black brown; mica rich; excavates as Well-graded SAND with Silt; dry; friable; slightly oxidized; micaceous			
4	P-3@4.5'									
6							Total Depth = 6' No Groundwater encountered Percolation Test Equipment set Presaturated with 5 gallons of water Backfilled with cuttings 5/16/2022			

Figure A-10,
Log of Boring P-3, Page 1 of 1

T2979-22-01 BORING LOGS.GPJ

SAMPLE SYMBOLS

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

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

GEOCON

PROJECT NO. T2979-22-01

DEPTH IN FEET	SAMPLE NO.	BULK	DR/SPT	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**BORING P-4** ELEV. (MSL.) **1585** DATE COMPLETED **5/13/2022** EQUIPMENT **CME 75 HSA** BY: **L. WEIDMAN**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
							MATERIAL DESCRIPTION			
0							**PAVEMENT SECTION** 4" AC, 5" BASE			
2							**QUARTZ DIORITE BEDROCK (qdi)** White black brown; mica rich; excavates as Well-graded SAND with Silt; dry; friable; slightly oxidized; micaceous			
4	P-4@4.5'									
6							Total Depth = 6' No Groundwater encountered Percolation Test Equipment set Presaturated with 5 gallons of water Backfilled with cuttings 5/16/2022			

Figure A-11,
Log of Boring P-4, Page 1 of 1

T2979-22-01 BORING LOGS.GPJ

SAMPLE SYMBOLS

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

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

GEOCON

PROJECT NO. T2979-22-01

DEPTH IN FEET	SAMPLE NO.	BULK	DR/SPT	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING P-5	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
							ELEV. (MSL.) **1588** DATE COMPLETED **5/13/2022** EQUIPMENT **CME 75 HSA** BY: **L. WEIDMAN**			
							MATERIAL DESCRIPTION			
0							**PAVEMENT SECTION** 3" AC, 5" BASE			
						SM				
2							**UNDOCUMENTED FILL (afu)** Silty SAND, medium dense, moist, dark red brown; fine to coarse sand; few mica			
4	P-5@4.5'						**QUARTZ DIORITE BEDROCK (qdi)** White black brown; mica rich; excavates as Well-graded SAND with Silt; dry; friable; slightly oxidized			
6							Total Depth = 6' No Groundwater encountered Percolation Test Equipment set Presaturated with 5 gallons of water Backfilled with cuttings 5/16/2022			

Figure A-12,
Log of Boring P-5, Page 1 of 1

T2979-22-01 BORING LOGS.GPJ

SAMPLE SYMBOLS

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

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

GEOCON

PROJECT NO. T2979-22-01

DEPTH IN FEET	SAMPLE NO.	BULK	DR/SPT	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**BORING P-6** ELEV. (MSL.) **1588** DATE COMPLETED **5/13/2022** EQUIPMENT **CME 75 HSA** BY: **L. WEIDMAN**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
							MATERIAL DESCRIPTION			
0							**PAVEMENT SECTION** 3" AC, 5" BASE			
						SM	**UNDOCUMENTED FILL (afu)** Silty SAND, medium dense, moist, dark red brown; fine to coarse sand; few mica			
2										
4	P-6@4.5'						**QUARTZ DIORITE BEDROCK (qdi)** White black brown; mica rich; excavates as Well-graded SAND with Silt; dry; friable; slightly oxidized			
6							Total Depth = 6' No Groundwater encountered Percolation Test Equipment set Presaturated with 5 gallons of water Backfilled with cuttings 5/16/2022			

Figure A-13,
Log of Boring P-6, Page 1 of 1

T2979-22-01 BORING LOGS.GPJ

SAMPLE SYMBOLS

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

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

GEOCON

PERCOLATION TEST REPORT

Project Name:		Riverside Redevelopment			**Project No.:**		T2979-22-01
Test Hole No.:		P-1			**Date Excavated:**		5/13/2022
Length of Test Pipe:			36.0	inches	**Soil Classification:**		SM
Height of Pipe above Ground:			0.0	inches	**Presoak Date:**		5/13/2022
Depth of Test Hole:			36.0	inches	**Perc Test Date:**		5/16/2022
Check for Sandy Soil Criteria Tested by:				Weidman	**Percolation Tested by:**		Weidman
Water level measured from BOTTOM of hole							

Sandy Soil Criteria Test

Trial No.	Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (in)	Final Water Level (in)	Δ in Water Level (in)	Percolation Rate (min/inch)
1	8:52 AM 9:17 AM	25	25	12.0	0.0	12.0	2.1
2	9:17 AM 9:42 AM	25	50	12.0	4.8	7.2	3.5
			Soil Criteria: Sandy				

Percolation Test

Reading No.	Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Head (in)	Final Water Head (in)	Δ in Water Level (in)	Percolation Rate (min/inch)
1	12:16 AM 12:26 AM	10	10	36.0	3.8	32.2	0.3
2	12:26 AM 12:36 AM	10	20	36.0	4.9	31.1	0.3
3	12:36 AM 12:46 AM	10	30	36.0	5.4	30.6	0.3
4	12:46 AM 12:56 AM	10	40	36.0	5.8	30.2	0.3
5	12:56 AM 1:06 AM	10	50	36.0	6.5	29.5	0.3
6	1:06 AM 1:16 AM	10	60	36.0	7.1	28.9	0.3

Infiltration Rate (in/hr):		14.7				
Radius of test hole (in):		4				**Figure A-14**
Average Head (in):		21.5				

PERCOLATION TEST REPORT							
Project Name:		Riverside Redevelopment			**Project No.:**		T2979-22-01
Test Hole No.:		P-2			**Date Excavated:**		5/13/2022
Length of Test Pipe:			24.0	inches	**Soil Classification:**		SM
Height of Pipe above Ground:			0.0	inches	**Presoak Date:**		5/13/2022
Depth of Test Hole:			24.0	inches	**Perc Test Date:**		5/16/2022
Check for Sandy Soil Criteria Tested by:				Weidman	**Percolation Tested by:**		Weidman
Water level measured from BOTTOM of hole							
Sandy Soil Criteria Test							
Trial No.	**Time**	**Time Interval (min)**	**Total Elapsed Time (min)**	**Initial Water Level (in)**	**Final Water Level (in)**	**Δ in Water Level (in)**	**Percolation Rate (min/inch)**
1	8:51 AM 9:16 AM	25	25	8.4	0.8	7.6	3.3
2	9:16 AM 9:41 AM	25	50	8.4	3.6	4.8	5.2
			Soil Criteria: Sandy				
			Percolation Test				
Reading No.	**Time**	**Time Interval (min)**	**Total Elapsed Time (min)**	**Initial Water Head (in)**	**Final Water Head (in)**	**Δ in Water Level (in)**	**Percolation Rate (min/inch)**
1	12:15 AM 12:25 AM	10	10	36.0	6.4	29.6	0.3
2	12:25 AM 12:35 AM	10	20	36.0	6.7	29.3	0.3
3	12:35 AM 12:45 AM	10	30	36.0	6.8	29.2	0.3
4	12:45 AM 12:55 AM	10	40	36.0	7.0	29.0	0.3
5	12:55 AM 1:05 AM	10	50	36.0	7.1	28.9	0.3
6	1:05 AM 1:15 AM	10	60	36.0	7.2	28.8	0.3
Infiltration Rate (in/hr):			14.6				
Radius of test hole (in):			4				**Figure A-15**
Average Head (in):			21.6				

PERCOLATION TEST REPORT							
Project Name:		Riverside Redevelopment			**Project No.:**		T2979-22-01
Test Hole No.:		P-3			**Date Excavated:**		5/13/2022
Length of Test Pipe:			54.0	inches	**Soil Classification:**		SM
Height of Pipe above Ground:			0.0	inches	**Presoak Date:**		5/13/2022
Depth of Test Hole:			54.0	inches	**Perc Test Date:**		5/16/2022
Check for Sandy Soil Criteria Tested by:				Weidman	**Percolation Tested by:**		Weidman
Water level measured from BOTTOM of hole							
Sandy Soil Criteria Test							
Trial No.	**Time**	**Time**	**Total**	**Initial Water**	**Final Water**	**Δ in Water**	**Percolation**
		Interval	**Elapsed**	**Level**	**Level**	**Level**	**Rate**
		(min)	**Time (min)**	**(in)**	**(in)**	**(in)**	**(min/inch)**
1	8:49 AM 9:14 AM	25	25	24.0	13.0	11.0	2.3
2	9:14 AM 9:39 AM	25	50	24.0	16.3	7.7	3.3
			Soil Criteria: Sandy				
			Percolation Test				
Reading	**Time**	**Time**	**Total**	**Initial Water**	**Final Water**	**Δ in Water**	**Percolation**
No.		**Interval**	**Elapsed**	**Head**	**Head**	**Level**	**Rate**
		(min)	**Time (min)**	**(in)**	**(in)**	**(in)**	**(min/inch)**
1	11:01 AM 11:11 AM	10	10	36.0	20.6	15.4	0.7
2	11:11 AM 11:21 AM	10	20	36.0	21.2	14.8	0.7
3	11:21 AM 11:31 AM	10	30	36.0	21.6	14.4	0.7
4	11:31 AM 11:41 AM	10	40	36.0	21.6	14.4	0.7
5	11:41 AM 11:51 AM	10	50	36.0	21.5	14.5	0.7
6	11:51 AM 12:01 PM	10	60	36.0	21.4	14.6	0.7
Infiltration Rate (in/hr):			5.7				
Radius of test hole (in):			4				**Figure A-16**
Average Head (in):			28.7				

PERCOLATION TEST REPORT							
Project Name:		Riverside Redevelopment			**Project No.:**		T2979-22-01
Test Hole No.:		P-4			**Date Excavated:**		5/13/2022
Length of Test Pipe:			54.0	inches	**Soil Classification:**		SM
Height of Pipe above Ground:			0.0	inches	**Presoak Date:**		5/13/2022
Depth of Test Hole:			54.0	inches	**Perc Test Date:**		5/16/2022
Check for Sandy Soil Criteria Tested by:				Weidman	**Percolation Tested by:**		Weidman
Water level measured from BOTTOM of hole							
Sandy Soil Criteria Test							
Trial No.	**Time**	**Time Interval (min)**	**Total Elapsed Time (min)**	**Initial Water Level (in)**	**Final Water Level (in)**	**Δ in Water Level (in)**	**Percolation Rate (min/inch)**
1	8:48 AM 9:13 AM	25	25	24.0	15.2	8.8	2.9
2	9:13 AM 9:38 AM	25	50	24.0	17.9	6.1	4.1
			Soil Criteria: Sandy				
Percolation Test							
Reading No.	**Time**	**Time Interval (min)**	**Total Elapsed Time (min)**	**Initial Water Head (in)**	**Final Water Head (in)**	**Δ in Water Level (in)**	**Percolation Rate (min/inch)**
1	11:00 AM 11:10 AM	10	10	36.0	21.8	14.2	0.7
2	11:10 AM 11:20 AM	10	20	36.0	22.1	13.9	0.7
3	11:20 AM 11:30 AM	10	30	36.0	22.3	13.7	0.7
4	11:30 AM 11:40 AM	10	40	36.0	22.7	13.3	0.8
5	11:40 AM 11:50 AM	10	50	36.0	23.0	13.0	0.8
6	11:50 AM 12:00 PM	10	60	36.0	23.4	12.6	0.8
Infiltration Rate (in/hr):			4.8				
Radius of test hole (in):			4				**Figure A-17**
Average Head (in):			29.7				

PERCOLATION TEST REPORT							
Project Name:		Riverside Redevelopment			**Project No.:**		T2979-22-01
Test Hole No.:		P-5			**Date Excavated:**		5/13/2022
Length of Test Pipe:			54.0	inches	**Soil Classification:**		SM
Height of Pipe above Ground:			0.0	inches	**Presoak Date:**		5/13/2022
Depth of Test Hole:			54.0	inches	**Perc Test Date:**		5/16/2022
Check for Sandy Soil Criteria Tested by:				Weidman	**Percolation Tested by:**		Weidman
Water level measured from BOTTOM of hole							
Sandy Soil Criteria Test							
Trial No.	**Time**	**Time**	**Total**	**Initial Water**	**Final Water**	**Δ in Water**	**Percolation**
		Interval	**Elapsed**	**Level**	**Level**	**Level**	**Rate**
		(min)	**Time (min)**	**(in)**	**(in)**	**(in)**	**(min/inch)**
1	8:46 AM 9:11 AM	25	25	24.0	15.0	9.0	2.8
2	9:11 AM 9:36 AM	25	50	24.0	18.0	6.0	4.2
			Soil Criteria: Sandy				
			Percolation Test				
Reading	**Time**	**Time**	**Total**	**Initial Water**	**Final Water**	**Δ in Water**	**Percolation**
No.		**Interval**	**Elapsed**	**Head**	**Head**	**Level**	**Rate**
		(min)	**Time (min)**	**(in)**	**(in)**	**(in)**	**(min/inch)**
1	9:46 AM 9:56 AM	10	10	36.0	10.2	25.8	0.4
2	9:56 AM 10:06 AM	10	20	36.0	10.6	25.4	0.4
3	10:06 AM 10:16 AM	10	30	36.0	10.8	25.2	0.4
4	10:16 AM 10:26 AM	10	40	36.0	10.9	25.1	0.4
5	10:26 AM 10:36 AM	10	50	36.0	10.9	25.1	0.4
6	10:36 AM 10:46 AM	10	60	36.0	10.9	25.1	0.4
Infiltration Rate (in/hr):			11.8				
Radius of test hole (in):			4				**Figure A-18**
Average Head (in):			23.5				

PERCOLATION TEST REPORT							
Project Name:		Riverside Redevelopment			**Project No.:**		T2979-22-01
Test Hole No.:		P-6			**Date Excavated:**		5/13/2022
Length of Test Pipe:			54.0	inches	**Soil Classification:**		SM
Height of Pipe above Ground:			0.0	inches	**Presoak Date:**		5/13/2022
Depth of Test Hole:			54.0	inches	**Perc Test Date:**		5/16/2022
Check for Sandy Soil Criteria Tested by:				Weidman	**Percolation Tested by:**		Weidman
Water level measured from BOTTOM of hole							
Sandy Soil Criteria Test							
Trial No.	**Time**	**Time**	**Total**	**Initial Water**	**Final Water**	**Δ in Water**	**Percolation**
		Interval	**Elapsed**	**Level**	**Level**	**Level**	**Rate**
		(min)	**Time (min)**	**(in)**	**(in)**	**(in)**	**(min/inch)**
1	8:45 AM 9:10 AM	25	25	24.0	16.4	7.6	3.3
2	9:10 AM 9:35 AM	25	50	24.0	18.0	6.0	4.2
			Soil Criteria: Sandy				
			Percolation Test				
Reading	**Time**	**Time**	**Total**	**Initial Water**	**Final Water**	**Δ in Water**	**Percolation**
No.		**Interval**	**Elapsed**	**Head**	**Head**	**Level**	**Rate**
		(min)	**Time (min)**	**(in)**	**(in)**	**(in)**	**(min/inch)**
1	9:45 AM 9:55 AM	10	10	36.0	21.6	14.4	0.7
2	9:55 AM 10:05 AM	10	20	36.0	21.7	14.3	0.7
3	10:05 AM 10:15 AM	10	30	36.0	22.0	14.0	0.7
4	10:15 AM 10:25 AM	10	40	36.0	22.2	13.8	0.7
5	10:25 AM 10:35 AM	10	50	36.0	22.4	13.6	0.7
6	10:35 AM 10:45 AM	10	60	36.0	22.6	13.4	0.7
Infiltration Rate (in/hr):			5.2				
Radius of test hole (in):			4				**Figure A-19**
Average Head (in):			29.3				

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	Rick Engineering Company	Date	6/7/2022
Designed by	Sam Schuchardt	Case No	
Company Project Number/Name	19550-A / Mission Grove Apartments		

BMP Identification

BMP NAME / ID: MWL-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)*
D-1	*57907*	*Mixed Surface Types*	*1*	*0.89*	*51653*			
	57907		**Total**		**51653**	**0.20**	***0.2***	***0.462***

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: Rick Engineering Company | Date: 6/7/2022

Designed by: Sam Schuchardt | Case No:

Company Project Number/Name: 19550-A / Mission Grove Apartments

BMP Identification

BMP NAME / ID: MWL-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)*
D-2	*78919*	*Mixed Surface Types*	*1*	*0.89*	*70395.7*			
	78919	***Total***			**70395.7**	**0.20**	***0.3***	***0.346***

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	Rick Engineering Company	Date	6/7/2022
Designed by	Sam Schuchardt	Case No	
Company Project Number/Name	19550-A / Mission Grove Apartments		

BMP Identification

BMP NAME / ID: MWL-3

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)*
D-3	*110588*	*Mixed Surface Types*	*0.9*	*0.73*	*80760.4*			
	110588		***Total***		**80760.4**	**0.20**	***0.4***	***0.462***

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	Rick Engineering Company	Date	6/7/2022
Designed by	Sam Schuchardt	Case No	
Company Project Number/Name	19550-A / Mission Grove Apartments		

BMP Identification

BMP NAME / ID: MWL-4

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)*
D-4	*83572*	*Mixed Surface Types*	*1*	*0.89*	*74546.2*			
	83572		***Total***		**74546.2**	**0.20**	***0.3***	***0.462***

Notes:

MWS Linear | *Sizing Options*

Flow Based Sizing

The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear 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	Treatment Flow Rate (cfs)
MWS-L-4-4	4′ x 4′	23 sq. ft.	0.052
MWS-L-4-6	4′ x 6′	32 sq. ft.	0.073
MWS-L-4-8	4′ x 8′	50 sq. ft.	0.115
MWS-L-4-13	4′ x 13′	63 sq. ft.	0.144
MWS-L-4-15	4′ x 15′	76 sq. ft.	0.175
MWS-L-4-17	4′ x 17′	90 sq. ft.	0.206
MWS-L-4-19	4′ x 19′	103 sq. ft.	0.237
MWS-L-4-21	4′ x 21′	117 sq. ft.	0.268
MWS-L-6-8	7′ x 9′	64 sq. ft.	0.147
MWS-L-8-8	8′ x 8′	100 sq. ft.	0.230
MWS-L-8-12	8′ x 12′	151 sq. ft.	0.346
MWS-L-8-16	8′ x 16′	201 sq. ft.	0.462
MWS-L-8-20	9′ x 21′	252 sq. ft.	0.577
MWS-L-8-24	9′ x 25′	302 sq. ft.	0.693

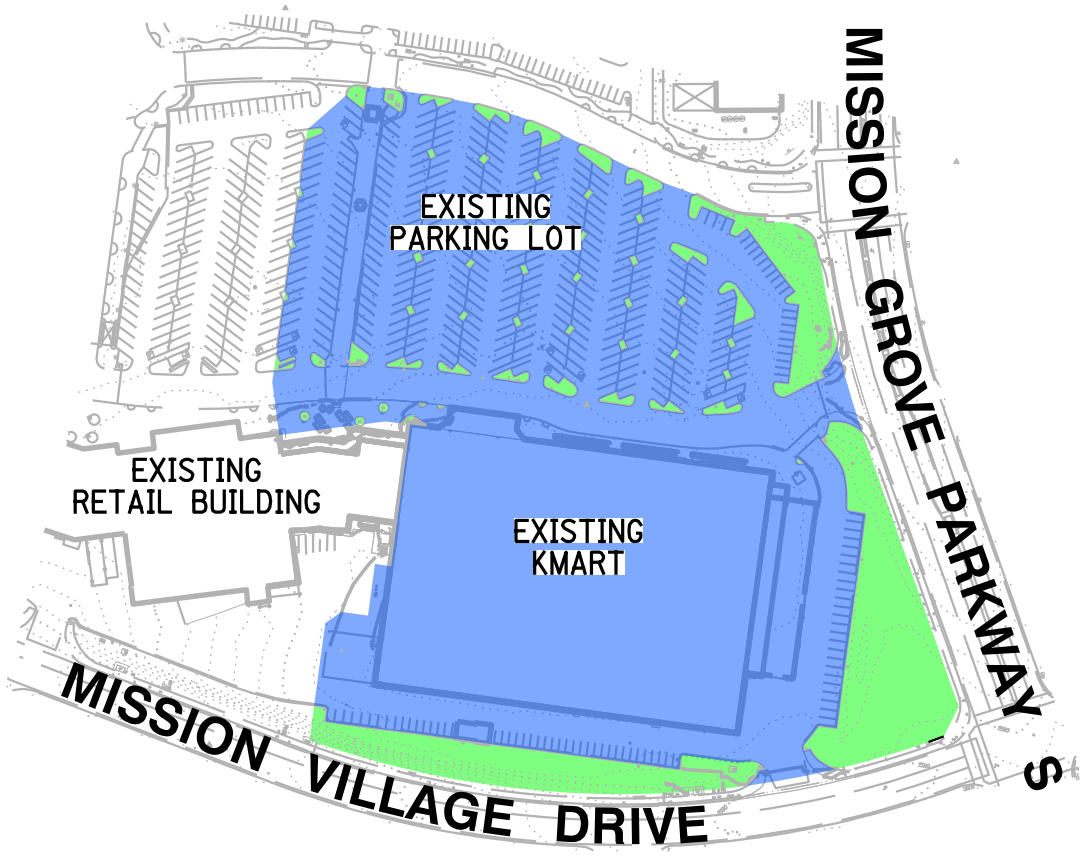
Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

HYDROMODIFICATION
PRE-PROJECT

LEGEND

PERVIOUS AREA	59,692 SF
IMPERVIOUS AREA	317,369 SF
TOTAL AREA	377,061 SF



SCALE: 1" = 200'

200 0 200 400

HYDROMODIFICATION POST-PROJECT

LEGEND

PERVIOUS AREA	59,119 SF
IMPERVIOUS AREA	317,942 SF
TOTAL AREA	377,061 SF

SCALE: 1" = 200'

200 0 200 400

HCOC calculations

Soil Type D- $P_{2yr-24hr} = 1.80$

*Per RCFCD Hydrology Manual

CN Landscape (turf-fair) = 82

CN Hardscape = 90

Pre Project

Total Area = 8.66 AC

Impervious = 7.29 acres

Pervious = 1.37 acres

$$CN = \frac{82(1.37) + 90(7.29)}{8.66} = 88.73$$

$Ia = 0.2 \times S = 0.25$

$S = (1000/CN) - 10 = 1.27$

$V = 1/12 \left(8.66 \times (1.80 - 0.25)^2\right) / (1.80 - 0.25 + 1.27)$

$V = 0.61$ acre-ft $\times 43560 =$ 26,781.74 ft^3

Post Project

Total Area = 8.66

Impervious = 7.30

Pervious = 1.36

$$CN = \frac{82(1.36) + 90(7.30)}{8.66} = 88.74$$

$Ia = 0.2 * S = 0.25$

$S = (1000/CN) - 10 = 1.27$

$V = 1/12 \left(8.66 \times (1.80 - 0.25)^2 / (1.80 - 0.25 + 1.27)\right)$

$V = 0.61$ acre-ft $* 43560 =$ 26,781.74 ft^3

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Shown on WQMP Drawings	3 Permanent Controls—Listed in WQMP Table and Narrative	4 Operational BMPs—Included 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.**

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Shown on WQMP Drawings	3 Permanent Controls—Listed in WQMP Table and Narrative	4 Operational BMPs—Included in WQMP Table and Narrative
☐ **D1. Need for future indoor & structural pest control**		☐ **Note building design features that discourage entry of pests.**	☐ **Provide Integrated Pest Management information to owners, lessees, and operators.**
☐ **D2. Landscape/ Outdoor Pesticide Use**	☐ **Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.** ☐ **Show self-retaining landscape areas, if any.** ☐ **Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)**	**State that final landscape plans will accomplish all of the following.** ☐ **Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.** ☐ **Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.** ☐ **Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.** ☐ **Consider using pest-resistant plants, especially adjacent to hardscape.** ☐ **To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.**	☐ **Maintain landscaping using minimum or no pesticides.** ☐ **See applicable operational BMPs in "What you should know for…..Landscape and Gardening" at http://rcflood.org/stormwater/Downloads/LandscapeGardenBrochure.pdf** ☐ **Provide IPM information to new owners, lessees and operators.**

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

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

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Shown on WQMP Drawings	3 Permanent Controls—Listed in WQMP Table and Narrative	4 Operational BMPs—Included in WQMP Table and Narrative
☐ H. Industrial processes.	☐ Show process area.	☐ If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	☐ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/

1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Shown on WQMP Drawings	3 Permanent Controls—Listed in WQMP Table and Narrative	4 Operational BMPs—Included in WQMP Table and Narrative
☐ I. Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	☐ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area. ☐ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ☐ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with therequirements 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

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

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

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Shown on WQMP Drawings	3 Permanent Controls—Listed in WQMP Table and Narrative	4 Operational BMPs—Included in WQMP Table and Narrative
☐ **K. Vehicle/Equipment Repair and Maintenance**	☐ **Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.** ☐ **Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.** ☐ **Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.**	☐ **State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.** ☐ **State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.** ☐ **State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.**	**In the Stormwater Control Plan, note that all of the following restrictions apply to use the site:** ☐ **No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.** ☐ **No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.** ☐ **No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment. Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/**

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Shown on WQMP Drawings	3 Permanent Controls—Listed in WQMP Table and Narrative	4 Operational BMPs—Included in WQMP Table and Narrative
☐ **L. Fuel Dispensing Areas**	☐ **Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.** ☐ **Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.**		☐ **The property owner shall dry sweep the fueling area routinely.** ☐ **See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

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

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Shown on WQMP Drawings	3 Permanent Controls—Listed in WQMP Table and Narrative	4 Operational BMPs—Included in WQMP Table and Narrative
☐ **M. Loading Docks**	☐ **Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer.** ☐ **Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.** ☐ **Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.**		☐ **Move loaded and unloaded items indoors as soon as possible.** ☐ **See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

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

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Shown on WQMP Drawings	3 Permanent Controls—Listed in WQMP Table and Narrative	4 Operational BMPs—Included in WQMP Table and Narrative
☑ **P. Plazas, sidewalks, and parking lots.**			☑ **Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.**

Appendix 9: O&M

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

Will be included in final WQMP

WHEN RECORDED MAIL TO:

City Surveyor
City of Riverside
City Hall, 3900 Main Street
Riverside, CA 92522

Planning Case: **PR-2022-001359**

For Recorder's Office Use Only

COVENANT AND AGREEMENT
ESTABLISHING NOTIFICATION PROCESS AND RESPONSIBILITY FOR
WATER QUALITY MANAGEMENT PLAN IMPLEMENTATION AND MAINTENANCE

THIS COVENANT AND AGREEMENT FOR WATER QUALITY MANAGEMENT PLAN IMPLEMENTATION AND MAINTENANCE is made and entered into this_____day of _____, 2022, by _____ ("Declarant"), with reference to the following facts:

A. Declarant is the fee owner of the real property (the "Property") situated in the City of Riverside, County of Riverside, State of California, and legally described in Exhibit "A", which is attached hereto and incorporated within by reference.

B. Declarant has applied to the City of Riverside ("City") for the construction of GP-2021-11040 located at 375 East Alessandro Boulevard in Riverside

C. As a condition of approval and prior to the map recordation and/or issuance of any permits, the City is requiring Declarant to execute and record an agreement stating that the future property owners shall be informed of the requirements to implement and maintain the Best Management Practices ("BMPs") as described in the approved project specific Water Quality Management Plan.

D. Declarant intends by this document to comply with the conditions imposed by the City and to impose upon the Property mutually beneficial restrictions, conditions, covenants and agreements for the benefit of Property.

NOW, THEREFORE, for the purposes of complying with the conditions imposed by the City of Riverside for the approval of Planning Case **PR-2022-001359**, Declarant hereby declares that the Property is and hereafter shall be held, conveyed, transferred, mortgaged, encumbered, leased, rented, used, occupied, sold and improved subject to the following declarations, limitations, covenants, conditions, restrictions and easements, all of which are imposed as equitable servitudes pursuant to a general plan for the development of the Property for the purpose of enhancing and protecting the value and attractiveness of the Property, and

each Parcel thereof, in accordance with the plan for the improvement of the Property, and to comply with certain conditions imposed by the City for the approval of **PR-2022-001359** and shall be binding and inure to the benefit of each successor and assignee in interest of each such party. Any conveyance, transfer, sale, assignment, lease or sublease made by Declarant of a Parcel of the Property shall be and hereby is deemed to incorporate by reference all the provisions of the Covenant and Agreement including, but not limited to, all the covenants, conditions, restrictions, limitations, grants of easement, rights, rights-of-way, and equitable servitude contained herein.

1. This Covenant and Agreement hereby establishes a notification process for future individual property owners to ensure they are subject to and adhere to the Water Quality Management Plan implementation measures and that it shall be the responsibility of the Declarant, its heirs, successors and assigns to implement and maintain all Best Management Practices (BMPs) in good working order.

2. Declarant shall use its best efforts to diligently implement and maintain all BMPs in a manner assuring peak performance at all times. All reasonable precautions shall be exercised by Declarant, its heirs, successors, and assigns, in the removal and extraction of any material(s) from the BMPs and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and regulations in effect at the time. As may be requested from time to time by the City, Declarant, its heirs, successors, and assigns shall provide the City with documentation identifying the material(s) removed, the quantity, and disposal destination.

3. In the event Declarant, or its heirs, successors or assigns, fails to undertake the maintenance contemplated by this Covenant and Agreement within twenty-one (21) days of being given written notice by the City, or fails to complete any maintenance contemplated by this Covenant and Agreement with reasonable diligence, the City is hereby authorized to cause any maintenance necessary to be completed and charge the entire cost and expense to the Declarant or Declarant's successors or assigns, including administrative costs, reasonable attorney's fees and interest thereon at the maximum rate authorized by the Civil Code from the date of the notice of expense until paid in full. As an additional remedy, the Public Works Director may withdraw any previous urban runoff-related approval with respect to the Property on which BMPs have been installed and/or implemented until such time as Declarant, its heirs, successors, or assigns, repays to City its reasonable costs incurred in accordance with this paragraph.

4. Any person who now or hereafter owns or acquires any right, title or interest in or to any parcel of the Property shall be deemed to have consented and agreed to every covenant, condition, restriction and easement contained herein.

5. In addition, each of the provisions hereof shall operate as covenants running with the land for the benefit of the Property and each Parcel thereof and shall inure to the benefit of all owners of the Parcels thereof, their successors and assigns in interest, and shall apply to and bind each successive owner of each Parcel, their successors and assigns in interest.

6. The terms of this Covenant and Agreement may be enforced by the City, its successors or assigns, and by any owner, lessee or tenant of the Parcels of the Property.

Should the City or any owner, lessee or tenant bring an action to enforce any of the terms of this Covenant and Agreement, the prevailing party shall be entitled to costs of suit including reasonable attorneys' fees.

7. Subject to the prior written approval of the City by its Public Works Director, any provision contained herein may be terminated, modified or amended as to all of the Property or any portion thereof. No such termination, modification or amendment shall be effective until there shall have been executed, acknowledged, and recorded in the Office of the Recorder of Riverside County, California, an appropriate instrument evidencing the same including the consent thereto by the City.

IN WITNESS WHEREOF, Declarant has caused this Covenant and Agreement to be executed as of the day and year first written above.

_____
Name:
Title:

APPROVED AS TO FORM:

_____
Name:
Deputy City Attorney

APPROVED AS TO CONTENT

_____
Name: Gilbert M. Hernandez
Public Works Department:

EXHIBIT A
(Legal Description)

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of_____)

On_____, before me,_____, a

notary public, personally appeared_____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

_____ **(SEAL)**
Signature

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of_____)

On_____, before me,_____, a

notary public, personally appeared_____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

_____ **(SEAL)**
Signature

Appendix 10: Educational Materials

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

CONTECH®
ENGINEERED SOLUTIONS

Filterra®
High Performance Bioretention

The experts you need to solve your stormwater challenges

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

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

Your Contech Team

STORMWATER CONSULTANT

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

STORMWATER DESIGN ENGINEER

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

REGULATORY MANAGER

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

SALES ENGINEER

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

Contech is your partner in stormwater management solutions

Low Impact Development in a Small Footprint – Filterra®

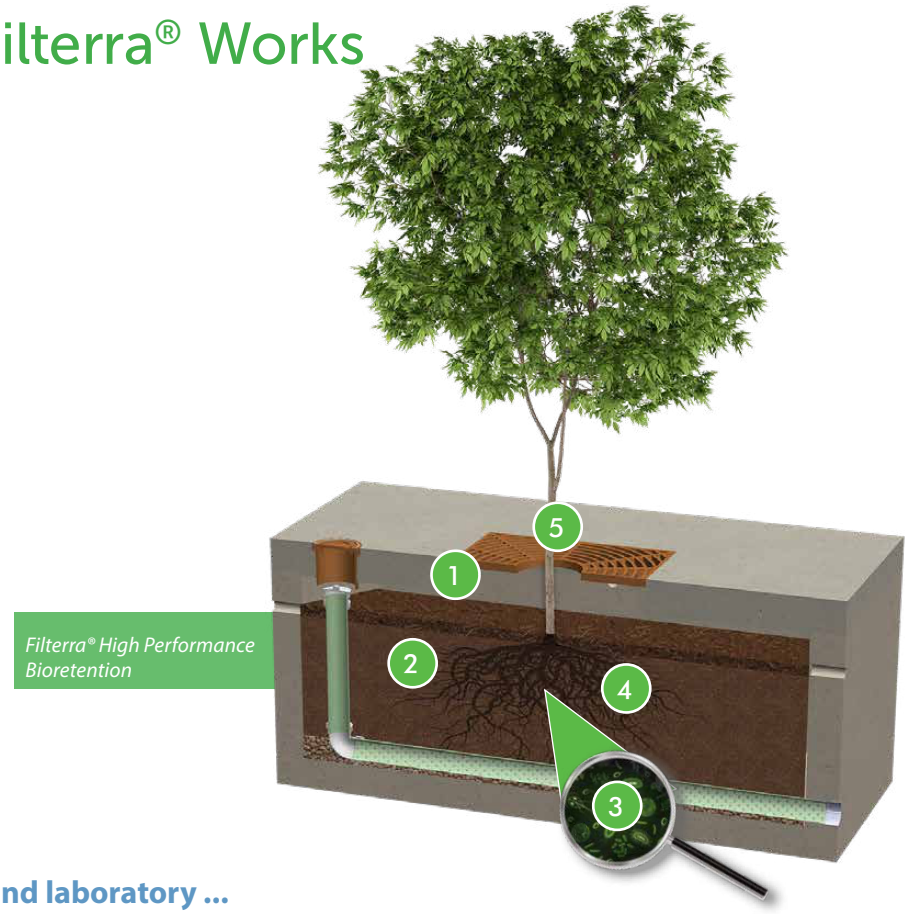
Filterra is an engineered high-performance bioretention system. While it operates similar to traditional bioretention, its high flow media allows for a reduction in footprint of up to 95% versus traditional bioretention practices. Filterra provides a Low Impact Development (LID) solution for tight, highly developed sites such as urban development projects, commercial parking lots, residential streets, and streetscapes. Its small footprint also reduces installation and life cycle costs versus traditional bioretention. Filterra can be configured in many different ways to enhance site aesthetics, integrate with other LID practices, or increase runoff reduction through infiltration below or downstream of the system.

At the Manchester Stormwater Park seen above, the Filterra systems surrounding the central courtyard allowed for the creation of a community space with parking, sidewalks, and benches in a quaint downtown area. A traditional bioretention system treating the same drainage area would have occupied the entire park area leaving no room for these amenities.

filterra® Bioretention Systems

filterra® Bioscape®

How the Filterra® Works



Tested in the field and laboratory ...

1. Stormwater enters the Filterra through a pipe, curb inlet, or sheet flow and ponds over the pretreatment mulch layer, capturing heavy sediment and debris. Organics and microorganisms within the mulch trap and degrade metals and hydrocarbons. The mulch also provides water retention for the system's vegetation.

2. Stormwater flows through engineered Filterra media which filters fine pollutants and nutrients. Organic material in the media removes dissolved metals and acts as a food source for root-zone microorganisms. Treated water exits through an underdrain pipe or infiltrates (if designed accordingly).

3. Rootzone microorganisms digest and transform pollutants into forms easily absorbed by plants.

4. Plant roots absorb stormwater and pollutants that were transformed by microorganisms, regenerating the media's pollutant removal capacity. The roots grow, provide a hospitable environment for the rootzone microorganisms and penetrate the media, maintaining hydraulic conductivity.

5. The plant trunk and foliage utilize nutrients such as Nitrogen and Phosphorus for plant health, sequester heavy metals into the biomass, and provide evapotranspiration of residual water within the system.

Plants and organic material are vital to the long term performance of bioretention systems

Using nature to facilitate Stormwater Management

Filterra® Features and Benefits

FEATURE	BENEFITS
High biofiltration media flow rate (up to 140"/hr+)	Greatly reduced footprint versus traditional bioretention and LID solutions
Filterra system is packaged, including all components necessary for system performance	Quality control for easy, fast and successful installation
Quick and easy maintenance	Low lifecycle costs
Variety of configurations and aesthetic options	Integrates easily into any site or landscape plan
Natural stormwater management processes featuring organics and vegetation	Meets Low Impact Development requirements and ensures long-term performance

The Filterra system can be configured with many different aesthetic options

Select Filterra® Approvals

Filterra is approved through numerous local, state and federal verification programs, including:

- New Jersey Department of Environmental Protection (NJ DEP)
- Washington Department of Ecology (GULD) – Basic, Enhanced, Phosphorus, and Oil
- Maryland Department of the Environment - Environmental Site Design (ESD)
- Texas Commission on Environmental Quality (TCEQ)
- Virginia Department of Environmental Quality (VA DEQ)
- Maine Department of Environmental Protection (ME DEP)
- Atlanta, GA Regional Commission
- Los Angeles County, CA - Alternate to Attachment H
- City of Portland, Oregon Bureau of Environmental Services
- North Carolina Department of Environmental Quality (NC DEQ)

Filterra® Performance Testing Results

APPLICATION TIPS

- The Filterra system has been tested under industry standard protocols and has proven its pollutant removal performance and system longevity.
- Contech invests significant resources in media blending calibration and product testing to ensure our media meets our strict performance specifications every time.
- Keep regulators and owners happy by selecting a product with predictable and proven maintenance longevity.

POLLUTANT OF CONCERN	MEDIAN REMOVAL EFFICIENCY	MEDIAN EFFLUENT CONCENTRATION (MG/L)
Total Suspended Solids (TSS)	86%	3.3
Total Phosphorus - TAPE (TP)	70%	0.05
Total Nitrogen (TN)	34%	0.54
Total Copper (TCu)	55%	0.004
Total Dissolved Copper	43%	0.003
Total Zinc (TZn)	56%	0.04
Total Dissolved Zinc	54%	0.1
Total Zinc (TZn)	56%	0.04
Total Petroleum Hydrocarbons	87%	0.71

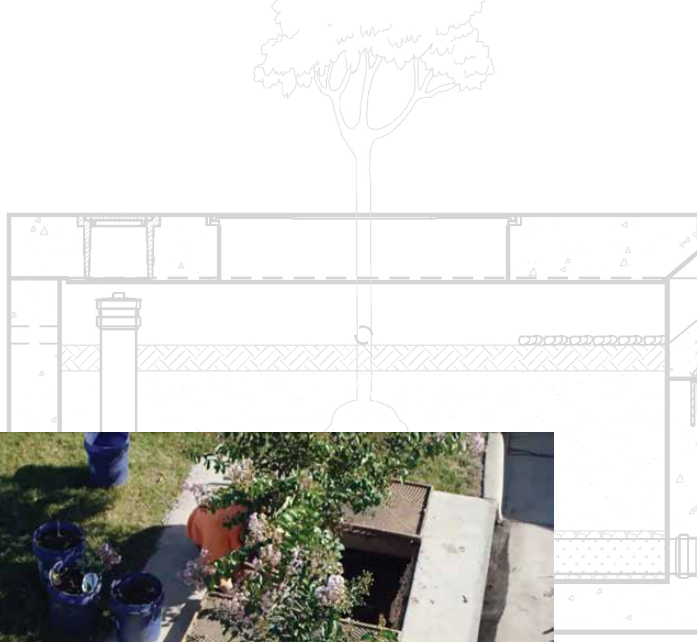
Each batch of Filterra® media has been extensively tested to ensure consistent performance every time.

Sources:
UVA (TARP) Field Study - 2006
Herrera (TAPE) Study - 2009
Herrera (TAPE) Study - 2014
NC State Study - 2015

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

Field tested and performance verified

Filterra® Maintenance



Activation and first year of maintenance is included with every system.*

With proper routine maintenance, the engineered media within the Filterra system should last as long as traditional bioretention media. Routine maintenance is included by the manufacturer on all Filterra systems for the first year after activation.* This includes a maximum of 2 visits to remove debris, replace pretreatment mulch, and prune the vegetation.

Maintenance is low-cost, low-tech and simple:

- Remove trash, sediment, and mulch
- Replace with a fresh 3" layer of mulch
- No confined space entry or special tools
- Easily performed by landscape contractor or facilities maintenance provider

** Some exclusions may apply.*

Filterra offers high performance bioretention for advanced pollutant removal with easy maintenance.

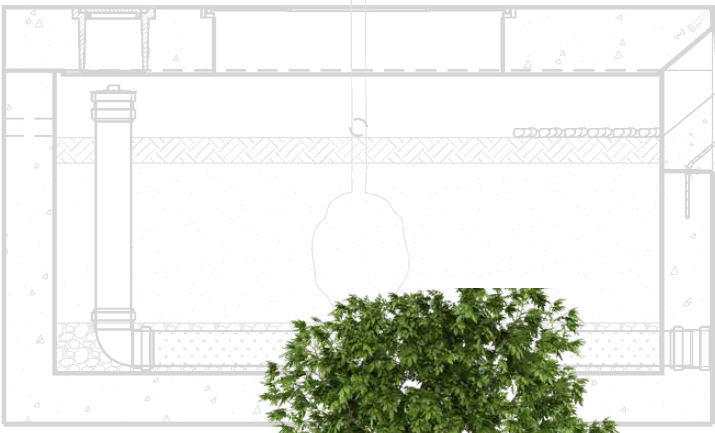
Plant health evaluation and pruning is important to encourage growth.

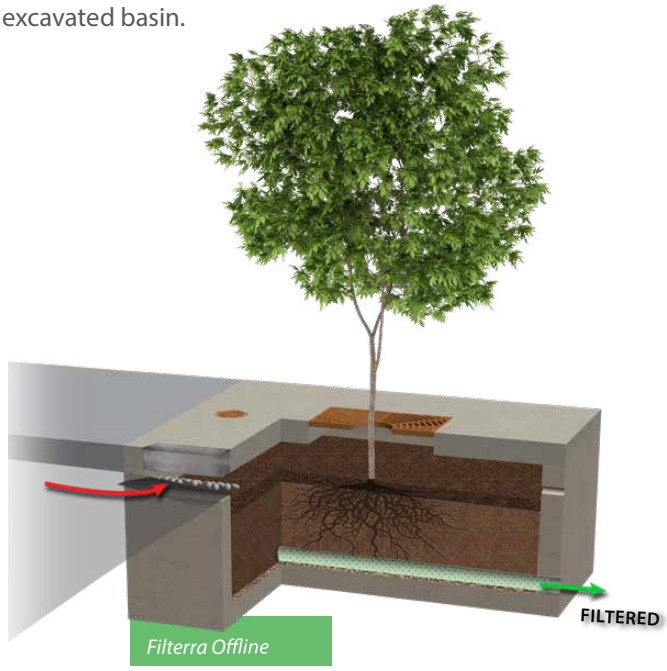
All stormwater treatment systems require maintenance for effective operation.

Filterra® Configurations

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

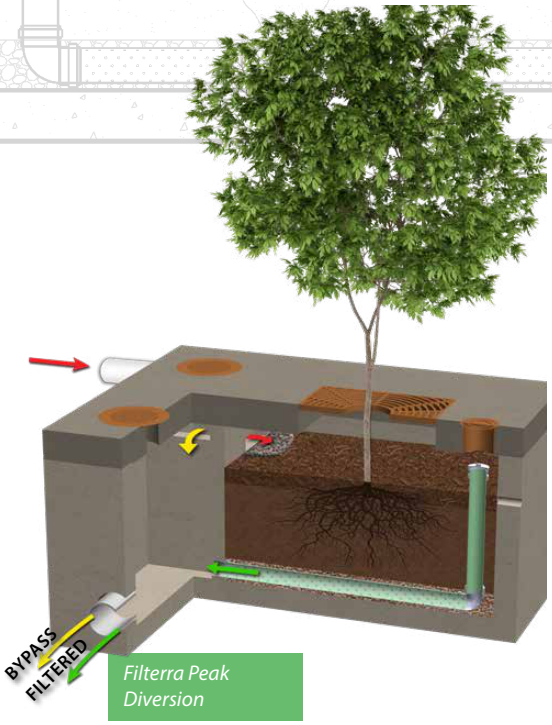
The Filterra is available in a variety of precast configurations as well as Filterra Bioscape, which can be installed directly into an excavated basin.



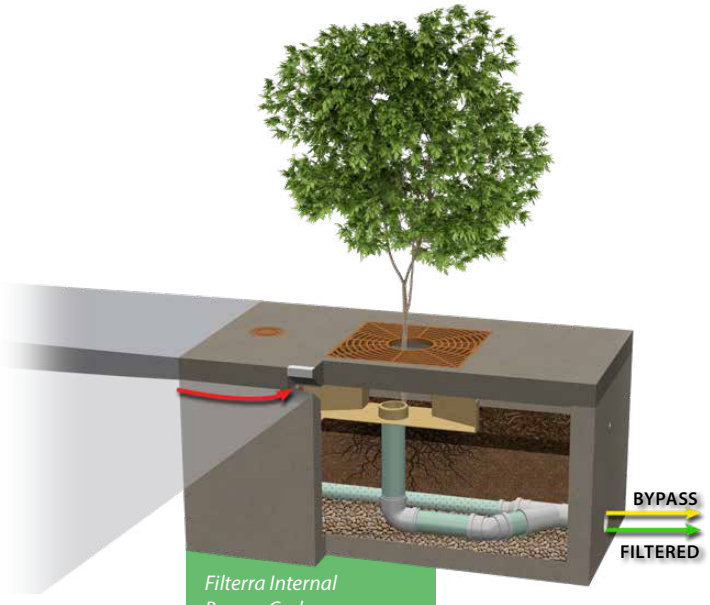


Filterra Offline

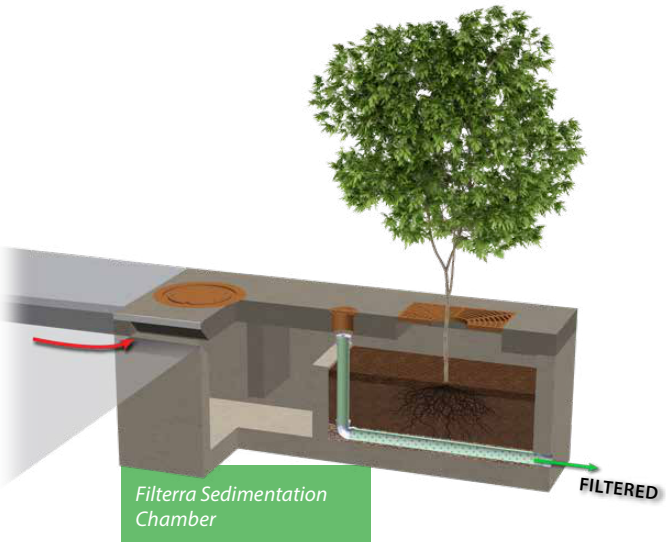
Bypass via downstream catch basin.



Filterra Peak Diversion



Filterra Internal Bypass Curb



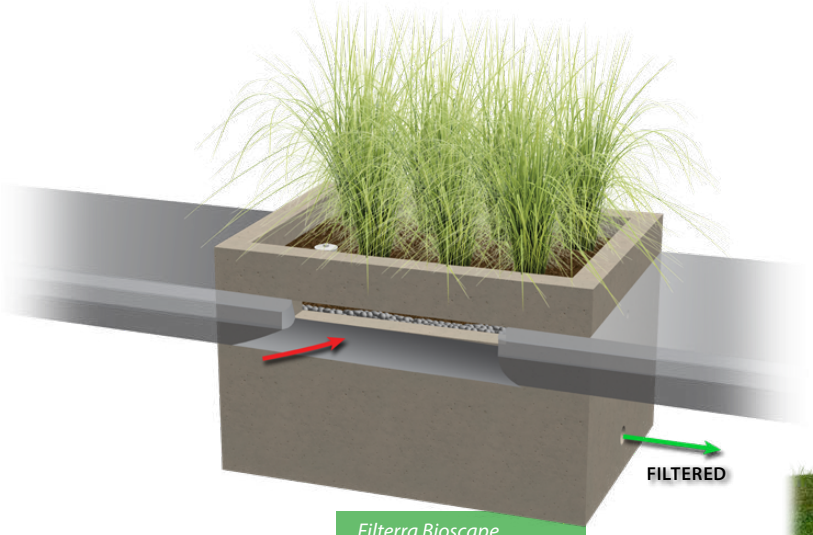
Filterra Sedimentation Chamber

Bypass via downstream catch basin.

**Additional configurations available, including offline - pipe, peak diversion - grate, and internal bypass curb-chamber.*

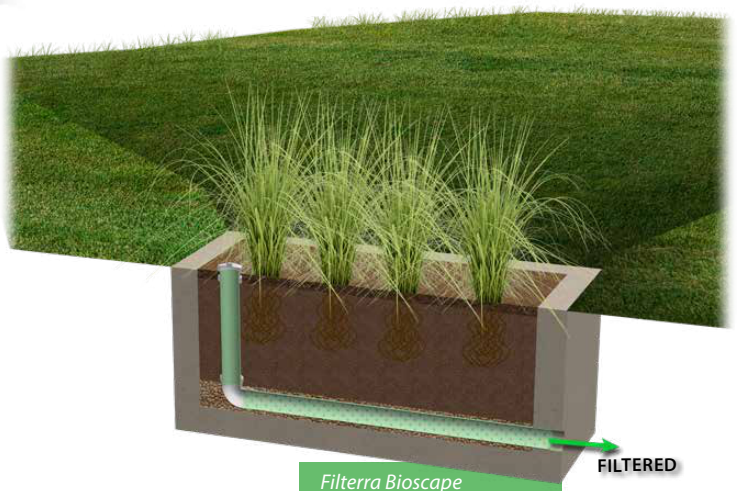
Multiple configurations allow for easy site integration

Filterra® Bioscape® Configurations



Filterra Bioscape Vault Offline

Bypass via downstream catch basin.



Filterra Bioscape Vault Basin

Bypass via upstream structure. Multiple inlet options.

Filterra Bioscape

Bypass via upstream structure. Multiple inlet options.

**Additional configurations available, including bioscape vault offline pipe.*

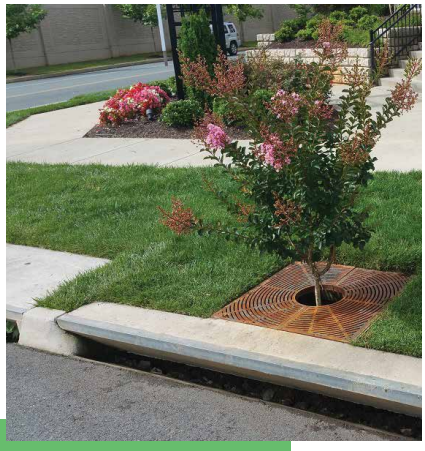
Filterra® Aesthetic Options

Multiple aesthetic options to enhance the appearance and integrate with landscaping ...

Standard Tree Grate

Custom/Decorative Tree Grate

Full Grate with Grasses



Recessed Top Slab

Open Top Planter - Filterra Bioscape

Street Tree

An aesthetic solution to meet your bioretention needs

Filterra® Bioscape®

Large-scale Filterra that can be customized to your site ...

- Ideal for Filterra systems greater than 300 square feet
- Design with or without containment structure
- Incorporate infiltration directly below the system, where required
- Combine with upstream storage or downstream infiltration
- Use as an alternative to larger regional traditional bioretention systems
- Easily add pretreatment Hydrodynamic Separator for large-scale or heavy pollutant loading applications

A partner you can rely on

STORMWATER SOLUTIONS

PIPE SOLUTIONS

STRUCTURES SOLUTIONS

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

THE CONTECH WAY

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

TAKE THE NEXT STEP

For more information: www.ContechES.com

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