Thienes Engineering, Inc.
CIVIL ENGINEERING ● LAND SURVEYING

PROJECT SPECIFIC PRELIMINARY WATER QUALITY MANAGEMENT PLAN (P-WQMP)

FOR:
P20-00004-BLDG1
FIRST MARCH LOGISTICS – BUILDING 1
NATWAR LANE
PERRIS, CALIFORNIA 92571
APNs: 294-180-28, -29, -30 AND PORTION OF -32

PREPARED FOR:
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MARCH 11, 2020
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MARCH 22, 2021
NOVEMBER 16, 2021

JOB NO. 3788

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FOR

“FIRST MARCH LOGISTICS – BUILDING 1”

PREPARED BY LUIS PRADO
UNDER THE SUPERVISION OF:

11/16/21

REINHARD STENZEL DATE
R.C.E. 56155
EXP. 12/31/2022

Project Specific Water Quality Management Plan

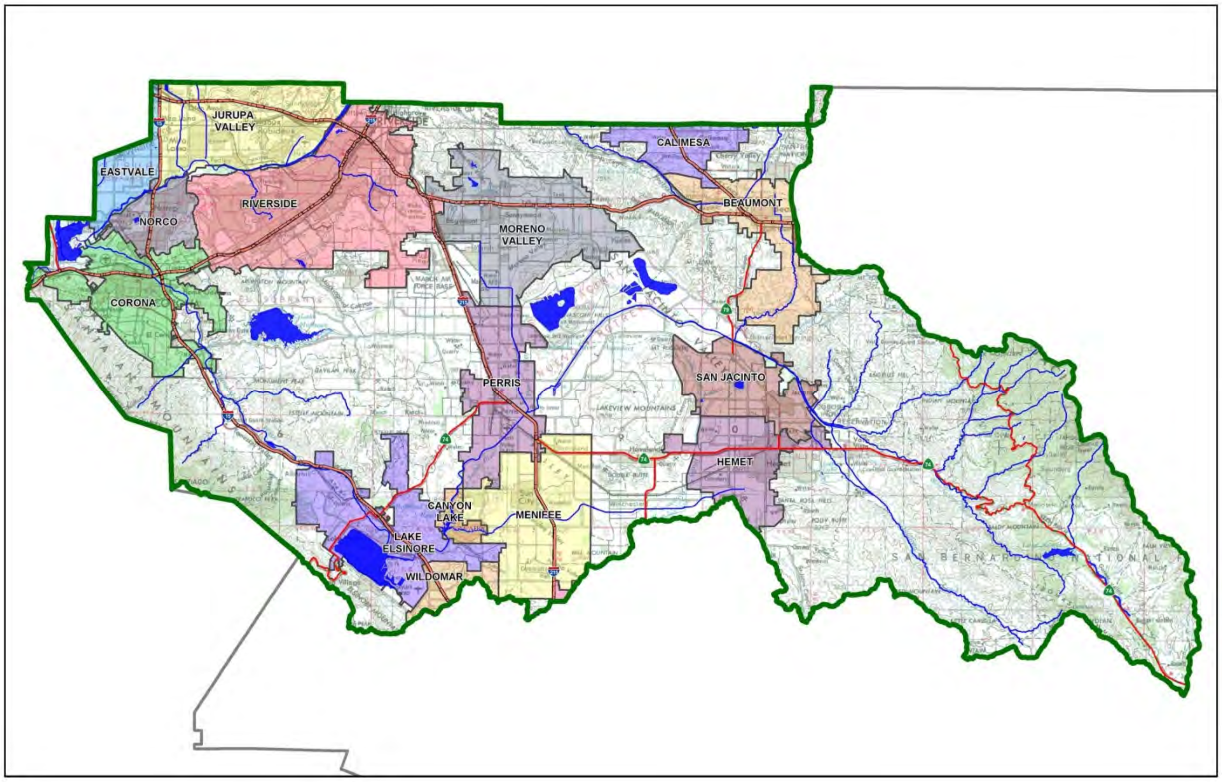
*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: First March Logistics – Building 1

Development No: P20-00004

Design Review/Case No: P20-00004-Bldg1

APN Numbers: 294-180-028, -029, -030 and 295-300-005, -007



☒ **Preliminary**

☐ **Final**

Original Date Prepared: March 11, 2020

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

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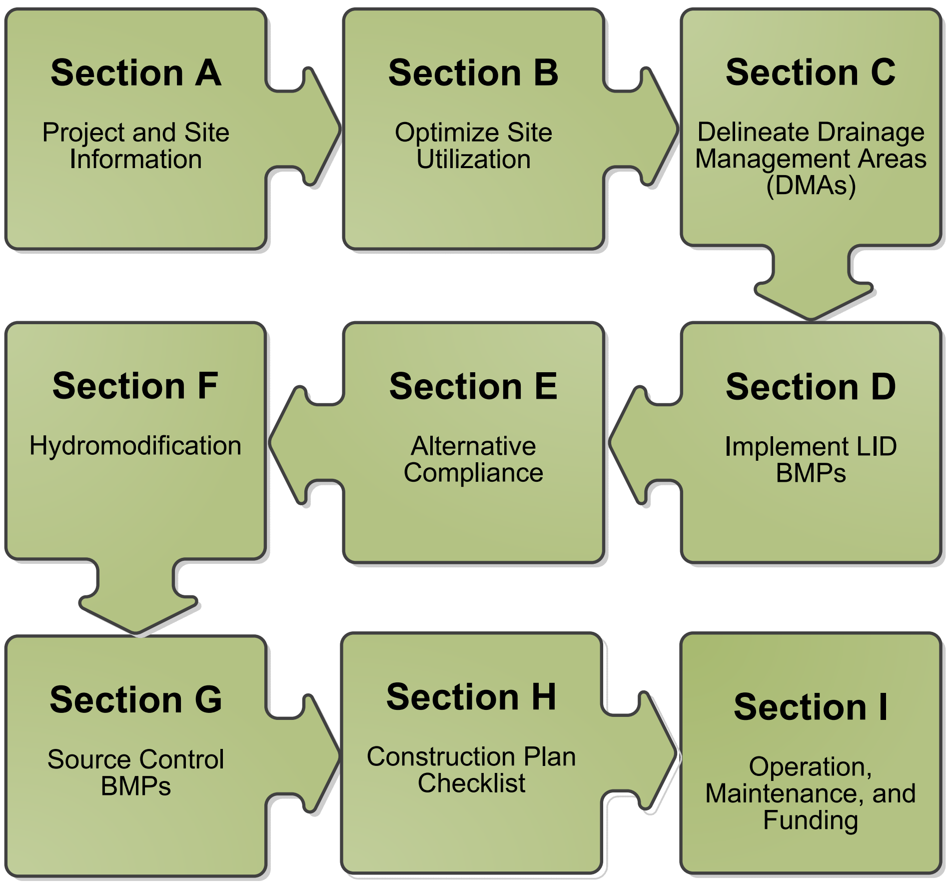
A Brief Introduction

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



OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for **First Industrial Realty Trust, Inc.** by **Thienes Engineering, Inc.** for the **First March Logistics – Building 1** project (P20-00004).

This WQMP is intended to comply with the requirements of **City of Perris** for **Ordinance No. 1194** 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 Perris** Ordinance **No. 1194**.

"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
Michael Goodwin	____________________
Owner's Printed Name	Owner's Title/Position

PREPARER'S CERTIFICATION

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

____________________	____________________
Preparer's Signature	Date
Reinhard Stenzel	Director of Engineering
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:	Light Industrial Warehouse	
Planning Area:	Industrial/Business Park	
Community Name:	N/A	
Development Name:	First March Logistics – Building 1	
Project Location		
Latitude & Longitude (GIS): 33.868953, -117.260566		
Project Watershed and Sub-Watershed: Santa Ana River & San Jacinto		
APN(s): 294-180-028, -029, -030 and 295-300-005, -007		
Total Project Area: 19.95 acres		
Map Book and Page No.: Assessor's Map BK294 PG. 18 and BK295 PG. 30		
Project Characteristics		
Proposed or Potential Land Use(s)		Light Industrial
Proposed or Potential SIC Code(s)		4225
Area of Existing Impervious Project Footprint (SF)		0
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement		797,148 (18.30 acres)
Does the project consist of offsite road improvements?		☒ Y ☐ N
Does the project propose to construct unpaved roads?		☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?		☐ Y ☒ N
Existing Site Characteristics		
Total area of existing Impervious Surfaces within the project limits (SF)		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)		Infiltration Report Available
What is the Water Quality Design Storm Depth for the project?		0.61

Project Description:
The project site encompasses approximately 19.95 acres. Proposed improvements to the site include a light industrial warehouse (Building 1) of approximately 419,034 square feet utilized for the transfer and storage of finished goods. There will be truck yards on the east and west sides of the building. Vehicle parking lots will be on the north and south sides of the project. Landscaping will be adjacent to the street and scattered throughout the site. Per the infiltration report, infiltration rates resulted in less than 0.3 inches per hour; therefore, the project proposes to use underground detention systems (StormTech MC-4500 Chambers) and proprietary biotreatment units (Bio Clean Modular Wetlands Systems) to treat runoff produced by the 85th percentile storm rainfall depth. In addition, catch basin filters will be provided in order to pre-treat runoff prior to entering the water quality features.

Existing Site:
Under existing conditions, the site is a vacant lot covered in natural grasses and sparse vegetation. Runoff from the site generally drains from west to east towards Natwar Lane.

Hydrology:
Flow from the easterly half of the building, the easterly truck yard and the northeasterly parking lot and drive aisle will drain to catch basins located in the easterly truck yard area. Runoff from the southerly parking lot and drive aisle will drain to a catch basin at the southeasterly portion of the parking lot. A proposed storm drain will convey flows from the southerly parking to the north and confluence with runoff from the easterly truck yard. The easterly

storm drain system continues northerly and connects to the proposed 84" public storm drain that wraps around this project/site.

Runoff from the westerly half of the building, the westerly truck yard, the northwesterly parking lot, and the southwesterly drive aisle will drain to catch basins located in the westerly truck yard. A storm drain will convey runoff northerly to the same proposed 84" public storm drain that wraps around this project/site.

This proposed 84" storm drain routes existing offsite run-on, from west of this project and west of the I-215, northerly around the building, and continues easterly towards an interim detention basin. The interim detention basin is used to detain the Q100 from the project site and all offsite flows. An 84" CMP riser/inlet is proposed to route/bubble up stormwater into the northeasterly corner of the interim detention basin. An interim pump is used to discharge residual stormwater, within the 84" pipe, via a parkway drain onto Western Way. A 24" CMP riser/outlet is proposed at the southeasterly corner to slowly discharge stormwater from the interim detention basin. At a specific water surface elevation, see separate "Interim Detention Basin Calculations" report prepared by Thienes Engineering, detained stormwater will outlet via the large/parallel parkway culverts onto Western Way.

In the ultimate condition, the interim detention basin and all interim storm drain apparatuses will be capped/abandoned and/or demolished for the construction of future Building 2. The proposed 84" public storm drain associated with this project will be extended easterly through future Building 2 and connect to the upstream portion of the proposed Perris Valley Channel Lateral "B". This lateral and all tributary areas to it are exempt from HCOCs.

The area fronting Natwar Lane (DMA C, 0.40 acres) comprised mostly of landscaping (and some driveway) will sheet flow offsite. These landscaped areas are considered self-treating areas. Similarly, the pervious area located adjacent to the Freeway (DMA D, 0.60 acres) will be conveyed to the south via a proposed gutter. A portion of the freeway drains toward the site and runoff will also be collected by the proposed gutter. A wall along the southerly neighbor's westerly property line will block offsite run-on and flows will continue southerly, discharging onto Nandina Drive.

A.1 Maps and Site Plans

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

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

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

A.2 Identify Receiving Waters

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

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Perris Valley Storm Drain	None	None	Not classified as a RARE waterbody.
San Jacinto River, Reach 3	None	AGR, GWR, REC1, REC2, WARM, WILD	Not classified as a RARE waterbody.
Canyon Lake (aka San Jacinto River, Reach 2)	Nutrients, Pathogens	MUN, AGR, GWR, REC1, REC2, WARM, WILD	Not classified as a RARE waterbody.
San Jacinto River, Reach 1	None	MUN, AGR, GWR, REC1, REC2, WARM, WILD	Not classified as a RARE waterbody.
Lake Elsinore	Nutrients, Organic Enrichment/Low Dissolved Oxygen, Indicator Bacteria	REC1, REC2, WARM, WILD	Not classified as a RARE waterbody.

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 (dependent on tenant)	☒ Y	☐ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)* City of Perris Grading Permit	☒ Y	☐ N
Other *(please list in the space below as required)* City of Perris Building Permit	☒ Y	☐ N

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

Section B: Optimize Site Utilization (LID Principles)

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

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

Site Optimization

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

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

- *There are no creeks, wetlands, or riparian habitats nearby.*
- *Existing drainage patterns flow from west to east to an existing 24" storm drain in Natwar Lane that conveys stormwater further east and ultimately into the Perris Valley Storm Drain. Proposed condition drainage patterns mimic pre-development conditions.*

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

- *Not applicable, the entire site was previously disturbed (mass-graded).*
- *Not applicable, there are no sensitive areas.*
- *No applicable, there are no existing trees or vegetation to preserve.*

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

- *Per the infiltration report, infiltration rates resulted in less than 0.3 inches per hour; therefore, the project proposes to use underground detention systems and proprietary biotreatment units to treat runoff produced by the 85th percentile storm rainfall depth.*

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

- *Impervious area on the site has been minimized to City standards.*
- *Due to the nature of the project site (large trucks), substitution of pavement for landscaping is not feasible. The project does not propose overflow parking where substitution of pavement for*

landscaping would be optimal. Landscaping has been provided wherever applicable and to the maximum extent practicable.

- *The entire Design Capture Volume (DCV) is handled by the proposed underground detention systems and proprietary biotreatment units. Permeable pavement is not needed to meet the DCV.*

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

- *Roof runoff is directed to the underground detention systems and proprietary biotreatment units for treatment.*
- *The site is not on a hillside.*
- *All stormwater runoff will be piped or sheet flow into the underground detention systems and proprietary biotreatment units; therefore, curb-cuts into landscaped areas are not utilized.*

Section C: Delineate Drainage Management Areas (DMAs)

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

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	Area (Acres)	DMA Type
A-1	Roofs/Conc/Asphalt	357,192	8.20	Type D
A-2	Ornamental Landscaping	13,068	0.30	Type D
B-1	Roofs/Conc/Asphalt	439,956	10.10	Type D
B-2	Ornamental Landscaping	15,246	0.35	Type D
C	Ornamental Landscaping	17,424	0.40	Type A
D	Ornamental Landscaping	26,136	0.60	Type A

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

DMA B-1 consists of landscape areas that drain offsite.

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

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
C	17,424	California Native Vegetation	Timed Sprinklers
D	26,136	California Native Vegetation	Timed Sprinklers

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]
n/a	n/a	n/a	n/a	n/a	n/a	n/a

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

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

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

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

DMA Name or ID	BMP Name or ID
A-1	StormTech MC-4500 Chambers & Modular Wetlands System (STC-A & MWS-A)
A-2	StormTech MC-4500 Chambers & Modular Wetlands System (STC-A & MWS-A)
B-1	StormTech MC-4500 Chambers & Modular Wetlands System (STC-B & MWS-B)
B-2	StormTech MC-4500 Chambers & Modular Wetlands System (STC-B & MWS-B)

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

Section D: Implement LID BMPs

D.1 Infiltration Applicability

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

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

Geotechnical Report

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

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

Infiltration Feasibility

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

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		X
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		X
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?	X	
If Yes, list affected DMAs: Per the infiltration report, infiltration rates resulted in less than 0.3 inches per hour; therefore, the project proposes to use underground detention systems and proprietary biotreatment units to treat runoff produced by the 85th percentile storm rainfall depth for the entire site.		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		X
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		X
Describe here:		

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

D.2 Harvest and Use Assessment

Please check what applies*:*

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

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

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

☒ None of the above

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

Irrigation Use Feasibility

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

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

Total Area of Irrigated Landscape: 1.65 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: 18.30 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: 0.79

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: 14.46 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)
14.46 acres	1.65 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: 119 (approximate # of parking stalls)

Project Type: Light Industrial

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: 18.30

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: 172

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

Minimum number of toilet users: 3,148

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)**
3,148	119

Other Non-Potable Use Feasibility

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

N/A

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

Average Daily Demand: N/A

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

Total Area of Impervious Surfaces: N/A

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

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

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

Minimum required use: N/A

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

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

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

D.3 Bioretention and Biotreatment Assessment

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

Select one of the following:

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

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

D.4 Feasibility Assessment Summaries

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

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				Alternative Compliance (Modular Wetlands Systems)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
A-1	☐	☐	☐	☐	☒
A-2	☐	☐	☐	☐	☒
B-1	☐	☐	☐	☐	☒
B-2	☐	☐	☐	☐	☒

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.

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	*Design Storm Depth (in)*	*Design Capture Volume,* V_{BMP} *(cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	[A]		[B]	[C]	[A] x [C]			
A-1	357,192	Roofs/Conc/Asphalt	*1.00*	*0.89*	*318,615.3*	*0.61*	*16196.3*	*16,415*
A-2	13,068	Ornamental Landscaping	*0.10*	*0.11*	*1,443.5*	*0.61*	*73.4*	
B-1	439,956	Roofs/Conc/Asphalt	*1.00*	*0.89*	*392,440.8*	*0.61*	*19949.1*	*20,172*
B-2	15,246	Ornamental Landscaping	*0.10*	*0.11*	*1,684.0*	*0.61*	*85.6*	
	370,260				*714,184*	0.61	36,304	36,587

[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.

E.1 Identify Pollutants of Concern

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

Table E.1 Potential Pollutants by Land Use Type

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

P = Potential

N = Not Potential

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

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

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

(4) Specifically petroleum hydrocarbons

(5) Specifically solvents

(6) Bacterial indicators are routinely detected in pavement runoff

E.2 Stormwater Credits

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

Table E.2 Water Quality Credits

Qualifying Project Categories	Credit Percentage[2]
N/A	
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 Imp Fraction, I_f	DMA Runoff Factor	DMA Area x Runoff Factor				
	[A]		[B]	[C]	[A] x [C]				
N/A	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*Design Storm Depth (in)*	*Minimum Design Capture Volume (cubic feet)*	*Total Storm Water Credit % Reduction*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*

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

E.4 Treatment Control BMP Selection

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

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

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

Table E.4 Treatment Control BMP Selection

Selected Treatment Control BMP Name or ID[1]	Priority Pollutant(s) of Concern to Mitigate[2]	Removal Efficiency Percentage[3]
Modular Wetlands System	Metals	38%-69%
Modular Wetlands System	Trash & Debris/TSS	85%
Modular Wetlands System	Oil & Grease	95%

[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 (min)	N/A	N/A	N/A
Volume (Cubic Feet)	N/A	N/A	N/A

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

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

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

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

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.

☐ d. None of the above.

All pertinent documentation used in analysis of the items a, b or c can be found in Appendix 7.

The project site is located within the exempted HCOC area, as presented in the April 20, 2017 approved WAP/HCOC document. Refer to HCOC map provided in Appendix 7. This project will route stormwater runoff easterly into an interim detention basin that will outlet into an interim proposed public storm drain that traverse southerly through Western Way and makes its way towards the Perris Valley Storm Drain. In the ultimate condition, the northerly 84" public storm drain will have been extended easterly and the project's stormwater will tie directly into the future Perris Valley Channel Lateral "B".

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
A. On-site storm drain inlets	• Mark all inlets with the words "Only Rain Down the Storm Drain" or similar.	• Maintain and periodically repaint or replace inlet markings annually. • Provide stormwater pollution prevention information to new site owners, lessees, or operators upon occupancy and annually thereafter. • See CASQA fact sheet SC-44 for "Drainage System Maintenance," included in Appendix of this document. • Include the following lease agreements: "Tenant shall not allow anyone to discharge anything to storm drain or to store or deposit materials so as to create a potential discharge to storm drains."

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
B. Interior floor drains and elevator shaft sump pumps	• Interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	• Inspect and maintain drains semi-annually to prevent blockages and overflow.
D2. Landscape / Outdoor Pesticide Use	• Landscape plans will 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. • Pest-resistant plans will be used adjacent to hardscape. • The landscape plans will consider plants appropriate to the site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	• Maintain landscaping only using minimum pesticides, when needed. • See Appendix 10 for "Landscape and Gardening" brochure by RCFlood. • Provide Integrated Pest Management (IPM) information to new owners, lessees and operators upon occupancy and annually thereafter. IPM is an effective and environmentally sensitive approach to pest management.
G. Refuse Areas	• Site refuse will be handled by contractor on a weekly basis. • Signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	• A minimum of two receptacles will be provided and located indoors. Receptacles are to be inspected daily and repairs or replacements to leaky receptacles will be completed immediately. Receptacles are to remain covered when not in use. Dumping of liquid or hazardous wastes is prohibited. A "no hazardous materials" sign will be posted. Spills will be cleaned immediately upon discovery. Spill control materials will be available onsite. See Appendix 10 for CASQA fact sheet SC-34 for "Waste Handling and Disposal."
H. Industrial processes	• All process activities to be performed indoors. No processes to drain to exterior or to storm drain system.	• See Appendix 10 for CASQA fact sheet SC-10 for "Non-Stormwater Discharges"
M. Loading Docks	• Spills will be cleaned up immediately and disposed of properly.	• Move loaded and unloaded items indoors as soon as possible. • See Appendix 10 for CASQA fact sheet SC-30 for "Outdoor Loading and Unloading"
O. Miscellaneous Drain or Wash Water or Other Sources	• A drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.	
P. Plazas, sidewalks, and parking lots		• Sweep plazas, sidewalks, and parking lots monthly 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)	Latitude	Longitude
A	On-site storm drain inlets	TBD	---	---
B	Interior floor drains and elevator shaft sump pumps	TBD	---	---
D2	Landscape / Outdoor Pesticide Use	TBD	---	---
G	Refuse Areas	TBD	---	---
H	Industrial processes	TBD	---	---
M	Loading Docks	TBD	---	---
P	Plazas, sidewalks, and parking lots	TBD	---	---
MWS-A	Modular Wetlands System	TBD	---	---
STC-A	Underground Detention	TBD	---	---
MWS-B	Modular Wetlands System	TBD	---	---
STC-B	Underground Detention	TBD	---	---

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.

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

Section I: Operation, Maintenance and Funding

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

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

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

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

Maintenance Mechanism: City of Perris:

Covenant and Agreement

Water Quality Management Plan and Urban Runoff BMP Transfer, Access and Maintenance Agreement

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.

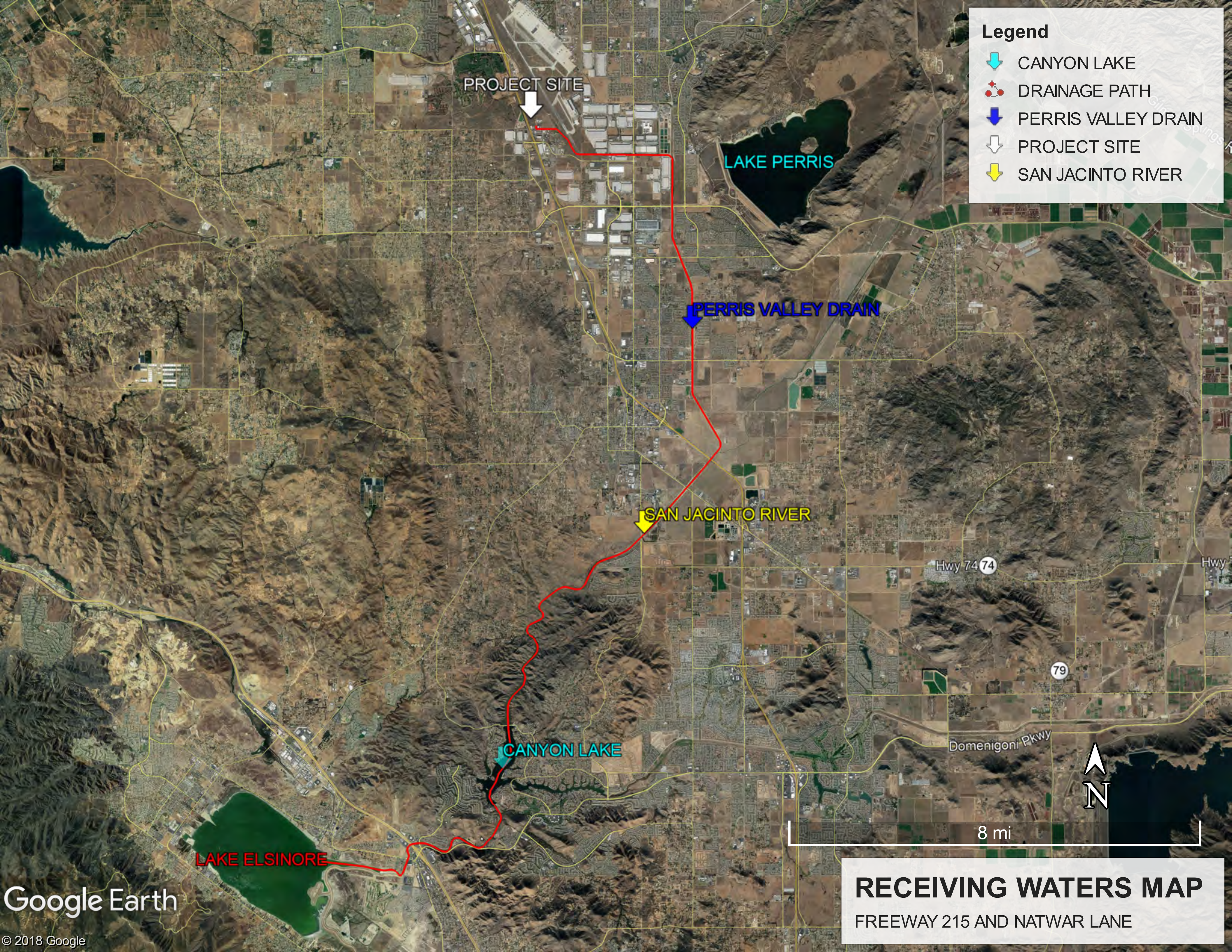
This section will be completed and addressed at the time of the final WQMP Submittal.

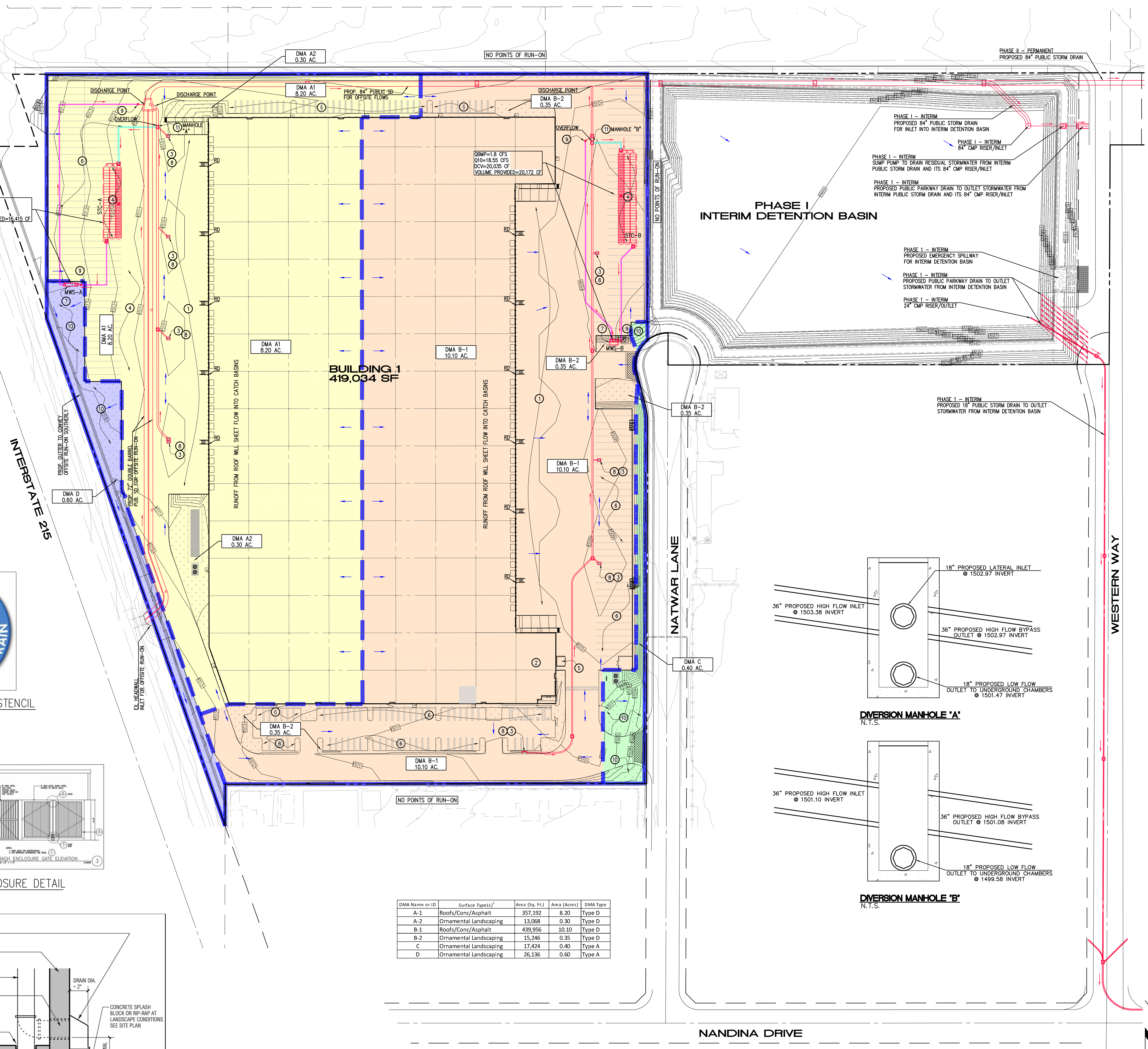
Appendix 1: Maps and Site Plans

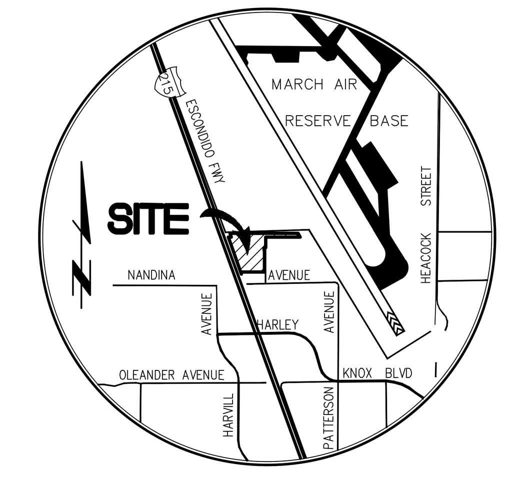
Location Map, WQMP Site Plan and Receiving Waters Map

VICINITY MAP

FIRST MARCH LOGISTICS - BUILDING 1


Legend
CANYON LAKE
DRAINAGE PATH
PERRIS VALLEY DRAIN
PROJECT SITE
SAN JACINTO RIVER
PROJECT SITE
LAKE PERRIS
PERRIS VALLEY DRAIN
SAN JACINTO RIVER
Hwy 74
74
Hwy
79
Domenigoni Pkwy
CANYON LAKE
LAKE ELSINORE
N
8 mi
Google Earth
© 2018 Google
RECEIVING WATERS MAP
FREEWAY 215 AND NATWAR LANE





VICINITY MAP

N.T.S.

LEGEND

1. LOADING/UNLOADING TRUCK DOCKS
2. EDUCATIONAL MATERIAL
3. STORM DRAIN STENCIL
4. MC-4500 STORMTECH CHAMBERS W/ IMPERMEABLE LINER
5. TRASH ENCLOSURE
6. PARKING LOT MAINTENANCE (SWEEPING)
7. PROPRIETARY BIOTREATMENT UNIT
8. DRAIN INSERT(S)
9. SUMP PUMP
10. SELF-TREATING LANDSCAPE
11. DIVERSION STRUCTURES

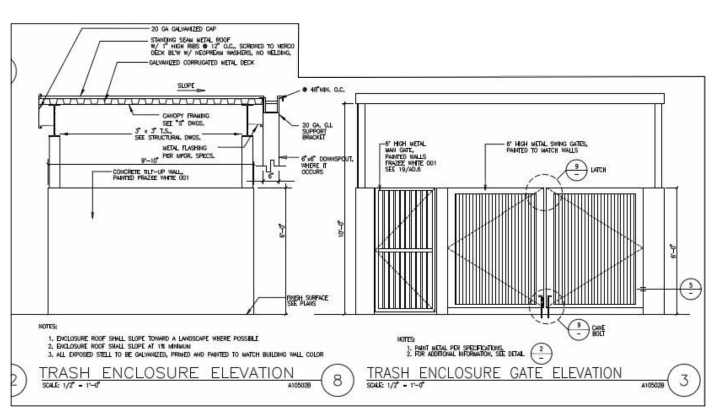
NOTE:

RD — ROOF DRAIN
BOUNDARY
SUBAREAS
SURFACE FLOW LINE
SD FLOW LINE
DMA A
DMA B
DMA C
DMA D
LANDSCAPE AREA

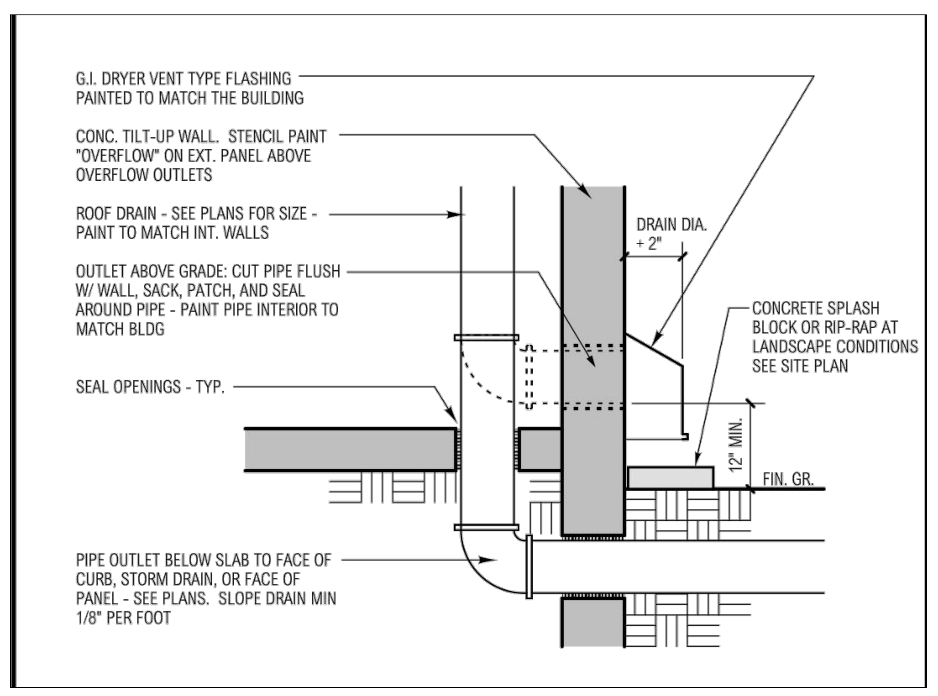
STORM DRAIN NOTES:

MAIN STORM DRAIN
INBOUND TO CHAMBERS
OUTBOUND FROM CHAMBERS

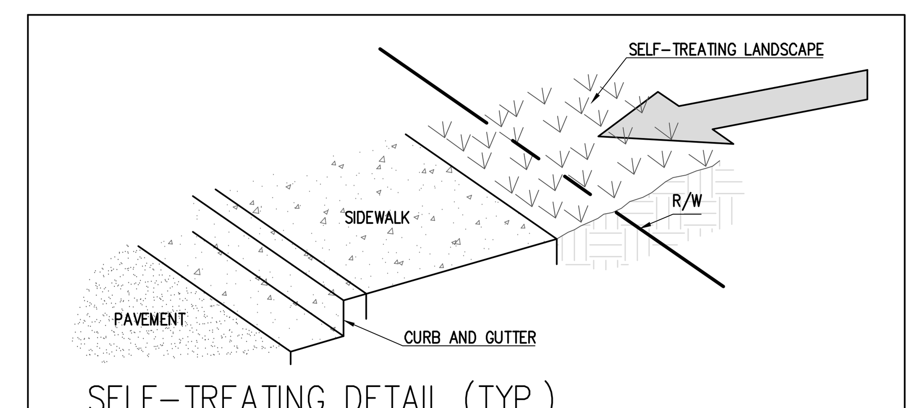
SAMPLE STORM DRAIN STENCIL



TRASH ENCLOSURE DETAIL



ROOF DRAIN/DOWNSPOUT DETAIL (TYP.)



SELF-TREATING DETAIL (TYP.)
GRASS AREAS SHEET FLOWING OFFSITE

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	Area (Acres)	DMA Type
A-1	Roofs/Conc/Asphalt	357,192	8.20	Type D
A-2	Ornamental Landscaping	13,068	0.30	Type D
B-1	Roofs/Conc/Asphalt	439,956	10.10	Type D
B-2	Ornamental Landscaping	15,246	0.35	Type D
C	Ornamental Landscaping	17,424	0.40	Type A
D	Ornamental Landscaping	26,136	0.60	Type A

SUMMARY TABLE

DMA	AREA (ACRES)	DCV (CF)	MODULAR WETLANDS SYSTEM (MWS)		MC-4500 STORMTECH CHAMBERS			TOTAL VOLUME PROVIDED (CF)	CHECK
			MWS MODEL	LINEAR STATIC CAPACITY (CF)	DETENTION REQUIRED (CF)	DETENTION PROVIDED (CF)	# OF CHAMBERS		
A	8.50	16,270	MWS-L-4-21	144	16,126	16,271	79	16,415	OK
B	10.45	20,035	MWS-L-8-12	187	19,848	19,985	98	20,172	OK
TOTAL	18.95	36,305		331	35,974	36,256	177	36,587	

0 30 60 120 180
SCALE: 1"=60'

Last Update: 11/16/21
O:\3700-3799\3788\3788BMPSITEMAP.dwg

CITY OF PERRIS
PUBLIC WORKS DEPARTMENT

POST-CONSTRUCTION BMP SITE PLAN

FIRST MARCH LOGISTICS BUILDING 1

FIR FREEWAY 215 AND NATWAR LANE, P20-00004-BLDG1

PREPARED FOR:

FIRST INDUSTRIAL REALTY TRUST, INC.
898 N. PACIFIC COAST HIGHWAY STE. 175
EL SEGUNDO, CA 90245
PHONE: (310) 321-3813

PREPARED BY:

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

Designed by ______
Date ______
Checked by ______
Date ______
Designed by ______
Date ______
Checked by ______
Date ______

Approved by ______ Date ______

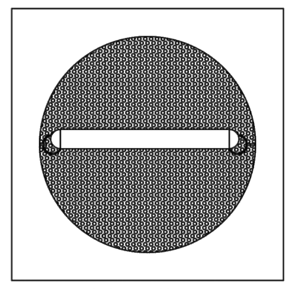
Public Works Director ______ R.C.E. ______

Sheet 1 of 2 Sheets

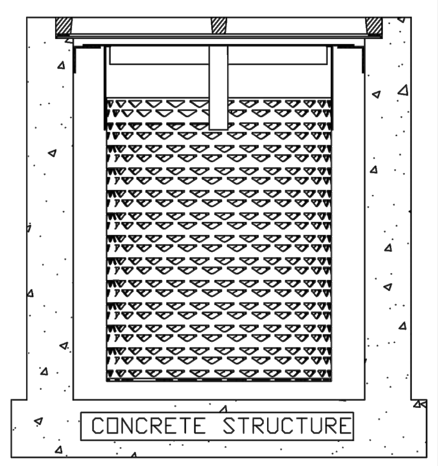
3788/1 OF 2 SHEET

BIO CLEAN FULL CAPTURE FILTER

FOR USE IN GRATE INLETS

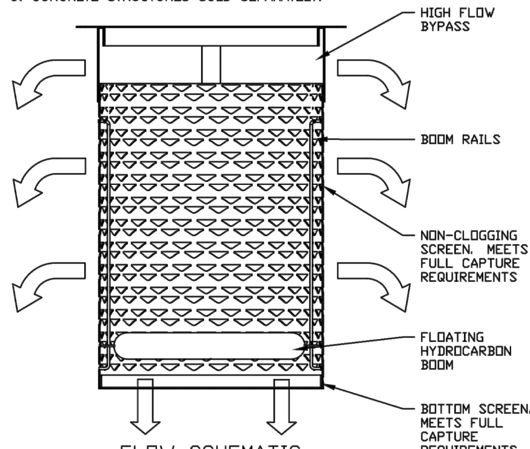


TOP VIEW



NOTES:

1. ALL HARDWARE, FLANGE, FRAME, SCREENS SHALL BE STAINLESS STEEL
2. HYDROCARBON BOOM SHALL BE 2" DIAMETER AND CONNECTED, MECHANICALLY TO THE FILTER FRAME WITH RAILS ALLOWING IT TO FLOAT ON THE WATER SURFACE REGARDLESS OF HEIGHT
3. SEE PERFORMANCE REPORTS IN MANUFACTURES SPECIFICATIONS
4. OTHER STANDARD AND CUSTOM MODEL SIZES AVAILABLE – CONTACT BIO CLEAN FOR MORE INFORMATION.
5. BASED ON 37% OPEN AREA.
6. CONSIDERS A SAFETY FACTOR OF 2.0.
7. CONSIDERS A LOCAL DEPRESSION PONDIING DEPTH OF 6 INCHES.
8. STORAGE CAPACITY BASED ON THE BASKET HALF FULL.
9. CONCRETE STRUCTURES SOLD SEPARATELY.



FLOW SCHEMATIC

MODEL #	TREATMENT FLOW (CFS)	BYPASS FLOW (CFS)	SOLIDS STORAGE CAPACITY (CF)
BIO-GRATE-FULL 12-12-12	1.55	1.55	0.27
BIO-GRATE-FULL 18-18-18	4.32	3.68	1.05
BIO-GRATE-FULL 24-24-24	7.67	4.83	2.41
BIO-GRATE-FULL 30-30-24	12.97	6.21	3.98
BIO-GRATE-FULL 25-38-24	13.53	6.59	4.16
BIO-GRATE-FULL 36-36-24	19.64	7.60	5.94
BIO-GRATE-FULL 48-48-18	25.59	10.13	7.92

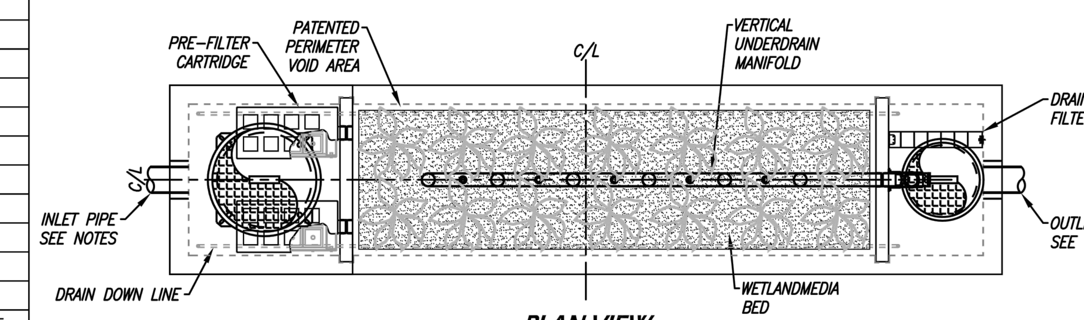
DRAWING: BIO CLEAN GRATE INLET FILTER DETAILS		MEETS FULL CAPTURE REQUIREMENTS	
TYPICAL MODEL DETAIL			
WARRANTY: 8 YEAR MANUFACTURERS		PROJECT:	
BIO CLEAN ENVIRONMENTAL SERVICES, INC. 398 VIA EL CENTRO, OCEANSIDE CA 92058 PHONE: 760-433-7640 FAX: 760-433-3176		REVISIONS:	DATE:
		REVISIONS:	DATE:
DATE: 10/12/17	SCALE: SF = 15	REVISIONS:	DATE:
DRAFTER: M.C.P.	UNITS = INCHES	REVISIONS:	DATE:

Bio Clean
A Forterra Company

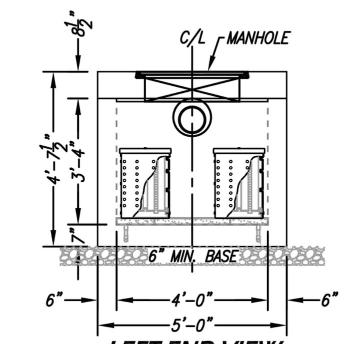
PAGE 1

SITE SPECIFIC DATA

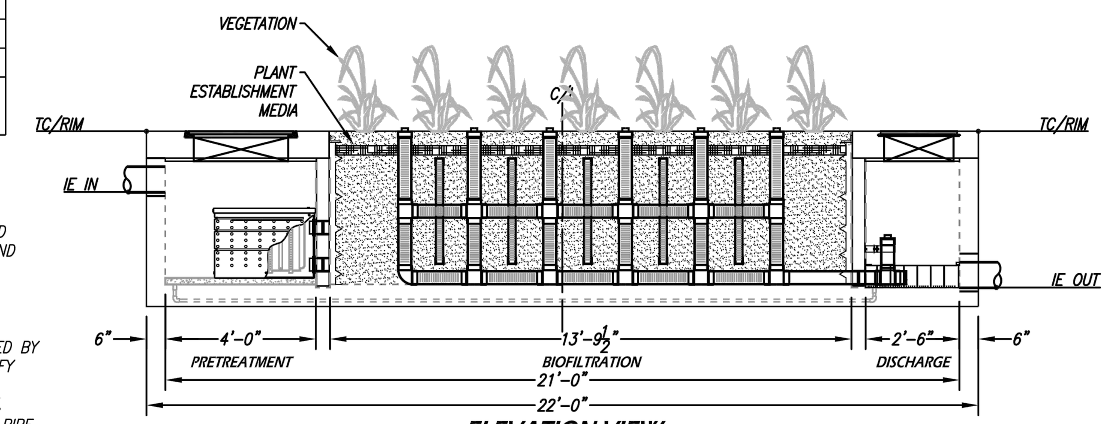
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PARKWAY	OPEN PLANTER	PARKWAY
FRAME & COVER	ø30"	N/A	ø24"
WETLANDMEDIA VOLUME (CY)			7.63
WETLANDMEDIA DELIVERY METHOD			TBD
ORIFICE SIZE (DIA. INCHES)			ø2.34"
MAXIMUM PICK WEIGHT (LBS)			43000
NOTES:			



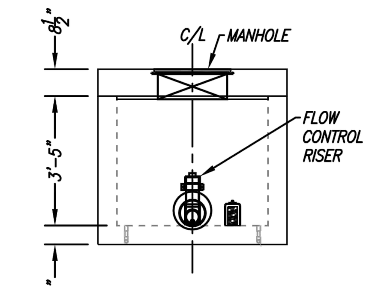
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
3. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURERS STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.

TREATMENT FLOW (CFS)	0.268
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	TBD
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

THE PRODUCT DESCRIBED MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL:

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MODULAR WETLANDS SYSTEMS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF MODULAR WETLANDS SYSTEMS IS PROHIBITED.

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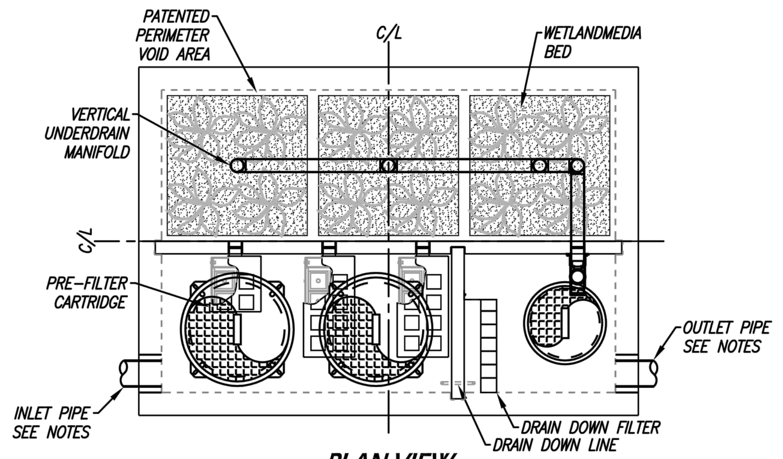
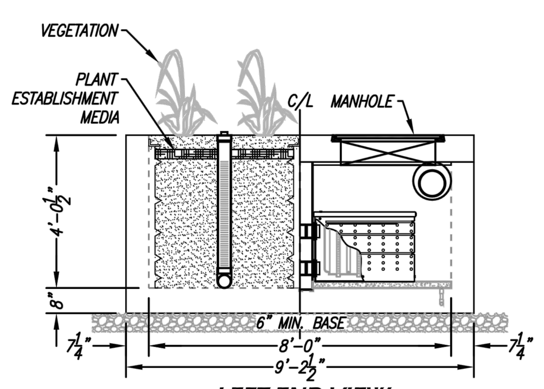
MWS-L-4-21-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

SITE SPECIFIC DATA

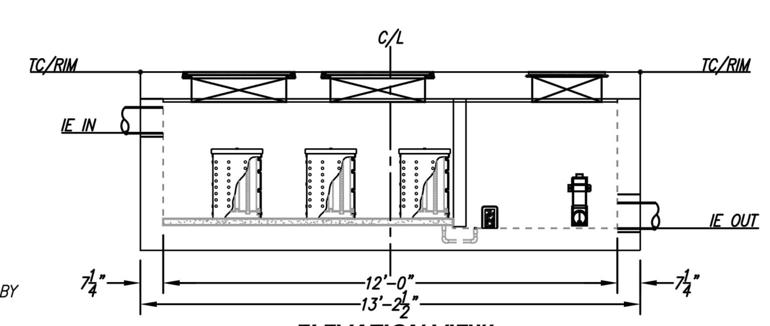
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PARKWAY	OPEN PLANTER	PARKWAY
FRAME & COVER	ø30"	N/A	ø24"
WETLANDMEDIA VOLUME (CY)			7.26
WETLANDMEDIA DELIVERY METHOD			TBD
ORIFICE SIZE (DIA. INCHES)			ø2.66"
MAXIMUM PICK WEIGHT (LBS)			TBD
NOTES:			



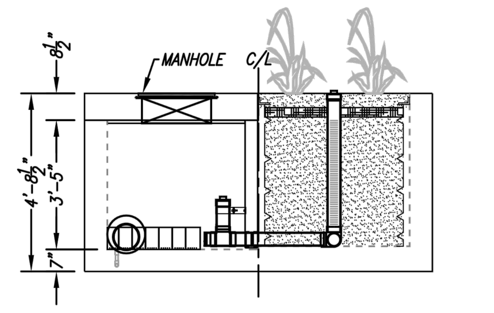
PLAN VIEW



LEFT END VIEW
BIOFILTRATION/PRETREATMENT



ELEVATION VIEW



RIGHT END VIEW
DISCHARGE/BIOFILTRATION

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
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GENERAL NOTES

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TREATMENT FLOW (CFS)	0.346
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	TBD
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

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PROPRIETARY AND CONFIDENTIAL:

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MWS-L-8-12-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

StormTech ADS

MC-4500 CHAMBER

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.

STORMTECH MC-4500 CHAMBER
(not to scale)

Nominal Chamber Specifications

Size (L x W x H)
52" x 100" x 60"
1,321 mm x 2,540 mm x 1,524 mm

Chamber Storage
106.5 ft³ (3.01 m³)

Min. Installed Storage*
162.6 ft³ (4.60 m³)

Weight
120 lbs (54.4 kg)

Shipping
7 chambers/pallet
11 pallets/truck

*Assumes a minimum of 12" (300 mm) of stone above, 9" (230 mm) of stone below chambers, 9" (230 mm) of stone between chambers/end caps and 40% stone porosity.

STORMTECH MC-4500 END CAP
(not to scale)

Nominal End Cap Specifications

Size (L x W x H)
35.1" x 90.2" x 59.4"
891 mm x 2,291 mm x 1,509 mm

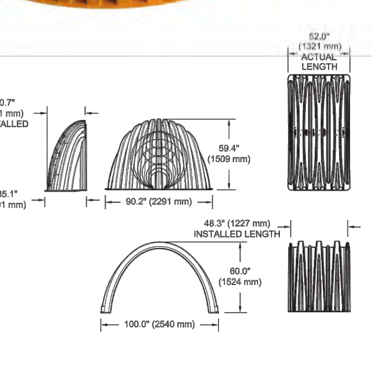
End Cap Storage
35.7 ft³ (1.01 m³)

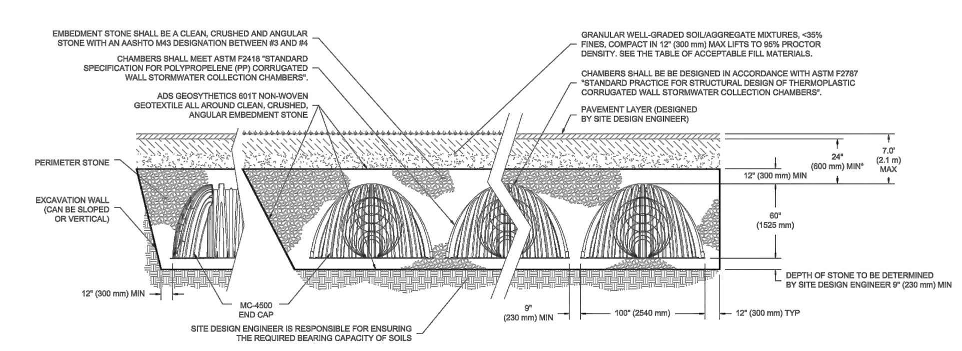
Min. Installed Storage*
108.7 ft³ (3.08 m³)

Weight
120 lbs (54.4 kg)

Shipping
7 end caps/pallet
11 pallets/truck

*Assumes a minimum of 12" (300 mm) of stone above, 9" (230 mm) of stone below, 6" (150 mm) of stone perimeter, 9" (230 mm) of stone between chambers/end caps and 40% stone porosity.





MC-4500 CHAMBER SPECIFICATIONS

STORAGE VOLUME PER CHAMBER FT³ (M³)

	Bare Chamber Storage ft³ (m³)	Chamber and Stone Foundation Depth in. (mm)			
		9" (230 mm)	12" (300 mm)	15" (375 mm)	18" (450 mm)
MC-4500 Chamber	106.5 (3.02)	162.6 (4.60)	166.3 (4.71)	169.6 (4.81)	173.6 (4.91)
MC-4500 End Cap	35.7 (1.0)	108.7 (3.08)	111.9 (3.17)	115.2 (3.26)	118.4 (3.35)

Note: Assumes 9" (230 mm) row spacing, 40% stone porosity, 12" (300 mm) stone above and includes the bare chamber/end cap volume. End cap volume assumes 12" (300 mm) stone perimeter.

AMOUNT OF STONE PER CHAMBER

ENGLISH TONS (yds³)	Stone Foundation Depth			
	9"	12"	15"	18"
MC-4500 Chamber	7.4 (5.2)	7.8 (5.5)	8.3 (5.9)	8.8 (6.2)
MC-4500 End Cap	9.6 (6.8)	10.0 (7.1)	10.4 (7.4)	10.9 (7.7)
METRIC KILOGRAMS (m³)	230 mm	300 mm	375 mm	450 mm
MC-4500 Chamber	6,681 (4.0)	7,117 (4.2)	7,552 (4.5)	7,987 (4.7)
MC-4500 End Cap	8,691 (5.2)	9,075 (5.4)	9,460 (5.6)	9,845 (5.9)

Note: Assumes 12" (300 mm) of stone above and 9" (230 mm) row spacing and 12" (300 mm) of perimeter stone in front of end caps.

VOLUME EXCAVATION PER CHAMBER YD³ (M³)

	Stone Foundation Depth			
	9" (230 mm)	12" (300 mm)	15" (375mm)	18" (450 mm)
MC-4500 Chamber	10.5 (8.0)	10.8 (8.3)	11.2 (8.5)	11.5 (8.8)
MC-4500 End Cap	9.3 (7.1)	9.6 (7.3)	9.9 (7.6)	10.2 (7.8)

Note: Assumes 9" (230 mm) of separation between chamber rows, 12" (300 mm) of perimeter in front of the end caps, and 24" (600 mm) of cover. The volume of excavation will varyas depth of cover increases.

ADS StormTech DESIGN TOOL

Working on a project?
Visit us at www.stormtech.com
and utilize the StormTech Design Tool

For more information on the StormTech MC-4500 Chamber and other ADS products, please contact our Customer Service Representatives at 1-800-821-6710

THE MOST ADVANCED NAME IN WATER MANAGEMENT SOLUTIONS™

Advanced Drainage Systems, Inc.
4640 Trueman Blvd., Hilliard, OH 43026
1-800-821-6710 www.ads-pipe.com

Last Update: 11/16/21
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CITY OF PERRIS
PUBLIC WORKS DEPARTMENT

POST-CONSTRUCTION BMP SITE PLAN

FIRST MARCH LOGISTICS BUILDING 1

FIR FREEWAY 215 AND NATWAR LANE, P20-00004-BLDG1

PREPARED FOR:

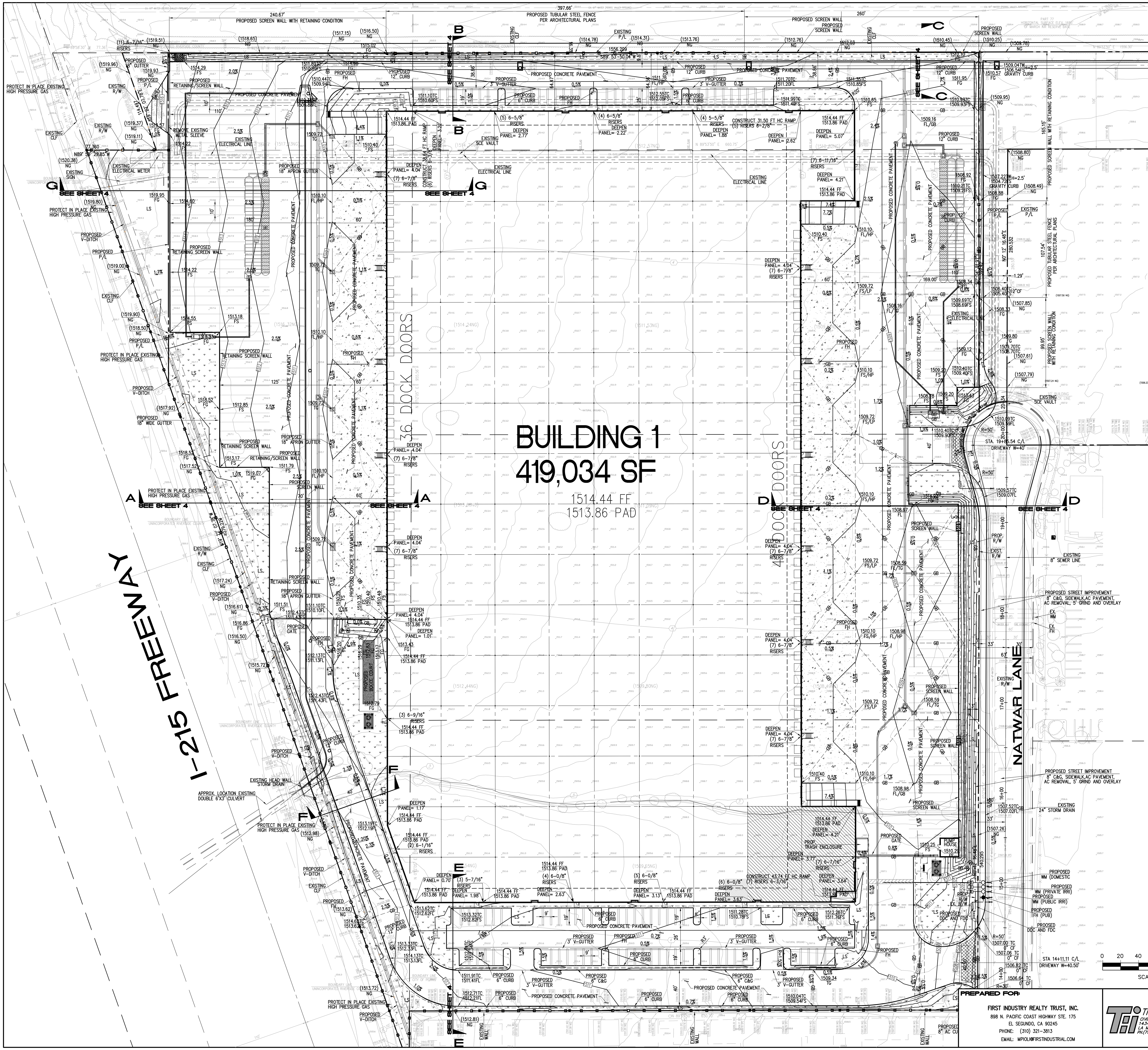
FIRST INDUSTRIAL REALTY TRUST, INC.
898 N. PACIFIC COAST HIGHWAY STE. 175
EL SEGUNDO, CA 90245
PHONE: (310) 321-3813

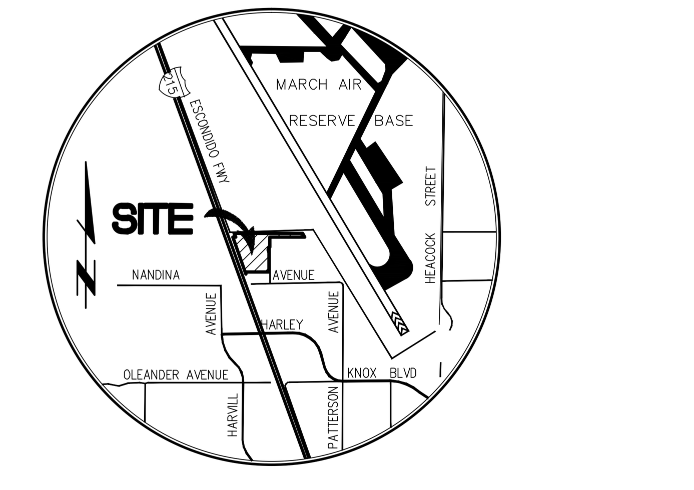
PREPARED BY:

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

Designed by		Approved by	Date
Date			
Checked by			
Date			
Designed by		Public Works Director	R.C.E.
Date			
Checked by			
Date		Sheet 2 of 2 Sheets	

3788/2 OF 2 SHEET





VICINITY MAP

N.T.S.

		EARTHWORK BALANCE CALCULATIONS	2/10/2021
PROJECT:		CONCEPTUAL GP (LEVEL FLOOR)	JN 3788
JOB#		215 FWY & NATWAR LANE	QUANTITY
		BLDG AREA	415,470
	K.	SITE AREA:	945,396
	L.	SUBSIDENCE FACTOR:	0.163
	M.	SHRINKAGE FACTOR:	13.0
	N.	SITE STRIPPING FACTOR:	0.10
	O.	OVEREXCAVATION:	46,163.33
	A.	CALCULATED CUT:	37,045
	B.	TOTAL SPOILS	**12,730**
		SPOILS FROM BASIN	**17,996**
		ADDITIONAL CUT (FLOOR SLAB)	1,282
	C.	**TOTAL CUT: (A+B)**	**69,053**
	D.	CALCULATED FILL:	44,884
	E.	LIGHT PAVING FILL:	
	F.	SUBSIDENCE: (LxK)/27=	5,690
	G.	SHRINKAGE: (M/100)C=	8,977
	H.	SITE STRIPPING	3,501
	I.	OVEREXCAVATION SHRINKAGE	6,001
	J.	**TOTAL FILL: (D+E+F+G+H)=**	**69,054**
	K.	**TOTAL (IMPORT) OR EXPORT:**	**(0)**
		SITE ADJUSTMENT	(0.00)

Last Update: 11/10/21
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CITY OF PERRIS
PUBLIC WORKS DEPARTMENT

CONCEPTUAL GRADING PLAN

FIRST MARCH LOGISTICS
NATWAR LANE

PREPARED FOR:

FIRST INDUSTRY REALTY TRUST, INC.
898 N. PACIFIC COAST HIGHWAY STE. 175
EL SEGUNDO, CA 90245
PHONE: (310) 321-3813
EMAIL: MPIOLI@FIRSTINDUSTRIAL.COM

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CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

Designed by ________
Date ________
Checked by ________
Date ________
Designed by ________
Date ________
Checked by ________
Date ________

Approved by ________ Date ________

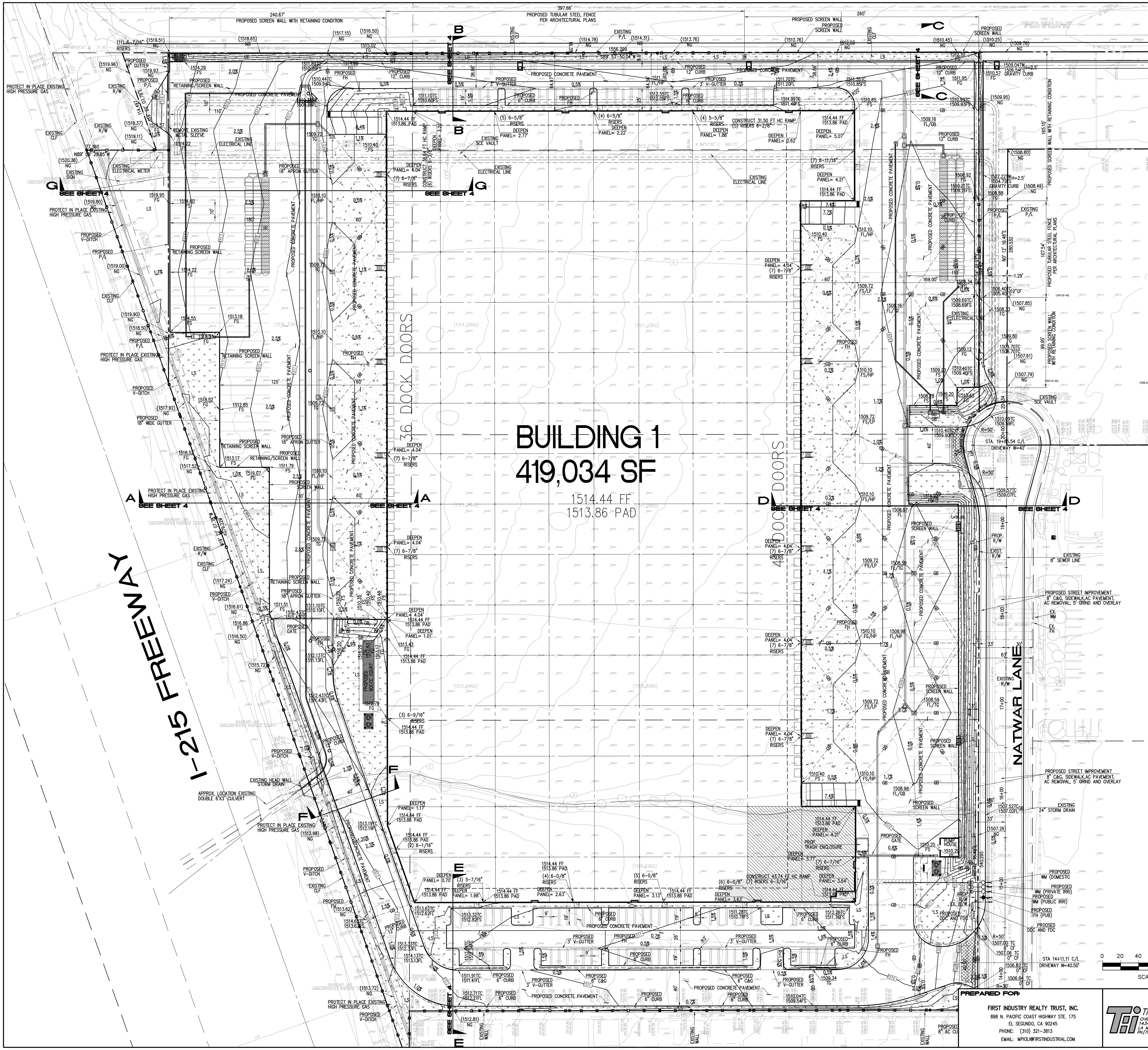
Public Works Director R.C.E. XXXXX

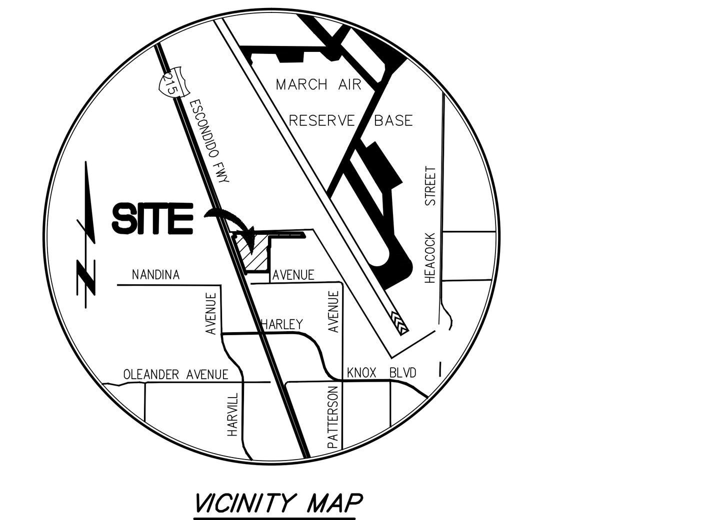
Sheet 1 of 8 Sheets

3788 1 OF 8 SHEET

Appendix 2: Construction Plans

Grading and Drainage Plans





VICINITY MAP
N.T.S.

SEE SHEET 2

		EARTHWORK BALANCE CALCULATIONS	2/10/2021
PROJECT:		CONCEPTUAL GP (LEVEL FLOOR)	JN 3788
JOB#		215 FWY & NATWAR LANE	QUANTITY
		BLDG AREA	415,470
	K.	SITE AREA:	945,396
	L.	SUBSIDENCE FACTOR:	0.163
	M.	SHRINKAGE FACTOR:	13.0
	N.	SITE STRIPPING FACTOR:	0.10
	O.	OVEREXCAVATION:	46,163.33
	A.	CALCULATED CUT:	37,045
	B.	TOTAL SPOILS	**12,730**
		SPOILS FROM BASIN	**17,996**
		ADDITIONAL CUT (FLOOR SLAB)	1,282
	C.	**TOTAL CUT: (A+B)**	**69,053**
	D.	CALCULATED FILL:	44,884
	E.	LIGHT PAVING FILL:	
	F.	SUBSIDENCE: (LxK)/27=	5,690
	G.	SHRINKAGE: (M/100)C=	8,977
	H.	SITE STRIPPING	3,501
	I.	OVEREXCAVATION SHRINKAGE	6,001
	J.	**TOTAL FILL: (D+E+F+G+H)=**	**69,054**
	K.	**TOTAL (IMPORT) OR EXPORT:**	**(0)**
		SITE ADJUSTMENT	(0.00)

0 20 40 80 120
SCALE: 1"=40'

Last Update: 11/10/21
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CITY OF PERRIS
PUBLIC WORKS DEPARTMENT

CONCEPTUAL GRADING PLAN

FIRST MARCH LOGISTICS
NATWAR LANE

PREPARED FOR:

FIRST INDUSTRY REALTY TRUST, INC.
898 N. PACIFIC COAST HIGHWAY STE. 175
EL SEGUNDO, CA 90245
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Designed by ________
Date ________
Checked by ________
Date ________
Designed by ________
Date ________
Checked by ________
Date ________

Approved by Date ________

Public Works Director R.C.E. XXXXX

Sheet 1 of 8 Sheets

3788 1 OF 8 SHEET

PONDING DEPTH (FT.)	LEGEND
7.40	
5.61	
3.74	
1.87	

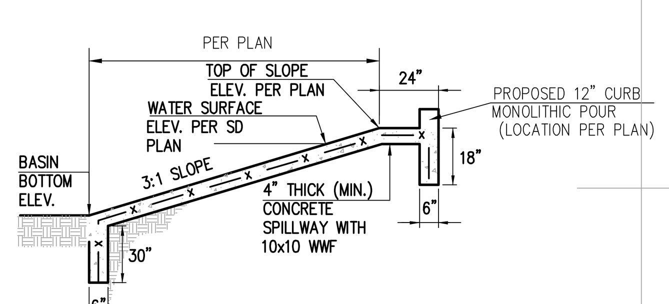
PROPOSED WATER SURFACE ELEVATION = 1509.40
MAXIMUM PONDING DEPTH = 7.50'
TOTAL PONDING VOLUME = 1339696 CF. / 30.755 AC. FT.

WATER SURFACE ELEVATION (WSE)	MAXIMUM PONDING DEPTH AT WSE (FT.)	LEGEND
1503.87	1.87	
1505.74	3.74	
1507.61	5.61	
1509.40	7.40	

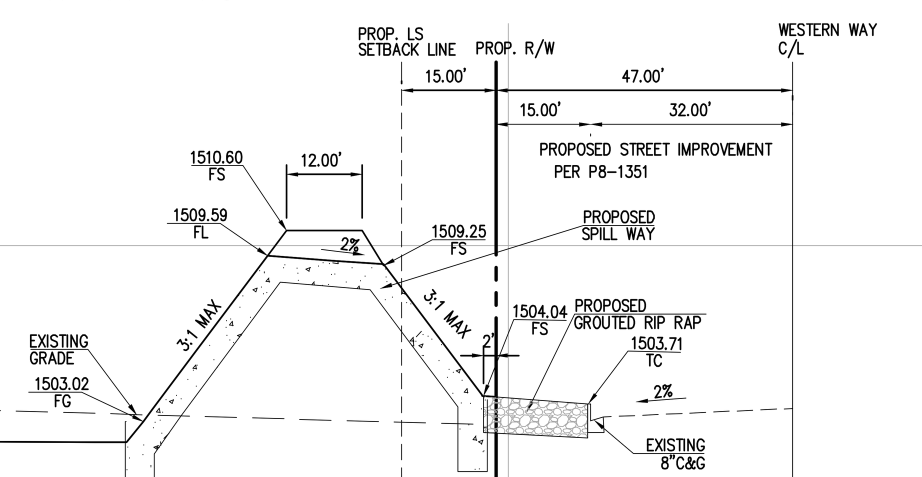
EARTHWORK ANALYSIS:

MATERIAL AVAILABLE:		MATERIAL REQUIRED:	
TOTAL EXCAVATION	24,978 C.Y.	FILL	6,981 C.Y.
APPROXIMATE EXPORT	17,996 C.Y.		

NOTE: EARTHWORK FIGURES SHOWN ARE APPROXIMATE FIGURES, AND ARE TO BE USED BY BUILDING DEPARTMENT ONLY. CONTRACTOR SHALL CALCULATE HIS OWN EARTHWORK QUANTITIES AND BID A COMPLETE JOB.



BASIN SLOPE DETAIL
NTS



SECTION A-A

SCALE: 1"=20'

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PREPARED FOR:

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EL SEGUNDO, CA 90245
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14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

CITY OF PERRIS
PUBLIC WORKS DEPARTMENT

DETENTION BASIN PLAN
FIRST MARCH
NATWAR LANE

Designed by ______
Date ______
Checked by ______
Date ______
Designed by ______
Date ______
Checked by ______
Date ______

Approved by ______ Date ______
Public Works Director R.C.E. XXXXX

Sheet 2 of 8 Sheets

3933/2 OF 8 SHEET


BUILDING 1
419,034 SF
1514.44 FF
1513.86 PAD
36 DOCK DOORS
41 DOCK DOORS
FREEWAY
215
B.N.S.F.
NATWAR LANE
SEE CONTINUATION BELOW
SEE CONTINUATION ABOVE
EXISTING P/L
PROPOSED FIRE HYDRANT
PROPOSED S.D. SEE SHEET 5 TO 8
PROPOSED UNDERGROUND FIRELINE PER UNDERGROUND FIRE PLAN
PROPOSED 6" SEWER LATERAL PROVIDE CLEAN OUT AT EVERY 100' O.C.
EXISTING ELECTRICAL EASEMENT TO BE VACATED
UNDERGROUND CHAMBERS SEE SHEET 5 TO 8
EXISTING HIGH PRESSURE GAS
EXISTING R/W
PROP. TRANSITION STRUCTURE PER SPPWC 342-2
EXISTING 10' WIDE SCG EASEMENT
PROP. WATER LINE
SCALE: 1"=40'
0 20 40 80 120
PREPARED FOR:
FIRST INDUSTRY REALTY TRUST, INC.
898 N. PACIFIC COAST HIGHWAY STE. 175
EL SEGUNDO, CA 90245
PHONE: (310) 321-3813
EMAIL: MPIOLI@FIRSTINDUSTRIAL.COM
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
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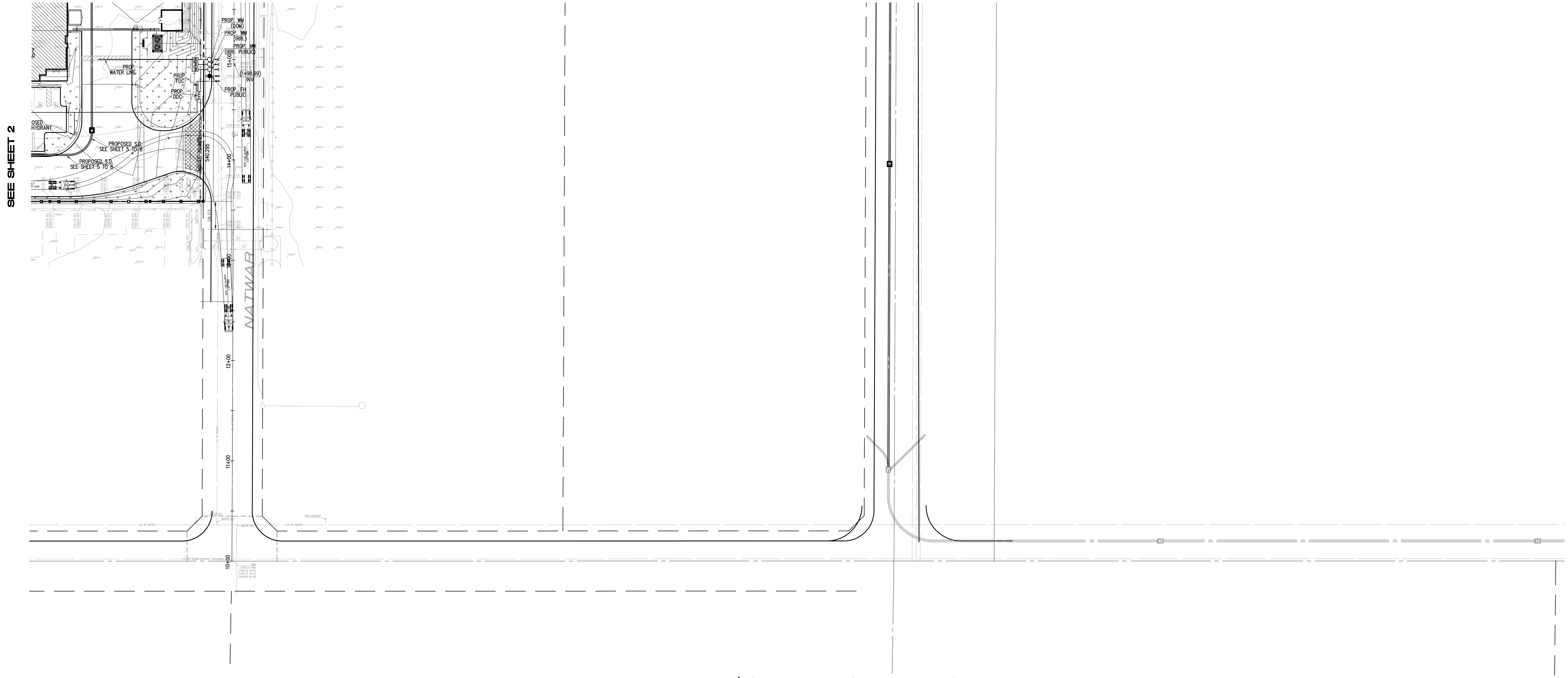
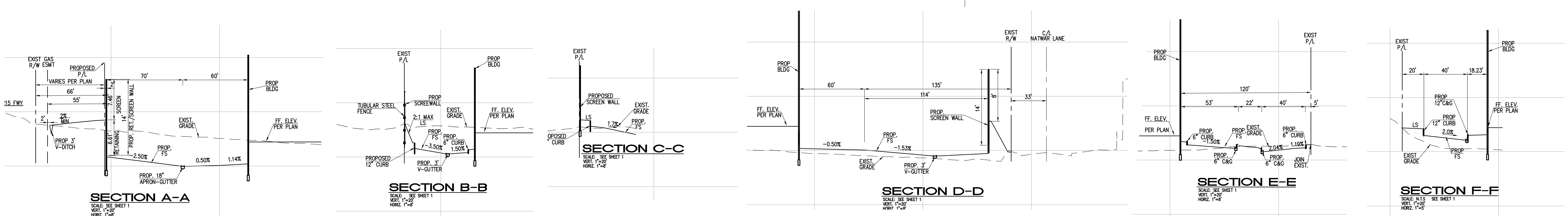
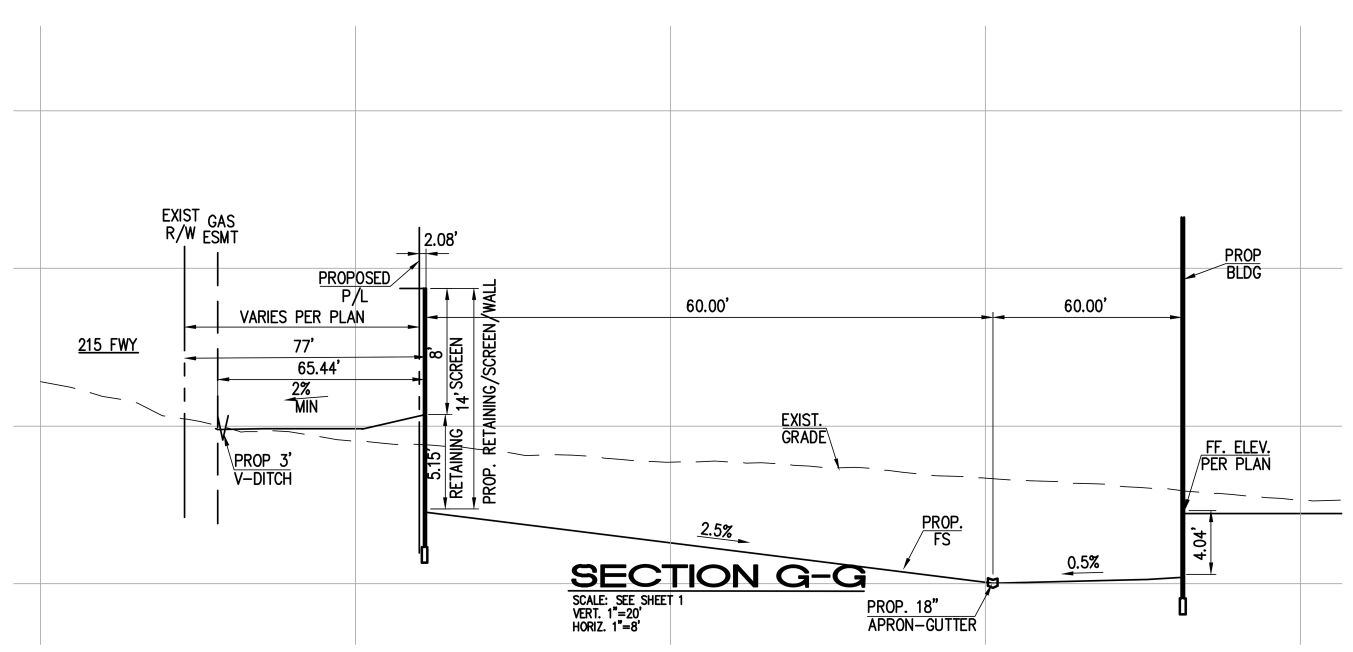
CITY OF PERRIS
PUBLIC WORKS DEPARTMENT
CONCEPTUAL UTILITY PLAN
FREEWAY 215 AND NATWAR LANE
NATWAR LANE
Designed by
Date
Checked by
Approved by
Public Works Director
R.C.E.
Sheet 3 of 8 Sheets
3788/3 OF 8 SHEET







0 20 40 80 120

SCALE: 1"=40'

Last Update: 11/10/21

CITY OF PERRIS

PUBLIC WORKS DEPARTMENT

CONCEPTUAL UTILITY PLAN

FREEWAY 215 AND NATWAR LANE

NATWAR LANE

PREPARED FOR:

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Date
Checked by
Date
Designed by
Date
Checked by
Date

Approved by
Date

Public Works Director
R.C.E. XXXXX

Sheet 4 of 8 Sheets

3788/4 OF 8 SHEET

CITY OF PERRIS

PUBLIC WORKS DEPARTMENT

CONCEPTUAL STORM DRAIN PLAN

FIRST MARCH LOGISTICS

NATWAR LANE

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Designed by ______
Date ______
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Date ______
Designed by ______
Date ______
Checked by ______
Date ______

Approved by Date ______

Public Works Director R.C.E. XXXXX

Sheet 5 of 8 Sheets

3788 5 OF 8 SHEET

Last Update:11/10/21
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CITY OF PERRIS

PUBLIC WORKS DEPARTMENT

CONCEPTUAL STORM DRAIN PROFILES

FIRST MARCH LOGISTICS

NATWAR LANE

PREPARED FOR:

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Date ______	
Checked by ______	
Date ______	
Designed by ______	Public Works Director R.C.E. XXXXX
Date ______	
Checked by ______	
Date ______	Sheet 6 of 8 Sheets

3788 6 OF 8 SHEET

Last Update: 11/10/21

CITY OF PERRIS
PUBLIC WORKS DEPARTMENT

CONCEPTUAL PUBLIC STORM DRAIN PLAN

FIRST MARCH LOGISTICS

NATWAR LANE

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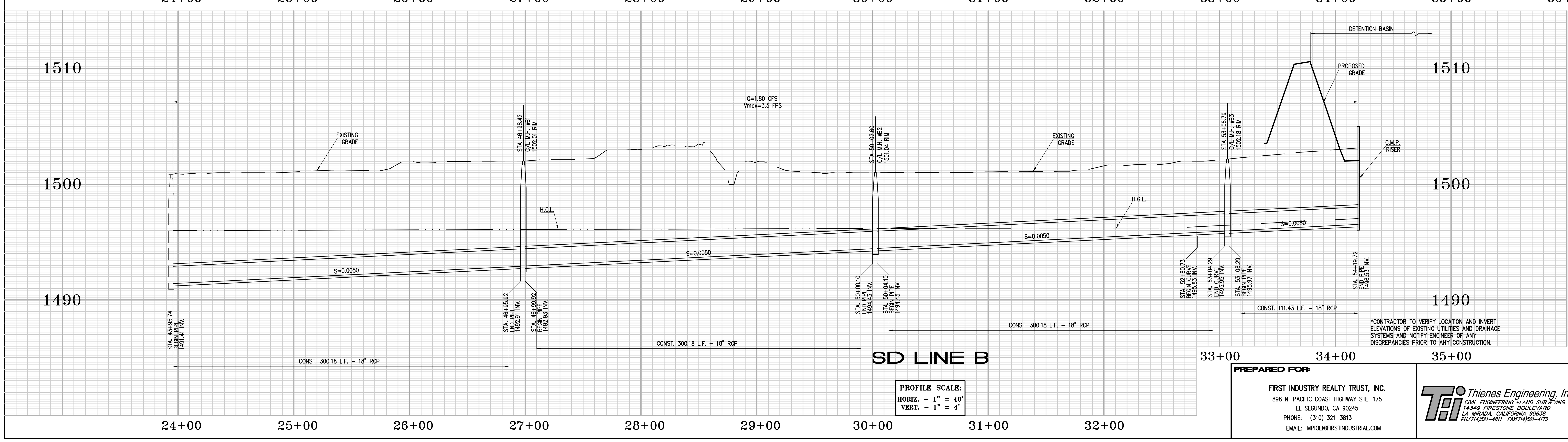
Approved by / Date
Public Works Director R.C.E. XXXXX
Sheet 7 of 8 Sheets

3788 7 OF 8 SHEET



Last Update:11/10/21

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PUBLIC WORKS DEPARTMENT

CONCEPTUAL PUBLIC STORM DRAIN PROFILES

FIRST MARCH LOGISTICS
NATWAR LANE

Designed by	Approved by	Date
Date		
Checked by		
Date		
Designed by		
Date	Public Works Director	R.C.E. XXXXX
Checked by		
Date	Sheet 8 of 8 Sheets	

3788 8 OF 8 SHEET

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

ARAGÓN GEOTECHNICAL, INC.
Consultants in the Earth & Material Sciences

July 19, 2019
Project No. 4528-I

First Industrial Realty Trust, Inc.
898 N. Pacific Coast Highway, Suite 175
El Segundo, California 90245

Attention: Mr. Matt Pioli

Subject: WQMP Site Assessment & Infiltration Test Results
"Freeway 215 & Natwar Lane" Light Industrial Project
City of Perris, Riverside County, California.

Dear Mr. Pioli:

In accordance with our proposal dated February 8, 2019, Aragón Geotechnical Inc. (AGI) has completed site testing and analyses of soil infiltration potential. Our conclusions are intended to support the creation of a site-specific water quality management plan (WQMP) and final selection of stormwater best management practices (BMPs) at the listed project. Data and recommendations for BMP engineering design and construction of low impact development (LID), hydromodification, and pollution prevention features are required by the Santa Ana Region (SAR) *Water Quality Management Plan* effective January 1, 2013. AGI services were performed concurrently with a preliminary geotechnical design investigation for the proposed industrial development. Subsurface explorations, geological reconnaissance and research, and characterization of the local groundwater regime were requirements for both of AGI's current studies. Our primary tasks for the infiltration feasibility assessment consisted of (1) Review of local and regional geologic, soil, and groundwater elevation maps plus proprietary data from other nearby AGI investigations; (2) Machine drilling of percolation test borings to estimated elevations of a proposed infiltration system, using a hollow-stem auger drilling rig; (3) Field tests of water absorption rates; and (4) Preparation of this results report. Calculations or recommendations for the design precipitation event intensity or duration, climate coefficients, storm water retention or treatment flow rates, or treatment volumes were outside of AGI's scope.

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Proposed Construction

AGI was furnished with a conceptual development plan dated February 26, 2019, prepared by the Irvine firm of HPA Architecture. The site plan included a proposed structure outline, but lacked topographic contours or preliminary finish surface elevations. The primary new features in the approximately 23.2-acre project site would be a 453,760-square-foot warehouse surrounded by access driveways and parking stalls for automobiles and heavy trucks. Concrete pavements are expected with limited possible exceptions for automobile parking lots. The logistics or light industrial building would reasonably comprise concrete tilt-up walls resting on shallow strip footings, with a concrete slab-on-grade industrial floor.

One BMP for stormwater management has been assessed by this study: A simple excavated water quality basin located in a narrow property “tail” that extends almost 1,000 feet east of the end of Natwar Lane. The basin would be situated just east of a proposed extension of Western Way, and an already-built Metropolitan Water District buried water transmission pipeline (the 96-inch-diameter welded-steel Perris Valley Pipeline). Estimated infiltration surface elevations were established by AGI at 10 feet below current grade. This deeper-than-average prospective basin floor was selected to maximize possible capture volume, while also assessing potentially more-favorable soils below cemented horizons detected during exploration drilling. Overflows or controlled discharges would presumably be directed east, toward an unlined surface swale within March Air Reserve Base property. Based on City-minimum landscape area guidelines, we would predict up to 88 percent of the site’s incident precipitation will intercept impermeable surfaces composed of the building and surrounding pavements.

Subsurface Investigation and Permeability Testing

At the time of AGI’s investigations, the project site consisted of a very flat, vacant, and formerly agricultural open field. Field work encountered ground surfaces that were soft and furrowed from weed abatement plowing.

Site-wide, 14 deep exploratory soil borings were drilled on June 18 and June 25, 2019 with a truck-mounted hollow-stem auger rig for the project geotechnical investigation. One boring was located east of the Perris Valley Pipeline where a basin could be accommodated. Most other geotechnical borings were situated within the building envelope. These borings, and some anecdotal information from other crews performing direct-push testing for environmental screening studies, were nonetheless useful for assessing feasibility for shallow basins or bioswales closer to Natwar Lane. All exploratory borings were continuously observed by AGI's engineering geologist and logged for materials classifications, interpreted materials origins, relative density as determined from *in situ* penetration tests, presence of groundwater, and other characteristics that can influence water uptake rates. The exploration borings were backfilled with tamped auger cuttings. No permanent wells were created. The Field Boring Log for the basin exploration hole B-10 is included in the accompanying Appendix. A modified version of the conceptual plan depicting a speculative BMP site, geotechnical and infiltration-related soil borings, and locations of tests done for this study is presented on Plate No. 1 at the back of this report.

AGI's infiltration determinations were based on technical guidelines for percolation testing in small-diameter boreholes. Most California jurisdictions including co-permittees of the Riverside County master discharge permit accept percolation test results for stormwater BMP design, with the proviso that percolation test data be adjusted to an equivalent one-dimensional (1-D) infiltration velocity. Boreholes of course infiltrate water both vertically and laterally. Considering potential available head in a narrow but fairly deep basin, AGI elected to use the constant-head U.S. Bureau of Reclamation Well Permeameter Method (USBR Procedure 7300-89). Measured water takes in units of vol/time are converted by formula into an equivalent infiltration test velocity in units of length/time. All field exploration, percolation testing, and derivations of equivalent infiltration rates were performed by or under direct supervision of the following qualified professionals:

- Fernando Aragón, P.E.: California Registered Civil Engineer and Geotechnical Engineer, with over 15 years of professional experience.
- Mark G. Doerschlag: California Professional Geologist and Certified Engineering Geologist, with over 35 years of professional experience.

The as-built test hole depths were established at 10.1 feet below ground surfaces (bgs). Approximately 2 to 3 inches of 3/4" gravel was placed in the bottom of each test hole, followed by insertion of a 3¼-inch O.D. PVC perforated pipe encased in filter fabric material. Well bore gravel filter packs were omitted from the annular space between the plastic pipe and hole sidewalls given stable and cohesive soils in the test intervals. Pre-saturation of the test bores was omitted for a constant-head test.

Heads of 5.0 feet were assigned for all 4 tested locations. AGI's intent was to test the roughly 5 feet of materials composing possible bottom and sidewall surfaces. The intended 5.0-foot interval also exceeded the minimum-desired test interval of at least 10 times the 4-inch borehole radius. Regular garden hoses provided pressurized municipal water to each test site. Feed water was introduced at the bottom of infiltration test holes. Maximum-available delivery rates of about 8 gallons per minute were much higher than water-take rates. The soils proved to be relatively impermeable. Water volumes delivered per time-trial increment were directly measured to the nearest 0.1 gallon using a Sensus SR-II magnetic-drive positive displacement water meter. A gate valve downstream of the meter was adjusted as needed to maintain the specified 5.0-foot test head. Absolute water level was monitored with an electric meter probe inserted into the primary perforated pipe. Total input durations of about 2½ hours were sufficient to arrive at near-steady-state water takes. A typical permeameter test would show incremental (constant-head) rates asymptotically approaching a minimum rate. Record sheets with the field measurement data are included in the Appendix.

FINDINGS

Local Soil Conditions

Surficial soils east of the Western Way projection consist of brown-colored and medium dense silty sand (Unified Soil Classification System symbol SM). The BMP-area shallow soils are notably “browner” and less cohesive than most near-surface horizons in the future building area. Slightly clayey and lightly cemented conditions occur near 5 feet deep. The base of the surficial subunit is marked by an erosional contact at a depth of 10 feet. A few very thin layers of cleaner sand may occur near the basal contact.

Materials at the tested basin-bottom elevation constitute dense to very dense, massive silty sand with some clay (symbol SM). Fines proportions of around 35% and distinctively weathered coarse sand grains are characteristic. Clayey sand (symbol SC) composes possibly half or more of the total interval between 15 and 26½ feet below grade. Vertical variability is gradational in nature, and not marked by sharp stratigraphic boundaries.

From a soil science viewpoint, the National Resources Conservation Service classifies basin-site surficial materials as Hanford fine sandy loam HgA. Hanford soils characteristically do not have indurated duripans, although as noted above there is some cemented soil below 5 feet based on our exploration. Sandy loam HgA is assigned to hydrologic soil group A. Soil classifications and hydrologic soil groups are usually limited to materials shallower than 60 inches or so; thus, we would expect that a basin-type BMP improvement will completely bypass NRCS soil series and cannot be qualified solely on the basis of a NRCS hydrologic soil group.

AGI's geotechnical studies identified the site materials as early to middle Pleistocene alluvium (unit $Qvof_a$ of Morton & Miller, 2006). Regional maps generally omit shallow veneers of younger sediments that are frequently found near the edges of the Perris Plain. We interpret materials shallower than 10 feet at the basin site as not technically part of the $Qvof_a$ unit. Weaker soil development would be consistent with a late Pleistocene age assignment. Most of the Perris Plain where the Wilson Avenue project is sited is considered part of the "Paloma" depositional surface of Woodford et al. (1971), typified by fairly strongly developed illuvial clay and calcic horizons atop the older parent materials. Detrital sediments have originated from granitic bedrock terrains located west and north of the project. The alluvium buries and conceals several deep erosional channels carved into granitic basement bedrock that can be considered tributaries to an ancestral San Jacinto River. The maximum depth of the $Qvof_a$ unit at the project site is not known with certainty, but may be approximately 550 feet based on geophysical survey data (AECOM, 2013). Basement rock rises rapidly toward the Interstate 215 freeway, where it is possibly only 50 to 70 feet deep.

Groundwater

AGI's BMP exploration boring did not encountered groundwater within the 26½-foot total exploration depth. At geotechnical boring B-1 to the west, slow groundwater inflows were observed. A stable water level 24.0 feet below grade was measured after several hours. Boring B-3 also exhibited a stable water level at around 28 feet. All other soil borings remained dry.

The project site is within the West San Jacinto groundwater subbasin. According to many years of monitoring well records reviewed through the State GeoTracker website, groundwater within a radius of about a half-mile from the property becomes shallower to the west and north, with minimum measured depths occasionally under 20 feet. Groundwater gradients steepen near the site. The hydrogeologic regime is complex due to the heterogeneity of the alluvial basin fill, substantial erosional relief of the buried bedrock surfaces under the northern Perris Valley, and municipal groundwater pumping. There is a well-documented record for rising groundwater levels inside the adjacent March Air Reserve Base. Rising water levels are attributed to changing land uses in the Perris

Plain vicinity, such as the cessation of formerly widespread agricultural pumping and introduction of irrigated suburban tracts, golf courses, and the Riverside National Cemetery near the project. Nonetheless, AGI concludes that minimum depths to permanent groundwater in the BMP basin area have always been in excess of 30 feet.

Jurisdictional requirements usually mandate a minimum separation between stormwater BMPs and groundwater of at least 10 feet and up to 40 feet (for very permeable soils). Data thus indicate there should be zero limitations on BMP design or construction due to groundwater at the project.

Permeameter Test Results

The table below summarizes the obtained field test results. Based on the drilling log, the test results are interpreted as representative of longer-duration uptake capacity in denser materials at the bottom of injection holes. Lateral absorption into thin cleaner-sand lenses was short-lived and limited in volume.

Test Location	Tested Interval (depth below existing ground surface, feet)	Constant-Head Percolation Rate (gal/hr)	Field Test Infiltration Velocity I_t (in/hr)
IN-1	6.1 - 10.1	8.4	0.17
IN-2	6.1 - 10.1	11.6	0.23
IN-3	6.1 - 10.1	20.8	0.41
IN-4	6.1 - 10.1	3.6	0.07

Measured percolation rates were converted to 1-D infiltration velocities by the USBR 7300-89 formula:

$$Ks = \frac{Q[\ln(H/r + (H/r + 1)^{0.5}) - 1](\mu_T/\mu_{20})}{2\pi H^2}$$

Where:

K_s = saturated hydraulic conductivity (infiltration rate, inches/hour)
H = height of water in well (inches)
Q = percolation flow rate from selected time interval (cubic inches/hour)
r = effective radius of well (inches)
μ_T = viscosity of water at water temperature, t
μ_{20} = viscosity of water at 20°C

The calculated result K_s is close to but not exactly the same as an infiltration test velocity I_t calculated from a ring infiltrometer test. The minor difference is ignored for stormwater BMP design.

The calculated velocities would be judged very poor for infiltration BMPs. We think the results correctly characterize the dense and somewhat clayey nature of test-area sediments deeper than 10 feet. We do not think there are better soil conditions above or below the tested intervals.

Conclusions, Recommendations, and Advice

The SAR *Water Quality Management Plan* explicitly requires any infiltration-based BMP to be clear of water in 72 hours or less after the design storm event. Mathematically, for typical volume-based BMP improvements, this requires field infiltration velocities I_t of roughly 1.6 inches per hour or faster. Achieved Natwar Lane project test results are far lower. AGI recommends a mean field-test infiltration test velocity of 0.22 inches per hour for the prospective basin near Western Way.

We think actual performance may be reduced further once available vadose-zone storage is filled during first-of-the-season storm events and the wetting front encounters deeper clayey strata. Riverside County guidelines for storm water best management practices specify a factor of safety of 3.0 when calculating the design infiltration velocity I_d for an infiltration-type BMP, based on the methods and results of this investigation (Appendix A, Table 1, *Design Handbook for Low Impact Development Best Management Practices)*. The AGI-recommended average I_t should be reduced by a factor of 3 to derive final I_d. Unless the design capture volume is unexpectedly small, it appears that the designated WQMP BMP site cannot rely on surface infiltration. Hydromodification to reduce peak flows will likely require extended detention, treatment, and thence controlled release to the MS4 system [open ditch in MARB property].

Our reviews of geotechnical boring data did not identify any other site areas that could be considered favorable for either shallow open-basin BMPs or subterranean installations. Soils beneath and beside the proposed warehouse were logged as cemented and would be judged impermeable starting just 2 to 3 feet below grade and extending to depths exceeding 10 feet. Limited areas had possibly permeable sandy horizons near 20 feet deep, but problems with inadequate separation to groundwater appear to rule out certain engineered options such as drywells. At this time, hydromodification with biofiltration "treat and release" appear to be the only viable options for peak-discharge and water quality management.

It is important to note the test velocities were obtained in carefully prepared test holes as free as practicable of surface sealing and boundary-zone compaction. Field performance of any designed LID improvement could be markedly lower than AGI's achieved results if precautions are not maintained during construction. It will be imperative to *specify* construction practices for minimizing excavation bottom compaction. Excavations should be made with backhoes, grade-alls, or excavators working from beside the basin bottom. An overall goal of preventing heavy equipment from rolling or tracking any infiltration system excavation bottom should be understood.

Lastly, AGI concludes from test and exploration findings that the selected BMP location should neither cause structural concerns, nor result in significantly increased risks to the proposed building or neighboring properties from slope instability, liquefaction, or settlement. Future grading plan reviews are recommended, however, to analyze bottom elevations and lateral setbacks to nearby proposed street improvements. We add that MWD may have additional setback requirements for treatment control BMPs near their Perris Valley Pipeline.

Investigation Limitations

The findings in this report may require modification as a result of later field observations. Our opinions have been based on the results of limited testing within the planned water-quality BMP site combined with extrapolations of soil conditions away from the test bores. The nature and extent of variations within or beyond the proposed BMP may not become evident until construction. If conditions encountered during construction vary significantly from those indicated by this report, or BMP type or location changes are proposed, then additional site testing, preparation recommendations, or as-built tests may be needed to achieve correct designs for the treatment control BMP system(s).

Closure

This report was prepared for the use of First Industrial Realty Trust, Inc., their civil engineers, and authorized designates in cooperation with this office. Our findings and recommendations were prepared in accordance with generally accepted professional principles and local practice in the fields of engineering geology and geotechnical engineering. We make no other warranties either expressed or implied. Questions concerning the test results or design advice are invited, and may be directed to the undersigned at our Riverside office at (951) 776-0345.

Respectfully submitted,
Aragón Geotechnical, Inc.

PROFESSIONAL GEOLOGIST MARK G. DOERSCHLAG No. 1752 Exp. 9/30/20 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER CARLOS FERNANDO ARAGON No. 2994 Exp: 06/30/20 GEOTECHNICAL STATE OF CALIFORNIA 7/19/19

7/19/19

Mark G. Doerschlag, CEG 1752
Engineering Geologist

C. Fernando Aragón, P.E., M.S.
Geotechnical Engineer, G.E. 2994

MGD/CFA:mma

Attachments: Exploratory Boring Log, Boring B-10
Percolation Field Test Data, Sites IN-1 through IN-4
Plate No. 1, Exploration & Infiltration Test Location Map (fold-out)

Distribution: (4) Addressee

REFERENCES

AECOM Technical Services, Inc., 2013, *Final 2011-2012 Annual Monitoring Report, Long-Term Groundwater Monitoring Program, March Air Reserve Base, Former March Air Force Base, California:* contractor's report dated December 9, 2013 (Contract No. FA8903-09-D-8547-0007, Project No. 60271680-0009AG), digital download from State of California GeoTracker website, https://geotracker.waterboards.ca.gov/

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Woodford, A.O., Shelton, J.S., Doehring, D.O., and Morton, R.K., 1971, Pliocene-Pleistocene history of the Perris Block, southern California: Geological Society of America Bulletin, v. 82, p. 3421-3448.

FIELD LOG OF BORING B - 10

Project: *FREEWAY 215 & NATWAR LANE INDUSTRIAL PROJECT*

Location: *CITY OF PERRIS, RIVERSIDE COUNTY, CALIF.*

Date(s) Drilled:	**6/25/19**	Logged By:	**M. Doerschlag**
Drilled By:	**GP Drilling**	Total Depth:	**26.5 Ft.**
Rig Make/Model:	**Mobile B-61**	Hammer Type:	**Automatic trip**
Drilling Method:	**Hollow-Stem Auger**	Hammer Weight/Drop:	**140 Lb./30 In.**
Hole Diameter:	**8 In.**	Surface Elevation:	**± 1505.0 Ft. AMSL per Earth DEM**

Comments: Located near center of proposed BMP basin.

DEPTH (ft.)	ELEVATION (MSL DATUM)	SAMPLE INTERVALS: TYPE, "N" or (Blows/ft.)	GRAPHIC LOG	USCS	GEOTECHNICAL DESCRIPTION	DRY DENSITY (pcf)	WATER CONTENT (%)	WELL COMPLETION	OTHER TESTS
0	1505			SM	Silty Sand: Brown; medium dense; slightly moist; fine to coarse-grained sand. Massive and probably bioturbated in upper 4-5 feet. Does not have particularly strong pedogenic soil development -- interpreted slightly younger fan sediments over Paloma-age alluvium. [Very old alluvium]				
5	1500	SPT 11 9 11 N=20		SM	← Silty sand, trace to some clay and slightly cemented, with diffuse carbonate. Not visibly porous.				
		SPT 8 13 13 N=26		SM	← Silty sand, trace of clay, weakly cemented, few coarse weathered granules, not visibly porous.				
		SPT 9 14 20 N=34			Sharp erosional contact.				
10	1495			SM	Silty Sand: Yellowish brown; dense; slightly moist; fine to coarse immature sand in silty matrix with variable clay content (unit alternately grades from silty sand to clayey sand). Grains highly weathered. Sample at 10' is massive and not visibly porous. [Very old alluvium]				
15	1490								

Continued on next sheet.

FIELD LOG OF BORING B - 10

Project:	*FREEWAY 215 & NATWAR LANE INDUSTRIAL PROJECT*
Location:	*CITY OF PERRIS, RIVERSIDE COUNTY, CALIF.*

Date(s) Drilled:	**6/25/19**	Logged By:	**M. Doerschlag**
Drilled By:	**GP Drilling**	Total Depth:	**26.5 Ft.**
Rig Make/Model:	**Mobile B-61**	Hammer Type:	**Automatic trip**
Drilling Method:	**Hollow-Stem Auger**	Hammer Weight/Drop:	**140 Lb./30 In.**
Hole Diameter:	**8 In.**	Surface Elevation:	**± 1505.0 Ft. AMSL per Earth DEM**

Comments: Located near center of proposed BMP basin.

DEPTH (ft.)	ELEVATION (MSL DATUM)	SAMPLE INTERVALS: BULK	SAMPLE INTERVALS: DRIVE	TYPE, "N" or (Blows/ft.)	GRAPHIC LOG	USCS	GEOTECHNICAL DESCRIPTION	DRY DENSITY (pcf)	WATER CONTENT (%)	WELL COMPLETION	OTHER TESTS
0	1505					SM	Silty Sand: Brown; medium dense; slightly moist; fine to coarse-grained sand. Massive and probably bioturbated in upper 4-5 feet. Does not have particularly strong pedogenic soil development -- interpreted slightly younger fan sediments over Paloma-age alluvium. [Very old alluvium]				
5	1500			SPT 11 9 11 N=20		SM	← Silty sand, trace to some clay and slightly cemented, with diffuse carbonate. Not visibly porous.				
				SPT 8 13 13 N=26		SM	← Silty sand, trace of clay, weakly cemented, few coarse weathered granules, not visibly porous. Sharp erosional contact.				
10	1495			SPT 9 14 20 N=34		SM	Silty Sand: Yellowish brown; dense; slightly moist; fine to coarse immature sand in silty matrix with variable clay content (unit alternately grades from silty sand to clayey sand). Grains highly weathered. Sample at 10' is massive and not visibly porous. [Very old alluvium]				
15	1490										

Continued on next sheet.

Percolation Data Sheet (Constant Head Method, Metered Input)

Project: FIRST AND. NATWAR	Project No. 4528-SF1	
Test Hole No. 1N-1	Date Drilled: 6/25/19	
Depth of Test Hole: 10.1	Soil Classification: SM	
Check for Sandy Soil Criteria Tested By: —	Date: —	Presoak: —
Field Percolation Test By: MOD	Date: 7/1/19	

Sandy Soil Criteria Test

Trial No.	Time	Time Interval (Min.)	Initial Water Level (In.)	Final Water Level (In.)	Δ in Water Level (In.)
1					
2					

Use: ☐ Normal Soil Criteria
☐ Sandy Soil Criteria (>50% of wetted interval drop in <25 min. both trials)

Time	Time Interval (min.)	Total Elapsed Time (min.)	Initial Meter Reading	Final Meter Reading	Total Discharge Volume (gal)	Wetted Length (ft.)	Q F.S. = 3 (gal/ft.²/day)
11:18	15.0	15:00	7030.7	7034.5	3.8	5.0 60"	
11:33	15.0	30:00	7034.5	7037.0	3.5		
11:48	15.0	45:00	7037.0	7040.4	3.4		
12:03	15.0	60:00	7040.4	7043.4	3.0		
12:18	15.0	75:00	7043.4	7046.0	2.6		
12:33	15.0	90:00	7046.0	7048.1	2.1		
12:48	15.0	105:00	7048.1	7050.0	1.9		
1:03	15.0	120:00	7050.0	7053.2	3.2		
1:18	15.0	135:00	7053.2	7056.3	3.1		
1:33 1:48	15.0	150:00	7056.3	7058.4	2.1	↓	

END

Percolation Data Sheet (Constant Head Method, Metered Input)

Project: FIRST IND. NATWAR	Project No. 4528-SF1
Test Hole No. IN-2	Date Drilled: 6/25/19
Depth of Test Hole: 10.1' bgs	Soil Classification: SM
Check for Sandy Soil Criteria Tested By: —	Date: — Presoak: —
Field Percolation Test By: KGL	Date: 7/1/19

Sandy Soil Criteria Test

Trial No.	Time	Time Interval (Min.)	Initial Water Level (In.)	Final Water Level (In.)	Δ in Water Level (In.)
1					
2					

Use: ☐ Normal Soil Criteria
☐ Sandy Soil Criteria (>50% of wetted interval drop in <25 min. both trials)

START 11:18

Time	Time Interval (min.)	Total Elapsed Time (min.)	Initial Meter Reading	Final Meter Reading	Total Discharge Volume (gal)	Wetted Length (ft.)	Q F.S. = 3 (gal/ft.^{2}/day)
	15.0	15MIN.	616.4	620.5	4.1	5.0'	
11:33	15.0	30:00	620.5	623.2	2.7		
11:48	15.0	45:00	623.2	626.1	2.9		
12:03	15.0	60:00	626.1	628.6	2.5		
12:18	15.0	75:00	628.6	631.4	2.8		
12:33	15.0	90:00	631.4	634.1	2.7		
12:48	15.0	105:00	634.1	637.0	2.9		
1:03	15.0	120:00	637.0	639.7	2.7		
1:18	15.0	135:00	639.7	642.2	2.5		
1:33 1:48	15.0	150:00	642.2	645.1	2.9	↓	

END

Aragón Geotechnical, Inc.

Percolation Data Sheet (Constant Head Method, Metered Input)

Project: FIRST AND. NATWAR	Project No. 4528-SF1
Test Hole No. IN-3	Date Drilled: 6/25/19
Depth of Test Hole: 10.1'	Soil Classification: SM
Check for Sandy Soil Criteria Tested By: →	Date: — Presoak: —
Field Percolation Test By: MGD/KL	Date: 7/1/19

Sandy Soil Criteria Test

Trial No.	Time	Time Interval (Min.)	Initial Water Level (In.)	Final Water Level (In.)	Δ in Water Level (In.)
1					
2					

Use: ☐ Normal Soil Criteria
☐ Sandy Soil Criteria (>50% of wetted interval drop in <25 min. both trials)

Time	Time Interval (min.)	Total Elapsed Time (min.)	Initial Meter Reading	Final Meter Reading	Total Discharge Volume (gal)	Wetted Length (ft.)	Q F.S. = 3 (gal/ft.²/day)
1400	15.0	15:00	7073.5	7081.7	8.2	60"/5.0'	
1415	15.0	30:00	7081.7	7088.2	6.5		
1430	15.0	45:00	7088.2	7092.6	4.4		
1445	15.0	60:00	7092.6	7098.2	5.6		
1500 / 1523	23.0	83:00	7098.2	7108.8	10.6		
1523 / 1530	7.0	90:00	7108.8	7111.3	2.5		
1530	15.0	105:00	7111.3	7116.8	5.5		
1545	15.0	120:00	7116.8	7120.4	3.6		
1600 / 1615	15.0	135:00	7120.4	7125.6	5.2		
	END						

Aragón Geotechnical, Inc.

Percolation Data Sheet (Constant Head Method, Metered Input)

Project: FIRST IND. NATWAR	Project No. 4528-SF1	
Test Hole No. 1N-4	Date Drilled: 6/25/19	
Depth of Test Hole: 10'-1"	Soil Classification: SM	
Check for Sandy Soil Criteria Tested By: —	Date: —	Presoak: —
Field Percolation Test By: KGL	Date: 7/1/19	

Sandy Soil Criteria Test

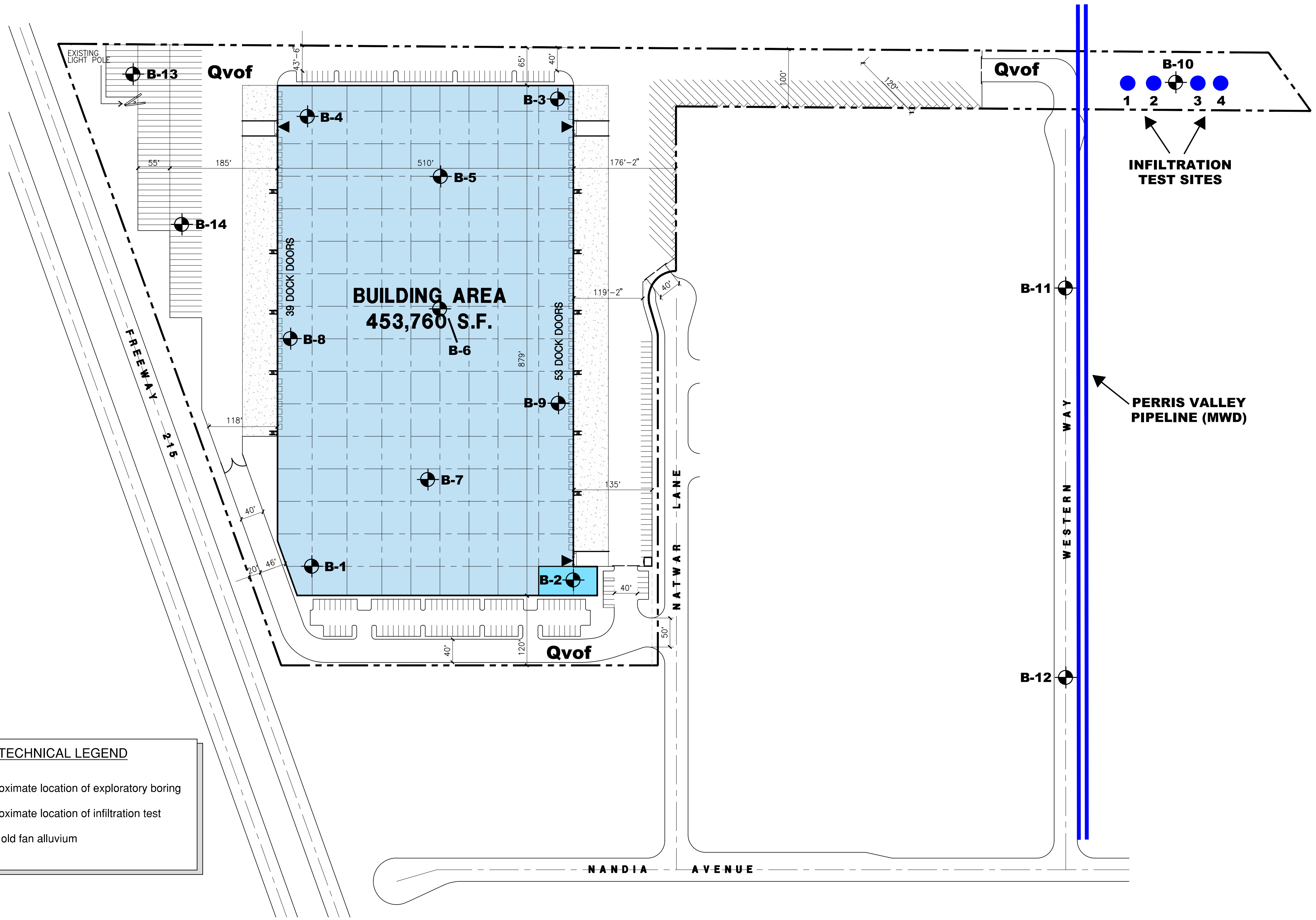
Trial No.	Time	Time Interval (Min.)	Initial Water Level (In.)	Final Water Level (In.)	Δ in Water Level (In.)
1					
2					

Use: ☐ Normal Soil Criteria
☐ Sandy Soil Criteria (>50% of wetted interval drop in <25 min. both trials)

START 1:57pm

Time	Time Interval (min.)	Total Elapsed Time (min.)	Initial Meter Reading	Final Meter Reading	Total Discharge Volume (gal)	Wetted Length (ft.)	Q F.S. = 3 (gal/ft.²/day)
	15.0	15 MIN	659.2	662.5	3.2	5.0'	
1412	15.0	30:00	662.5	664.6	2.1	↓	
1427	15.0	45:00	664.6	666.6	2.0		
1442	15.0	60:00	666.6	667.9	1.3		
1457	15.0	75:00	667.9	669.9	2.0		
1512	15.0	90:00	669.9	671.3	2.3		
1527	15.0	105:00	671.3	672.4	1.1		
1542	15.0	120:00	672.4	673.6	1.2		
1557 1612	15.0	135:00	673.6	674.5	0.9		
	END						

Aragón Geotechnical, Inc.



GEOTECHNICAL LEGEND

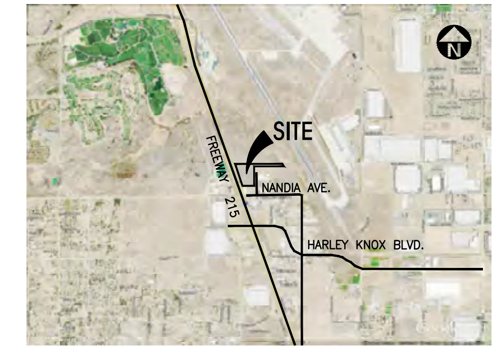
- **B-14** Approximate location of exploratory boring
- **4** Approximate location of infiltration test
- Qvof Very old fan alluvium

Note: This is a conceptual plan. It is based on preliminary information which is not fully verified and may be incomplete. It is meant as a comparative aid in examining alternate development strategies and any quantities indicated are subject to revision as more reliable information becomes available.

north

1" = 80'
0 80 160 240

Aerial Map



Tabulation

SITE AREA		
in sq. ft.		1,012,436 s.f.
in acres		23.2 ac
BUILDING AREA		
office 1st floor		5,000 s.f.
office 1st floor		5,000 s.f.
warehouse		443,760 s.f.
TOTAL		453,760 s.f.
COVERAGE		44.8%
AUTO PARKING REQUIRED		
1st 20K @ 1/1,000 sf		20 stalls
2nd 20K @ 1/2,000 sf		10 stalls
Over 40K @ 1/5,000 sf		83 stalls
TOTAL		113 stalls
AUTO PARKING PROVIDED		
standard (9'x19')		174 stalls
TRAILER PARKING PROVIDED		
trailer (12' x 55')		144 stalls
Zoning Ordinance for City		
Zoning Designation - Perris Valley Commercial Center SP (PVCC-SP) - Light Industrial		
MAXIMUM FLOOR AREA RATIO		
F.A.R. - .75		
MAXIMUM LOT COVERAGE		
Coverage - 50%		
SETBACKS		
Front Yard / Street side	Side Yard	
Local / Collector St. - 10'	Adjoining non-residential - 0'	
Arterials - 15'	Adjoining residential - 20'	
Expressway/Freeway - 20'		
Rear Yard		
Adjoining non- residential - 0'		
Adjoining residential - 20'		
LANDSCAPE REQUIRED		
Percentage		12%
LANDSCAPE REQUIRED		
Percentage (base on net)		12.3%
in sq. ft.		124,669 s.f.

Legend

- POTENTIAL OFFICE WITH 2ND FLOOR
- WAREHOUSE
- ▼ DRIVE THRU DOOR

HPA architecture | AGI

EXPLORATION & TEST LOCATION MAP

FREEWAY 215 & NATWAR LANE, PERRIS, CA

PROJECT NO. 4528-SFI | DATE: 7/19/19 | PLATE NO. 1

Conceptual Site Plan

Freeway 215 & Natwar Lane

City of Perris, CA

FIRST INDUSTRIAL REALTY TRUST

18831 Bardeen Ave. - Ste. #100
Irvine, CA 92612
(949) 863-1770
www.hparchs.com

February 26, 2019 / Job #19100

Scheme 1

Appendix 4: Historical Site Conditions

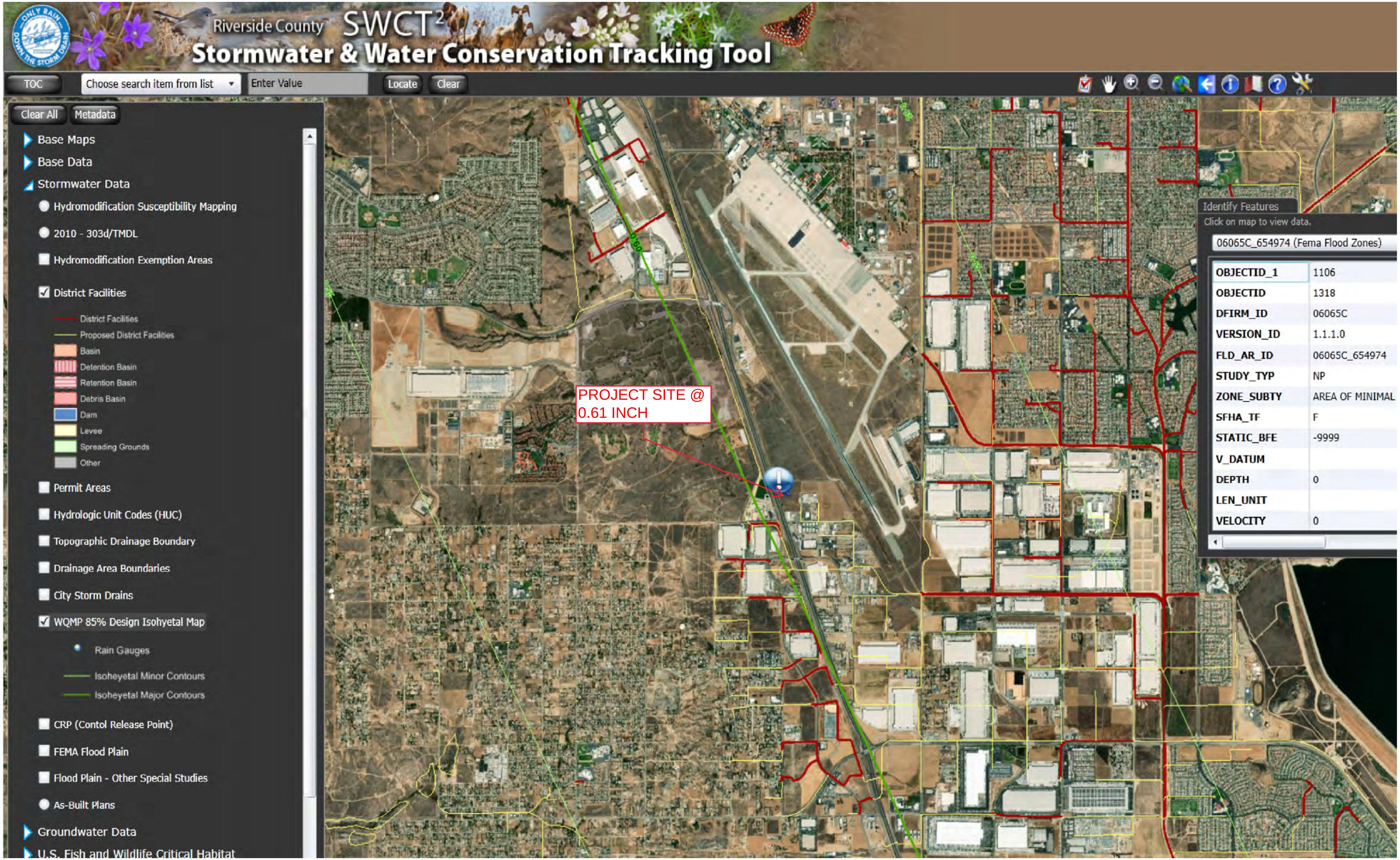
Phase I Environmental Site Assessment or Other Information on Past Site Use (NOT APPLICABLE)

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis (NOT APPLICABLE)

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation



Riverside County SWCT²
Stormwater & Water Conservation Tracking Tool
TOC
Choose search item from list
Enter Value
Locate
Clear
Clear All
Metadata
Base Maps
Base Data
Stormwater Data
Hydromodification Susceptibility Mapping
2010 - 303d/TMDL
Hydromodification Exemption Areas
District Facilities
District Facilities
Proposed District Facilities
Basin
Detention Basin
Retention Basin
Debris Basin
Dam
Levee
Spreading Grounds
Other
Permit Areas
Hydrologic Unit Codes (HUC)
Topographic Drainage Boundary
Drainage Area Boundaries
City Storm Drains
WQMP 85% Design Isohyetal Map
Rain Gauges
Isoheyetal Minor Contours
Isoheyetal Major Contours
CRP (Contol Release Point)
FEMA Flood Plain
Flood Plain - Other Special Studies
As-Built Plans
Groundwater Data
U.S. Fish and Wildlife Critical Habitat
PROJECT SITE @ 0.61 INCH
Identify Features
Click on map to view data.
06065C_654974 (Fema Flood Zones)
OBJECTID_1 1106
OBJECTID 1318
DFIRM_ID 06065C
VERSION_ID 1.1.1.0
FLD_AR_ID 06065C_654974
STUDY_TYP NP
ZONE_SUBTY AREA OF MINIMAL
SFHA_TF F
STATIC_BFE -9999
V_DATUM
DEPTH 0
LEN_UNIT
VELOCITY 0

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: Thienes Engineering, Inc. — Date: 11/16/2021

Designed by: Vicky Li — Case No:

Company Project Number/Name: First March Logistics - Building 1 (3788)

BMP Identification

BMP NAME / ID: MWS-A / DMA A

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}= 0.61 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)*
A-1	*357192*	*Roofs*	*1*	*0.89*	*318615.3*			
A-2	*13068*	*Ornamental Landscaping*	*0.1*	*0.11*	*1443.5*			
	370260	***Total***			**320058.8**	**0.61**	**16269.7**	**16415**

Notes:

WetlandMOD VOLUME BASED SIZING SHEET

Horizontal Flow Biofiltration System

Project Location

Project Name	First March Logistics - Building 1 (DMA A)
City/Town	Perris
State	California
Zip Code	92571

SIZING CALCULATIONS	Inputs	Units	Notes/References
Impervious Area			
BMP Drainage Area (not required - manual entry - not part of formula)	8.5	Acres	This includes all areas that will contribute runoff to the proposed BMP, including pervious areas, impervious areas, and off-site areas, whether or not they are directly or indirectly connected to the BMP.
Watershed Impervious Ratio (not reguired - manual entry - not part of formula)			Watershed Imperviousness Ratio", is equal to the percent of total impervious area in the "BMP Drainage Area" divided by 100
Runoff Coefficient "C" (not required - manual entry - not part of formula)			
Water Quality Volume (required)	16270	cubic feet	Use sizing procedures provided by state or local agencies to determine the appropriate Water Quality Volume. Intensities and design storms vary widely by region and method.
Design Storm Duration	0	hours	Varies depending on geographical region. Set at 0 for pump system set up. LA County 3 hours. Call for details.
MWS - Linear Sizing			
MWS - Linear Model Number (from matrix)	MWS-L-4-21	quantity	Please choose size from "Model Size Matrix" Tab
# Of Units	1	quantity	Select the number of systems required to treat the water quality volume. Will very depending on drain down time regulaitons.
Discharge Rate (from matrix)	30.41	gallons/minute	Rate of 0.26 gpm/sq ft or 25 in/hr. Field Verified.
Volume Treated During Event			
Processed through MWS - Linear	0.0	cubic feet	30.41 gals/minute
Volume Treated Following Event			
MWS - Linear Static Capacity (from matrix)	144	cubic feet	
Volume Needed in *Pre-Storage*	16126	cubic feet	Set at zero to start. Size pre-storage system to hold this volume
			Sizing complete when eqaul to value of zero.
TOTAL STORMWATER TREATED	16270	cubic feet	Note: This amount should be equal to the "Water Quality Volume"
Drain Down Time	66.88	hours	Drain down time must be equal to or less than requirement of local juristiction. Default 48 hours.

Feel free to fax or email proposed sizing calculations to Modular Wetlands Systems, Inc. for assistance with sizing, compliance, and design.

Phone: 760.433.7640
Fax: 760.433.3176
Email: Info@modularwetlands.com

StormTech
Detention • Retention • Recharge
Subsurface Stormwater Management℠

MC-4500 Site Calculator

Project Information:

Project Name: First March Logistics - Building 1 (DMA A)
Location: Perris, CA
Date: 11/16/2021
Engineer: Thienes Engineering, Inc.
StormTech RPM:

System Requirements

Units		Imperial	
Required Storage Volume		16126	CF
Stone Porosity (Industry Standard = 40%)		40	%
Stone Above Chambers	(12 inch min.)	12	inches
Stone Foundation Depth	(9 inch min.)	36	inches
Average Cover over Chambers	(24 inch min.)	24	inches
Bed size controlled by WIDTH or LENGTH?		WIDTH	
Limiting WIDTH or LENGTH dimension		35	feet
Storage Volume per Chamber		195.5	CF
Storage Volume per End Cap		137.7	CF

System Sizing

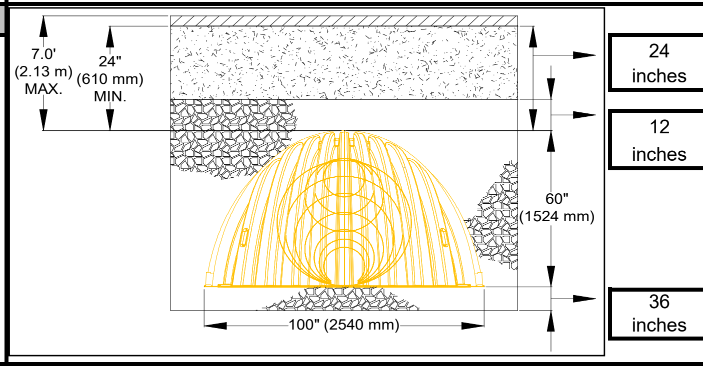
Number of Chambers Required	79	each
Number of End Caps Required	6	each
Bed Size (including perimeter stone)	3,190	square feet
Stone Required (including perimeter stone)	1055	tons
Volume of Excavation	1182	cubic yards
Non-woven Filter Fabric Required (20% Safety Factor)	1197	square yards
Length of Isolator Row	115.8	feet
Woven Isolator Row Fabric (20% Safety Factor)	318	square yards
Installed Storage Volume	16,271	cubic feet

Controlled by Width (Rows)

Maximum Width = 35 feet

1 row of 27 chambers
2 row of 26 chambers

Maximum Length = 115.8 feet
Maximum Width = 28.5 feet



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: Thienes Engineering, Inc. Date: 11/16/2021

Designed by: Vicky Li Case No:

Company Project Number/Name: First March Logistics - Building 1 (3788)

BMP Identification

BMP NAME / ID: MWS-B / DMA B

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}= 0.61 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)*
B-1	*439956*	*Roofs*	*1*	*0.89*	*392440.8*			
B-2	*15246*	*Ornamental Landscaping*	*0.1*	*0.11*	*1684*			
	455202	***Total***			**394124.8**	**0.61**	**20034.7**	**20172**

Notes:

WetlandMOD VOLUME BASED SIZING SHEET

Horizontal Flow Biofiltration System

Project Location

Project Name	First March Logistics - Building 1 (DMA B)
City/Town	Perris
State	California
Zip Code	92571

SIZING CALCULATIONS

	Inputs	Units	Notes/References
Impervious Area			
BMP Drainage Area (not required - manual entry - not part of formula)	10.45	Acres	This includes all areas that will contribute runoff to the proposed BMP, including pervious areas, impervious areas, and off-site areas, whether or not they are directly or indirectly connected to the BMP.
Watershed Impervious Ratio (not reguired - manual entry - not part of formula)			Watershed Imperviousness Ratio", is equal to the percent of total impervious area in the "BMP Drainage Area" divided by 100
Runoff Coefficient "C" (not required - manual entry - not part of formula)			
Water Quality Volume (required)	20035	cubic feet	Use sizing procedures provided by state or local agencies to determine the appropriate Water Quality Volume. Intensities and design storms vary widely by region and method.
Design Storm Duration	0	hours	Varies depending on geographical region. Set at 0 for pump system set up. LA County 3 hours. Call for details.
MWS - Linear Sizing			
MWS - Linear Model Number (from matrix)	MWS-L-8-12	quantity	Please choose size from "Model Size Matrix" Tab
# Of Units	1	quantity	Select the number of systems required to treat the water quality volume. Will very depending on drain down time regulaitons.
Discharge Rate (from matrix)	39.25	gallons/minute	Rate of 0.26 gpm/sq ft or 25 in/hr. Field Verified.
Volume Treated During Event			
Processed through MWS - Linear	0.0	cubic feet	39.25 gals/minute
Volume Treated Following Event			
MWS - Linear Static Capacity (from matrix)	187	cubic feet	
Volume Needed in *Pre-Storage*	19848	cubic feet	Set at zero to start. Size pre-storage system to hold this volume
			Sizing complete when eqaul to value of zero.
TOTAL STORMWATER TREATED	20035	cubic feet	Note: This amount should be equal to the "Water Quality Volume"
Drain Down Time	63.81	hours	Drain down time must be equal to or less than requirement of local juristiction. Default 48 hours.

Feel free to fax or email proposed sizing calculations to Modular Wetlands Systems, Inc. for assistance with sizing, compliance, and design.

Phone: 760.433.7640
Fax: 760.433.3176
Email: Info@modularwetlands.com

Project Information:

Project Name: First March Logistics - Building 1 (DMA B)
Location: Perris, CA
Date: 11/16/2021
Engineer: Thienes Engineering, Inc.
StormTech RPM:

StormTech
Detention • Retention • Recharge
Subsurface Stormwater Management℠

MC-4500 Site Calculator

System Requirements

Units		Imperial	
Required Storage Volume		19848	CF
Stone Porosity (Industry Standard = 40%)		40	%
Stone Above Chambers	(12 inch min.)	12	inches
Stone Foundation Depth	(9 inch min.)	36	inches
Average Cover over Chambers	(24 inch min.)	24	inches
Bed size controlled by WIDTH or LENGTH?		WIDTH	
Limiting WIDTH or LENGTH dimension		35	feet
Storage Volume per Chamber		195.5	CF
Storage Volume per End Cap		137.7	CF

System Sizing

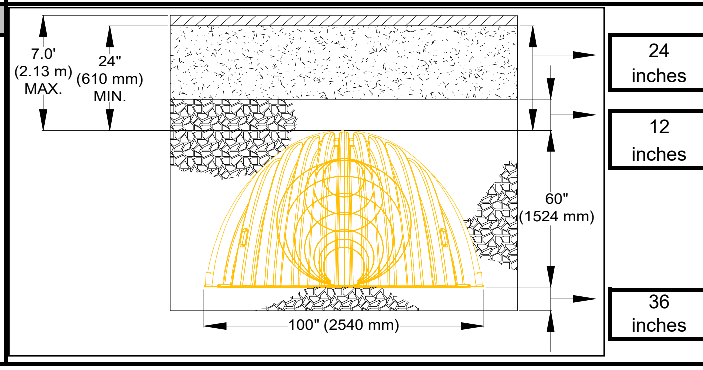
Number of Chambers Required	98	each
Number of End Caps Required	6	each
Bed Size (including perimeter stone)	3,933	square feet
Stone Required (including perimeter stone)	1299	tons
Volume of Excavation	1457	cubic yards
Non-woven Filter Fabric Required (20% Safety Factor)	1453	square yards
Length of Isolator Row	139.9	feet
Woven Isolator Row Fabric (20% Safety Factor)	384	square yards
Installed Storage Volume	19,985	cubic feet

Controlled by Width (Rows)

Maximum Width = 35 feet

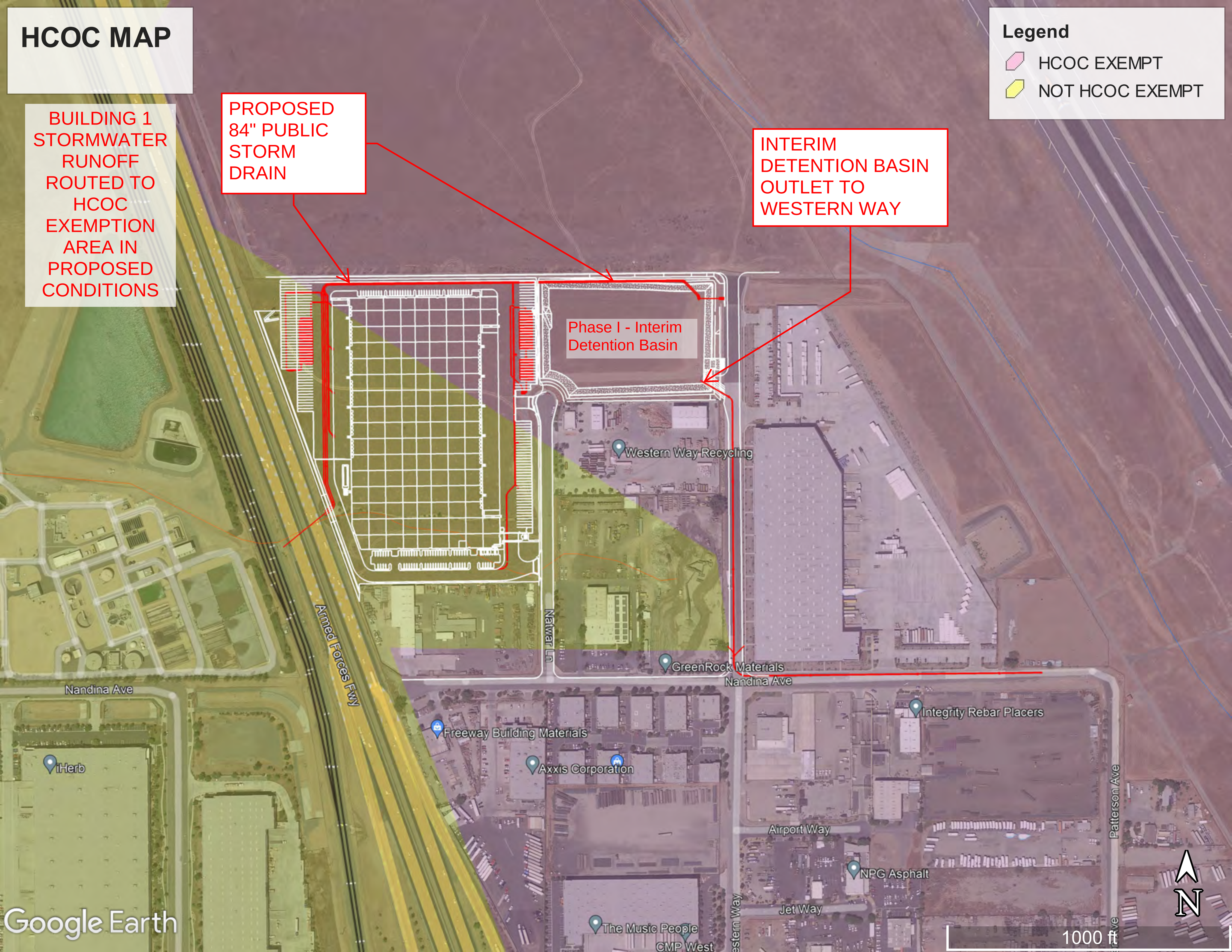
2 rows of 33 chambers
1 row of 32 chambers

Maximum Length = 139.9 feet
Maximum Width = 28.5 feet



Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern


HCOC MAP
Legend
HCOC EXEMPT
NOT HCOC EXEMPT
BUILDING 1 STORMWATER RUNOFF ROUTED TO HCOC EXEMPTION AREA IN PROPOSED CONDITIONS
PROPOSED 84" PUBLIC STORM DRAIN
INTERIM DETENTION BASIN OUTLET TO WESTERN WAY
Phase I - Interim Detention Basin
Western Way Recycling
Natwar Ln
Armed Forces Fwy
GreenRock Materials
Nandina Ave
Nandina Ave
Integrity Rebar Placers
Freeway Building Materials
Axxis Corporation
iHerb
Airport Way
Patterson Ave
NPG Asphalt
Jet Way
The Music People
CMP West
Google Earth
1000 ft
N

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

Appendix 9: O&M

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

Appendix 10: Educational Materials

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