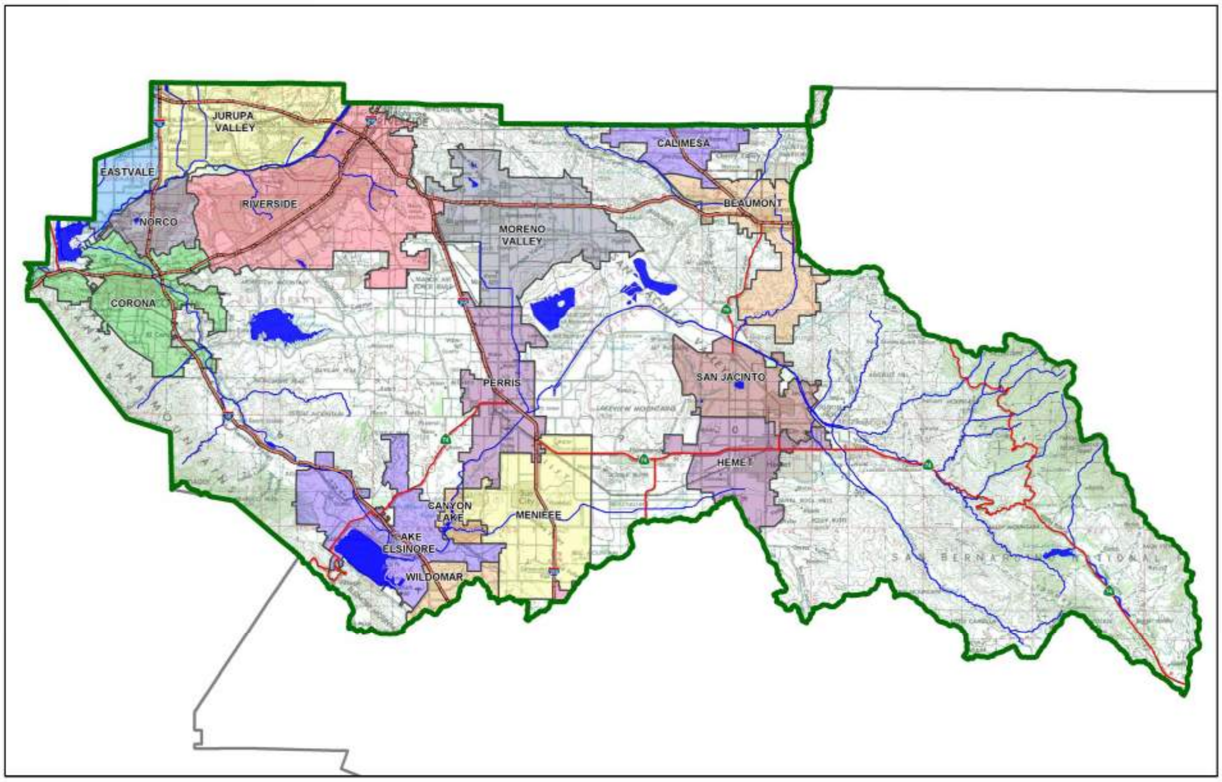
Project Specific Water Quality Management Plan

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

Project Title: Caliber Collision

Development No: 33235-3318 Zeiders Road

Design Review/Case No: PR21-0293



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☒ **Preliminary**
☐ **Final**

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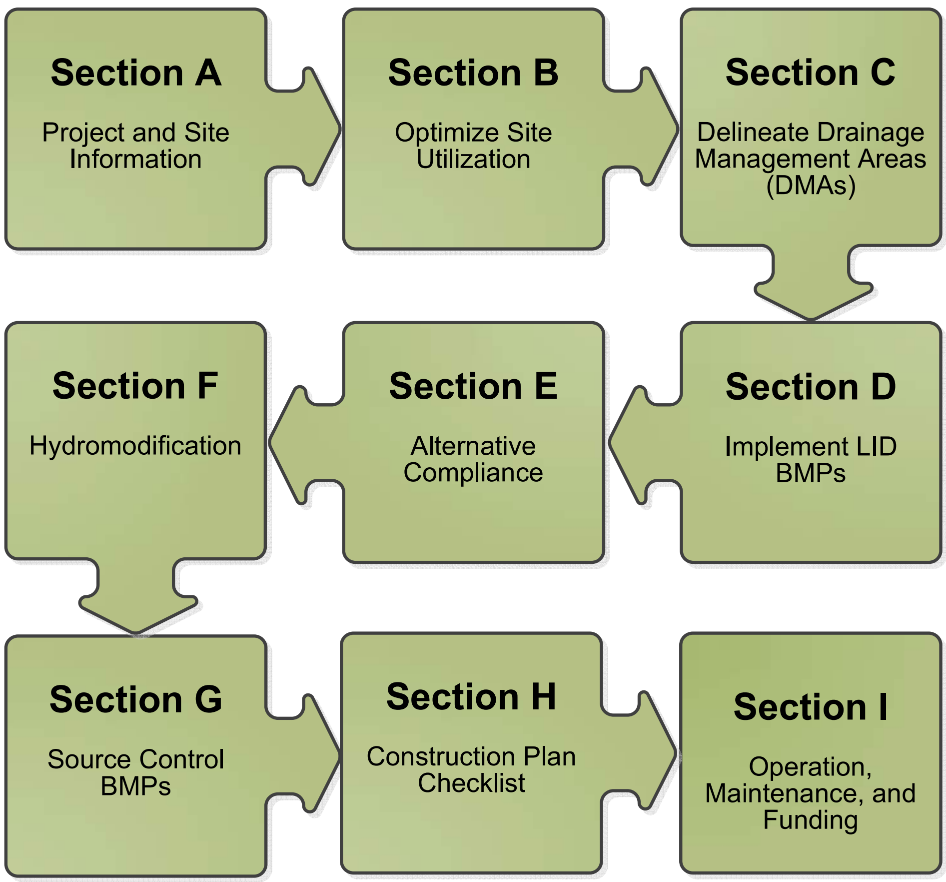
Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**
Template revised June 30, 2016

A Brief Introduction

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



OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for Victory Development by Latitude 33 Planning and Engineering for the Caliber Collision project.

This WQMP is intended to comply with the requirements of City of Menifee for Ordinance 2012-102 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 Menifee Water Quality Ordinance (Municipal Code Chapter 15.01).

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

Owner's Signature	Date
Bronson Reed	Construction Manager
Owner's Printed Name	Owner's Title/Position

PREPARER'S CERTIFICATION

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

	02/11/2022
Preparer's Signature	Date
Nick Psyhogios	Principal Civil Engineer
Preparer's Printed Name	Preparer's Title/Position

Preparer's Licensure:

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Section A: Project and Site Information

PROJECT INFORMATION		
Type of Project:	Commercial/Industrial/Auto Repair	
Planning Area:	33235-3318 Zeiders Road	
Community Name:	Menifee	
Development Name:	Insert Planning Area / Community Name/ Development Name, if known	
PROJECT LOCATION		
Latitude & Longitude (DMS): 33°38'19.27"N 117°10'39.20"W		
Project Watershed and Sub-Watershed: Santa Ana River Watershed		
Gross Acres: 2.39 APN(s): 384130028		
Map Book and Page No.: PM 7105		
PROJECT CHARACTERISTICS		
Proposed or Potential Land Use(s)		Auto Repair Shop
Proposed or Potential SIC Code(s)		7532
Area of Impervious Project Footprint (SF)		69,470
Total Area of <u>proposed</u> Impervious Surfaces within the Project Footprint (SF)/or Replacement		69,470
Does the project consist of offsite road improvements?		☒ Y ☐ N
Does the project propose to construct unpaved roads?		☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?		☐ Y ☒ N
EXISTING SITE CHARACTERISTICS		
Total area of <u>existing</u> Impervious Surfaces within the Project limits Footprint (SF)		0
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)		C
What is the Water Quality Design Storm Depth for the project?		d = 0.59 inches

The project site is located along Zieders Road, north of Keller Road and south of Scott Road, within the City of Menifee, California. The proposed project consists of an auto body repair and paint shop, approximately 18,717 square feet, with associated parking, walkways, and landscape areas. The building will include service bays for the paint and body shop work, as well as vehicle storage. In the pre-development conditions, runoff flows from the southeast corner towards the northwest corner of the property, where it enters a natural channel offsite. The existing soil is HSG C per the USDA NRCS Soil Survey, and therefore has very low infiltration rates throughout the site.

In the post-development condition, the east to west drainage pattern is maintained. Site runoff is directed towards proposed stormdrain inlets throughout the site via sheet flow and gutter flow. The runoff is conveyed through the proposed stormdrain system and discharged to a biofiltration basin located on the west side of the property. This basin is sized for water treatment and hydromodification, as well as designed to reduce the peak flow leaving the site to not exceed that of pre-development.

Portions of the site along both the southern edge and the western edge of the property are proposed landscape that will serve as self-treating landscape area. Runoff from this area flows directly offsite.

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 (based on 2012 Impairment Listing)	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Salt Creek	Not listed as Impaired Water Body	REC1, REC2, WARM, WILD	~10 miles (Temescal Creek Reach 5)
Canyon Lake	Nutrients, Pathogens	AGR, GWR, MUN, REC1, REC2, WARM, WILD,	~5 miles (Temescal Creek Reach 5)
San Jacinto River – Lake Elsinore to Canyon Lake	Not listed as Impaired Water Body	AGR, GWR, MUN, REC1, REC2, WARM, WILD	~5.5 miles (Temescal Creek Reach 5)
Lake Elsinore	Nutrients (TMDL), Organic Enrichment/Low Dissolved Oxygen (TMDL), PCBs, Sediment Toxicity	REC1, REC2, WARM, WILD,	~3 miles (Temescal Creek Reach 5)

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?

Existing drainage patterns have been identified on the DMA Exhibit. In predevelopment, the site drains from southeast to northwest. Due to the project scope, the site requires grading to accommodate the improvements, thus preventing the preservation of the existing drainage paths. The overall pattern across the site, however, is generally preserved and the site will continue to drain from southeast to northwest.

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

Existing vegetation is shown on the DMA exhibit and consists mostly of grass. One constraint in the vegetation is an existing tree on the property. This tree will be removed because it is in the center of the development, and it would not be feasible to protect it in place. Due to the proposed project and the thin existing vegetation, preservation of natural vegetation is not feasible.

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

The existing soil is mainly dense sand with silt and at least one location of clay according to the geotechnical report. The natural infiltration capacity is not known at this time but is expected to be low based on the existing soil which is HSG C according to the USDA NRCS Soil Survey. Due to this constraint, in the proposed development, proposed pervious areas will have the ability to infiltrate at a capacity similar to the pre-development condition, but proposed impervious areas will not infiltrate and will be directed to a biofiltration basin BMP which will not infiltrate due to the low permeability of the natural soil (see attached Infiltration Feasibility letter in Appendix 3).

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

Impervious areas have been minimized to the minimum required amount which will still allow the project to be feasible. Impervious areas include paved parking, driveways, walkways, concrete for utilities and site features, and the building. D.G. paths have been incorporated where possible to also help minimize areas of pavement and concrete. These impervious areas are identified on the DMA exhibit.

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

Runoff is dispersed with landscaped medians and parking islands where the opportunity was feasible. Curb cuts allow gutter flow to be directed to landscaped areas before entering the biofiltration basin. Otherwise, dispersion is not feasible based on the proposed site layout and necessary site features. Roof drains have been directed towards landscaped areas where feasible based on necessary site design elements.

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
1	Roof	19,940	D
2	Pavement	48,690	D
3	Landscaped	17,240	D
4	Biofiltration BMP	5,485	D
5	Landscape	12,755	A
6	Decomposed Granite	845	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)
5	12,755	Landscaping / Grass	N/A

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

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

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

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

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

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

DMA Name or ID	BMP Name or ID
1	BMP 1
2	BMP 1
3	BMP 1
4	BMP 1
6	BMP 1

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

Section D: Implement LID BMPs

D.1 Infiltration Applicability

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

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

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

Geotechnical Report

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

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

Infiltration Feasibility

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

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		X
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		X
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?		X
If Yes, list affected DMAs:		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		X
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?	X	
Describe here: Soil is mostly dense sand with silt, HSGs C and D according to USGS. See attached infiltration infeasibility letter for more information.		

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

D.2 Harvest and Use Assessment

Please check what applies*:*

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

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

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

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If 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: 0.71 acres

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

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

Total Area of Impervious Surfaces: 1.56 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: 0.47

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: 0.73 acres

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

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
0.73 acres	0.71 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: 10

Project Type: Commercial/Industrial Auto Repair Shop

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: 1.56

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: 132

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: 206

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

Minimum required Toilet Users (Step 4)	Projected number of toilet users (Step 1)
206	10

Other Non-Potable Use Feasibility

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

N/A

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

Average Daily Demand: Projected Average Daily Use (gpd)

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

Total Area of Impervious Surfaces: Insert Area (Acres)

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-4 in Chapter 2 to determine the minimum demand for non-potable uses per tributary impervious acre.

Enter the factor from Table 2-4: Enter Value

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: Minimum use required (gpd)

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)**
Minimum use required (gpd)	Projected Average Daily Use (gpd)

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment 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	
1	☐	☐	☐	☒	☐
2	☐	☐	☐	☒	☐
3	☐	☐	☐	☒	☐
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.

A biotreatment BMP has been selected for DMA's 1-4. Per the infiltration feasibility letter, it is recommended to not rely on infiltration to manage stormwater. For this reason, biotreatment was selected instead of bioretention. DMA 5 is the only DMA on the site that will not be treated with the proposed Biofiltration basin. DMA 5 is self-treating (all vegetation) and drains immediately offsite to a natural drainage course.

D.5 LID BMP Sizing

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

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Areas x Runoff Factor**	***Enter BMP Name / Identifier Here*** ***BMP 1***		
	[A]		[B]	[C]	[A] x [C]	*Design Storm Depth (in)*	*Design Capture Volume,* **V_{BMP}** *(cubic feet)*	*Proposed Volume on Plans (cubic feet)*
1	*19,940*	*Roofs*	*1*	*0.89*	*17,787*			
2	*48,690*	*Concrete or Asphalt*	*1*	*0.89*	*43,432*			
3	*17,240*	*Natural (C Soil)*	*0.3*	*0.23*	*3,882*			
4	*5,485*	*Natural (C Soil)*	*0.3*	*0.23*	*1,235*			
6	*845*	*Decomposed Granite*	*0.4*	*0.28*	*236*			
	$A_T = \Sigma[A]$ 92,200				$\Sigma = [D]$ 66,572	[E] 0.59	$[F] = \frac{[D]x[E]}{12}$ 3273	[G] ***6110***

[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.

E.1 Identify Pollutants of Concern

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

Table E.1 Potential Pollutants by Land Use Type

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

P = Potential

N = Not Potential

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

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

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

(4) *Specifically petroleum hydrocarbons*

(5) *Specifically solvents*

(6) *Bacterial indicators are routinely detected in pavement runoff*

E.2 Stormwater Credits

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

Table E.2 Water Quality Credits

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

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

E.3 Sizing Criteria

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

Table E.3 Treatment Control BMP Sizing

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

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

[E] is for Flow-Based Treatment Control BMPs [E] = .2, for Volume-Based Control Treatment BMPs, [E] obtained from Exhibit A in the WQMP Guidance Document

[G] is for Flow-Based Treatment Control BMPs [G] = 43,560, for Volume-Based Control Treatment BMPs, [G] = 12

[H] is from the Total Credit Percentage as Calculated from Table E.2 above

[I] as obtained from a design procedure sheet from the BMP manufacturer and should be included in Appendix 6

E.4 Treatment Control BMP Selection

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

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

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

Table E.4 Treatment Control BMP Selection

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

[1] Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.
[2] Cross Reference Table E.1 above to populate this column.
[3] As documented in a Co-Permittee Approved Study and provided in Appendix 6.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

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

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

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

If Yes, HCOC criteria do not apply.

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

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

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

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

Table F.1 Hydrologic Conditions of Concern Summary

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

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

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

INSERT TEXT HERE

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	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.
Landscape/Outdoor Pesticide Use	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	Maintain landscaping using minimum or no pesticides. See applicable operational BMPs in "What you should know for…..Landscape and Gardening" at http://rcflood.org/stormwater/Error! Hyperlink reference not valid. Provide IPM information to new owners, lessees and operators.

	soil conditions. Consider using pest-resistant plants, especially adjacent to hardscape. To ensure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	
Refuse areas	State how site refuse will be handled and provide supporting detail to what is shown on plans. State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	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
Vehicle/Equipment Repair and Maintenance	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.	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.
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
Plazas, sidewalks, and parking lots.		Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Section H: Construction Plan Checklist

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

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)	BMP Location (Lat/Long)
BMP 1	Bmp 1 – Biofiltration Basin	Site Grading Plan	33°38'19.27"N 117°10'39.20"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

This section will be completed and addressed at the time of the final WQMP Submittal.

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. *Funding and responsible party/owner will be determined at final engineering.*
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: Insert text here.

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

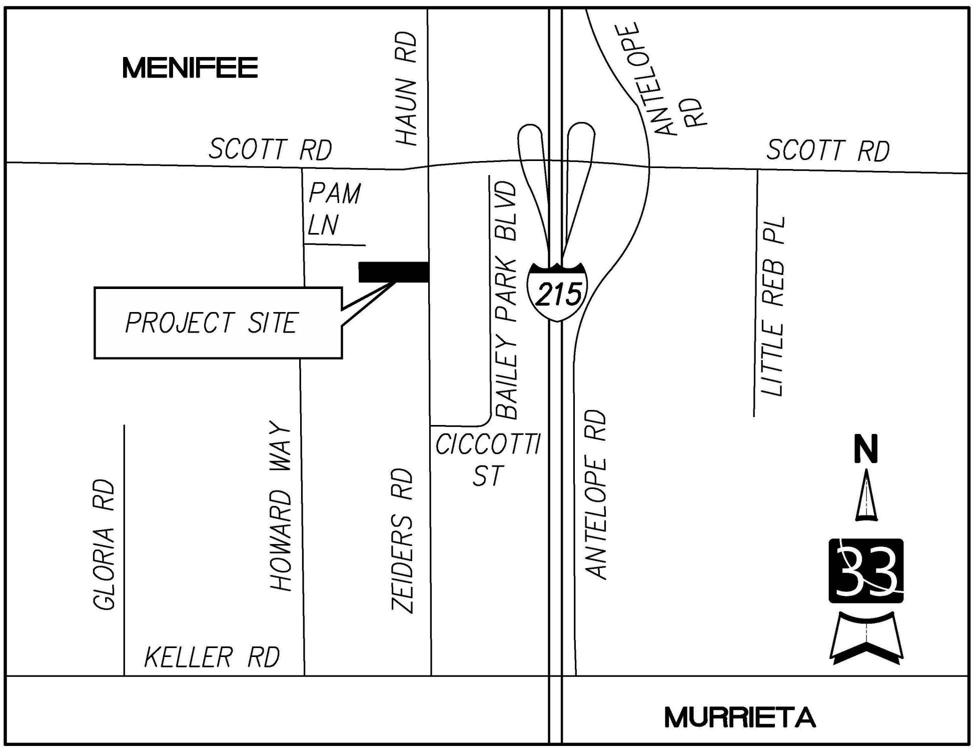
☐ Y ☒ N

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

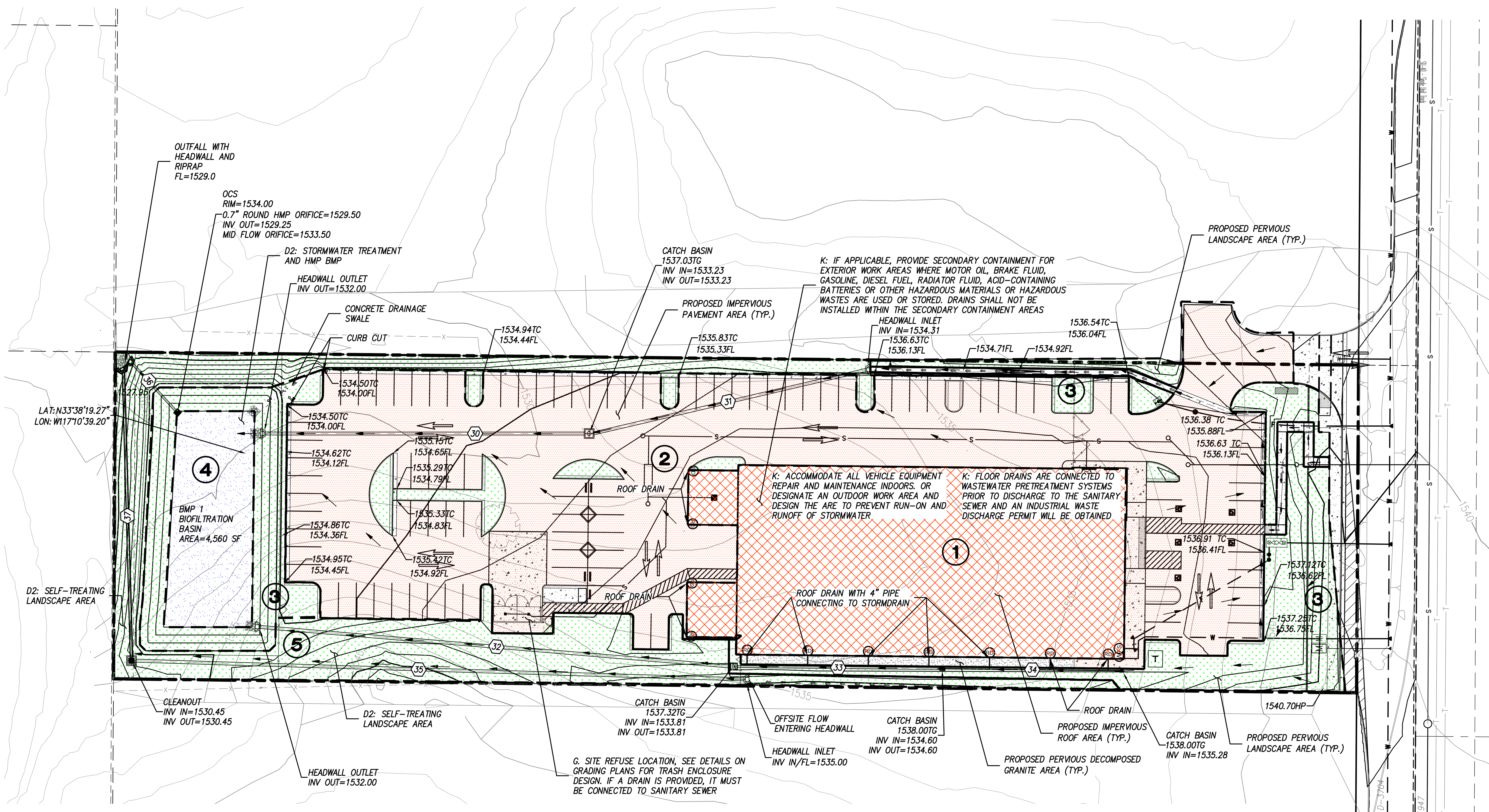
CALIBER COLLISION
33235-33185 ZEIDERS RD,
MENIFEE, CA 92584

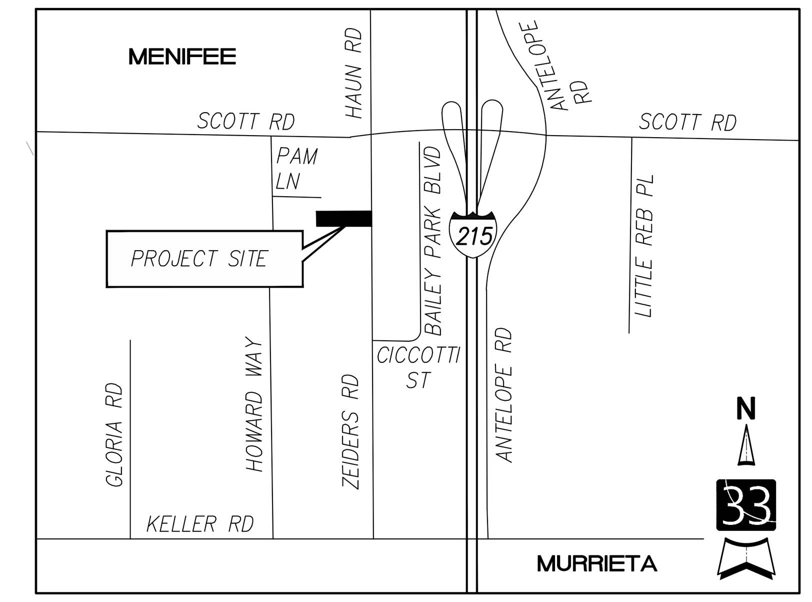


VICINITY MAP

NO SCALE

POST-CONSTRUCTION BMP SITE PLAN
CALIBER COLLISION - PR21-0293





VICINITY MAP
NO SCALE

0 15 30 60 90
(IN FEET)
1 inch = 30 ft.

POLLUTANT SOURCES AND CONTROLS

POTENTIAL SOURCES OF RUNOFF POLLUTANTS	PERMANENT CONTROLS (SEE PLAN)
INTERIOR FLOOR DRAINS	B
LANDSCAPE/OUTDOOR PESTICIDE USE	D2
REFUSE AREAS	G
VEHICLE/EQUIPMENT REPAIR AND MAINTENANCE	K
FIRE SPRINKLER TEST WATER	N
PLAZAS, SIDEWALKS, AND PARKING LOTS	P

NOTE: SEE WQMP REPORT FOR PERMANENT CONTROLS AND OPERATIONAL BMPS LISTED IN TABLE AND NARRATIVE OF SECTION G: SOURCE CONTROL BMPS

DMA TABLE AND BMP SIZING

DMA	DMA AREA (SQUARE FEET)	POST-PROJECT SURFACE TYPE	EFFECTIVE IMPERVIOUS FRACTION	DAM RUNOFF FACTOR	DMA AREAS X RUNOFF FACTOR	DESIGN STORM DEPTH (IN)	DESIGN CAPTURE VOLUME, VBPM (CUBIC FEET)	PROPOSED VOLUME OF BMP
1	19,940	ROOFS	1	0.89	17787			
2	48,690	CONCRETE OR ASPHALT	1	0.89	43432			
3	17,240	NATURAL (C SOIL)	0.3	0.23	3882			
4	5,485	NATURAL (C SOIL)	0.3	0.23	1235			
6	845	DECOMPOSED GRANITE	0.4	0.28	236			
TOTAL	92200				66571.3	0.59	3273.1	6110

NOTE:
1. DMA 5 IS SELF-TREATING AND NOT INCLUDED IN THIS TABLE. AREA=12,755 AND SURFACE TYPE IS NATURAL VEGETATION/GRASS
2. SEE WQMP SECTION D FOR FURTHER BMP SIZING CALCULATIONS

STORM DRAIN DATA

NO	BEARING	LENGTH	SLOPE	NOTE
30	S89°59'57"W	163.36'	0.75%	12.0" HDPE
31	S77°03'03"W	142.66'	0.75%	12.0" HDPE
32	N85°13'37"W	240.00'	0.75%	12.0" HDPE
33	N89°24'13"W	103.62'	0.75%	12.0" HDPE
34	N89°21'04"W	89.01'	0.75%	12.0" HDPE
35	N88°15'07"W	309.47'	1.46%	12.0" HDPE
36	N42°37'31"W	33.06'	0.73%	12.0" HDPE
37	N1°35'26"W	145.42'	0.99%	12.0" HDPE

EXISTING SITE INFORMATION

HYDROLOGIC SOIL GROUP: SOIL CLASS TYPES "C" AND "D"

GROUNDWATER: ~20' DEPTH

EXISTING NATURAL HYDROLOGIC FEATURES: NO NATURAL HYDROLOGIC FEATURES EXIST ONSITE.

EXISTING TOPOGRAPHY AND IMPERVIOUS AREA: EXISTING TOPOGRAPHY SHOWN HEREON. SEE AREA SUMMARY TABLE FOR EXISTING IMPERVIOUS AREA.

EXISTING DRAINAGE: EXISTING DRAINAGE IS SHOWN HEREON.

PROPOSED SITE INFORMATION

PROPOSED GRADING: SHOWN HEREON.

PROPOSED IMPERVIOUS FEATURES: SHOWN HEREON.

PROPOSED DRAINAGE: SHOWN HEREON.

PROPOSED DESIGN FEATURES: SITE DESIGN REQUIREMENTS SHOWN HEREON.

DRAINAGE MANAGEMENT AREAS: SHOWN HEREON. SEE DMA SUMMARY TABLE.

POTENTIAL POLLUTANT SOURCE AREAS AND SOURCE CONTROL: SHOWN HEREON. SEE WQMP REPORT FOR EXPLANATION.

STRUCTURAL BMPS: BIOFILTRATION BASIN SHOWN HEREON. SEE DETAILS BELOW.

LEGEND

- IMPERVIOUS PAVEMENT AREA
- IMPERVIOUS ROOF AREA
- PERVIOUS DECOMPOSED GRANITE AREA
- PERVIOUS LANDSCAPE AREA
- PERVIOUS BMP AREA
- DMA BOUNDARY
- (1) DMA IDENTIFIER
- DRAINAGE PATTERNS

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

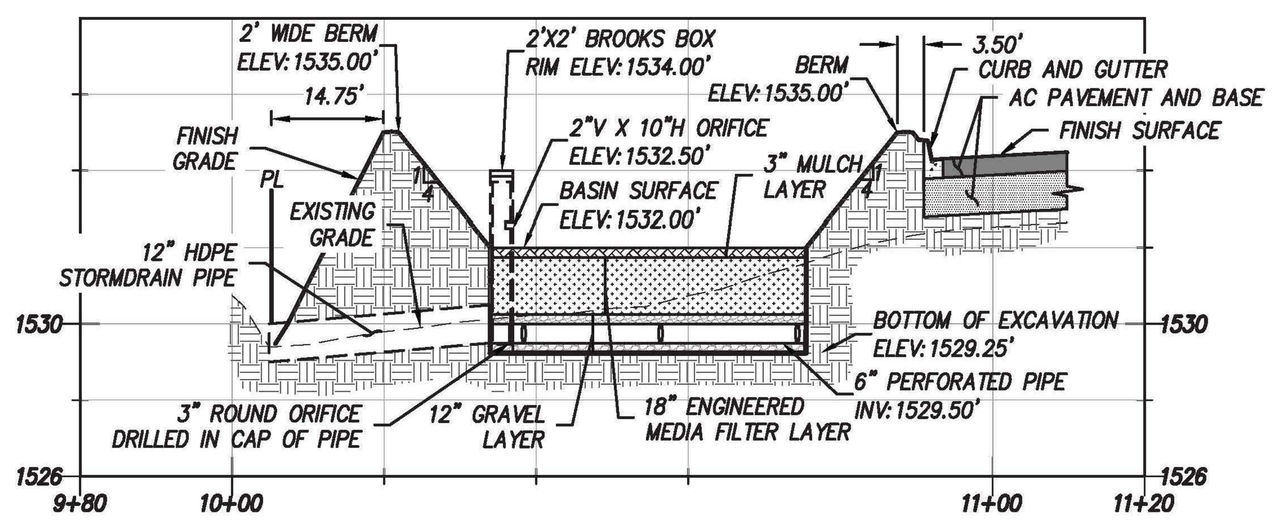
DATE	REVISION	BY
10.27.2021	CUP APPLICATION	XXX

POST-CONSTRUCTION BMP SITE PLAN
CALIBER COLLISION - PR21-0293
33235-33185 ZEIDERS RD, MENIFEE, CA 92584

L33 PROJECT NUMBER (PN): 1799.00
OTHER PN: XXXX.XX
DESIGNED BY: MAM DATE: 10.27.2021
DRAWN BY: MAM DATE: 10.27.2021
CHECKED BY: SDD DATE: 10.27.2021

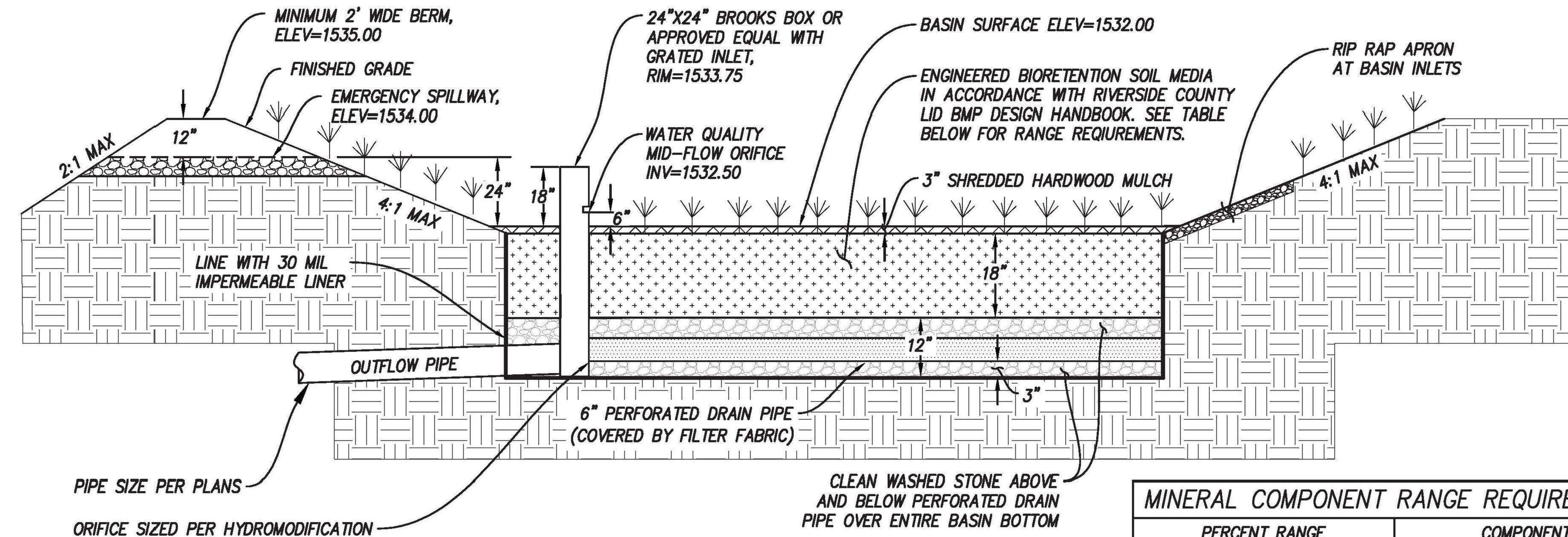
SHEET 1 OF 1

POST-CONSTRUCTION BMP SITE PLAN
CALIBER COLLISION - PR21-0293
DETAILS AND CROSS SECTIONS



BIOFILTRATION BASIN CROSS SECTION

SCALE: 1"=10'

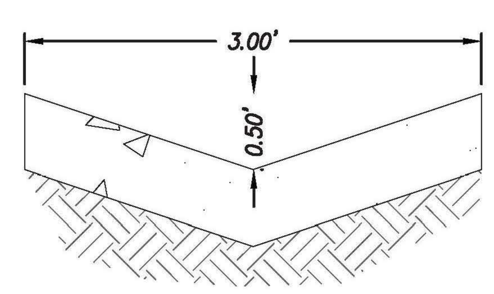


NOTE: BIOFILTRATION BASIN SHALL BE CONSTRUCTED IN ACCORDANCE WITH RIVERSIDE COUNTY LOW IMPACT DEVELOPMENT BMP DESIGN HANDBOOK AND PROJECT SPECIFIC WATER QUALITY MANAGEMENT PLAN FOR THE SANTA ANA WATERSHED REGION

MINERAL COMPONENT RANGE REQUIREMENTS

PERCENT RANGE	COMPONENT
70-80	SAND
15-20	SILT
5-10	CLAY

BIOFILTRATION BASIN DETAIL



CONCRETE SWALE

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

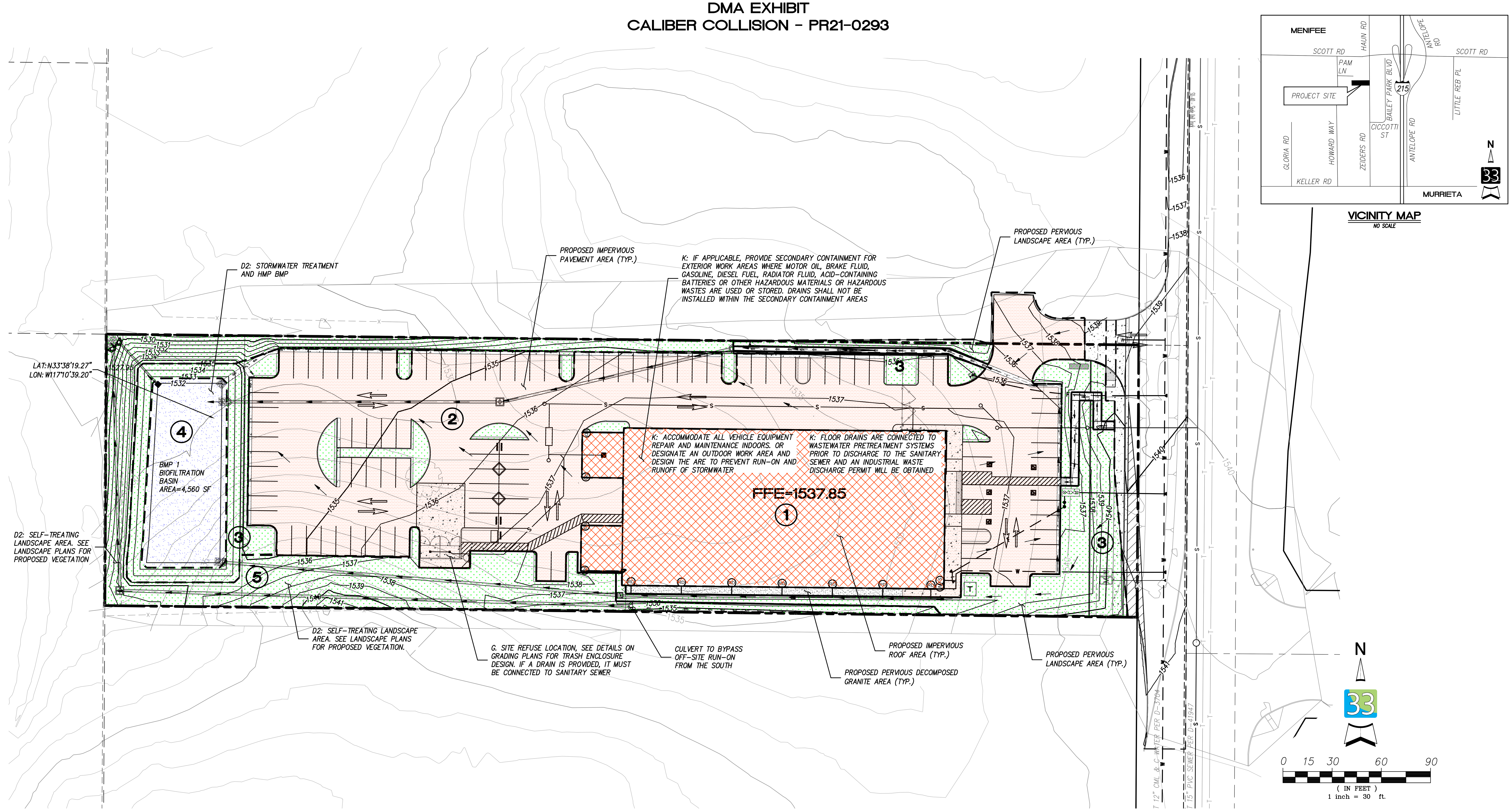
DATE	REVISION	BY
10.27.2021	CUP APPLICATION	MAM
02.11.2022	2ND CUP SUBMITTAL	MAM

DMA EXHIBIT
CALIBER COLLISION - PR21-0293
33235-33185 ZEIDERS RD,
MENIFEE, CA 92584

L33 PROJECT NUMBER (PN): 1799.00
OTHER PN: XXXX.XX
DESIGNED BY: MAM DATE: 10.27.2021
DRAWN BY: MAM DATE: 10.27.2021
CHECKED BY: SDD DATE: 10.27.2021

SHEET 1 OF 1

DMA EXHIBIT
CALIBER COLLISION - PR21-0293



POLLUTANT SOURCES AND CONTROLS

POTENTIAL SOURCES OF RUNOFF POLLUTANTS	PERMANENT CONTROLS (SEE PLAN)
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VEHICLE/EQUIPMENT REPAIR AND MAINTENANCE	K
FIRE SPRINKLER TEST WATER	N
PLAZAS, SIDEWALKS, AND PARKING LOTS	P

NOTE: SEE WQMP REPORT FOR PERMANENT CONTROLS AND OPERATIONAL BMPS LISTED IN TABLE AND NARRATIVE OF SECTION G: SOURCE CONTROL BMPS

DMA TABLE AND BMP SIZING

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2	48,690	CONCRETE OR ASPHALT	1	0.89	43432			
3	17,240	NATURAL (C SOIL)	0.3	0.23	3882			
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TOTAL	92200				66571.3	0.59	3273.1	6110

NOTE:
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EXISTING SITE INFORMATION

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GROUNDWATER: ~20' DEPTH

EXISTING NATURAL HYDROLOGIC FEATURES: NO NATURAL HYDROLOGIC FEATURES EXIST ONSITE.

EXISTING TOPOGRAPHY AND IMPERVIOUS AREA: EXISTING TOPOGRAPHY SHOWN HEREON. SEE AREA SUMMARY TABLE FOR EXISTING IMPERVIOUS AREA.

EXISTING DRAINAGE: EXISTING DRAINAGE IS SHOWN HEREON.

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PROPOSED IMPERVIOUS FEATURES: SHOWN HEREON.

PROPOSED DRAINAGE: SHOWN HEREON.

PROPOSED DESIGN FEATURES: SITE DESIGN REQUIREMENTS SHOWN HEREON.

DRAINAGE MANAGEMENT AREAS: SHOWN HEREON. SEE DMA SUMMARY TABLE.

POTENTIAL POLLUTANT SOURCE AREAS AND SOURCE CONTROL: SHOWN HEREON. SEE WQMP REPORT FOR EXPLANATION.

STRUCTURAL BMPS: BIOFILTRATION BASIN SHOWN HEREON. SEE DETAILS BELOW.

LEGEND

- IMPERVIOUS PAVEMENT AREA
- IMPERVIOUS ROOF AREA
- PERVIOUS DECOMPOSED GRANITE AREA
- PERVIOUS LANDSCAPE AREA
- PERVIOUS BMP AREA
- DMA BOUNDARY
- DMA IDENTIFIER
- DRAINAGE PATTERNS

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PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

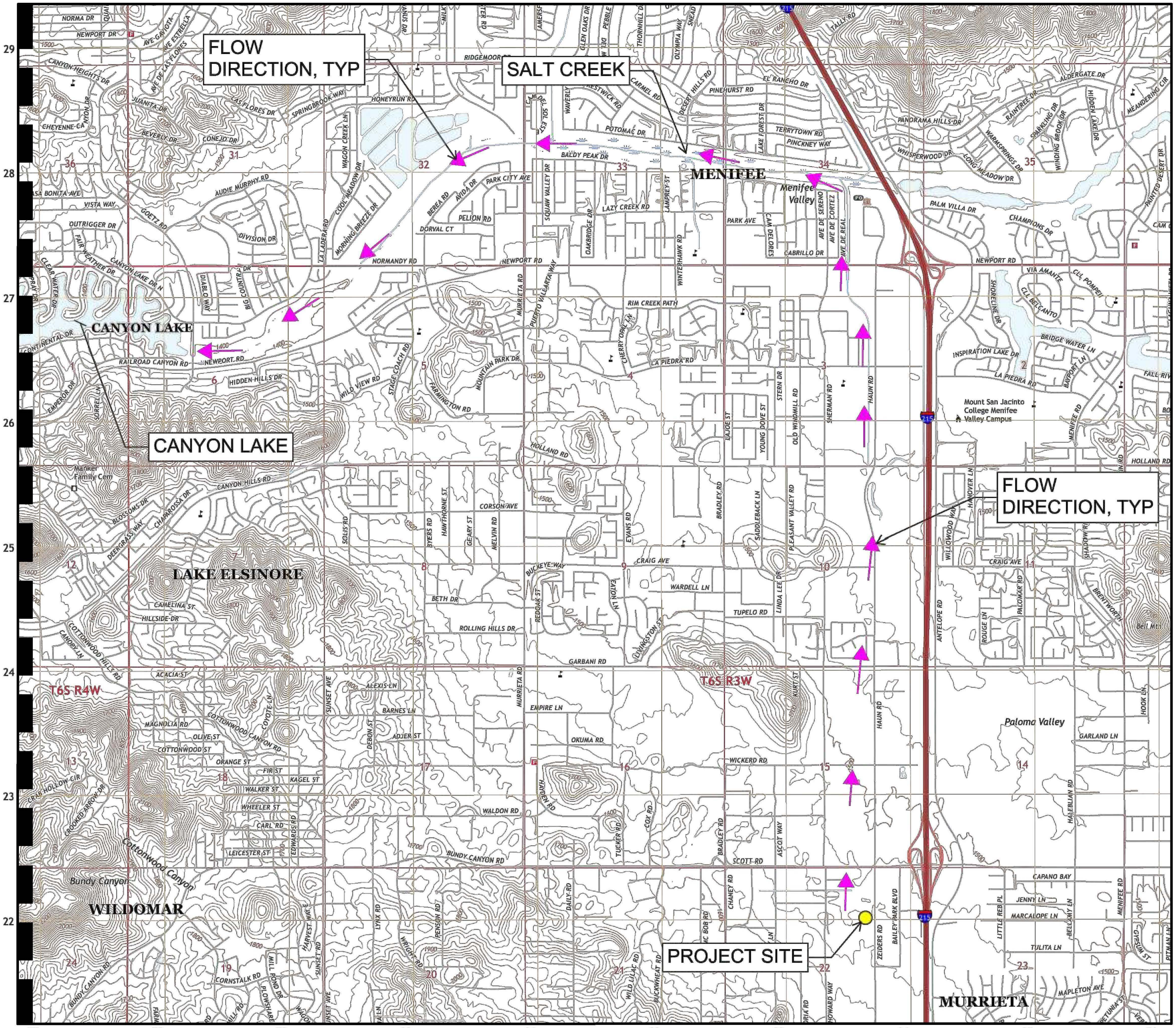
DATE	REVISION	BY
10.27.2021	CUP APPLICATION	MAM
02.11.2022	2ND CUP SUBMITTAL	MAM

DMA EXHIBIT
CALIBER COLLISION - PR21-0293
33235-33185 ZEIDERS RD, MENIFEE, CA 92584

L33 PROJECT NUMBER (PN): 1799.00
OTHER PN: XXXX.XX
DESIGNED BY: MAM DATE: 10.27.2021
DRAWN BY: MAM DATE: 10.27.2021
CHECKED BY: SDD DATE: 10.27.2021

SHEET 1 OF 1

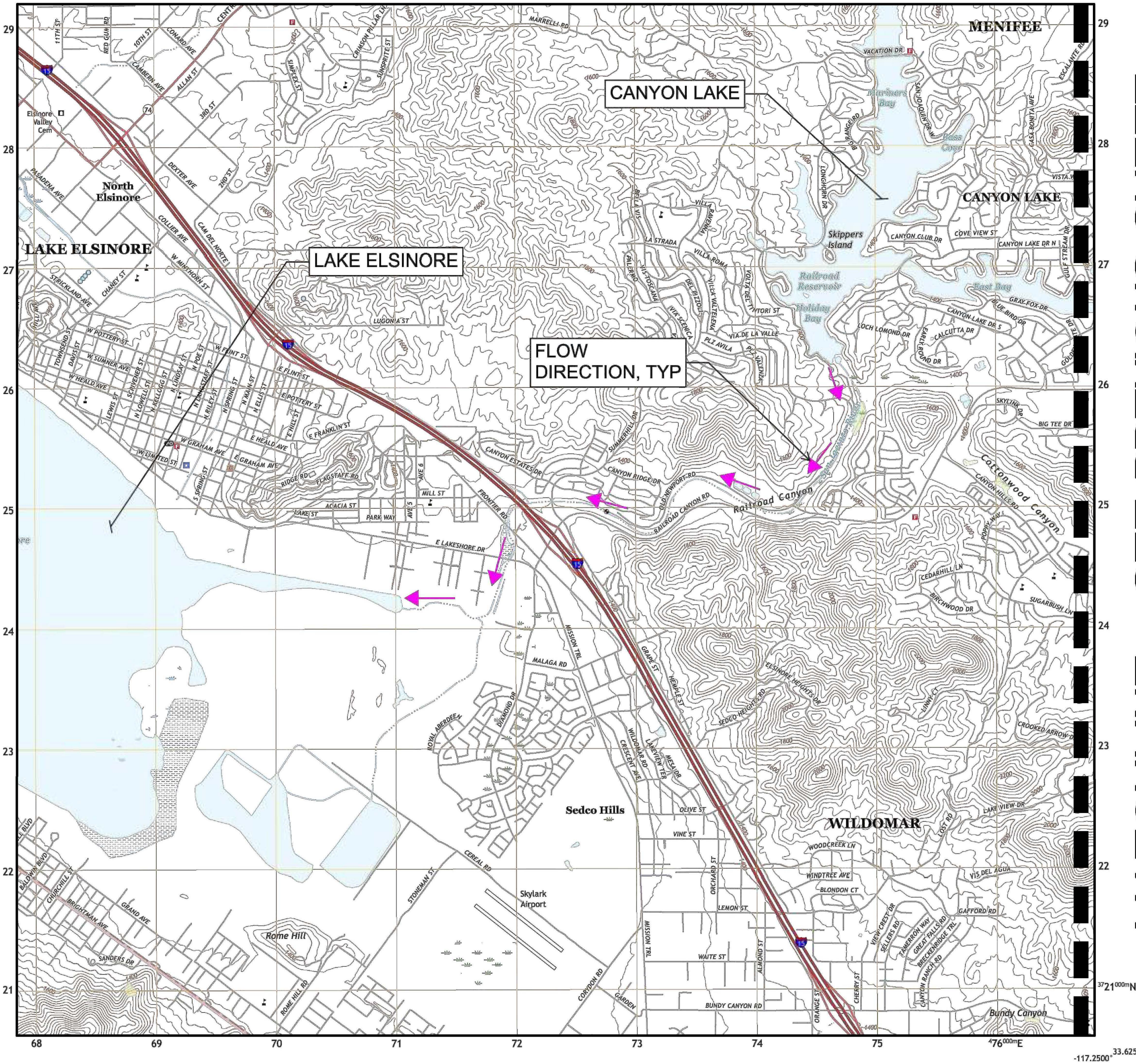
MATCHLINE - SEE NEXT SHEET



33.6250°
-117.2500°

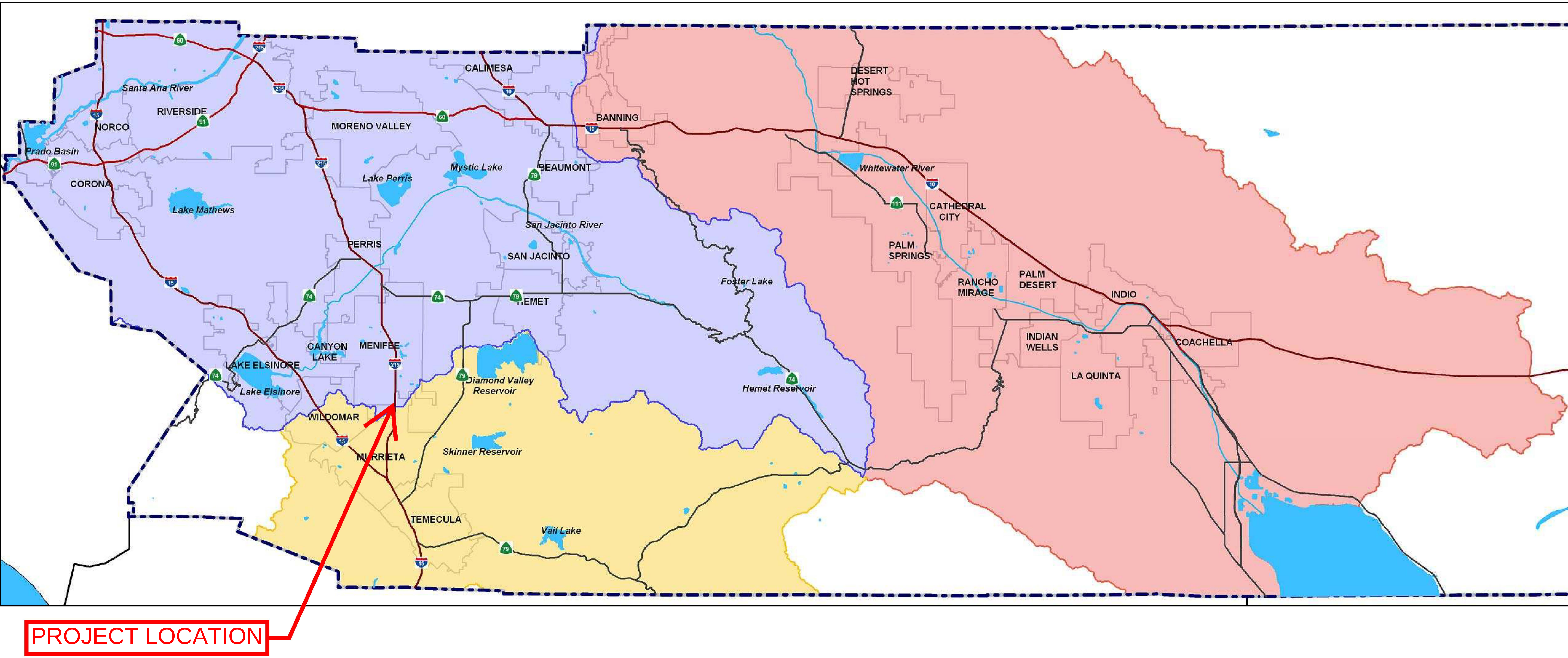
RECEIVING WATERS MAP

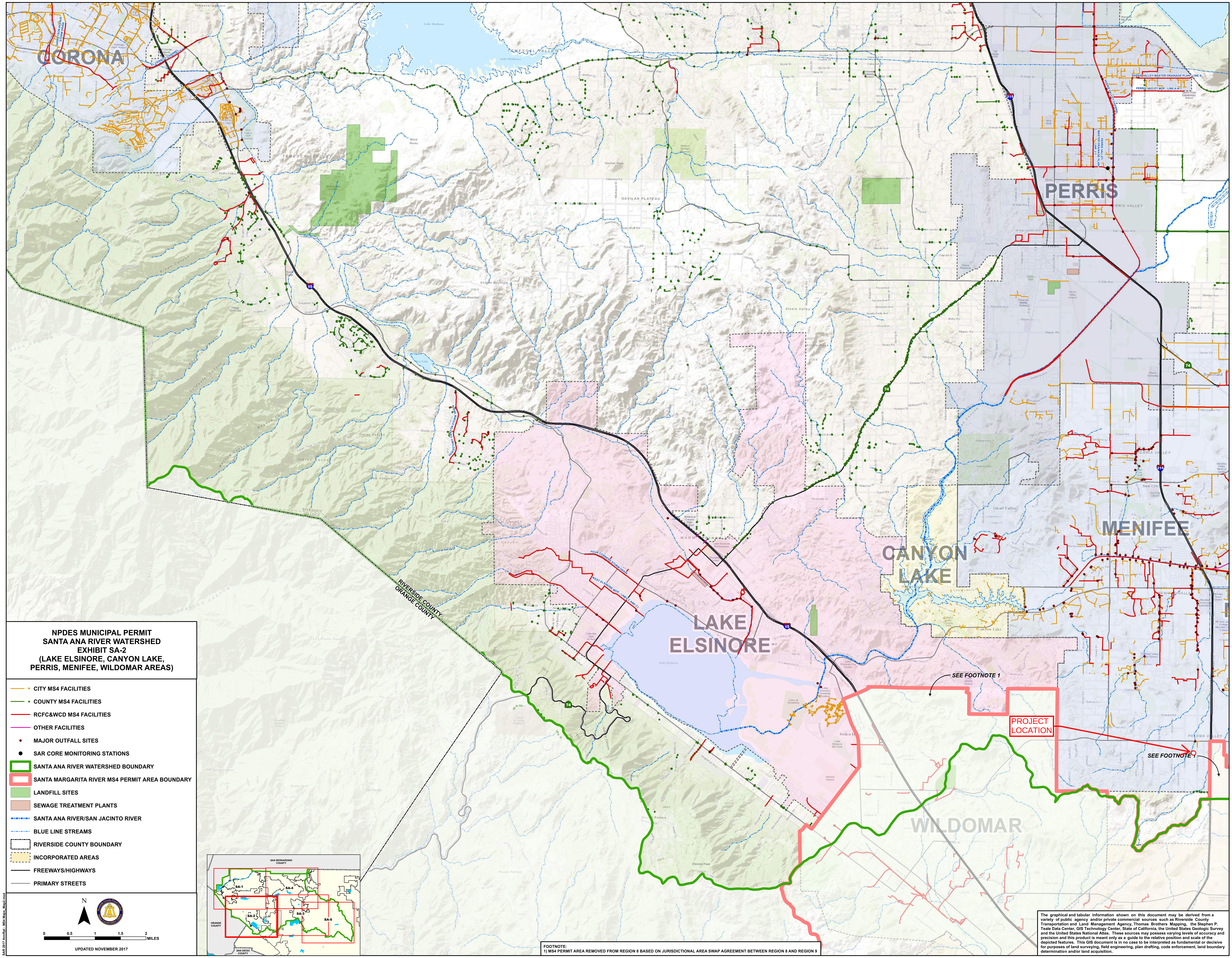
CALIBER COLLISION – P21-0293
SCALE: 1"=4000'
SHEET 1 OF 2



RECEIVING WATERS MAP

CALIBER COLLISION – P21-0293
SCALE: 1"=4000'
SHEET 2 OF 2


CALIMESA
DESERT HOT SPRINGS
Santa Ana River
RIVERSIDE
NORCO
MORENO VALLEY
BANNING
Prado Basin
CORONA
Lake Perris
Mystic Lake
BEAUMONT
Whitewater River
Lake Mathews
San Jacinto River
CATHEDRAL CITY
PERRIS
SAN JACINTO
PALM SPRINGS
Foster Lake
RANCHO MIRAGE
PALM DESERT
INDIO
HEMET
CANYON LAKE
MENIFEE
INDIAN WELLS
COACHELLA
LAKE ELSINORE
Lake Elsinore
Diamond Valley Reservoir
Hemet Reservoir
LA QUINTA
WILDOMAR
Skinner Reservoir
MURRIETA
TEMECULA
Vail Lake
PROJECT LOCATION

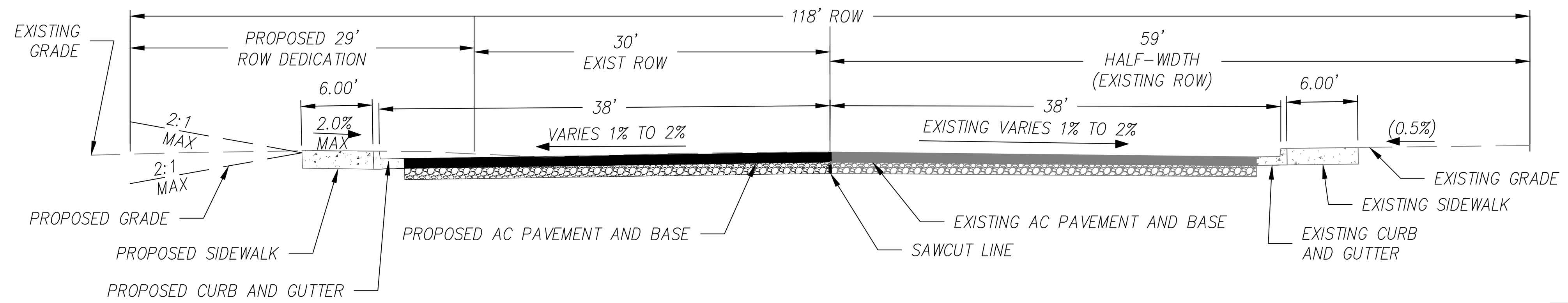


NPDES MUNICIPAL PERMIT
SANTA ANA RIVER WATERSHED
EXHIBIT SA-2
(LAKE ELSINORE, CANYON LAKE, PERRIS, MENIFEE, WILDOMAR AREAS)
CITY MS4 FACILITIES
COUNTY MS4 FACILITIES
RCFC&WCD MS4 FACILITIES
OTHER FACILITIES
MAJOR OUTFALL SITES
SAR CORE MONITORING STATIONS
SANTA ANA RIVER WATERSHED BOUNDARY
SANTA MARGARITA RIVER MS4 PERMIT AREA BOUNDARY
LANDFILL SITES
SEWAGE TREATMENT PLANTS
SANTA ANA RIVER/SAN JACINTO RIVER
BLUE LINE STREAMS
RIVERSIDE COUNTY BOUNDARY
INCORPORATED AREAS
FREEWAYS/HIGHWAYS
PRIMARY STREETS
N
0 0.5 1 1.5 2 MILES
UPDATED NOVEMBER 2017
SAR 2017 AnnRpt - MS4 Maps_Map2.mxd
CORONA
PERRIS
MENIFEE
CANYON LAKE
LAKE ELSINORE
WILDOMAR
RIVERSIDE COUNTY
ORANGE COUNTY
SEE FOOTNOTE 1
PROJECT LOCATION
SEE FOOTNOTE
GAVILAN PLATEAU
FOOTNOTE:
1) MS4 PERMIT AREA REMOVED FROM REGION 8 BASED ON JURISDICTIONAL AREA SWAP AGREEMENT BETWEEN REGION 8 AND REGION 9
The graphical and tabular information shown on this document may be derived from a variety of public agency and/or private commercial sources such as Riverside County Transportation and Land Management Agency, Thomas Brothers Mapping, the Stephen P. Teale Data Center, GIS Technology Center, State of California, the United States Geologic Survey and the United States National Atlas. These sources may possess varying levels of accuracy and precision and this product is meant only as a guide to the relative position and scale of the depicted features. This GIS document is in no case to be interpreted as fundamental or decisive for purposes of land surveying, field engineering, plan drafting, code enforcement, land boundary determination and/or land acquisition.

Appendix 2: Construction Plans

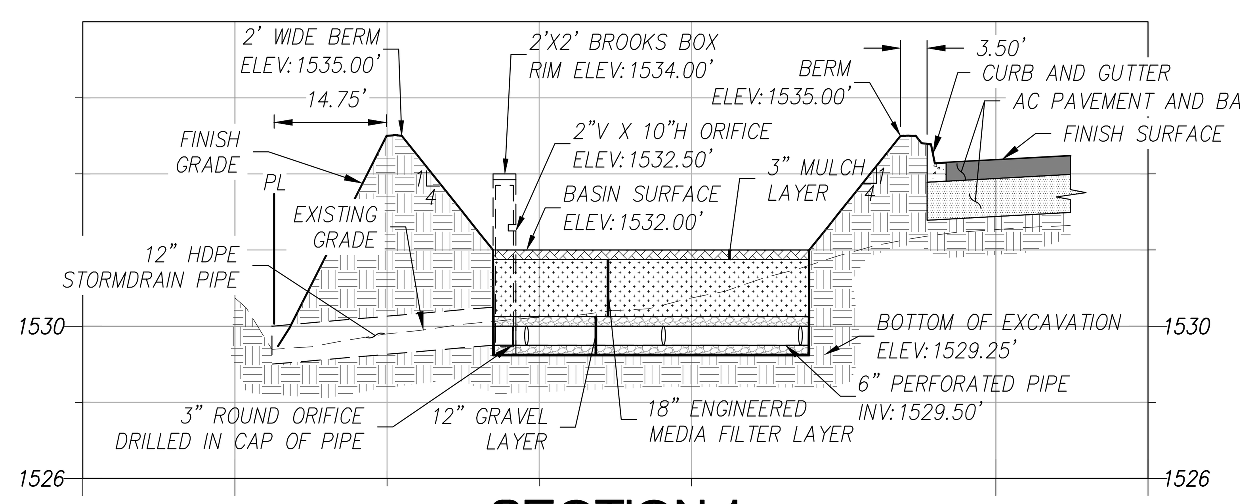
Grading and Drainage Plans

CONCEPTUAL SITE, GRADING, DRAINAGE, CIRCULATION, AND UTILITY PLAN

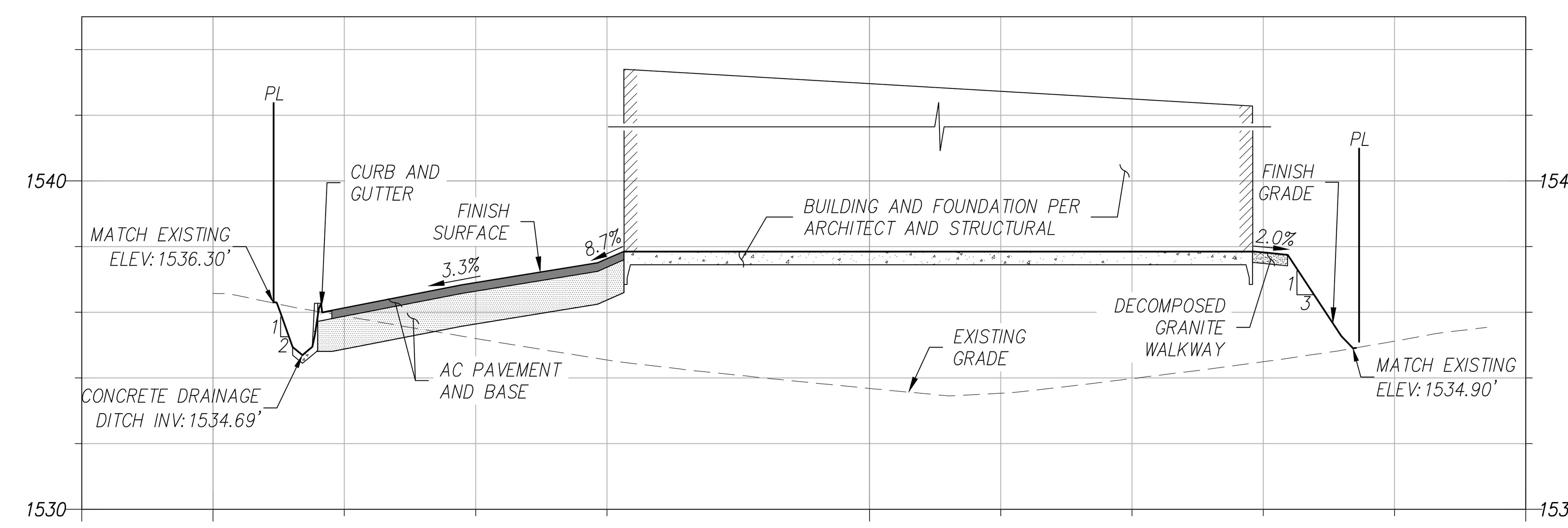


ZEIDERS ROAD IMPROVEMENTS - SECTION - NORTH VIEW

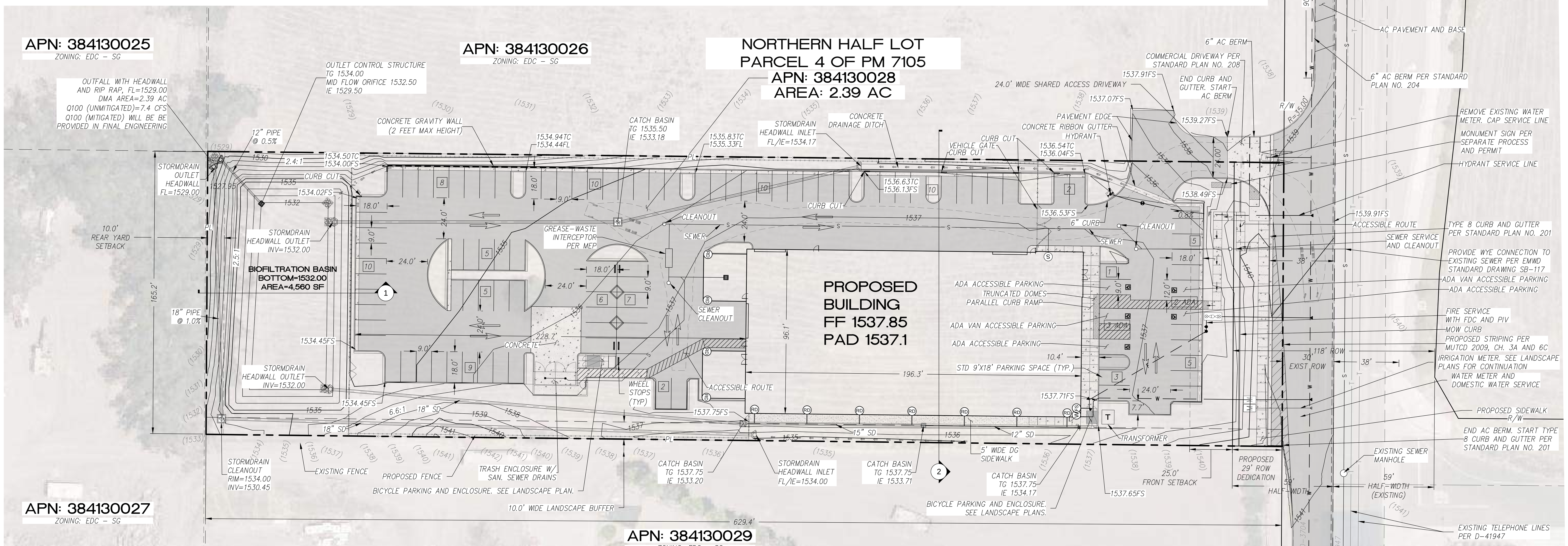
NOT TO SCALE



SECTION 1



SECTION 2



PARKING CALCULATIONS

STANDARD:

1 SPACE PER 150 SQ. FT GROSS FLOOR AREA (NOT INCLUDING FOR SERVICE BAYS) & 4 SPACES PER SERVICE BAY (CMDC TABLE 9.215.040-1)

TOTAL BUILDING AREA = 18,717 SF
6-SERVICE BAYS = 7,392 SF

18,717-7,392=11,325 SF -> 11,325/150 =75.5 SPACES

76+24 = 100 SPACES REQUIRED
101 PROVIDED (INCLUDES ADA STALLS)

ADA:
5 REQUIRED (CBC 11B-208)

5 PROVIDED:
2 VAN ACCESSIBLE
3 STANDARD ADA

BICYCLE:
1 PER 25 PARKING SPACES REQUIRED (CMDC 9.215.040-5)

101 / 25 = 4.04 REQ
8 PROVIDED IN 2X ENCLOSURES

UTILITY NOTES

DRY UTILITIES (GAS, ELECTRICAL, LIGHTING, TELECOMM) PER OTHERS AND NOT DEPICTED ON THESE PLANS.

UTILITY PURVEYORS

WATER & SEWER: EASTERN MUNICIPAL WATER DISTRICT
TELECOMMUNICATIONS: FRONTIER COMMUNICATIONS

PROJECT DESCRIPTION

THE PROPOSED PROJECT IS AN AUTO BODY REPAIR AND PAINT SHOP TO BE CONSTRUCTED ON THE SITE. THE PROJECT WILL CONSIST OF AN APPROXIMATELY 18,600 SQUARE FOOD BUILDING, AND WILL REQUIRE PARKING FOR CUSTOMERS AND EMPLOYEES, SERVICE BAYS FOR THE PAINT AND BODY SHOP WORK, AND VEHICLE STORAGE.

ZONING

EXISTING: ECONOMIC DEVELOPMENT CORRIDOR - SOUTHERN GATEWAY (EDC-SG)
PROPOSED: ECONOMIC DEVELOPMENT CORRIDOR - SOUTHERN GATEWAY (EDC-SG)

EARTHWORK QUANTITY RAW

ESTIMATED CUT VOLUME=4,700 CY
ESTIMATED FILL VOLUME=9,200 CY
NET VOLUME=4,200 CY IMPORT

ADJUSTED FOR PAVEMENT THICKNESS

GENERAL NOTES

1. THE PARCEL AREA EXPRESSED HEREON ARE DERIVED FROM THE REQUEST FOR PROPOSAL AND ARE NOT BASED ON BOUNDARY RESEARCH OR VERIFICATION.
2. TOPOGRAPHY SHOWN IS PRELIMINARY. OBTAINED FROM GOOGLE EARTH PRO AND ADJUSTED TO NAVD88.
3. NO INFILTRATION CONDITION ASSUMED. PER USDA WEB SOIL SURVEY, PROPERTY LIES IN TYPE C & D SOILS. NO SIGNIFICANT INFILTRATION CAPACITY IS EXPECTED, IF ANY.

0 15 30 60 90
(IN FEET)
1 inch = 30 ft.

N

STATEMENT OF OPERATIONS

AUTO BODY REPAIR AND PAINT SERVICE
MONDAY THROUGH FRIDAY: 7:30AM - 5:30PM
SATURDAY: POSSIBLE HOURS 8AM - 12PM
20 FULL TIME EMPLOYEES
NUMBER OF CUSTOMERS PER DAY: 13 - 15

INTENDED USE

AUTO BODY REPAIR AND PAINT SHOP

LEGEND

PROPERTY LINE
SETBACKS
RIGHT-OF-WAY
AC PAVEMENT
PCC PAVEMENT/SIDEWALK
DG SURFACING
EX TELECOM
EX 12" WATER LINE
EX 15" SEWER LINE
6" FIRE LINE
2" WATER LATERAL
4" SEWER LATERAL
STORMDRAIN
FIRE HYDRANT
WATER METER
BACKFLOW PREVENTER

AREAS

TOTAL AREA: 2.39 ACRES
TOTAL PROPOSED BUILDING AREA: 0.43 ACRES
TOTAL PROPOSED PAVED AREA: 1.66 ACRES
TOTAL PROPOSED LANDSCAPE AREA: 0.30 ACRES

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

DATE	REVISION	BY
10/28/2021	1ST CUP SUBMITTAL	MAM
02/11/2022	2ND CUP SUBMITTAL	MAM

CONCEPTUAL SITE, GRADING, DRAINAGE, CIRCULATION, AND UTILITY PLAN

CALIBER COLLISION
ZEIDERS RD,
MENIFEE CA 92584

L33 PROJECT NUMBER (PN): 1799.00
OTHER PN: N/A
DESIGNED BY: DP DATE: 10.27.2021
DRAWN BY: AK DATE: 10.27.2021
CHECKED BY: SD/NP DATE: 10.27.2021

2/9/2022 2:24:44 PM

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

WILL BE PROVIDED IN FINAL WQMP

Appendix 4: Historical Site Conditions

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

WILL BE PROVIDED IN FINAL WQMP

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

Infiltration, Harvest and Use, and Bioretention were determined to be infeasible as stormwater treatment BMPs for this project, so Biotreatment is proposed. The following letter from the Geotechnical Consultant states that the existing soils are not suitable for infiltration.

Professional Service Industries, Inc.
11980 Telegraph Road, Unit 104
Santa Fe Springs, California 90670
Phone: (714) 484-8600
Fax: (562) 777-0899

January 21, 2022

Victory Real Estate Development
8201 Preston Road, Suite 700
Dallas, Texas 75225

Attn: Mr. Tim Kraftson
tim.kraftson@vg-re.com

Re: Geotechnical Evaluation of Infiltration Feasibility
Proposed Caliber Collision Development
North of 33235 Zeiders Road
Menifee, California 92584
Project Number: 0066-2170

Reference:

Professional Service Industries, Inc. (PSI), "Geotechnical Investigation, Proposed Caliber Collision Development, North of 33235 Zeiders Road, Menifee, California 92584", Project No. 0066-2170, dated October 1, 2021.

As requested, Professional Service Industries (PSI), an Intertek company, is pleased to provide our opinion concerning possible infiltration at the subject project referenced above. This work has been performed based on our proposal (0066-352332) dated August 30, 2021 and authorized by Jessi Fazio on August 30, 2021.

Based on our geotechnical investigation of the site and the Conceptual Site Grading plan (Latitude33, 10/27/21), the soils below the proposed biofiltration basin generally consist of very dense silty sand. The USDA NCRS soil survey of the area reports Wyman Loam (WyC2) clay loam; hydric group C. This hydric group is known to have a slow infiltration rate when thoroughly wet. PSI recommends not relying on infiltration at this site to manage stormwater.

Should you have any questions after reviewing this letter, please feel free to contact our office at your convenience.

Respectfully submitted for,

PROFESSIONAL SERVICE INDUSTRIES, INC.

REGISTERED PROFESSIONAL ENGINEER DOUGLAS T. ABERNATHY GE 2547 Exp. 12/31/22 GEOTECHNICAL STATE OF CALIFORNIA

Douglas T. Abernathy, PE, GE
Senior Project Manager

Thomas Vick
Principal Consultant

CC: Latitude33 (Sean Drake)

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

Santa Ana Watershed - BMP Design Volume, V_{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	Latitude 33 Planning and Engineering	Date	1/26/2022
Designed by		Case No	
Company Project Number/Name	Caliber Collision, PR21-0293		

BMP Identification

BMP NAME / ID BMP 1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.59 inches

Drainage Management Area Tabulation

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

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
1	*19,940*	*Roofs*	*1*	*0.89*	*17786.5*			
2	*48690*	*Concrete or Asphalt*	*1*	*0.89*	*43431.5*			
3	*17240*	*Natural (C Soil)*	*0.3*	*0.23*	*3881.9*			
4	*5485*	*Natural (C Soil)*	*0.3*	*0.23*	*1235*			
6	*845*	*Decomposed Granite*	*0.4*	*0.28*	*236.4*			
	92200	***Total***			**66571.3**	**0.59**	***3273.1***	***6110***

Notes:

Bioretention Facility - Design Procedure	BMP ID	Legend:	Required Entries
	BMP 1		Calculated Cells

Company Name: Latitude 33 Planning and Engineering — Date: 2/10/2022

Designed by: Matt McGuirk — County/City Case No.:

Design Volume

Enter the area tributary to this feature — A_T= 2.0524564 acres

Enter V_{BMP} determined from Section 2.1 of this Handbook — V_{BMP}= 3,273 ft^3

Type of Bioretention Facility Design

◉ Side slopes required (parallel to parking spaces or adjacent to walkways)

○ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer — d_S = 1.5 ft

Top Width of Bioretention Facility, excluding curb — w_T = 50.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ — d_E = 1.34 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 2,450 ft^2

Proposed Surface Area — A= 4,560 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility — z = 4 :1

Diameter of Underdrain — 6 inches

Longitudinal Slope of Site (3% maximum) — 0 %

6" Check Dam Spacing — 0 feet

Describe Vegetation: Shrubs

Notes:

3.5 Bioretention Facility

Type of BMP	LID – Bioretention
Treatment Mechanisms	Infiltration, Evapotranspiration, Evaporation, Biofiltration
Maximum Drainage Area	This BMP is intended to be integrated into a project's landscaped area in a distributed manner. Typically, contributing drainage areas to Bioretention Facilities range from less than 1 acre to a maximum of around 10 acres.
Other Names	Rain Garden, Bioretention Cell, Bioretention Basin, Biofiltration Basin, Landscaped Filter Basin, Porous Landscape Detention

Description

Bioretention Facilities are shallow, vegetated basins underlain by an engineered soil media. Healthy plant and biological activity in the root zone maintain and renew the macro-pore space in the soil and maximize plant uptake of pollutants and runoff. This keeps the Best Management Practice (BMP) from becoming clogged and allows more of the soil column to function as both a sponge (retaining water) and a highly effective and self-maintaining biofilter. In most cases, the bottom of a Bioretention Facility is unlined, which also provides an opportunity for infiltration to the extent the underlying onsite soil can accommodate. When the infiltration rate of the underlying soil is exceeded, fully biotreated flows are discharged via underdrains. Bioretention Facilities therefore will inherently achieve the maximum feasible level of infiltration and evapotranspiration and achieve the minimum feasible (but highly biotreated) discharge to the storm drain system.

Siting Considerations

These facilities work best when they are designed in a relatively level area. Unlike other BMPs, Bioretention Facilities can be used in smaller landscaped spaces on the site, such as:

- ✓ Parking islands
- ✓ Medians
- ✓ Site entrances

Landscaped areas on the site (such as may otherwise be required through minimum landscaping ordinances), can often be designed as Bioretention Facilities. This can be accomplished by:

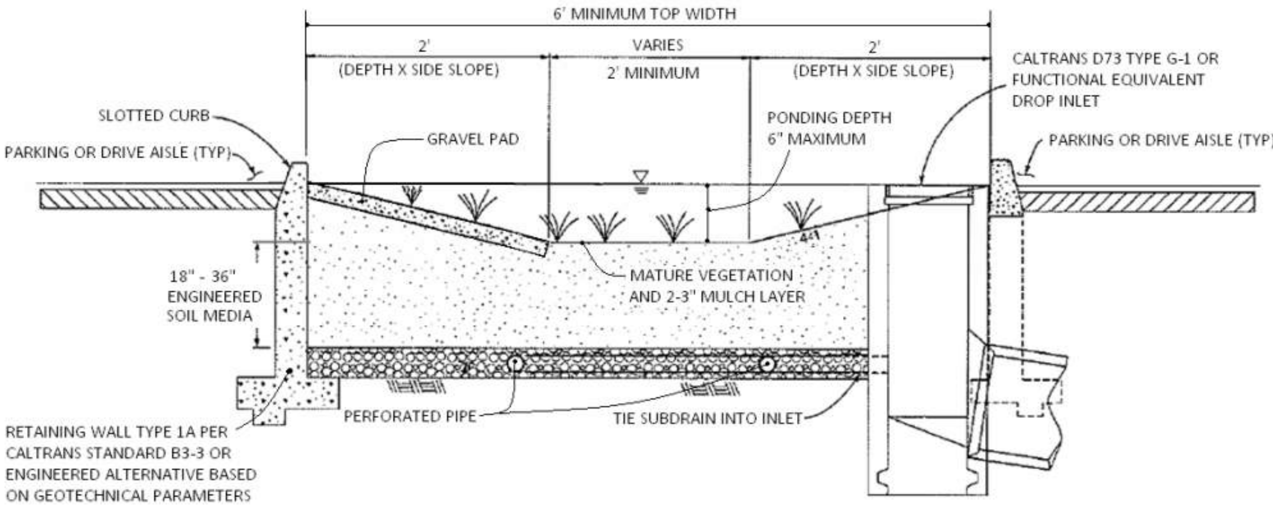
- *Depressing* landscaped areas below adjacent impervious surfaces, rather than elevating those areas
- Grading the site to direct runoff from those impervious surfaces *into* the Bioretention Facility, rather than away from the landscaping
- Sizing and designing the depressed landscaped area as a Bioretention Facility as described in this Fact Sheet

Bioretention Facilities should however not be used downstream of areas where large amounts of sediment can clog the system. Placing a Bioretention Facility at the toe of a steep slope should also be avoided due to the potential for clogging the engineered soil media with erosion from the slope, as well as the potential for damaging the vegetation.

Design and Sizing Criteria

The recommended cross section necessary for a Bioretention Facility includes:

- Vegetated area
- 18' minimum depth of engineered soil media
- 12' minimum gravel layer depth with 6' perforated pipes (added flow control features such as orifice plates may be required to mitigate for HCOC conditions)



While the 18-inch minimum engineered soil media depth can be used in some cases, it is recommended to use 24 inches or a preferred 36 inches to provide an adequate root zone for the chosen plant palate. Such a design also provides for improved removal effectiveness for nutrients. The recommended ponding depth inside of a Bioretention Facility is 6 inches; measured from the flat bottom surface to the top of the water surface as shown in Figure 1.

Because this BMP is filled with an engineered soil media, pore space in the soil and gravel layer is assumed to provide storage volume. However, several considerations must be noted:

- Surcharge storage above the soil surface (6 inches) is important to assure that design flows do not bypass the BMP when runoff exceeds the soil's absorption rate.
- In cases where the Bioretention Facility contains engineered soil media deeper than 36 inches, the pore space within the engineered soil media can only be counted to the 36-inch depth.
- A maximum of 30 percent pore space can be used for the soil media whereas a maximum of 40 percent pore space can be use for the gravel layer.

Figure 1: Standard Layout for a Bioretention Facility

Engineered Soil Media Requirements

The engineered soil media shall be comprised of 85 percent mineral component and 15 percent organic component, by volume, drum mixed prior to placement. The mineral component shall be a Class A sandy loam topsoil that meets the range specified in Table 1 below. The organic component shall be nitrogen stabilized compost[1], such that nitrogen does not leach from the media.

Table 1: Mineral Component Range Requirements

Percent Range	Component
70-80	Sand
15-20	Silt
5-10	Clay

The trip ticket, or certificate of compliance, shall be made available to the inspector to prove the engineered mix meets this specification.

Vegetation Requirements

Vegetative cover is important to minimize erosion and ensure that treatment occurs in the Bioretention Facility. The area should be designed for at least 70 percent mature coverage throughout the Bioretention Facility. To prevent the BMP from being used as walkways, Bioretention Facilities shall be planted with a combination of small trees, densely planted shrubs, and natural grasses. Grasses shall be native or ornamental; preferably ones that do not need to be mowed. The application of fertilizers and pesticides should be minimal. To maintain oxygen levels for the vegetation and promote biodegradation, it is important that vegetation not be completely submerged for any extended period of time. Therefore, a maximum of 6 inches of ponded water shall be used in the design to ensure that plants within the Bioretention Facility remain healthy.

A 2 to 3-inch layer of standard shredded aged hardwood mulch shall be placed as the top layer inside the Bioretention Facility. The 6-inch ponding depth shown in Figure 1 above shall be measured from the top surface of the 2 to 3-inch mulch layer.

Curb Cuts

To allow water to flow into the Bioretention Facility, 1-foot-wide (minimum) curb cuts should be placed approximately every 10 feet around the perimeter of the Bioretention Facility. Figure 2 shows a curb cut in a Bioretention Facility. Curb cut flow lines must be at or above the V_{BMP} water surface level.

[1] For more information on compost, visit the US Composting Council website at: http://compostingcouncil.org/

Figure 2: Curb Cut located in a Bioretention Facility

To reduce erosion, a gravel pad shall be placed at each inlet point to the Bioretention Facility. The gravel should be 1- to 1.5-inch diameter in size. The gravel should overlap the curb cut opening a minimum of 6 inches. The gravel pad inside the Bioretention Facility should be flush with the finished surface at the curb cut and extend to the bottom of the slope.

In addition, place an apron of stone or concrete, a foot square or larger, inside each inlet to prevent vegetation from growing up and blocking the inlet. See Figure 3.

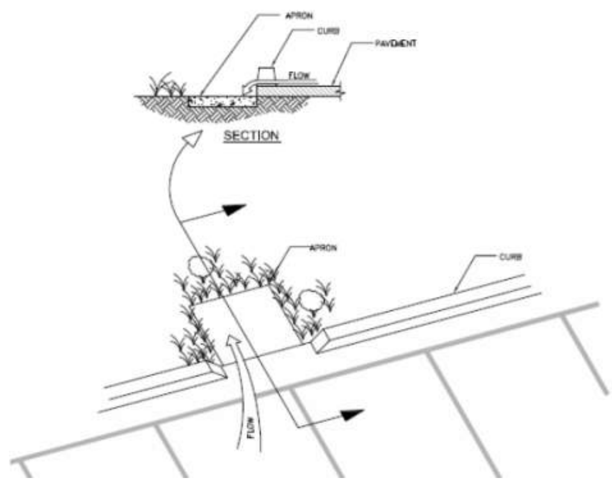


Figure 3: Apron located in a Bioretention Facility

Terracing the Landscaped Filter Basin

It is recommended that Bioretention Facilities be level. In the event the facility site slopes and lacks proper design, water would fill the lowest point of the BMP and then discharge from the basin without being treated. To ensure that the water will be held within the Bioretention Facility on sloped sites, the BMP must be terraced with nonporous check dams to provide the required storage and treatment capacity.

The terraced version of this BMP shall be used on non-flat sites with no more than a 3 percent slope. The surcharge depth cannot exceed 0.5 feet, and side slopes shall not exceed 4:1. Table 2 below shows the spacing of the check dams, and slopes shall be rounded up (i.e., 2.5 percent slope shall use 10' spacing for check dams).

Table 2: Check Dam Spacing

6" Check Dam Spacing	
Slope	**Spacing**
1%	*25'*
2%	*15'*
3%	*10'*

Roof Runoff

Roof downspouts may be directed towards Bioretention Facilities. However, the downspouts must discharge onto a concrete splash block to protect the Bioretention Facility from erosion.

Retaining Walls

It is recommended that Retaining Wall Type 1A, per Caltrans Standard B3-3 or equivalent, be constructed around the entire perimeter of the Bioretention Facility. This practice will protect the sides of the Bioretention Facility from collapsing during construction and maintenance or from high service loads adjacent to the BMP. Where such service loads would not exist adjacent to the BMP, an engineered alternative may be used if signed by a licensed civil engineer.

Side Slope Requirements

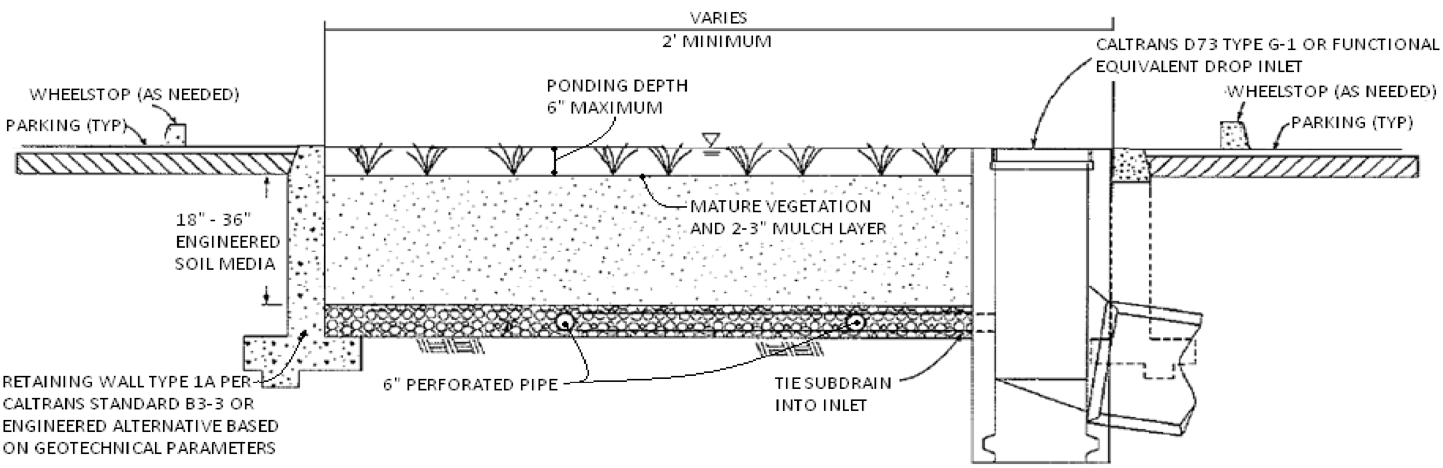
Bioretention Facilities Requiring Side Slopes

The design should assure that the Bioretention Facility does not present a tripping hazard. Bioretention Facilities proposed near pedestrian areas, such as areas parallel to parking spaces or along a walkway, must have a gentle slope to the bottom of the facility. Side slopes inside of a Bioretention Facility shall be 4:1. A typical cross section for the Bioretention Facility is shown in Figure 1.

Bioretention Facilities Not Requiring Side Slopes

Where cars park perpendicular to the Bioretention Facility, side slopes are not required. A 6-inch maximum drop may be used, and the Bioretention Facility must be planted with trees and shrubs to prevent pedestrian access. In this case, a curb is not placed around the Bioretention Facility,

but wheel stops shall be used to prevent vehicles from entering the Bioretention Facility, as shown in Figure 4.



Planter Boxes

Bioretention Facilities can also be placed above ground as planter boxes. Planter boxes must have a minimum width of 2 feet, a maximum surcharge depth of 6 inches, and no side slopes are necessary. Planter boxes must be constructed so as to ensure that the top surface of the engineered soil media will remain level. This option may be constructed of concrete, brick, stone or other stable materials that will not warp or bend. Chemically treated wood or galvanized steel, which has the ability to contaminate stormwater, should not be used. Planter boxes must be lined with an impermeable liner on all sides, including the bottom. Due to the impermeable liner, the inside bottom of the planter box shall be designed and constructed with a cross fall, directing treated flows within the subdrain layer toward the point where subdrain exits the planter box, and subdrains shall be oriented with drain holes oriented down. These provisions will help avoid excessive stagnant water within the gravel underdrain layer. Similar to the in-ground Bioretention Facility versions, this BMP benefits from healthy plants and biological activity in the root zone. Planter boxes should be planted with appropriately selected vegetation.

Figure 5: Planter Box
Source: LA Team Effort

Overflow

An overflow route is needed in the Bioretention Facility design to bypass stored runoff from storm events larger than V_{BMP} or in the event of facility or subdrain clogging. Overflow systems must connect to an acceptable discharge point, such as a downstream conveyance system as shown in Figure 1 and Figure 4. The inlet to the overflow structure shall be elevated inside the Bioretention Facility to be flush with the ponding surface for the design capture volume (V_{BMP}) as shown in Figure 4. This will allow the design capture volume to be fully treated by the Bioretention Facility, and for larger events to safely be conveyed to downstream systems. The overflow inlet shall **not** be located in the entrance of a Bioretention Facility, as shown in Figure 6.

Underdrain Gravel and Pipes
An underdrain gravel layer and pipes shall be provided in accordance with Appendix B – Underdrains.

Figure 6: Incorrect Placement of an Overflow Inlet.

Inspection and Maintenance Schedule

The Bioretention Facility area shall be inspected for erosion, dead vegetation, soggy soils, or standing water. The use of fertilizers and pesticides on the plants inside the Bioretention Facility should be minimized.

Schedule	Activity
Ongoing	• Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. • Remove trash and debris • Replace damaged grass and/or plants • Replace surface mulch layer as needed to maintain a 2-3 inch soil cover.
After storm events	• Inspect areas for ponding
Annually	• Inspect/clean inlets and outlets

Bioretention Facility Design Procedure

1) Enter the area tributary, A_T, to the Bioretention Facility.

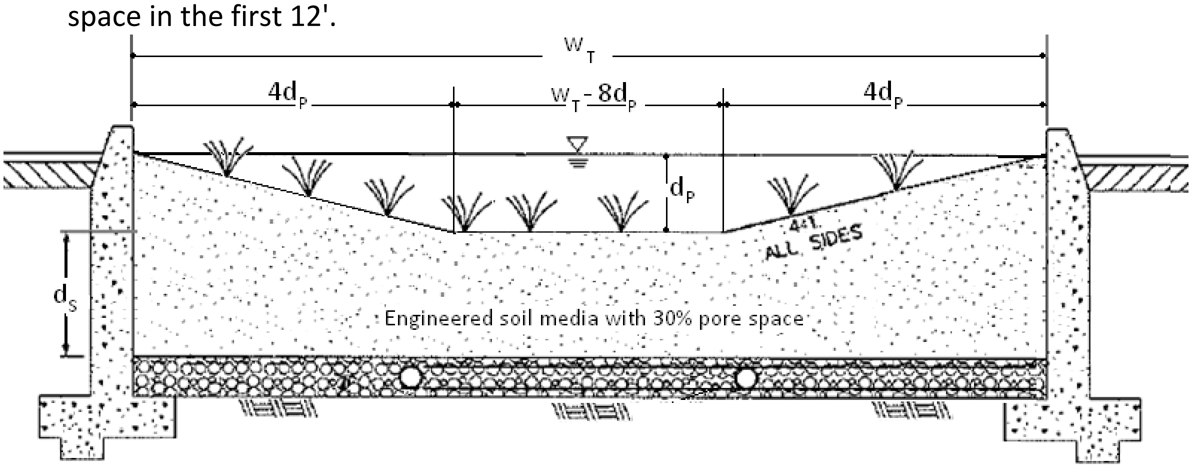
2) Enter the Design Volume, $V_{BMP,}$ determined from Section 2.1 of this Handbook.

3) Select the type of design used. There are two types of Bioretention Facility designs: the standard design used for most project sites that include side slopes, and the modified design used when the BMP is located perpendicular to the parking spaces or with planter boxes that do not use side slopes.

4) Enter the depth of the engineered soil media, d_S. The minimum depth for the engineered soil media can be 18' in limited cases, but it is recommended to use 24' or a preferred 36' to provide an adequate root zone for the chosen plant palette. Engineered soil media deeper than 36' will only get credit for the pore space in the first 36'.

5) Enter the top width of the Bioretention Facility.

6) Calculate the total effective depth, d_E, within the Bioretention Facility. The maximum allowable pore space of the soil media is 30% while the maximum allowable pore space for the gravel layer is 40%. Gravel layer deeper than 12' will only get credit for the pore space in the first 12'.



   a. For the design with side slopes the following equation shall be used to determine the total effective depth. Where, d_P is the depth of ponding within the basin.

$$d_E(\text{ft}) = \frac{0.3 \times \left[\left(w_T(\text{ft}) \times d_S(\text{ft})\right) + 4\left(d_P(\text{ft})\right)^2\right] + 0.4 \times 1(\text{ft}) + d_P(\text{ft})\left[4d_P(\text{ft}) + \left(w_T(\text{ft}) - 8d_P(\text{ft})\right)\right]}{w_T(\text{ft})}$$

   This above equation can be simplified if the maximum ponding depth of 0.5’ is used. The equation below is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_E(\text{ft}) = (0.3 \times d_S(\text{ft}) + 0.4 \text{ x } 1(\text{ft})) - \left(\frac{0.7\ (\text{ft}^2)}{w_T(\text{ft})}\right) + 0.5(\text{ft})$$

b. For the design without side slopes the following equation shall be used to determine the total effective depth:

$$d_E(ft) = d_P(ft) + [(0.3) \times d_S(ft) + (0.4) \times 1(ft)]$$

The equation below, using the maximum ponding depth of 0.5', is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_E(ft) = 0.5\ (ft) + [(0.3) \times d_S(ft) + (0.4) \times 1(ft)]$$

7) Calculate the minimum surface area, A_M, required for the Bioretention Facility. This does not include the curb surrounding the Bioretention Facility or side slopes.

$$A_M(ft^2) = \frac{V_{BMP}(ft^3)}{d_E\ (ft)}$$

8) Enter the proposed surface area. This area shall not be less than the minimum required surface area.

9) Verify that side slopes are no steeper than 4:1 in the standard design, and are not required in the modified design.

10) Provide the diameter, minimum 6 inches, of the perforated underdrain used in the Bioretention Facility. See Appendix B for specific information regarding perforated pipes.

11) Provide the slope of the site around the Bioretention Facility, if used. The maximum slope is 3 percent for a standard design.

12) Provide the check dam spacing, if the site around the Bioretention Facility is sloped.

13) Describe the vegetation used within the Bioretention Facility.

References Used to Develop this Fact Sheet

Anderson, Dale V. "Landscaped Filter Basin Soil Requirements." Riverside, May 2010.

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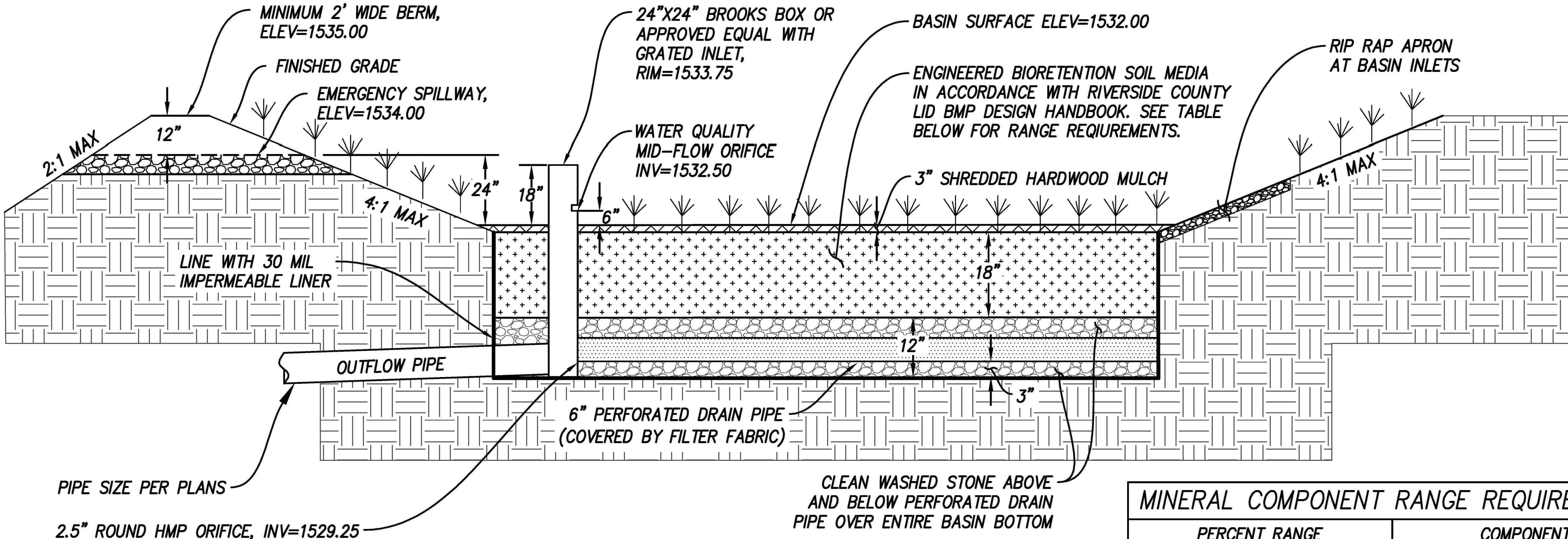
Urbonas, Ben R. Stormwater Sand Filter Sizing and Design: A Unit Operations Approach. Denver: Urban Drainage and Flood Control District, 2002.



MINERAL COMPONENT RANGE REQUIREMENTS	
PERCENT RANGE	COMPONENT
70–80	SAND
15–20	SILT
5–10	CLAY

NOTE: BIOFILTRATION BASIN SHALL BE CONSTRUCTED IN ACCORDANCE WITH RIVERSIDE COUNTY LOW IMPACT DEVELOPMENT BMP DESIGN HANDBOOK AND PROJECT SPECIFIC WATER QUALITY MANAGEMENT PLAN FOR THE SANTA ANA WATERSHED REGION

BIO-FILTRATION BASIN DETAIL (1)

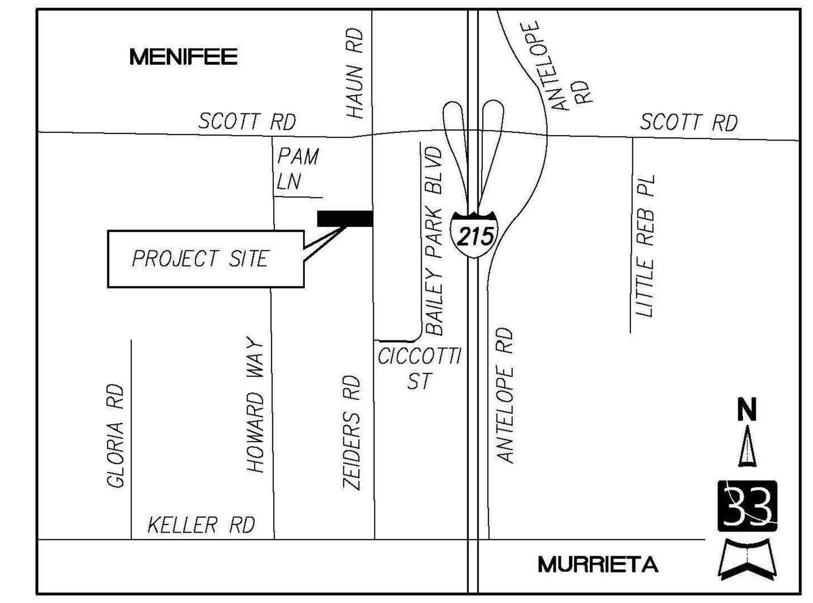
NTS

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

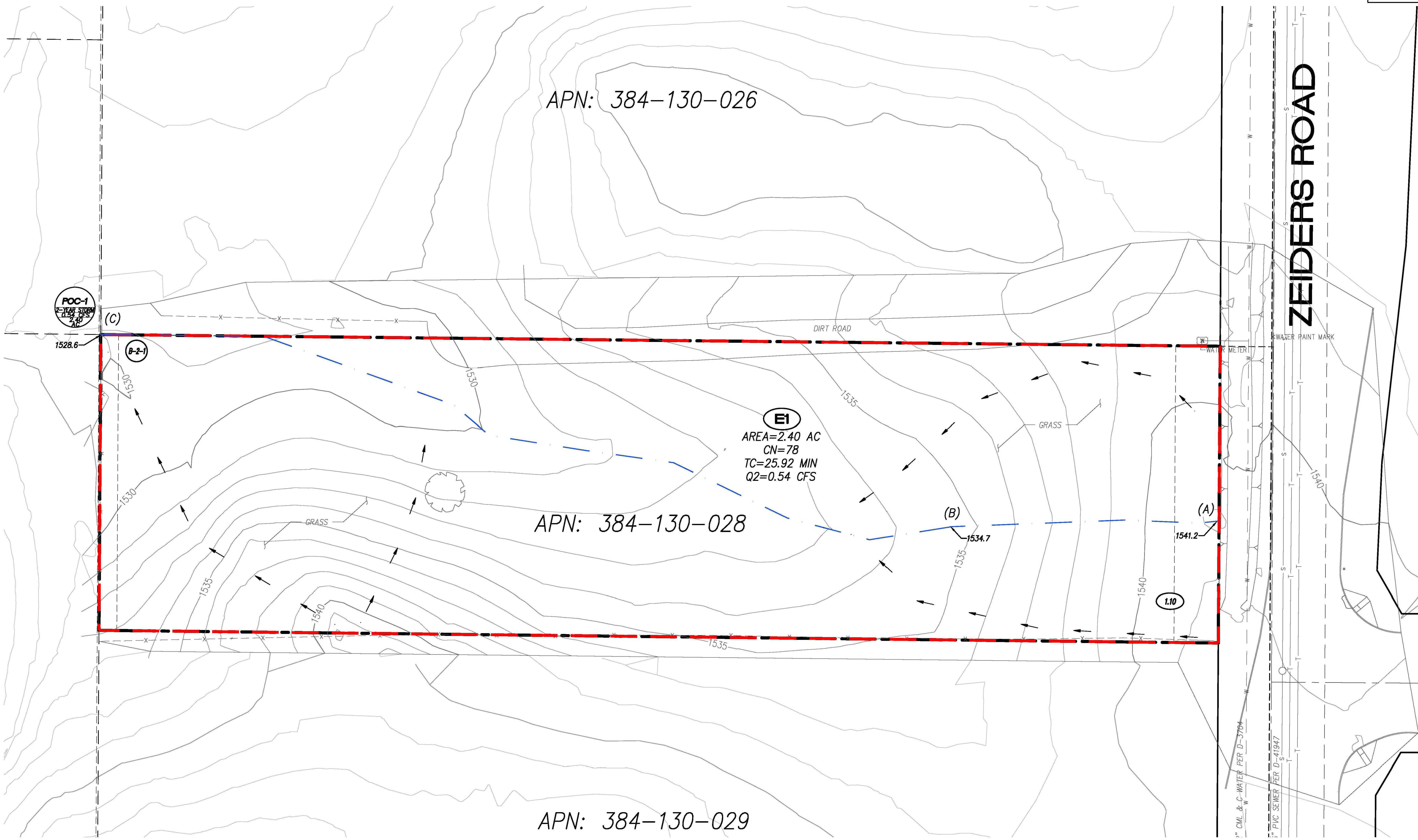
Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

EXISTING CONDITIONS
HYDROMODIFICATION EXHIBIT



VICINITY MAP
NO SCALE



LEGEND

RIGHT-OF-WAY LINE	
PROPERTY LINE	
MAJOR CONTOUR	(365)
MINOR CONTOUR	
K-RAIL	
FENCE	
TREES/SHRUBS	
SUB-BASINS	
DRAINAGE PATTERNS	
FLOWLINE	
CONVEYANCE LINK	
SUB-BASIN ID	XXXX
NODE ID	
TC SEGMENT	(X)
CONVEYANCE LINK ID	X
BASIN DATA	X / X / CFS / XX.XX / AC

N

0 15 30 60 90
(IN FEET)
1 inch = 30 ft.

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

DATE	REVISION	BY
10.27.2021	CUP APPLICATION	XXX

CALIBER COLLISION
33235-33185 ZEIDERS RD, MENIFEE, CA 92584

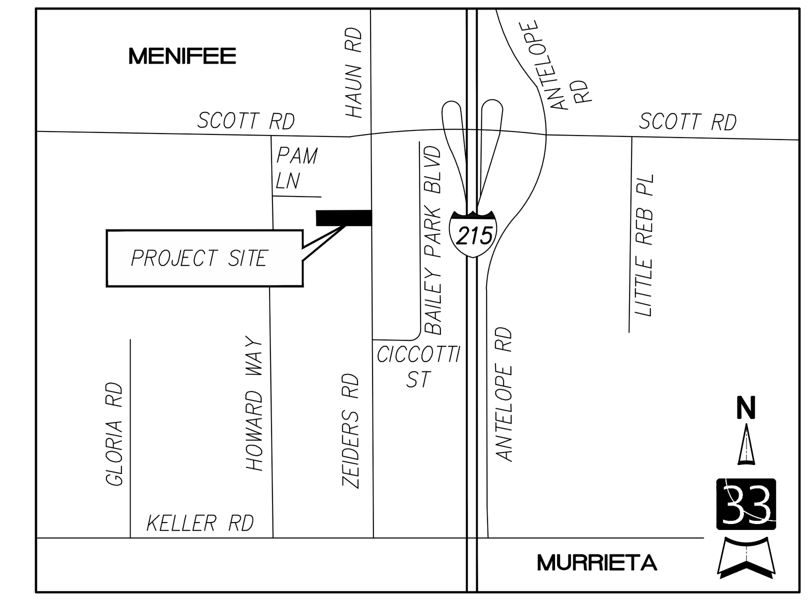
L33 PROJECT NUMBER (PN): 1799.00
OTHER PN: XXXX.XX
DESIGNED BY: MAM DATE: 10.27.2021
DRAWN BY: MAM DATE: 10.27.2021
CHECKED BY: SDD DATE: 10.27.2021

SHEET 1 OF 2

PROPOSED CONDITIONS HYDROMODIFICATION EXHIBIT

SUBBASIN TABLE

SUBBASIN ID	AREA (AC)	CURVE NUMBER (C)	TC (MIN)
P10	2.053	93.4	7.90
P11	0.357	80	19.45

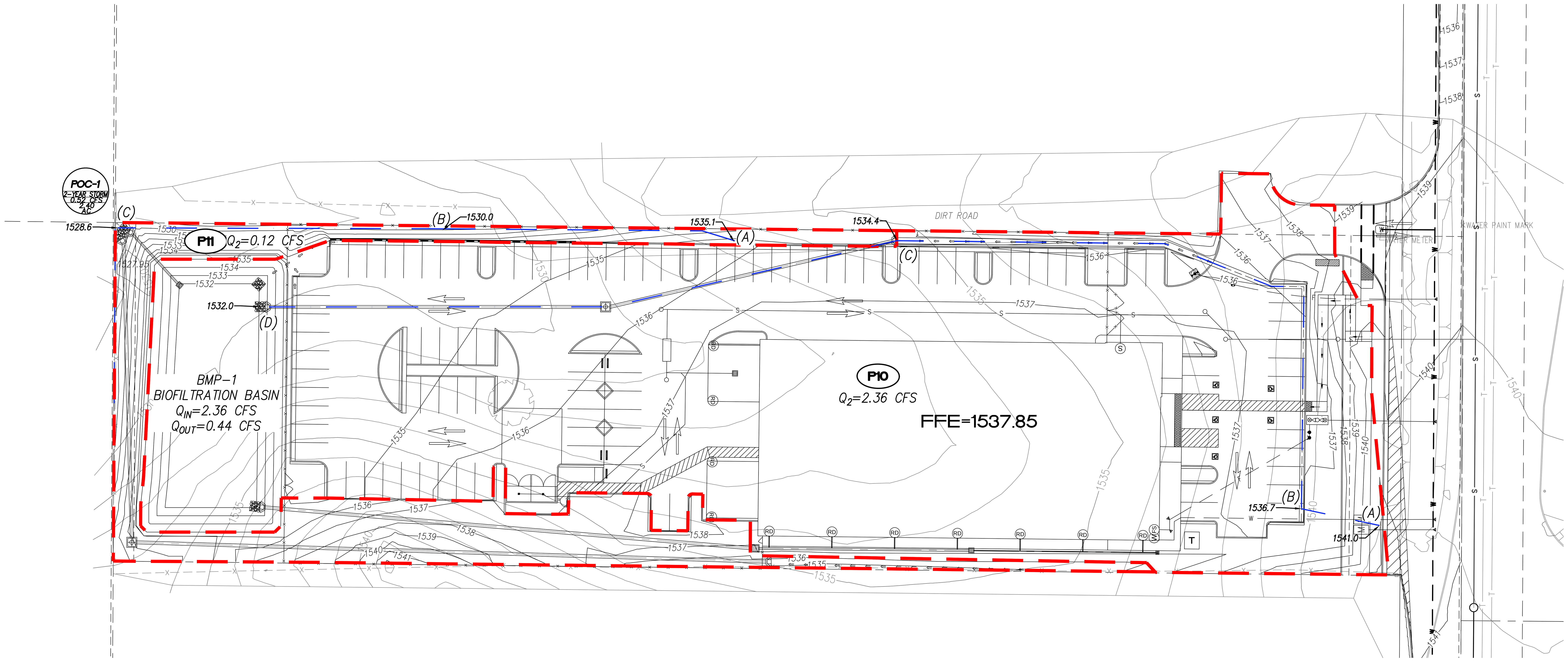


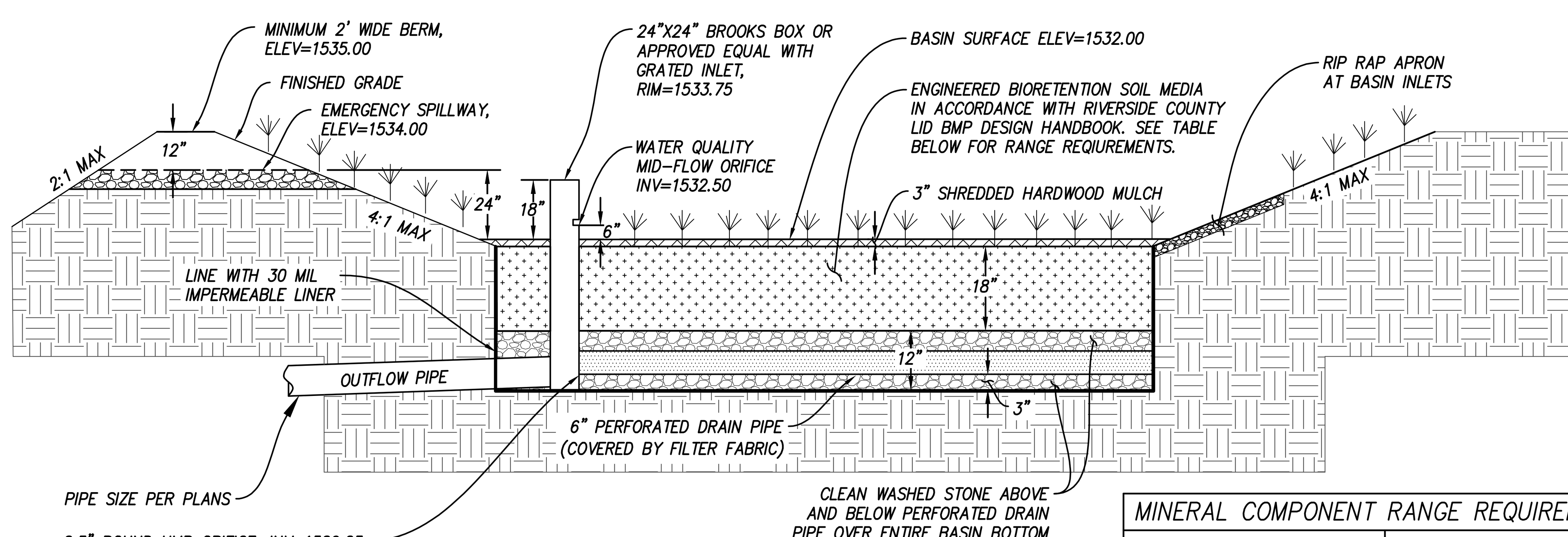
VICINITY MAP

NO SCALE

LEGEND

- RIGHT-OF-WAY LINE
- PROPERTY LINE
- MAJOR CONTOUR (365)
- MINOR CONTOUR
- K-RAIL
- FENCE
- TREES/SHRUBS
- SUB-BASINS
- DRAINAGE PATTERNS
- FLOWLINE
- CONVEYANCE LINK
- INITIAL SUB-BASIN ID (XXXX)
- NODE ID (XXXX)
- ELEVATION AT NODE (XX.XX)
- CONVEYANCE LINK ID (XXXX)
- BASIN DATA (X / X / CFS / FPS / XX.XX AC)





MINERAL COMPONENT RANGE REQUIREMENTS

PERCENT RANGE	COMPONENT
70-80	SAND
15-20	SILT
5-10	CLAY

NOTE: BIOFILTRATION BASIN SHALL BE CONSTRUCTED IN ACCORDANCE WITH RIVERSIDE COUNTY LOW IMPACT DEVELOPMENT BMP DESIGN HANDBOOK AND PROJECT SPECIFIC WATER QUALITY MANAGEMENT PLAN FOR THE SANTA ANA WATERSHED REGION

BMP 1 - BIOFILTRATION BASIN (1)

NTS

N

0 15 30 60 90

(IN FEET)
1 inch = 30 ft.

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

DATE	REVISION	BY
10.27.2021	CUP APPLICATION	MAM
02.11.2022	2ND CUP SUBMITTAL	MAM

CALIBER COLLISION

33235-33185 ZEIDERS RD, MENIFEE, CA 92584

L33 PROJECT NUMBER (PN): 1799.00
OTHER PN: XXXX.XX
DESIGNED BY: MAM DATE: 10.27.2021
DRAWN BY: MAM DATE: 10.27.2021
CHECKED BY: SDD DATE: 10.27.2021

SHEET 2 OF 2

2/10/2022 1:42:37 PM

Project Description

File Name .... 1799.00 HMP Model 2 Year 24 Hour TR-55 PRE.SPF

Project Options

Flow Units .... CFS
Elevation Type .... Elevation
Hydrology Method .... SCS TR-55
Time of Concentration (TOC) Method .... SCS TR-55
Link Routing Method .... Kinematic Wave
Enable Overflow Ponding at Nodes .... YES
Skip Steady State Analysis Time Periods ... YES

Analysis Options

Start Analysis On	Oct 07, 2021	00:00:00
End Analysis On	Oct 08, 2021	00:00:00
Start Reporting On	Oct 07, 2021	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	2
Subbasins..	1
Nodes...	1
Junctions	0
Outfalls	1
Flow Diversions	0
Inlets	0
Storage Nodes	0
Links...	0
Channels	0
Pipes	0
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1	100-YEAR	Time Series	100-YEAR	Cumulative	inches	California	Riverside (Lake Elsinore)	100	6.20	SCS Type I 24-hr
2	2-YEAR	Time Series	2-YEAR	Cumulative	inches	California	Riverside (Lake Elsinore)	2	2.20	SCS Type I 24-hr

Subbasin Summary

SN	Subbasin ID	Area (ac)	Peak Rate Factor	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	E1	2.40	484.00	78.00	2.20	0.60	1.44	0.54	0 00:25:55

Subbasin Hydrology

Subbasin : E1

Input Data

Area (ac) 2.40
Peak Rate Factor 484.00
Weighted Curve Number 78.00
Rain Gage ID 2-YEAR

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Meadow, non-grazed	2.40	D	78.00
Composite Area & Weighted CN	2.40		78.00

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft^2)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.2	0.00	0.00
Flow Length (ft) :	150	0.00	0.00
Slope (%) :	4.333	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.20	0.00	0.00
Velocity (ft/sec) :	0.17	0.00	0.00
Computed Flow Time (min) :	15.10	0.00	0.00

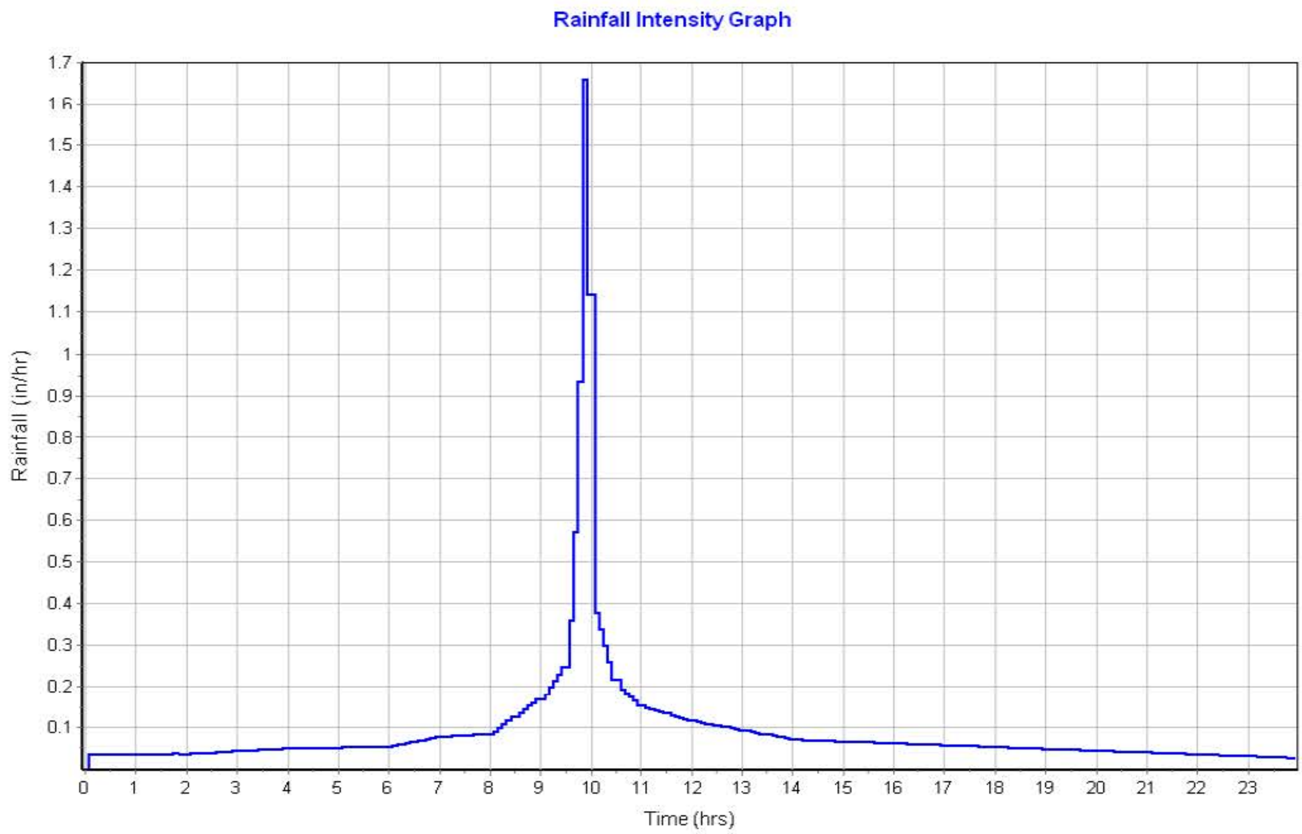
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	1.22	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	0.77	0.00	0.00
Computed Flow Time (min) :	10.82	0.00	0.00

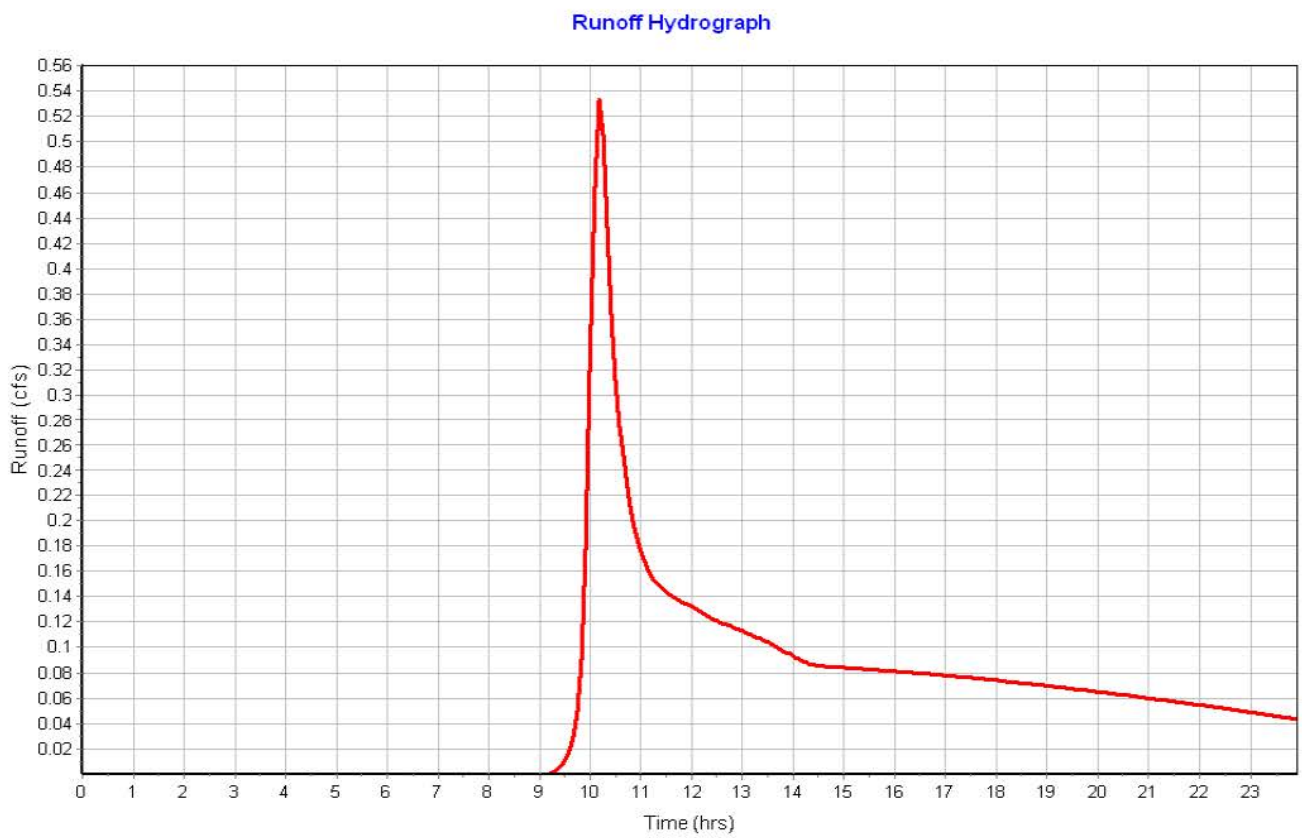
Total TOC (min) 25.92

Subbasin Runoff Results

Total Rainfall (in) 2.20
Total Runoff (in) 0.60
Peak Runoff (cfs) 0.54
Weighted Curve Number 78.00
Time of Concentration (days hh:mm:ss) 0 00:25:55

Subbasin : E1


Rainfall Intensity Graph
Rainfall (in/hr)
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time (hrs)


Runoff Hydrograph
Runoff (cfs)
0.56
0.54
0.52
0.5
0.48
0.46
0.44
0.42
0.4
0.38
0.36
0.34
0.32
0.3
0.28
0.26
0.24
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time (hrs)

Project Description

File Name .... 1799.00 HMP Model 2 Year 24 Hour TR-55 POST.SPF

Project Options

Flow Units .... CFS
Elevation Type .... Elevation
Hydrology Method .... SCS TR-55
Time of Concentration (TOC) Method .... SCS TR-55
Link Routing Method .... Kinematic Wave
Enable Overflow Ponding at Nodes .... YES
Skip Steady State Analysis Time Periods ... YES

Analysis Options

Start Analysis On	Oct 07, 2021	00:00:00
End Analysis On	Oct 08, 2021	00:00:00
Start Reporting On	Oct 07, 2021	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	2
Subbasins..	2
Nodes...	3
Junctions	1
Outfalls	1
Flow Diversions	0
Inlets	0
Storage Nodes	1
Links..	4
Channels	0
Pipes	1
Pumps	0
Orifices	3
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1	100-YEAR	Time Series	100-YEAR	Cumulative	inches	California	Riverside (Lake Elsinore)	100	6.20	SCS Type I 24-hr
2	2-YEAR	Time Series	2-YEAR	Cumulative	inches	California	Riverside (Lake Elsinore)	2	2.20	SCS Type I 24-hr

Subbasin Summary

SN	Subbasin ID	Area (ac)	Peak Rate Factor	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	P10	2.05	484.00	93.42	2.20	1.53	3.15	2.36	0 00:07:54
2	P11	0.36	484.00	80.00	2.20	0.69	0.25	0.12	0 00:19:27

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	BMP-OUTLET	Junction	1528.50	1532.00	1528.50	1532.00	0.00	0.44	1529.70	0.00	2.30	0 00:00	0.00	0.00
2	POC-1	Outfall	1528.60					0.52	1529.20					
3	BMP-1	Storage Node	1532.00	1535.00	1532.00		0.00	2.24	1532.77				0.00	0.00

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
1	1	Pipe	BMP-OUTLET	POC-1	50.00	1529.50	1529.00	1.0000	18.000	0.0120	0.44	11.38	0.04	3.11	0.20	0.13	0.00	Calculated
2	HMP-ORIFICE	Orifice	BMP-1	BMP-OUTLET		1532.00	1528.50		2.500		0.14							
3	MID-FLOW	Orifice	BMP-1	BMP-OUTLET		1532.00	1528.50		2.000		0.30							
4	OVERFLOW	Orifice	BMP-1	BMP-OUTLET		1532.00	1528.50		24.000		0.00							

Subbasin Hydrology

Subbasin : P10

Input Data

Area (ac) 2.05
Peak Rate Factor 484.00
Weighted Curve Number 93.42
Rain Gage ID 2-YEAR

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
> 75% grass cover, Good	0.52	D	80.00
Paved parking & roofs	1.53	D	98.00
Composite Area & Weighted CN	2.05		93.42

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft^2)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.2	0.00	0.00
Flow Length (ft) :	40	0.00	0.00
Slope (%) :	10	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.20	0.00	0.00
Velocity (ft/sec) :	0.18	0.00	0.00
Computed Flow Time (min) :	3.75	0.00	0.00

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	310	0.00	0.00
Slope (%) :	0.75	0.00	0.00
Surface Type :	Paved	Grassed waterway	Unpaved
Velocity (ft/sec) :	1.76	0.00	0.00
Computed Flow Time (min) :	2.94	0.00	0.00

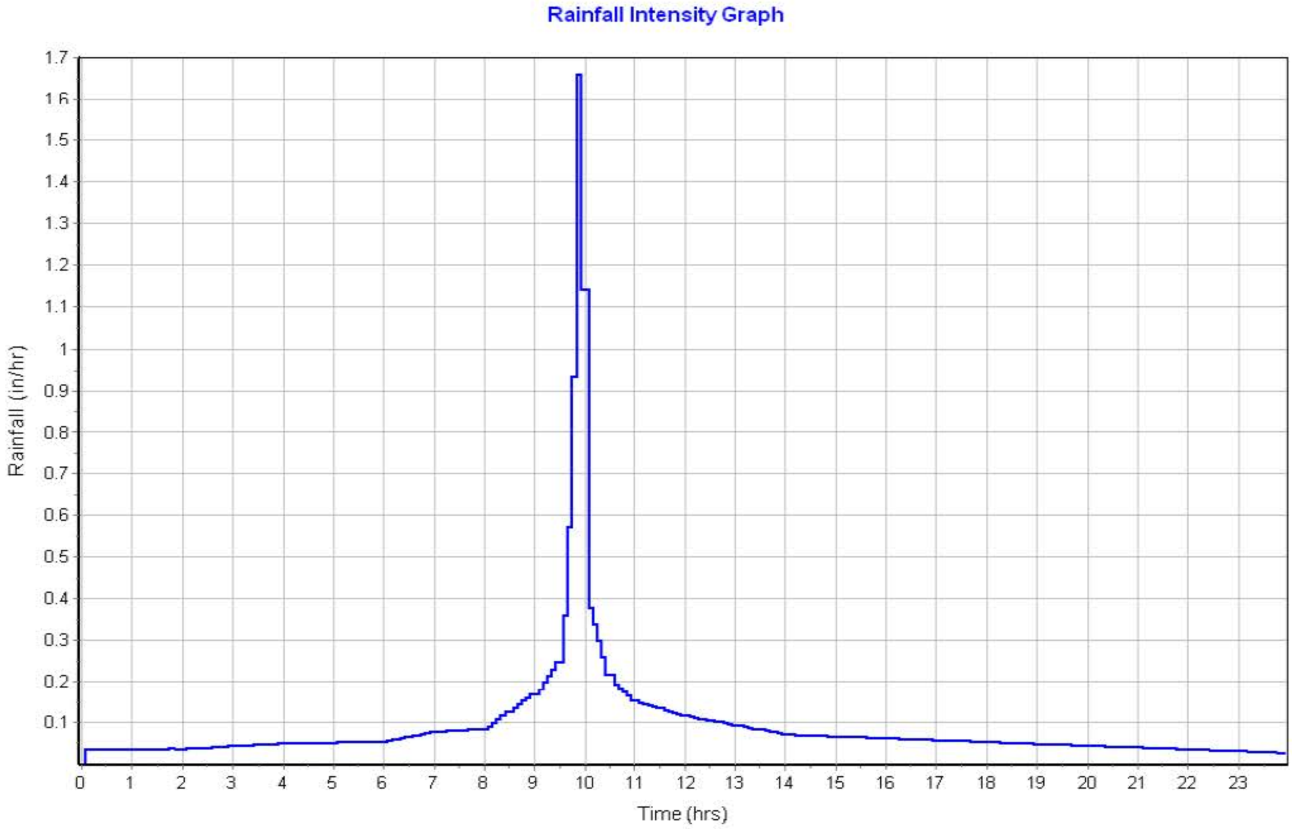
Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.012	0.00	0.00
Flow Length (ft) :	310	0.00	0.00
Channel Slope (%) :	.75	0.00	0.00
Cross Section Area (ft²) :	.7854	0.00	0.00
Wetted Perimeter (ft) :	3.14	0.00	0.00
Velocity (ft/sec) :	4.27	0.00	0.00
Computed Flow Time (min) :	1.21	0.00	0.00

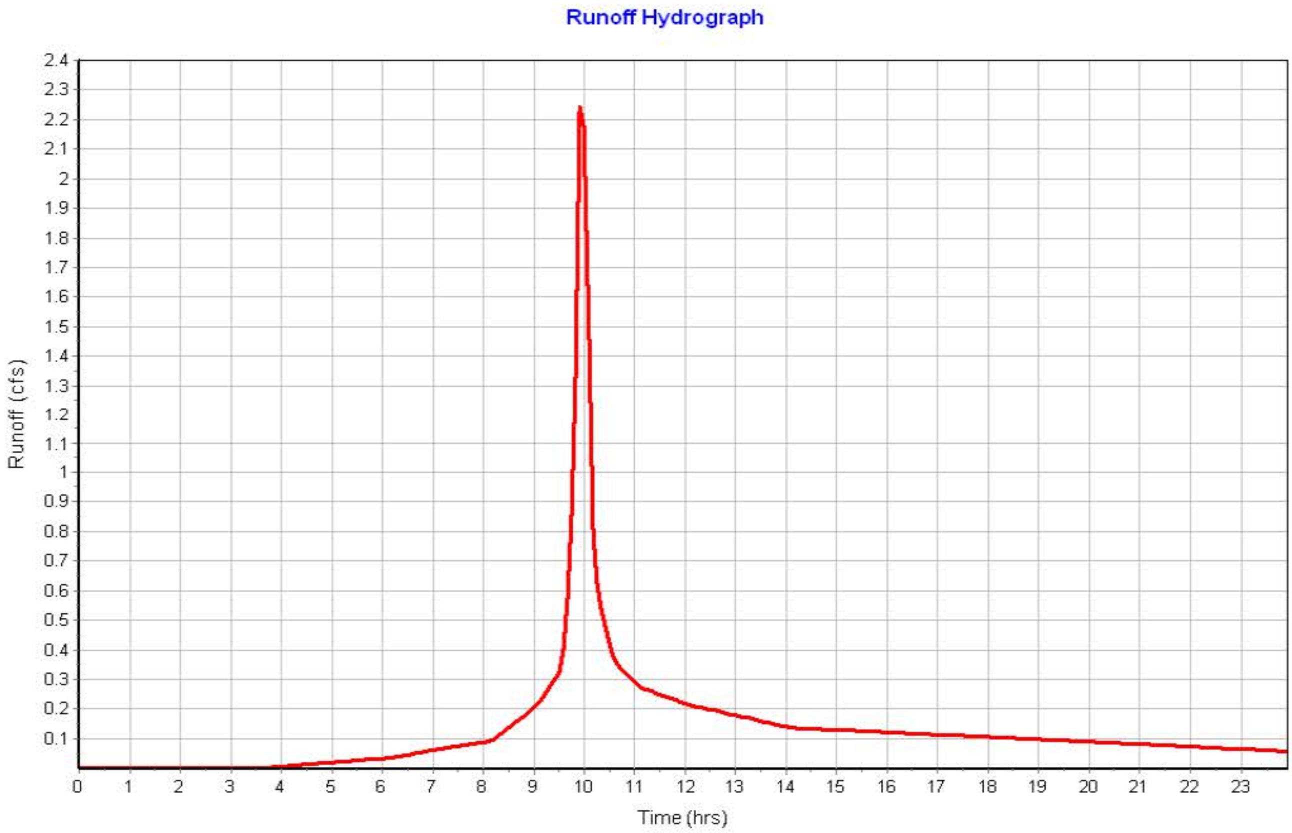
Total TOC (min) 7.90

Subbasin Runoff Results

Total Rainfall (in) 2.20
Total Runoff (in) 1.53
Peak Runoff (cfs) 2.36
Weighted Curve Number 93.42
Time of Concentration (days hh:mm:ss) 0 00:07:54

Subbasin : P10





Subbasin : P11

Input Data

Area (ac) 0.36
Peak Rate Factor 484.00
Weighted Curve Number 80.00
Rain Gage ID 2-YEAR

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
> 75% grass cover, Good	0.36	D	80.00
Composite Area & Weighted CN	0.36		80.00

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.2	0.00	0.00
Flow Length (ft) :	150	0.00	0.00
Slope (%) :	3.4	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.20	0.00	0.00
Velocity (ft/sec) :	0.15	0.00	0.00
Computed Flow Time (min) :	16.64	0.00	0.00

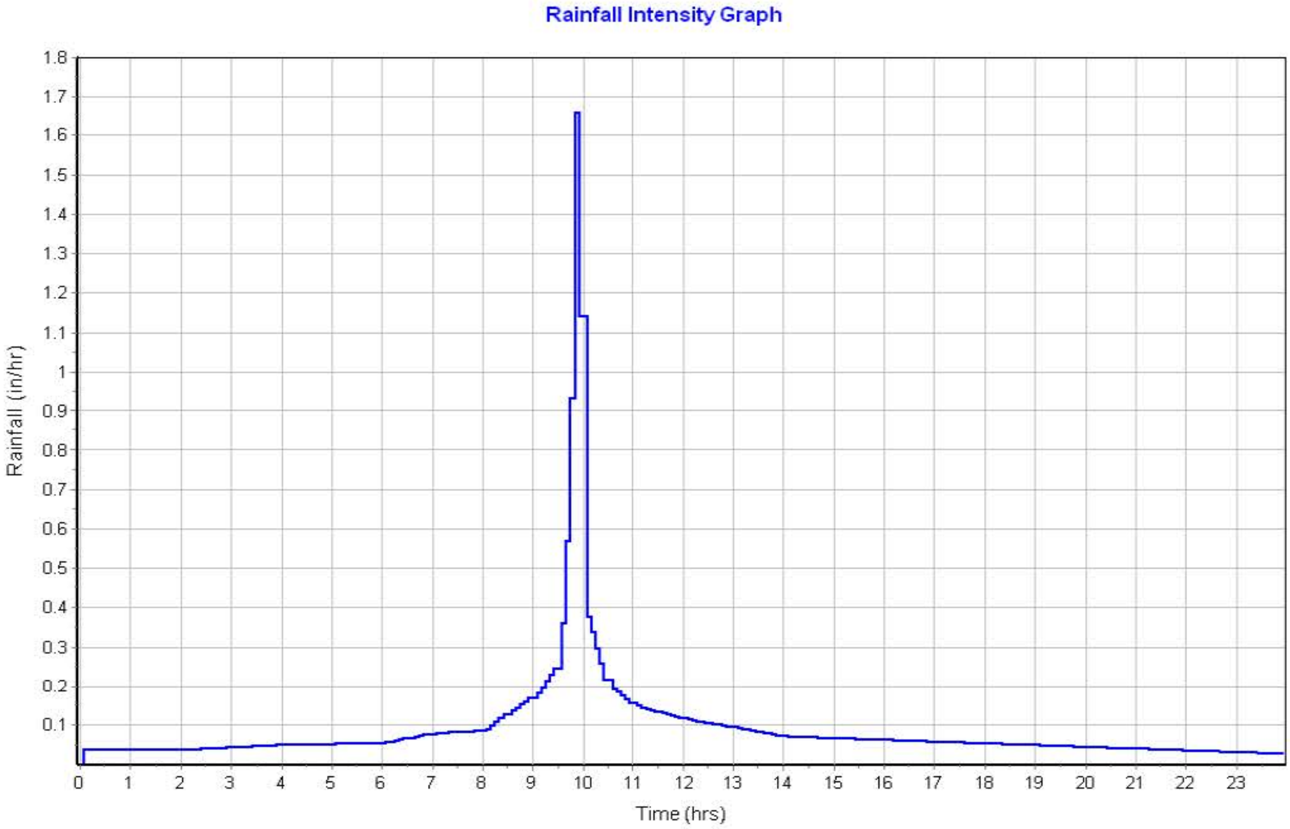
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	150	0.00	0.00
Slope (%) :	1.6	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	0.89	0.00	0.00
Computed Flow Time (min) :	2.81	0.00	0.00

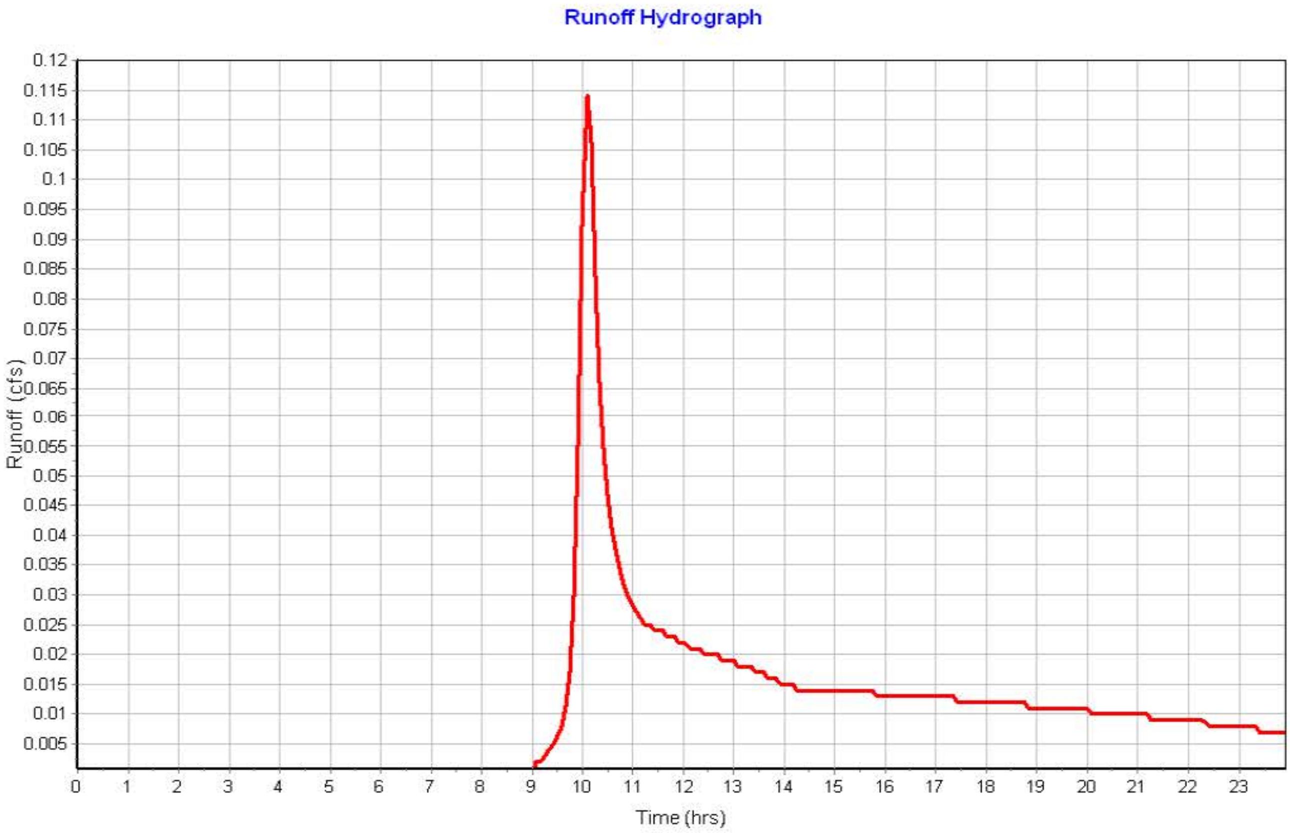
Total TOC (min) 19.45

Subbasin Runoff Results

Total Rainfall (in) 2.20
Total Runoff (in) 0.69
Peak Runoff (cfs) 0.12
Weighted Curve Number 80.00
Time of Concentration (days hh:mm:ss) 0 00:19:27

Subbasin : P11





Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft²)	Minimum Pipe Cover (in)
1	BMP-OUTLET	1528.50	1532.00	3.50	1528.50	0.00	1532.00	0.00	0.00	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	BMP-OUTLET	0.44	0.00	1529.70	1.20	0.00	2.30	1529.58	1.08	0 10:33	0 00:00	0.00	0.00

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
1	1	50.00	1529.50	1.00	1529.00	0.40	0.50	1.0000	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1

Pipe Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
1	1	0.44	0 10:34	11.38	0.04	3.11	0.27	0.20	0.13	0.00		Calculated

Storage Nodes

Storage Node : BMP-1

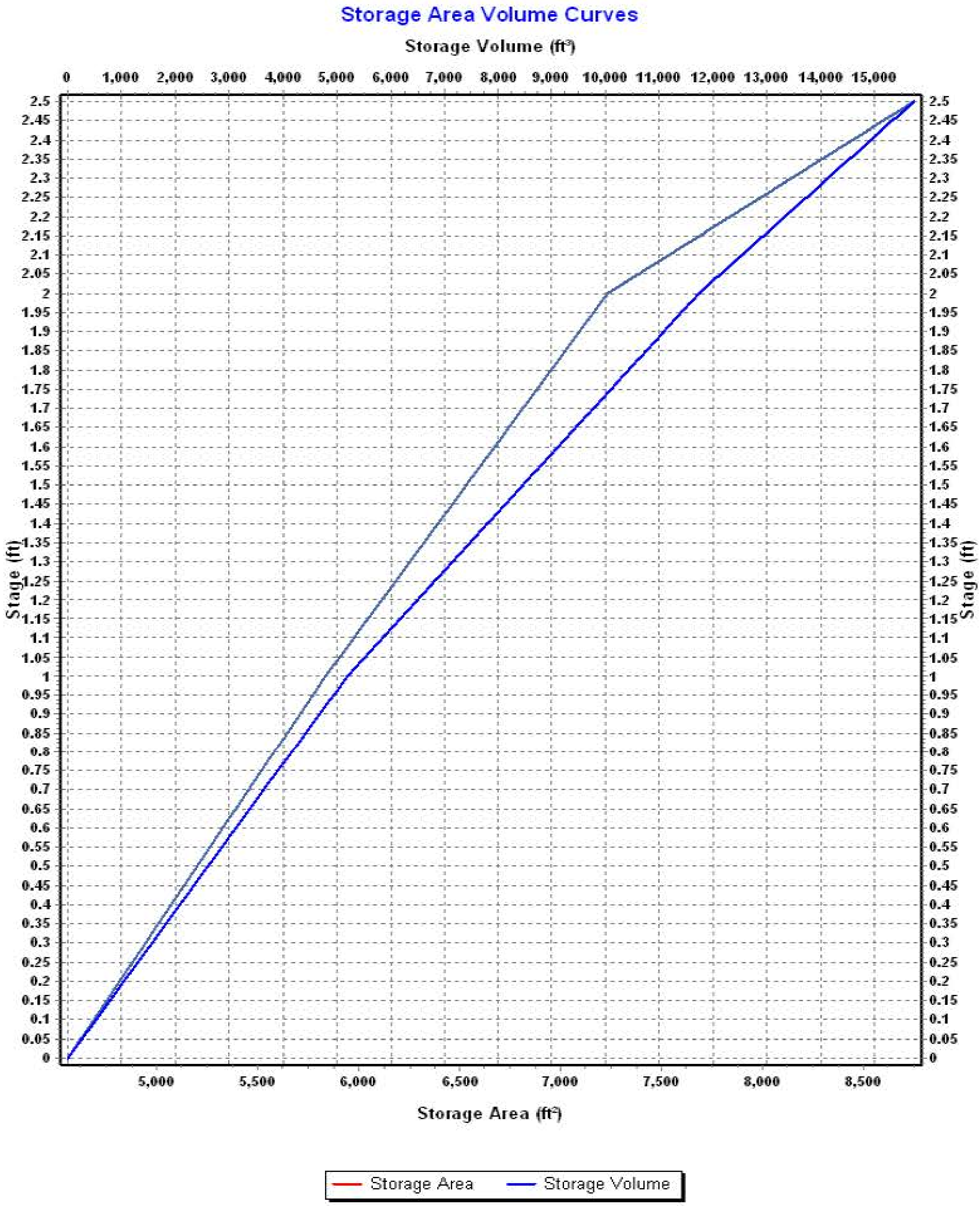
Input Data

Invert Elevation (ft) 1532.00
Max (Rim) Elevation (ft) 1535.00
Max (Rim) Offset (ft) 3.00
Initial Water Elevation (ft) 1532.00
Initial Water Depth (ft) 0.00
Ponded Area (ft²) 0.00
Evaporation Loss 0.00

Storage Area Volume Curves

Storage Curve : BMP-1

Stage (ft)	Storage Area (ft²)	Storage Volume (ft³)
0	4560	0.000
1	5835	5197.50
2	7235	11732.50
2.5	8750	15728.75


Storage Area Volume Curves
Storage Volume (ft³)
0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 10,000 11,000 12,000 13,000 14,000 15,000
Stage (ft)
Storage Area (ft²)
5,000 5,500 6,000 6,500 7,000 7,500 8,000 8,500
Storage Area
Storage Volume

Storage Node : BMP-1 (continued)

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	HMP-ORIFICE	Side	CIRCULAR	No	2.50			1529.50	0.61
2	MID-FLOW	Side	Rectangular	No		2.00	10.00	1532.50	0.63
3	OVERFLOW	Bottom	Rectangular	No		24.00	24.00	1534.00	0.63

Output Summary Results

Peak Inflow (cfs) 2.24
Peak Lateral Inflow (cfs) 2.24
Peak Outflow (cfs) 0.44
Peak Exfiltration Flow Rate (cfm) 0.00
Max HGL Elevation Attained (ft) 1532.77
Max HGL Depth Attained (ft) 0.77
Average HGL Elevation Attained (ft) 1532.35
Average HGL Depth Attained (ft) 0.35
Time of Max HGL Occurrence (days hh:mm) 0 10:33
Total Exfiltration Volume (1000-ft³) 0.000
Total Flooded Volume (ac-in) 0
Total Time Flooded (min) 0
Total Retention Time (sec) 0.00

WILL BE PROVIDED IN FINAL WQMP

Appendix 9: O&M

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

WILL BE PROVIDED IN FINAL WQMP

Appendix 10: Educational Materials

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

WILL BE PROVIDED IN FINAL WQMP