Recording requested by and mail to:

City Clerk
City of Beaumont
550 E. Sixth Street
Beaumont, CA 92223

SPACE ABOVE THIS LINE FOR RECORDER'S USE
EXEMPT FROM RECORDER'S FEES PURSUANT TO GOVERNMENT CODE SECTION 6103 AND 27383

APN: 417-220-009

STORM WATER MANAGEMENT WQMP/BMP FACILITIES

COVENANT AND AGREEMENT NO.

City of Beaumont, Riverside County, California

THIS COVENANT AND AGREEMENT is made and entered into this 24th of 2025, by and between LARRY AGUILERA and VERONICA E. AGUILERA, Trustees of The Larry Aguilera and Veronica E. Aguilera Revocable Trust dated November 12 2021, ("Owner"), and the City of Beaumont, California, ("City").

The Owner hereby certifies I am (we are) the sole owner of certain real property located at 371 RISCO CIRCLE (Site Address) in the City of Beaumont, County of Riverside, State of California, more specifically described in **Exhibit "A"** and depicted in **Exhibit "B"** ("Property").

The Owner covenants and agrees to comply with the Project Water Quality Management Plan ("WQMP"), attached hereto as **Exhibit "C"**, providing for storm water quality treatment within the confines of the Property.

The Owner covenants and agrees that the health, safety and welfare of the residents of the City of Beaumont, require that the Best Management Practice ("BMP") facilities, more specifically described in the WQMP (for example bio- swales, catch basins, roof drains and appurtenances) be constructed and maintained to minimize pollutants in urban runoff by the Owner.

The Owner further covenants and agrees as follows:

1. The on-site storm water management/BMP facilities mentioned above shall be constructed by the Owner at its sole cost and expense, in accordance with the plans and specifications identified in the WQMP approved by City.

2. The Owner shall adequately maintain the storm water management/BMP facilities in a manner assuring peak performance at all times, including source control BMPs at all times as its sole responsibility, at its sole cost and expense. This includes all pipes and channels built to convey storm water on the Property, including catch basin inserts, underground detention ponds, swales and vegetation provided to control the quantity and quality of the

storm water. Adequate maintenance is herein defined as good working condition so that these facilities are performing in accordance with their design functions continuously at all times.

3. The Owner shall annually inspect the storm water management/BMP facilities mentioned above and submit an inspection report annually to the Public Works Department by the anniversary of the date of this Agreement of each year. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the storm water management BMPs listed in the WQMP such as bioswales, catch basins and related filter units, etc. Deficiencies shall be noted in the inspection report and corrected by Owner promptly.

4. The Owner hereby grants permission to City, its authorized agents and employees, to enter upon the Property and to inspect the storm water management/BMP facilities, take samples and perform testing whenever the City deems necessary and as required by the City's most current National Pollutant Discharge Elimination System (NPDES) Permit. The purpose of the inspection, testing and sampling is to follow up on apparent and reported deficiencies and/or to respond to citizen complaints and meet the requirements of the City's NPDES Permit issued by the State Water Resources Control Board – Santa Ana River Region. The City shall provide the Owner with advanced notice of entering upon the Property, except in the event of an emergency, as determined by the City. The City shall provide the Owner copies of the inspection findings and a directive to commence with the repairs if necessary. Owner or Owner's successors or assigns shall pay City for all costs incurred by City in the inspection, sampling, testing of the BMPs within thirty (30) calendar days of City invoice.

5. In the event the Owner fails to maintain the storm water management/BMP facilities in good working condition acceptable to the City, upon five (5) days advanced written notice, the City may enter upon the Property and take whatever steps necessary to correct deficiencies identified in any inspection report and to charge the costs of such repairs to the Owner the cost of which shall constitute a lien against the Property. In the event of an emergency, as determined by City, advanced notice as aforesaid, shall not be required. Notwithstanding the forgoing, it is expressly understood and agreed that the City is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation to the City.

6. The Owner will perform the work necessary to keep these facilities in good working order as appropriate. The maintenance schedule for the storm water management BMP facilities (including sediment removal) is outlined in the approved WQMP and the schedule must be followed at all times. In the future, City of Beaumont may adopt an annual Stormwater Inspection Fee that would be assessed to the Owner.

7. In the event the City, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials and the like, the Owner, its successors and assigns shall reimburse the City upon demand, within thirty (30) days of receipt thereof for all actual costs incurred by the City hereunder.
8. This Agreement imposes no liability of any kind whatsoever on the City. Owner agrees to indemnify, defend (with counsel reasonably approved by the City) and hold harmless the City and its authorized officers, employees, agents and volunteers from any and all claims, actions, losses, damages, and/or liability arising out of this Agreement from any cause whatsoever, including the acts, errors or omissions of any person and for any costs or expenses incurred by the City on account of any claim except where such indemnification is prohibited by law. This indemnification provision shall apply regardless of the existence or degree of fault of indemnitees. The Owner's indemnification obligation applies to the City's "active" as well as "passive" negligence but does not apply to the City's "sole negligence" or "willful misconduct" within the meaning of Civil Code Section

2782, or to any claims, actions, losses, damages, and/or liabilities, to the extent caused by the acts or omissions of any third party contractors undertaking any work (other than field inspections) or other maintenance on the Property on behalf of the City under this Agreement.

9. This Agreement shall be recorded with the County Recorder for the County of Riverside and shall constitute a covenant running with the land, equitable servitude and lien against the Property, and shall be binding on the Owner, its successors, assigns, transferees, administrators, executors, heirs, encumbrancers and any other successors in interests, including any homeowner's association.

10. In addition to any remedy available to City under this Agreement, if Owner violates any term of this Agreement and does not cure the violation within the time already provided in this Agreement, or, if not provided, within thirty (30) calendar days, or within such time authorized by the City if said cure reasonably requires more than the subject time, the City may bring an action at law or in equity in a court of competent jurisdiction to enforce compliance by the Owner with the terms of this Agreement. In such action, the City may recover any damages to which the City may be entitled for the violation, enjoin the violation by temporary or permanent injunction without the necessity of proving actual damages or the inadequacy of otherwise available legal remedies, or obtain other equitable relief, including, but not limited to, the restoration of the Property and/or the BMPs identified in the WQMP to the condition in which it/they existed prior to any such violation or injury.

11. Owner shall provide printed educational materials with any sale of the Property which provide information on what storm water management facilities are present, the types and locations of maintenance signs that are required and how the necessary maintenance can be maintained.

12. Owner shall provide actual notice of this Agreement and its terms to any respective buyers or successor(s) in interest.

13. In order to be valid, amendment or change to this Agreement including the WQMP and BMPs requires an amendment executed by the City and Owner which is recorded with the Riverside County Recorder.

WITNESS the following signatures:

OWNER: LARRY AGUILERA AND VERONICA E. AGUILERA REVOCABLE TRUST DATED NOV. 12 2021

By: _____ By: _____

Name: LARRY AGUILERA Jr. Name: VERONICA E. AGUILERA

Title: TRUSTEE Title: TRUSTEE

Organization: _____ Organization: _____

All signatures on this Agreement on behalf of the Owner must be acknowledged before a Notary Public. In the event that the owner is a corporation, the President/Vice President and the corporate secretary of the corporation must sign.

City:

CITY OF BEAUMONT
a Municipal Corporation

Signature: _____
City Manager

ATTEST:

Signature: _____
City Clerk

APPROVED AS TO FORM:

Signature: _____
John Pinkney, City Attorney

APPROVED AS TO CONTENT:

Signature: _____
Robert Vestal, Director of Engineering/Public Works

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

State of California)
County of Riverside)

On Nov. 24, 2025, before me, KARINA LISETTE CISNEROS, Notary Public, notary public, personally appeared Larry Aguilera who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.
WITNESS my hand and official seal.

Signature: _____ (Seal)

KARINA LISETTE CISNEROS
Comm. # 2493289
County of RIVERSIDE
California - Notary Public
Comm. Expires JUNE 28, 2028
NXC1

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

State of California)
County of Riverside)

On Nov. 24, 2025 before me, KARINA LISETTE CISNEROS, Notary Public, notary public, personally appeared Veronica Aguilera who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.
WITNESS my hand and official seal.

Signature: _____ (Seal)

KARINA LISETTE CISNEROS
Comm. # 2493289
County of RIVERSIDE
California - Notary Public
Comm. Expires JUNE 28, 2028
NXC1

to and not in limitation of any other warranty or remedy required by law or by the Contract Documents. If the Contract Documents and the work includes original construction of individual dwelling units to be sold, Subcontractor warrants that its work will comply in all respects with the standards of construction set forth in Title 7 of the California Civil Code, 895 et seq.

SECTION 18. SPECIAL PROVISIONS. (Including unit pricing, if applicable):
Contractors are required by law to be licensed and regulated by the Contractors State License Board which has Jurisdiction to investigate complaints against contractors if a complaint regarding a patent act or omissions is filed within four years of the date of the alleged violation. A complaint regarding a latent act or omissions pertaining to structural defects must be filed within 10 years of the date of the alleged violations. Any questions concerning a Contractor may be referred to the Registrar, Contractors State License Board, P.O. Box 26000, Sacramento, California, 95826.

Dated: 10.14.25

CONTRACTOR:

Pence Construction, Inc.

By: _____
Rick Pence - President

P.O. Box 7550, Redlands, Ca. 92373
(Address)

589075
(Contractor's License No)

Dated: 10/15/25

SUBCONTRACTOR:

Industry Coatings

By: _____
Neal Perry, President

10722 Arrow Route Suite 202
(Address) Rancho Cucamonga, CA 91730

928248
(Contractor's License No)

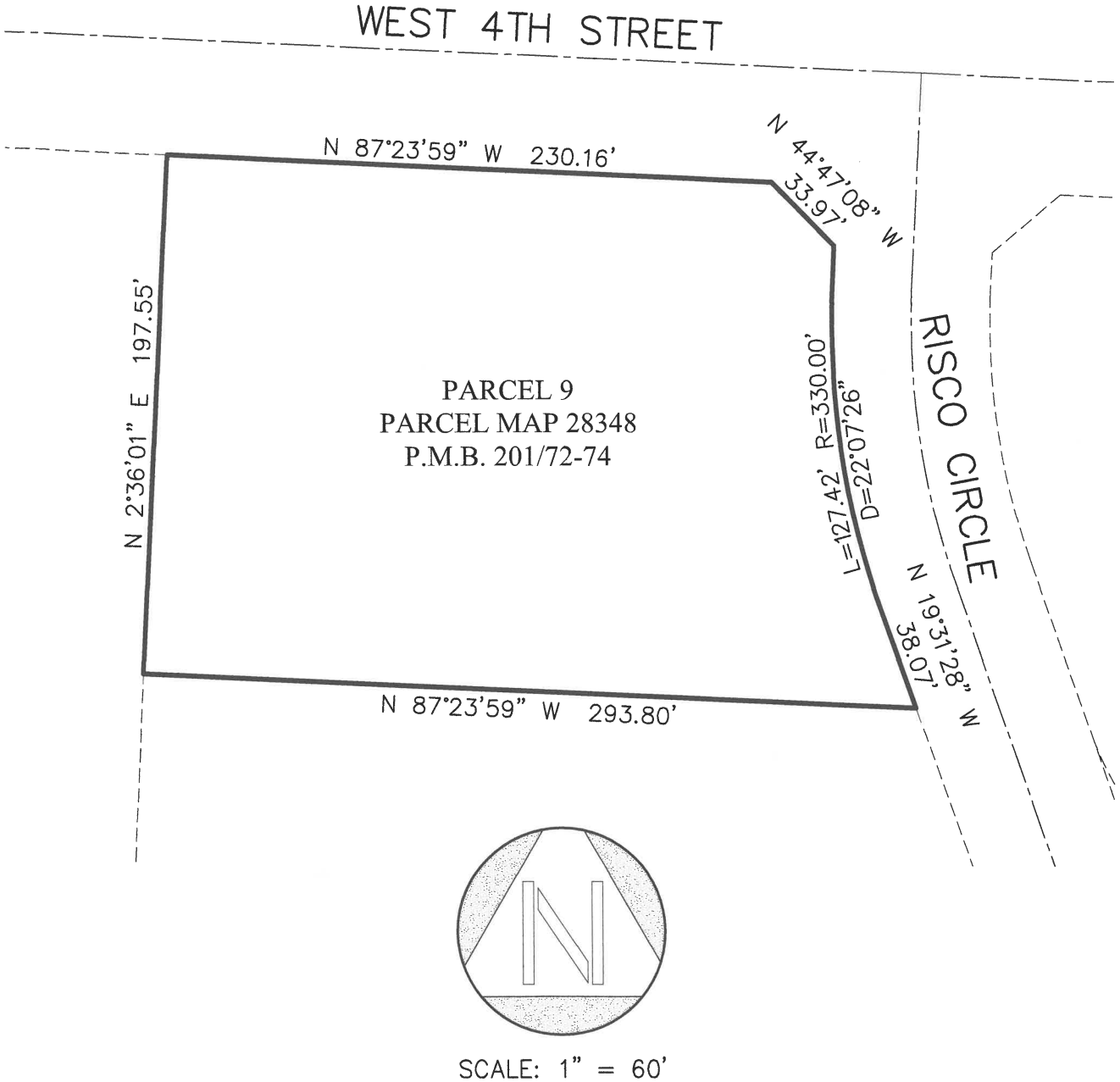
NOTE: This document has important legal consequences. Consultation with an attorney prior to execution of this document is encouraged. Some construction prime contracts may require the use of specialized provisions not included in this form.

EXHIBIT "A"
LEGAL DESCRIPTION

PARCEL 9 OF PARCEL MAP 28348, IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 201, PAGES 72 THROUGH 74 INCLUSIVE OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

APN: 417-220-009

EXHIBIT "B"
DIAGRAM OF PROPERTY



SCALE: 1" = 60'

EXHIBIT "C"
WQMP

Project Specific Water Quality Management Plan

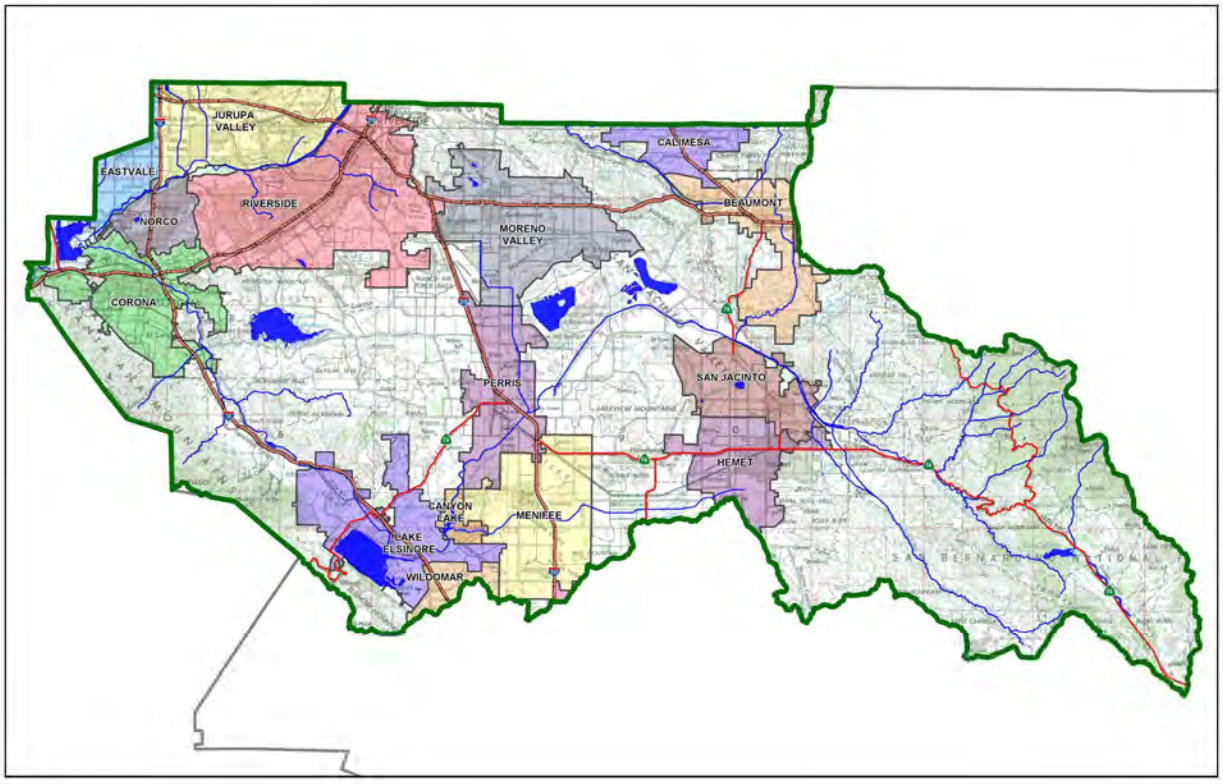
*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

No further comments -
Recommended for approval
Sarah.Seitz
NV5 09/25/2025

Project Title: AA FENCE WAREHOUSE

Development No: Parcel 7 of Parcel Map No. 35611 - City of Beaumont

Design Review/Case No: PLAN2022-0854 / PW2023-1088



☐ **Preliminary**
☒ **Final**

Original Date Prepared: FEBRUARY 12, 2025

Revision Date(s): AUGUST 5, 2025
SEPTEMBER 18, 2025

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

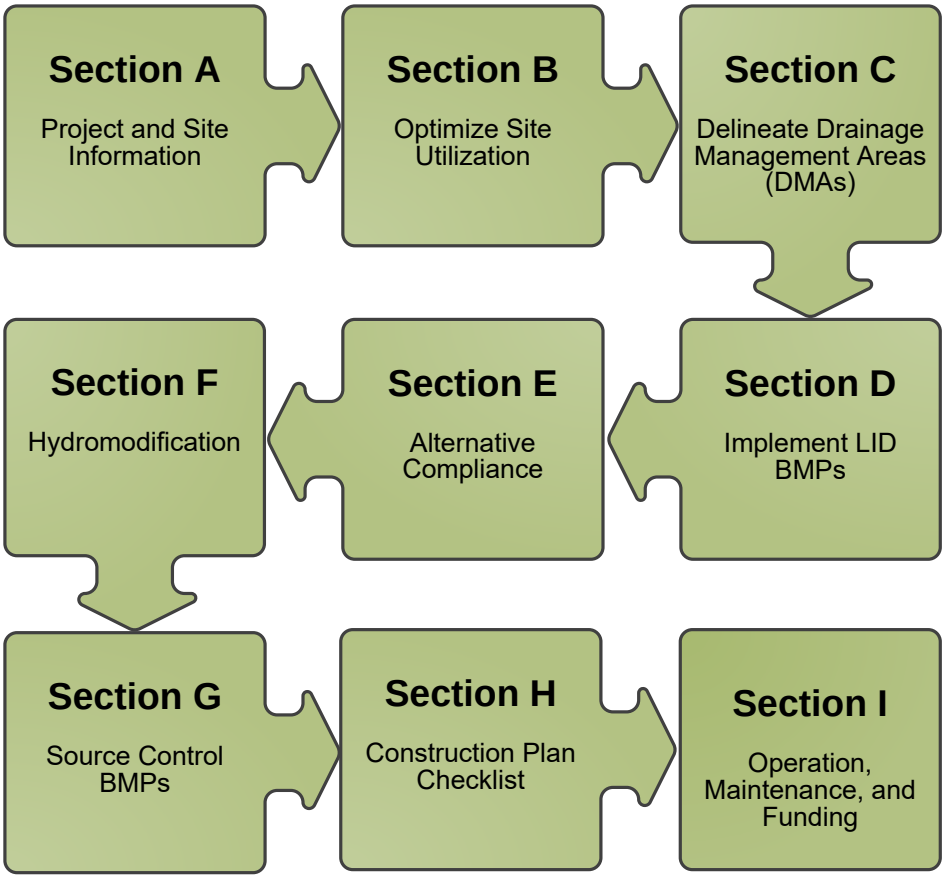
Contact Information:

Prepared for:
MR. Larry Aguilera
320 E. 3rd Street
Beaumont, CA 92223
PH: (951) 538-9424

Prepared by:
Sitetech, Inc.
8061 Church Street
P.O. Box 592
Highland, CA 92346
PREPARER: BERNIE MAYER
PH: (909) 863-3180

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 MR. Larry Aguilera by SITETECH INC. for the AA FENCE WAREHOUSE project.

This WQMP is intended to comply with the requirements of CITY OF BEAUMONT for ORDINANCE NO. 14.08 and per COUNTY OF RIVERSIDE for ORDINANCE NO. 754.2 which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under CITY OF BEAUMONT Water Quality Ordinance (Municipal Code Section 14.08).

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

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

PREPARER'S CERTIFICATION

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

Preparer's Signature	SEPTEMBER 18, 2025 Date
BERNHARD K. MAYER Preparer's Printed Name	PRESIDENT Preparer's Title/Position

Preparer's Licensure:

Table of Contents

List of Tables

List of Appendices

Section A: Project and Site Information

PROJECT INFORMATION			
Type of Project:	Manufacturing		
Planning Area:	I - Industrial		
Community Name:	Beaumont		
Development Name:	AA Fence Warehouse		
PROJECT LOCATION			
Latitude & Longitude (DMS):	33.68450°, -117.36706°		
Project Watershed and Sub-Watershed:	Santa Ana River Watershed & San Jacinto River Subwatershed		
Gross Acres: 1.20 APN(s): 417-220-009			
Map Book and Page No.: Thomas Guide, pg. no. 720, grid F3			
PROJECT CHARACTERISTICS			
Proposed or Potential Land Use(s)	Contracting & Building Material Storage,	Construction Services	
Proposed or Potential SIC Code(s)		3446	
Area of Project Footprint (SF)		52,272	
Disturbed Area (SF)		52,272	
Total Area of proposed Impervious Surfaces within the Project Footprint (SF)/or Replacement		41,810	
Does the project consist of offsite road improvements?		☐ Y	☒ N
Does the project propose to construct unpaved roads?		☐ Y	☒ N
Is the project part of a larger common plan of development (phased project)?		☐ Y	☒ N
EXISTING SITE CHARACTERISTICS			
Total area of existing Impervious Surfaces within the Project limits Footprint (SF)		0	
Is the project located within any MSHCP Criteria Cell?		☐ Y	☒ N
If so, identify the Cell number:			
Are there any natural hydrologic features on the project site?		☐ Y	☒ N
Is a Geotechnical Report attached?		☐ Y	☒ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)		C	
What is the Water Quality Design Storm Depth for the project?		0.82	

The project proposes to construct of a new building, cement concrete pavement, curbs, gutters and ornamental landscaping. Additional improvements will include striping for parking and a Bio-Retention Basin. A portion of the existing curb & gutter in the public right-of-way will need to be altered due to the proposal of (2) driveway approaches.

This 1.20-acre development is Parcel 9, shown on Parcel Map No. 28348. The proposed site can be broken down one distinct drainage management area, DMA-1. DMA-1 consists of the full disturbed area of the development and includes the Bio-Retention Basin that will be used to treat the stormwater runoff produced in DMA 1. Stormwater generated from DMA 1 will sheet flow southerly and concentrated via curbs and gutters where stormwater will be directed to flow through the Bio-Retention Basin before it outlets through a parkway drain onto Risco Circle. The underground storage tank is for 100-Year runoff mitigation only per the drainage study done for this project. There will be 2 sump pumps proposed, one to pump out the treated water from the Bio-Retention Basin underdrain and one to pump out the mitigated runoff from the storage tank. Both pumps will have outlet pipes cored through a concrete "u" channel and will outlet through the parkway drain onto Risco Circle.

A.1 Maps and Site Plans

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

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

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

A.2 Identify Receiving Waters

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

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
San Timoteo Creek, Reach 3	None	GWR, REC1, REC2, WARM, WILD	None
San Timoteo Creek, Reach 2	None	GWR, REC1, REC2, WARM, WILD	None
San Timoteo Creek, Reach 1	None	GWR, REC1, REC2, WARM, WILD	None
San Ana River, Reach 5	None	AGR, GWR, MUN, RARE, REC!, REC2, WARM, WILD	None
San Ana River, Reach 4	None	GWR, REC1, REC2, WARM, WILD	None
San Ana River, Reach 3	None	GWR, REC1, REC2, WARM, WILD	None
Prado Dam	pH	RARE, REC1, REC2, WARM, WILD	None
Santa Ana River, Reach 2	Indicator Bacteria	AGR, GWR, RARE, REC1, REC2, WARM, WILD	21.5± Miles
Santa Ana River, Reach 1	None	BIOL, REC1, WARM, REC2, WILD	None
Pacific Ocean	None	None	None

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 Beaumont Grading Permit	☒ Y	☐ N
Other *(please list in the space below as required)* City of Beaumont 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.

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

Site Optimization

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

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

> The existing drainage patterns will be partially preserved. Existing stormwater runoff generally flows from the northeast to the southwest corner at average grades of 1% to 3%. The proposed drainage will continue to flow from the north to south, but the existing low point will be relocated to the southeast corner after grading is complete. Runoff will discharge onto Risco Circle through a parkway drain.

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

> No. The lot is currently vacant with overgrown natural vegetation, this will be replaced with 80% impervious area and 20% proposed landscaping.

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

No. Adding 41,810 sq. ft. of impervious surface to the site. The existing soils characteristics have poor infiltration so a Bio-Retention Basin is need for treatment BMPs.

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

Yes. The drive aisles and parking stalls are designed to minimum width and length requirements. The proposed development will include 10,462 square feet of pervious area.

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

Yes. Roof drains will directly discharge into adjacent landscaped areas around proposed building. Remaining runoff will sheet flow to curb & gutters that will direct stormwater into the Bio-Retention Basin.

Section C: Delineate Drainage Management Areas (DMAs)

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

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1][2]	Area (Sq. Ft.)	DMA Type
D1	ROOF	17,819	D
D2	CONCRETE	23,991	D
D3	LANDSCAPING	10,462	D

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

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

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
N/A	N/A	N/A	N/A

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

Self-Retaining Area				**Type 'C' DMAs that are draining to the Self-Retaining Area**		
DMA Name/ ID	Post-project surface type	Area (square feet) [A]	Storm Depth (inches) [B]	DMA Name / ID	[C] from Table C.4 = [C]	Required Retention Depth (inches) [D]
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	Impervious fraction [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
D1	BMP-1 BIO-RETENTION BASIN
D2	BMP-1 BIO-RETENTION BASIN
D3	BMP-1 BIO-RETENTION BASIN

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

Section D: Implement LID BMPs

D.1 Infiltration Applicability

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

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

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

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Co-permittee 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: DMA-1		
…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.

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

Irrigation Use Feasibility

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

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

Total Area of Irrigated Landscape: 10,390

Type of Landscaping (Conservation Design or Active Turf): CONSERVATION DESIGN

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

Total Area of Impervious Surfaces: 41,810

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: 1.98

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: 20,572

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)
20,0572	10,390

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: 8

Project Type: COMMERCIAL

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

Total Area of Impervious Surfaces: 0.96 ACRES

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

Enter your TUTIA factor: 171

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: 164

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)
164	8

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.

NO

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

Average Daily Demand: N/A

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

Total Area of Impervious Surfaces: N/A

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

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

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

Minimum required use: N/A

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

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

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

D.3 Bioretention and Biotreatment Assessment

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

Select one of the following:

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

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

D.4 Feasibility Assessment Summaries

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

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
D1	☐	☐	☒	☐	☐
D2	☐	☐	☒	☐	☐
D3	☐	☐	☒	☐	☐

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**	***Enter BMP Name / Identifier Here*** ***Underground Infiltration Chambers / INF-1***		
	[A]		[B]	[C]	[A] x [C]			
D1	17,819	Roofs	1.0	0.89	15,894.5	*Design Storm Depth (in)*	*Design Capture Volume,* $\mathbf{V_{BMP}}$ *(cubic feet)*	*Proposed Volume on Plans (cubic feet)*
D2	23,991	Conc/Asph	1.0	0.89	21,000.0			
D3	10,462	Landscaping	0.1	0.11	1155.6			
	$A_T = \Sigma[A]$ 52,272				Σ= [D] 38,450.1	[E] 0.82	$[F] = \frac{[D]x[E]}{12}$ 2,627.4	[G] 4,537

[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

BMP1 – BIO-RETENTION BASIN SIZING – SEE NEXT PAGE

AAA FENCE WAREHOUSE - BIORETENTION SYSTEM

Amended Soil Infil. Rate (in/hr)	5		Basin Footprint (ft^2)	1269
Amended Soil Factor of Safety	2		Amended Soil Depth (ft)	3.00
Amended Soil Design Infil. Rate (in/hr)	2.5		Amended Soil Porosity	30%
Drawdown Time (hr)	48		Gravel Depth (ft)	4.50
Maximum Ponding Depth (ft)	0.5		Gravel Porosity	40%
Design Ponding Depth (ft)	0.5		Duration of Storm (hr)	3

Results

Design Capture Volume (ft^3)	=	2627
Total Biotreated Volume (ft^3)	=	4537
$V_{BMP} > V_{DCV}$???	=	YES

	=	INPUT DATA
	=	CALCULATED DATA

* Treated Volume = Soil Footprint x [(Design Ponding Depth / 2) + (Soil Depth x Soil Porosity) + (Gravel Depth x Gravel Porosity) + (Duration of Storm x (Soil Design Infiltration Rate / 12))]

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[(1)]	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[(1)]	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]
Total Credit Percentage[1]	

[1]*Cannot Exceed 50%*

[2]*Obtain corresponding data from Table 3-8 in the WQMP Guidance Document*

E.3 Sizing Criteria

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

Table E.3 Treatment Control BMP Sizing

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

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

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

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

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

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

E.4 Treatment Control BMP Selection

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

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

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

Table E.4 Treatment Control BMP Selection

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

[1] Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.

[2] Cross Reference Table E.1 above to populate this column.

[3] As documented in a Co-Permittee Approved Study and provided in Appendix 6.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

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

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

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

If Yes, HCOC criteria do not apply.

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

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

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

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

Table F.1 Hydrologic Conditions of Concern Summary

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

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

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

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

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

F.2 HCOC Mitigation

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

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

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

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

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

PRE-DEVELOPED RUNOFF VOLUME FROM A 2-YEAR STORM IS 0. THE RAINFALL INTENSITY (0.584 IN/HR) IS LESS THAN THE INFILTRATION RATE (1.22 IN/HR) SO ALL OF THE 2-YEAR STORM WILL INFILTRATE INTO THE EXISTING CONDITION. THE DEVELOPED CONDITION PRODUCES 1,844 CUBIC FEET. THE PROPOSED BIO-RETENTION BASIN CAPACITY IS 4,537 CUBIC FEET. THE BASIN HOLDS THE ENTIRE 2-YEAR STORM – NO FURTHER HCOC MITIGATION REQUIRED. SEE THE HYDROGRAPH AND RELATED INFORMATION IN APPENDIX 7.

Section G: Source Control BMPs

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

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

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

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

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

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
Curb-Opening Basin Inlet	Mark top of curb near bio-retention basin inlets with the words "Only Rain Down the Storm Drain" or similar. Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.	Maintain and periodically repaint or replace inlet markings. Provide stormwater pollution prevention information to new site owners, lessees, or operators. See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit

		materials so as to create a potential discharge to storm drains."
Need for Future Indoor & Structural Pest Control	Note building design features that discourage entry of pests.	Provide Integrated Pest Management (IPM) information to owners, lessees, and operators.
Landscape / Outdoor Pesticide Use	No native trees or significant vegetation exists on site. Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. Consider using pest-resistant plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	Maintain landscaping using minimum or no pesticides. See applicable operational BMPs in "What you should know for…..Landscape and Gardening". Provide Integrated Pest Management information to new owners, lessees and operators.
Refuse Areas	Slope refuse area to drain and prevent surrounding runoff from entering refuse area. Signs to be posted on or near dumpsters with the words "Do not dump hazardous materials here"	Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
Roofing, Gutters, & Trim	Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.	None
Plazas, Sidewalks, and Parking Lots	None	Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Sump Pump	Captured and Treated DCV will be discharged with subdrains to the sump pump System. The sump pump will pump the treated DCV to the Parkway drain which will convey the DCV to Risco Circle.	Inspect sump pump on a quarterly basis, once being before the rainy season (oct. 1st). Make sure pump is operational and maintain per installed pump's manufacturers recommendations
Oils & Greases	Bio-Retention Basin	Inspect semi-annually at beginning and end of wet season to identify potential problems such as erosion of the slopes near around the basin. Remove accumulated trash/debris at the start and end of the wet season Inspect for standing water at the end of the wet season and by inspecting within 48 hours of significant rain events. Check for surface ponding. If ponding occurs, provide a fresh infiltration surface by excavating and replacing 2-4 inches of soil.
Sediment	Bio-Retention Basin	Inspect semi-annually at beginning and end of wet season to identify potential problems such as erosion of the slopes near around the basin. Remove accumulated trash/debris at the start and end of the wet season Inspect for standing water at the end of the wet season and by inspecting within 48 hours of significant rain events. Check for surface ponding. If ponding occurs, provide a fresh infiltration surface by excavating and replacing 2-4 inches of soil.
Metals	Bio-Retention Basin	
Bacteria & Viruses	Bio-Retention Basin	
Nutrients	Bio-Retention Basin	
Oxygen Demanding Substances	Bio-Retention Basin	
Hydromodification	Bio-Retention Basin holds the excess runoff produced when comparing the pre-developed condition to the developed condition. See drainage study in Appendix 7.	Inspect semi-annually at beginning and end of wet season to identify potential problems such as erosion of the slopes near around the basin. Remove accumulated trash/debris at the start and end of the wet season Inspect for standing water at the end of the wet season and by inspecting within 48 hours of significant rain events. Check for surface ponding. If ponding occurs, provide a fresh infiltration surface by excavating and replacing 2-4 inches of soil

Section H: Construction Plan Checklist

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

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)	BMP Location (Lat/Long)
BMP1	BIO-RETENTION BASIN	CONCEPTUAL GRADING SHT. 2	33.925719 / -116.996360

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

Section I: Operation, Maintenance and Funding

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

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

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

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

Maintenance Mechanism:

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

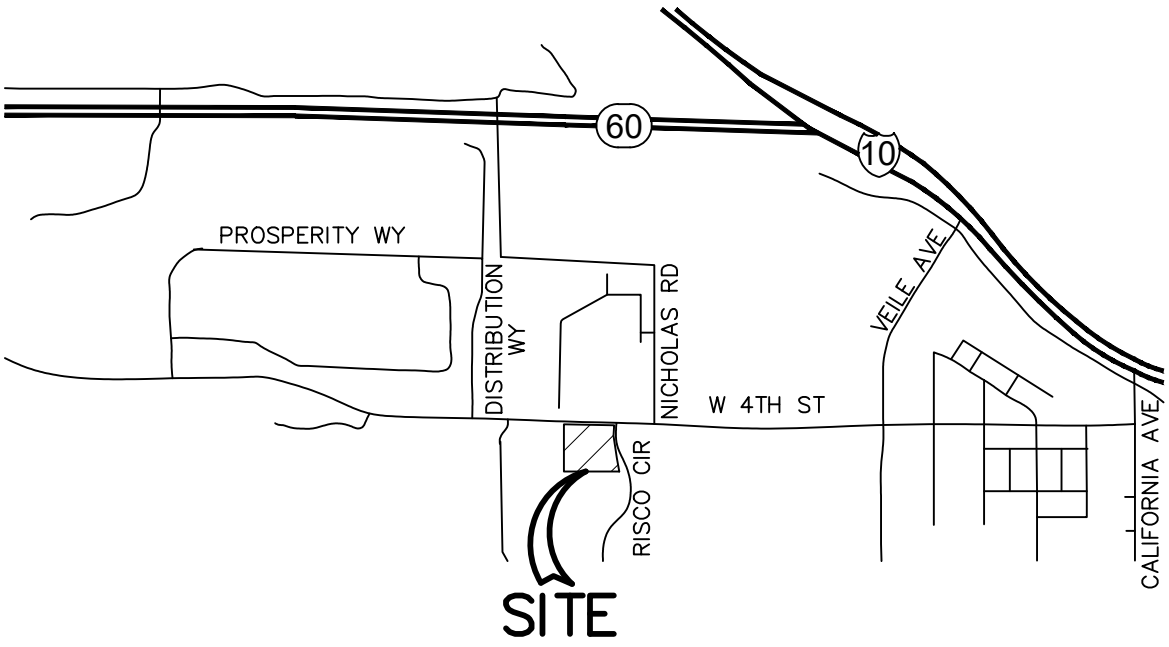
☐ Y ☒ N

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.

O&M FUNDING INFORMATION TO BE PROVIDED ON FINAL WQMP

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

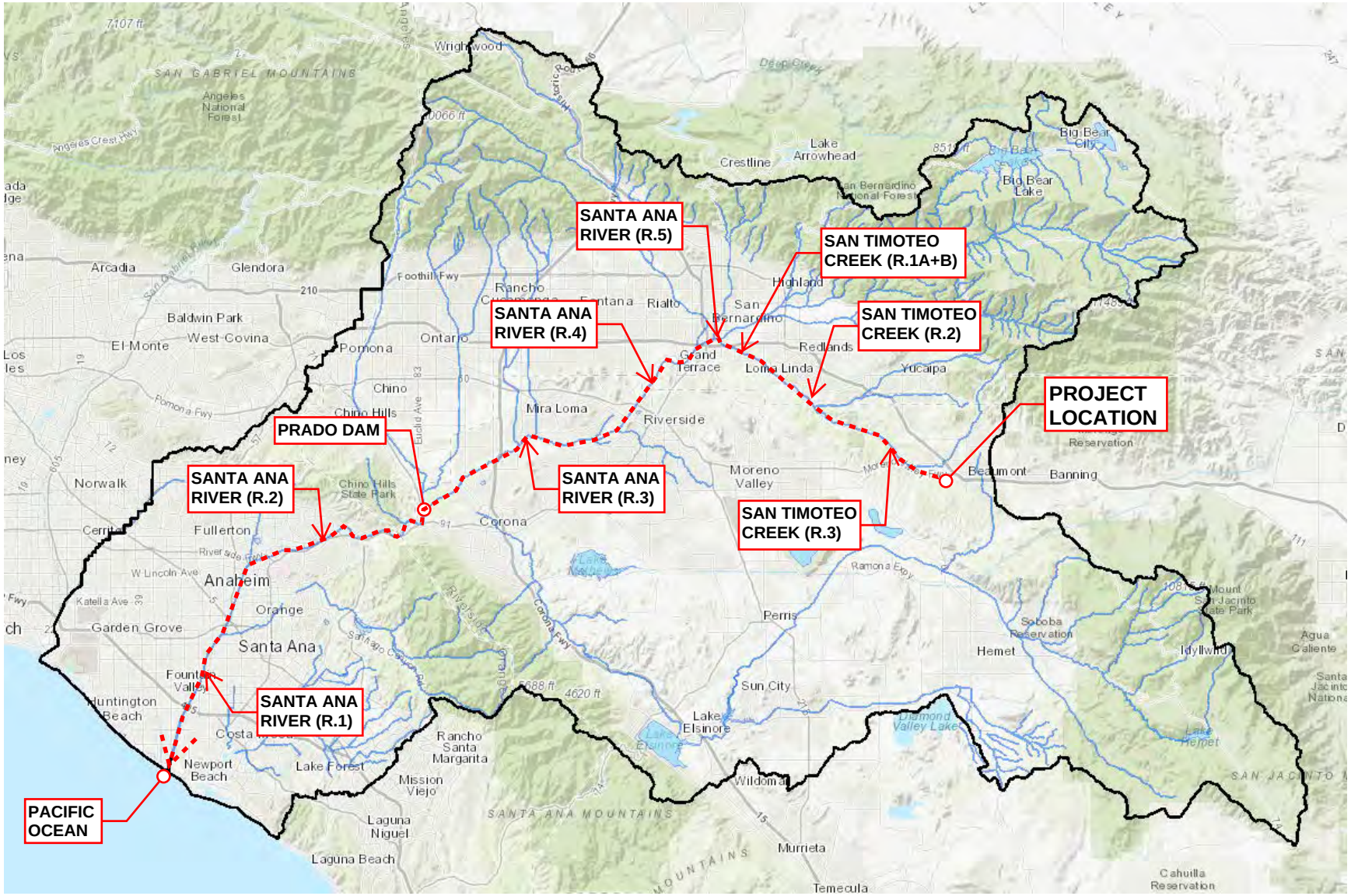


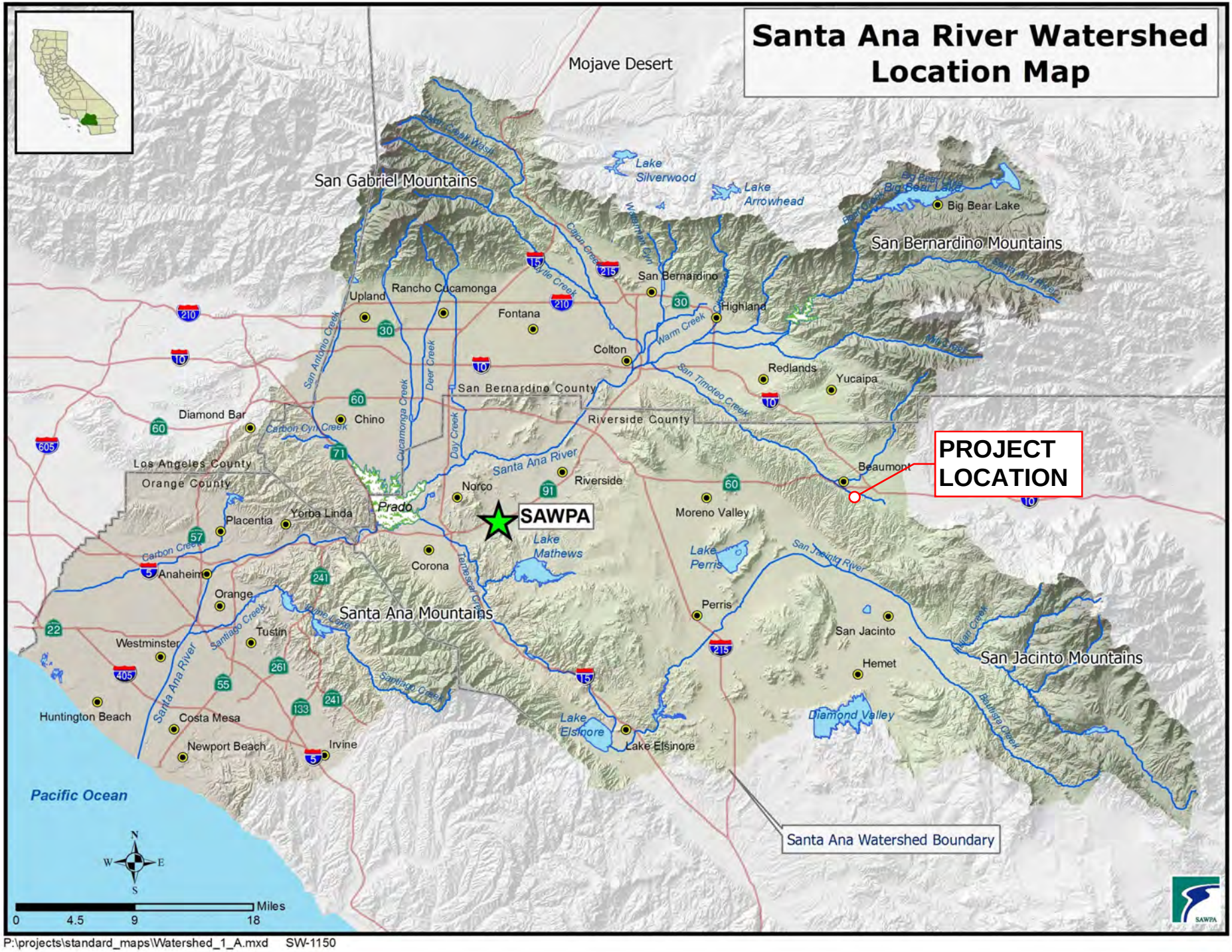
VICINITY MAP

NO SCALE

RECEIVING WATERS MAP

sawpa.net





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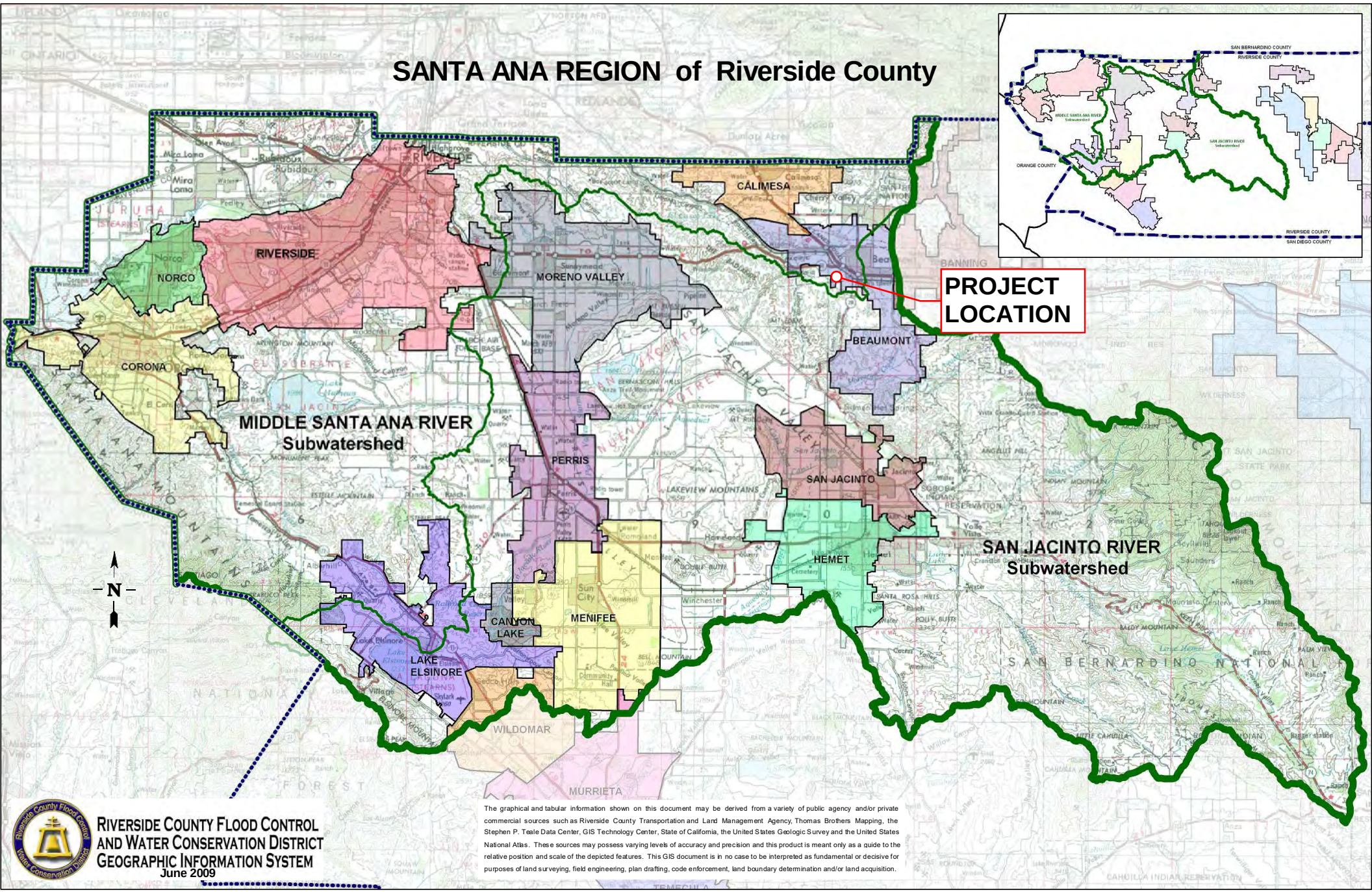


RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
GEOGRAPHIC INFORMATION SYSTEM
June 2009

CITY OF BEAUMONT
FINAL WQMP
AA FENCE WAREHOUSE
APN 417-220-009
4TH SREET & RISCO CIRCLE

WATER QUALITY MANAGMENT NOTES:

1. CONSTRUCT 4,537 C.F. BIO-RETENTION BASIN PER DETAIL (2,627 C.F. REQ'D)
2. INSTALL 36" NDS DRAIN BASIN WITH GRATED INLET WITH ZOELLER CAST IRON SUBMERSIBLE SUMP PUMP.
3. INSTALL "NO DUMPING – DRAINS TO RIVER" ON CURB NEAR BIO-FILTRATION BASIN INLET AND OUTLET PER DETAIL.
4. INSTALL UNDER SIDEWALK DRAIN PER RIVERSIDE STD. PLAN NO. 309.
5. CONSTRUCT ROOF DRAIN DOWNSPOUTS TO OUTLET ONTO SPLASH PAD, PER DETAIL ON THIS SHEET.
6. GRADE AND INSTALL LANDSCAPE ADJACENT TO HARDSCAPE AT 1" MINIMUM SUMP, PER DETAIL.
7. INSTALL AND MAINTAIN EFFICIENT IRRIGATION OF LANDSCAPED AREAS PER CASQA BMP SD-12.
8. COVERED TRASH ENCLOSURE TO BE MAINTAINED PER CASQA BMP SD-32.
9. PERFORM PARKING LOT / DRIVEWAY SWEEPING ON A MONTHLY BASIS.
10. PROVIDE 3' WIDE CURB OPENING FOR STORMWATER INLET AND OUTLET.
11. INSTALL 12" THICK RIP-RAP DOWN-DRAIN/SPLASH PAD PER DETAIL.
12. INSTALL LANDSCAPED SWALE AT 1.0% MINIMUM GRADE.
13. CONSTRUCT LONGITUDINAL GUTTER PER S.P.P.W.C. STD. 122-2.
14. 3" FORCED DRAIN FROM SUMP PUMP TO CATCH BASIN.
15. INSTALL 6" NDS SPEE-D CATCH BASIN WITH 4" P.V.C. DRAIN PIPE – CORE THROUGH CONCRETE "U" CHANNEL FOR SUMP PUMP OUTLET.
16. INSTALL 12" THICK RIP-RAP AT BASIN OVERFLOW OUTLET.
17. CONSTRUCT 4' WIDE BY 6" DEEP CONCRETE "U" CHANNEL PER DETAIL.
18. 15,000 GAL. STORM WATER TANK FOR RUNOFF MITIGATION – NOT A PART OF WATER QUALITY MITIGATION
19. 12" H.D.P.E. STORM DRAIN TO TANK – NOT A PART OF WATER QUALITY
20. 4" P.V.C. DRAIN PIPE AT 1.0% MIN. TO CONNECT WALL SUB-DRAIN TO SUMP PUMP

LEGAL DESCRIPTION:

PARCEL 9 OF PARCEL MAP NUMBER 28348 IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA. LOCATED IN A SUBDIVISION OF A PORTION OF THE NORTH HALF OF THE SOUTHWEST QUARTER OF SECTION 9, TOWNSHIP 3 SOUTH, RANGE 1 WEST, SAN BERNARDINO BASE AND MERIDIAN, AS SHOWN ON MAP FILED IN BOOK 201, PAGES 72 THROUGH 74 INCLUSIVE OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

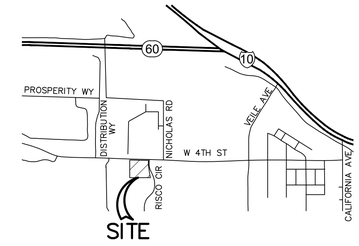
APN: 417-220-009

AREA OF PROPOSED SURFACES:

TOTAL AREA (EXISTING):	52,220 S.F. (1.20-ACRES)
EXISTING PERVIOUS AREA:	52,220 S.F. (1.20-ACRES)
EXISTING IMPERVIOUS AREA:	0 S.F. (0-ACRES)
TOTAL AREA (GROSS WQMP):	52,220 S.F. (1.20-ACRES)
PROPOSED PERVIOUS AREA:	10,390 S.F. (0.24-ACRES)
PROPOSED IMPERVIOUS AREA:	41,830 S.F. (0.96-ACRES)

LEGEND:

- 1000 – INDICATES EXISTING CONTOUR
- – INDICATES STREET CENTERLINE
- – INDICATES BOUNDARY LINE
- – INDICATES FLOW DIRECTION
- – INDICATES DRAINAGE AREA LIMITS
- T.P. – INDICATES TOP OF PONDING
- T.M. – INDICATES TOP OF MEDIA
- BOT. – INDICATES BOTTOM OF GRAVEL/BASIN



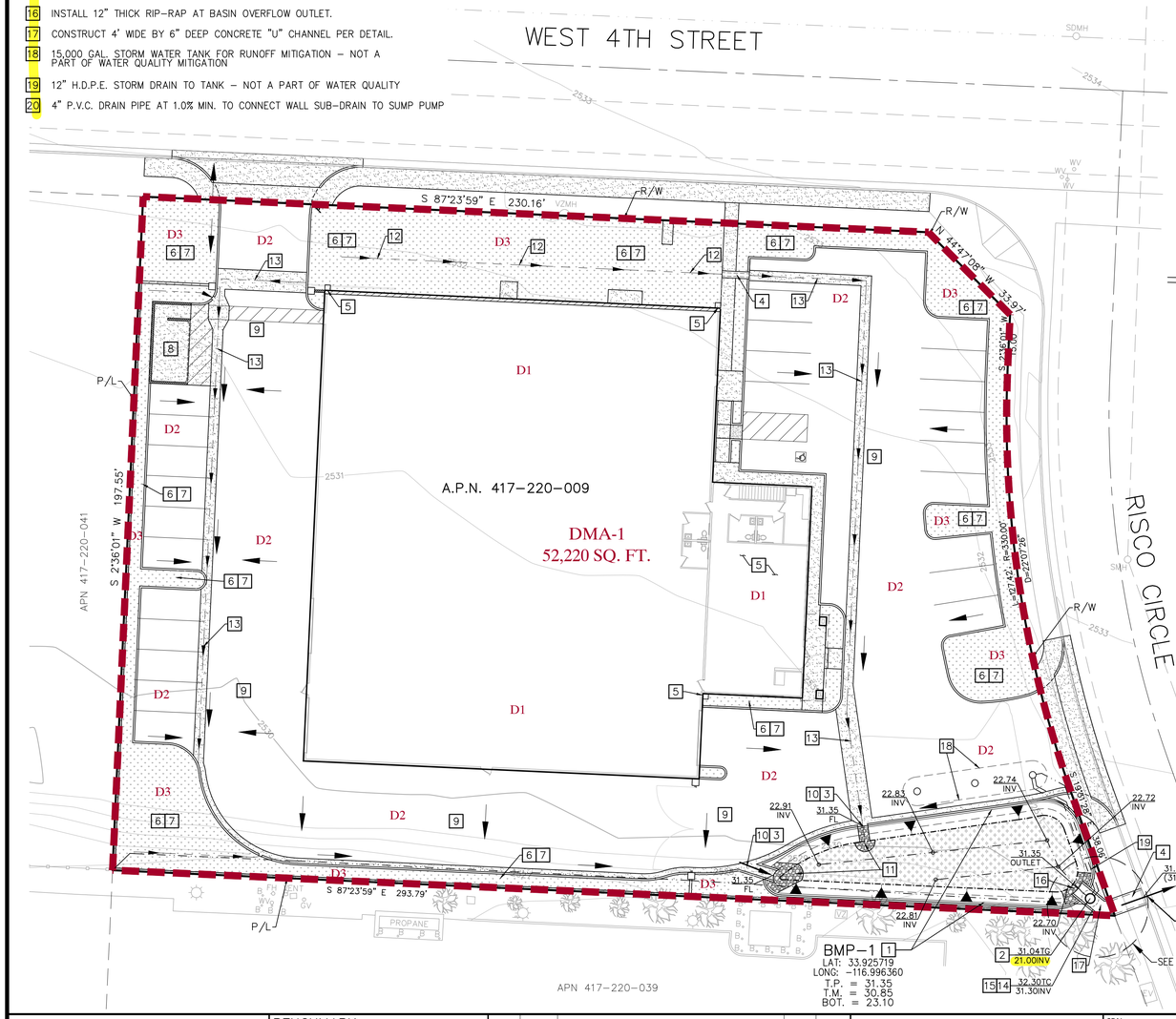
VICINITY MAP
NO SCALE

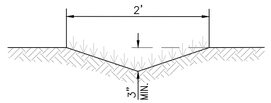
FWQMP SUMMARY (DMA-1)

DMA TYPE/ID	DMA AREA (FT^2)	POST-PROJECT SURFACE TYPE	IMPERVIOUS FRACTION (I_f)	DMA RUNOFF FACTOR	DMA AREAS x RUNOFF FACTOR	DESIGN CAPTURE VOLUME, V_{BMP} (FT^3)
D1	17,819	ROOFS	1.0	0.89	15,894.5	2,627
D2	23,991	CONC / ASPH	1.0	0.89	21,400.0	
D3	10,462	LANDSCAPING	0.1	0.11	1155.6	

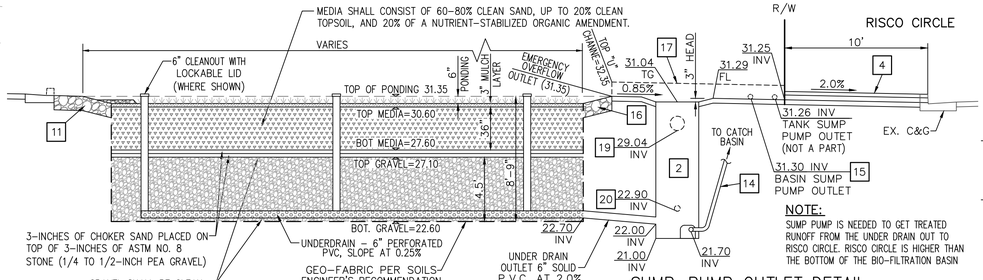
VBMP CAPTURE SUMMARY

DMA TYPE/ID	REQUIRED V_{BMP} (FT^3)	INFILTRATION BASIN (FT^3)	TOTAL DCV CAPTURED (%)
D1-D3	2,627	4,537	173



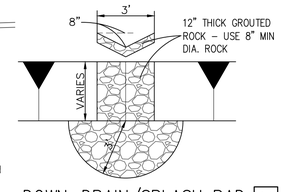


LANDSCAPED SWALE DETAIL 12
NOT TO SCALE



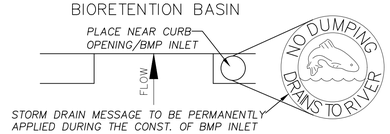
BIO-RETENTION BASIN 1
SCALE: 1"=5'

SUMP-PUMP OUTLET DETAIL
SCALE: 1"=5'

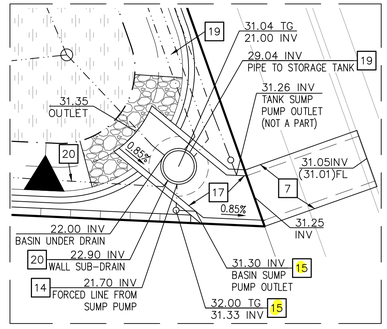


DOWN-DRAIN/SPLASH PAD 11
SCALE: 1"=5'

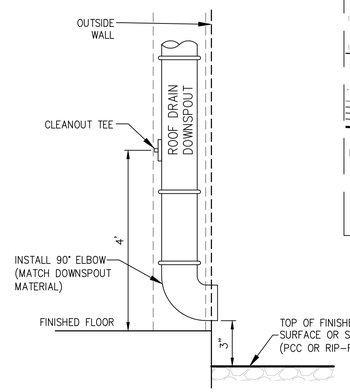
CONCRETE "U" CHANNEL 17
SCALE: 1"=3'



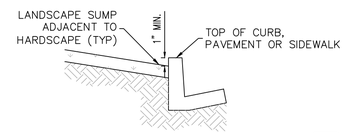
STORM DRAIN MESSAGE DETAIL 3
NOT TO SCALE



DETAIL "A"
SCALE: 1"=6'



ROOF DRAIN DOWNSPOUT 5



LANDSCAPE TO HARDSCAPE DETAIL 6
NOT TO SCALE

OWNER/APPLICANT:

MR. LARRY AGUILERA
320 E. 3RD STREET
BEAUMONT, CA 92223
CONTACT: MR. LARRY AGUILERA
PH: (951) 538-9424

ENGINEER/MAP PREPARER:

SITETECH, INC.
8061 CHURCH STREET, P.O. BOX 592
HIGHLAND, CA 92346
CONTACT: BERNIE MAYER
PH: (909) 864-3180
E-MAIL: bmayer@sitetechinc.com

SURVEY NOTE:

THE SOURCE OF THE EXISTING GROUND SURVEY IS FROM A FIELD SURVEY COMPLETED IN MARCH 2023. EXISTING GROUND CONTOURS WERE DRAWN FROM SPOT ELEVATIONS OBTAINED IN A GRID FASHION AND AT GRADE BREAKS.

24-HOUR CONTACT:

MR. LARRY AGUILERA
320 E. 3RD STREET
BEAUMONT, CA 92223
CONTACT: MR. LARRY AGUILERA
PH: (951) 538-9424

BASIS OF BEARING:

THE BEARINGS ON THIS MAP WERE BASED ON THE CENTERLINE OF FOURTH STREET AS SHOWN ON PARCEL MAP NO.28348 FILED IN BOOK 201, PAGE 72 OF PARCEL MAPS.

BEARINGS BEING NORTH 87° 23' 59" WEST

SOILS ENGINEER:

GEOSOILS, INC.
18451 COLLIER AVENUE, SUITE A
LAKE ELSINORE, CA 92530
PH: (951) 471-0700
REPORT W.O. NO.: 8454-A-SC
REPORT DATE: 8/28/2022

SCALE: 1"=20'

DIGALERT
Call 2 Working Days Before You Dig! 811

BENCHMARK:
RIVERSIDE COUNTY BM C-3.
0.25 MILES SOUTH ALONG BEAUMONT AVE. FROM INTERSECTION OF BEAUMONT AVE. AND 6TH ST. APPROX. 37.0 FEET WEST OF THE CENTER LINE OF BEAUMONT AVE. AT THE SOUTH ENT OF THE BRIDGE CROSSING OVER HWY 60. 2.0 FEET EAST OF SIDEWALK. 1.0 EAST OF 12 INCH CONCRETE RETAINING WALL. ON THE SOUTH EDGE OF A CONCRETE APRON. SET FLUSH IN THE CONCRETE SURFACE, A BRONZE DISK MARKED C-3 1965.
ELEV. 2606.072

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS		CITY

SITETECH INC.
8061 CHURCH ST. HIGHLAND CA 92346 PO BOX 592
PH; (909) 864-3180, FAX: (909) 864-0850

09/18/25
BERNHARD K. MAYER R.C.E. 36866 DATE

SEAL: REGISTERED PROFESSIONAL ENGINEER, BERNHARD K. MAYER, NO. 36866, Exp. 6-30-26, CIVIL, STATE OF CALIFORNIA

DESIGN BY:
DRAWN BY:
CHECKED BY:
SCALE:
DATE:
JOB NUMBER:

Reviewed By: _____ Staff Engineer Date: _____
Recommended for Approval By: _____ Administrative Engineer Date: _____
Approved By: _____ City Engineer/Director of Public Works Date: _____

CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
550E. 6th St
Beaumont, CA 92223
TEL: (951) 769-8520 FAX: (951) 769-8526

CITY OF BEAUMONT, CALIFORNIA
FINAL WATER QUALITY MANAGEMENT PLANS
CORNER OF 4TH STREET & RISCO CIRCLE
APN 417-220-009
FINAL W.Q.M.P.

SHEET 1 OF 1 SHEETS
FILE NO:
PW2022-0887

Appendix 2: Construction Plans

Grading and Drainage Plans

CITY OF BEAUMONT
PRECISE GRADING AND EROSION CONTROL PLAN
AA FENCE WAREHOUSE
APN 417-220-009
4TH SREET & RISCO CIRCLE

OWNER/APPLICANT:

MR. LARRY AGUILERA
320 E. 3RD STREET
BEAUMONT, CA 92223
CONTACT: MR. LARRY AGUILERA
PH: (951) 538-9424

24-HOUR CONTACT:

MR. LARRY AGUILERA
320 E. 3RD STREET
BEAUMONT, CA 92223
CONTACT: MR. LARRY AGUILERA
PH: (951) 538-9424

ENGINEER/MAP PREPARER:

SITETECH, INC.
8061 CHURCH STREET, P.O. BOX 592
HIGHLAND, CA 92346
CONTACT: BERNIE MAYER
PH: (909) 864-3180
E-MAIL: bmayer@sitetechinc.com

BASIS OF BEARING:

THE BEARINGS ON THIS MAP WERE BASED ON THE CENTERLINE OF FOURTH STREET AS SHOWN ON PARCEL MAP NO.28348 FILED IN BOOK 201, PAGE 72 OF PARCEL MAPS.

BEARINGS BEING NORTH 87° 23' 59" WEST

SURVEY NOTE:

THE SOURCE OF THE EXISTING GROUND SURVEY IS FROM A FIELD SURVEY COMPLETED IN MARCH 2023. EXISTING GROUND CONTOURS WERE DRAWN FROM SPOT ELEVATIONS OBTAINED IN A GRID FASHION AND AT GRADE BREAKS.

SOILS ENGINEER/REPORT:

SOCAL PROFESSIONAL ENGINEERS, INC.
5 EAST CITRUS AVENUE
REDLANDS, CA 92373
PH: (909) 271-3135
REPORT DATE: DEC. 7, 2023
WORK ORDER NO.: 1652301.00

GENERAL:

1. ALL GRADING SHALL CONFORM TO THE CITY OF BEAUMONT ORDINANCES, CURRENT ADOPTED CALIFORNIA BUILDING CODE, APPENDIX J, STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, "LATEST EDITION" AND RECOMMENDATIONS OF THE SOILS ENGINEER.
2. NO WORK SHALL COMMENCED UNTIL ALL PERMITS HAVE BEEN OBTAINED FROM THE CITY AND OTHER APPROPRIATE AGENCIES.
3. ALL PROPERTY CORNERS SHALL BE CLEARLY DELINEATED IN THE FIELD PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION /GRADING.
4. DURING ROUGH GRADING OPERATIONS AND PRIOR TO CONSTRUCTION OF PERMANENT DRAINAGE STRUCTURES, TEMPORARY DRAINAGE AND EROSION CONTROL SHOULD BE PROVIDED TO PREVENT PONDING WATER, SEDIMENT TRANSPORTATION, AND DAMAGE TO ADJACENT PROPERTIES.
5. DUST SHALL BE CONTROLLED BY WATERING OR OTHER APPROVED METHODS.
6. NO FILL SHALL BE PLACED ON EXITING GROUND THAT HAS NOT BEEN CLEARED OF WEEDS. DEBRIS, TOPSOIL AND OTHER DELETERIOUS MATERIAL.
7. MAXIMUM CUT AND FILL SLOPE = 2: 1 EXCEPT WHERE SPECIFICALLY APPROVED OTHERWISE.
8. PROVIDE A 5' WIDE BY 1' HIGH BERM OR EQUIVALENT ALONG THE TOP OF ALL FILL SLOPES OVER 5' HIGH.
9. PROVIDE A BROW DITCH DESIGNED TO HANDLE 100 YR STORM FLOWS ALONG THE TOP OF CUT SLOPES.
10. NO OBSTRUCTION OF FLOODPLAIN OR NATURAL WATER COURSES SHALL BE PERMITTED.
11. ALL EXISTING DRAINAGE COURSES ON THE PROJECT SITE SHALL CONTINUE TO FUNCTION, ESPECIALLY DURING STORM CONDITIONS, PROTECTIVE MEASURES AND TEMPORARY DRAINAGE PROVISIONS MUST BE USED TO PROTECT ADJOINING PROPERTIES DURING GRADING OPERATIONS.
12. CUT AND FILL SLOPES EQUAL TO OR GREATER THAN 3' IN VERTICAL HEIGHT SHALL BE PLANTED WITH GRASS OR GROUND COVER TO PROTECT THE SLOPE FROM EROSION AND INSTABILITY IN ACCORDANCE WITH CITY OF BEAUMONT REQUIREMENTS PRIOR TO FINAL GRADING INSPECTION
13. ALL SLOPES REQUIRED TO BE PLANTED SHALL BE PLANTED WITH APPROVED GROUND COVER AT 12" ON CENTER. SLOPES EXCEEDING 15' IN VERTICAL HEIGHT SHALL BE PLANTED WITH APPROVED TREES SPACED NOT TO EXCEED 20' ON CENTER OR SHRUBS NOT TO EXCEED 10' OR A COMBINATION OF SHRUBS AND TREES NOT TO EXCEED 15' IN ADDITION TO A GRASS MIX GROUND COVER. SLOPES EQUAL TO OR GREATER THAN 4' IN VERTICAL HEIGHT SHALL BE PROVIDED WITH AN IN-GROUND IRRIGATION SYSTEM COMPLETE WITH AN APPROPRIATE BACKFLOW PREVENTION DEVICE PER CITY REQUIREMENTS.
14. IF STEEP SLOPING TERRAIN OCCURS UPON WHICH FILL IS TO BE PLACED. IT MUST BE CLEARED, KEYED, AND BENCHED INTO FIRM NATURAL SOIL FOR FULL SUPPORT. PREPARATION SHALL BF APPROVED BY A SUITABLY QUALIFIED AND REGISTERED GEOTECHNICAL ENGINEER OR GEOLOGIST PRIOR TO PLACEMENT OF FILL MATERIAL.
15. THE GROUND IMMEDIATELY ADJACENT TO A FOUNDATION SHALL BE SLOPED AWAY FROM THE BUILDING AT A SLOPE OF NOT LESS THAN ONE UNIT VERTICAL IN 20 UNITS HORIZONTAL (5-PERCENT SLOPE) FOR A MINIMUM DISTANCE OF 10 FEET MEASURED PERPENDICULAR TO THE FACE OF THE WALL. IF PHYSICAL OBSTRUCTIONS OR LOT LINES PROHIBIT 10 FEET (3048 MM) OF HORIZONTAL DISTANCE, A 5-PERCENT SLOPE SHALL BE PROVIDED TO AN APPROVED ALTERNATIVE METHOD OF DIVERTING WATER AWAY FROM THE FOUNDATION. SWALES USED FOR THIS PURPOSE SHALL BE SLOPED A MINIMUM OF 2 PERCENT WHERE LOCATED WITHIN 10 FEET OF THE BUILDING FOUNDATION. IMPERVIOUS SURFACES WITHIN 10 FEET OF THE BUILDING FOUNDATION SHALL BE SLOPED A MINIMUM OF 2 PERCENT AWAY FROM THE BUILDING.
16. ALL GRADING SHALL BE CONTINUOUSLY OBSERVED BY A COMPETENT SOILS ENGINEER WHO SHALL VERIFY THAT ALL FILL HAS BEEN PROPERLY PLACED AND WHO SHALL SUBMIT A FINAL COMPACTION REPORT FOR ALL FILLS OVER 1' DEEP.
17. A FINAL GEOTECHNICAL REPORT OF COMPLETION OF THE ROUGH GRADING, STATING SUBSTANTIAL CONFORMANCE WITH THE APPROVED GRADING PLAN, SHALL BE SUBMITTED TO THE BUILDING AND SAFETY DEPARTMENT PRIOR TO REQUESTING INSPECTION AND ISSUANCE OF BUILDING PERMITS. CERTIFICATIONS SHALL INCLUDE LINE GRADES, ELEVATIONS, AND LOCATION OF CUT/FILL SLOPES.
18. A LAND SURVEYOR OR ENGINEER AUTHORIZED TO PRACTICE LAND SURVEYING SHALL SUBMIT A PAD CERTIFICATION FOR ALL PADS. THE ELEVATION WITH RESPECT TO MEAN SEA LEVEL SHALL BE GIVEN. IF AN ELEVATION WITH RESPECT TO ADJACENT GROUND SURFACE IS REQUIRED, THE ACTUAL DISTANCE ABOVE THE ADJACENT GROUND SHALL BE GIVEN.
19. A GEOTECHNICAL ENGINEER OR GEOLOGIST SHALL SUBMIT TO THE BUILDING AND SAFETY DEPARTMENT AND THE PUBLIC WORKS DEPARTMENT A FINAL GEOTECHNICAL REPORT OF COMPLETION OF FINAL GRADING STATING SUBSTANTIAL CONFORMANCE WITH THE APPROVED PLANS FOR ALL GRADING DESIGNATED AS "ENGINEERED GRADING".
20. THE CONTRACTOR SHALL NOTIFY THE PUBLIC WORKS DEPARTMENT AT LEAST 24 HOURS IN ADVANCE REQUESTING FINISH LOT GRADE AND DRAINAGE INSPECTION. THIS INSPECTION MUST BE APPROVED PRIOR TO BUILDING PERMIT FINAL INSPECTION FOR EACH LOT.
21. ALL STORM DRAINS, CATCH BASINS, AND STORM WATER RUNOFF STRUCTURES WILL BE PROVIDED WITH ADEQUATE CAPABILITIES TO FILTER AND RETAIN SEDIMENT, GRIT, OIL, AND GREASE TD PREVENT POLLUTION IN STORM WATER RUNOFF IN COMPLIANCE WITH THE CITY OF BEAUMONT'S BEST MANAGEMENT PRACTICES AND BEAUMONT'S DRAINAGE MASTER PLAN FOR STORMWATER AS WELL AS BEST MANAGEMENT PRACTICES IDENTIFIED IN THE CURRENT REPORT OF WASTE DISCHARGE FOR RIVERSIDE COUNTY PERMITTEES.
22. CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT TWO DAYS BEFORE DIGGING AT 8-1-1 AND THE FOLLOWING UTILITY OR AGENCIES A MINIMUM OF TWO WORKING DAYS PRIOR TO COMMENCING ANY CONSTRUCTION OR GRADING:

a. CITY OF BEAUMONT	951.769.8520
b. VERIZON	909.913.4500
c. SOUTHERN CALIFORNIA GAS COMPANY	909.335.7928
d. BEAUMONT CHERRY VALLEY WATER DISTRICT	951.845.9581
e. EDISON	909.307.6767

23. TRENCHING FOR UTILITIES AND STRUCTURES IS NOT ALLOWED UNTIL A SOIL COMPACTION REPORT IS SUBMITTED TO AND APPROVED BY THE PUBLIC WORKS DEPARTMENT.
24. THE CONTRACTOR SHALL MAINTAIN ADJACENT STREETS IN A NEAT, SAFE, CLEAN AND SANITARY CONDITION AT ALL TIMES AND TO THE SATISFACTION OF THE CITY'S INSPECTOR. THE ADJACENT STREETS SHALL BE KEPT CLEAN OF SEDIMENT, DEBRIS AND OTHER NUISANCES AT ALL TIMES. THE DEVELOPER SHALL BE RESPONSIBLE FOR ANY CLEAN UP ON ADJACENT STREETS AFFECTED BY THE CONSTRUCTION.
25. ALL OPERATIONS CONDUCTED ON THE SITE OR ADJACENT THERETO SHALL ADHERE TO THE NOISE ORDINANCE SET FORTH BY THE CITY MUNICIPAL CODE. ALL OPERATIONS SHALL BE LIMITED BY THE NOISE ORDINANCE TO THE LIMIT OF DECIBELS SPECIFIED FOR THE AREA AND TIME PERIOD. CONSTRUCTION ACTIVITIES WILL BE LIMITED TO THE PERIOD BETWEEN 7:00 A.M. AND 6:00 P.M. MONDAY THROUGH FRIDAY.
26. ALL OFF-SITE HAUL ROUTES SHALL BE SUBMITTED BY THE CONTRACTOR TO THE CITY ENGINEER FOR APPROVAL TWO FULL WORKING DAYS PRIOR TO BEGINNING OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DEBRIS OR DAMAGE OCCURRING ALONG THE HAUL ROUTE OR ADJACENT STREETS AS A RESULT OF THE GRADING OPERATION.

SITE MAP
SCALE: 1"=50'

CONSTRUCTION NOTES:

		QUANTITIES
1	CONSTRUCT 4" A.C. PAVING OVER 8" CLASS II BASE IN DRIVE AISLES AND 3" A.C. PAVING OVER 5" CLASS II BASE IN PARKING AREAS PER SOILS REPORT.	15,465 S.F. (368 TON ASPH/383 C.Y. BASE) 4,520 S.F. (81 TON ASPH/68 C.Y. BASE)
2	CONSTRUCT 6" CURB PER COUNTY OF RIVERSIDE STD. PLAN NO 204.	725 L.F.
3	4" THICK CURB ADJACENT SIDEWALK PER RIVERSIDE COUNTY STD. 401 – PER SEPARATE PERMIT.	
4	CONSTRUCT CASE "D" CURB RAMP PER CO. OF RIVERSIDE STD. PLAN NO 403.	1 EA.
5	CONSTRUCT 3' WIDE LONGITUDINAL GUTTER PER S.P.P.W.C. STD. 122-2.	294 L.F.
6	PROVIDE CURB OPENING FOR DRAINAGE INLET AND OUTLET.	4 EA.
7	INSTALL 12" WIDE UNDER SIDEWALK DRAIN PER CO. OF RIVERSIDE STD. PLAN NO. 309.	1 EA.
8	CONSTRUCT 4,537 CUBIC FOOT BIO-RETENTION BASIN PER DETAIL ON SHEET 3.	1 EA.
9	CONSTRUCT CONCRETE "U" CHANNEL PER DETAIL ON SHEET 2.	12 L.F.
10	INSTALL ADA ACCESSIBLE PARKING STALL, AND PATH OF TRAVEL PER ADA REQUIREMENTS.	
11	CONSTRUCT COVERED TRASH ENCLOSURE, PER SEPARATE PERMIT.	1 EA.
12	CONSTRUCT DRIVE APPROACH PER CO. OF RIVERSIDE STD. PLAN NO 207A – PER SEPARATE PERMIT.	
13	CONSTRUCT GRADED DRAINAGE SWALE AT 1.0% MINIMUM GRADE.	149 L.F.
14	PARKING LOT SIGNAGE AND STRIPING, PER ARCHITECTURAL PLANS.	
15	BUILDING STEM WALL PER ARCHITECTURAL PLANS.	116 L.F.
16	CONSTRUCT 6" CURB & GUTTER PER CO. OF RIVERSIDE STD. PLAN NO. 200.	276 L.F.
17	CONSTRUCT 6' WIDE CROSS GUTTER PER SPPWC STD. 122-2.	64 L.F.
18	GRIND & OVERLAY EXISTING PAVEMENT 0.17' MIN. DEPTH – PER SEPARATE PERMIT.	
19	CONSTRUCT 12" THICK RIP-RAP – USE 8" MIN. DIAMETER ROCK.	2 C.Y.
20	6' MAX HEIGHT RETAINING WALL WITH WROUGHT IRON FENCE ON TOP – PER SEPARATE PERMIT. SEE DETAILS ON SH. 3.	480 L.F.
21	CONSTRUCT 6' HIGH AUTOMATIC WROUGHT IRON GATE WITH KNOX BOX.	50 L.F.
22	RECONSTRUCT CURB RAMP IF RAMP DOES NOT MEET CURRENT CITY OR ADA STANDARDS. CITY INSPECTOR TO MAKE FINAL DECISION – PER SEPARATE PERMIT.	
23	INSTALL CITY OF BEAUMONT'S LIGHTING ORDINANCE – PER SEPARATE PERMIT.	
24	INSTALL 36" NDS DRAIN BASIN WITH GRATED INLET WITH ZOELLER CAST IRON SUBMERSIBLE SUMP PUMP.	1 EA.
25	3" FORCED DRAIN FROM SUMP PUMP – SEE SUMP PUMP OUTLET DETAIL ON SHT. 3	45 L.F.
26	INSTALL CA-MUTCD R3-2 (NO LEFT TURN) SIGN.	1 EA.
27	MODIFY GUTTER TO HAVE 5% MAX DIRECTIONAL SLOPE WITHIN ADA PATH OF TRAVEL.	1 EA.
28	INSTALL UNDERGROUND STORM WATER STORAGE TANK (15,000 GAL/2,005 CU. FT.) WITH SUMP PUMP AND OUTLET PIPE – CONTRACTOR TO PROVIDE SHOP DRAWINGS.	4 EA.
29	INSTALL 48" WIDE UNDER SIDEWALK DRAIN PER CO. OF RIVERSIDE STD. PLAN NO. 309 – PER SEPARATE PERMIT.	
30	INSTALL 6" SEWER LATERAL AT 2.0% MINIMUM GRADE.	24 L.F.
31	INSTALL 1" DOMESTIC SERVICE.	1 EA.
32	INSTALL 1" IRRIGATION SERVICE.	1 EA.
33	INSTALL 4" FIRE SERVICE AND METER ASSEMBLY WITH BACK-FLOW PREVENTER PER BEAUMONT-CHERRY VALLEY WATER DIST. PLATE 7.	1 EA.
34	CONSTRUCT 4" THICK CONCRETE OVER COMPACTED NATIVE.	773 S.F.
35	INSTALL 12" H.D.P.E. DRAIN PIPE AT 6.0% MINIMUM.	41 L.F.
36	INSTALL 4" P.V.C. DRAIN PIPE AT 1.0% MINIMUM TO CONNECT WALL SUB-DRAIN TO SUMP PUMP	280 L.F.
37	INSTALL 6" NDS SPEE-D CATCH BASIN WITH 4" P.V.C. DRAIN PIPE – CORE THROUGH CONCRETE "U" CHANNEL FOR SUMP PUMP OUTLET.	2 EA.
99	EXISTING ITEM (PER PLAN) TO BE PROTECTED IN PLACE.	

AREA OF PROPOSED SURFACES:

TOTAL AREA (EXISTING):	52,272 S.F. (1.20-ACRES)
EXISTING PERVIOUS AREA:	52,272 S.F. (1.20-ACRES)
EXISTING IMPERVIOUS AREA:	0 S.F. (0-ACRES)
TOTAL AREA (GROSS WQMP):	52,272 S.F. (1.20-ACRES)
PROPOSED PERVIOUS AREA:	10,462 S.F. (0.17-ACRES)
PROPOSED IMPERVIOUS AREA:	41,810 S.F. (1.03-ACRES)

SITE INFORMATION:

EXISTING ZONING:	MANUFACTURING (M)
PROPOSED ZONING:	MANUFACTURING (M)
EXISTING LAND USE:	INDUSTRIAL (I)
PROPOSED LAND USE:	INDUSTRIAL (I)

FLOOD ZONE:
ZONE X PER FEMA FIRM MAP
NO. 06065C0811G DATED 8/28/08

SITE ADDRESS:

(APPROX.) WEST CORNER OF 4TH ST & RISCO CIRCLE
BEAUMONT, CA 92223

LEGAL DESCRIPTION:

PARCEL 9 OF PARCEL MAP NUMBER 28348 IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA. LOCATED IN A SUBDIVISION OF A PORTION OF THE NORTH HALF OF THE SOUTHWEST QUARTER OF SECTION 9, TOWNSHIP 3 SOUTH, RANGE 1 WEST, SAN BERNARDINO BASE AND MERIDIAN, AS SHOWN ON MAP FILED IN BOOK 201, PAGES 72 THROUGH 74 INCLUSIVE OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

APN: 417-220-009

PRE-GRADING/CONSTRUCTION NOTE:

A PRE-GRADING/PRE-CONSTRUCTION MEETING AND SITE INSPECTION SHALL BE ARRANGED FOR BY THE SITE DEVELOPER PRIOR TO COMMENCING GRADING OPERATIONS. THOSE PARTIES REQUIRED TO ATTEND THE PRE-CONSTRUCTION MEETING SHALL INCLUDE BUT ARE NOT LIMITED TO THE DEVELOPER, PROJECT SUPERINTENDENT, ENGINEER OF RECORD, SOILS ENGINEER, GRADING CONTRACTOR AND THE UNDERGROUND UTILITIES CONTRACTOR. REPRESENTING THE DEPARTMENT OF BUILDING AND SAFETY SHALL BE THE GRADING PLAN-CHECKER AND/OR GRADING INSPECTOR. THE FOCUS OF THE PRE-CONSTRUCTION MEETING SHALL BE TO DISCUSS THE VARIOUS ASPECTS AND RESPONSIBILITIES OF THE GRADING PROJECT AND TO PROVIDE AN APPROXIMATE TIME-TABLE FOR THE COMPLETION OF ROUGH GRADING. ARRANGE FOR A PRE-GRADING/ PRE-CONSTRUCTION MEETING BY CALLING THE DISTRICT OFFICE RESPONSIBLE FOR PROVIDING YOUR GRADING AND BUILDING INSPECTIONS.

TEMPORARY EROSION CONTROL NOTES:

1. IN CASE OF EMERGENCY, CALL: LARRY AGUILERA AT (951) 538-9424
2. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES. NECESSARY MATERIALS SHALL BE AVAILABLE ON SITE AND STOCKPILED AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES WHEN RAIN IS IMMINENT. EROSION CONTROL DEVICES SHALL NOT BE MOVED OR MODIFIED WITHOUT THE APPROVAL OF THE QSP.
3. ALL REMOVABLE EROSION PROTECTIVE DEVICES SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN THE 72-HOUR RAIN PROBABILITY FORECAST EXCEEDS 50%.
4. AFTER A RAINSTORM, ALL SILT AND DEBRIS SHALL BE REMOVED FROM STREET, SURGE BERMS, SILT FENCES, AND DESILTING BASINS WITH THE BASINS PUMPED AND WATER TO BE DISPERSED ON SITE.
5. GRADED AREAS ON THE PERMITTED AREA PERIMETER MUST DRAIN AWAY FROM THE FACE OF SLOPES AT THE CONCLUSION OF EACH WORKING DAY. DRAINAGE IS TO BE DIRECTED TOWARD DESILTING FACILITIES.
6. THE PERMITTEE AND CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS ONTO AREAS WHERE IMPOUNDED WATER CREATES A HAZARDOUS CONDITION.
7. ALL TEMPORARY GRADING HAUL ROADS WITHIN AREAS WHICH ARE TO REMAIN UNDEVELOPED AND NATURAL SHALL BE RESTORED TO NATURAL CONDITIONS AND REVEGETATED WITH NATIVE GRASSES UPON COMPLETION OF GRADING OPERATIONS.
8. STOCKPILING AND/OR VEHICLE STAGING AREAS SHALL BE LOCATED AS FAR AS PRACTICABLE FROM DWELLINGS.
9. EROSION CONTROL DEVICES WILL BE MODIFIED AS NEEDED AS THE PROJECT PROGRESSES.
10. THE PLACEMENT OF ADDITIONAL DEVICES TO REDUCE EROSION DAMAGE WITHIN THE SITE IS LEFT TO THE DISCRETION OF THE QSP.
11. THE QSP SHALL OBSERVE EROSION CONTROL WORK AND MUST INFORM THE CITY AND THE DEVELOPER IF THE WORK IS NOT IN ACCORDANCE WITH THE APPROVED PLAN.

DRAINAGE NOTES:

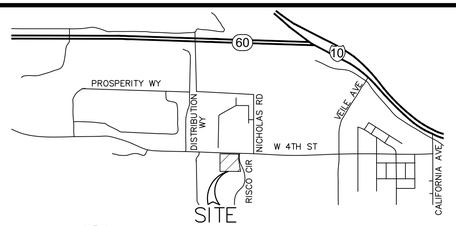
1. THE ENGINEER OF RECORD WHO PREPARED AND SIGNED THE GRADING PLAN HAS VERIFIED THAT THE PROPOSED DRAINAGE SYSTEM IS CONSISTENT WITH THE NATURAL DRAINAGE PATTERN OF THE SITE AND WILL NOT ADVERSELY AFFECT THE ADJACENT PROPERTIES.
2. THE ENGINEER OF RECORD WHO PREPARED AND SIGNED THE GRADING PLAN HAS VERIFIED THAT THE PROPOSED DRAINAGE SYSTEM AND CONFIGURATION COMPLIES WITH SECTION J109.4 OF THE CBC WHICH STATES THAT DRAINAGE ACROSS PROPERTY LINES SHALL NOT EXCEED THAT WHICH EXISTED PRIOR TO GRADING OR CONSTRUCTION. EXCESS OR CONCENTRATED DRAINAGE SHALL BE CONTAINED ONSITE OR DIRECTED TO AN APPROVED DRAINAGE FACILITY.

EARTHWORK QUANTITY ESTIMATE:

	CUT/RAW (C.Y)	FILL/RAW (C.Y.)
EXCAVATION	33	——
EMBANKMENT	——	2,450
SUBSIDENCE (0.15')	——	264
SHRINKAGE (18%)	——	6
SUB-X LOSS (18%)	——	415
TOTALS	33	3,135

IMPORT = 3,102 C.Y.

NOTE: EARTHWORK QUANTITIES ARE ESTIMATES ONLY FOR PERMITTING, CONTRACTOR TO DO THEIR OWN TAKE-OFF PRIOR TO CONSTRUCTION.



VICINITY MAP
NO SCALE

SOILS ENGINEER'S STATEMENT:

THIS PLAN HAS BEEN REVIEWED BY SOCAL PROFESSIONAL ENGINEERS, INC. AND APPEARS TO BE IN GENERAL CONFORMANCE WITH RECOMMENDATIONS IN OUR REPORT DATED DEC. 7, 2023, WORK ORDER NO.: 1652301.00. THIS PLAN HAS BEEN REVIEWED FOR GEOTECHNICAL ASPECTS ONLY. WE MAKE NO REPRESENTATION REGARDING ACCURACY OF DIMENSIONS, QUANTITIES, MEASUREMENTS, CALCULATIONS OR ANY PORTION OF THE DESIGN. GEOTECHNICAL CONDITIONS AND RECOMMENDATIONS SHOULD BE CONFIRMED BY THE GEOTECHNICAL CONSULTANT IN THE FIELD AT TIME OF CONSTRUCTION.

DATE: 09/16/25
BY: KHALED S. FARAH
LIC. NO.: RCE 83128
LIC. EXP.: 3/31/25

REGISTERED CIVIL ENGINEER
KHALED S. FARAH
NO. 83128
STATE OF CALIFORNIA

UTILITY AGENCIES SERVICING THIS PROJECT:

CITY OF BEAUMONT (SEWER) 550 E. 6TH STREET BEAUMONT, CA 92223	ATTENTION: THAXTON VAN BELLE TELEPHONE: (951) 769-8520
BEAUMONT-CHERRY VALLEY WATER DIST. 560 MAGNOLIA AVENUE BEAUMONT, CA 92223	ATTENTION: DANIEL JAGGERS TELEPHONE: (951) 845-9581
SOUTHERN CALIFORNIA EDISON 287 TENNESSEE STREET REDLANDS, CA. 92373	ATTENTION: BOB PATTERSON TELEPHONE: (909) 307-6767
SOUTHERN CALIFORNIA GAS COMPANY P.O. BOX 3003 REDLANDS, CA. 92373-0306	ATTENTION: JOHN GOMEZ TELEPHONE: (909) 335-7928
FRONTIER COMMUNICATIONS 1980 ORANGE TREE LANE REDLANDS, CA. 92373	ATTENTION: BRUCE FOYTIK TELEPHONE: (909) 748-6645
TIME WARNER 1722 ORANGE TREE LANE P.O. BOX 710 REDLANDS, CA. 92373	ATTENTION: RAY MIX TELEPHONE: (909) 798-3588

SHEET INDEX:

WDID# 8 33C409483

DIGALERT — Call 2 Working Days Before You Dig! 811

BENCHMARK:
RIVERSIDE COUNTY BM C-3.
0.25 MILES SOUTH ALONG BEAUMONT AVE. FROM INTERSECTION OF BEAUMONT AVE. AND 6TH ST. APPROX. 37.0 FEET WEST OF THE CENTER LINE OF BEAUMONT AVE. AT THE SOUTH ENT OF THE BRIDGE CROSSING OVER HWY 60. 2.0 FEET EAST OF SIDEWALK. 1.0 EAST OF 12 INCH CONCRETE RETAINING WALL. ON THE SOUTH EDGE OF A CONCRETE APRON. SET FLUSH IN THE CONCRETE SURFACE, A BRONZE DISK MARKED C-3 1965.
ELEV. 2606.072

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS		CITY

SITETECH INC.
8061 CHURCH ST. HIGHLAND CA 92346 PO BOX 592
PH: (909) 864-3180, FAX: (909) 864-0850

09/18/25
BERNHARD K. MAYER R.C.E. 36866 — DATE

SEAL: REGISTERED PROFESSIONAL ENGINEER BERNHARD K. MAYER NO. 36866 Exp. 6-30-26 CIVIL STATE OF CALIFORNIA

DESIGN BY:
DRAWN BY:
CHECKED BY:
SCALE:
DATE:
JOB NUMBER:

CITY OF BEAUMONT CALIFORNIA DEC NOV 18, 1912

Reviewed By: _____ Date: _____
Staff Engineer

Recommended for Approval By: _____ Date: _____
Administrative Engineer

Approved By: _____ Date: _____
City Engineer/Director of Public Works

CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
550E. 6th St
Beaumont, CA 92223
TEL: (951) 769-8520 FAX: (951) 769-8526

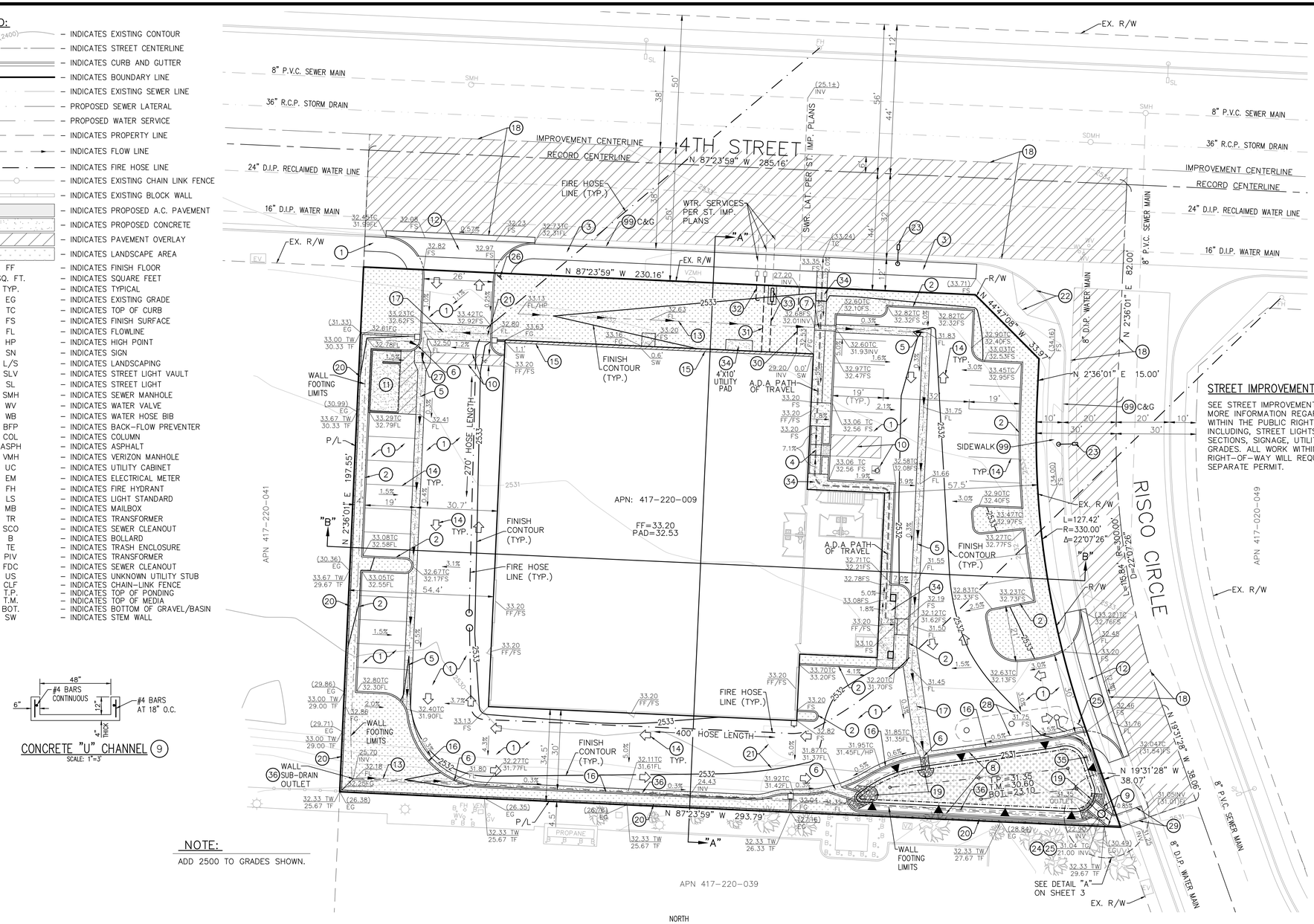
CITY OF BEAUMONT, CALIFORNIA
PRECISE GRADING & EROSION CONTROL PLANS FOR:
CORNER OF 4TH STREET & RISCO CIRCLE
APN 417-220-009
TITLE SHEET

SHEET 1 OF 4 SHEETS
FILE NO: PW2025-0167

LEGEND:

- (2400) – INDICATES EXISTING CONTOUR
- – INDICATES STREET CENTERLINE
- – INDICATES CURB AND GUTTER
- – INDICATES BOUNDARY LINE
- – INDICATES EXISTING SEWER LINE
- – INDICATES PROPOSED SEWER LATERAL
- – INDICATES PROPOSED WATER SERVICE
- – INDICATES PROPERTY LINE
- – INDICATES FLOW LINE
- – INDICATES FIRE HOSE LINE
- – INDICATES EXISTING CHAIN LINK FENCE
- – INDICATES EXISTING BLOCK WALL
- – INDICATES PROPOSED A.C. PAVEMENT
- – INDICATES PROPOSED CONCRETE
- – INDICATES PAVEMENT OVERLAY
- – INDICATES LANDSCAPE AREA

FF	– INDICATES FINISH FLOOR
SQ. FT.	– INDICATES SQUARE FEET
TYP.	– INDICATES TYPICAL
EG	– INDICATES EXISTING GRADE
TC	– INDICATES TOP OF CURB
FS	– INDICATES FINISH SURFACE
FL	– INDICATES FLOWLINE
HP	– INDICATES HIGH POINT
SN	– INDICATES SIGN
L/S	– INDICATES LANDSCAPING
SLV	– INDICATES STREET LIGHT VAULT
SL	– INDICATES STREET LIGHT
SMH	– INDICATES SEWER MANHOLE
WV	– INDICATES WATER VALVE
WB	– INDICATES WATER HOSE BIB
BFP	– INDICATES BACK–FLOW PREVENTER
COL	– INDICATES COLUMN
ASPH	– INDICATES ASPHALT
VMH	– INDICATES VERIZON MANHOLE
UC	– INDICATES UTILITY CABINET
EM	– INDICATES ELECTRICAL METER
FH	– INDICATES FIRE HYDRANT
LS	– INDICATES LIGHT STANDARD
MB	– INDICATES MAILBOX
TR	– INDICATES TRANSFORMER
SCO	– INDICATES SEWER CLEANOUT
B	– INDICATES BOLLARD
TE	– INDICATES TRASH ENCLOSURE
PIV	– INDICATES TRANSFORMER
FDC	– INDICATES SEWER CLEANOUT
US	– INDICATES UNKNOWN UTILITY STUB
CLF	– INDICATES CHAIN–LINK FENCE
T.P.	– INDICATES TOP OF PONDING
T.M.	– INDICATES TOP OF MEDIA
BOT.	– INDICATES BOTTOM OF GRAVEL/BASIN
SW	– INDICATES STEM WALL



CONSTRUCTION NOTES:

1. CONSTRUCT 4" A.C. PAVING OVER 8" CLASS II BASE IN DRIVE AISLES AND 3" A.C. PAVING OVER 5" CLASS II BASE IN PARKING AREAS PER SOILS REPORT.
2. CONSTRUCT 6" CURB PER COUNTY OF RIVERSIDE STD. PLAN NO 204.
3. 4" THICK CURB ADJACENT SIDEWALK PER RIVERSIDE COUNTY STD. 401 – PER SEPARATE PERMIT.
4. CONSTRUCT CASE "D" CURB RAMP PER CO. OF RIVERSIDE STD. PLAN NO 403.
5. CONSTRUCT 3' WIDE LONGITUDINAL GUTTER PER S.P.P.W.C. STD. 122–2.
6. PROVIDE CURB OPENING FOR DRAINAGE INLET AND OUTLET.
7. INSTALL 12" WIDE UNDER SIDEWALK DRAIN PER CO. OF RIVERSIDE STD. PLAN NO. 309.
8. CONSTRUCT 4,537 CUBIC FOOT BIO–RETENTION BASIN PER DETAIL ON SHEET 3.
9. CONSTRUCT CONCRETE "U" CHANNEL PER DETAIL ON SHEET 2.
10. INSTALL ADA ACCESSIBLE PARKING STALL, AND PATH OF TRAVEL PER ADA REQUIREMENTS.
11. CONSTRUCT COVERED TRASH ENCLOSURE, PER SEPARATE PERMIT.
12. CONSTRUCT DRIVE APPROACH PER CO. OF RIVERSIDE STD. PLAN NO 207A – PER SEPARATE PERMIT.
13. CONSTRUCT GRADED DRAINAGE SWALE AT 1.0% MINIMUM GRADE.
14. PARKING LOT SIGNAGE AND STRIPING, PER ARCHITECTURAL PLANS.
15. BUILDING STEM WALL PER ARCHITECTURAL PLANS.
16. CONSTRUCT 6" CURB & GUTTER PER CO. OF RIVERSIDE STD. PLAN NO. 200.
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19. CONSTRUCT 12" THICK RIP–RAP – USE 8" MIN. DIAMETER ROCK.
20. 6' MAX HEIGHT RETAINING WALL WITH WROUGHT IRON FENCE ON TOP – PER SEPARATE PERMIT. SEE DETAILS ON ON SHT. 3.
21. CONSTRUCT 6' HIGH AUTOMATIC WROUGHT IRON GATE WITH KNOX BOX.
22. RECONSTRUCT CURB RAMP IF RAMP DOES NOT MEET CURRENT CITY OR ADA STANDARDS. CITY INSPECTOR TO MAKE FINAL DECISION – PER SEPARATE PERMIT.
23. INSTALL CITY OF BEAUMONT'S LIGHTING ORDINANCE – PER SEPARATE PERMIT.
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25. 3" FORCED DRAIN FROM SUMP PUMP – SEE SUMP PUMP OUTLET DETAIL ON SHT. 3
26. INSTALL CA–MUTCD R3–2 (NO LEFT TURN) SIGN.
27. MODIFY GUTTER TO HAVE 5% MAX DIRECTIONAL SLOPE WITHIN ADA PATH OF TRAVEL.
28. INSTALL UNDERGROUND STORM WATER STORAGE TANK (15,000 GAL./2,005 CU. FT.) WITH SUMP PUMP AND OUTLET PIPE – CONTRACTOR TO PROVIDE SHOP DRAWINGS.
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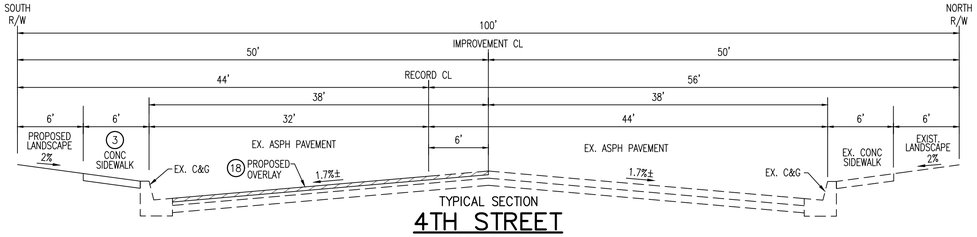
37. INSTALL 6" NDS SPEE–D CATCH BASIN WITH 4" P.V.C. DRAIN PIPE – CORE THROUGH CONCRETE "U" CHANNEL FOR SUMP PUMP OUTLET.

99. EXISTING ITEM (PER PLAN) TO BE PROTECTED IN PLACE.

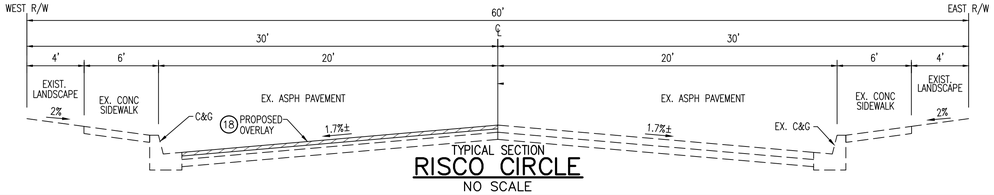
STREET IMPROVEMENT NOTE:

SEE STREET IMPROVEMENT PLANS FOR MORE INFORMATION REGARDING WORK WITHIN THE PUBLIC RIGHT–OF–WAY INCLUDING, STREET LIGHTS, PAVEMENT SECTIONS, SIGNAGE, UTILITIES AND GRADES. ALL WORK WITHIN PUBLIC RIGHT–OF–WAY WILL REQUIRE A SEPARATE PERMIT.

TRUCK–TURNING EXHIBIT
SCALE: 1"=50'



TYPICAL SECTION
4TH STREET
NO SCALE



TYPICAL SECTION
RISCO CIRCLE
NO SCALE

CONCRETE "U" CHANNEL (9)
SCALE: 1"=3'

NOTE:
ADD 2500 TO GRADES SHOWN.

N
SCALE: 1"=20'
20 0 20 40

WDID# 8 33C409483

DIGALERT
Call 2 Working Days Before You Dig! 811

BENCHMARK:
RIVERSIDE COUNTY BM C–3.
0.25 MILES SOUTH ALONG BEAUMONT AVE. FROM INTERSECTION OF BEAUMONT AVE. AND 6TH ST. APPROX. 37.0 FEET WEST OF THE CENTER LINE OF BEAUMONT AVE. AT THE SOUTH ENT OF THE BRIDGE CROSSING OVER HWY 60. 2.0 FEET EAST OF SIDEWALK. 1.0 EAST OF 12 INCH CONCRETE RETAINING WALL. ON THE SOUTH EDGE OF A CONCRETE APRON. SET FLUSH IN THE CONCRETE SURFACE, A BRONZE DISK MARKED C–3 1965.
ELEV. 2606.072

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS	CITY	

SITETECH INC.
8061 CHURCH ST. HIGHLAND CA 92346 PO BOX 592
PH: (909) 864-3180, FAX: (909) 864-0850

BERNHARD K. MAYER
R.C.E. 36866
09/18/25
DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
BERNHARD K. MAYER
NO. 36866
Exp. 6–30–26
CIVIL
STATE OF CALIFORNIA

DESIGN BY:
DRAWN BY:
CHECKED BY:
SCALE:
DATE:
JOB NUMBER:

Reviewed By: _____ Staff Engineer Date: _____

Recommended for Approval By: _____ Administrative Engineer Date: _____

Approved By: _____ City Engineer/Director of Public Works Date: _____

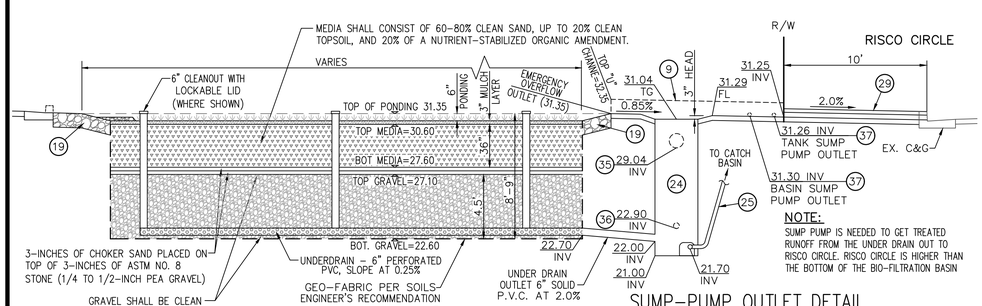
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
550E. 6th St
Beaumont, CA 92223
TEL: (951) 769–8520 FAX: (951) 769–8526

CITY OF BEAUMONT, CALIFORNIA
PRECISE GRADING & EROSION CONTROL PLANS FOR:

CORNER OF 4TH STREET & RISCO CIRCLE APN 417–220–009

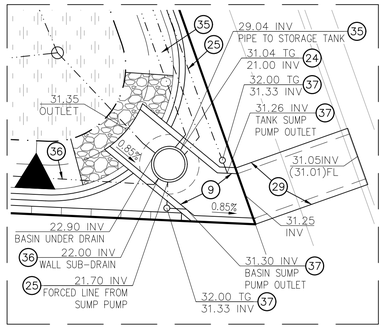
PRECISE GRADING PLAN

SHEET 2 OF 4 SHEETS
FILE NO: PW2025-0167



BIO-RETENTION BASIN (8)
SCALE: 1"=5'

SUMP-PUMP OUTLET DETAIL
SCALE: 1"=5'



DETAIL "A"
SCALE: 1"=6'

CONSTRUCTION NOTES:

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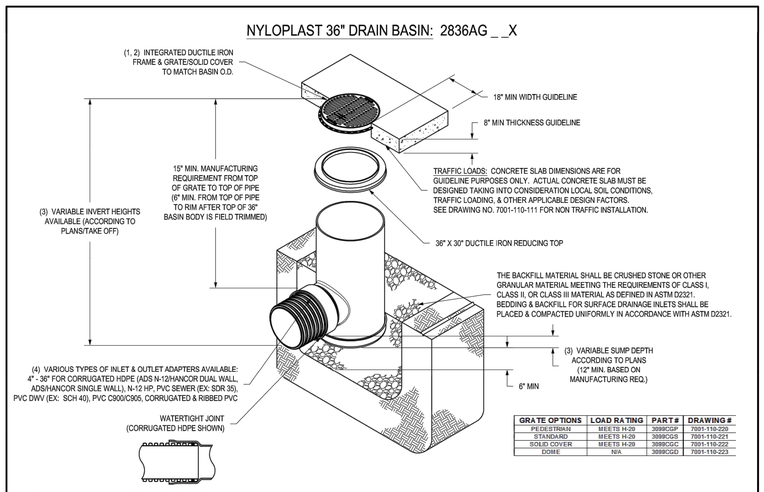
7. INSTALL 12" WIDE UNDER SIDEWALK DRAIN PER CO. OF RIVERSIDE STD. PLAN NO. 309.
8. CONSTRUCT 4,537 CUBIC FOOT BIO-RETENTION BASIN PER DETAIL ON SHEET 3.
9. CONSTRUCT CONCRETE "U" CHANNEL PER DETAIL ON SHEET 2.
10. INSTALL ADA ACCESSIBLE PARKING STALL, AND PATH OF TRAVEL PER ADA REQUIREMENTS.
11. CONSTRUCT COVERED TRASH ENCLOSURE, PER SEPARATE PERMIT.
12. CONSTRUCT DRIVE APPROACH PER CO. OF RIVERSIDE STD. PLAN NO 207A – PER SEPARATE PERMIT.
13. CONSTRUCT GRADED DRAINAGE SWALE AT 1.0% MINIMUM GRADE.
14. PARKING LOT SIGNAGE AND STRIPING, PER ARCHITECTURAL PLANS.
15. BUILDING STEM WALL PER ARCHITECTURAL PLANS.
16. CONSTRUCT 6" CURB & GUTTER PER CO. OF RIVERSIDE STD. PLAN NO. 200.
17. CONSTRUCT 6' WIDE CROSS GUTTER PER SPPWC STD. 122–2.
18. GRIND & OVERLAY EXISTING PAVEMENT 0.17' MIN. DEPTH – PER SEPARATE PERMIT.
19. CONSTRUCT 12" THICK RIP-RAP – USE 8" MIN. DIAMETER ROCK.
20. 6' MAX HEIGHT RETAINING WALL WITH WROUGHT IRON FENCE ON TOP – PER SEPARATE PERMIT. SEE DETAILS ON ON SHT. 3.
21. CONSTRUCT 6' HIGH AUTOMATIC WROUGHT IRON GATE WITH KNOX BOX.
22. RECONSTRUCT CURB RAMP IF RAMP DOES NOT MEET CURRENT CITY OR ADA STANDARDS. CITY INSPECTOR TO MAKE FINAL DECISION – PER SEPARATE PERMIT.
23. INSTALL CITY OF BEAUMONT'S LIGHTING ORDINANCE – PER SEPARATE PERMIT.
24. INSTALL 36" NDS DRAIN BASIN WITH GRATED INLET WITH ZOELLER CAST IRON SUBMERSIBLE SUMP PUMP.
25. 3" FORCED DRAIN FROM SUMP PUMP – SEE SUMP PUMP OUTLET DETAIL ON SHT. 3
26. INSTALL CA-MUTCD R3-2 (NO LEFT TURN) SIGN.
27. MODIFY GUTTER TO HAVE 5% MAX DIRECTIONAL SLOPE WITHIN ADA PATH OF TRAVEL.
28. INSTALL UNDERGROUND STORM WATER STORAGE TANK (15,000 GAL/2,005 CU. FT.) WITH SUMP PUMP AND OUTLET PIPE – CONTRACTOR TO PROVIDE SHOP DRAWINGS.
29. INSTALL 48" WIDE UNDER SIDEWALK DRAIN PER CO. OF RIVERSIDE STD. PLAN NO. 309 – PER SEPARATE PERMIT.
30. INSTALL 6" SEWER LATERAL AT 2.0% MINIMUM GRADE.
31. INSTALL 1" DOMESTIC SERVICE.
32. INSTALL 1" IRRIGATION SERVICE.
33. INSTALL 4" FIRE SERVICE AND METER ASSEMBLY WITH BACK-FLOW PREVENTER PER BEAUMONT-CHERRY VALLEY WATER DIST. PLATE 7.
34. CONSTRUCT 4" THICK CONCRETE OVER COMPACTED NATIVE.
35. INSTALL 12" H.D.P.E. DRAIN PIPE AT 6.0% MINIMUM.
36. INSTALL 4" P.V.C. DRAIN PIPE AT 1.0% MINIMUM TO CONNECT WALL SUB-DRAIN TO SUMP PUMP
37. INSTALL 6" NDS SPEE-D CATCH BASIN WITH 4" P.V.C. DRAIN PIPE – CORE THROUGH CONCRETE "U" CHANNEL FOR SUMP PUMP OUTLET.

99. EXISTING ITEM (PER PLAN) TO BE PROTECTED IN PLACE.

NYLOPLAST 36" DRAIN BASIN: 2836AG _ _X



GRATE OPTIONS	LOAD RATING	PART #	DRAWING #
PEDESTRIAN	MEETS H-20	3099CGP	7001-110-220
STANDARD	MEETS H-20	3099CGS	7001-110-221
SOLID COVER	MEETS H-20	3099CGC	7001-110-222
DOME	N/A	3099CGD	7001-110-223

1 - GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-00-05.
2 - FRAMES & REDUCING TOP SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-00-05.
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASIN BODIES OVER 84" DUE TO SHIPPING RESTRICTIONS.
4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER.
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.

DRAWN BY	NMH	MATERIAL	
DATE	9-21-18		
APPD BY	NMH		
DATE	9-21-18		
REVSD BY	NMH	PROJECT NO./NAME	
DATE	10-04-21		
APPD BY	NMH		
DATE	10-04-21		
DWG SIZE	A	SCALE 1:40	SHEET 1 OF 1

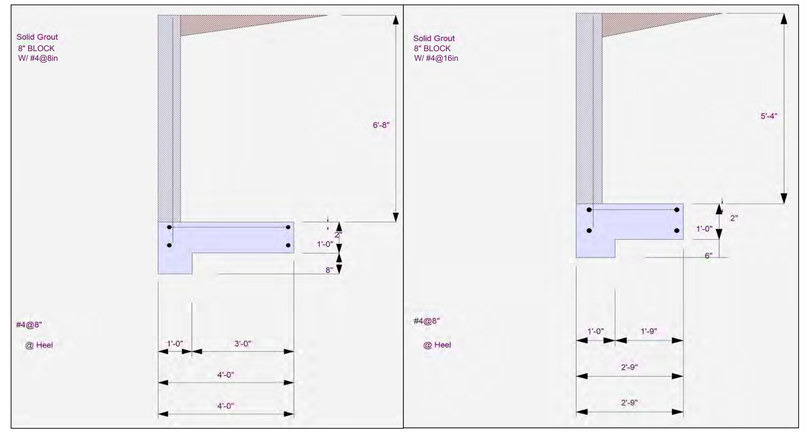
3130 VERONA AVE
BUFORD, GA 30518
PHN (770) 932-2443
FAX (770) 932-2490
www.nyloplast-us.com

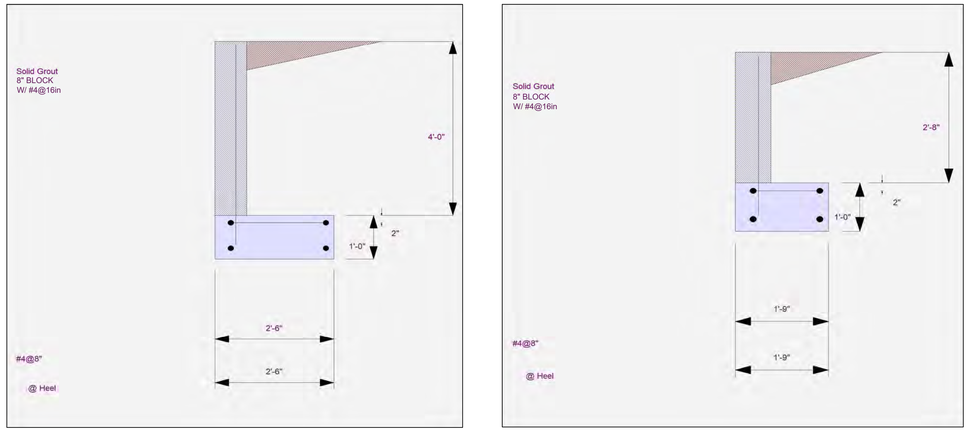
TITLE
36" DRAIN BASIN QUICK SPEC INSTALLATION DETAIL

DWG NO. 7001-110-526 REV B

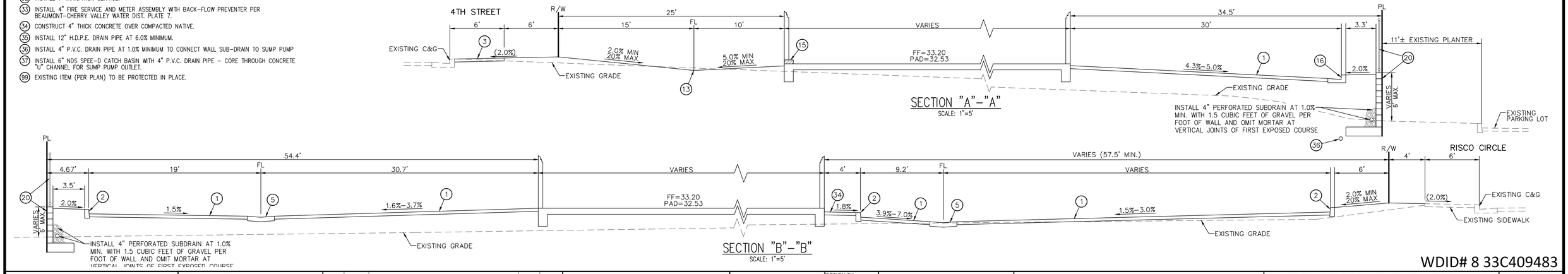
WALL NOTES:

1. 6' HIGH WROUGHT IRON FENCE TO BE INSTALLED ON TOP OF WALL FOR FALL PROTECTION
2. INSTALL EMULSIFIED ASPHALT WATER-PROOFING (OR EQUIVALENT PER OWNERS REQUEST
3. INSTALL 2-#4 BARS AT THE TOP OF ALL WALLS AND INSTALL 2-#4 BARS AT THE MID HEIGHT OF ALL WALLS OVER 4' HIGH
4. CONCRETE TO BE 2,500 PSI AT 28 DAYS
5. AREAS OF FOOTINGS TO BE SUB-EXCAVATED AND RECOMPACTED PER SOILS ENGINEERS RECOMMENDATIONS
6. INSTALL 4" PERFORATED SUBDRAIN AT 1.0% MIN. WITH 1.5 CUBIC FEET OF GRAVEL PER FOOT OF WALL AND OMIT MORTAR AT VERTICAL JOINTS OF FIRST EXPOSED COURSE
7. USE STANDARD GRAY PRECISION BLOCK





RETAINING WALL DETAILS (20)
NO SCALE



SECTION "A"-"A"
SCALE: 1"=5'

SECTION "B"-"B"
SCALE: 1"=5'

WDID# 8 33C409483

DIGALERT — Call 2 Working Days Before You Dig! 811

BENCHMARK:
RIVERSIDE COUNTY BM C-3.
0.25 MILES SOUTH ALONG BEAUMONT AVE. FROM INTERSECTION OF BEAUMONT AVE. AND 6TH ST. APPROX. 37.0 FEET WEST OF THE CENTER LINE OF BEAUMONT AVE. AT THE SOUTH ENT OF THE BRIDGE CROSSING OVER HWY 60. 2.0 FEET EAST OF SIDEWALK. 1.0 EAST OF 12 INCH CONCRETE RETAINING WALL. ON THE SOUTH EDGE OF A CONCRETE APRON. SET FLUSH IN THE CONCRETE SURFACE, A BRONZE DISK MARKED C-3 1965.
ELEV. 2606.072

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS		CITY

SITETECH INC.
8061 CHURCH ST. HIGHLAND CA 92346 PO BOX 592
PH: (909) 864-3180, FAX: (909) 864-0850

BERNHARD K. MAYER
R.C.E. 36866
09/18/25
DATE

SEAL: REGISTERED PROFESSIONAL ENGINEER — BERNHARD K. MAYER — NO. 36866 Exp. 6-30-26 — CIVIL — STATE OF CALIFORNIA

DESIGN BY:
DRAWN BY:
CHECKED BY:
SCALE:
DATE:
JOB NUMBER:

Reviewed By: _____ Staff Engineer Date: _____
Recommended for Approval By: _____ Administrative Engineer Date: _____
Approved By: _____ City Engineer/Director of Public Works Date: _____

CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
550E. 6th St
Beaumont, CA 92223
TEL: (951) 769-8520 FAX: (951) 769-8526

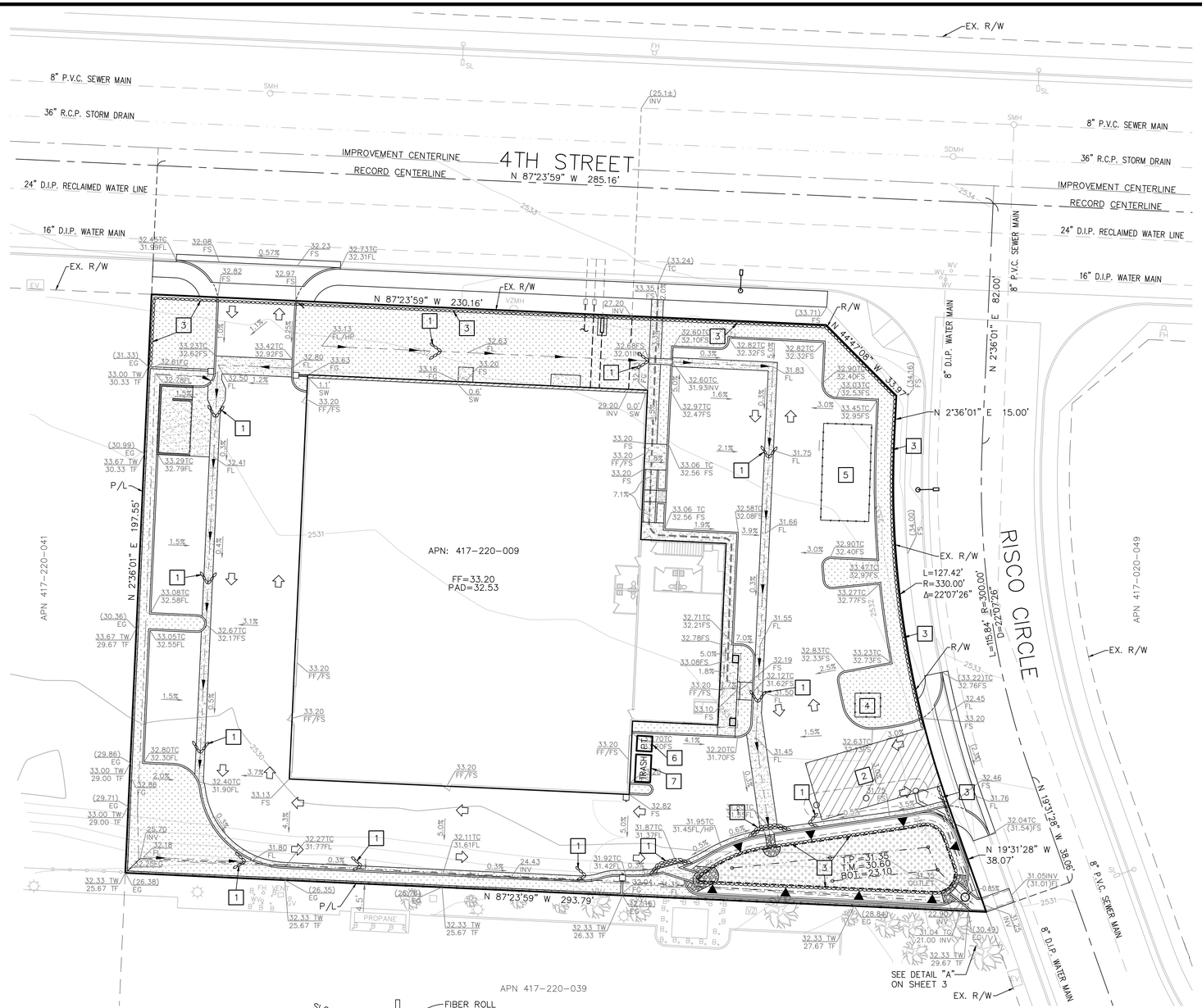
CITY OF BEAUMONT, CALIFORNIA
PRECISE GRADING & EROSION CONTROL PLANS FOR:
CORNER OF 4TH STREET & RISCO CIRCLE APN 417-220-009
GRADING DETAILS & SECTIONS

SHEET 3 OF 4 SHEETS
FILE NO: PW2025-0167

LEGEND:

- (2400) – INDICATES EXISTING CONTOUR
- – INDICATES STREET CENTERLINE
- – INDICATES CURB AND GUTTER
- – INDICATES BOUNDARY LINE
- – INDICATES EXISTING SEWER LINE
- – INDICATES PROPOSED SEWER LATERAL
- – INDICATES PROPOSED WATER SERVICE
- – INDICATES PROPERTY LINE
- – INDICATES FLOW LINE
- – INDICATES EXISTING CHAIN LINK FENCE
- – INDICATES EXISTING BLOCK WALL
- – INDICATES PROPOSED A.C. PAVEMENT
- – INDICATES PROPOSED CONCRETE
- – INDICATES PAVEMENT OVERLAY
- – INDICATES LANDSCAPE AREA

FF	– INDICATES FINISH FLOOR
SQ. FT.	– INDICATES SQUARE FEET
TYP.	– INDICATES TYPICAL
EG	– INDICATES EXISTING GRADE
TC	– INDICATES TOP OF CURB
FS	– INDICATES FINISH SURFACE
FL	– INDICATES FLOWLINE
HP	– INDICATES HIGH POINT
SN	– INDICATES SIGN
L/S	– INDICATES LANDSCAPING
SLV	– INDICATES STREET LIGHT VAULT
SL	– INDICATES STREET LIGHT
SMH	– INDICATES SEWER MANHOLE
WV	– INDICATES WATER VALVE
WB	– INDICATES WATER HOSE BIB
BFP	– INDICATES BACK–FLOW PREVENTER
COL	– INDICATES COLUMN
ASPH	– INDICATES ASPHALT
VMH	– INDICATES VERIZON MANHOLE
UC	– INDICATES UTILITY CABINET
EM	– INDICATES ELECTRICAL METER
FH	– INDICATES FIRE HYDRANT
LS	– INDICATES LIGHT STANDARD
MB	– INDICATES MAILBOX
TR	– INDICATES TRANSFORMER
SCO	– INDICATES SEWER CLEANOUT
B	– INDICATES BOLLARD
TE	– INDICATES TRASH ENCLOSURE
PIV	– INDICATES TRANSFORMER
FDC	– INDICATES SEWER CLEANOUT
US	– INDICATES UNKNOWN UTILITY STUB
CLF	– INDICATES CHAIN–LINK FENCE
T.P.	– INDICATES TOP OF PONDING
T.M.	– INDICATES TOP OF MEDIA
BOT.	– INDICATES BOTTOM OF GRAVEL/BASIN



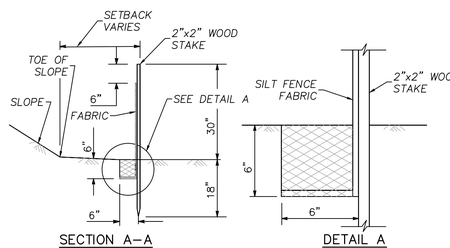
EROSION CONTROL CONSTRUCTION NOTES:

1. CONSTRUCT CHECK DAMS PER CASQA BMP SE–4 WITH FIBER ROLLS PER CASQA BMP SE–5 OR GRAVEL BAGS. ARROW DESIGNATES SPILLWAY LOCATION. CHECK DAMS REQUIRE PERIODIC SEDIMENT REMOVAL. (SEE DETAILS THIS SHEET)
2. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE PER CASQA BMP TC–1. (SEE DETAIL THIS SHEET)
3. INSTALL FIBER ROLLS PER CASQA BMP SE–5 OR SILT FENCE PER CASQA BMP SE–1. PERIODIC SEDIMENT REMOVAL IS REQUIRED. (SEE DETAILS THIS SHEET)
4. CONCRETE WASH–OUT PER CALIFORNIA STORM WATER BMP HANDBOOK WM–8.
5. FENCED STORAGE AND DELIVERY AREA PER CALIFORNIA STORM WATER BPM HANDBOOK WM–1
6. PORTABLE TOILET AREA WITH SECONDARY CONTAINMENT PER CASQA BMP WM–9.
7. DUMPSTER/DISPOSAL AREA PER CASQA BMP WM–5.

SECTION "D"–"D"

2 STABILIZED CONSTRUCTION ENTRANCE

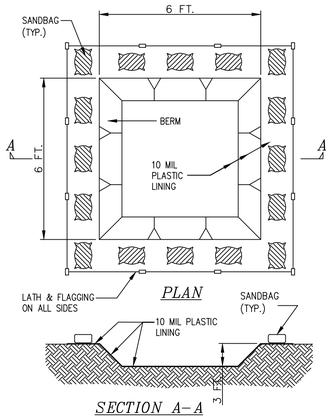
NO SCALE



SECTION A–A DETAIL A

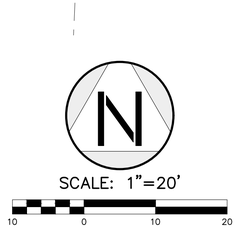
SILT FENCE DETAIL

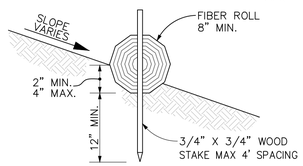
NO SCALE



4 CONCRETE WASHOUT DETAIL

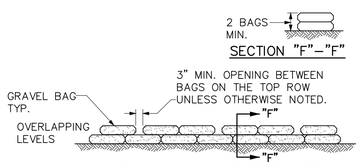
NOT TO SCALE





FIBER ROLL DETAIL

NO SCALE



GRAVEL BAG PLACEMENT DETAIL

NO SCALE

NOTE:
ADD 2500 TO GRADES SHOWN.

WDID# 8 33C409483

DIGALERT — Call 2 Working Days Before You Dig! 811

BENCHMARK:
RIVERSIDE COUNTY BM C–3.
0.25 MILES SOUTH ALONG BEAUMONT AVE. FROM INTERSECTION OF BEAUMONT AVE. AND 6TH ST. APPROX. 37.0 FEET WEST OF THE CENTER LINE OF BEAUMONT AVE. AT THE SOUTH ENT OF THE BRIDGE CROSSING OVER HWY 60. 2.0 FEET EAST OF SIDEWALK. 1.0 EAST OF 12 INCH CONCRETE RETAINING WALL. ON THE SOUTH EDGE OF A CONCRETE APRON. SET FLUSH IN THE CONCRETE SURFACE, A BRONZE DISK MARKED C–3 1965.
ELEV. 2606.072

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS	CITY	

SITETECH INC.
8061 CHURCH ST. HIGHLAND CA 92346 PO BOX 592
PH; (909) 864-3180, FAX: (909) 864-0850

09/18/25
BERNHARD K. MAYER
R.C.E. 36866
DATE

SEAL: REGISTERED PROFESSIONAL ENGINEER BERNHARD K. MAYER NO. 36866 Exp. 6–30–26 CIVIL STATE OF CALIFORNIA

DESIGN BY:	
DRAWN BY:	
CHECKED BY:	
SCALE:	
DATE:	
JOB NUMBER:	

Reviewed By: _____ Staff Engineer Date: _____

Recommended for Approval By: _____ Administrative Engineer Date: _____

Approved By: _____ City Engineer/Director of Public Works Date: _____

CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
550E. 6th St
Beaumont, CA 92223
TEL: (951) 769–8520 FAX: (951) 769–8526

CITY OF BEAUMONT, CALIFORNIA
PRECISE GRADING & EROSION CONTROL PLANS FOR:
CORNER OF 4TH STREET & RISCO CIRCLE APN 417–220–009
EROSION CONTROL PLAN

SHEET 4 OF 4 SHEETS
FILE NO: PW2025-0167

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

SoCal Professional Engineers, Inc.
Serving all Southern California
229 Cajon St., Ste.#2, Redlands, CA 92373 909.271.3135

December 7, 2023

Mr. Larry Aguilera
320 E. 3rd Street
Beaumont, California 92223

SUBJECT: **ONSITE STORMWATER INFILTRATION SYSTEM INVESTIGATION**
Proposed Commercial Building
Risco Circle, APN 417-220-009 1.2± Acres
Beaumont, Riverside County, California
Work Order No. 1652301.00

Mr. Aguilera:

In accordance with your authorization, we have conducted percolation testing for the infiltration system proposed for the subject property. The purpose of our investigation was to provide infiltration rates for the proposed infiltration systems.

Site Description

Attached as **Plate 1**, the Infiltration Test Location Map utilized the 20-scale," Site Plan" prepared by SiteTech, Inc. of Highland CA, showing the approximate location(s) of the infiltration tests on the site. The subject site is located south of 4th Street west of Risco Circle. in the City of Beaumont, Riverside County, California. The geographical relationships of the site and surrounding area are depicted on our Site Location Map, **Figure 1**.

At the time of our investigation, the site was vacant as shown on the Site Plan. Vegetation on the subject site consisted of minor weeds. Topographically, the site consists of nearly level terrain with gradients of approximately 5 percent to the south toward the adjacent. Overall relief on the subject site, is approximately 5-ft.

Percolation/Infiltration Investigation

Percolation/infiltration testing was conducted on October 18, 2023. Two tests were performed within the project area within the existing native soils. The test locations are depicted on the Infiltration Test Location Map, **Plate 1**. Two separate shallow borings were excavated, and two percolation tests were performed at depths corresponding to the depth of the proposed infiltration system. Additionally, an exploratory boring was advanced to a total depth explored of 15-ft below the ground surface. (bgs).

The exploratory excavation indicates that the area of the proposed system is underlain by Quaternary Aged Older Surficial Deposits, (map symbol Qoa) (Dibblee Jr., 2003). This unit was overlain by undocumented fill and extended to the total depth explored of 15-ft bgs (B-1).

Soils were visually classified according to the Unified Soil Classification System as silty Sand (Unified Soil Classification – SM) described as dark brown, fine to coarse grained, gravelly, slightly moist, and loose becoming denser with depth. This unit extends to the maximum depth explored of 15 ft below the existing ground surface.

Detailed descriptions of the onsite units are presented on our exploratory trench logs included in **Appendix B**.

LABORATORY TESTING PROGRAM

Sieve analysis testing was performed on a soil sample representative of the earth materials exposed in the near surface soils at depths of 0-5ft were 42-percent passing the #200 sieve. The test results are included in **Appendix C**, **Laboratory Test Results**.

GROUNDWATER

Groundwater was not encountered within our exploratory boring/trench, which were advanced to a maximum depth of 15-ft bgs in area of the proposed building pads. Historic high groundwater in the area is reported at a depth of +200ftbgs (U.S.G.S. Scientific Investigations Report 2006–5026),

SUMMARY OF TEST PROCEDURES

The testing procedure was performed in accordance with Riverside County Department of Environmental Health's "Local Management Program for Onsite Wastewater Treatment Systems", which became effective October 5, 2016, and the resulting perc rates were converted to infiltration rates utilizing the Porchet Method as outlined in the Riverside County Flood Control and Water Conservation District, "Design Handbook for Low Impact Development Best Management Practices" dated September 2011. The percolation tests were performed at depths within the underlying soils corresponding to the proposed system. Procedures for normal soils were followed.

Conclusion

Testing indicated infiltration rates at the proposed bottom of the systems within the native soils obtained consistent rates. The percolation rate was converted to infiltration rate utilizing the Porchet Method. The rates provided do not include a safety factor. The exploratory boring location and test locations are presented on our Test Location Map, **Plate 1**.

PERCOLATION TEST NO.	DEPTH OF TEST	INFILTRATION RATE (In/Hr)
1	5-FT	1.55
2	5-FT	1.22

CLOSURE

It should be noted that infiltration rates determined by testing are ultimate rates based on short-duration field test results utilizing clear water. Infiltration rates can be affected by silt build-up, debris, degree of soil saturation, and other factors. An appropriate safety factor should be applied prior to use in design to account for subsoil inconsistencies, possible compaction related to site grading, and potential silting of the percolating soils. The safety factor should also be determined with consideration to other factors in the system design, particularly storm water volume estimates and the safety factors associated with those design components.

LIMITATIONS

The tested rates are representative for the areas and soil types tested. Should the systems be moved, or the exposed soil types are found to different within the proposed systems, the approved infiltration rates may not apply. Our investigation was performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable Geotechnical Engineers and Geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

The report is issued with the understanding that it is used only by the owner and it is the sole responsibility of the owner or their representative to ensure that the information and recommendations contained herein are brought to the attention of the architect, engineer, and appropriate jurisdictional agency for the project and incorporated into the plans; and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations contained herein during construction and in the field.

The samples taken and used for testing and the observations made are believed representative; however, soil and geologic conditions can vary significantly between test locations. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by **SoCal Professional Engineers, Inc.**, or its assigns.

The findings of this report are valid as of the present date. However, changes in the condition of a property can occur with the passage of time, whether due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and revision as changed conditions are identified. The firm that performed the geotechnical investigation for this project should be retained to provide testing observation services during construction to maintain continuity of geotechnical interpretation and to check that the recommendations presented herein are implemented during construction of improvements.

If another geotechnical firm is selected to perform the inspection services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. Selection of another firm to perform any of the recommended activities or failure to retain the undersigned to perform the recommended activities wholly absolves **SoCal Professional Engineers, Inc**, the undersigned, and its assigns from any and all liability arising directly or indirectly from any aspects of this project.

We appreciate the opportunity to be of service. Limitations and conditions contained in reference documents are considered in full force and applicable. If you have any questions, please do not hesitate to call our office.

Respectfully Submitted,

SoCal Professional Engineers, Inc.

Khaled S. Farah
Civil Engineer, RCE 83128

ATTACHMENTS
Plate 1 – Infiltration Test Location Map
Appendix A –References
Appendix B – Boring Log
Appendix C- Laboratory Test Results
Appendix D- Test Data Sheets & Porchet Conversion Results

IN THE CITY OF BEAUMONT

CONDITIONAL USE PERMIT

SITE PLAN

PARCEL 9 OF PARCEL MAP NUMBER 28348 IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA. LOCATED IN A SUBDIVISION OF A PORTION OF THE NORTH HALF OF THE SOUTHWEST QUARTER OF SECTION 9, TOWNSHIP 3 SOUTH, RANGE 1 WEST, SAN BERNARDINO BASE AND MERIDIAN, AS SHOWN ON MAP FILED IN BOOK 201, PAGES 72 THROUGH 74 INCLUSIVE OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

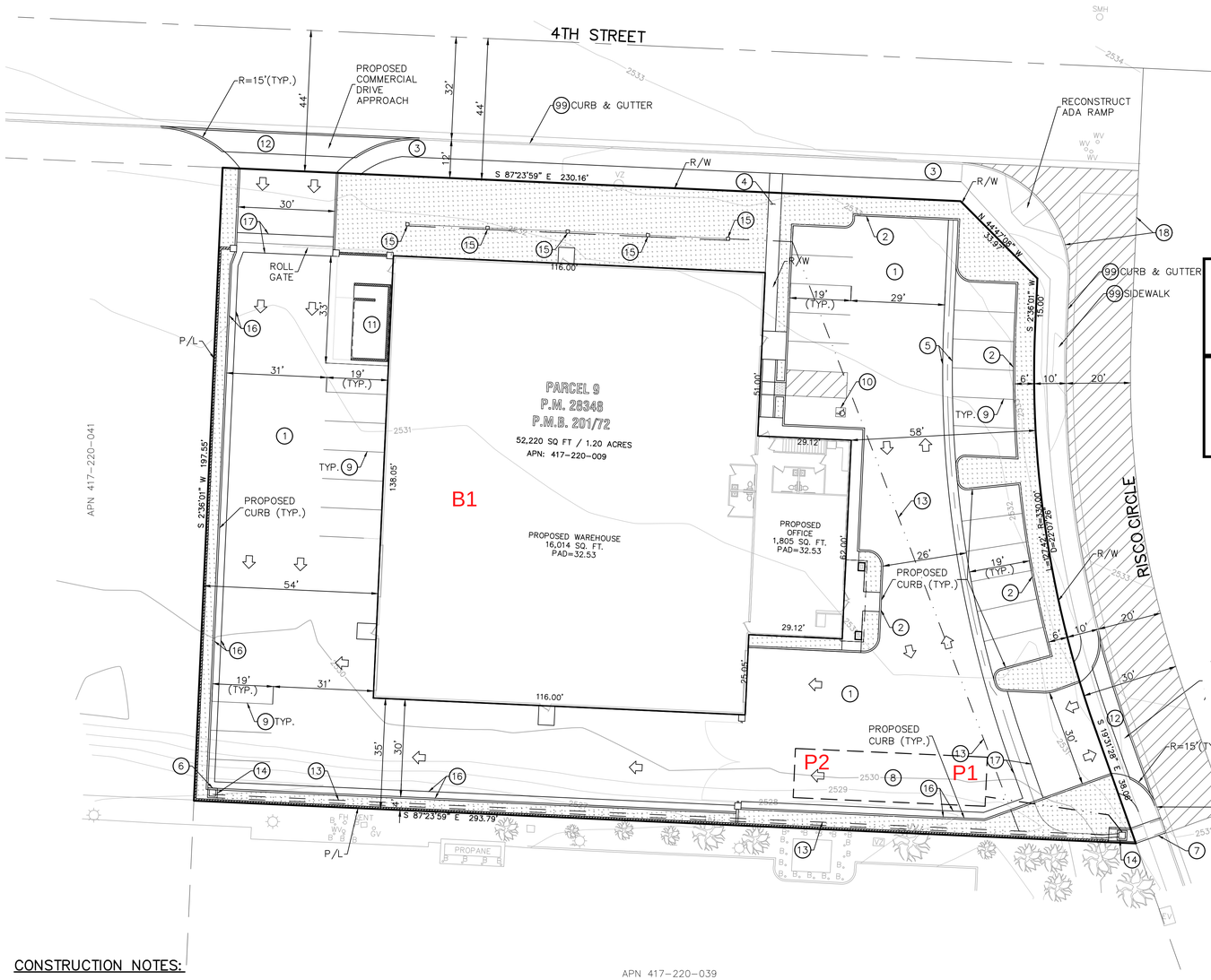
SITETECH, INC. AUGUST, 2023

OWNER/APPLICANT:

MR. LARRY AGUILERA
320 E. 3RD STREET
BEAUMONT, CA 92223
PH: (951) 538-9424

ENGINEER/MAP PREPARER:

SITETECH, INC.
PO BOX 592
8061 CHURCH STREET
HIGHLAND, CA 92346
PH: (909) 864-3180



SoCal Professional Engineers, Inc.
Infiltration Test Map
WO1652301.01 December 2023 Plate 1

B1 Approximate Location of Exploratory Trench

P2 Approximate Location of Percolation Test

NOTES:

1. THE PROPOSED PROJECT IS FOR A WAREHOUSE FACILITY.
2. ASSESSOR'S PARCEL NUMBER: 417-220-009.
3. THIS PROJECT SIZE IS 1.20 NET ACRES.
4. EXISTING AND PROPOSED ZONING IS M (MANUFACTURING).
5. LAND USE OF ALL SURROUNDING PROPERTY TO THIS PROJECT: MANUFACTURING – NORTH MANUFACTURING – EAST / STEEL SUPPLY – SOUTH / PROPANE SUPPLY & VACANT – WEST.
6. THERE ARE NO NEW STREETS PROPOSED WITHIN THIS DEVELOPMENT.
7. NO REGULATED TREES WILL BE REMOVED AS A PART OF THIS PROJECT.
8. THE AVERAGE SLOPE OF BOTH FEASIBLE ACCESS ROUTE AND FEASIBLE BUILDING SITE DOES NOT EXCEED TEN PERCENT (10%).
9. FOR COMPLETE LEGAL DESCRIPTION, SEE TITLE REPORT.
10. TOPOGRAPHIC MAPPING WAS OBTAINED FROM A FIELD SURVEY PERFORMED BY SITETECH, INC. IN MARCH, 2023.

TOTAL BUILDING AREA:

17,819 SQ. FT.

UTILITY PROVIDERS:

CITY OF BEAUMONT:	(951) 769-8520
FRONTIER COMMUNICATIONS:	(800) 483-4000
SOUTHERN CALIFORNIA GAS COMPANY:	(800) 427-2200
BEAUMONT-CHERRY VALLEY WATER DISTRICT:	(951) 845-9581
SOUTHERN CALIFORNIA EDISON COMPANY:	(800) 655-4555
UNDERGROUND SERVICE ALERT:	(800) 227-2600

CONSTRUCTION NOTES:

1. CONSTRUCT A.C. PAVING.
2. CONSTRUCT 6" CURB PER COUNTY OF RIVERSIDE STD. PLAN NO 200.
3. CONSTRUCT SIDEWALK OVER NATIVE.
4. CONSTRUCT CURB RAMP.
5. CONSTRUCT 3' WIDE LONGITUDINAL GUTTER PER S.P.P.W.C. STD. 122-2.
6. PROVIDE CURB OPENING FOR DRAINAGE INLET AND OUTLET.
7. INSTALL UNDER SIDEWALK DRAIN PER RIVERSIDE STD. PLAN NO. 309.
8. INSTALL 2,977 CUBIC FEET ADS MC-3500 UNDERGROUND INFILTRATION BASIN FOR DMA-1 (2,897 C.F. REQUIRED) OR APPROVED EQUAL.
9. PARKING LOT SIGNAGE AND STRIPING, PER ARCHITECTURAL PLANS.
10. INSTALL ADA ACCESSIBLE PARKING STALL, PER ADA REQUIREMENTS.
11. CONSTRUCT COVERED TRASH ENCLOSURE, PER SEPARATE PERMIT.
12. CONSTRUCT DRIVE APPROACH PER COUNTY OF RIVERSIDE STD. PLAN NO 207A.
13. INSTALL STORM DRAIN LINE AT 0.5% MIN.
14. INSTALL 24" X 24" OLD CASTLE CATCH BASIN, PRODUCT NO. 2424CB OR APPROVED EQUAL.
15. INSTALL AREA DRAIN.
16. CONSTRUCT 6" CURB & GUTTER PER COUNTY OF RIVERSIDE STD. PLAN NO. 200.
17. CONSTRUCT 6' WIDE CROSS GUTTER PER SPPWC STD. 122-2.
18. GRIND & OVERLAY EXISTING PAVEMENT 0.1' MIN. DEPTH.
99. EXISTING ITEM (PER PLAN) TO BE PROTECTED IN PLACE.

BASIS OF BEARINGS

THE BEARINGS ON THIS MAP WERE BASED ON THE CENTERLINE OF FOURTH STREET AS SHOWN ON PARCEL MAP NO.28348 FILED IN BOOK 201, PAGE 72 OF PARCEL MAPS.

BEARINGS BEING NORTH 87° 23' 59" WEST

BENCHMARK

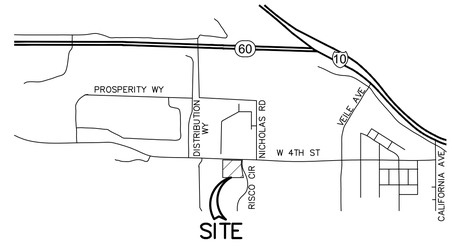
RIVERSIDE COUNTY BENCHMARK: C-3

DESCRIPTION: 0.25 MILES SOUTH ALONG BEAUMONT AVENUE FROM THE INTERSECTION OF BEAUMONT AVENUE AND SIXTH STREET. APPROXIMATELY 37.0 FEET WEST OF THE CENTER LINE OF BEAUMONT AVENUE. AT THE SOUTH ENT OF THE BRIDGE CROSSING OVER HIGHWAY 60. 2.0 FEET EAST OF SIDEWALK. 1.0 EASET OF 12 INCH CONCRETE RETAINING WALL. ON THE SOUTH EDGE OF CONCRETE APRON. SET FLUSH IN THE CONCRETE SURFACE, A BRONZE DISK MARKED C-3 1965.

ELEVATION: 2606.072'

LEGEND:

- 2400 – INDICATES EXISTING CONTOUR
- INDICATES EXISTING PROPERTY LINE
- INDICATES EXISTING RIGHT OF WAY LINE
- INDICATES PROPOSED RIGHT OF WAY LINE
- INDICATES MAP BOUNDARY LINE
- INDICATES LANDSCAPE AREA



VICINITY MAP

NO SCALE

REGISTERED PROFESSIONAL ENGINEER BERNHARD K. MAYER NO. 36866 Exp. 6-30-24 CIVIL STATE OF CALIFORNIA

SITETECH INC.
8061 CHURCH ST. HIGHLAND CA 92346 PO BOX 592
TELEPHONE (909) 864-3180

08/01/23

BERNHARD K. MAYER R.C.E. 36866 L.S. 7319 DATE

APPENDIX A

References

REFERENCES

CDM Smith, Inc. 2013, "Technical Guidance Document for Water Quality Management Plans" dated June 7, 2013.

Department of Water Resources Website, 2018, "Groundwater Data Section".

Riverside County Department of Environmental Health, 2016, "Local Management Program for Onsite Wastewater Treatment Systems", effective October 5, 2016.

Riverside County Flood Control and Water Conservation District, 2011, "Design Handbook for Low Impact Development Best Management Practices" dated 9, 2011.

Riverside County, Graphic Information Services (GIS), Map My County.

Morton, D.M., 2004, "Preliminary Digital Geologic Map of the Santa Ana 30' x 60' Quadrangle, Southern California (Version 2.0)", U.S. Geological Survey in Cooperation with the California Geologic Survey, Open-File Report 99-172, Scale: 1" = 100,000'.

SiteTech, Inc, 2023, "Conditional Use Permit/Site Plan, APN:417-220-009, Risco Circle. Beaumont CA 92223", scale 1" = 20', dated August 2023.

Dibblee Jr., Tomas W., 2003 "Geologic Map of The Beaumont Quadrangle, Riverside County, DF-114,", Scale: 1" = 24,000'.

U.S. Geological Survey, In Cooperation With San Gorgonio Pass Water Agency, 2006," Geology, Ground-Water, Hydrology, Geochemistry, and Ground-Water Simulation of the Beaumont and Banning Storage Units, San Gorgonio Pass Area, Riverside County, California Scientific Investigations Report 2006–5026".

U.S.G.S., Morton Douglas, M., 2003, "Geologic Map of the Riverside East / South ½ of San Bernardino South Quadrangles, San Bernardino & Riverside County, Quadrangle", DF-109, Scale: 1:24,000.

APPENDIX B

Exploratory Boring Log

LOGGED BY: JRH	METHOD OF EXCAVATION: BACKHOE EQUIPPED W/ 30-INCH BUCKET ELEVATION: ±	10/17/2023 LOCATION: SEE PLOT PLAN

DEPTH (FEET)	CLASSIFICATION	BLOWS/FOOT	UNDISTURBED SAMPLE	BULK SAMPLE	MOISTURE CONTENT(%)	INPLACE DRY DENSITY (PCF)	TRENCH LOG NO._1____ DESCRIPTION	SOIL TEST
				^ | V			**UNDOCUMENTED ARTIFICIAL FILL(Quf)**	
							SILTY SAND (SM): DARK BROWN, FINE TO COARSE GRAINED,	
							MEDIUM DENSE, SLIGHTLY MOIST	
							LOOSE IN UPPER 3FT	
5							**OLDER SURFICIAL SEDIMENTS(Qoa)**	
				^ | | | | | | V			SILTY SAND (SM): BROWN, FINE TO COARSE GRAINED,ABUNDANT	
							GRAVEL MINOR COBBLE, MEDIUM DENSE, SLIGHTLY MOIST	
							BECOMING COARSER WITH DEPTH	
10								SEIVE
15								
20							**TOTAL DEPTH 15.0'** **NO GROUNDWATER**	
25								
30								
35								
40								

JOB NO: 1652301.01	LOG OF TRENCH	FIGURE: B-1

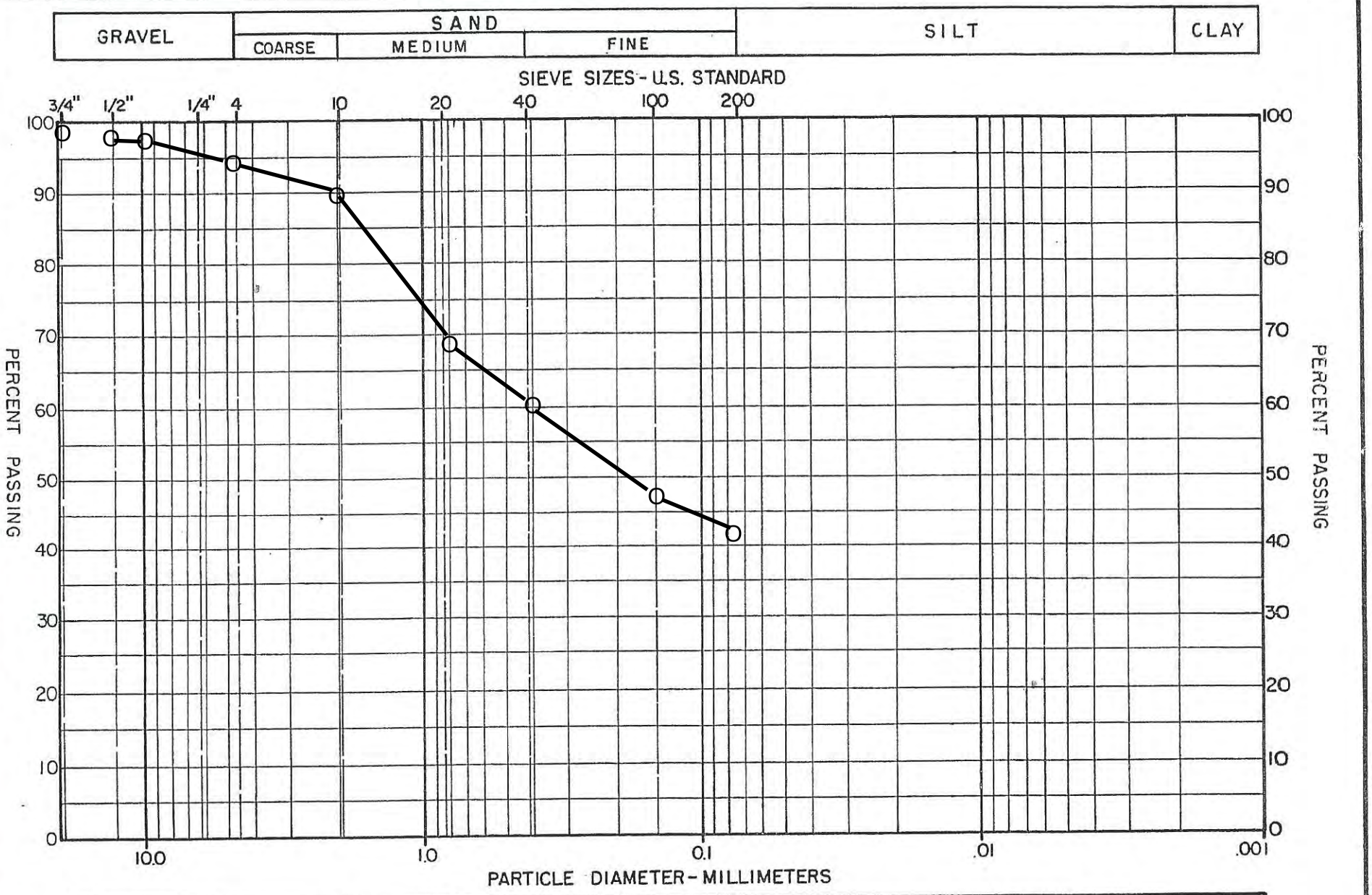
APPENDIX C

Laboratory Test Results

JOB NO: 1652301.01

GRAIN SIZE DISTRIBUTION

FIGURE NO: C-1



BORING NO.	DEPTH, FT.	SYMBOL	LIQUID LIMIT	PLASTIC INDEX	CLASSIFICATION
B-1	5-12	o			SM

APPENDIX D

Test Data Sheet & Porchet Conversion Results

Leach Line Percolation Data Sheet

Project:	RISCO CIRCLE	Job No.	WO1652301.01		
Test Hole No.	1	Date Excavated:	10/17/2023		
Depth of Hole:	40 inches	Soil Classification:	SC		
Check for Sandy Soil Criteria Tested by		Date:		Presoak Date:	10/17/2023
Actual Percolation Tested by:	JRH	Date:	10/18/2023		

Sandy Soil Criteria Test

Trial No.	Date	Time	Time Interval (Min)	Initial water level (Inches)	Final Water Level (Inches)	Diff. in Water Level (Inches)
1			0			0
2			0			0

Use: **5 GALLON PRESOAK/NORMAL** Soil Criteria

Trial No.	Time Interval	Time	Initial Water Level	Final Water Level	Water Level	Percolation Rate
	(Min)	(Min)	(Inches)	(Inches)	(Inches)	Min/Inch
7:41 8:11	30	30	40.0	26.75	13.25	**2.3**
8:11 **8:41**	30	60	40.0	30.50	9.5	**3.2**
8:41 **9:11**	30	90	40.0	31.33	8.675	**3.5**
9:11 **9:41**	30	120	40.0	31.63	8.375	**3.6**
9:41 **10:11**	30	150	40.0	32.00	8	**3.8**
10:11 **10:41**	30	180	40.0	32.25	7.75	**3.9**
10:41	0	N/A				
0:00	0	N/A				
0:00	0	N/A				
0:00	0	N/A				

Leach Line Percolation Data Sheet

Project:	RISCO CIRCLE	Job No.	WO1652301.01		
Test Hole No.	2	Date Excavated:	10/17/2023		
Depth of Hole:	40 inches	Soil Classification:	SC		
Check for Sandy Soil Criteria Tested by		Date:		Presoak Date:	10/17/2023
Actual Percolation Tested by:	JRH	Date:	10/18/2023		

Sandy Soil Criteria Test

Trial No.	Date	Time	Time Interval (Min)	Initial water level (Inches)	Final Water Level (Inches)	Diff. in Water Level (Inches)
1			0			0
2			0			0

Use: **5 GALLON PRESOAK/NORMAL** Soil Criteria

Trial No.	Time	Time Interval	Initial Water Level	Final Water Level	Water Level	Percolation Rate
	(Min)	(Min)	(Inches)	(Inches)	(Inches)	Min/Inch
7:45	30	30	40.0	28.75	11.25	**2.7**
8:15						
8:15	30	60	40.0	31.25	8.75	**3.4**
8:45						
8:45	30	90	40.0	32.50	7.5	**4.0**
9:15						
9:15	30	120	40.0	33.13	6.875	**4.4**
9:45						
9:45	30	150	40.0	33.50	6.5	**4.6**
10:15						
10:15	30	180	40.0	33.75	6.25	**4.8**
10:45						
10:45	0	N/A				
0:00	0	N/A				
0:00	0	N/A				
0:00	0	N/A				

PORCHET METHOD-CONVERSION OF PERCOLATION RATE TO INFILTRATION RATE	PERC TEST NO: NO 1	LEGEND	REQUIRED ENTRY / CALCULATED ENTRY

Company Name: SOCAL PROFESSIONAL ENGINEERS DATE: 10/17/2023

Designed By: JRH CASE: RISCO CIRCLE

PERCOLATION TEST CONVERSION TO INFILTRATION RATE

THE CONVERSION EQUATION USED IS:

$$I_T(\text{in/hr}) = \frac{dh(\text{in}) \times 60(\text{min/hr}) \times r(\text{in})}{dt(\text{min}) \times [r(\text{in}) + 2h_{AVG}(\text{in})]}$$

Hole Radius	r=	8	inches
Time Interval	dt=	30	minutes
Initial height of water during selected time interval	H_0=	40	inches
Final height of water during selected time interval	H_f=	32.25	inches
Change in height of water during selected time interval	dH=	7.75	inches
Average head of height over the selected time interval	H_{AVG}=	36.125	inches
Converted infiltration rate per test data	I_T=	1.55	inches/hour

COMMENTS

PORCHET METHOD-CONVERSION OF PERCOLATION RATE TO INFILTRATION RATE	PERC TEST NO: NO. 2	LEGEND	REQUIRED ENTRY / CALCULATED ENTRY

Company Name: SOCAL PROFESSIONAL ENGINEERS DATE: 10/17/2023

Designed By: JRH CASE: RISCO CIRCLE

PERCOLATION TEST CONVERSION TO INFILTRATION RATE

THE CONVERSION EQUATION USED IS:

$$I_T(\text{in/hr}) = \frac{dh(\text{in}) \times 60(\text{min/hr}) \times r(\text{in})}{dt(\text{min}) \times [r(\text{in}) + 2h_{AVG}(\text{in})]}$$

Hole Radius	r=	8	inches
Time Interval	dt=	30	minutes
Initial height of water during selected time interval	H_0=	40	inches
Final height of water during selected time interval	H_f=	33.75	inches
Change in height of water during selected time interval	dH=	6.25	inches
Average head of height over the selected time interval	H_{AVG}=	36.875	inches
Converted infiltration rate per test data	I_T=	1.22	inches/hour

COMMENTS

Appendix 4: Historical Site Conditions

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

NOT APPLICABLE

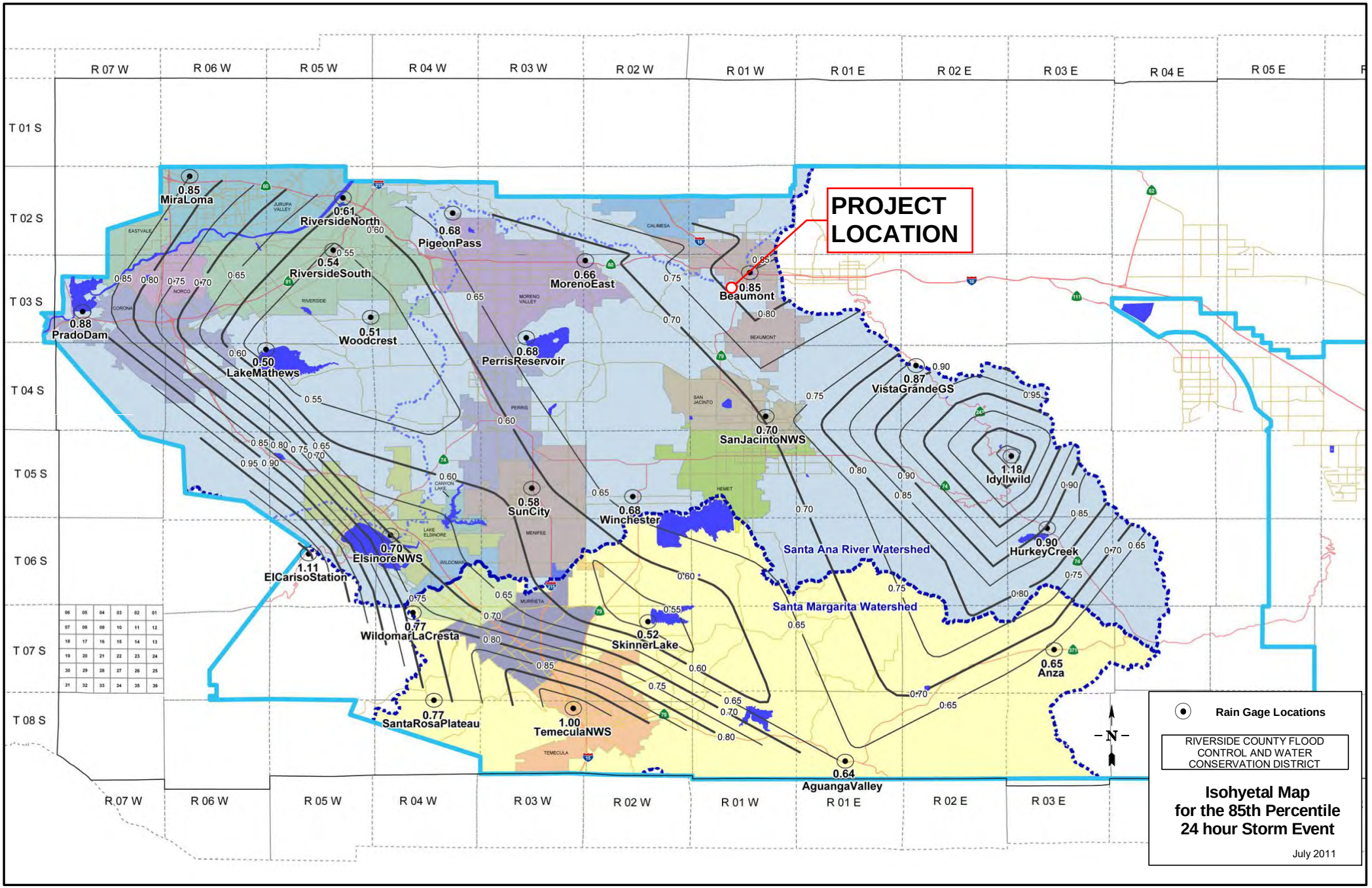
Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

NOT APPLICABLE

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation


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

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	SITETECH INC.	Date	6/13/2024
Designed by	BAM	Case No	2022-0854
Company Project Number/Name	AAA FENCE WAREHOUSE - 4TH & RISCO		

BMP Identification

BMP NAME / ID: INFILTRATION BASIN (BMP1)

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}= 0.82 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)*
D1	*17,819*	*Roofs*	*1*	*0.89*	*15894.5*			
D2	*23,991*	*Concrete or Asphalt*	*1*	*0.89*	*21400*			
D3	*10,462*	*Ornamental Landscaping*	*0.1*	*0.11*	*1155.6*			
	52272	***Total***			**38450.1**	**0.82**	***2627.4***	***2760***

Notes:

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

Company Name:	SITETECH, INC	Date:	6/13/2024
Designed by:	BAM	County/City Case No.:	2022-0854

Design Volume

Enter the area tributary to this feature	A_T=	1.2	acres
Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	2,627	ft^3

Type of Bioretention Facility Design

- (●) Side slopes required (parallel to parking spaces or adjacent to walkways)
- ( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer	d_S =	3.0	ft
Top Width of Bioretention Facility, excluding curb	w_T =	22.0	ft
Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$	d_E =	1.77	ft
Minimum Surface Area, A_m $A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$	A_M =	1,486	ft^2
Proposed Surface Area	A=	1,665	ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility	z =	4	:1
Diameter of Underdrain		6	inches
Longitudinal Slope of Site (3% maximum)		3	%
6" Check Dam Spacing		10	feet
Describe Vegetation:		Natural Grasses	

Notes:

AAA FENCE WAREHOUSE - BIORETENTION SYSTEM

Amended Soil Infil. Rate (in/hr)	5		Basin Footprint (ft^2)	1269
Amended Soil Factor of Safety	2		Amended Soil Depth (ft)	3.00
Amended Soil Design Infil. Rate (in/hr)	2.5		Amended Soil Porosity	30%
Drawdown Time (hr)	48		Gravel Depth (ft)	1.00
Maximum Ponding Depth (ft)	0.5		Gravel Porosity	40%
Design Ponding Depth (ft)	0.5		Duration of Storm (hr)	3

Results

Design Capture Volume (ft^3)	=	2627
Total Biotreated Volume (ft^3)	=	2760
$V_{BMP} > V_{DCV}$???	=	YES

	=	INPUT DATA
	=	CALCULATED DATA

* Treated Volume = Soil Footprint x [(Design Ponding Depth / 2) + (Soil Depth x Soil Porosity) + (Gravel Depth x Gravel Porosity) + (Duration of Storm x (Soil Design Infiltration Rate / 12))]

3.5 Bioretention Facility

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

Description

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

Siting Considerations

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

- ✓ Parking islands
- ✓ Medians
- ✓ Site entrances

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

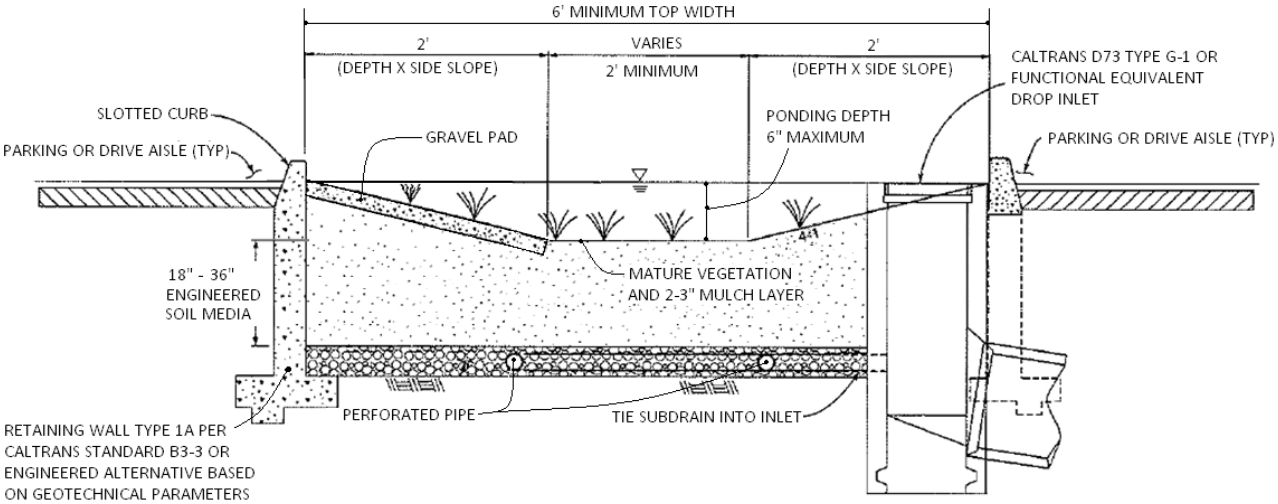
- *Depressing* landscaped areas below adjacent impervious surfaces, rather than elevating those areas
- Grading the site to direct runoff from those impervious surfaces *into* the Bioretention Facility, rather than away from the landscaping
- Sizing and designing the depressed landscaped area as a Bioretention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

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

Design and Sizing Criteria

The recommended cross section necessary for a Bioretention Facility includes:

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



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

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

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

Figure 1: Standard Layout for a Bioretention Facility

Engineered Soil Media Requirements

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

Table 1: Mineral Component Range Requirements

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

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

Vegetation Requirements

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

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

Curb Cuts

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

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

Figure 2: Curb Cut located in a Bioretention Facility

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

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

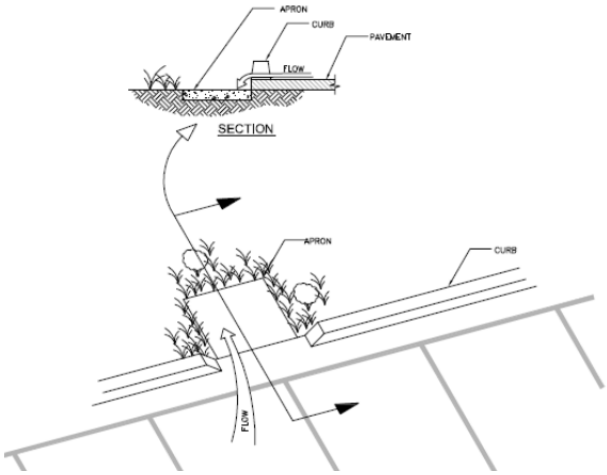


Figure 3: Apron located in a Bioretention Facility

Terracing the Landscaped Filter Basin

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

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

Table 2: Check Dam Spacing

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

Roof Runoff

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

Retaining Walls

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

Side Slope Requirements

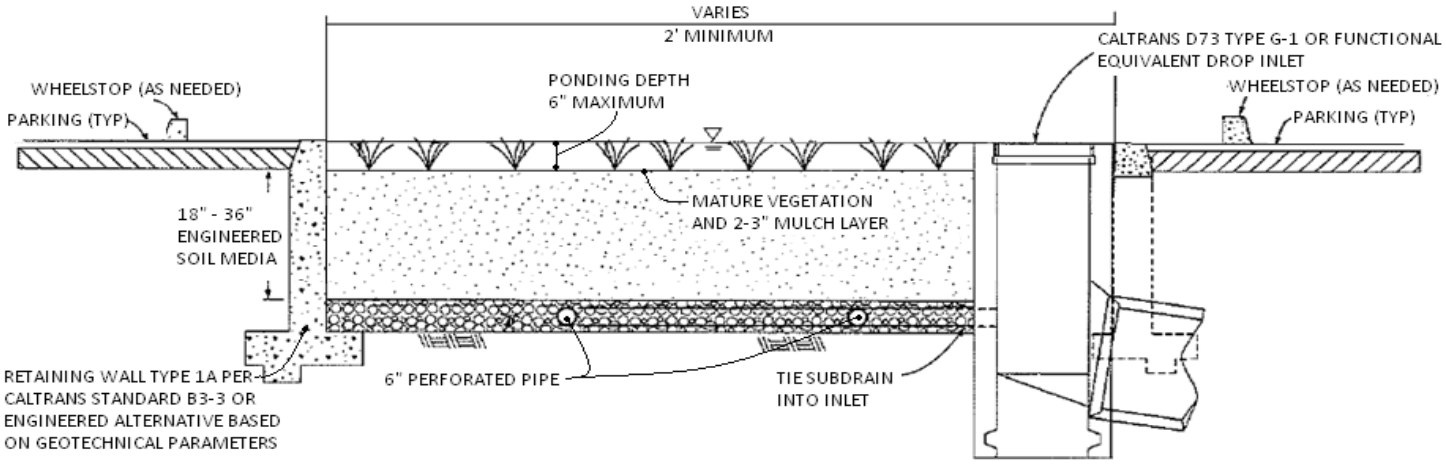
Bioretention Facilities Requiring Side Slopes

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

Bioretention Facilities Not Requiring Side Slopes

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

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



Planter Boxes

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

Figure 5: Planter Box
Source: LA Team Effort

Overflow

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

Underdrain Gravel and Pipes

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

Figure 6: Incorrect Placement of an Overflow Inlet.

Inspection and Maintenance Schedule

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

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

Bioretention Facility Design Procedure

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

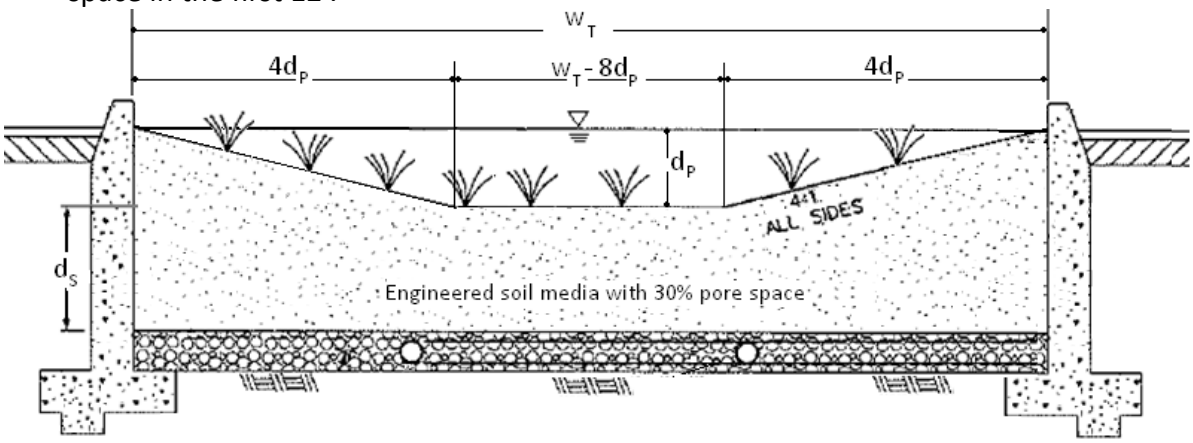
2) Enter the Design Volume, $V_{BMP,}$ determined from Section 2.1 of this Handbook.

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

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

5) Enter the top width of the Bioretention Facility.

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

13) Describe the vegetation used within the Bioretention Facility.

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Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

HYDROGRAPH AND RELATED MATERIALS

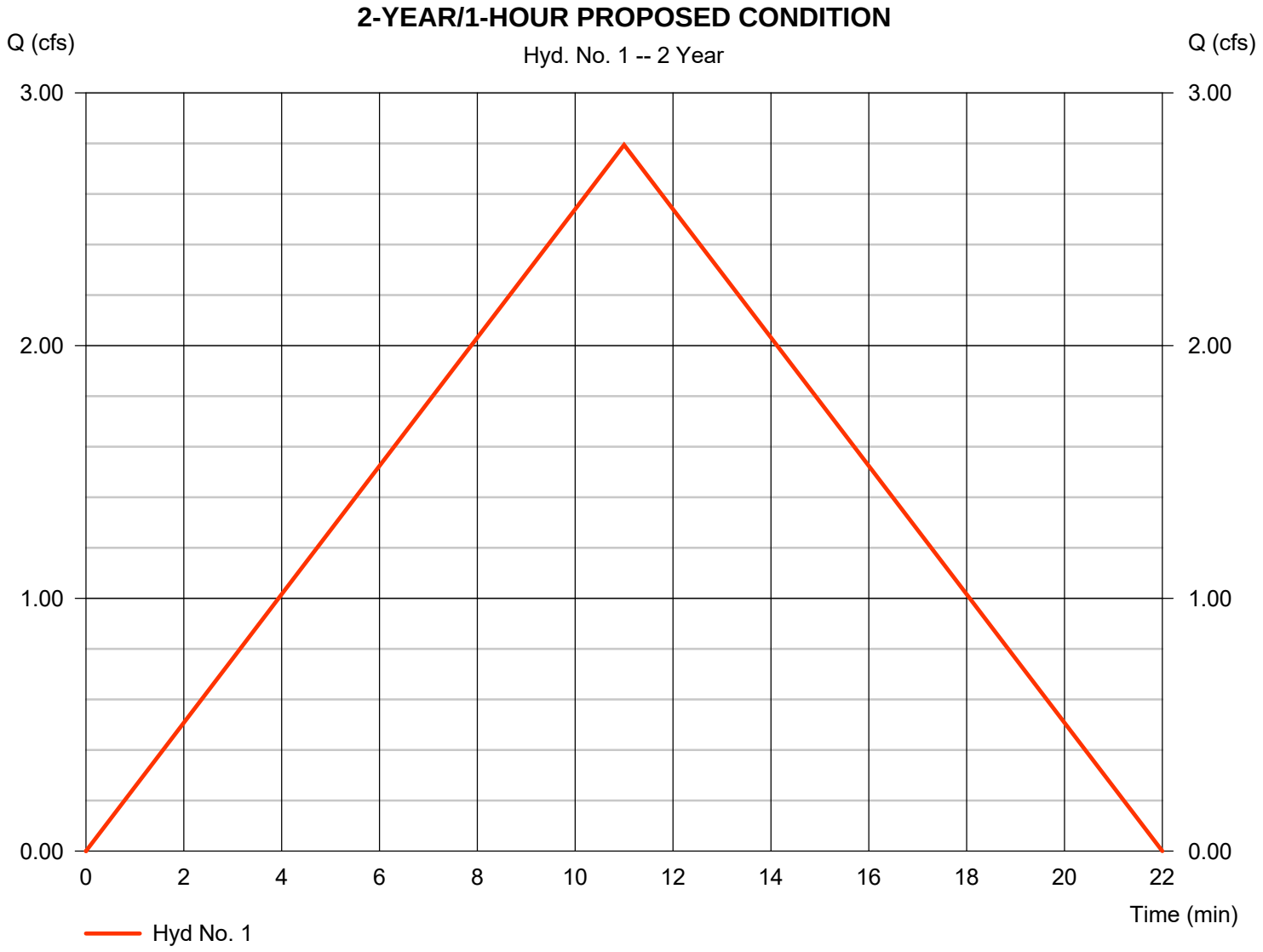
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020.4 Thursday, 07 / 18 / 2024

Hyd. No. 1

2-YEAR/1-HOUR PROPOSED CONDITION

Hydrograph type	=	Rational	Peak discharge	=	2.794 cfs
Storm frequency	=	2 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	1,844 cuft
Drainage area	=	1.200 ac	Runoff coeff.	=	0.524
Intensity	=	4.443 in/hr	Tc by User	=	11.00 min
IDF Curve	=	SampleFHA.idf	Asc/Rec limb fact	=	1/1



RUNOFF COEFFICIENT CALCULATIONS

	EXIST.	PROP.
C = RUNOFF COEFFICIENT		
I = 2Y/1HR RAINFALL INTENSITY (IN/HR)	0.584	0.584
F_P = INFILTRATION RATE (IN/HR)	1.22	1.22
a_i = RATIO OF IMPERVIOUS AREA	0.00	0.80
a_p = RATIO OF PERVIOUS AREA	1.00	0.20

$$C = 0.9\left(a_i + \frac{(I - F_p)a_p}{I}\right)$$

EXISTING RUNOFF COEFFICIENT:

$$C = 0.9\left(0.00 + \frac{(0.584 - 1.22)1.00}{0.584}\right)$$

$$C = -98^*$$

*INFILTRATION RATE IS HIGHER THAN 2Y/1HR RAINFALL – EXISTING 2Y RUNOFF = 0

PROPOSED RUNOFF COEFFICIENT:

$$C = 0.9\left(0.80 + \frac{(0.584 - 1.22)0.20}{0.584}\right)$$

$$C = 52.4$$

NOAA Atlas 14, Volume 6, Version 2
Location name: Beaumont, California, USA*
Latitude: 33.9261°, Longitude: -116.9962°
Elevation: 2535 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.121 (0.101-0.147)	0.158 (0.131-0.191)	0.213 (0.177-0.259)	0.264 (0.217-0.324)	0.344 (0.273-0.437)	0.415 (0.323-0.538)	0.497 (0.377-0.661)	0.592 (0.437-0.811)	0.743 (0.525-1.06)	0.879 (0.599-1.30)
10-min	0.174 (0.145-0.211)	0.226 (0.188-0.274)	0.305 (0.253-0.371)	0.378 (0.311-0.464)	0.493 (0.392-0.626)	0.595 (0.463-0.772)	0.712 (0.540-0.947)	0.849 (0.626-1.16)	1.06 (0.752-1.52)	1.26 (0.859-1.87)
15-min	0.210 (0.175-0.255)	0.274 (0.228-0.332)	0.369 (0.306-0.449)	0.457 (0.376-0.561)	0.596 (0.474-0.757)	0.719 (0.560-0.933)	0.861 (0.654-1.15)	1.03 (0.757-1.41)	1.29 (0.910-1.84)	1.52 (1.04-2.26)
30-min	0.306 (0.255-0.370)	0.398 (0.331-0.483)	0.537 (0.446-0.653)	0.665 (0.548-0.816)	0.867 (0.689-1.10)	1.05 (0.814-1.36)	1.25 (0.950-1.67)	1.49 (1.10-2.04)	1.87 (1.32-2.68)	2.22 (1.51-3.28)
60-min	0.448 (0.374-0.543)	0.584 (0.486-0.708)	0.787 (0.654-0.958)	0.976 (0.803-1.20)	1.27 (1.01-1.61)	1.53 (1.19-1.99)	1.84 (1.39-2.44)	2.19 (1.62-3.00)	2.75 (1.94-3.93)	3.25 (2.22-4.81)
2-hr	0.637 (0.531-0.772)	0.795 (0.662-0.964)	1.03 (0.853-1.25)	1.24 (1.02-1.52)	1.56 (1.24-1.99)	1.85 (1.44-2.40)	2.17 (1.64-2.88)	2.53 (1.87-3.47)	3.10 (2.19-4.42)	3.59 (2.45-5.32)
3-hr	0.778 (0.649-0.943)	0.959 (0.798-1.16)	1.22 (1.01-1.49)	1.46 (1.20-1.79)	1.81 (1.44-2.30)	2.12 (1.65-2.75)	2.46 (1.86-3.27)	2.84 (2.10-3.89)	3.42 (2.42-4.89)	3.92 (2.68-5.81)
6-hr	1.13 (0.939-1.36)	1.38 (1.15-1.67)	1.74 (1.44-2.11)	2.05 (1.68-2.51)	2.50 (1.99-3.18)	2.88 (2.25-3.74)	3.30 (2.50-4.39)	3.75 (2.77-5.14)	4.42 (3.12-6.32)	4.98 (3.40-7.38)
12-hr	1.53 (1.27-1.85)	1.91 (1.59-2.32)	2.43 (2.02-2.96)	2.87 (2.36-3.52)	3.49 (2.78-4.43)	3.98 (3.10-5.17)	4.50 (3.42-5.99)	5.05 (3.72-6.91)	5.82 (4.11-8.31)	6.43 (4.39-9.53)
24-hr	2.04 (1.81-2.35)	2.65 (2.34-3.06)	3.45 (3.04-3.99)	4.11 (3.59-4.79)	5.01 (4.24-6.03)	5.70 (4.73-7.02)	6.42 (5.20-8.08)	7.16 (5.65-9.26)	8.17 (6.19-11.0)	8.96 (6.56-12.5)
2-day	2.47 (2.19-2.85)	3.29 (2.91-3.80)	4.40 (3.88-5.09)	5.33 (4.66-6.22)	6.65 (5.63-8.01)	7.70 (6.39-9.47)	8.80 (7.13-11.1)	9.98 (7.87-12.9)	11.6 (8.81-15.7)	13.0 (9.49-18.1)
3-day	2.69 (2.38-3.10)	3.61 (3.19-4.16)	4.90 (4.32-5.67)	6.01 (5.26-7.01)	7.63 (6.46-9.19)	8.96 (7.43-11.0)	10.4 (8.42-13.1)	11.9 (9.42-15.4)	14.2 (10.7-19.1)	16.1 (11.8-22.4)
4-day	2.92 (2.58-3.36)	3.94 (3.48-4.55)	5.38 (4.74-6.23)	6.63 (5.80-7.74)	8.47 (7.17-10.2)	9.98 (8.28-12.3)	11.6 (9.41-14.6)	13.4 (10.6-17.3)	16.0 (12.1-21.6)	18.2 (13.3-25.4)
7-day	3.37 (2.99-3.89)	4.56 (4.03-5.26)	6.21 (5.47-7.18)	7.63 (6.68-8.90)	9.70 (8.22-11.7)	11.4 (9.45-14.0)	13.2 (10.7-16.6)	15.2 (12.0-19.6)	18.0 (13.7-24.3)	20.4 (14.9-28.4)
10-day	3.70 (3.27-4.26)	4.99 (4.41-5.76)	6.79 (5.99-7.86)	8.33 (7.29-9.72)	10.5 (8.93-12.7)	12.3 (10.2-15.2)	14.3 (11.6-18.0)	16.3 (12.9-21.1)	19.3 (14.6-26.0)	21.7 (15.9-30.3)
20-day	4.61 (4.08-5.31)	6.29 (5.56-7.26)	8.57 (7.56-9.92)	10.5 (9.18-12.2)	13.2 (11.2-15.9)	15.4 (12.8-18.9)	17.7 (14.3-22.3)	20.1 (15.8-26.0)	23.5 (17.8-31.7)	26.2 (19.2-36.6)
30-day	5.43 (4.80-6.26)	7.44 (6.58-8.59)	10.2 (8.95-11.7)	12.4 (10.9-14.5)	15.6 (13.2-18.8)	18.1 (15.0-22.2)	20.6 (16.7-26.0)	23.4 (18.4-30.2)	27.1 (20.6-36.6)	30.1 (22.1-42.0)
45-day	6.53 (5.78-7.53)	8.98 (7.94-10.4)	12.2 (10.8-14.1)	14.9 (13.0-17.4)	18.6 (15.7-22.4)	21.4 (17.8-26.4)	24.4 (19.8-30.7)	27.4 (21.6-35.5)	31.7 (24.0-42.7)	35.0 (25.6-48.7)
60-day	7.64 (6.76-8.80)	10.5 (9.25-12.1)	14.2 (12.5-16.4)	17.2 (15.1-20.1)	21.3 (18.1-25.7)	24.5 (20.4-30.2)	27.8 (22.5-35.0)	31.2 (24.6-40.3)	35.8 (27.1-48.2)	39.3 (28.8-54.8)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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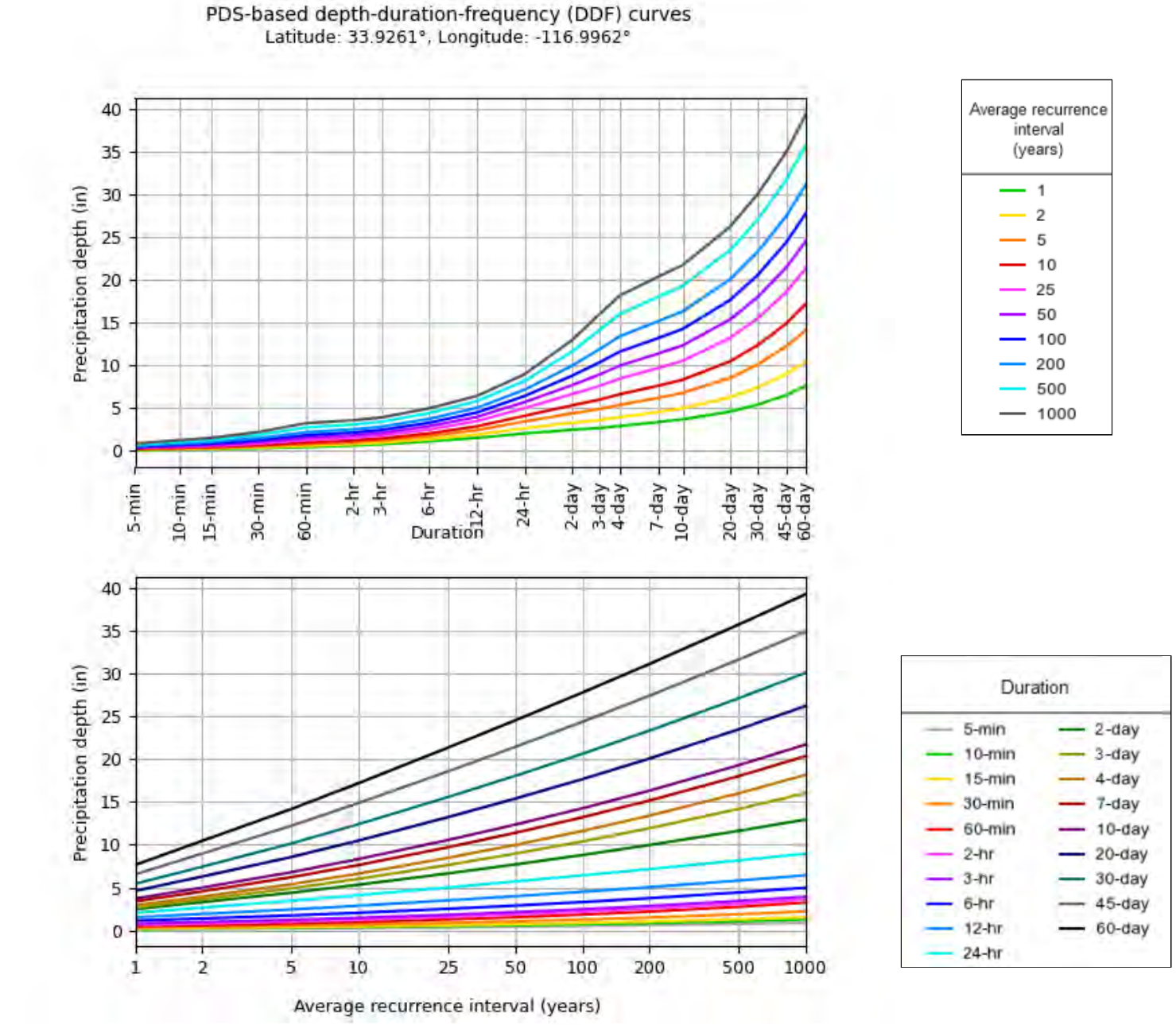
PF graphical



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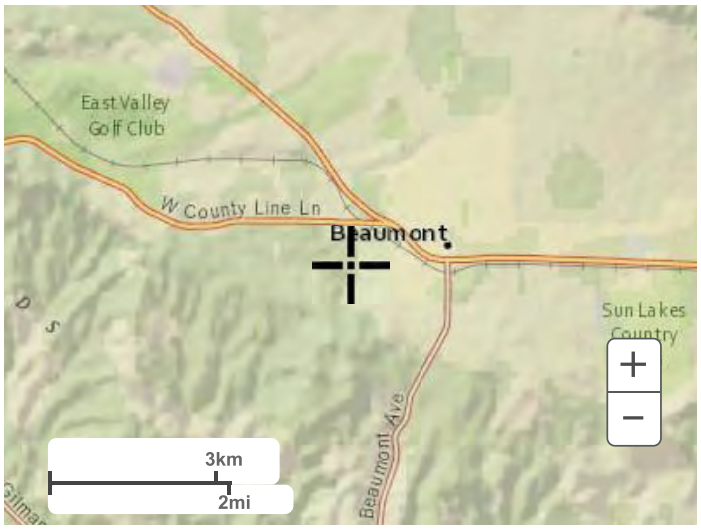
Maps & aerials

Small scale terrain



Large scale terrain

Large scale map

Large scale aerial

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National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

FINAL DRAINAGE STUDY
PW2025-0169

PREPARED FOR:

AA FENCE - WAREHOUSE
SW CORNER OF 4TH STREET & RISCO CIRCLE

CONTACT: MR. LARRY AGUILERA
320 E. 3RD STREET
BEAUMONT, CA 92223
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CITY OF BEAUMONT
COUNTY OF RIVERSIDE

PREPARED BY:

SITETECH, INC.
8061 CHURCH STREET
HIGHLAND CA 92346
PO BOX 592
PH. (909) 864-3180

BERNHARD K. MAYER R.C.E. 36866

09/18/2025
DATE

INTRODUCTION

The purpose of this study is to determine the rate of storm water runoff which will flow through the property during a 100-Year, 10-Year & 2-Year storm event and determine any mitigations which are necessary to protect the proposed development during the storm event. This study shows how the runoff will flow through the existing and proposed site.

EXISTING WATERSHED DESCRIPTION

In its existing condition the runoff from the 1.2 acre vacant site sheet flows from the northeast corner to the southwest corner and outlets onto the adjacent property to the west. The north and east sides of the project have existing curb and gutter, the existing grade west of the property sheet flows westerly and the south property flows south. With these existing conditions there will not be any off-site run-on. The site is 0% impervious. The properties to the north east and south are industrial/manufacturing facilities, the property to the west is vacant. The project is located within FEMA flood zone “X” (area of minimal flood hazard per FEMA FIRM map no. 06065C0811G, dated 8/28/08. Existing cover for site is “Grass, Annual or Perennial” with a Soil type of “C” giving the existing condition a CN of 86. (See Appx. 6 for Runoff Index Numbers)

PROPOSED WATERSHED DESCRIPTION

The proposed runoff condition accounts for a new parking lot, building, walkways, landscaping and a Bio-Retention Basin. These improvements make the site 80.1% impervious. Runoff from the proposed development will be conveyed to curb & gutters, v-gutters and drainage swales. Runoff from the site will be conveyed southerly via v-gutters and curb & gutters to the Bio-Retention Basin. The Bio-Retention Basin is for WQMP treatment only. The bio-retention basin is sized to hold the entire 2-year storm for hydrodification and peak-runoff mitigation. Overflow from Bio-Retention Basin will overflow out a concrete “U” channel which will convey the runoff to a parkway drain which outlets onto Risco Circle. The Bio-Retention basin has 12” of freeboard which aligns with the top of the concrete “U” channel. There will not be any off-site run-on when developed nor will there be any runoff discharged onto adjacent properties. All site runoff will be conveyed to Risco Circle. The 100-year/24-hour storm runoff mitigation will be conveyed to a catch basin before the outlet onto Risco Circle. The catch basin and 12” HDPE storm drain will convey the runoff to underground storage tanks (81,000 gal.) which will hold the required 100-year/24-hour storm mitigation. Risco Circle is a fully improved street designed to service industrial properties – there will not be any downstream impacts as a result of this development. There will be 2 sump pumps proposed, one to pump out the treated water from the Bio-Retention Basin underdrain and one to pump out the mitigated runoff from the storage tank. Both pumps will have outlet pipes cored through a concrete “u” channel and will outlet through the parkway drain onto Risco Circle. Proposed cover for site is “Urban Cover – Residential or Commercial Landscaping” with a Soil type of “C” giving the propose condition a CN of 69. (See Appx. 6 for Runoff Index Numbers)

METHODOLOGY - Rational Method

The following scenario was modeled: Existing & Developed Condition, 2 year, 10 year & 100 year storm

Rational Method computations were performed using Advanced Engineering Software (aes) 2016, ver. 23.0, based on the Riverside County Hydrology Manual. Rainfall depth was derived from the Riverside County Flood Control & Water Conservation District Hydrology Manual's Slope of Intensity Duration Curve (plate D-4.6) and precipitation frequency Atlas, NOAA Atlas 14. The hydrologic soils group for this project is Group C which was derived from the USDA NRCS custom soils report - Printouts of the rational method calculations, as well as applicable plates from the Manual, are included in this report in Appx. 6.

Hydrographs

CIVILCADD/CIVILDESIGN, 1989 - 2004, Version 7.0 was used to calculate the Riverside County Synthetic Unit Hydrology Method (RCFC & WCD Manual date - April 1978).
(Results and values used to calculate the Synthetic Unity Hydrograph can be found in Appx. 1.)

CONCLUSIONS

This drainage study and the calculations presented herein demonstrate the following:

TOTAL RUNOFF EXISTING CONDITION = 4.00 CFS (Q100)

(SEE APPX. 3) = 2.24 CFS (Q10)

= 1.00 CFS (Q2)

TOTAL RUNOFF PROPOSED CONDITION = 4.62 CFS (Q100)

(SEE APPX. 3) = 2.77 CFS (Q10)

= 1.44 CFS (Q2)

100-YEAR / 24-HOUR VOLUME MITIGATION

TOTAL VOLUME EXISTING CONDITION = 20,848.7 CU. FT. (V100)
(SEE APPX. 1)

TOTAL VOLUME PROPOSED CONDITION = 22,634.0 CU. FT. (V100)
(SEE APPX. 1)

DIFFERENCE IN RUNOFF VOLUME = 1,785.3 CU. FT.

1 CU. FT. = 7.4805 GAL 1,785.3 X 7.4805 = 13,355 GAL.

STORAGE PROVIDED FOR VOLUME MITIGATION = 15,000 GAL. (2005 CU. FT.)
(SEE TANK DETAIL APPX. 4 AND TANK AND MAINTENANCE APPX. 6)

BASIN RUNOFF CAPACITY

AT FULL WQMP TREATMENT CAPACITY THE BIORETENTION BASIN WILL BE ABLE TO CONVEY THE 100-YEAR/1-HOUR STORM TO THE OUTLET STRUCTURE. (SEE BASIN CROSS SECTIONS IN APPX. 4 AND HYDRAULIC CALCULATIONS IN APPX 5.)

WQMP MITIGATION (FOR REFERENCE ONLY)

REQUIRED VOLUME FOR WQMP TREATMENT = 2,627 CU. FT.
REQUIRED VOLUME FOR HYDROMODIFICATION = 1,844 CU. FT.
BIO-FILTRATION BASIN SIZE = 4,537 CU. FT.
(SEE BASIN SIZING IN APPX. 5)

BASIN HOLDS REQUIRED WQMP TREATMENT VOLUME AND ENTIRE 2-YEAR STORM. THIS MITIGATES HYDROMODIFICATION AND PEAK RUNOFF.
(SEE WQMP REPORT FOR MORE INFORMATION)

DRAWDOWN CALCULATIONS

BIO-FILTRATION BASIN SIZE = 4,537 CU. FT.

1 CU. FT. = 7.4805 GAL 4,537 X 7.4805 = 33,939 GAL.

TOTAL STORAGE TANK SIZE = 15,000 GAL.

ZOELLER FLOW-MATE SERIES MODEL 137 SUMP PUMP RATE = 75 GAL. / MINUTE
(SEE APPX. 4 FOR PUMP SPECS.)
(SEE APPX. 6 FOR PUMP MAINTENANCE)

BASIN = 33,939 GAL. / (75 GAL. / MIN.) = 453 MIN. = 7.55 HOURS < 24 HOURS = OK

TANK = 15,000 GAL. / (75 GAL. / MIN.) = 200 MIN. = 3.33 HOURS < 24 HOURS = OK

RIP-RAP CALCULATIONS

$$D = \frac{V^2}{2gC^2(s-1)}$$

The variables in the riprap sizing equation are (units shown in SI, but our calculation allows a variety of units):
C = Isbash constant. Per references below, C=0.86 for highly turbulent conditions or C=1.2 for low turbulence.
D = Median diameter of spherical stone or rock. Also known as D_{50} (m).
g = Acceleration due to gravity, 9.8066 m/s^2 (32.17 ft/ s^2)
S = Specific gravity of stone or rock. Typically varies from 2.56 to 2.92 depending on the rock material. A commonly used value is 2.65.
V = Water velocity approaching the riprap (m/s).

C=0.86

g=32.17

V=3.14

S=2.65

$$D = \frac{3.14^2}{2(32.17)0.86^2(2.65-1)} = 0.125 \text{ FT} =$$ **1.5 INCH MIN. DIAMETER ROCK**

USING 8” MIN. DIAMETER ROCK = OK

APPENDIX 1 – HYDROGRAPHS

- EXISTING 100Y/24HR HYDROGRAPH
- PROPOSED 100Y/24HR HYDROGRAPH

U n i t H y d r o g r a p h A n a l y s i s

Study date 09/16/25 File: PENCE24100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 4042

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

SITETECH
PENCE
EXISTING CONDITION
100-YEAR

Drainage Area = 1.20(Ac.) = 0.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.20(Ac.) = 0.002 Sq. Mi.
Length along longest watercourse = 327.00(Ft.)
Length along longest watercourse measured to centroid = 163.50(Ft.)
Length along longest watercourse = 0.062 Mi.
Length along longest watercourse measured to centroid = 0.031 Mi.
Difference in elevation = 8.00(Ft.)
Slope along watercourse = 129.1743 Ft./Mi.
Average Manning's 'N' = 0.035
Lag time = 0.031 Hr.
Lag time = 1.86 Min.
25% of lag time = 0.46 Min.
40% of lag time = 0.74 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.20	2.65	3.18

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.20	6.42	7.70

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.650(In)
Area Averaged 100-Year Rainfall = 6.420(In)

Point rain (area averaged) = 6.420(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 6.420(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.200	86.00	0.000

Total Area Entered = 1.20(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
86.0	94.4	0.073	0.000	0.073	1.000	0.073
					Sum (F) =	0.073

Area averaged mean soil loss (F) (In/Hr) = 0.073
Minimum soil loss rate ((In/Hr)) = 0.036
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	269.277	53.291	0.644
2	0.167	538.555	38.887	0.470
3	0.250	807.832	7.822	0.095
		Sum = 100.000	Sum=	1.209

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.051	0.129	0.046	0.01
2	0.17	0.07	0.051	0.129	0.046	0.01
3	0.25	0.07	0.051	0.128	0.046	0.01
4	0.33	0.10	0.077	0.128	0.069	0.01
5	0.42	0.10	0.077	0.127	0.069	0.01
6	0.50	0.10	0.077	0.127	0.069	0.01
7	0.58	0.10	0.077	0.126	0.069	0.01
8	0.67	0.10	0.077	0.126	0.069	0.01
9	0.75	0.10	0.077	0.125	0.069	0.01
10	0.83	0.13	0.103	0.125	0.092	0.01
11	0.92	0.13	0.103	0.124	0.092	0.01
12	1.00	0.13	0.103	0.124	0.092	0.01
13	1.08	0.10	0.077	0.123	0.069	0.01
14	1.17	0.10	0.077	0.123	0.069	0.01
15	1.25	0.10	0.077	0.122	0.069	0.01

16	1.33	0.10	0.077	0.122	0.069	0.01
17	1.42	0.10	0.077	0.121	0.069	0.01
18	1.50	0.10	0.077	0.121	0.069	0.01
19	1.58	0.10	0.077	0.120	0.069	0.01
20	1.67	0.10	0.077	0.120	0.069	0.01
21	1.75	0.10	0.077	0.119	0.069	0.01
22	1.83	0.13	0.103	0.119	0.092	0.01
23	1.92	0.13	0.103	0.118	0.092	0.01
24	2.00	0.13	0.103	0.118	0.092	0.01
25	2.08	0.13	0.103	0.117	0.092	0.01
26	2.17	0.13	0.103	0.117	0.092	0.01
27	2.25	0.13	0.103	0.116	0.092	0.01
28	2.33	0.13	0.103	0.116	0.092	0.01
29	2.42	0.13	0.103	0.115	0.092	0.01
30	2.50	0.13	0.103	0.115	0.092	0.01
31	2.58	0.17	0.128	0.115	---	0.01
32	2.67	0.17	0.128	0.114	---	0.01
33	2.75	0.17	0.128	0.114	---	0.01
34	2.83	0.17	0.128	0.113	---	0.02
35	2.92	0.17	0.128	0.113	---	0.02
36	3.00	0.17	0.128	0.112	---	0.02
37	3.08	0.17	0.128	0.112	---	0.02
38	3.17	0.17	0.128	0.111	---	0.02
39	3.25	0.17	0.128	0.111	---	0.02
40	3.33	0.17	0.128	0.110	---	0.02
41	3.42	0.17	0.128	0.110	---	0.02
42	3.50	0.17	0.128	0.109	---	0.02
43	3.58	0.17	0.128	0.109	---	0.02
44	3.67	0.17	0.128	0.108	---	0.02
45	3.75	0.17	0.128	0.108	---	0.02
46	3.83	0.20	0.154	0.108	---	0.05
47	3.92	0.20	0.154	0.107	---	0.05
48	4.00	0.20	0.154	0.107	---	0.05
49	4.08	0.20	0.154	0.106	---	0.05
50	4.17	0.20	0.154	0.106	---	0.05
51	4.25	0.20	0.154	0.105	---	0.05
52	4.33	0.23	0.180	0.105	---	0.07
53	4.42	0.23	0.180	0.104	---	0.08
54	4.50	0.23	0.180	0.104	---	0.08
55	4.58	0.23	0.180	0.104	---	0.08
56	4.67	0.23	0.180	0.103	---	0.08
57	4.75	0.23	0.180	0.103	---	0.08
58	4.83	0.27	0.205	0.102	---	0.10
59	4.92	0.27	0.205	0.102	---	0.10
60	5.00	0.27	0.205	0.101	---	0.10
61	5.08	0.20	0.154	0.101	---	0.05
62	5.17	0.20	0.154	0.100	---	0.05
63	5.25	0.20	0.154	0.100	---	0.05
64	5.33	0.23	0.180	0.100	---	0.08
65	5.42	0.23	0.180	0.099	---	0.08
66	5.50	0.23	0.180	0.099	---	0.08
67	5.58	0.27	0.205	0.098	---	0.11
68	5.67	0.27	0.205	0.098	---	0.11
69	5.75	0.27	0.205	0.097	---	0.11
70	5.83	0.27	0.205	0.097	---	0.11
71	5.92	0.27	0.205	0.097	---	0.11
72	6.00	0.27	0.205	0.096	---	0.11

73	6.08	0.30	0.231	0.096	---	0.14
74	6.17	0.30	0.231	0.095	---	0.14
75	6.25	0.30	0.231	0.095	---	0.14
76	6.33	0.30	0.231	0.094	---	0.14
77	6.42	0.30	0.231	0.094	---	0.14
78	6.50	0.30	0.231	0.094	---	0.14
79	6.58	0.33	0.257	0.093	---	0.16
80	6.67	0.33	0.257	0.093	---	0.16
81	6.75	0.33	0.257	0.092	---	0.16
82	6.83	0.33	0.257	0.092	---	0.16
83	6.92	0.33	0.257	0.091	---	0.17
84	7.00	0.33	0.257	0.091	---	0.17
85	7.08	0.33	0.257	0.091	---	0.17
86	7.17	0.33	0.257	0.090	---	0.17
87	7.25	0.33	0.257	0.090	---	0.17
88	7.33	0.37	0.282	0.089	---	0.19
89	7.42	0.37	0.282	0.089	---	0.19
90	7.50	0.37	0.282	0.089	---	0.19
91	7.58	0.40	0.308	0.088	---	0.22
92	7.67	0.40	0.308	0.088	---	0.22
93	7.75	0.40	0.308	0.087	---	0.22
94	7.83	0.43	0.334	0.087	---	0.25
95	7.92	0.43	0.334	0.087	---	0.25
96	8.00	0.43	0.334	0.086	---	0.25
97	8.08	0.50	0.385	0.086	---	0.30
98	8.17	0.50	0.385	0.085	---	0.30
99	8.25	0.50	0.385	0.085	---	0.30
100	8.33	0.50	0.385	0.085	---	0.30
101	8.42	0.50	0.385	0.084	---	0.30
102	8.50	0.50	0.385	0.084	---	0.30
103	8.58	0.53	0.411	0.083	---	0.33
104	8.67	0.53	0.411	0.083	---	0.33
105	8.75	0.53	0.411	0.083	---	0.33
106	8.83	0.57	0.437	0.082	---	0.35
107	8.92	0.57	0.437	0.082	---	0.35
108	9.00	0.57	0.437	0.081	---	0.36
109	9.08	0.63	0.488	0.081	---	0.41
110	9.17	0.63	0.488	0.081	---	0.41
111	9.25	0.63	0.488	0.080	---	0.41
112	9.33	0.67	0.514	0.080	---	0.43
113	9.42	0.67	0.514	0.080	---	0.43
114	9.50	0.67	0.514	0.079	---	0.43
115	9.58	0.70	0.539	0.079	---	0.46
116	9.67	0.70	0.539	0.078	---	0.46
117	9.75	0.70	0.539	0.078	---	0.46
118	9.83	0.73	0.565	0.078	---	0.49
119	9.92	0.73	0.565	0.077	---	0.49
120	10.00	0.73	0.565	0.077	---	0.49
121	10.08	0.50	0.385	0.077	---	0.31
122	10.17	0.50	0.385	0.076	---	0.31
123	10.25	0.50	0.385	0.076	---	0.31
124	10.33	0.50	0.385	0.075	---	0.31
125	10.42	0.50	0.385	0.075	---	0.31
126	10.50	0.50	0.385	0.075	---	0.31
127	10.58	0.67	0.514	0.074	---	0.44
128	10.67	0.67	0.514	0.074	---	0.44
129	10.75	0.67	0.514	0.074	---	0.44

130	10.83	0.67	0.514	0.073	---	0.44
131	10.92	0.67	0.514	0.073	---	0.44
132	11.00	0.67	0.514	0.072	---	0.44
133	11.08	0.63	0.488	0.072	---	0.42
134	11.17	0.63	0.488	0.072	---	0.42
135	11.25	0.63	0.488	0.071	---	0.42
136	11.33	0.63	0.488	0.071	---	0.42
137	11.42	0.63	0.488	0.071	---	0.42
138	11.50	0.63	0.488	0.070	---	0.42
139	11.58	0.57	0.437	0.070	---	0.37
140	11.67	0.57	0.437	0.070	---	0.37
141	11.75	0.57	0.437	0.069	---	0.37
142	11.83	0.60	0.462	0.069	---	0.39
143	11.92	0.60	0.462	0.069	---	0.39
144	12.00	0.60	0.462	0.068	---	0.39
145	12.08	0.83	0.642	0.068	---	0.57
146	12.17	0.83	0.642	0.068	---	0.57
147	12.25	0.83	0.642	0.067	---	0.57
148	12.33	0.87	0.668	0.067	---	0.60
149	12.42	0.87	0.668	0.067	---	0.60
150	12.50	0.87	0.668	0.066	---	0.60
151	12.58	0.93	0.719	0.066	---	0.65
152	12.67	0.93	0.719	0.066	---	0.65
153	12.75	0.93	0.719	0.065	---	0.65
154	12.83	0.97	0.745	0.065	---	0.68
155	12.92	0.97	0.745	0.065	---	0.68
156	13.00	0.97	0.745	0.064	---	0.68
157	13.08	1.13	0.873	0.064	---	0.81
158	13.17	1.13	0.873	0.064	---	0.81
159	13.25	1.13	0.873	0.063	---	0.81
160	13.33	1.13	0.873	0.063	---	0.81
161	13.42	1.13	0.873	0.063	---	0.81
162	13.50	1.13	0.873	0.062	---	0.81
163	13.58	0.77	0.591	0.062	---	0.53
164	13.67	0.77	0.591	0.062	---	0.53
165	13.75	0.77	0.591	0.061	---	0.53
166	13.83	0.77	0.591	0.061	---	0.53
167	13.92	0.77	0.591	0.061	---	0.53
168	14.00	0.77	0.591	0.060	---	0.53
169	14.08	0.90	0.693	0.060	---	0.63
170	14.17	0.90	0.693	0.060	---	0.63
171	14.25	0.90	0.693	0.060	---	0.63
172	14.33	0.87	0.668	0.059	---	0.61
173	14.42	0.87	0.668	0.059	---	0.61
174	14.50	0.87	0.668	0.059	---	0.61
175	14.58	0.87	0.668	0.058	---	0.61
176	14.67	0.87	0.668	0.058	---	0.61
177	14.75	0.87	0.668	0.058	---	0.61
178	14.83	0.83	0.642	0.057	---	0.58
179	14.92	0.83	0.642	0.057	---	0.58
180	15.00	0.83	0.642	0.057	---	0.59
181	15.08	0.80	0.616	0.057	---	0.56
182	15.17	0.80	0.616	0.056	---	0.56
183	15.25	0.80	0.616	0.056	---	0.56
184	15.33	0.77	0.591	0.056	---	0.53
185	15.42	0.77	0.591	0.055	---	0.54
186	15.50	0.77	0.591	0.055	---	0.54

187	15.58	0.63	0.488	0.055	---	0.43
188	15.67	0.63	0.488	0.055	---	0.43
189	15.75	0.63	0.488	0.054	---	0.43
190	15.83	0.63	0.488	0.054	---	0.43
191	15.92	0.63	0.488	0.054	---	0.43
192	16.00	0.63	0.488	0.053	---	0.43
193	16.08	0.13	0.103	0.053	---	0.05
194	16.17	0.13	0.103	0.053	---	0.05
195	16.25	0.13	0.103	0.053	---	0.05
196	16.33	0.13	0.103	0.052	---	0.05
197	16.42	0.13	0.103	0.052	---	0.05
198	16.50	0.13	0.103	0.052	---	0.05
199	16.58	0.10	0.077	0.052	---	0.03
200	16.67	0.10	0.077	0.051	---	0.03
201	16.75	0.10	0.077	0.051	---	0.03
202	16.83	0.10	0.077	0.051	---	0.03
203	16.92	0.10	0.077	0.051	---	0.03
204	17.00	0.10	0.077	0.050	---	0.03
205	17.08	0.17	0.128	0.050	---	0.08
206	17.17	0.17	0.128	0.050	---	0.08
207	17.25	0.17	0.128	0.050	---	0.08
208	17.33	0.17	0.128	0.049	---	0.08
209	17.42	0.17	0.128	0.049	---	0.08
210	17.50	0.17	0.128	0.049	---	0.08
211	17.58	0.17	0.128	0.049	---	0.08
212	17.67	0.17	0.128	0.048	---	0.08
213	17.75	0.17	0.128	0.048	---	0.08
214	17.83	0.13	0.103	0.048	---	0.05
215	17.92	0.13	0.103	0.048	---	0.06
216	18.00	0.13	0.103	0.047	---	0.06
217	18.08	0.13	0.103	0.047	---	0.06
218	18.17	0.13	0.103	0.047	---	0.06
219	18.25	0.13	0.103	0.047	---	0.06
220	18.33	0.13	0.103	0.046	---	0.06
221	18.42	0.13	0.103	0.046	---	0.06
222	18.50	0.13	0.103	0.046	---	0.06
223	18.58	0.10	0.077	0.046	---	0.03
224	18.67	0.10	0.077	0.046	---	0.03
225	18.75	0.10	0.077	0.045	---	0.03
226	18.83	0.07	0.051	0.045	---	0.01
227	18.92	0.07	0.051	0.045	---	0.01
228	19.00	0.07	0.051	0.045	---	0.01
229	19.08	0.10	0.077	0.044	---	0.03
230	19.17	0.10	0.077	0.044	---	0.03
231	19.25	0.10	0.077	0.044	---	0.03
232	19.33	0.13	0.103	0.044	---	0.06
233	19.42	0.13	0.103	0.044	---	0.06
234	19.50	0.13	0.103	0.043	---	0.06
235	19.58	0.10	0.077	0.043	---	0.03
236	19.67	0.10	0.077	0.043	---	0.03
237	19.75	0.10	0.077	0.043	---	0.03
238	19.83	0.07	0.051	0.043	---	0.01
239	19.92	0.07	0.051	0.042	---	0.01
240	20.00	0.07	0.051	0.042	---	0.01
241	20.08	0.10	0.077	0.042	---	0.03
242	20.17	0.10	0.077	0.042	---	0.04
243	20.25	0.10	0.077	0.042	---	0.04

244	20.33	0.10	0.077	0.042	---	0.04
245	20.42	0.10	0.077	0.041	---	0.04
246	20.50	0.10	0.077	0.041	---	0.04
247	20.58	0.10	0.077	0.041	---	0.04
248	20.67	0.10	0.077	0.041	---	0.04
249	20.75	0.10	0.077	0.041	---	0.04
250	20.83	0.07	0.051	0.041	---	0.01
251	20.92	0.07	0.051	0.040	---	0.01
252	21.00	0.07	0.051	0.040	---	0.01
253	21.08	0.10	0.077	0.040	---	0.04
254	21.17	0.10	0.077	0.040	---	0.04
255	21.25	0.10	0.077	0.040	---	0.04
256	21.33	0.07	0.051	0.040	---	0.01
257	21.42	0.07	0.051	0.039	---	0.01
258	21.50	0.07	0.051	0.039	---	0.01
259	21.58	0.10	0.077	0.039	---	0.04
260	21.67	0.10	0.077	0.039	---	0.04
261	21.75	0.10	0.077	0.039	---	0.04
262	21.83	0.07	0.051	0.039	---	0.01
263	21.92	0.07	0.051	0.039	---	0.01
264	22.00	0.07	0.051	0.038	---	0.01
265	22.08	0.10	0.077	0.038	---	0.04
266	22.17	0.10	0.077	0.038	---	0.04
267	22.25	0.10	0.077	0.038	---	0.04
268	22.33	0.07	0.051	0.038	---	0.01
269	22.42	0.07	0.051	0.038	---	0.01
270	22.50	0.07	0.051	0.038	---	0.01
271	22.58	0.07	0.051	0.038	---	0.01
272	22.67	0.07	0.051	0.038	---	0.01
273	22.75	0.07	0.051	0.037	---	0.01
274	22.83	0.07	0.051	0.037	---	0.01
275	22.92	0.07	0.051	0.037	---	0.01
276	23.00	0.07	0.051	0.037	---	0.01
277	23.08	0.07	0.051	0.037	---	0.01
278	23.17	0.07	0.051	0.037	---	0.01
279	23.25	0.07	0.051	0.037	---	0.01
280	23.33	0.07	0.051	0.037	---	0.01
281	23.42	0.07	0.051	0.037	---	0.01
282	23.50	0.07	0.051	0.037	---	0.01
283	23.58	0.07	0.051	0.037	---	0.01
284	23.67	0.07	0.051	0.037	---	0.01
285	23.75	0.07	0.051	0.036	---	0.01
286	23.83	0.07	0.051	0.036	---	0.01
287	23.92	0.07	0.051	0.036	---	0.01
288	24.00	0.07	0.051	0.036	---	0.01
	Sum =	100.0			Sum =	57.4

Flood volume = Effective rainfall 4.79(In)
times area 1.2(Ac.)/[(In)/(Ft.)] = 0.5(Ac.Ft)
Total soil loss = 1.63(In)
Total soil loss = 0.163(Ac.Ft)
Total rainfall = 6.42(In)
Flood volume = **20848.7 Cubic Feet**
Total soil loss = 7116.8 Cubic Feet

Peak flow rate of this hydrograph = 0.981(CFS)

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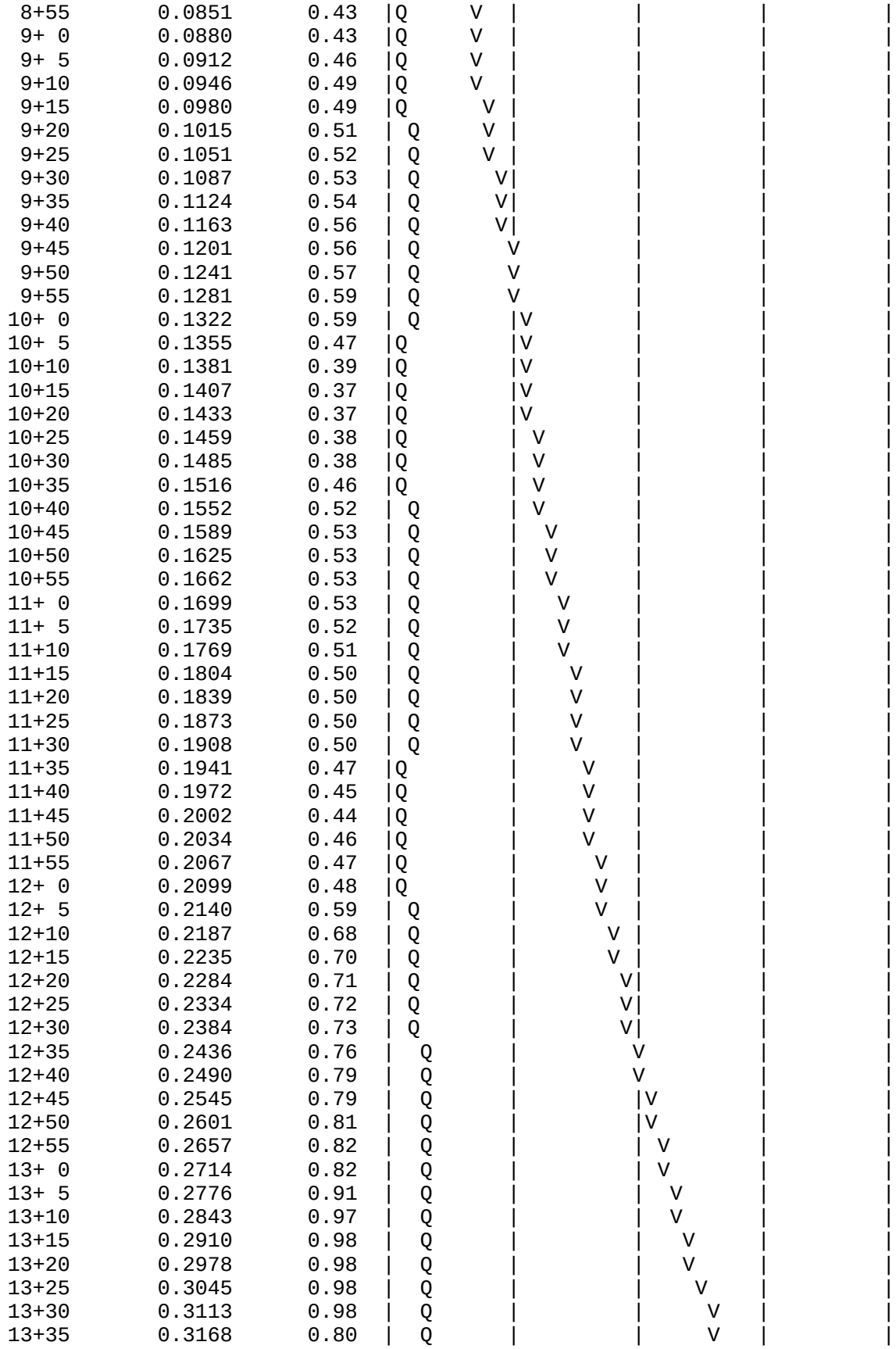
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0001	0.01	Q				
0+15	0.0001	0.01	Q				
0+20	0.0002	0.01	Q				
0+25	0.0002	0.01	Q				
0+30	0.0003	0.01	Q				
0+35	0.0004	0.01	Q				
0+40	0.0004	0.01	Q				
0+45	0.0005	0.01	Q				
0+50	0.0006	0.01	Q				
0+55	0.0006	0.01	Q				
1+ 0	0.0007	0.01	Q				
1+ 5	0.0008	0.01	Q				
1+10	0.0009	0.01	Q				
1+15	0.0009	0.01	Q				
1+20	0.0010	0.01	Q				
1+25	0.0011	0.01	Q				
1+30	0.0011	0.01	Q				
1+35	0.0012	0.01	Q				
1+40	0.0012	0.01	Q				
1+45	0.0013	0.01	Q				
1+50	0.0014	0.01	Q				
1+55	0.0015	0.01	Q				
2+ 0	0.0016	0.01	Q				
2+ 5	0.0016	0.01	Q				
2+10	0.0017	0.01	Q				
2+15	0.0018	0.01	Q				
2+20	0.0019	0.01	Q				
2+25	0.0020	0.01	Q				
2+30	0.0021	0.01	Q				
2+35	0.0022	0.01	Q				
2+40	0.0023	0.02	Q				
2+45	0.0024	0.02	Q				
2+50	0.0025	0.02	Q				
2+55	0.0027	0.02	Q				
3+ 0	0.0028	0.02	Q				
3+ 5	0.0029	0.02	Q				
3+10	0.0031	0.02	Q				
3+15	0.0032	0.02	Q				
3+20	0.0034	0.02	Q				
3+25	0.0035	0.02	Q				
3+30	0.0037	0.02	Q				
3+35	0.0038	0.02	Q				
3+40	0.0040	0.02	Q				
3+45	0.0042	0.02	Q				
3+50	0.0045	0.04	Q				
3+55	0.0048	0.05	Q				
4+ 0	0.0052	0.06	Q				
4+ 5	0.0056	0.06	Q				

4+10	0.0060	0.06	Q	|	|	|	|
4+15	0.0064	0.06	Q	|	|	|	|
4+20	0.0069	0.08	Q	|	|	|	|
4+25	0.0076	0.09	Q	|	|	|	|
4+30	0.0082	0.09	Q	|	|	|	|
4+35	0.0088	0.09	Q	|	|	|	|
4+40	0.0095	0.09	Q	|	|	|	|
4+45	0.0101	0.09	Q	|	|	|	|
4+50	0.0109	0.11	Q	|	|	|	|
4+55	0.0117	0.12	Q	|	|	|	|
5+ 0	0.0126	0.13	QV	|	|	|	|
5+ 5	0.0132	0.09	QV	|	|	|	|
5+10	0.0137	0.07	QV	|	|	|	|
5+15	0.0141	0.07	QV	|	|	|	|
5+20	0.0147	0.08	QV	|	|	|	|
5+25	0.0154	0.09	QV	|	|	|	|
5+30	0.0160	0.10	QV	|	|	|	|
5+35	0.0168	0.11	QV	|	|	|	|
5+40	0.0177	0.13	QV	|	|	|	|
5+45	0.0186	0.13	QV	|	|	|	|
5+50	0.0195	0.13	QV	|	|	|	|
5+55	0.0204	0.13	QV	|	|	|	|
6+ 0	0.0213	0.13	QV	|	|	|	|
6+ 5	0.0223	0.15	QV	|	|	|	|
6+10	0.0235	0.16	QV	|	|	|	|
6+15	0.0246	0.16	Q V	|	|	|	|
6+20	0.0257	0.17	Q V	|	|	|	|
6+25	0.0269	0.17	Q V	|	|	|	|
6+30	0.0280	0.17	Q V	|	|	|	|
6+35	0.0293	0.18	Q V	|	|	|	|
6+40	0.0306	0.20	Q V	|	|	|	|
6+45	0.0320	0.20	Q V	|	|	|	|
6+50	0.0334	0.20	Q V	|	|	|	|
6+55	0.0347	0.20	Q V	|	|	|	|
7+ 0	0.0361	0.20	Q V	|	|	|	|
7+ 5	0.0375	0.20	Q V	|	|	|	|
7+10	0.0389	0.20	Q V	|	|	|	|
7+15	0.0403	0.20	Q V	|	|	|	|
7+20	0.0418	0.22	Q V	|	|	|	|
7+25	0.0434	0.23	Q V	|	|	|	|
7+30	0.0450	0.23	Q V	|	|	|	|
7+35	0.0467	0.25	|Q V	|	|	|	|
7+40	0.0485	0.26	|Q V	|	|	|	|
7+45	0.0504	0.27	|Q V	|	|	|	|
7+50	0.0523	0.28	|Q V	|	|	|	|
7+55	0.0544	0.30	|Q V	|	|	|	|
8+ 0	0.0564	0.30	|Q V	|	|	|	|
8+ 5	0.0587	0.33	|Q V	|	|	|	|
8+10	0.0612	0.36	|Q V	|	|	|	|
8+15	0.0637	0.36	|Q V	|	|	|	|
8+20	0.0662	0.36	|Q V	|	|	|	|
8+25	0.0687	0.36	|Q V	|	|	|	|
8+30	0.0712	0.36	|Q V	|	|	|	|
8+35	0.0738	0.38	|Q V	|	|	|	|
8+40	0.0766	0.39	|Q V	|	|	|	|
8+45	0.0793	0.40	|Q V	|	|	|	|
8+50	0.0821	0.41	|Q V	|	|	|	|



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13+40       0.3214      0.67  | Q       |         |     V   |         |
13+45       0.3258      0.64  | Q       |         |      V  |         |
13+50       0.3302      0.64  | Q       |         |      V  |         |
13+55       0.3346      0.64  | Q       |         |      V  |         |
14+ 0       0.3390      0.64  | Q       |         |       V |         |
14+ 5       0.3439      0.71  | Q       |         |       V |         |
14+10       0.3491      0.76  |  Q      |         |        V|         |
14+15       0.3544      0.77  |  Q      |         |        V|         |
14+20       0.3596      0.75  |  Q      |         |         V         |
14+25       0.3646      0.74  | Q       |         |         V         |
14+30       0.3697      0.74  | Q       |         |         V         |
14+35       0.3748      0.74  | Q       |         |          V        |
14+40       0.3799      0.74  | Q       |         |          V        |
14+45       0.3850      0.74  | Q       |         |          | V      |
14+50       0.3899      0.72  | Q       |         |          | V      |
14+55       0.3948      0.71  | Q       |         |          | V      |
15+ 0       0.3997      0.71  | Q       |         |          |  V     |
15+ 5       0.4045      0.69  | Q       |         |          |  V     |
15+10       0.4091      0.68  | Q       |         |          |   V    |
15+15       0.4138      0.68  | Q       |         |          |   V    |
15+20       0.4184      0.66  | Q       |         |          |   V    |
15+25       0.4228      0.65  | Q       |         |          |    V   |
15+30       0.4273      0.65  | Q       |         |          |    V   |
15+35       0.4313      0.58  | Q       |         |          |     V  |
15+40       0.4350      0.53  | Q       |         |          |     V  |
15+45       0.4386      0.52  | Q       |         |          |     V  |
15+50       0.4422      0.52  | Q       |         |          |     V  |
15+55       0.4458      0.53  | Q       |         |          |      V |
16+ 0       0.4494      0.53  | Q       |         |          |      V |
16+ 5       0.4514      0.28  |Q        |         |          |      V |
16+10       0.4520      0.10  Q         |         |          |      V |
16+15       0.4524      0.06  Q         |         |          |      V |
16+20       0.4529      0.06  Q         |         |          |      V |
16+25       0.4533      0.06  Q         |         |          |      V |
16+30       0.4537      0.06  Q         |         |          |      V |
16+35       0.4540      0.05  Q         |         |          |      V |
16+40       0.4542      0.03  Q         |         |          |      V |
16+45       0.4545      0.03  Q         |         |          |      V |
16+50       0.4547      0.03  Q         |         |          |      V |
16+55       0.4549      0.03  Q         |         |          |       V|
17+ 0       0.4551      0.03  Q         |         |          |       V|
17+ 5       0.4556      0.07  Q         |         |          |       V|
17+10       0.4562      0.09  Q         |         |          |       V|
17+15       0.4568      0.10  Q         |         |          |       V|
17+20       0.4575      0.10  Q         |         |          |       V|
17+25       0.4582      0.10  Q         |         |          |       V|
17+30       0.4588      0.10  Q         |         |          |       V|
17+35       0.4595      0.10  Q         |         |          |       V|
17+40       0.4602      0.10  Q         |         |          |       V|
17+45       0.4608      0.10  Q         |         |          |       V|
17+50       0.4614      0.08  Q         |         |          |       V|
17+55       0.4619      0.07  Q         |         |          |       V|
18+ 0       0.4623      0.07  Q         |         |          |       V|
18+ 5       0.4628      0.07  Q         |         |          |       V|
18+10       0.4632      0.07  Q         |         |          |       V|
18+15       0.4637      0.07  Q         |         |          |       V|
18+20       0.4642      0.07  Q         |         |          |       V|
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18+25	0.4646	0.07	Q	|	|	|	V |
18+30	0.4651	0.07	Q	|	|	|	V |
18+35	0.4655	0.05	Q	|	|	|	V |
18+40	0.4658	0.04	Q	|	|	|	V |
18+45	0.4660	0.04	Q	|	|	|	V |
18+50	0.4662	0.02	Q	|	|	|	V |
18+55	0.4662	0.01	Q	|	|	|	V |
19+ 0	0.4663	0.01	Q	|	|	|	V |
19+ 5	0.4665	0.02	Q	|	|	|	V |
19+10	0.4667	0.04	Q	|	|	|	V|
19+15	0.4670	0.04	Q	|	|	|	V|
19+20	0.4674	0.06	Q	|	|	|	V|
19+25	0.4679	0.07	Q	|	|	|	V|
19+30	0.4683	0.07	Q	|	|	|	V|
19+35	0.4687	0.06	Q	|	|	|	V|
19+40	0.4690	0.04	Q	|	|	|	V|
19+45	0.4693	0.04	Q	|	|	|	V|
19+50	0.4695	0.02	Q	|	|	|	V|
19+55	0.4696	0.01	Q	|	|	|	V|
20+ 0	0.4696	0.01	Q	|	|	|	V|
20+ 5	0.4698	0.03	Q	|	|	|	V|
20+10	0.4701	0.04	Q	|	|	|	V|
20+15	0.4704	0.04	Q	|	|	|	V|
20+20	0.4707	0.04	Q	|	|	|	V|
20+25	0.4710	0.04	Q	|	|	|	V|
20+30	0.4713	0.04	Q	|	|	|	V|
20+35	0.4716	0.04	Q	|	|	|	V|
20+40	0.4719	0.04	Q	|	|	|	V|
20+45	0.4722	0.04	Q	|	|	|	V|
20+50	0.4724	0.03	Q	|	|	|	V|
20+55	0.4725	0.02	Q	|	|	|	V|
21+ 0	0.4726	0.01	Q	|	|	|	V|
21+ 5	0.4728	0.03	Q	|	|	|	V|
21+10	0.4731	0.04	Q	|	|	|	V|
21+15	0.4734	0.05	Q	|	|	|	V|
21+20	0.4736	0.03	Q	|	|	|	V|
21+25	0.4737	0.02	Q	|	|	|	V|
21+30	0.4738	0.01	Q	|	|	|	V|
21+35	0.4740	0.03	Q	|	|	|	V|
21+40	0.4743	0.04	Q	|	|	|	V|
21+45	0.4746	0.05	Q	|	|	|	V|
21+50	0.4749	0.03	Q	|	|	|	V|
21+55	0.4750	0.02	Q	|	|	|	V|
22+ 0	0.4751	0.02	Q	|	|	|	V|
22+ 5	0.4753	0.03	Q	|	|	|	V|
22+10	0.4756	0.04	Q	|	|	|	V|
22+15	0.4759	0.05	Q	|	|	|	V|
22+20	0.4761	0.03	Q	|	|	|	V|
22+25	0.4763	0.02	Q	|	|	|	V|
22+30	0.4764	0.02	Q	|	|	|	V|
22+35	0.4765	0.02	Q	|	|	|	V|
22+40	0.4766	0.02	Q	|	|	|	V|
22+45	0.4767	0.02	Q	|	|	|	V|
22+50	0.4768	0.02	Q	|	|	|	V|
22+55	0.4770	0.02	Q	|	|	|	V|
23+ 0	0.4771	0.02	Q	|	|	|	V|
23+ 5	0.4772	0.02	Q	|	|	|	V|

23+10	0.4773	0.02	Q	|	|	|	V|
23+15	0.4774	0.02	Q	|	|	|	V|
23+20	0.4776	0.02	Q	|	|	|	V|
23+25	0.4777	0.02	Q	|	|	|	V|
23+30	0.4778	0.02	Q	|	|	|	V|
23+35	0.4779	0.02	Q	|	|	|	V|
23+40	0.4781	0.02	Q	|	|	|	V|
23+45	0.4782	0.02	Q	|	|	|	V|
23+50	0.4783	0.02	Q	|	|	|	V|
23+55	0.4784	0.02	Q	|	|	|	V|
24+ 0	0.4786	0.02	Q	|	|	|	V|
24+ 5	0.4786	0.01	Q	|	|	|	V|
24+10	0.4786	0.00	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

Study date 09/16/25 File: PENCE24100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 4042

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

SITETECH
PENCE
PROPOSED CONDITION
100-YEAR

Drainage Area = 1.20(Ac.) = 0.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.20(Ac.)= 0.002 Sq. Mi.
Length along longest watercourse = 462.00(Ft.)
Length along longest watercourse measured to centroid = 231.00(Ft.)
Length along longest watercourse = 0.087 Mi.
Length along longest watercourse measured to centroid = 0.044 Mi.
Difference in elevation = 1.70(Ft.)
Slope along watercourse = 19.4286 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.025 Hr.
Lag time = 1.48 Min.
25% of lag time = 0.37 Min.
40% of lag time = 0.59 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.20	2.65	3.18

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.20	6.42	7.70

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.650(In)
Area Averaged 100-Year Rainfall = 6.420(In)

Point rain (area averaged) = 6.420(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 6.420(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.200	69.00	0.801

Total Area Entered = 1.20(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
69.0	84.4	0.194	0.801	0.054	1.000	0.054
					Sum (F) =	0.054

Area averaged mean soil loss (F) (In/Hr) = 0.054
Minimum soil loss rate ((In/Hr)) = 0.027
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.580

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	337.121	60.196	0.728
2	0.167	674.241	35.174	0.425
3	0.250	1011.362	4.630	0.056
		Sum = 100.000	Sum=	1.209

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.051	0.096	0.030	0.02
2	0.17	0.07	0.051	0.096	0.030	0.02
3	0.25	0.07	0.051	0.095	0.030	0.02
4	0.33	0.10	0.077	0.095	0.045	0.03
5	0.42	0.10	0.077	0.094	0.045	0.03
6	0.50	0.10	0.077	0.094	0.045	0.03
7	0.58	0.10	0.077	0.094	0.045	0.03
8	0.67	0.10	0.077	0.093	0.045	0.03
9	0.75	0.10	0.077	0.093	0.045	0.03
10	0.83	0.13	0.103	0.093	---	0.01
11	0.92	0.13	0.103	0.092	---	0.01
12	1.00	0.13	0.103	0.092	---	0.01
13	1.08	0.10	0.077	0.092	0.045	0.03
14	1.17	0.10	0.077	0.091	0.045	0.03
15	1.25	0.10	0.077	0.091	0.045	0.03

16	1.33	0.10	0.077	0.090	0.045	0.03
17	1.42	0.10	0.077	0.090	0.045	0.03
18	1.50	0.10	0.077	0.090	0.045	0.03
19	1.58	0.10	0.077	0.089	0.045	0.03
20	1.67	0.10	0.077	0.089	0.045	0.03
21	1.75	0.10	0.077	0.089	0.045	0.03
22	1.83	0.13	0.103	0.088	---	0.01
23	1.92	0.13	0.103	0.088	---	0.01
24	2.00	0.13	0.103	0.088	---	0.02
25	2.08	0.13	0.103	0.087	---	0.02
26	2.17	0.13	0.103	0.087	---	0.02
27	2.25	0.13	0.103	0.086	---	0.02
28	2.33	0.13	0.103	0.086	---	0.02
29	2.42	0.13	0.103	0.086	---	0.02
30	2.50	0.13	0.103	0.085	---	0.02
31	2.58	0.17	0.128	0.085	---	0.04
32	2.67	0.17	0.128	0.085	---	0.04
33	2.75	0.17	0.128	0.084	---	0.04
34	2.83	0.17	0.128	0.084	---	0.04
35	2.92	0.17	0.128	0.084	---	0.04
36	3.00	0.17	0.128	0.083	---	0.05
37	3.08	0.17	0.128	0.083	---	0.05
38	3.17	0.17	0.128	0.083	---	0.05
39	3.25	0.17	0.128	0.082	---	0.05
40	3.33	0.17	0.128	0.082	---	0.05
41	3.42	0.17	0.128	0.082	---	0.05
42	3.50	0.17	0.128	0.081	---	0.05
43	3.58	0.17	0.128	0.081	---	0.05
44	3.67	0.17	0.128	0.081	---	0.05
45	3.75	0.17	0.128	0.080	---	0.05
46	3.83	0.20	0.154	0.080	---	0.07
47	3.92	0.20	0.154	0.080	---	0.07
48	4.00	0.20	0.154	0.079	---	0.07
49	4.08	0.20	0.154	0.079	---	0.08
50	4.17	0.20	0.154	0.079	---	0.08
51	4.25	0.20	0.154	0.078	---	0.08
52	4.33	0.23	0.180	0.078	---	0.10
53	4.42	0.23	0.180	0.078	---	0.10
54	4.50	0.23	0.180	0.077	---	0.10
55	4.58	0.23	0.180	0.077	---	0.10
56	4.67	0.23	0.180	0.077	---	0.10
57	4.75	0.23	0.180	0.076	---	0.10
58	4.83	0.27	0.205	0.076	---	0.13
59	4.92	0.27	0.205	0.076	---	0.13
60	5.00	0.27	0.205	0.075	---	0.13
61	5.08	0.20	0.154	0.075	---	0.08
62	5.17	0.20	0.154	0.075	---	0.08
63	5.25	0.20	0.154	0.074	---	0.08
64	5.33	0.23	0.180	0.074	---	0.11
65	5.42	0.23	0.180	0.074	---	0.11
66	5.50	0.23	0.180	0.073	---	0.11
67	5.58	0.27	0.205	0.073	---	0.13
68	5.67	0.27	0.205	0.073	---	0.13
69	5.75	0.27	0.205	0.072	---	0.13
70	5.83	0.27	0.205	0.072	---	0.13
71	5.92	0.27	0.205	0.072	---	0.13
72	6.00	0.27	0.205	0.071	---	0.13

73	6.08	0.30	0.231	0.071	---	0.16
74	6.17	0.30	0.231	0.071	---	0.16
75	6.25	0.30	0.231	0.070	---	0.16
76	6.33	0.30	0.231	0.070	---	0.16
77	6.42	0.30	0.231	0.070	---	0.16
78	6.50	0.30	0.231	0.070	---	0.16
79	6.58	0.33	0.257	0.069	---	0.19
80	6.67	0.33	0.257	0.069	---	0.19
81	6.75	0.33	0.257	0.069	---	0.19
82	6.83	0.33	0.257	0.068	---	0.19
83	6.92	0.33	0.257	0.068	---	0.19
84	7.00	0.33	0.257	0.068	---	0.19
85	7.08	0.33	0.257	0.067	---	0.19
86	7.17	0.33	0.257	0.067	---	0.19
87	7.25	0.33	0.257	0.067	---	0.19
88	7.33	0.37	0.282	0.066	---	0.22
89	7.42	0.37	0.282	0.066	---	0.22
90	7.50	0.37	0.282	0.066	---	0.22
91	7.58	0.40	0.308	0.066	---	0.24
92	7.67	0.40	0.308	0.065	---	0.24
93	7.75	0.40	0.308	0.065	---	0.24
94	7.83	0.43	0.334	0.065	---	0.27
95	7.92	0.43	0.334	0.064	---	0.27
96	8.00	0.43	0.334	0.064	---	0.27
97	8.08	0.50	0.385	0.064	---	0.32
98	8.17	0.50	0.385	0.063	---	0.32
99	8.25	0.50	0.385	0.063	---	0.32
100	8.33	0.50	0.385	0.063	---	0.32
101	8.42	0.50	0.385	0.063	---	0.32
102	8.50	0.50	0.385	0.062	---	0.32
103	8.58	0.53	0.411	0.062	---	0.35
104	8.67	0.53	0.411	0.062	---	0.35
105	8.75	0.53	0.411	0.061	---	0.35
106	8.83	0.57	0.437	0.061	---	0.38
107	8.92	0.57	0.437	0.061	---	0.38
108	9.00	0.57	0.437	0.061	---	0.38
109	9.08	0.63	0.488	0.060	---	0.43
110	9.17	0.63	0.488	0.060	---	0.43
111	9.25	0.63	0.488	0.060	---	0.43
112	9.33	0.67	0.514	0.059	---	0.45
113	9.42	0.67	0.514	0.059	---	0.45
114	9.50	0.67	0.514	0.059	---	0.45
115	9.58	0.70	0.539	0.059	---	0.48
116	9.67	0.70	0.539	0.058	---	0.48
117	9.75	0.70	0.539	0.058	---	0.48
118	9.83	0.73	0.565	0.058	---	0.51
119	9.92	0.73	0.565	0.057	---	0.51
120	10.00	0.73	0.565	0.057	---	0.51
121	10.08	0.50	0.385	0.057	---	0.33
122	10.17	0.50	0.385	0.057	---	0.33
123	10.25	0.50	0.385	0.056	---	0.33
124	10.33	0.50	0.385	0.056	---	0.33
125	10.42	0.50	0.385	0.056	---	0.33
126	10.50	0.50	0.385	0.055	---	0.33
127	10.58	0.67	0.514	0.055	---	0.46
128	10.67	0.67	0.514	0.055	---	0.46
129	10.75	0.67	0.514	0.055	---	0.46

130	10.83	0.67	0.514	0.054	---	0.46
131	10.92	0.67	0.514	0.054	---	0.46
132	11.00	0.67	0.514	0.054	---	0.46
133	11.08	0.63	0.488	0.054	---	0.43
134	11.17	0.63	0.488	0.053	---	0.43
135	11.25	0.63	0.488	0.053	---	0.43
136	11.33	0.63	0.488	0.053	---	0.44
137	11.42	0.63	0.488	0.053	---	0.44
138	11.50	0.63	0.488	0.052	---	0.44
139	11.58	0.57	0.437	0.052	---	0.38
140	11.67	0.57	0.437	0.052	---	0.38
141	11.75	0.57	0.437	0.052	---	0.39
142	11.83	0.60	0.462	0.051	---	0.41
143	11.92	0.60	0.462	0.051	---	0.41
144	12.00	0.60	0.462	0.051	---	0.41
145	12.08	0.83	0.642	0.051	---	0.59
146	12.17	0.83	0.642	0.050	---	0.59
147	12.25	0.83	0.642	0.050	---	0.59
148	12.33	0.87	0.668	0.050	---	0.62
149	12.42	0.87	0.668	0.049	---	0.62
150	12.50	0.87	0.668	0.049	---	0.62
151	12.58	0.93	0.719	0.049	---	0.67
152	12.67	0.93	0.719	0.049	---	0.67
153	12.75	0.93	0.719	0.049	---	0.67
154	12.83	0.97	0.745	0.048	---	0.70
155	12.92	0.97	0.745	0.048	---	0.70
156	13.00	0.97	0.745	0.048	---	0.70
157	13.08	1.13	0.873	0.048	---	0.83
158	13.17	1.13	0.873	0.047	---	0.83
159	13.25	1.13	0.873	0.047	---	0.83
160	13.33	1.13	0.873	0.047	---	0.83
161	13.42	1.13	0.873	0.047	---	0.83
162	13.50	1.13	0.873	0.046	---	0.83
163	13.58	0.77	0.591	0.046	---	0.54
164	13.67	0.77	0.591	0.046	---	0.54
165	13.75	0.77	0.591	0.046	---	0.55
166	13.83	0.77	0.591	0.045	---	0.55
167	13.92	0.77	0.591	0.045	---	0.55
168	14.00	0.77	0.591	0.045	---	0.55
169	14.08	0.90	0.693	0.045	---	0.65
170	14.17	0.90	0.693	0.044	---	0.65
171	14.25	0.90	0.693	0.044	---	0.65
172	14.33	0.87	0.668	0.044	---	0.62
173	14.42	0.87	0.668	0.044	---	0.62
174	14.50	0.87	0.668	0.044	---	0.62
175	14.58	0.87	0.668	0.043	---	0.62
176	14.67	0.87	0.668	0.043	---	0.62
177	14.75	0.87	0.668	0.043	---	0.62
178	14.83	0.83	0.642	0.043	---	0.60
179	14.92	0.83	0.642	0.042	---	0.60
180	15.00	0.83	0.642	0.042	---	0.60
181	15.08	0.80	0.616	0.042	---	0.57
182	15.17	0.80	0.616	0.042	---	0.57
183	15.25	0.80	0.616	0.042	---	0.57
184	15.33	0.77	0.591	0.041	---	0.55
185	15.42	0.77	0.591	0.041	---	0.55
186	15.50	0.77	0.591	0.041	---	0.55

187	15.58	0.63	0.488	0.041	---	0.45
188	15.67	0.63	0.488	0.041	---	0.45
189	15.75	0.63	0.488	0.040	---	0.45
190	15.83	0.63	0.488	0.040	---	0.45
191	15.92	0.63	0.488	0.040	---	0.45
192	16.00	0.63	0.488	0.040	---	0.45
193	16.08	0.13	0.103	0.040	---	0.06
194	16.17	0.13	0.103	0.039	---	0.06
195	16.25	0.13	0.103	0.039	---	0.06
196	16.33	0.13	0.103	0.039	---	0.06
197	16.42	0.13	0.103	0.039	---	0.06
198	16.50	0.13	0.103	0.039	---	0.06
199	16.58	0.10	0.077	0.038	---	0.04
200	16.67	0.10	0.077	0.038	---	0.04
201	16.75	0.10	0.077	0.038	---	0.04
202	16.83	0.10	0.077	0.038	---	0.04
203	16.92	0.10	0.077	0.038	---	0.04
204	17.00	0.10	0.077	0.037	---	0.04
205	17.08	0.17	0.128	0.037	---	0.09
206	17.17	0.17	0.128	0.037	---	0.09
207	17.25	0.17	0.128	0.037	---	0.09
208	17.33	0.17	0.128	0.037	---	0.09
209	17.42	0.17	0.128	0.036	---	0.09
210	17.50	0.17	0.128	0.036	---	0.09
211	17.58	0.17	0.128	0.036	---	0.09
212	17.67	0.17	0.128	0.036	---	0.09
213	17.75	0.17	0.128	0.036	---	0.09
214	17.83	0.13	0.103	0.036	---	0.07
215	17.92	0.13	0.103	0.035	---	0.07
216	18.00	0.13	0.103	0.035	---	0.07
217	18.08	0.13	0.103	0.035	---	0.07
218	18.17	0.13	0.103	0.035	---	0.07
219	18.25	0.13	0.103	0.035	---	0.07
220	18.33	0.13	0.103	0.035	---	0.07
221	18.42	0.13	0.103	0.034	---	0.07
222	18.50	0.13	0.103	0.034	---	0.07
223	18.58	0.10	0.077	0.034	---	0.04
224	18.67	0.10	0.077	0.034	---	0.04
225	18.75	0.10	0.077	0.034	---	0.04
226	18.83	0.07	0.051	0.034	---	0.02
227	18.92	0.07	0.051	0.033	---	0.02
228	19.00	0.07	0.051	0.033	---	0.02
229	19.08	0.10	0.077	0.033	---	0.04
230	19.17	0.10	0.077	0.033	---	0.04
231	19.25	0.10	0.077	0.033	---	0.04
232	19.33	0.13	0.103	0.033	---	0.07
233	19.42	0.13	0.103	0.032	---	0.07
234	19.50	0.13	0.103	0.032	---	0.07
235	19.58	0.10	0.077	0.032	---	0.04
236	19.67	0.10	0.077	0.032	---	0.05
237	19.75	0.10	0.077	0.032	---	0.05
238	19.83	0.07	0.051	0.032	---	0.02
239	19.92	0.07	0.051	0.032	---	0.02
240	20.00	0.07	0.051	0.031	---	0.02
241	20.08	0.10	0.077	0.031	---	0.05
242	20.17	0.10	0.077	0.031	---	0.05
243	20.25	0.10	0.077	0.031	---	0.05

244	20.33	0.10	0.077	0.031	---	0.05
245	20.42	0.10	0.077	0.031	---	0.05
246	20.50	0.10	0.077	0.031	---	0.05
247	20.58	0.10	0.077	0.030	---	0.05
248	20.67	0.10	0.077	0.030	---	0.05
249	20.75	0.10	0.077	0.030	---	0.05
250	20.83	0.07	0.051	0.030	---	0.02
251	20.92	0.07	0.051	0.030	---	0.02
252	21.00	0.07	0.051	0.030	---	0.02
253	21.08	0.10	0.077	0.030	---	0.05
254	21.17	0.10	0.077	0.030	---	0.05
255	21.25	0.10	0.077	0.030	---	0.05
256	21.33	0.07	0.051	0.029	---	0.02
257	21.42	0.07	0.051	0.029	---	0.02
258	21.50	0.07	0.051	0.029	---	0.02
259	21.58	0.10	0.077	0.029	---	0.05
260	21.67	0.10	0.077	0.029	---	0.05
261	21.75	0.10	0.077	0.029	---	0.05
262	21.83	0.07	0.051	0.029	---	0.02
263	21.92	0.07	0.051	0.029	---	0.02
264	22.00	0.07	0.051	0.029	---	0.02
265	22.08	0.10	0.077	0.028	---	0.05
266	22.17	0.10	0.077	0.028	---	0.05
267	22.25	0.10	0.077	0.028	---	0.05
268	22.33	0.07	0.051	0.028	---	0.02
269	22.42	0.07	0.051	0.028	---	0.02
270	22.50	0.07	0.051	0.028	---	0.02
271	22.58	0.07	0.051	0.028	---	0.02
272	22.67	0.07	0.051	0.028	---	0.02
273	22.75	0.07	0.051	0.028	---	0.02
274	22.83	0.07	0.051	0.028	---	0.02
275	22.92	0.07	0.051	0.028	---	0.02
276	23.00	0.07	0.051	0.028	---	0.02
277	23.08	0.07	0.051	0.028	---	0.02
278	23.17	0.07	0.051	0.027	---	0.02
279	23.25	0.07	0.051	0.027	---	0.02
280	23.33	0.07	0.051	0.027	---	0.02
281	23.42	0.07	0.051	0.027	---	0.02
282	23.50	0.07	0.051	0.027	---	0.02
283	23.58	0.07	0.051	0.027	---	0.02
284	23.67	0.07	0.051	0.027	---	0.02
285	23.75	0.07	0.051	0.027	---	0.02
286	23.83	0.07	0.051	0.027	---	0.02
287	23.92	0.07	0.051	0.027	---	0.02
288	24.00	0.07	0.051	0.027	---	0.02
	Sum =	100.0			Sum =	62.4

Flood volume = Effective rainfall 5.20(In)
times area 1.2(Ac.)/[(In)/(Ft.)] = 0.5(Ac.Ft)
Total soil loss = 1.22(In)
Total soil loss = 0.122(Ac.Ft)
Total rainfall = 6.42(In)
Flood volume = **22634.0 Cubic Feet**
Total soil loss = 5331.5 Cubic Feet

Peak flow rate of this hydrograph = 1.000(CFS)

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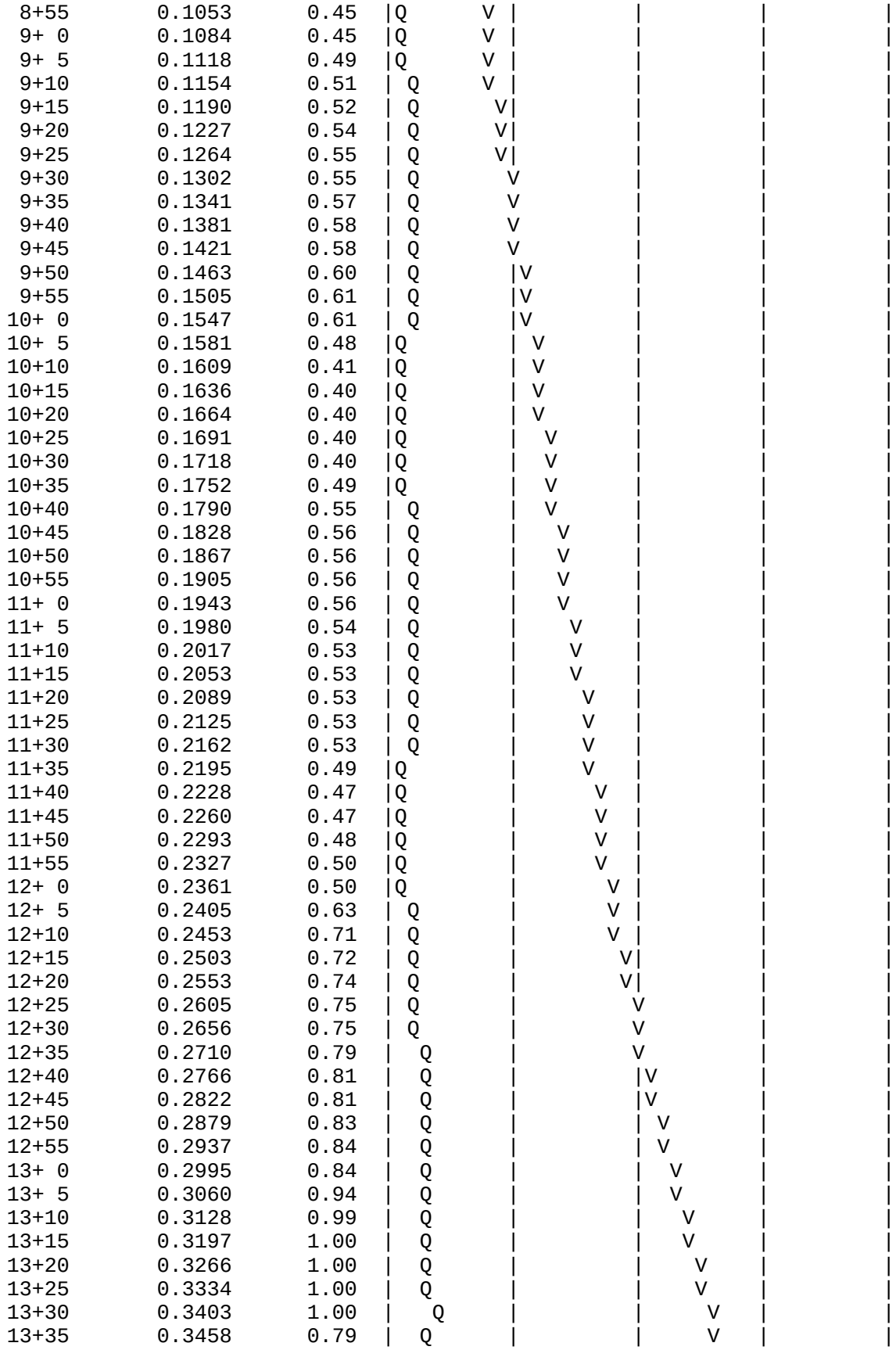
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0001	0.02	Q				
0+10	0.0003	0.02	Q				
0+15	0.0005	0.03	Q				
0+20	0.0007	0.03	Q				
0+25	0.0010	0.04	Q				
0+30	0.0012	0.04	Q				
0+35	0.0015	0.04	Q				
0+40	0.0018	0.04	Q				
0+45	0.0020	0.04	Q				
0+50	0.0022	0.02	Q				
0+55	0.0023	0.01	Q				
1+ 0	0.0024	0.01	Q				
1+ 5	0.0026	0.03	Q				
1+10	0.0028	0.04	Q				
1+15	0.0031	0.04	Q				
1+20	0.0034	0.04	Q				
1+25	0.0036	0.04	Q				
1+30	0.0039	0.04	Q				
1+35	0.0042	0.04	Q				
1+40	0.0045	0.04	Q				
1+45	0.0047	0.04	Q				
1+50	0.0049	0.03	Q				
1+55	0.0050	0.02	Q				
2+ 0	0.0052	0.02	Q				
2+ 5	0.0053	0.02	Q				
2+10	0.0054	0.02	Q				
2+15	0.0056	0.02	Q				
2+20	0.0057	0.02	Q				
2+25	0.0058	0.02	Q				
2+30	0.0060	0.02	Q				
2+35	0.0062	0.04	Q				
2+40	0.0066	0.05	Q				
2+45	0.0070	0.05	Q				
2+50	0.0073	0.05	Q				
2+55	0.0077	0.05	Q				
3+ 0	0.0081	0.05	Q				
3+ 5	0.0085	0.05	Q				
3+10	0.0088	0.06	Q				
3+15	0.0092	0.06	Q				
3+20	0.0096	0.06	Q				
3+25	0.0100	0.06	Q				
3+30	0.0104	0.06	Q				
3+35	0.0108	0.06	Q				
3+40	0.0112	0.06	Q				
3+45	0.0116	0.06	Q				
3+50	0.0121	0.08	Q				
3+55	0.0127	0.09	Q				
4+ 0	0.0133	0.09	QV				
4+ 5	0.0140	0.09	QV				

4+10	0.0146	0.09	QV	|	|	|	|
4+15	0.0152	0.09	QV	|	|	|	|
4+20	0.0160	0.11	QV	|	|	|	|
4+25	0.0168	0.12	QV	|	|	|	|
4+30	0.0177	0.12	QV	|	|	|	|
4+35	0.0185	0.12	QV	|	|	|	|
4+40	0.0194	0.12	QV	|	|	|	|
4+45	0.0203	0.13	QV	|	|	|	|
4+50	0.0212	0.14	QV	|	|	|	|
4+55	0.0223	0.16	QV	|	|	|	|
5+ 0	0.0234	0.16	QV	|	|	|	|
5+ 5	0.0242	0.12	QV	|	|	|	|
5+10	0.0249	0.10	QV	|	|	|	|
5+15	0.0256	0.10	QV	|	|	|	|
5+20	0.0264	0.12	Q V	|	|	|	|
5+25	0.0272	0.13	Q V	|	|	|	|
5+30	0.0281	0.13	Q V	|	|	|	|
5+35	0.0291	0.15	Q V	|	|	|	|
5+40	0.0302	0.16	Q V	|	|	|	|
5+45	0.0313	0.16	Q V	|	|	|	|
5+50	0.0325	0.16	Q V	|	|	|	|
5+55	0.0336	0.16	Q V	|	|	|	|
6+ 0	0.0347	0.16	Q V	|	|	|	|
6+ 5	0.0359	0.18	Q V	|	|	|	|
6+10	0.0373	0.19	Q V	|	|	|	|
6+15	0.0386	0.19	Q V	|	|	|	|
6+20	0.0399	0.19	Q V	|	|	|	|
6+25	0.0413	0.19	Q V	|	|	|	|
6+30	0.0426	0.20	Q V	|	|	|	|
6+35	0.0441	0.21	Q V	|	|	|	|
6+40	0.0457	0.23	Q V	|	|	|	|
6+45	0.0472	0.23	Q V	|	|	|	|
6+50	0.0488	0.23	Q V	|	|	|	|
6+55	0.0504	0.23	Q V	|	|	|	|
7+ 0	0.0519	0.23	Q V	|	|	|	|
7+ 5	0.0535	0.23	Q V	|	|	|	|
7+10	0.0551	0.23	Q V	|	|	|	|
7+15	0.0567	0.23	Q V	|	|	|	|
7+20	0.0584	0.25	Q V	|	|	|	|
7+25	0.0602	0.26	|Q V	|	|	|	|
7+30	0.0620	0.26	|Q V	|	|	|	|
7+35	0.0639	0.28	|Q V	|	|	|	|
7+40	0.0659	0.29	|Q V	|	|	|	|
7+45	0.0680	0.29	|Q V	|	|	|	|
7+50	0.0701	0.31	|Q V	|	|	|	|
7+55	0.0724	0.32	|Q V	|	|	|	|
8+ 0	0.0746	0.33	|Q V	|	|	|	|
8+ 5	0.0771	0.36	|Q V	|	|	|	|
8+10	0.0798	0.39	|Q V	|	|	|	|
8+15	0.0825	0.39	|Q V	|	|	|	|
8+20	0.0851	0.39	|Q V	|	|	|	|
8+25	0.0878	0.39	|Q V	|	|	|	|
8+30	0.0905	0.39	|Q V	|	|	|	|
8+35	0.0933	0.41	|Q V	|	|	|	|
8+40	0.0962	0.42	|Q V	|	|	|	|
8+45	0.0991	0.42	|Q V	|	|	|	|
8+50	0.1022	0.44	|Q V	|	|	|	|



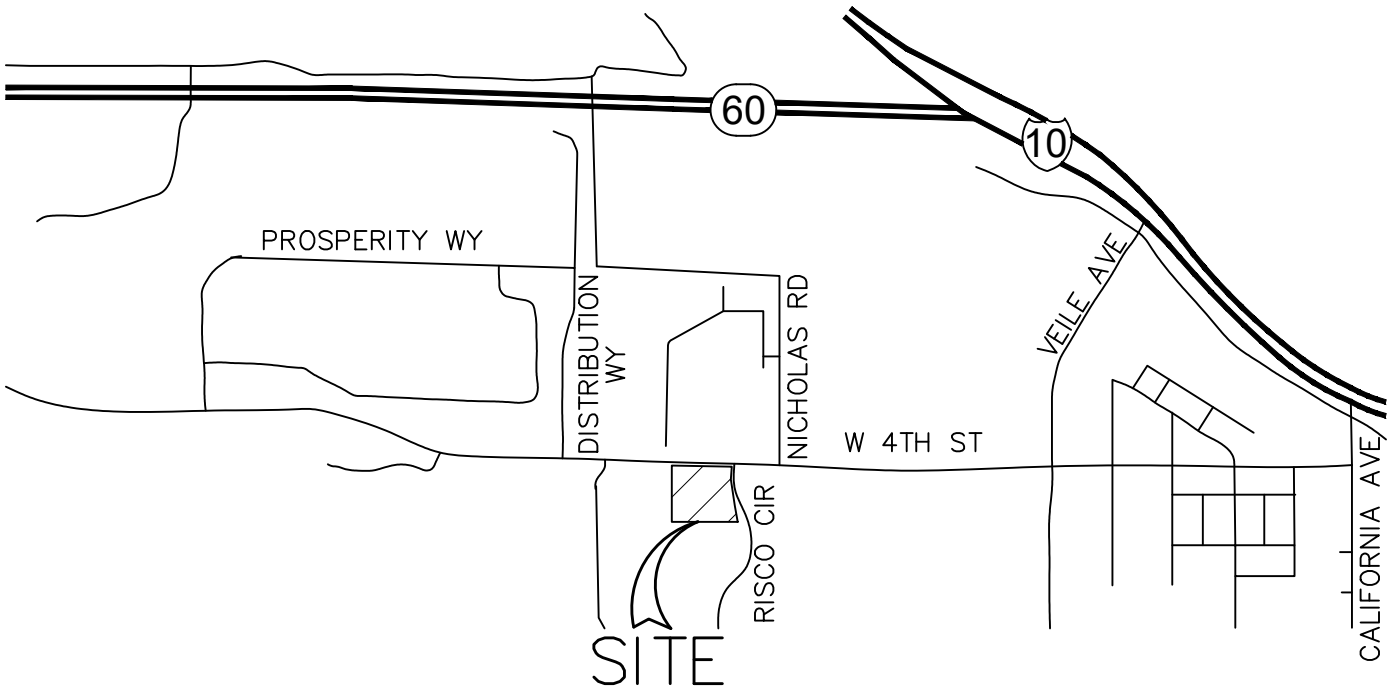
```
13+40       0.3505      0.67  | Q       |         |     V   |         |
13+45       0.3550      0.66  | Q       |         |      V  |         |
13+50       0.3595      0.66  | Q       |         |      V  |         |
13+55       0.3641      0.66  | Q       |         |       V |         |
14+ 0       0.3686      0.66  | Q       |         |       V |         |
14+ 5       0.3737      0.74  | Q       |         |       V |         |
14+10       0.3791      0.78  |  Q      |         |        V|         |
14+15       0.3845      0.79  |  Q      |         |        V|         |
14+20       0.3898      0.77  |  Q      |         |         V         |
14+25       0.3950      0.76  |  Q      |         |         V         |
14+30       0.4002      0.76  |  Q      |         |         V         |
14+35       0.4054      0.76  |  Q      |         |          V        |
14+40       0.4106      0.76  |  Q      |         |          V        |
14+45       0.4158      0.76  |  Q      |         |          | V      |
14+50       0.4209      0.74  | Q       |         |          | V      |
14+55       0.4259      0.73  | Q       |         |          | V      |
15+ 0       0.4309      0.73  | Q       |         |          |  V     |
15+ 5       0.4357      0.71  | Q       |         |          |  V     |
15+10       0.4405      0.70  | Q       |         |          |  V     |
15+15       0.4453      0.70  | Q       |         |          |   V    |
15+20       0.4500      0.68  | Q       |         |          |   V    |
15+25       0.4546      0.67  | Q       |         |          |   V    |
15+30       0.4591      0.66  | Q       |         |          |    V   |
15+35       0.4632      0.59  | Q       |         |          |    V   |
15+40       0.4670      0.55  | Q       |         |          |    V   |
15+45       0.4707      0.54  | Q       |         |          |     V  |
15+50       0.4744      0.54  | Q       |         |          |     V  |
15+55       0.4782      0.54  | Q       |         |          |     V  |
16+ 0       0.4819      0.54  | Q       |         |          |      V |
16+ 5       0.4837      0.26  |Q        |         |          |      V |
16+10       0.4844      0.10  Q         |         |          |      V |
16+15       0.4849      0.08  Q         |         |          |      V |
16+20       0.4854      0.08  Q         |         |          |      V |
16+25       0.4860      0.08  Q         |         |          |      V |
16+30       0.4865      0.08  Q         |         |          |      V |
16+35       0.4869      0.06  Q         |         |          |      V |
16+40       0.4872      0.05  Q         |         |          |      V |
16+45       0.4876      0.05  Q         |         |          |      V |
16+50       0.4879      0.05  Q         |         |          |      V |
16+55       0.4882      0.05  Q         |         |          |      V |
17+ 0       0.4886      0.05  Q         |         |          |      V |
17+ 5       0.4891      0.09  Q         |         |          |      V |
17+10       0.4899      0.11  Q         |         |          |      V |
17+15       0.4906      0.11  Q         |         |          |      V |
17+20       0.4914      0.11  Q         |         |          |      V |
17+25       0.4922      0.11  Q         |         |          |      V |
17+30       0.4929      0.11  Q         |         |          |      V |
17+35       0.4937      0.11  Q         |         |          |       V|
17+40       0.4945      0.11  Q         |         |          |       V|
17+45       0.4953      0.11  Q         |         |          |       V|
17+50       0.4959      0.09  Q         |         |          |       V|
17+55       0.4965      0.08  Q         |         |          |       V|
18+ 0       0.4970      0.08  Q         |         |          |       V|
18+ 5       0.4976      0.08  Q         |         |          |       V|
18+10       0.4982      0.08  Q         |         |          |       V|
18+15       0.4987      0.08  Q         |         |          |       V|
18+20       0.4993      0.08  Q         |         |          |       V|
```

18+25	0.4999	0.08	Q	|	|	|	V |
18+30	0.5004	0.08	Q	|	|	|	V |
18+35	0.5009	0.06	Q	|	|	|	V |
18+40	0.5012	0.05	Q	|	|	|	V |
18+45	0.5016	0.05	Q	|	|	|	V |
18+50	0.5018	0.03	Q	|	|	|	V |
18+55	0.5020	0.02	Q	|	|	|	V |
19+ 0	0.5022	0.02	Q	|	|	|	V |
19+ 5	0.5024	0.04	Q	|	|	|	V |
19+10	0.5028	0.05	Q	|	|	|	V |
19+15	0.5032	0.05	Q	|	|	|	V |
19+20	0.5037	0.07	Q	|	|	|	V |
19+25	0.5042	0.08	Q	|	|	|	V |
19+30	0.5048	0.09	Q	|	|	|	V |
19+35	0.5053	0.07	Q	|	|	|	V |
19+40	0.5057	0.06	Q	|	|	|	V |
19+45	0.5060	0.05	Q	|	|	|	V |
19+50	0.5063	0.04	Q	|	|	|	V |
19+55	0.5065	0.03	Q	|	|	|	V |
20+ 0	0.5066	0.02	Q	|	|	|	V|
20+ 5	0.5069	0.04	Q	|	|	|	V|
20+10	0.5073	0.05	Q	|	|	|	V|
20+15	0.5077	0.06	Q	|	|	|	V|
20+20	0.5081	0.06	Q	|	|	|	V|
20+25	0.5084	0.06	Q	|	|	|	V|
20+30	0.5088	0.06	Q	|	|	|	V|
20+35	0.5092	0.06	Q	|	|	|	V|
20+40	0.5096	0.06	Q	|	|	|	V|
20+45	0.5100	0.06	Q	|	|	|	V|
20+50	0.5103	0.04	Q	|	|	|	V|
20+55	0.5105	0.03	Q	|	|	|	V|
21+ 0	0.5106	0.03	Q	|	|	|	V|
21+ 5	0.5109	0.04	Q	|	|	|	V|
21+10	0.5113	0.06	Q	|	|	|	V|
21+15	0.5117	0.06	Q	|	|	|	V|
21+20	0.5120	0.04	Q	|	|	|	V|
21+25	0.5122	0.03	Q	|	|	|	V|
21+30	0.5124	0.03	Q	|	|	|	V|
21+35	0.5127	0.05	Q	|	|	|	V|
21+40	0.5131	0.06	Q	|	|	|	V|
21+45	0.5135	0.06	Q	|	|	|	V|
21+50	0.5137	0.04	Q	|	|	|	V|
21+55	0.5139	0.03	Q	|	|	|	V|
22+ 0	0.5141	0.03	Q	|	|	|	V|
22+ 5	0.5145	0.05	Q	|	|	|	V|
22+10	0.5148	0.06	Q	|	|	|	V|
22+15	0.5153	0.06	Q	|	|	|	V|
22+20	0.5155	0.04	Q	|	|	|	V|
22+25	0.5157	0.03	Q	|	|	|	V|
22+30	0.5159	0.03	Q	|	|	|	V|
22+35	0.5161	0.03	Q	|	|	|	V|
22+40	0.5163	0.03	Q	|	|	|	V|
22+45	0.5165	0.03	Q	|	|	|	V|
22+50	0.5167	0.03	Q	|	|	|	V|
22+55	0.5169	0.03	Q	|	|	|	V|
23+ 0	0.5171	0.03	Q	|	|	|	V|
23+ 5	0.5173	0.03	Q	|	|	|	V|

23+10	0.5175	0.03	Q	|	|	|	V|
23+15	0.5177	0.03	Q	|	|	|	V|
23+20	0.5179	0.03	Q	|	|	|	V|
23+25	0.5181	0.03	Q	|	|	|	V|
23+30	0.5183	0.03	Q	|	|	|	V|
23+35	0.5185	0.03	Q	|	|	|	V|
23+40	0.5187	0.03	Q	|	|	|	V|
23+45	0.5189	0.03	Q	|	|	|	V|
23+50	0.5191	0.03	Q	|	|	|	V|
23+55	0.5193	0.03	Q	|	|	|	V|
24+ 0	0.5195	0.03	Q	|	|	|	V|
24+ 5	0.5196	0.01	Q	|	|	|	V|
24+10	0.5196	0.00	Q	|	|	|	V|

APPENDIX 2 – MAPS

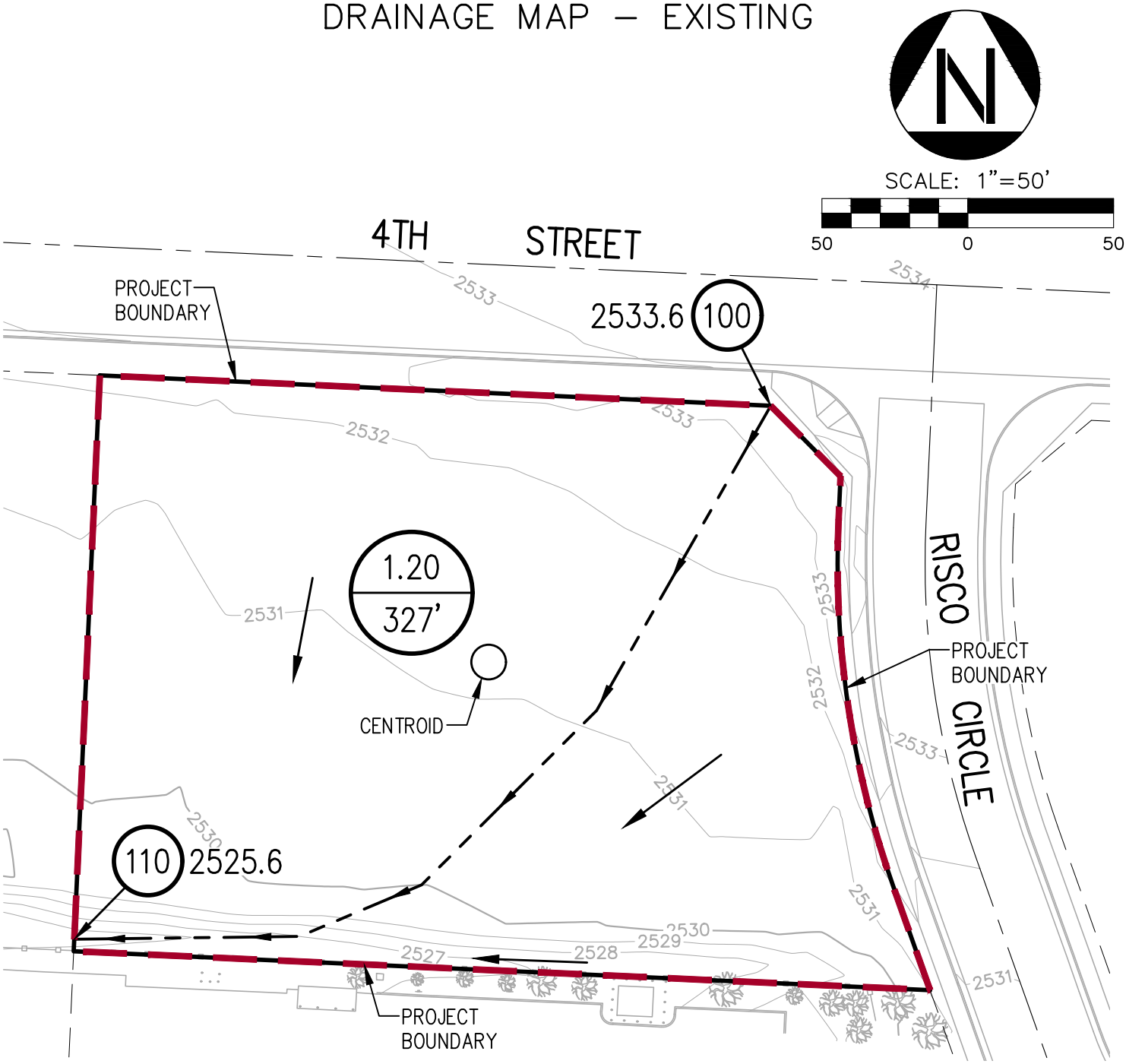
- VICINITY MAP
- DRAINAGE MAP - EXISTING
- DRAINAGE MAP – PROPOSED



VICINITY MAP

NO SCALE

DRAINAGE MAP – EXISTING



FLOW PROCESS CHART EXISTING:

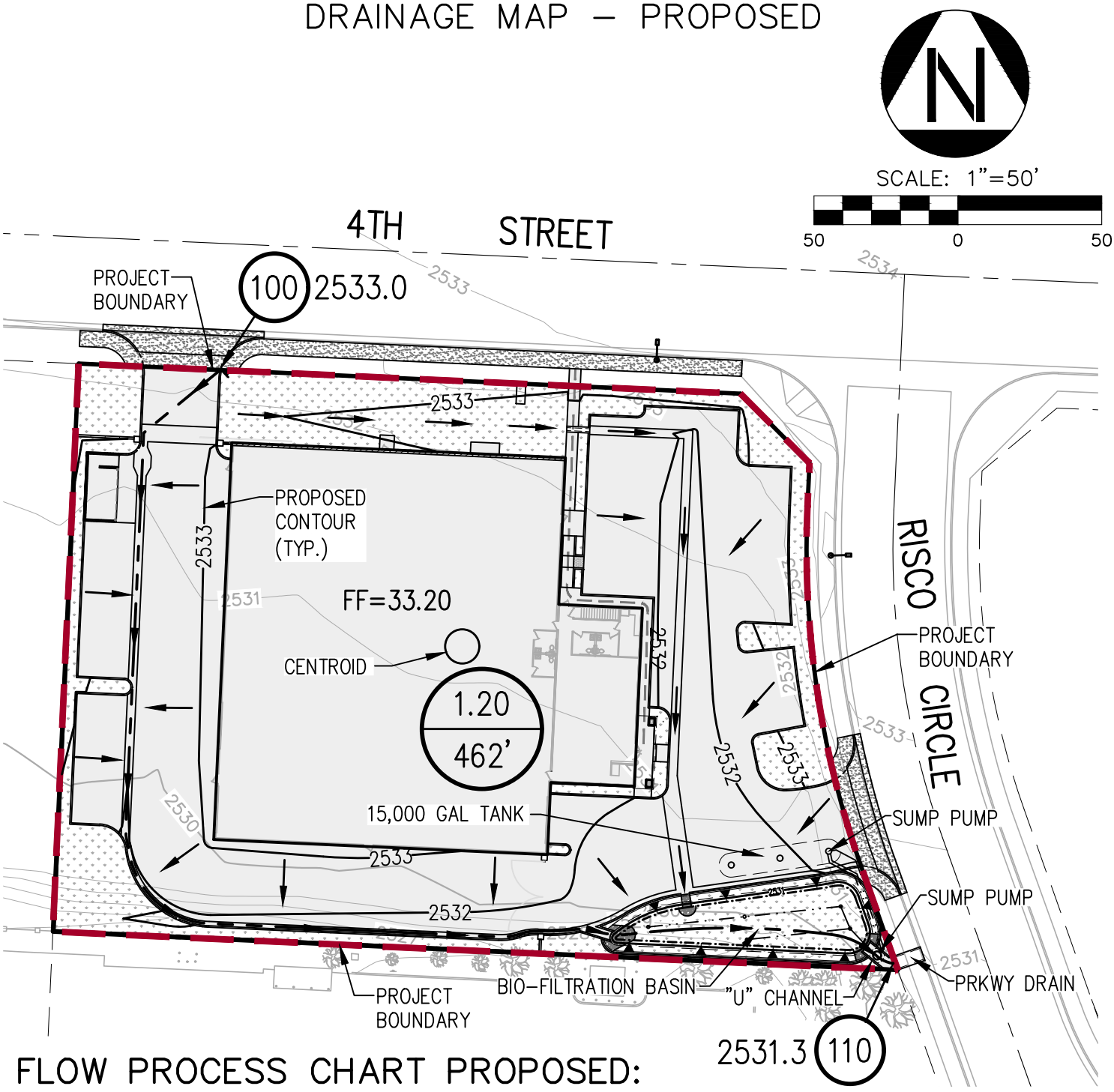
FROM NODE	TO NODE	FROM ELEV	TO ELEV	Q (CFS) 2 YR/1 HR	Q (CFS) 10 YR/1 HR	Q (CFS) 100 YR/1 HR
100	110	2533.6	2525.6	1.00	2.24	4.00

REGISTERED PROFESSIONAL ENGINEER
BERNHARD K. MAYER
NO. 36866
Exp. 6-30-26
CIVIL
STATE OF CALIFORNIA

DRAINAGE LEGEND:

- DRAINAGE AREA (AC) / FLOW PATH LENGTH: 10.00 / 500'
- NODE ELEV.: 2391.5
- NODE #: 100
- FLOW LINE
- WATERSHED BOUNDARY
- FLOW DIRECTION

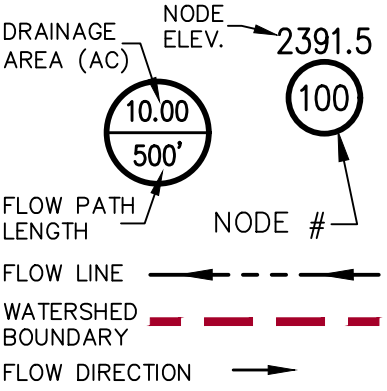
DRAINAGE MAP – PROPOSED



FLOW PROCESS CHART PROPOSED:

FROM NODE	TO NODE	FROM ELEV	TO ELEV	Q (CFS) 2 YR/1 HR	Q (CFS) 10 YR/1 HR	Q (CFS) 100 YR/1 HR
100	110	2533.0	2531.3	1.44	2.77	4.62

DRAINAGE LEGEND:



REGISTERED PROFESSIONAL ENGINEER
BERNHARD K. MAYER
NO. 36866
Exp. 6-30-26
CIVIL
STATE OF CALIFORNIA

PROJECT IMPERVIOUS AREA = 41,810 S.F.

PROJECT PERVIOUS AREA = 10,462 S.F.

APPENDIX 3 – HYDROLOGY

- 2-YEAR / 1HR HYDROLOGY - EXISTING
- 10-YEAR / 1HR HYDROLOGY - EXISTING
- 100-YEAR / 1HR HYDROLOGY – EXISTING
- 2-YEAR / 1HR HYDROLOGY - PROPOSED
- 10-YEAR / 1HR HYDROLOGY - PROPOSED
- 100-YEAR / 1HR HYDROLOGY - PROPOSED

```
**************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1524

                          Analysis prepared by:

                              SITETECH, INC.
                         8061 CHURCH STREET, P.O. 592
                              HIGHLAND, CA 92346
                              PH: (909) 864-3180

 ************************* DESCRIPTION OF STUDY *************************
* 2 YEAR - 1 HOUR DESIGN STORM                                           *
* AAA FENCE WAREHOUSE                                                    *
* EXISTING CONDITION                                                     *
 **************************************************************************

  FILE NAME: PEN2E.DAT
  TIME/DATE OF STUDY: 15:15 07/31/2025
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  2-YEAR, 1-HOUR PRECIPITATION(INCH) =  0.584
  100-YEAR, 1-HOUR PRECIPITATION(INCH) =  1.840
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =    2.00   1-HOUR INTENSITY(INCH/HOUR) =   0.584
  SLOPE OF INTENSITY DURATION CURVE = 0.5000
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    110.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
```

```
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   327.00
  UPSTREAM ELEVATION(FEET) =   2533.60
  DOWNSTREAM ELEVATION(FEET) =   2525.60
  ELEVATION DIFFERENCE(FEET) =      8.00
  TC = 0.533*[(  327.00**3)/(     8.00)]**.2 =   11.337
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.343
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6225
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      1.00
  TOTAL AREA(ACRES) =      1.20   TOTAL RUNOFF(CFS) =      1.00
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.2  TC(MIN.) =     11.34
  PEAK FLOW RATE(CFS)   =       1.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
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                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1524

                          Analysis prepared by:

                              SITETECH, INC.
                         8061 CHURCH STREET, P.O. 592
                              HIGHLAND, CA 92346
                              PH: (909) 864-3180

 ************************* DESCRIPTION OF STUDY *************************
* 10 YEAR - 1 HOUR DESIGN STORM                                         *
* AAA FENCE WAREHOUSE                                                   *
* EXISTING CONDITION                                                    *
 *************************************************************************

  FILE NAME: PEN10E.DAT
  TIME/DATE OF STUDY: 15:16 07/31/2025
-------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
-------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  2-YEAR, 1-HOUR PRECIPITATION(INCH) =  0.584
  100-YEAR, 1-HOUR PRECIPITATION(INCH) =  1.840
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   1.112
  SLOPE OF INTENSITY DURATION CURVE = 0.5000
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    110.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
```

```
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   327.00
  UPSTREAM ELEVATION(FEET) =   2533.60
  DOWNSTREAM ELEVATION(FEET) =   2525.60
  ELEVATION DIFFERENCE(FEET) =      8.00
  TC = 0.533*[(  327.00**3)/(     8.00)]**.2 =   11.337
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.558
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7292
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      2.24
  TOTAL AREA(ACRES) =      1.20   TOTAL RUNOFF(CFS) =      2.24
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.2  TC(MIN.) =     11.34
  PEAK FLOW RATE(CFS)   =       2.24
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
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                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1524

                          Analysis prepared by:

                              SITETECH, INC.
                         8061 CHURCH STREET, P.O. 592
                              HIGHLAND, CA 92346
                              PH: (909) 864-3180

 ************************* DESCRIPTION OF STUDY *************************
* 100 YEAR - 1 HOUR DESIGN STORM                                         *
* AAA FENCE WAREHOUSE                                                    *
* EXISTING CONDITION                                                     *
 ************************************************************************

  FILE NAME: PEN100E.DAT
  TIME/DATE OF STUDY: 15:17 07/31/2025
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  2-YEAR, 1-HOUR PRECIPITATION(INCH) =  0.584
  100-YEAR, 1-HOUR PRECIPITATION(INCH) =  1.840
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.840
  SLOPE OF INTENSITY DURATION CURVE = 0.5000
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    110.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
```

```
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   327.00
  UPSTREAM ELEVATION(FEET) =   2533.60
  DOWNSTREAM ELEVATION(FEET) =   2525.60
  ELEVATION DIFFERENCE(FEET) =      8.00
  TC = 0.533*[(  327.00**3)/(     8.00)]**.2 =   11.337
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.233
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7884
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      4.00
  TOTAL AREA(ACRES) =      1.20   TOTAL RUNOFF(CFS) =      4.00
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.2  TC(MIN.) =     11.34
  PEAK FLOW RATE(CFS)   =       4.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1524

                          Analysis prepared by:

                              SITETECH, INC.
                         8061 CHURCH STREET, P.O. 592
                              HIGHLAND, CA 92346
                              PH: (909) 864-3180

 ************************* DESCRIPTION OF STUDY *************************
* 2 YEAR - 1 HOUR DESIGN STORM                                           *
* AAA FENCE WAREHOUSE                                                    *
* PROPOSED CONDITION                                                     *
 **************************************************************************

  FILE NAME: PEN2P.DAT
  TIME/DATE OF STUDY: 15:18 07/31/2025
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  2-YEAR, 1-HOUR PRECIPITATION(INCH) =  0.584
  100-YEAR, 1-HOUR PRECIPITATION(INCH) =  1.840
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =    2.00   1-HOUR INTENSITY(INCH/HOUR) =   0.584
  SLOPE OF INTENSITY DURATION CURVE = 0.5000
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    110.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
```

```
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   462.00
  UPSTREAM ELEVATION(FEET) =   2533.00
  DOWNSTREAM ELEVATION(FEET) =   2531.30
  ELEVATION DIFFERENCE(FEET) =      1.70
  TC = 0.303*[(  462.00**3)/(     1.70)]**.2 =   10.821
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.375
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8727
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      1.44
  TOTAL AREA(ACRES) =      1.20   TOTAL RUNOFF(CFS) =      1.44
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.2  TC(MIN.) =     10.82
  PEAK FLOW RATE(CFS)   =       1.44
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1524

                          Analysis prepared by:

                              SITETECH, INC.
                         8061 CHURCH STREET, P.O. 592
                              HIGHLAND, CA 92346
                              PH: (909) 864-3180

 ************************* DESCRIPTION OF STUDY *************************
* 10 YEAR - 1 HOUR DESIGN STORM                                         *
* AAA FENCE WAREHOUSE                                                   *
* PROPOSED CONDITION                                                    *
 *************************************************************************

  FILE NAME: PEN10P.DAT
  TIME/DATE OF STUDY: 15:18 07/31/2025
-------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
-------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  2-YEAR, 1-HOUR PRECIPITATION(INCH) =  0.584
  100-YEAR, 1-HOUR PRECIPITATION(INCH) =  1.840
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   1.112
  SLOPE OF INTENSITY DURATION CURVE = 0.5000
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    110.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
```

```
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   462.00
  UPSTREAM ELEVATION(FEET) =   2533.00
  DOWNSTREAM ELEVATION(FEET) =   2531.30
  ELEVATION DIFFERENCE(FEET) =      1.70
  TC = 0.303*[(  462.00**3)/(     1.70)]**.2 =   10.821
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.618
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8832
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      2.77
  TOTAL AREA(ACRES) =      1.20   TOTAL RUNOFF(CFS) =      2.77
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.2  TC(MIN.) =     10.82
  PEAK FLOW RATE(CFS)   =       2.77
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
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                Release Date: 07/01/2016  License ID 1524

                          Analysis prepared by:

                              SITETECH, INC.
                         8061 CHURCH STREET, P.O. 592
                              HIGHLAND, CA 92346
                              PH: (909) 864-3180

 ************************* DESCRIPTION OF STUDY *************************
* 100 YEAR - 1 HOUR DESIGN STORM                                         *
* AAA FENCE WAREHOUSE                                                    *
* PROPOSED CONDITION                                                     *
 **************************************************************************

  FILE NAME: PEN100P.DAT
  TIME/DATE OF STUDY: 15:20 07/31/2025
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  2-YEAR, 1-HOUR PRECIPITATION(INCH) =  0.584
  100-YEAR, 1-HOUR PRECIPITATION(INCH) =  1.840
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.840
  SLOPE OF INTENSITY DURATION CURVE = 0.5000
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    110.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
```

```
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   462.00
  UPSTREAM ELEVATION(FEET) =   2533.00
  DOWNSTREAM ELEVATION(FEET) =   2531.30
  ELEVATION DIFFERENCE(FEET) =      1.70
  TC = 0.303*[(  462.00**3)/(     1.70)]**.2 =   10.821
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.333
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8891
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      4.62
  TOTAL AREA(ACRES) =      1.20   TOTAL RUNOFF(CFS) =      4.62
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.2  TC(MIN.) =     10.82
  PEAK FLOW RATE(CFS)   =       4.62
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX 4 – DRAINAGE DETAILS

- BIO-RETENTION BASIN SIZING
- DRAINAGE DETAILS & SECTIONS

AAA FENCE WAREHOUSE - BIORETENTION SYSTEM

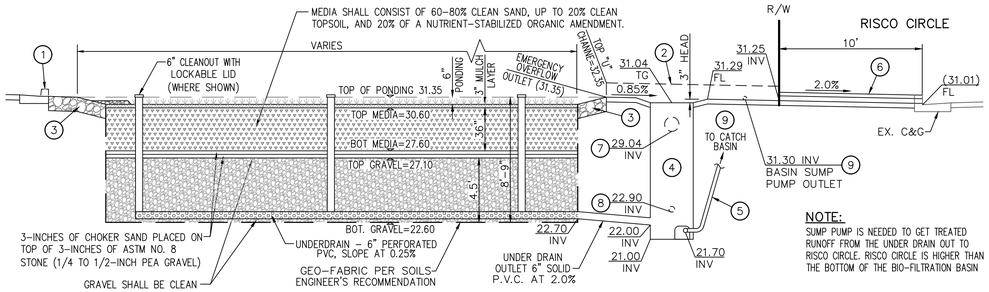
Amended Soil Infil. Rate (in/hr)	5		Basin Footprint (ft^2)	1269
Amended Soil Factor of Safety	2		Amended Soil Depth (ft)	3.00
Amended Soil Design Infil. Rate (in/hr)	2.5		Amended Soil Porosity	30%
Drawdown Time (hr)	48		Gravel Depth (ft)	1.00
Maximum Ponding Depth (ft)	0.5		Gravel Porosity	40%
Design Ponding Depth (ft)	0.5		Duration of Storm (hr)	3

Results

Design Capture Volume (ft^3)	=	2627
Total Biotreated Volume (ft^3)	=	2760
$V_{BMP} > V_{DCV}$???	=	YES

	=	INPUT DATA
	=	CALCULATED DATA

* Treated Volume = Soil Footprint x [(Design Ponding Depth / 2) + (Soil Depth x Soil Porosity) + (Gravel Depth x Gravel Porosity) + (Duration of Storm x (Soil Design Infiltration Rate / 12))]



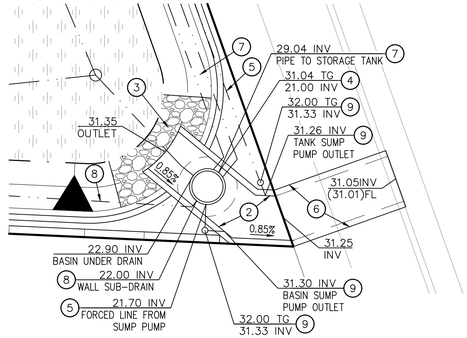
BIO-RETENTION BASIN DETAIL

SCALE: 1"=5'

BASIN SUMP-PUMP OUTLET CROSS-SECTION

SCALE: 1"=5'

NOTE:
SUMP PUMP IS NEEDED TO GET TREATED RUNOFF FROM THE UNDER DRAIN OUT TO RISCO CIRCLE. RISCO CIRCLE IS HIGHER THAN THE BOTTOM OF THE BIO-FILTRATION BASIN

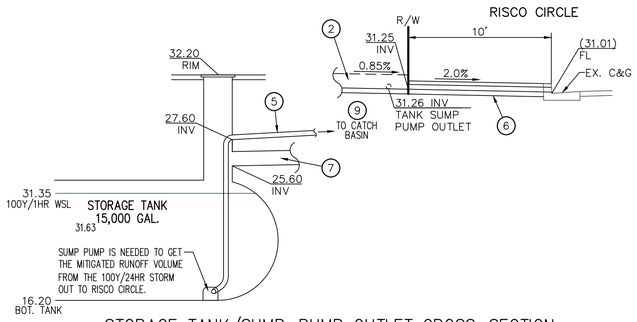


STORAGE TANK/SUMP-PUMP OUTLET PLAN VIEW

SCALE: 1"=5'

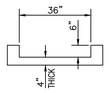
CONSTRUCTION NOTES:

1. PROVIDE CURB OPENING FOR DRAINAGE INLET AND OUTLET.
2. CONCRETE "U" CHANNEL PER DETAIL.
3. 12" THICK RIP-RAP - USE 8" MIN. DIAMETER ROCK.
4. 36" NDS DRAIN BASIN WITH GRATED INLET WITH ZOELLER CAST IRON SUBMERSIBLE SUMP PUMP.
5. 3" FORCED DRAIN FROM SUMP PUMP.
6. 48" WIDE UNDER SIDEWALK DRAIN PER CO. OF RIVERSIDE STD. PLAN NO. 309.
7. 12" H.D.P.E. DRAIN PIPE AT 6.0% MINIMUM.
8. 4" P.V.C. DRAIN PIPE FROM WALL SUB-DRAIN.
9. 6" NDS SPEE-D CATCH BASIN WITH 4" P.V.C. DRAIN PIPE - CORE THROUGH CONCRETE "U" CHANNEL FOR SUMP PUMP OUTLET.



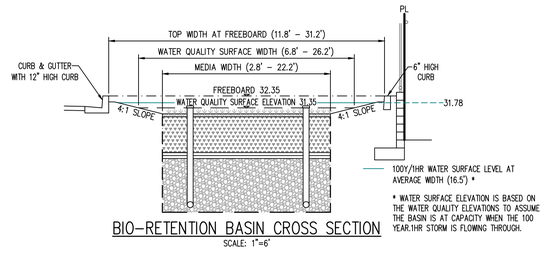
STORAGE TANK/SUMP-PUMP OUTLET CROSS-SECTION

SCALE: 1"=5'



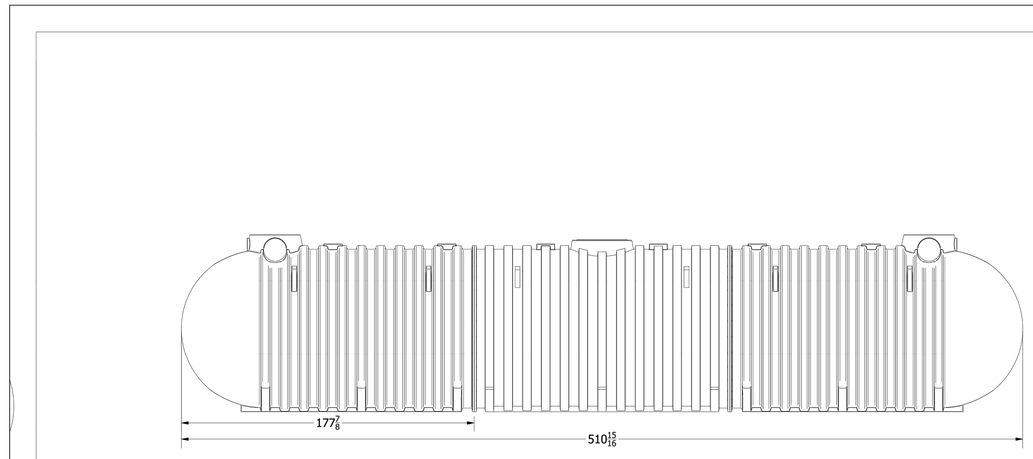
BASIN INLET SECTION

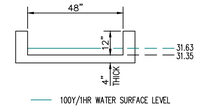
SCALE: 1"=3'



BIO-RETENTION BASIN CROSS SECTION

SCALE: 1"=6'





CONCRETE "U" CHANNEL

SCALE: 1"=3'

DRAWN	toddbolzer	12/21/2020
CHECKED		
QA		
MFG		
APPROVED		

NORWESCO, INC. SAINT BONIFACIUS, MN

TITLE: 15000 GALLON UNDERGROUND TANK

SIZE: B | PN 41615 | REV

SCALE: 1/16 | SHEET 1 OF 1

Trusted. Tested. Tough.®

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

ZOELLER PUMP COMPANY

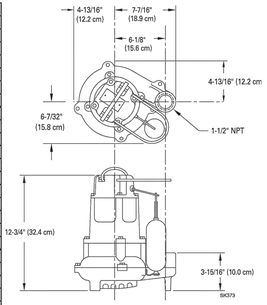
SECTION: 2.15.060
FM2782
0222
Supersedes
0220

TECHNICAL DATA SHEET
FLOW-MATE SERIES
Models 137, 139 Effluent / Dewatering Pumps

PRODUCT SPECIFICATIONS

MOTOR	Horse Power	1/2
	Voltage	115 - 460
	Phase	1 or 3 Ph
	Hertz	60 Hz
	RPM	1725 RPM
	Type	Split phase or 3 phase
	Insulation	Class B
	Amps	2 - 10.5
PUMP	Operation	Automatic or nonautomatic
	Auto On/Off Points	10" (25.4 cm) / 2-3/4" (7 cm)
	Discharge Size	1-1/2" NPT
	Solids Handling	5/8" (15 mm) spherical solids
	Cord Length	10' (3 m) automatic, 15' (5 m) nonautomatic
	Cord Type	UL listed, neoprene cord
	Max. Head	26' (8 m)
	Max. Flow Rate	93 GPM (362 LPM)
	Max. Operating Temp.	130° F (54° C) (extra duty 140°F (60°C))
	Cooling	Oil filled
	Motor Protection	Auto reset thermal overload (1 Ph)
MATERIALS	Motor Housing	Cast iron (137) or bronze (139)
	Pump Housing	Cast iron (137) or bronze (139)
	Base	Cast iron (137) or bronze (139)
	Upper Bearing	Sleeve bearing
	Lower Bearing	Sleeve bearing
	Mechanical Seals	Carbon and ceramic
	Impeller Type	Non-clogging vortex
	Impeller	Cast iron or bronze
	Hardware	Stainless steel
	Motor Shaft	AISI 1215 cold rolled steel
	Gasket	Neoprene

NOTE: See model comparison chart for specific details.



TOTAL DYNAMIC HEAD FLOW PER MINUTE

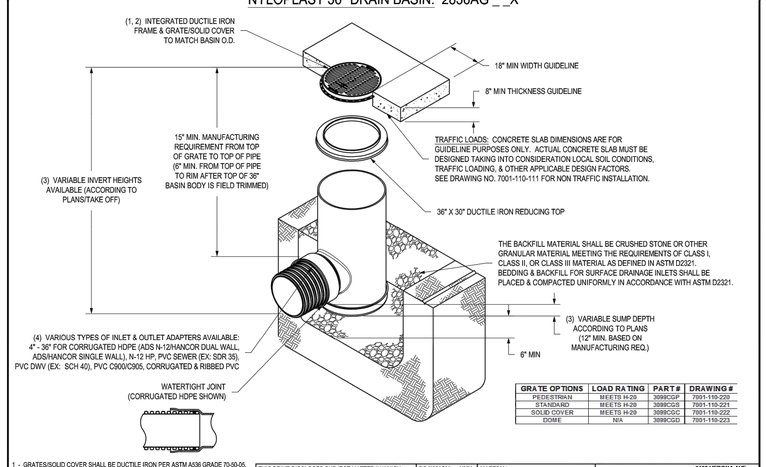
MODEL		137/139	
Feet	Meters	Gal.	Liters
5	1.5	90	340
10	3.0	75	284
15	4.6	58	220
20	6.1	36	136
25	7.6	8	30
Shut-off Head:		26 ft.(8.0m)	

Made In The USA.
Using a MAJORITY OF U.S. components.

Tested to Standard UL778 and Certified to CSA Standard C22.2 No. 108

502-778-2731 | 800-928-7867 | 3649 Cane Run Road | Louisville, KY 40211-1961 | zoellerpumps.com

NYLOPLAST 36" DRAIN BASIN: 2836AG _ _X



GRATE OPTIONS	LOAD RATING	PART #	DRAWING #
PEDESTRIAN	MEETS H-20	3099CGP	7001-110-220
STANDARD	MEETS H-20	3099CGS	7001-110-221
SOLID COVER	MEETS H-20	3099CGC	7001-110-222
DOME	N/A	3099CGD	7001-110-223

1 - GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-60-05.
2 - FRAMES & REDUCING TOP SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASIN BODIES OVER 84" DUE TO SHIPPING RESTRICTIONS.
4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER.
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.

DRAWN BY	NMH	MATERIAL	
DATE	9-21-18		
APPD BY	NMH		
DATE	9-21-18		
REVSD BY	NMH	PROJECT NO./NAME	
DATE	10-04-21		
APPD BY	NMH		
DATE	10-04-21		
DWG SIZE	A	SCALE 1:40 SHEET 1 OF 1	

ADS Nyloplast

3130 VERONA AVE
BUFORD, GA 30518
PHN (770) 932-2443
FAX (770) 932-2490
www.nyloplast-us.com

TITLE: 36" DRAIN BASIN QUICK SPEC INSTALLATION DETAIL

DWG NO. 7001-110-526 REV B

SITETECH INC.
8061 CHURCH ST. HIGHLAND CA 92346 PO BOX 592
PH: (909) 864-3180, FAX: (909) 864-0850

BERNHARD K. MAYER
R.C.E. 36866

09/16/25
DATE

SEAL: REGISTERED PROFESSIONAL ENGINEER · BERNHARD K. MAYER · NO. 36866 Exp. 6-30-26 · CIVIL · STATE OF CALIFORNIA

CITY OF BEAUMONT, CALIFORNIA

DRAINAGE DETAILS & SECTIONS

CORNER OF 4TH STREET & RISCO CIRCLE APN 417-220-009

SHEET 1 OF 1 SHEETS

FILE NO: PW2025-0169

APPENDIX 5 – HYDRAULIC CALCULATIONS

- 12” STORM DRAIN
- BASIN CROSS-SECTION
- 36” CATCH BASIN INLET
- 36” WIDE BASIN INLET
- 48” WIDE PARKWAY DRAIN
- 48” WIDE “U” CHANNEL

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Jul 31 2025

12IN HDPE DRAIN PIPE TO STORAGE TANKS

Circular

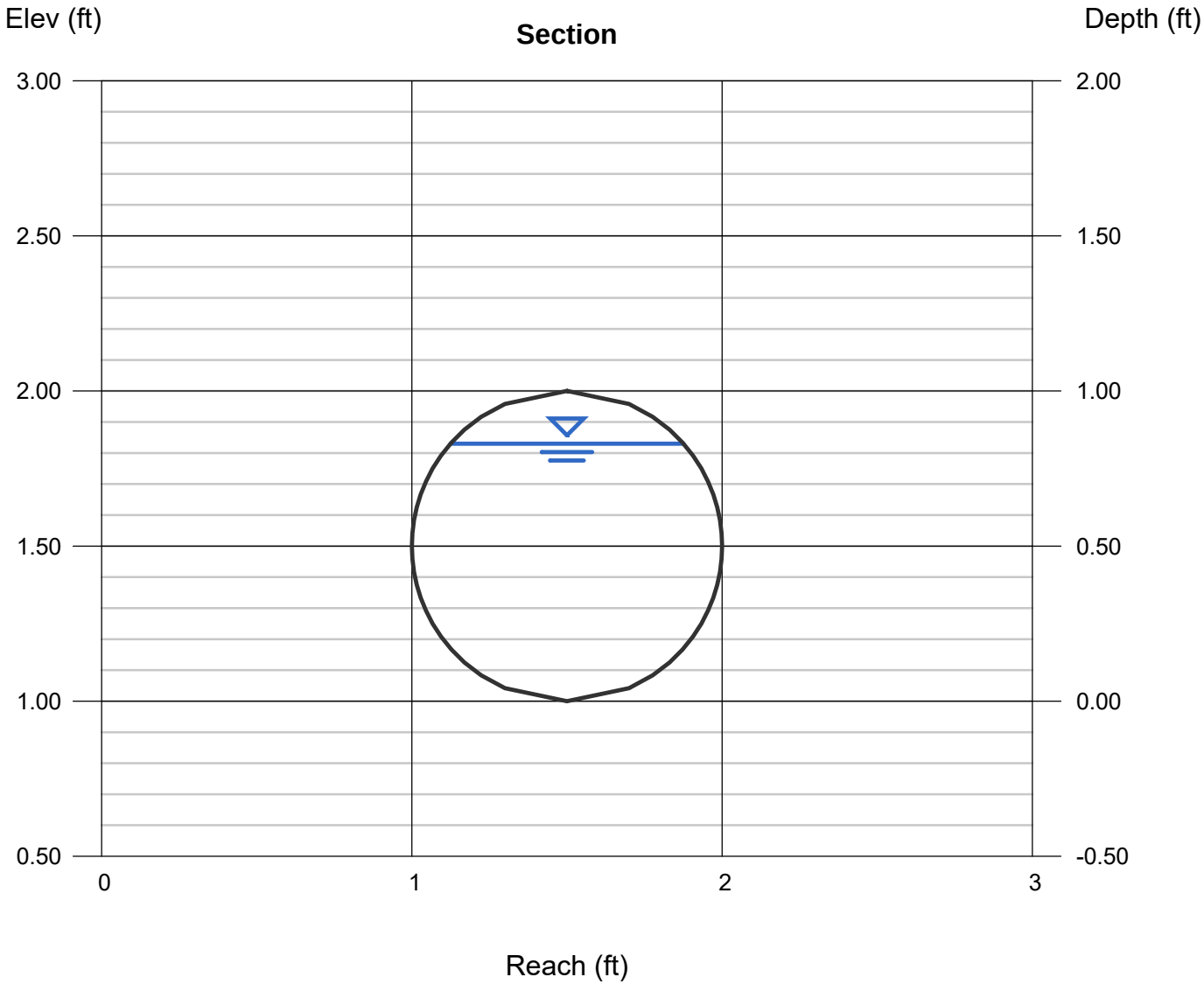
Diameter (ft)	= 1.00
Invert Elev (ft)	= 1.00
Slope (%)	= 6.00
N-Value	= 0.025

Calculations

Compute by:	Known Q
Known Q (cfs)	= 4.62

Highlighted

Depth (ft)	= 0.83
Q (cfs)	= 4.620
Area (sqft)	= 0.70
Velocity (ft/s)	= 6.58
Wetted Perim (ft)	= 2.30
Crit Depth, Yc (ft)	= 0.90
Top Width (ft)	= 0.75
EGL (ft)	= 1.50



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Jul 30 2025

100 YEAR/1 HR WATER SURFACE LEVEL AT AVERAGE BASIN WIDTH (16.5')

Trapezoidal

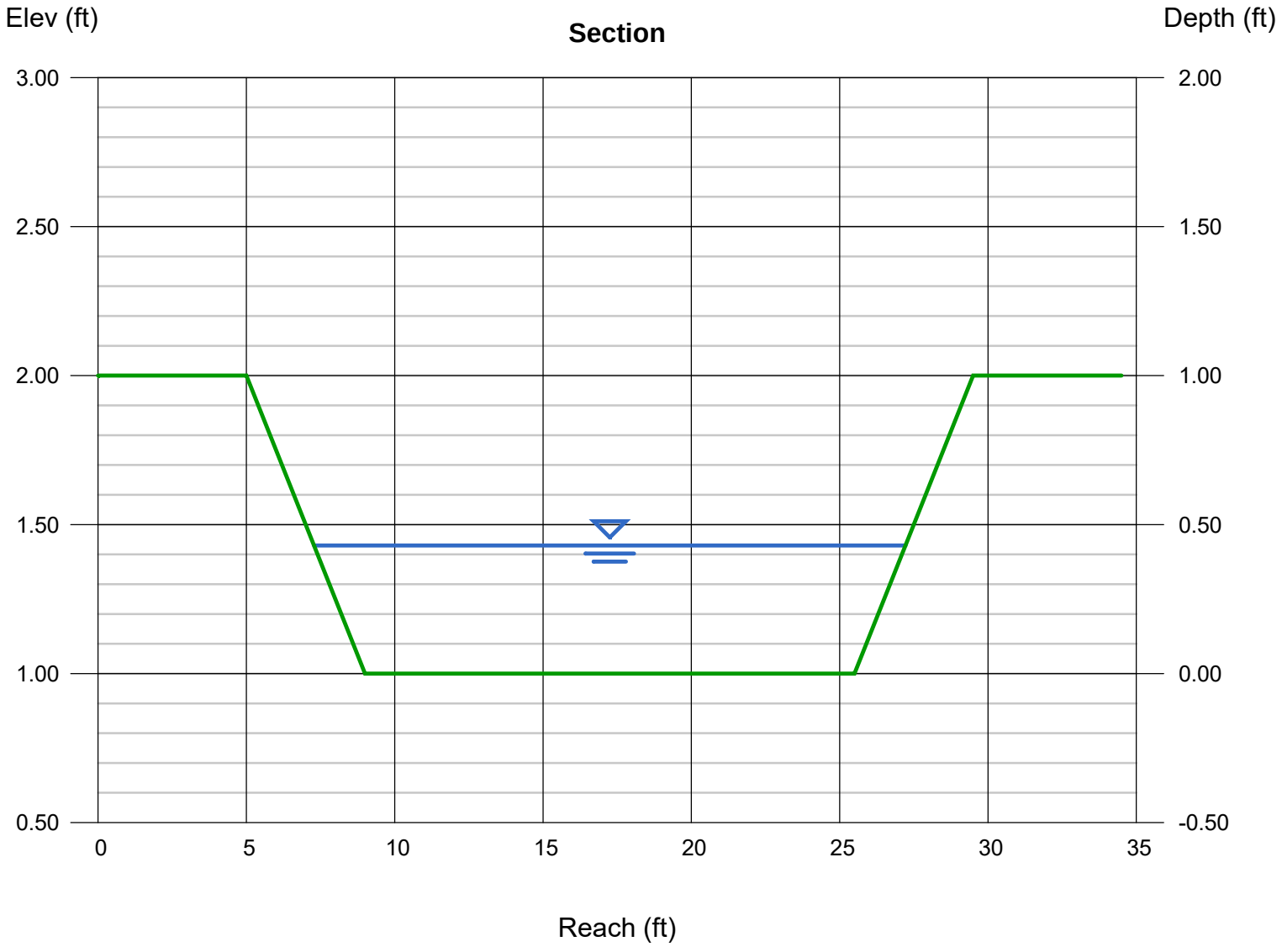
Bottom Width (ft)	= 16.50
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.05
N-Value	= 0.030

Calculations

Compute by:	Known Q
Known Q (cfs)	= 4.62

Highlighted

Depth (ft)	= 0.43
Q (cfs)	= 4.620
Area (sqft)	= 7.83
Velocity (ft/s)	= 0.59
Wetted Perim (ft)	= 20.05
Crit Depth, Yc (ft)	= 0.14
Top Width (ft)	= 19.94
EGL (ft)	= 0.44



Inlet Report

36IN GRATED INLET REQUIRED HEAD FOR 100-YEAR CFS

Drop Grate Inlet

Location	= Sag
Curb Length (ft)	= -0-
Throat Height (in)	= -0-
Grate Area (sqft)	= 7.06
Grate Width (ft)	= 3.00
Grate Length (ft)	= 3.00

Gutter

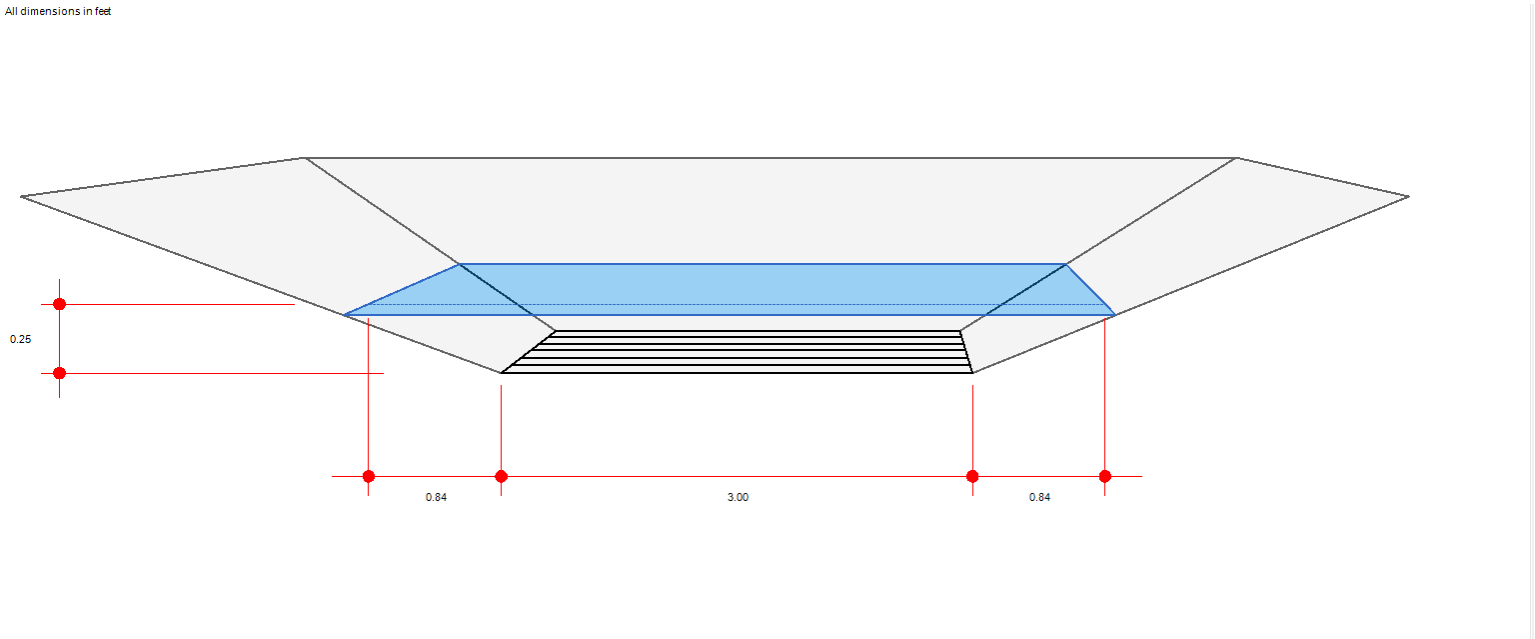
Slope, Sw (ft/ft)	= 0.300
Slope, Sx (ft/ft)	= 0.300
Local Depr (in)	= -0-
Gutter Width (ft)	= 3.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 4.62

Highlighted

Q Total (cfs)	= 4.62
Q Capt (cfs)	= 4.62
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 3.04
Efficiency (%)	= 100
Gutter Spread (ft)	= 4.69
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Sep 18 2025

36IN WIDE BASIN INLET

Rectangular

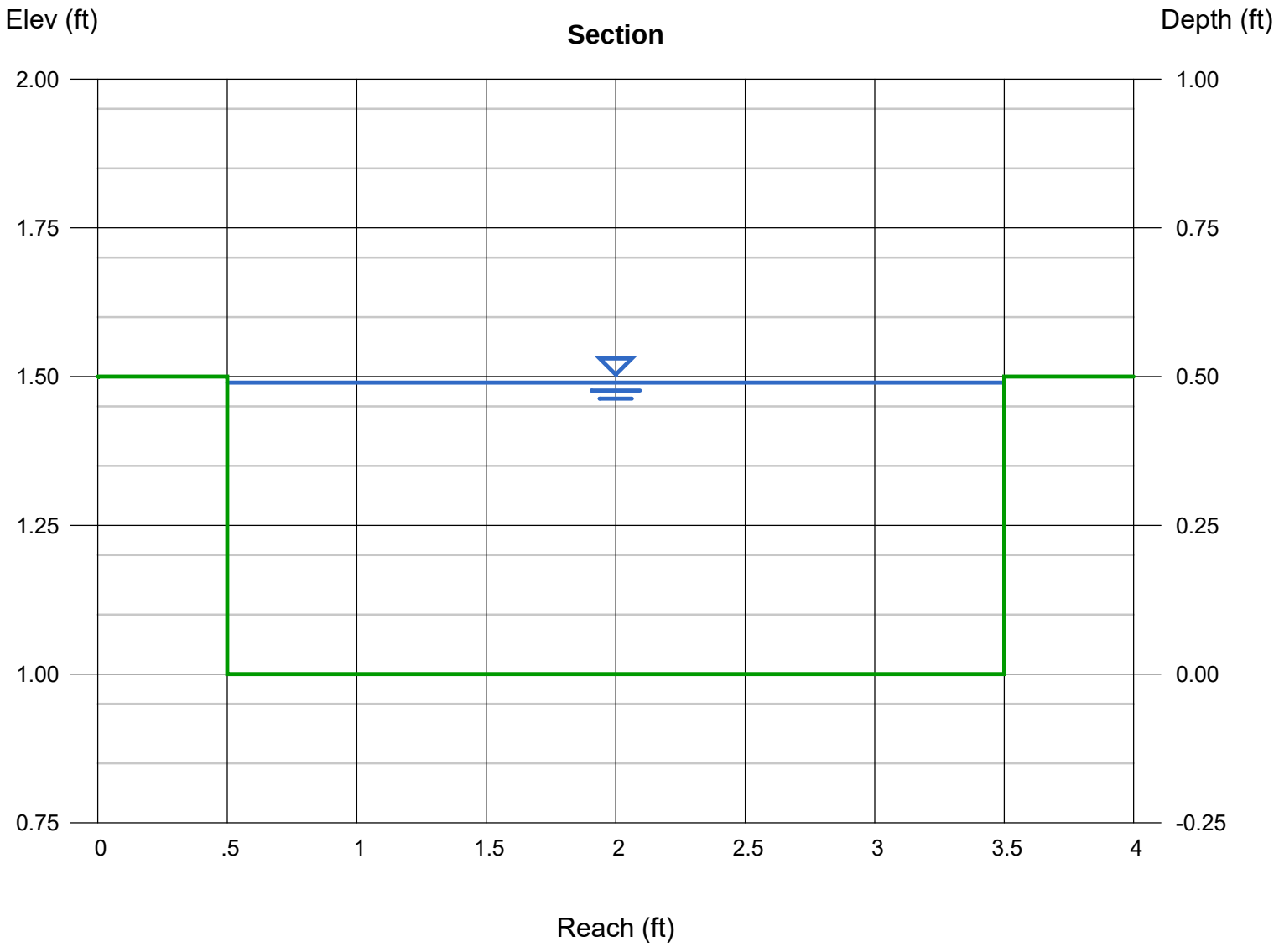
Bottom Width (ft)	= 3.00
Total Depth (ft)	= 0.50
Invert Elev (ft)	= 1.00
Slope (%)	= 0.30
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 4.62

Highlighted

Depth (ft)	= 0.49
Q (cfs)	= 4.620
Area (sqft)	= 1.47
Velocity (ft/s)	= 3.14
Wetted Perim (ft)	= 3.98
Crit Depth, Yc (ft)	= 0.42
Top Width (ft)	= 3.00
EGL (ft)	= 0.64



Channel Report

48IN WIDE PARKWAY DRAIN

Rectangular

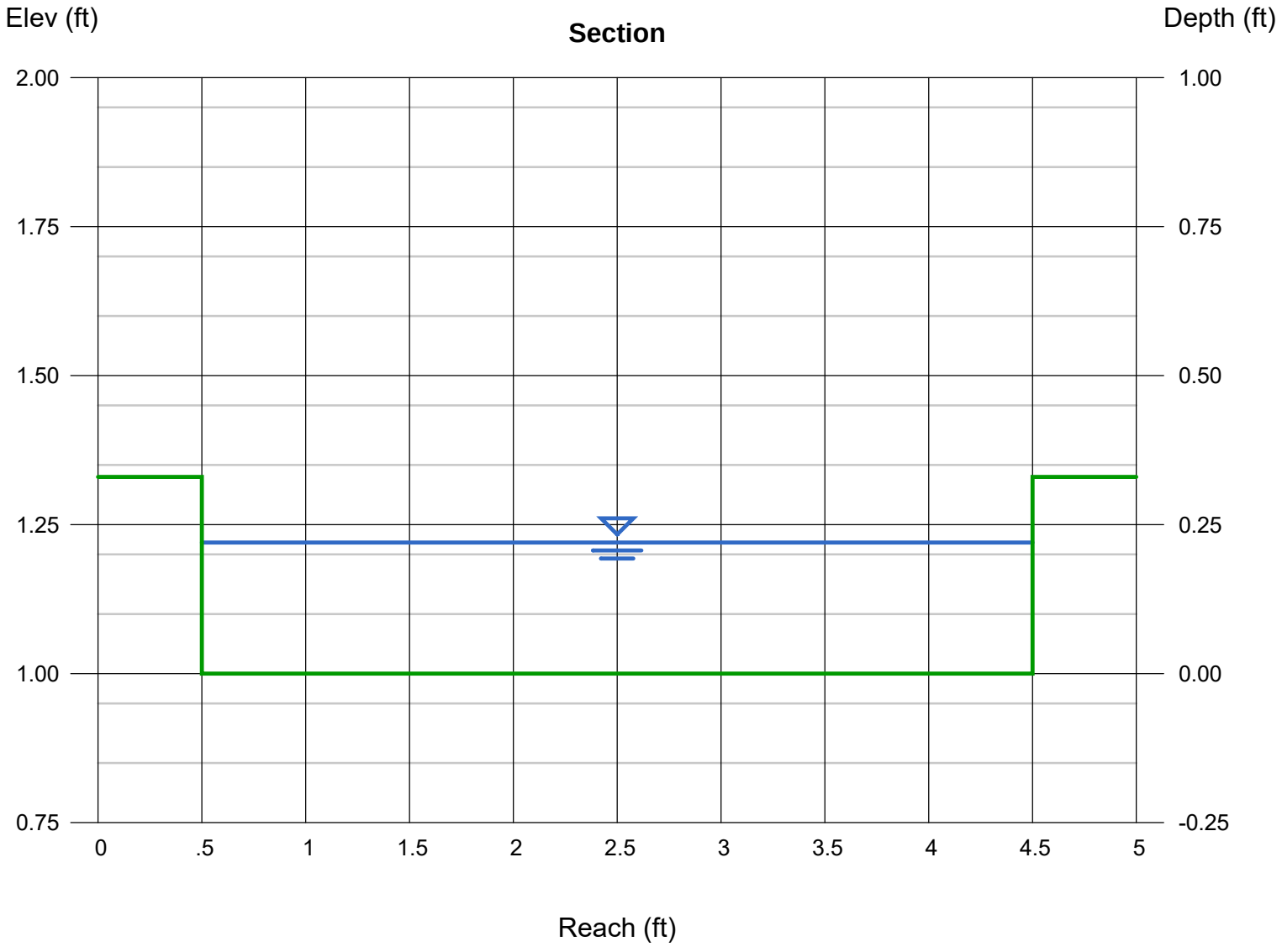
Bottom Width (ft)	= 4.00
Total Depth (ft)	= 0.33
Invert Elev (ft)	= 1.00
Slope (%)	= 2.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 4.62

Highlighted

Depth (ft)	= 0.22
Q (cfs)	= 4.620
Area (sqft)	= 0.88
Velocity (ft/s)	= 5.22
Wetted Perim (ft)	= 4.44
Crit Depth, Yc (ft)	= 0.33
Top Width (ft)	= 4.00
EGL (ft)	= 0.64



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Jul 30 2025

48IN WIDE U-CHANNEL

Rectangular

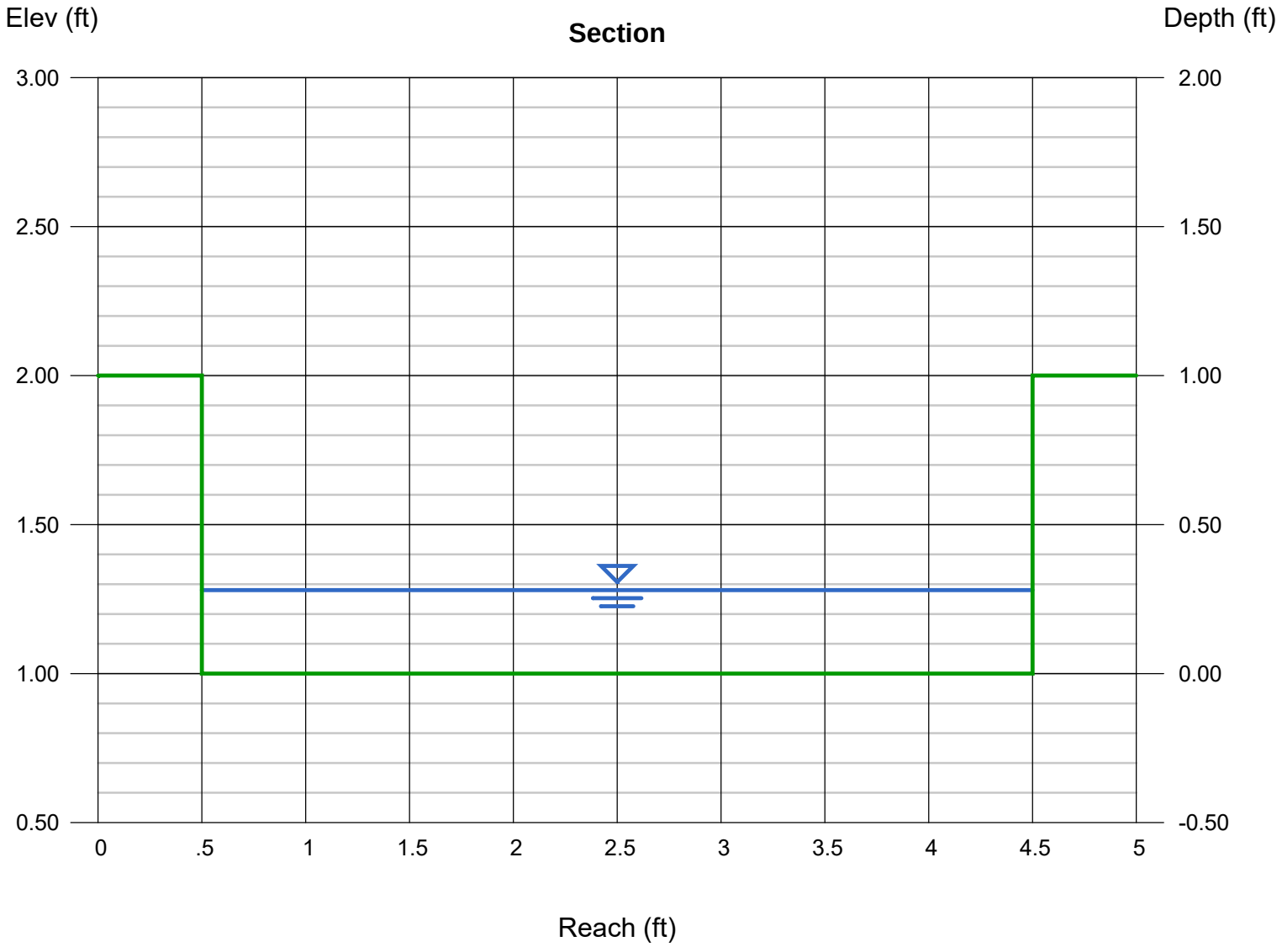
Bottom Width (ft)	= 4.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.85
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 4.62

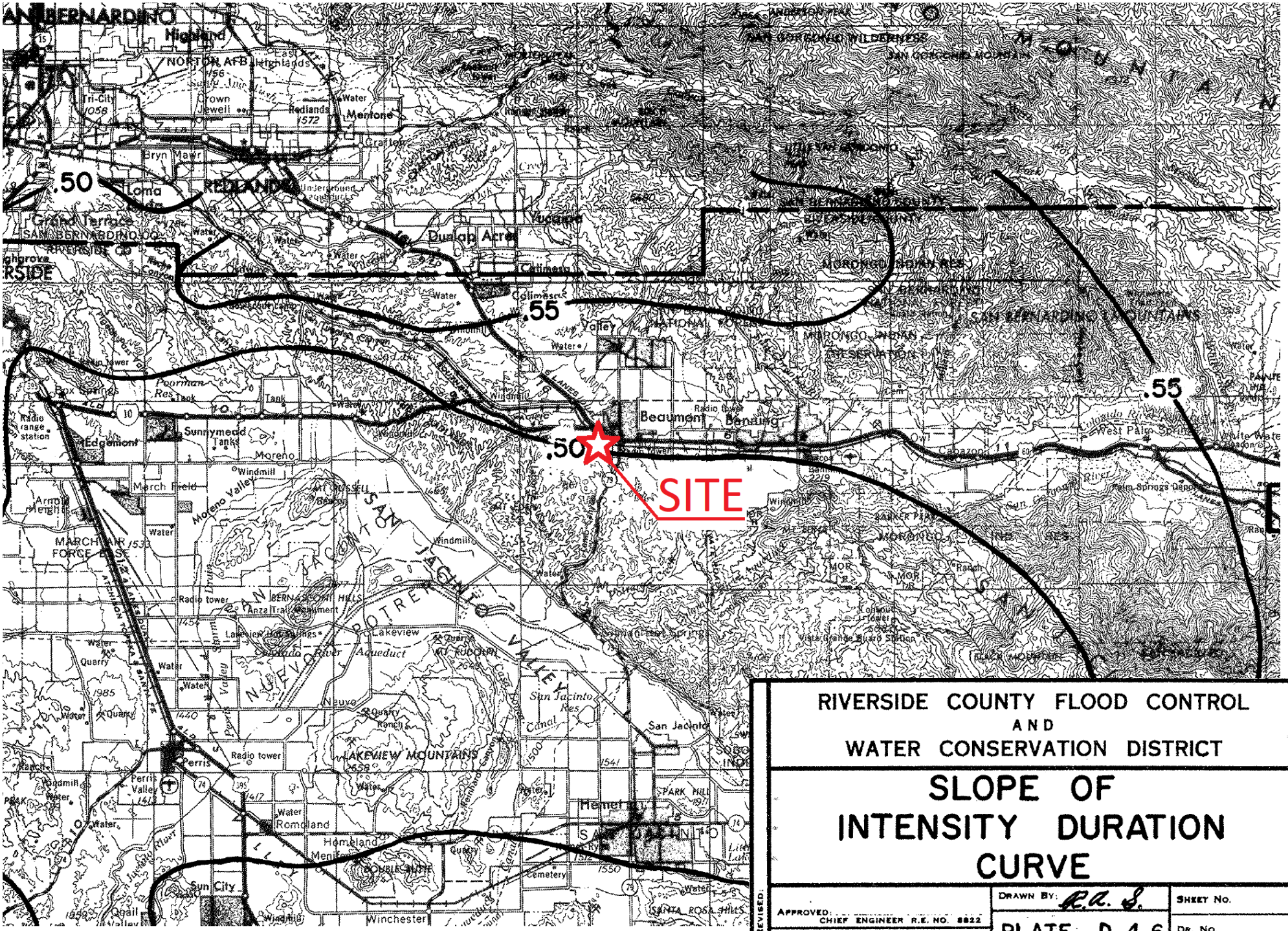
Highlighted

Depth (ft)	= 0.28
Q (cfs)	= 4.620
Area (sqft)	= 1.12
Velocity (ft/s)	= 4.10
Wetted Perim (ft)	= 4.56
Crit Depth, Yc (ft)	= 0.35
Top Width (ft)	= 4.00
EGL (ft)	= 0.54



APPENDIX 6 – REFERENCE MATERIAL

- INTENSITY DURATION CURVE
- RUNOFF INDEX NUMBERS
- NOAA RAINFALL DATA
- USDA NRCS SOIL MAP
- USDA NRCS SOILS DATA
- FEMA FLOOD MAP
- SOILS REPORT
- STORAGE TANK MAINTENANCE
- SUMP PUMP MAINTENANCE



RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

SLOPE OF INTENSITY DURATION CURVE

REVISED:	DRAWN BY: R.A.S.	SHEET NO.
APPROVED: CHIEF ENGINEER R.E. NO. 8822	PLATE D-4.6	DR. NO.
DATE:		

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

RCFC & WCD
HYDROLOGY MANUAL

RUNOFF INDEX NUMBERS FOR PERVIOUS AREA

PLATE D-5.5 (1 of 2)

NOAA Atlas 14, Volume 6, Version 2
Location name: Beaumont, California, USA*
Latitude: 33.9261°, Longitude: -116.9962°
Elevation: 2535 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.121 (0.101-0.147)	0.158 (0.131-0.191)	0.213 (0.177-0.259)	0.264 (0.217-0.324)	0.344 (0.273-0.437)	0.415 (0.323-0.538)	0.497 (0.377-0.661)	0.592 (0.437-0.811)	0.743 (0.525-1.06)	0.879 (0.599-1.30)
10-min	0.174 (0.145-0.211)	0.226 (0.188-0.274)	0.305 (0.253-0.371)	0.378 (0.311-0.464)	0.493 (0.392-0.626)	0.595 (0.463-0.772)	0.712 (0.540-0.947)	0.849 (0.626-1.16)	1.06 (0.752-1.52)	1.26 (0.859-1.87)
15-min	0.210 (0.175-0.255)	0.274 (0.228-0.332)	0.369 (0.306-0.449)	0.457 (0.376-0.561)	0.596 (0.474-0.757)	0.719 (0.560-0.933)	0.861 (0.654-1.15)	1.03 (0.757-1.41)	1.29 (0.910-1.84)	1.52 (1.04-2.26)
30-min	0.306 (0.255-0.370)	0.398 (0.331-0.483)	0.537 (0.446-0.653)	0.665 (0.548-0.816)	0.867 (0.689-1.10)	1.05 (0.814-1.36)	1.25 (0.950-1.67)	1.49 (1.10-2.04)	1.87 (1.32-2.68)	2.22 (1.51-3.28)
60-min	0.448 (0.374-0.543)	0.584 (0.486-0.708)	0.787 (0.654-0.958)	0.976 (0.803-1.20)	1.27 (1.01-1.61)	1.53 (1.19-1.99)	1.84 (1.39-2.44)	2.19 (1.62-3.00)	2.75 (1.94-3.93)	3.25 (2.22-4.81)
2-hr	0.637 (0.531-0.772)	0.795 (0.662-0.964)	1.03 (0.853-1.25)	1.24 (1.02-1.52)	1.56 (1.24-1.99)	1.85 (1.44-2.40)	2.17 (1.64-2.88)	2.53 (1.87-3.47)	3.10 (2.19-4.42)	3.59 (2.45-5.32)
3-hr	0.778 (0.649-0.943)	0.959 (0.798-1.16)	1.22 (1.01-1.49)	1.46 (1.20-1.79)	1.81 (1.44-2.30)	2.12 (1.65-2.75)	2.46 (1.86-3.27)	2.84 (2.10-3.89)	3.42 (2.42-4.89)	3.92 (2.68-5.81)
6-hr	1.13 (0.939-1.36)	1.38 (1.15-1.67)	1.74 (1.44-2.11)	2.05 (1.68-2.51)	2.50 (1.99-3.18)	2.88 (2.25-3.74)	3.30 (2.50-4.39)	3.75 (2.77-5.14)	4.42 (3.12-6.32)	4.98 (3.40-7.38)
12-hr	1.53 (1.27-1.85)	1.91 (1.59-2.32)	2.43 (2.02-2.96)	2.87 (2.36-3.52)	3.49 (2.78-4.43)	3.98 (3.10-5.17)	4.50 (3.42-5.99)	5.05 (3.72-6.91)	5.82 (4.11-8.31)	6.43 (4.39-9.53)
24-hr	2.04 (1.81-2.35)	2.65 (2.34-3.06)	3.45 (3.04-3.99)	4.11 (3.59-4.79)	5.01 (4.24-6.03)	5.70 (4.73-7.02)	6.42 (5.20-8.08)	7.16 (5.65-9.26)	8.17 (6.19-11.0)	8.96 (6.56-12.5)
2-day	2.47 (2.19-2.85)	3.29 (2.91-3.80)	4.40 (3.88-5.09)	5.33 (4.66-6.22)	6.65 (5.63-8.01)	7.70 (6.39-9.47)	8.80 (7.13-11.1)	9.98 (7.87-12.9)	11.6 (8.81-15.7)	13.0 (9.49-18.1)
3-day	2.69 (2.38-3.10)	3.61 (3.19-4.16)	4.90 (4.32-5.67)	6.01 (5.26-7.01)	7.63 (6.46-9.19)	8.96 (7.43-11.0)	10.4 (8.42-13.1)	11.9 (9.42-15.4)	14.2 (10.7-19.1)	16.1 (11.8-22.4)
4-day	2.92 (2.58-3.36)	3.94 (3.48-4.55)	5.38 (4.74-6.23)	6.63 (5.80-7.74)	8.47 (7.17-10.2)	9.98 (8.28-12.3)	11.6 (9.41-14.6)	13.4 (10.6-17.3)	16.0 (12.1-21.6)	18.2 (13.3-25.4)
7-day	3.37 (2.99-3.89)	4.56 (4.03-5.26)	6.21 (5.47-7.18)	7.63 (6.68-8.90)	9.70 (8.22-11.7)	11.4 (9.45-14.0)	13.2 (10.7-16.6)	15.2 (12.0-19.6)	18.0 (13.7-24.3)	20.4 (14.9-28.4)
10-day	3.70 (3.27-4.26)	4.99 (4.41-5.76)	6.79 (5.99-7.86)	8.33 (7.29-9.72)	10.5 (8.93-12.7)	12.3 (10.2-15.2)	14.3 (11.6-18.0)	16.3 (12.9-21.1)	19.3 (14.6-26.0)	21.7 (15.9-30.3)
20-day	4.61 (4.08-5.31)	6.29 (5.56-7.26)	8.57 (7.56-9.92)	10.5 (9.18-12.2)	13.2 (11.2-15.9)	15.4 (12.8-18.9)	17.7 (14.3-22.3)	20.1 (15.8-26.0)	23.5 (17.8-31.7)	26.2 (19.2-36.6)
30-day	5.43 (4.80-6.26)	7.44 (6.58-8.59)	10.2 (8.95-11.7)	12.4 (10.9-14.5)	15.6 (13.2-18.8)	18.1 (15.0-22.2)	20.6 (16.7-26.0)	23.4 (18.4-30.2)	27.1 (20.6-36.6)	30.1 (22.1-42.0)
45-day	6.53 (5.78-7.53)	8.98 (7.94-10.4)	12.2 (10.8-14.1)	14.9 (13.0-17.4)	18.6 (15.7-22.4)	21.4 (17.8-26.4)	24.4 (19.8-30.7)	27.4 (21.6-35.5)	31.7 (24.0-42.7)	35.0 (25.6-48.7)
60-day	7.64 (6.76-8.80)	10.5 (9.25-12.1)	14.2 (12.5-16.4)	17.2 (15.1-20.1)	21.3 (18.1-25.7)	24.5 (20.4-30.2)	27.8 (22.5-35.0)	31.2 (24.6-40.3)	35.8 (27.1-48.2)	39.3 (28.8-54.8)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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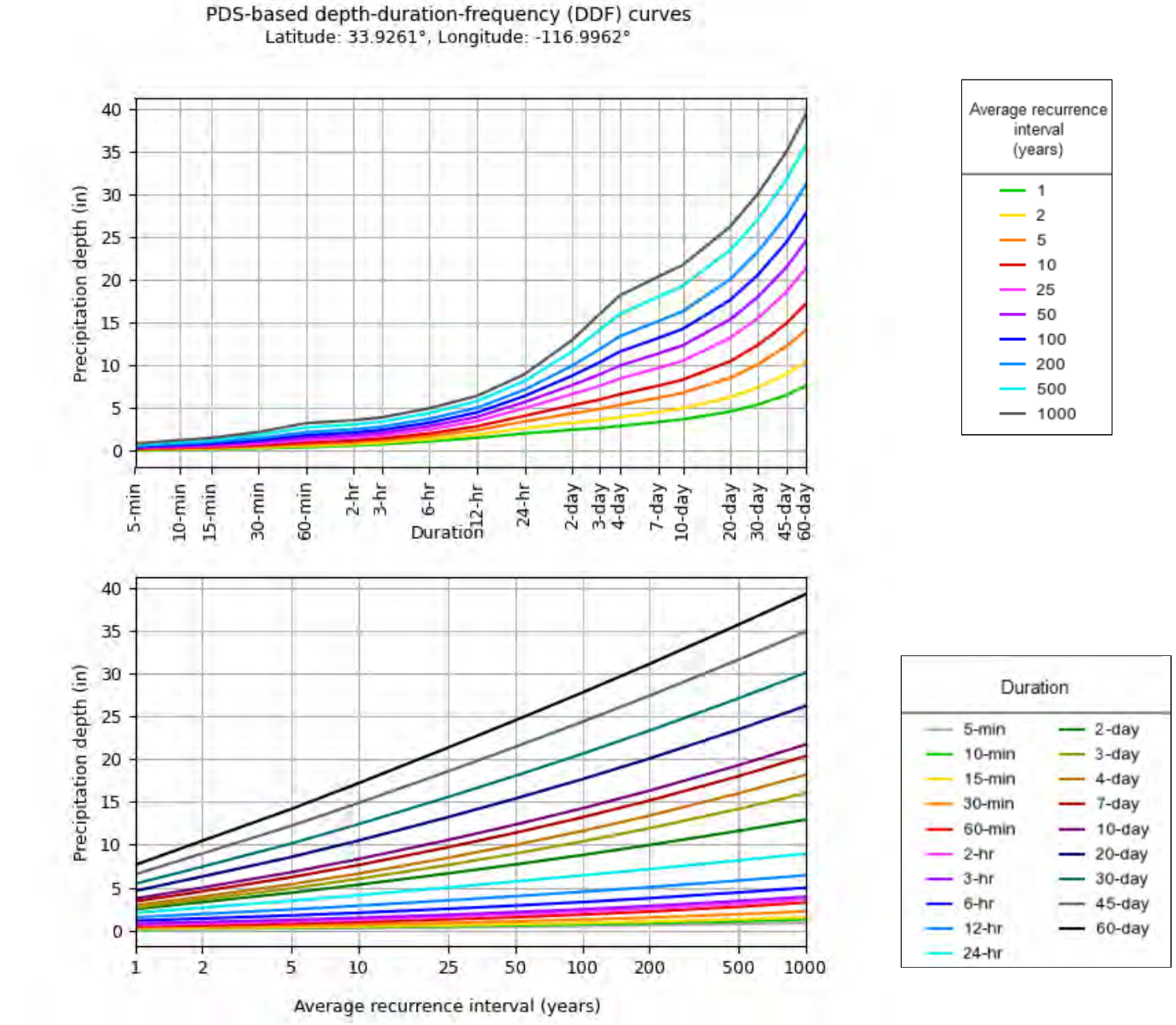
PF graphical



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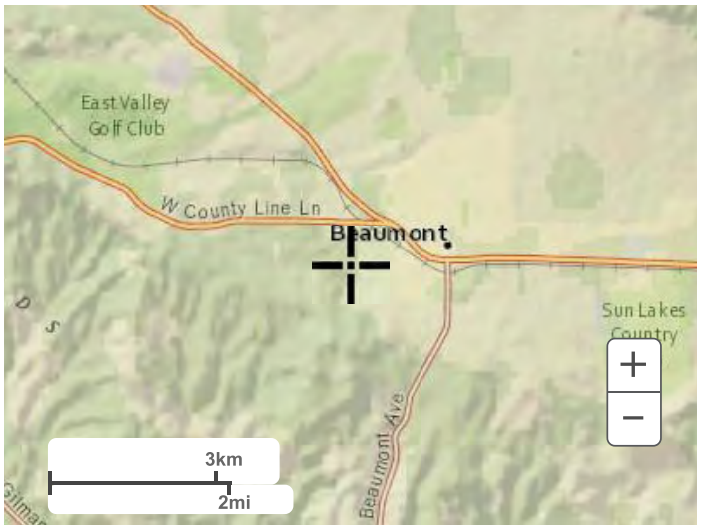
Maps & aerials

Small scale terrain



Large scale terrain

Large scale map

Large scale aerial

Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Map Scale: 1:630 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 30 60 120 180

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

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

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

Special Point Features

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 17, Aug 30, 2024

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

Date(s) aerial images were photographed: Mar 15, 2022—May 28, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
RaB2	Ramona sandy loam, 2 to 5 percent slopes, eroded	1.7	100.0%
Totals for Area of Interest		**1.7**	**100.0%**

Western Riverside Area, California

RaB2—Ramona sandy loam, 2 to 5 percent slopes, eroded

Map Unit Setting

National map unit symbol: hcy5
Elevation: 250 to 3,500 feet
Mean annual precipitation: 10 to 20 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 230 to 320 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Ramona

Setting

Landform: Terraces, alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 23 inches: fine sandy loam
H3 - 23 to 68 inches: sandy clay loam
H4 - 68 to 74 inches: gravelly sandy loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R019XD029CA - LOAMY

Hydric soil rating: No

Minor Components

Arlington
Percent of map unit: 4 percent
Hydric soil rating: No

Hanford
Percent of map unit: 4 percent
Hydric soil rating: No

Greenfield
Percent of map unit: 4 percent
Hydric soil rating: No

Tujunga
Percent of map unit: 3 percent
Hydric soil rating: No

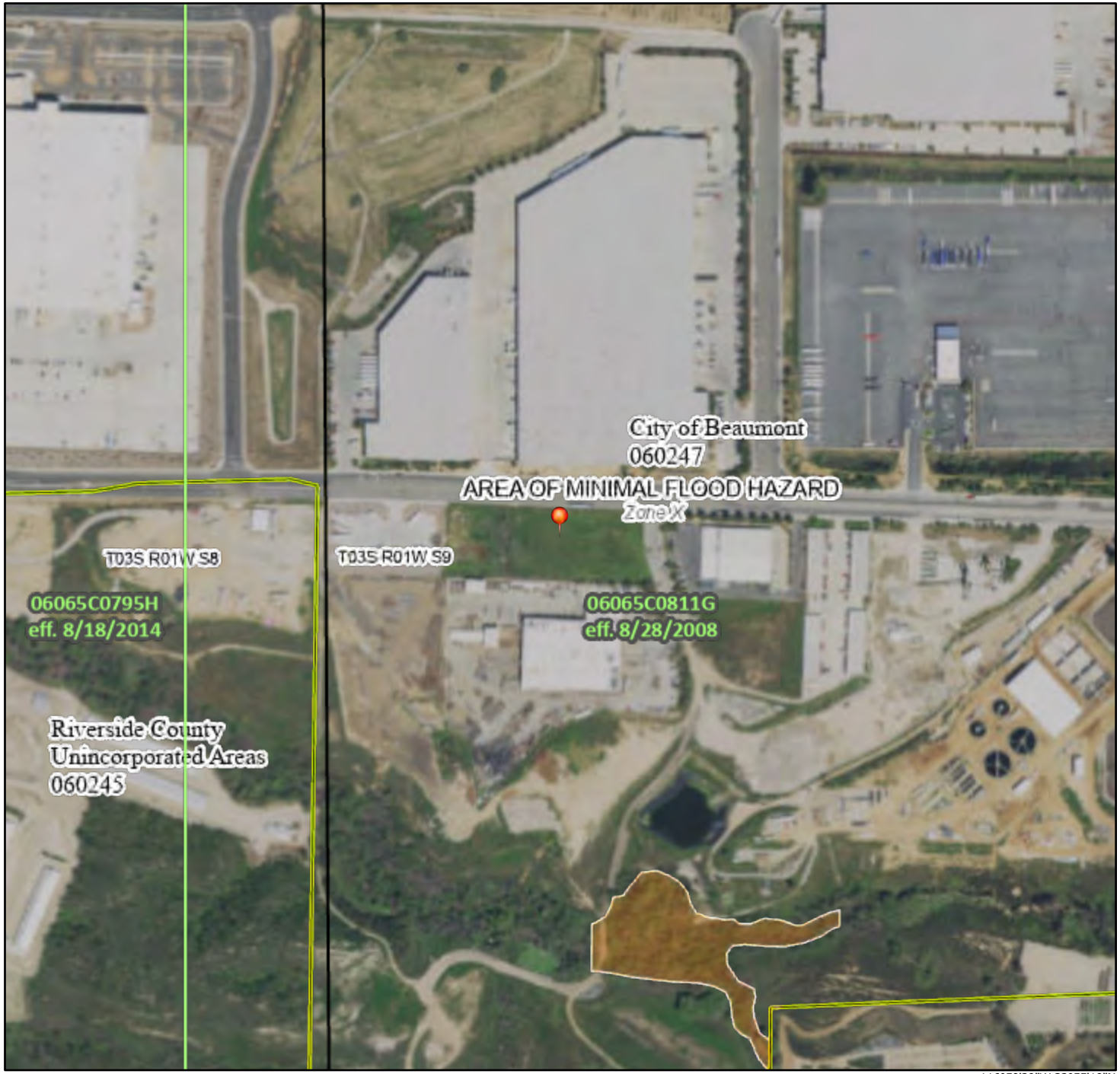
Data Source Information

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 17, Aug 30, 2024

National Flood Hazard Layer FIRMette

FEMA

117°0'6"W 33°55'49"N



116°59'29"W 33°55'19"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/12/2024 at 6:34 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

SoCal Professional Engineers, Inc.
Serving all Southern California
229 Cajon St., Ste.#2, Redlands, CA 92373 909.271.3135

December 7, 2023

Mr. Larry Aguilera
320 E. 3rd Street
Beaumont, California 92223

SUBJECT: **ONSITE STORMWATER INFILTRATION SYSTEM INVESTIGATION**
Proposed Commercial Building
Risco Circle, APN 417-220-009 1.2± Acres
Beaumont, Riverside County, California
Work Order No. 1652301.00

Mr. Aguilera:

In accordance with your authorization, we have conducted percolation testing for the infiltration system proposed for the subject property. The purpose of our investigation was to provide infiltration rates for the proposed infiltration systems.

Site Description

Attached as **Plate 1**, the Infiltration Test Location Map utilized the 20-scale," Site Plan" prepared by SiteTech, Inc. of Highland CA, showing the approximate location(s) of the infiltration tests on the site. The subject site is located south of 4th Street west of Risco Circle. in the City of Beaumont, Riverside County, California. The geographical relationships of the site and surrounding area are depicted on our Site Location Map, **Figure 1**.

At the time of our investigation, the site was vacant as shown on the Site Plan. Vegetation on the subject site consisted of minor weeds. Topographically, the site consists of nearly level terrain with gradients of approximately 5 percent to the south toward the adjacent. Overall relief on the subject site, is approximately 5-ft.

Percolation/Infiltration Investigation

Percolation/infiltration testing was conducted on October 18, 2023. Two tests were performed within the project area within the existing native soils. The test locations are depicted on the Infiltration Test Location Map, **Plate 1**. Two separate shallow borings were excavated, and two percolation tests were performed at depths corresponding to the depth of the proposed infiltration system. Additionally, an exploratory boring was advanced to a total depth explored of 15-ft below the ground surface. (bgs).

The exploratory excavation indicates that the area of the proposed system is underlain by Quaternary Aged Older Surficial Deposits, (map symbol Qoa) (Dibblee Jr., 2003). This unit was overlain by undocumented fill and extended to the total depth explored of 15-ft bgs (B-1).

Soils were visually classified according to the Unified Soil Classification System as silty Sand (Unified Soil Classification – SM) described as dark brown, fine to coarse grained, gravelly, slightly moist, and loose becoming denser with depth. This unit extends to the maximum depth explored of 15 ft below the existing ground surface.

Detailed descriptions of the onsite units are presented on our exploratory trench logs included in **Appendix B**.

LABORATORY TESTING PROGRAM

Sieve analysis testing was performed on a soil sample representative of the earth materials exposed in the near surface soils at depths of 0-5ft were 42-percent passing the #200 sieve. The test results are included in **Appendix C**, **Laboratory Test Results**.

GROUNDWATER

Groundwater was not encountered within our exploratory boring/trench, which were advanced to a maximum depth of 15-ft bgs in area of the proposed building pads. Historic high groundwater in the area is reported at a depth of +200ftbgs (U.S.G.S. Scientific Investigations Report 2006–5026),

SUMMARY OF TEST PROCEDURES

The testing procedure was performed in accordance with Riverside County Department of Environmental Health's "Local Management Program for Onsite Wastewater Treatment Systems", which became effective October 5, 2016, and the resulting perc rates were converted to infiltration rates utilizing the Porchet Method as outlined in the Riverside County Flood Control and Water Conservation District, "Design Handbook for Low Impact Development Best Management Practices" dated September 2011. The percolation tests were performed at depths within the underlying soils corresponding to the proposed system. Procedures for normal soils were followed.

Conclusion

Testing indicated infiltration rates at the proposed bottom of the systems within the native soils obtained consistent rates. The percolation rate was converted to infiltration rate utilizing the Porchet Method. The rates provided do not include a safety factor. The exploratory boring location and test locations are presented on our Test Location Map, **Plate 1**.

PERCOLATION TEST NO.	DEPTH OF TEST	INFILTRATION RATE (In/Hr)
1	5-FT	1.55
2	5-FT	1.22

CLOSURE

It should be noted that infiltration rates determined by testing are ultimate rates based on short-duration field test results utilizing clear water. Infiltration rates can be affected by silt build-up, debris, degree of soil saturation, and other factors. An appropriate safety factor should be applied prior to use in design to account for subsoil inconsistencies, possible compaction related to site grading, and potential silting of the percolating soils. The safety factor should also be determined with consideration to other factors in the system design, particularly storm water volume estimates and the safety factors associated with those design components.

LIMITATIONS

The tested rates are representative for the areas and soil types tested. Should the systems be moved, or the exposed soil types are found to different within the proposed systems, the approved infiltration rates may not apply. Our investigation was performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable Geotechnical Engineers and Geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

The report is issued with the understanding that it is used only by the owner and it is the sole responsibility of the owner or their representative to ensure that the information and recommendations contained herein are brought to the attention of the architect, engineer, and appropriate jurisdictional agency for the project and incorporated into the plans; and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations contained herein during construction and in the field.

The samples taken and used for testing and the observations made are believed representative; however, soil and geologic conditions can vary significantly between test locations. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by **SoCal Professional Engineers, Inc.**, or its assigns.

The findings of this report are valid as of the present date. However, changes in the condition of a property can occur with the passage of time, whether due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and revision as changed conditions are identified. The firm that performed the geotechnical investigation for this project should be retained to provide testing observation services during construction to maintain continuity of geotechnical interpretation and to check that the recommendations presented herein are implemented during construction of improvements.

If another geotechnical firm is selected to perform the inspection services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. Selection of another firm to perform any of the recommended activities or failure to retain the undersigned to perform the recommended activities wholly absolves **SoCal Professional Engineers, Inc**, the undersigned, and its assigns from any and all liability arising directly or indirectly from any aspects of this project.

We appreciate the opportunity to be of service. Limitations and conditions contained in reference documents are considered in full force and applicable. If you have any questions, please do not hesitate to call our office.

Respectfully Submitted,

SoCal Professional Engineers, Inc.

Khaled S. Farah
Civil Engineer, RCE 83128

ATTACHMENTS
Plate 1 – Infiltration Test Location Map
Appendix A –References
Appendix B – Boring Log
Appendix C- Laboratory Test Results
Appendix D- Test Data Sheets & Porchet Conversion Results

IN THE CITY OF BEAUMONT

CONDITIONAL USE PERMIT

SITE PLAN

PARCEL 9 OF PARCEL MAP NUMBER 28348 IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA. LOCATED IN A SUBDIVISION OF A PORTION OF THE NORTH HALF OF THE SOUTHWEST QUARTER OF SECTION 9, TOWNSHIP 3 SOUTH, RANGE 1 WEST, SAN BERNARDINO BASE AND MERIDIAN, AS SHOWN ON MAP FILED IN BOOK 201, PAGES 72 THROUGH 74 INCLUSIVE OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

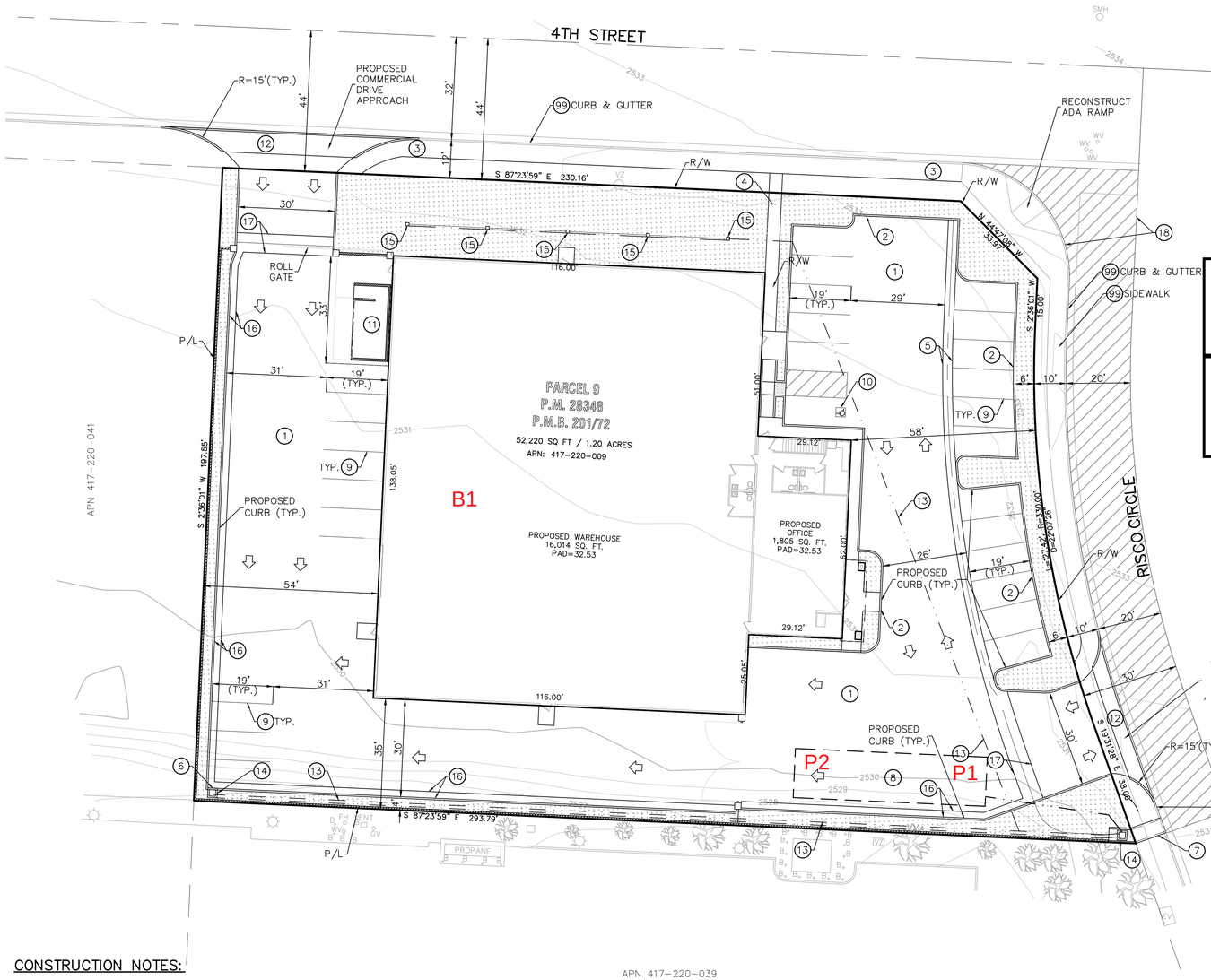
SITETECH, INC. AUGUST, 2023

OWNER/APPLICANT:

MR. LARRY AGUILERA
320 E. 3RD STREET
BEAUMONT, CA 92223
PH: (951) 538-9424

ENGINEER/MAP PREPARER:

SITETECH, INC.
PO BOX 592
8061 CHURCH STREET
HIGHLAND, CA 92346
PH: (909) 864-3180



SoCal Professional Engineers, Inc.
Infiltration Test Map
WO1652301.01 December 2023 Plate 1

B1 Approximate Location of Exploratory Trench

P2 Approximate Location of Percolation Test

NOTES:

1. THE PROPOSED PROJECT IS FOR A WAREHOUSE FACILITY.
2. ASSESSOR'S PARCEL NUMBER: 417-220-009.
3. THIS PROJECT SIZE IS 1.20 NET ACRES.
4. EXISTING AND PROPOSED ZONING IS M (MANUFACTURING).
5. LAND USE OF ALL SURROUNDING PROPERTY TO THIS PROJECT: MANUFACTURING – NORTH MANUFACTURING – EAST / STEEL SUPPLY – SOUTH / PROPANE SUPPLY & VACANT – WEST.
6. THERE ARE NO NEW STREETS PROPOSED WITHIN THIS DEVELOPMENT.
7. NO REGULATED TREES WILL BE REMOVED AS A PART OF THIS PROJECT.
8. THE AVERAGE SLOPE OF BOTH FEASIBLE ACCESS ROUTE AND FEASIBLE BUILDING SITE DOES NOT EXCEED TEN PERCENT (10%).
9. FOR COMPLETE LEGAL DESCRIPTION, SEE TITLE REPORT.
10. TOPOGRAPHIC MAPPING WAS OBTAINED FROM A FIELD SURVEY PERFORMED BY SITETECH, INC. IN MARCH, 2023.

TOTAL BUILDING AREA:

17,819 SQ. FT.

UTILITY PROVIDERS:

CITY OF BEAUMONT:	(951) 769-8520
FRONTIER COMMUNICATIONS:	(800) 483-4000
SOUTHERN CALIFORNIA GAS COMPANY:	(800) 427-2200
BEAUMONT-CHERRY VALLEY WATER DISTRICT:	(951) 845-9581
SOUTHERN CALIFORNIA EDISON COMPANY:	(800) 655-4555
UNDERGROUND SERVICE ALERT:	(800) 227-2600

CONSTRUCTION NOTES:

1. CONSTRUCT A.C. PAVING.
2. CONSTRUCT 6" CURB PER COUNTY OF RIVERSIDE STD. PLAN NO 200.
3. CONSTRUCT SIDEWALK OVER NATIVE.
4. CONSTRUCT CURB RAMP.
5. CONSTRUCT 3' WIDE LONGITUDINAL GUTTER PER S.P.P.W.C. STD. 122-2.
6. PROVIDE CURB OPENING FOR DRAINAGE INLET AND OUTLET.
7. INSTALL UNDER SIDEWALK DRAIN PER RIVERSIDE STD. PLAN NO. 309.
8. INSTALL 2,977 CUBIC FEET ADS MC-3500 UNDERGROUND INFILTRATION BASIN FOR DMA-1 (2,897 C.F. REQUIRED) OR APPROVED EQUAL.
9. PARKING LOT SIGNAGE AND STRIPING, PER ARCHITECTURAL PLANS.
10. INSTALL ADA ACCESSIBLE PARKING STALL, PER ADA REQUIREMENTS.
11. CONSTRUCT COVERED TRASH ENCLOSURE, PER SEPARATE PERMIT.
12. CONSTRUCT DRIVE APPROACH PER COUNTY OF RIVERSIDE STD. PLAN NO 207A.
13. INSTALL STORM DRAIN LINE AT 0.5% MIN.
14. INSTALL 24" X 24" OLD CASTLE CATCH BASIN, PRODUCT NO. 2424CB OR APPROVED EQUAL.
15. INSTALL AREA DRAIN.
16. CONSTRUCT 6" CURB & GUTTER PER COUNTY OF RIVERSIDE STD. PLAN NO. 200.
17. CONSTRUCT 6' WIDE CROSS GUTTER PER SPPWC STD. 122-2.
18. GRIND & OVERLAY EXISTING PAVEMENT 0.1' MIN. DEPTH.
99. EXISTING ITEM (PER PLAN) TO BE PROTECTED IN PLACE.

BASIS OF BEARINGS

THE BEARINGS ON THIS MAP WERE BASED ON THE CENTERLINE OF FOURTH STREET AS SHOWN ON PARCEL MAP NO.28348 FILED IN BOOK 201, PAGE 72 OF PARCEL MAPS.

BEARINGS BEING NORTH 87° 23' 59" WEST

BENCHMARK

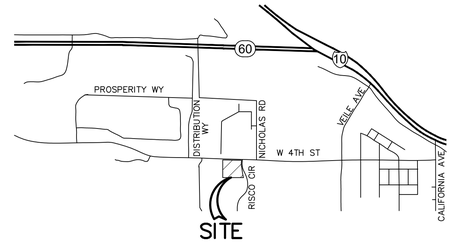
RIVERSIDE COUNTY BENCHMARK: C-3

DESCRIPTION: 0.25 MILES SOUTH ALONG BEAUMONT AVENUE FROM THE INTERSECTION OF BEAUMONT AVENUE AND SIXTH STREET. APPROXIMATELY 37.0 FEET WEST OF THE CENTER LINE OF BEAUMONT AVENUE. AT THE SOUTH ENT OF THE BRIDGE CROSSING OVER HIGHWAY 60. 2.0 FEET EAST OF SIDEWALK. 1.0 EASET OF 12 INCH CONCRETE RETAINING WALL. ON THE SOUTH EDGE OF CONCRETE APRON. SET FLUSH IN THE CONCRETE SURFACE, A BRONZE DISK MARKED C-3 1965.

ELEVATION: 2606.072'

LEGEND:

- 2400 – INDICATES EXISTING CONTOUR
- INDICATES EXISTING PROPERTY LINE
- INDICATES EXISTING RIGHT OF WAY LINE
- INDICATES PROPOSED RIGHT OF WAY LINE
- INDICATES MAP BOUNDARY LINE
- INDICATES LANDSCAPE AREA



VICINITY MAP

NO SCALE

REGISTERED PROFESSIONAL ENGINEER BERNHARD K. MAYER NO. 36866 Exp. 6-30-24 CIVIL STATE OF CALIFORNIA

SITETECH INC.
8061 CHURCH ST. HIGHLAND CA 92346 PO BOX 592
TELEPHONE (909) 864-3180

08/01/23

BERNHARD K. MAYER R.C.E. 36866 L.S. 7319 DATE

APPENDIX A

References

REFERENCES

CDM Smith, Inc. 2013, "Technical Guidance Document for Water Quality Management Plans" dated June 7, 2013.

Department of Water Resources Website, 2018, "Groundwater Data Section".

Riverside County Department of Environmental Health, 2016, "Local Management Program for Onsite Wastewater Treatment Systems", effective October 5, 2016.

Riverside County Flood Control and Water Conservation District, 2011, "Design Handbook for Low Impact Development Best Management Practices" dated 9, 2011.

Riverside County, Graphic Information Services (GIS), Map My County.

Morton, D.M., 2004, "Preliminary Digital Geologic Map of the Santa Ana 30' x 60' Quadrangle, Southern California (Version 2.0)", U.S. Geological Survey in Cooperation with the California Geologic Survey, Open-File Report 99-172, Scale: 1" = 100,000'.

SiteTech, Inc, 2023, "Conditional Use Permit/Site Plan, APN:417-220-009, Risco Circle. Beaumont CA 92223", scale 1" = 20', dated August 2023.

Dibblee Jr., Tomas W., 2003 "Geologic Map of The Beaumont Quadrangle, Riverside County, DF-114,", Scale: 1" = 24,000'.

U.S. Geological Survey, In Cooperation With San Gorgonio Pass Water Agency, 2006," Geology, Ground-Water, Hydrology, Geochemistry, and Ground-Water Simulation of the Beaumont and Banning Storage Units, San Gorgonio Pass Area, Riverside County, California Scientific Investigations Report 2006–5026".

U.S.G.S., Morton Douglas, M., 2003, "Geologic Map of the Riverside East / South ½ of San Bernardino South Quadrangles, San Bernardino & Riverside County, Quadrangle", DF-109, Scale: 1:24,000.

APPENDIX B

Exploratory Boring Log

LOGGED BY: JRH	METHOD OF EXCAVATION: BACKHOE EQUIPPED W/ 30-INCH BUCKET ELEVATION: ±	10/17/2023 LOCATION: SEE PLOT PLAN

DEPTH (FEET)	CLASSIFICATION	BLOWS/FOOT	UNDISTURBED SAMPLE	BULK SAMPLE	MOISTURE CONTENT(%)	INPLACE DRY DENSITY (PCF)	TRENCH LOG NO._1____ DESCRIPTION	SOIL TEST
				^ | V			**UNDOCUMENTED ARTIFICIAL FILL(Quf)**	
							SILTY SAND (SM): DARK BROWN, FINE TO COARSE GRAINED,	
							MEDIUM DENSE, SLIGHTLY MOIST	
							LOOSE IN UPPER 3FT	
5							**OLDER SURFICIAL SEDIMENTS(Qoa)**	
				^ | | | | | | V			SILTY SAND (SM): BROWN, FINE TO COARSE GRAINED,ABUNDANT	
							GRAVEL MINOR COBBLE, MEDIUM DENSE, SLIGHTLY MOIST	
							BECOMING COARSER WITH DEPTH	
10								SEIVE
15								
20							**TOTAL DEPTH 15.0'** **NO GROUNDWATER**	
25								
30								
35								
40								

JOB NO: 1652301.01	LOG OF TRENCH	FIGURE: B-1

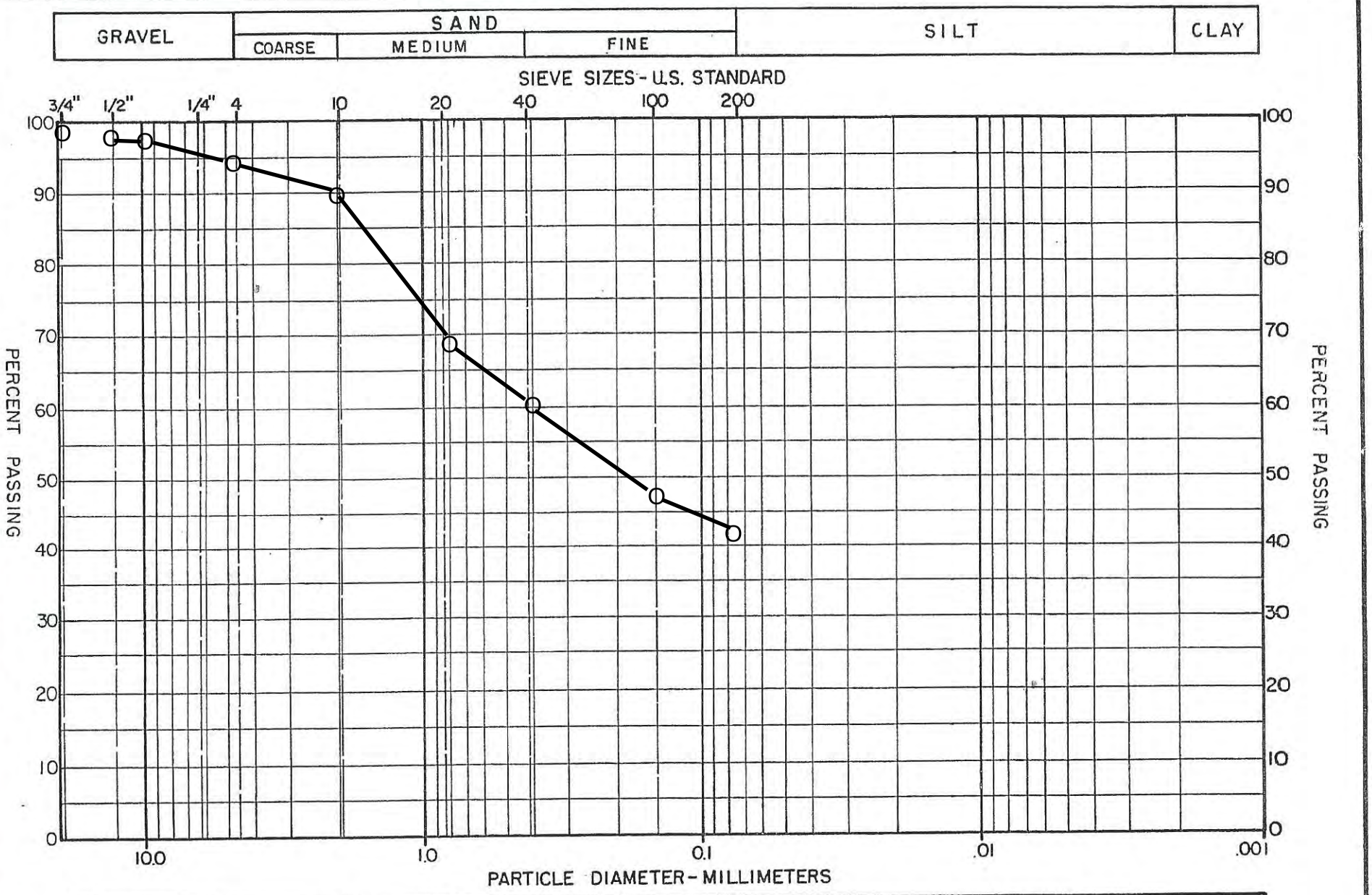
APPENDIX C

Laboratory Test Results

JOB NO: 1652301.01

GRAIN SIZE DISTRIBUTION

FIGURE NO: C-1



BORING NO.	DEPTH, FT.	SYMBOL	LIQUID LIMIT	PLASTIC INDEX	CLASSIFICATION
B-1	5-12	o			SM

APPENDIX D

Test Data Sheet & Porchet Conversion Results

Leach Line Percolation Data Sheet

Project:	RISCO CIRCLE	Job No.	WO1652301.01		
Test Hole No.	1	Date Excavated:	10/17/2023		
Depth of Hole:	40 inches	Soil Classification:	SC		
Check for Sandy Soil Criteria Tested by		Date:		Presoak Date:	10/17/2023
Actual Percolation Tested by:	JRH	Date:	10/18/2023		

Sandy Soil Criteria Test

Trial No.	Date	Time	Time Interval (Min)	Initial water level (Inches)	Final Water Level (Inches)	Diff. in Water Level (Inches)
1			0			0
2			0			0

Use: **5 GALLON PRESOAK/NORMAL** Soil Criteria

Trial No.	Time Interval	Time	Initial Water Level	Final Water Level	Water Level	Percolation Rate
	(Min)	(Min)	(Inches)	(Inches)	(Inches)	Min/Inch
7:41 8:11	30	30	40.0	26.75	13.25	**2.3**
8:11 **8:41**	30	60	40.0	30.50	9.5	**3.2**
8:41 **9:11**	30	90	40.0	31.33	8.675	**3.5**
9:11 **9:41**	30	120	40.0	31.63	8.375	**3.6**
9:41 **10:11**	30	150	40.0	32.00	8	**3.8**
10:11 **10:41**	30	180	40.0	32.25	7.75	**3.9**
10:41	0	N/A				
0:00	0	N/A				
0:00	0	N/A				
0:00	0	N/A				

Leach Line Percolation Data Sheet

Project:	RISCO CIRCLE	Job No.	WO1652301.01		
Test Hole No.	2	Date Excavated:	10/17/2023		
Depth of Hole:	40 inches	Soil Classification:	SC		
Check for Sandy Soil Criteria Tested by		Date:		Presoak Date:	10/17/2023
Actual Percolation Tested by:	JRH	Date:	10/18/2023		

Sandy Soil Criteria Test

Trial No.	Date	Time	Time Interval (Min)	Initial water level (Inches)	Final Water Level (Inches)	Diff. in Water Level (Inches)
1			0			0
2			0			0

Use: **5 GALLON PRESOAK/NORMAL** Soil Criteria

Trial No.	Time	Time Interval	Initial Water Level	Final Water Level	Water Level	Percolation Rate
	(Min)	(Min)	(Inches)	(Inches)	(Inches)	Min/Inch
7:45	30	30	40.0	28.75	11.25	**2.7**
8:15						
8:15	30	60	40.0	31.25	8.75	**3.4**
8:45						
8:45	30	90	40.0	32.50	7.5	**4.0**
9:15						
9:15	30	120	40.0	33.13	6.875	**4.4**
9:45						
9:45	30	150	40.0	33.50	6.5	**4.6**
10:15						
10:15	30	180	40.0	33.75	6.25	**4.8**
10:45						
10:45	0	N/A				
0:00	0	N/A				
0:00	0	N/A				
0:00	0	N/A				

PORCHET METHOD-CONVERSION OF PERCOLATION RATE TO INFILTRATION RATE	PERC TEST NO: NO 1	LEGEND	REQUIRED ENTRY
			CALCULATED ENTRY

Company Name: SOCAL PROFESSIONAL ENGINEERS DATE: 10/17/2023

Designed By: JRH CASE: RISCO CIRCLE

PERCOLATION TEST CONVERSION TO INFILTRATION RATE

THE CONVERSION EQUATION USED IS:

$$I_T(\text{in/hr}) = \frac{dh(\text{in}) \times 60(\text{min/hr}) \times r(\text{in})}{dt(\text{min}) \times [r(\text{in}) + 2h_{AVG}(\text{in})]}$$

Hole Radius	r=	8	inches
Time Interval	dt=	30	minutes
Initial height of water during selected time interval	H_0=	40	inches
Final height of water during selected time interval	H_f=	32.25	inches
Change in height of water during selected time interval	dH=	7.75	inches
Average head of height over the selected time interval	H_{AVG}=	36.125	inches
Converted infiltration rate per test data	I_T=	1.55	inches/hour

COMMENTS

PORCHET METHOD-CONVERSION OF PERCOLATION RATE TO INFILTRATION RATE	PERC TEST NO: NO. 2	LEGEND	REQUIRED ENTRY / CALCULATED ENTRY

Company Name: SOCAL PROFESSIONAL ENGINEERS DATE: 10/17/2023

Designed By: JRH CASE: RISCO CIRCLE

PERCOLATION TEST CONVERSION TO INFILTRATION RATE

THE CONVERSION EQUATION USED IS:

$$I_T(\text{in/hr}) = \frac{dh(\text{in}) \times 60(\text{min/hr}) \times r(\text{in})}{dt(\text{min}) \times [r(\text{in}) + 2h_{AVG}(\text{in})]}$$

Hole Radius	r=	8	inches
Time Interval	dt=	30	minutes
Initial height of water during selected time interval	H_0=	40	inches
Final height of water during selected time interval	H_f=	33.75	inches
Change in height of water during selected time interval	dH=	6.25	inches
Average head of height over the selected time interval	H_{AVG}=	36.875	inches
Converted infiltration rate per test data	I_T=	1.22	inches/hour

COMMENTS

NORWESCO SNYDER INDUSTRIES, INC.

10,000 gallon below ground installation requirements

- **For septic installations, it is important to contact your local or state sanitarian regarding approved installation procedures.**

- **Water runoff caused by sloping terrain, adjacent structures, or paved surfaces can be problematic if the site selection and installation are not managed properly. Failure to locate the tank site properly in areas of water runoff caused by sloping terrain, adjacent structures or paved surfaces, and/or not managing the installation properly can void the warranty.**

1. REQUIRED EQUIPMENT

1a. You'll need an excavator large enough to lift 3000 pounds.

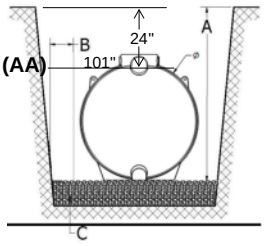
1b. You'll need an excavator large enough to lift a tank that is 9' tall, 8.5' wide and 30' long.

1c. An excavator large enough to dig a hole:
143" deep (about 12 feet)
408" long (about 34 feet)
150" wide (about 13 feet)

1d. Water truck/access to 7000 gallons of water. Using a garden hose could take 30 hours to fill tank.

1e. 1" steel bars and 4 chain sling to move tank.

2. EXCAVATION AND REQUIRED BEDDING



A. Excavate to a depth that will provide a minimum of 6" and maximum of 24" of cover over the top of the cylindrical part of the tank (AA) This would be at 101" high from the bottom.

B. Allow 18" to 24" on both sides and both ends of the tank.

C. Prepare the tank bed.
Bedding material is well-packed sand — 6" minimum in soil terrain, 12" minimum in rock terrain.
The tank should be installed level.
18 Yards of sand will be needed

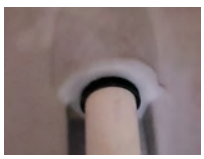
2. REQUIRED BACKFILL MATERIAL

A. ¾- minus backfill from top of bedding to bottom of fitting flats on top of the tank. Do not use native soil.
60-80 Yards of 3/4 minus will be needed

3. BACKFILLING EXTERIOR

A. Put 2000 gallons of water in the tank, then start backfilling.
B. Use ¾ minus backfill from top of bedding to bottom of fitting flats on top. Note: Keep water in tank 12" higher than backfill outside the tank during the entire backfill process up to 7000 gallons.
C. Maximum backfill over the top of the tank is 24" See #2 for details.
D. Mound soil over the top of the tank to direct surface water away from the tank.

4. ADDITIONAL INFORMATION



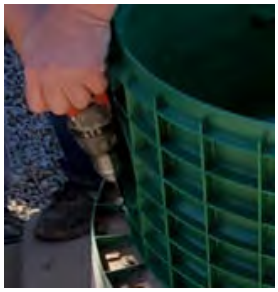
A. Gaskets:
Provided by customer.
Use ones similar to our septic tank gaskets.

B. Venting: Provided by customer and required.
C. Traffic Rating: NOT TRAFFIC RATED.
D. Pumping Tank: After installing the tank let the soil settle before pumping the tank dry.

6. OPTIONAL MANHOLE EXTENSIONS

A. 6" Tall X 24" Diameter or 12" Tall X 24" Diameter risers.

B. Manhole extensions are supplied with screws. Butyl rope not included.



7. Buoyancy Control/Additional Ballast

Soil Cover Over Top of Tank (inches)	Norwesco 10,000 Gallon Underground Storage Tank: Additional Ballast Weight Required (lbs) for the Noted Groundwater Rise Above the Bottom of the Buried Tank (feet)															
	Groundwater Rise Above Bottom of Buried Tank (feet)															
	0.5'	1.0'	1.5'	2.0'	2.5'	3.0'	3.5'	4.0'	4.5'	5.0'	5.5'	6.0'	6.5'	7.0'	7.5'	8.0'
6"	No Additional Ballast Weight Required for Buoyancy Control			1000	7500	15000	23000	30000	38000	45000	55000	60000	65000	70000	75000	80000
12"						1500	10000	20000	25000	32000	40000	45000	52000	60000	65000	65000
18"								5000	12000	20000	30000	35000	40000	45000	50000	55000
24"										1000	15000	20000	26000	32000	40000	40000

Notes:	
	1. Assume tank is empty (worst case scenario).
	2. Ballast Cover Weight Assumed to be Uniformly Distributed Across Top of Tank.
	3. Soil Cover Dry Unit Weight Assumed to be 110 pcf.

CAUTION

Failure to comply with the points below voids warranty.

A. Tanks are not fire-resistant. Do not store them near an open flame or heat in excess of 180 °F.

B. Do not install any tank under the path of vehicles or heavy equipment.

C. Do not leave tanks empty for extended periods of time.

D. Only for use as underground tanks.

E. May be used as holding tanks or for pumping applications where permitted by local codes.

F. Made of resins that meet FDA specifications for the storage of drinking water and can be used for that application.

G. Protect the tank from sharp objects which could puncture it and cause leakage.

H. Maximum temperature of liquid entering tank is 120° F.

WARRANTY

Manufacturer warrants that if this part is proven to be defective in material or workmanship within three (3) years from the date of manufacture, manufacturer will (at company's option) either replace or repair said part. This standard limited warranty does not apply to damages resulting from misuse, improper application of recommended materials, accident, or improper installation or maintenance. Remedy to the buyer is limited to the replacement of any defective product (or its component where applicable), F.O.B. point of manufacture. The buyer's remedy under this warranty does not include any other direct or indirect consequential damages which result from defects in material and/or workmanship of its products.

NORWESCO

4365 Steiner Street
St. Bonifacius, MN 55375
(800) 328-3420
www.norwesco.com
P/N 64875

SNYDER INDUSTRIES, INC.

6940 O Street
Suite 100
Lincoln, NE 68510
(402) 467-5221
www.snydernet.com

Proper Venting Of Each Tank

1. U-Vent can come out of riser (1a) or out of the top of the tank. (1b)

2. Notice how it's the same size as the pipe coming out of the tank.

3. Make sure the U-Vent is the same size or larger than the largest pipe coming into or out of the tank.

Trusted. Tested. Tough.®

Register your Zoeller Pump Company Product on our website: http://reg.zoellerpumps.com/

ZOELLER® PUMP COMPANY

MAIL TO: P.O. BOX 16347 • Louisville, KY 40256-0347
SHIP TO: 3649 Cane Run Road • Louisville, KY 40211-1961
Tel: (502) 778-2731 • 1 (800) 928-PUMP

FM2298
1023
Supersedes
0723

Visit our website: zoellerpumps.com

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

FAMILY OWNED AMERICAN PROUD

OWNER'S MANUAL

NOTICE TO INSTALLER: Instructions must remain with installation.

Certified to CSA Standard C22.2 No. 145
Tested to FM Standard 3600 & 3615 & 3616

ZOELLER HAZARDOUS LOCATION PUMPS
Class I, Division I, Groups C & D and Class 1, Zone 1, Groups IIA & IIB Gas Areas
OR
Class II, Division I, Groups E, F & G and Zone 20, Dust Areas

EFFLUENT	SEWAGE
X161, X163, X165 X185, X186, X188, X189 X191	X282, X284 X292, X293, X294, X295

Table of Contents

Owner's Information

Model Number: _____ **DateCode:** _____

☐ **Simplex** ☐ **Duplex**

Job Name: _____

Distributor: _____

Date of Purchase: _____ **Zoeller S/O No.:** _____

Contractor: _____

Date of Installation: _____

System Readings During Start-up: Voltage _____ **Amps** _____

Safety Instructions

TO AVOID SERIOUS OR FATAL PERSONAL INJURY OR MAJOR PROPERTY DAMAGE, READ AND FOLLOW ALL SAFETY INSTRUCTIONS IN THIS MANUAL AND ON THE PUMP.

THIS MANUAL IS INTENDED TO ASSIST IN THE INSTALLATION AND OPERATION OF THIS UNIT AND MUST BE KEPT WITH THE PUMP.

This is a **SAFETY ALERT SYMBOL.** When you see this symbol on the pump or in the manual, look for one of the following signal words and be alert to the potential for personal injury or property damage.

⚠ DANGER — Warns of hazards that **WILL** cause serious personal injury, death or major property damage.

⚠ WARNING — Warns of hazards that **CAN** cause serious personal injury, death or major property damage.

⚠ CAUTION — Warns of hazards that **CAN** cause personal injury or property damage.

⚠ NOTICE — INDICATES SPECIAL INSTRUCTIONS WHICH ARE VERY IMPORTANT AND MUST BE FOLLOWED.

THOROUGHLY REVIEW ALL INSTRUCTIONS AND WARNINGS PRIOR TO PERFORMING ANY WORK ON THIS PUMP.

MAINTAIN ALL SAFETY DECALS.

REFER TO WARRANTY ON PAGE 2.

LIMITED WARRANTY

Manufacturer warrants, to the purchaser and subsequent owner during the warranty period, every new product to be free from defects in material and workmanship under normal use and service, when properly used and maintained, for a period of one year from date of purchase by the end user, or 18 months from date of original manufacture of the product, whichever comes first. Parts that fail within the warranty period, one year from date of purchase by the end user, or 18 months from the date of original manufacture of the product, whichever comes first, that inspections determine to be defective in material or workmanship, will be repaired, replaced or remanufactured at Manufacturer's option, provided however, that by so doing we will not be obligated to replace an entire assembly, the entire mechanism or the complete unit. No allowance will be made for shipping charges, damages, labor or other charges that may occur due to product failure, repair or replacement.

This warranty does not apply to and there shall be no warranty for any material or product that has been disassembled without prior approval of Manufacturer, subjected to misuse, misapplication, neglect, alteration, accident or act of nature; that has not been installed, operated or maintained in accordance with Manufacturer's installation instructions; that has been exposed to outside substances including but not limited to the following: sand, gravel, cement, mud, tar, hydrocarbons, hydrocarbon derivatives (oil, gasoline, solvents, etc.), or other abrasive or corrosive substances, etc. in all pumping applications. The warranty set out in the paragraph above is in lieu of all other warranties expressed or implied; and we do not authorize any representative or other person to assume for us any other liability in connection with our products.

Contact Manufacturer at, 3649 Cane Run Road, Louisville, Kentucky 40211, Attention: Customer Support Department to obtain any needed repair or replacement of part(s) or additional information pertaining to our warranty.

MANUFACTURER EXPRESSLY DISCLAIMS LIABILITY FOR SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES OR BREACH OF EXPRESSED OR IMPLIED WARRANTY; AND ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND OF MERCHANTABILITY SHALL BE LIMITED TO THE DURATION OF THE EXPRESSED WARRANTY.

Some states do not allow limitations on the duration of an implied warranty, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

In instances where property damages are incurred as a result of an alleged product failure, the property owner must retain possession of the product for investigation purpose.

PREINSTALLATION INFORMATION

1. **Inspect your pump.** Occasionally, products are damaged during shipment. If the unit is damaged, contact your distributor before using. **DO NOT** remove the test plugs in the cover nor the motor housing.
2. **Carefully read the literature** provided to familiarize yourself with specific details regarding installation and use. These materials should be retained for future reference.
3. **National Electrical Code (NEC) articles 500 through 503 explain in detail the requirements for the installation and wiring of electrical equipment in hazardous locations.**

⚠ WARNING

SEE BELOW FOR LIST OF WARNINGS

1. NOT FOR USE IN ACIDIC ATMOSPHERES.
2. Do not lift, carry, or hang pump by the electrical cables. Damage to the electrical cables can cause shock, burns or death.
3. For non-automatic Class II, Division I (alternate Zone 20 designation) rated models, the float switch "off" level must be set a minimum of 10 inches for the X160-X190, X280, X290 series.
4. **Make sure there is a properly grounded connection available.** All pumps are furnished with provisions for proper grounding to help protect you against the possibility of electrical shock.
5. Make certain that the control box is within the reach of the pump's power supply cord. **DO NOT USE AN EXTENSION CORD.** Extension cords that are too long or too light do not deliver sufficient voltage to the pump motor. But, more important, they could present a safety hazard if the insulation were to become damaged or the connection end were to fall into the sump.
6. **Make sure the pump electrical supply circuit is equipped with fuses and disconnect or circuit breakers of proper capacity.** A separate branch circuit is recommended, sized according to the "National Electrical Code" for the current shown on the pump nameplate.
7. Risk of electric shock - These pumps have not been investigated for use in swimming pool areas.
8. Prop65 warning for California residents: Cancer and reproductive harm- www.P65Warnings.ca.gov.
9. Electrical wiring and protection **must** be in accordance with the National Electrical Code per NEC articles 500 through 503 for installation in Class I, Division 1, Groups C & D Class I, Zone 1, Groups IIA& IIB locations, and Class II, Division II, Group E, F, G and Zone 20 and any other applicable state and local electrical requirements.
10. Use pressure-rated pipe and fittings when connecting to the disharge of the pump.

⚠ CAUTION

SEE BELOW FOR LIST OF CAUTIONS

1. Check to be sure your power source is capable of handling the voltage requirements of the motor, as indicated on the pump nameplate.
2. The float switches must be connected to an intrinsically safe circuit in the control panel. The installation of float switches is the responsibility of the installing party and care should be taken that the tethered float switch will not hang up on the pump apparatus or pit peculiarities and is secured so that the pump will shut off. It is recommended that rigid piping and fittings be used and the pit be 36" or larger in diameter.
3. **INFORMATION - VENT HOLE PURPOSE.** It is necessary that all submersible pumps capable of handling various sizes of solid waste be of the bottom intake design to reduce clogging and seal failures. If a check valve is incorporated in the installation, a vent hole (approx. 3/16") must be drilled in the discharge pipe below the check valve and pit cover to purge the unit of trapped air. Water stream will be visible from this hole during pump run periods. This vent hole should be checked periodically for clogging and cleaned as necessary. Trapped air is caused by agitation and/or a dry basin.
4. Water hammer creates momentary high pressure surges. These surges can cause severe damage to check valves and the piping system. Consideration for water hammer must be included in the piping system design. Reference ASPE Data Book, Chapter 2.33. Some systems may require external spring or lever weighted check valves or other engineered solutions.
5. Three phase pumps must be connected for proper rotation, which is counterclockwise looking into impeller inlet.
6. Care should be taken during the initial installation to be sure that adequate air supply is available whenever any person is in the basin. Always follow OSHA guidelines on confined space requirements.

ELECTRICAL DATA

Model	HP	RPM	Voltage	Phase	Hertz	Amps			"KVA Code"	Winding Resistance Line-to-Line
						Full Load	Shut Off	Locked Rotor		
MX161	1/2	3450	115	1	60	15.0	7.7	52.2	N	**
NX161	1/2	3450	115	1	60	15.0	7.7	52.2	N	.53/.46*
DX161	1/2	3450	230	1	60	7.5	3.6	15.1	H	**
EX161	1/2	3450	230	1	60	7.5	3.6	15.1	H	4.6/4.0*
HX161	1/2	3450	200	1	60	8.8	6.3	19.8	J	**
IX161	1/2	3450	200	1	60	8.8	6.3	19.8	J	3.5/3.0*
JX161	1/2	3450	200	3	60	6.4	3.1	23.6	S	6.1/5.3
FX161	1/2	3450	230	3	60	5.2	2.7	24.0	T	5.5/4.8
GX161	1/2	3450	460	3	60	2.9	1.4	12.0	T	22.1/19.2
MX163	1/2	3450	115	1	60	15.0	8.4	52.2	N	**
NX163	1/2	3450	115	1	60	15.0	8.4	52.2	N	.53/.46*
DX163	1/2	3450	230	1	60	7.5	4.0	15.1	H	**
EX163	1/2	3450	230	1	60	7.5	4.0	15.1	H	4.6/4.0*
HX163	1/2	3450	200	1	60	8.5	4.3	19.8	J	**
IX163	1/2	3450	200	1	60	8.5	4.3	19.8	J	3.5/3.0*
JX163	1/2	3450	200	3	60	6.0	3.4	23.6	S	6.1/5.3
FX163	1/2	3450	230	3	60	4.8	3.0	24.0	T	5.5/4.8
GX163	1/2	3450	460	3	60	2.9	1.5	12.0	T	22.1/18.2
DX165	1	3450	230	1	60	10.2	5.5	20.1	E	**
EX165	1	3450	230	1	60	10.2	5.5	20.1	E	3.0/2.6*
HX165	1	3450	200	1	60	12.6	6.1	26.8	F	**
IX165	1	3450	200	1	60	12.6	6.1	26.8	F	2.0/1.8*
JX165	1	3450	200	3	60	7.5	4.8	31.1	M	3.6/3.2
FX165	1	3450	230	3	60	7.4	3.8	29.8	N	5.5/4.7
GX165	1	3450	460	3	60	3.7	2.1	14.9	N	21.8/19.0
DX185	1	3450	230	1	60	9.8	5.0	20.1	E	**
EX185	1	3450	230	1	60	9.8	5.0	20.1	E	3.0/2.6*
HX185	1	3450	200	1	60	11.5	5.1	26.8	F	**
IX185	1	3450	200	1	60	11.5	5.1	26.8	F	2.0/1.8*
JX185	1	3450	200	3	60	7.5	3.6	31.1	M	3.6/3.2
FX185	1	3450	230	3	60	7.4	3.8	29.8	N	5.5/4.7
GX185	1	3450	460	3	60	3.7	1.9	14.9	N	21.8/19.0
DX186	1-1/2	3450	230	1	60	13.7	9.3	45.7	H	**
EX186	1-1/2	3450	230	1	60	13.7	9.3	45.7	H	1.3/1.1*
HX186	1-1/2	3450	200	1	60	17.2	11.8	54.5	J	**
IX186	1-1/2	3450	200	1	60	17.2	11.8	54.5	J	.84/.73*
JX186	1-1/2	3450	200	3	60	10.3	6.0	45.2	M	2.5/2.2
FX186	1-1/2	3450	230	3	60	9.2	5.5	39.4	M	3.4/2.9
GX186	1-1/2	3450	460	3	60	4.6	2.8	19.7	M	13.5/11.7
DX188	1-1/2	3450	230	1	60	14.0	7.4	45.7	H	**
EX188	1-1/2	3450	230	1	60	14.0	7.4	45.7	H	1.3/1.1*
HX188	1-1/2	3450	200	1	60	16.8	9.8	54.5	J	**
IX188	1-1/2	3450	200	1	60	16.8	9.8	54.5	J	.84/.73*
JX188	1-1/2	3450	200	3	60	10.3	4.7	45.2	M	2.5/2.2
FX188	1-1/2	3450	230	3	60	8.9	4.1	39.4	M	3.4/2.9
GX188	1-1/2	3450	460	3	60	4.6	2.0	19.7	M	13.5/11.7
DX189	2	3450	230	1	60	17.1	9.4	45.7	F	**
EX189	2	3450	230	1	60	17.1	9.4	45.7	F	1.3/1.1*
HX189	2	3450	200	1	60	20.5	11.5	54.5	F	**
IX189	2	3450	200	1	60	20.5	11.5	54.5	F	.84/.73*
JX189	2	3450	200	3	60	13.2	6.8	45.2	J	2.5/2.2
FX189	2	3450	230	3	60	11.2	5.1	39.4	J	3.4/2.9
GX189	2	3450	460	3	60	6.0	2.8	19.7	J	13.5/11.7
DX191	2	3450	230	1	60	14.5	8.5	45.7	F	**
EX191	2	3450	230	1	60	14.5	8.5	45.7	F	1.3/1.1*
MX282	1/2	1750	115	1	60	10.3	7.3	30.2	H	1.4/1.2*
NX282	1/2	1750	115	1	60	10.3	7.3	30.2	H	1.4/1.2*
DX282	1/2	1750	230	1	60	5.0	4.0	15.1	H	5.7/4.9*
EX282	1/2	1750	230	1	60	5.0	4.0	15.1	H	5.7/4.9*
HX282	1/2	1750	200	1	60	6.1	4.5	17.7	H	4.7/4.0*
IX282	1/2	1750	200	1	60	6.1	4.5	17.7	H	4.7/4.0*

* Line to line reading will only reflect the run winding resistance.
**Line to line reading will only reflect the relay coil resistance on automatic 160-290 series.

Start winding resistance can only be measured after removing the cover.
Note: For total resistance including power cable, see chart on page 5.

CONTINUED ON NEXT PAGE

ELECTRICAL DATA, continued

Model	HP	RPM	Voltage	Phase	Hertz	Amps				Winding Resistance Line-to-Line
						Full Load	Shut Off	Locked Rotor	"KVA Code"	
FX282	1/2	1750	230	3	60	3.0	2.3	12.2	L	9.4/8.1
GX282	1/2	1750	460	3	60	1.7	1.1	6.1	L	37.4/32.5
DX284	1	1750	230	1	60	8.9	6.7	24.9	G	**
EX284	1	1750	230	1	60	8.9	6.7	24.9	G	2.5/2.2*
HX284	1	1750	200	1	60	9.3	6.4	26.8	F	**
IX284	1	1750	200	1	60	9.3	6.4	26.8	F	2.0/1.8*
JX284	1	1750	200	3	60	5.5	4.0	26.3	L	3.0/2.6
FX284	1	1750	230	3	60	5.0	4.0	22.2	K	4.9/4.3
GX284	1	1750	460	3	60	2.6	1.9	11.1	K	19.0/17.0
MX292	1/2	3450	115	1	60	15.0	10.6	52.2	N	**
NX292	1/2	3450	115	1	60	15.0	10.6	52.2	N	.53/.46*
DX292	1/2	3450	230	1	60	7.5	4.7	15.1	H	4.6/4.0*
EX292	1/2	3450	230	1	60	7.5	4.7	15.1	H	4.6/4.0*
HX292	1/2	3450	200	1	60	8.8	7.4	19.8	J	3.5/3.0*
IX292	1/2	3450	200	1	60	8.8	7.4	19.8	J	3.5/3.0*
JX292	1/2	3450	200	3	60	6.4	4.0	23.6	S	6.1/5.3
FX292	1/2	3450	230	3	60	5.2	3.5	24.0	T	5.5/4.8
GX292	1/2	3450	460	3	60	2.9	1.7	12.0	T	22.1/19.2
DX293	1	3450	230	1	60	10.2	6.6	20.1	E	**
EX293	1	3450	230	1	60	10.2	6.6	20.1	E	3.0/2.6*
HX293	1	3450	200	1	60	12.0	7.5	26.8	F	**
IX293	1	3450	200	1	60	12.0	7.5	26.8	F	2.0/1.8*
JX293	1	3450	200	3	60	8.2	5.2	31.1	M	3.6/3.2
FX293	1	3450	230	3	60	7.6	5.2	29.8	N	5.5/4.7
GX293	1	3450	460	3	60	4.0	2.6	14.9	N	21.8/19.0
DX294	1-1/2	3450	230	1	60	13.7	9.7	45.7	H	**
EX294	1-1/2	3450	230	1	60	13.7	9.7	45.7	H	1.3/1.1*
HX294	1-1/2	3450	200	1	60	17.8	11.6	54.5	J	**
IX294	1-1/2	3450	200	1	60	17.8	11.6	54.5	J	.84/.73*
JX294	1-1/2	3450	200	3	60	10.8	6.2	45.2	M	2.5/2.2
FX294	1-1/2	3450	230	3	60	9.5	5.6	39.4	M	3.4/2.9
GX294	1-1/2	3450	460	3	60	4.8	2.8	19.7	M	13.5/11.7
DX295	2	3450	230	1	60	17.1	12.0	45.7	F	**
EX295	2	3450	230	1	60	17.1	12.0	45.7	F	1.3/1.1*
HX295	2	3450	200	1	60	20.5	14.7	54.5	F	**
IX295	2	3450	200	1	60	20.5	14.7	54.5	F	.84/.73*
JX295	2	3450	200	3	60	14.3	8.8	45.2	J	2.5/2.2
FX295	2	3450	230	3	60	12.2	7.5	39.4	J	3.4/2.9
GX295	2	3450	460	3	60	6.1	3.8	19.7	J	13.5/11.7

* Line to line reading will only reflect the run winding resistance.
**Line to line reading will only reflect the relay coil resistance on automatic 160-290 series.

Start winding resistance can only be measured after removing the cover.
Note: For total resistance including power cable, see chart on page 5.

Resistance per foot of power cable

AWG	ohms/ft	Added resistance	
		25'	50'
18	0.0064	0.16	0.32
16	0.0040	0.10	0.20
14	0.0025	0.06	0.13
12	0.0016	0.04	0.08

GENERAL INFORMATION

HAZARDOUS LOCATION PUMP DESCRIPTION

1. Pumps are constructed of class 30 cast iron with powder coated epoxy protection for long life when pumping sewage in submersible applications.

2. Pump motors are available in single and three phase design.

3. The Hazardous Location Pump is a single seal design and has seal leak probes. Single phase units have an internal thermal overload. Three phase pumps have a thermal sensor. A moisture sensor seal fail circuit is incorporated into the control panel required for nonautomatic pumps. Moisture sensor indicator panel, 10-1031, is recommended but not required for automatic pump models.

4. Three phase pumps require overload protection in the control panel.

5. **⚠ NOTICE** These pumps are to be repaired by firms approved by Zoeller Company and in accordance to Policy # FM0212-3d. Otherwise, they are to be returned to the factory for repair.

Note: cCSAus listed pumps are certified to CSA standard C22.2 No 145 and tested to FM standards 3600, 3615 and 3616 by CSA.

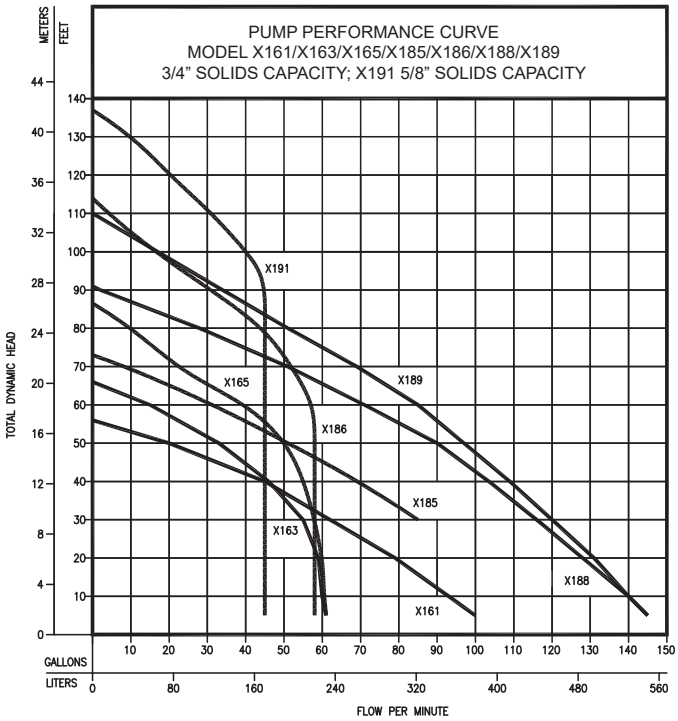
FIELD ASSEMBLED INSTALLATION

1. Contractor shall furnish all labor, material, equipment and incidentals required for installation of hazardous location pump.

2. Installation and piping instructions are included with the rail system and basin instructions. If pump is being retrofitted to an existing rail system, accessory parts may be required. Consult the factory and advise make and model of rail system being used.

3. All electrical connections including pump to control box and power supply to control panels must comply with the "National Electrical Code" and applicable local codes. Installation of electrical panels and connections should be made by a qualified licensed electrician.

4. When installing a pump with a check valve, or a rail system with a check valve, you must give the pump case time to fill to help prevent air lock when lowering the unit into the liquid. The 6404/6405 pump case has an air vent located behind the discharge. This air vent is across the pump housing mounting surface and must be cleaned before each reinstall. An air vent hole (3/16") must be drilled in discharge pipe below the check valve to help prevent air lock. This drilled hole must be cleaned before each reinstall. After the pump is installed, run the unit submerged to assure the pump case is filled (Water should come out of 3/16" diameter hole).



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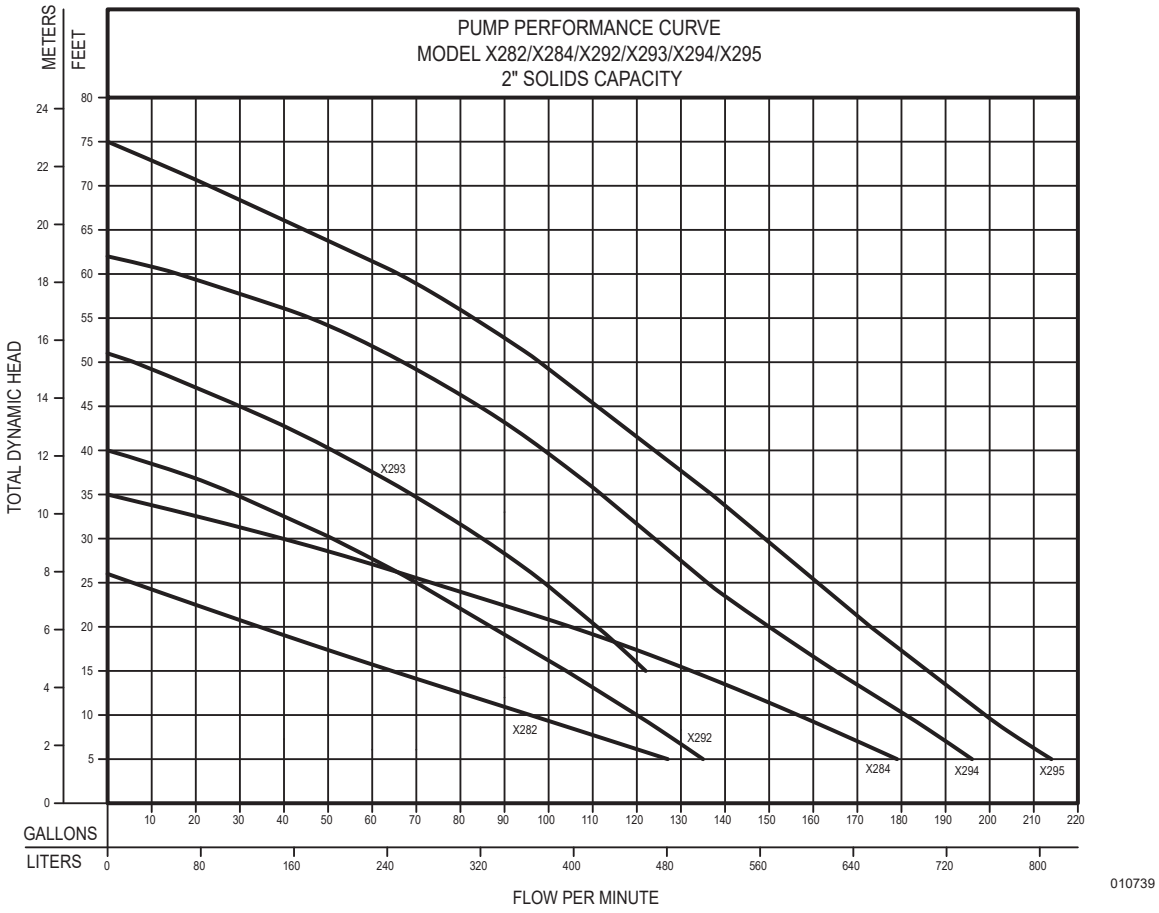
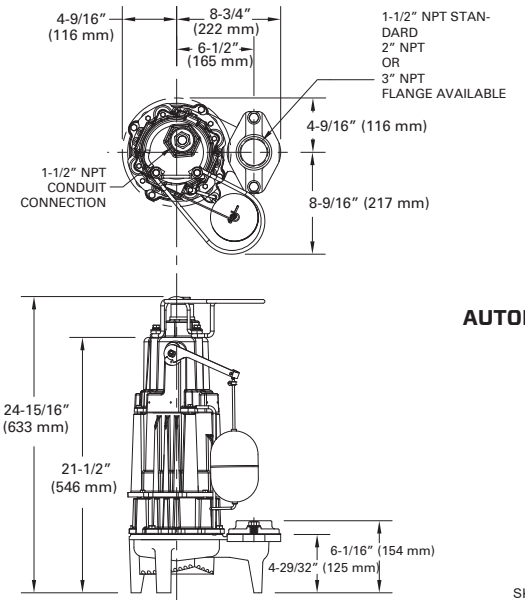
GENERAL INFORMATION, continued



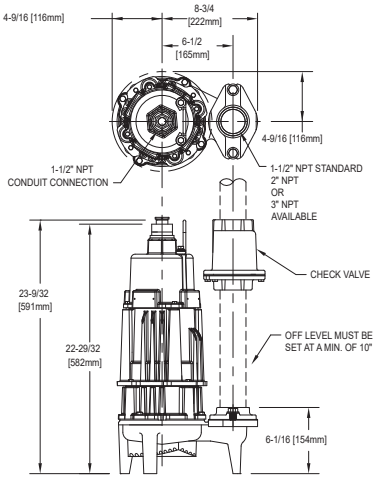
PUMP DIMENSIONS

X160 - X190 Series



AUTOMATIC

SK2506



NONAUTOMATIC

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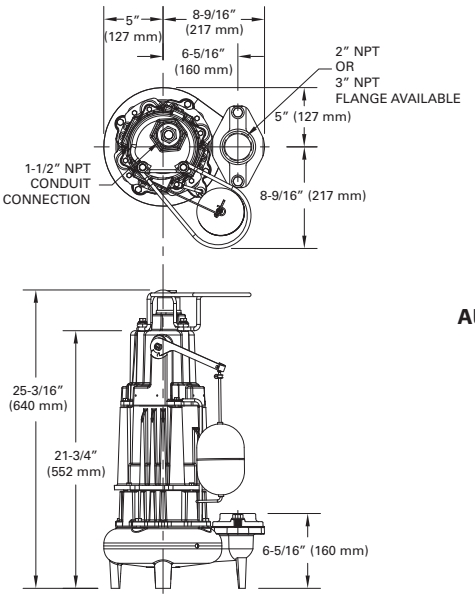
X280 Series



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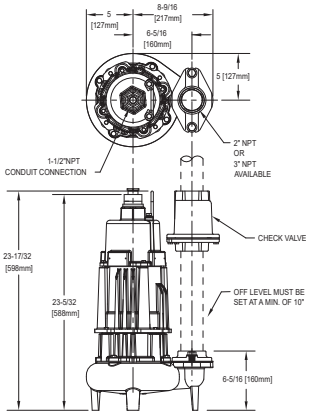

NONAUTOMATIC

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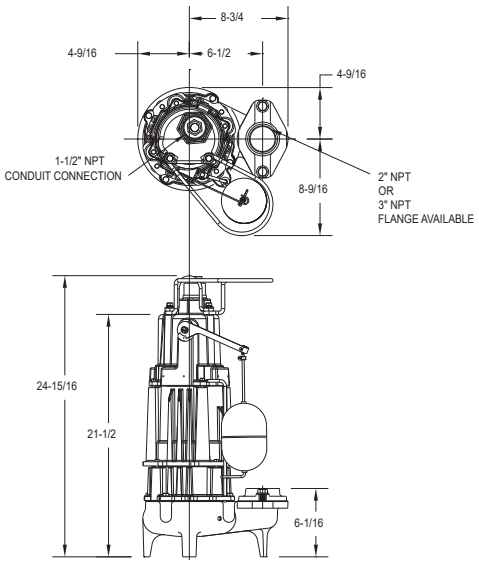
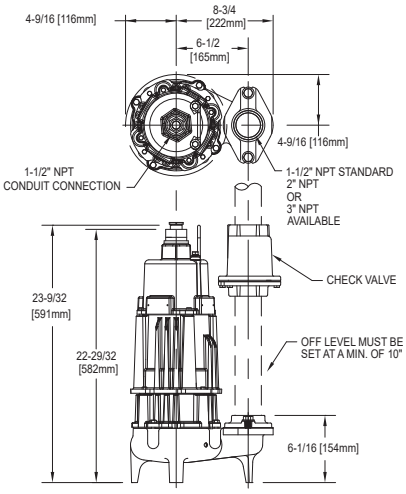
X290 Series



AUTOMATIC

SK2508



NONAUTOMATIC

SK1914

PUMP WIRING INSTRUCTIONS

⚠ WARNING FOR YOUR PROTECTION, ALWAYS DISCONNECT THE PUMP FROM ITS POWER SOURCE BEFORE HANDLING. All electrical

⚠ WARNING connections must be wired and grounded in accordance with the National Electrical Code and all applicable local codes and ordinances.

⚠ WARNING **RISK OF ELECTRICAL SHOCK** Do not remove the power supply cord or strain relief.

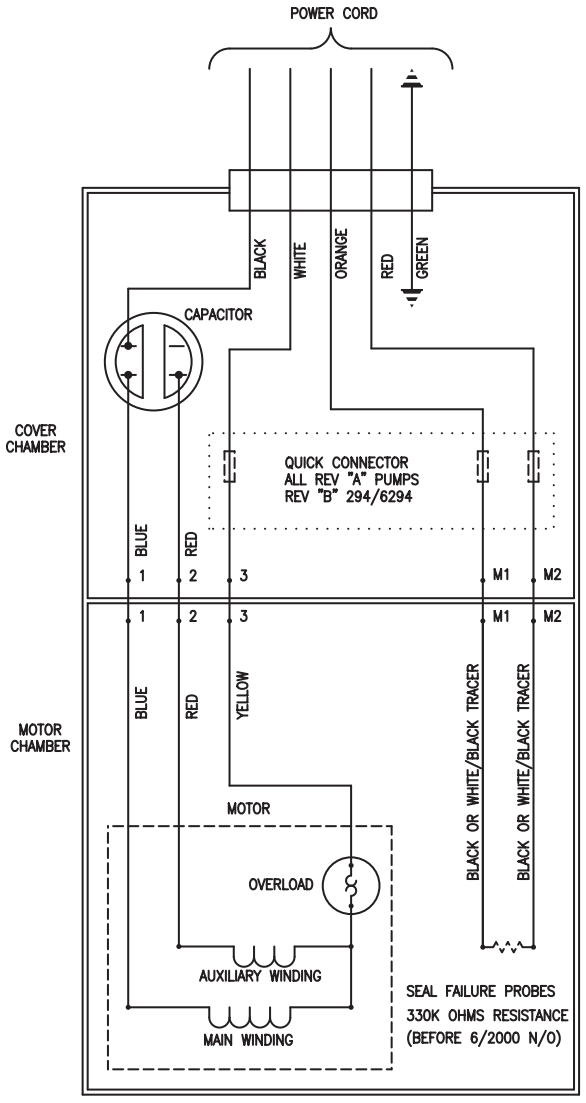
⚠ WARNING Installation and checking of electrical circuits and hardware should be performed by a qualified licensed electrician.

EXPLOSION PROOF WIRING DIAGRAMS
X160, X180, X190, X280, X290

⚠ WARNING **NOT FOR USE IN ACIDIC ATMOSPHERES.**

All installation of controls, protection devices and wiring should be done by a qualified licensed electrician. All electrical and safety codes should be followed including the most recent National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).

SINGLE PHASE NONAUTOMATIC



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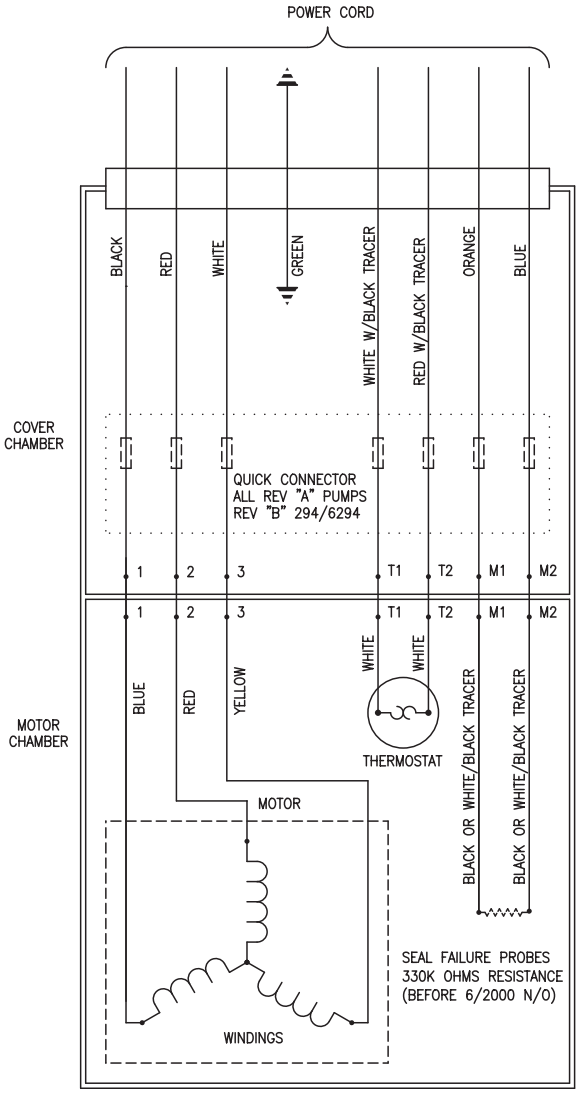
THREE PHASE



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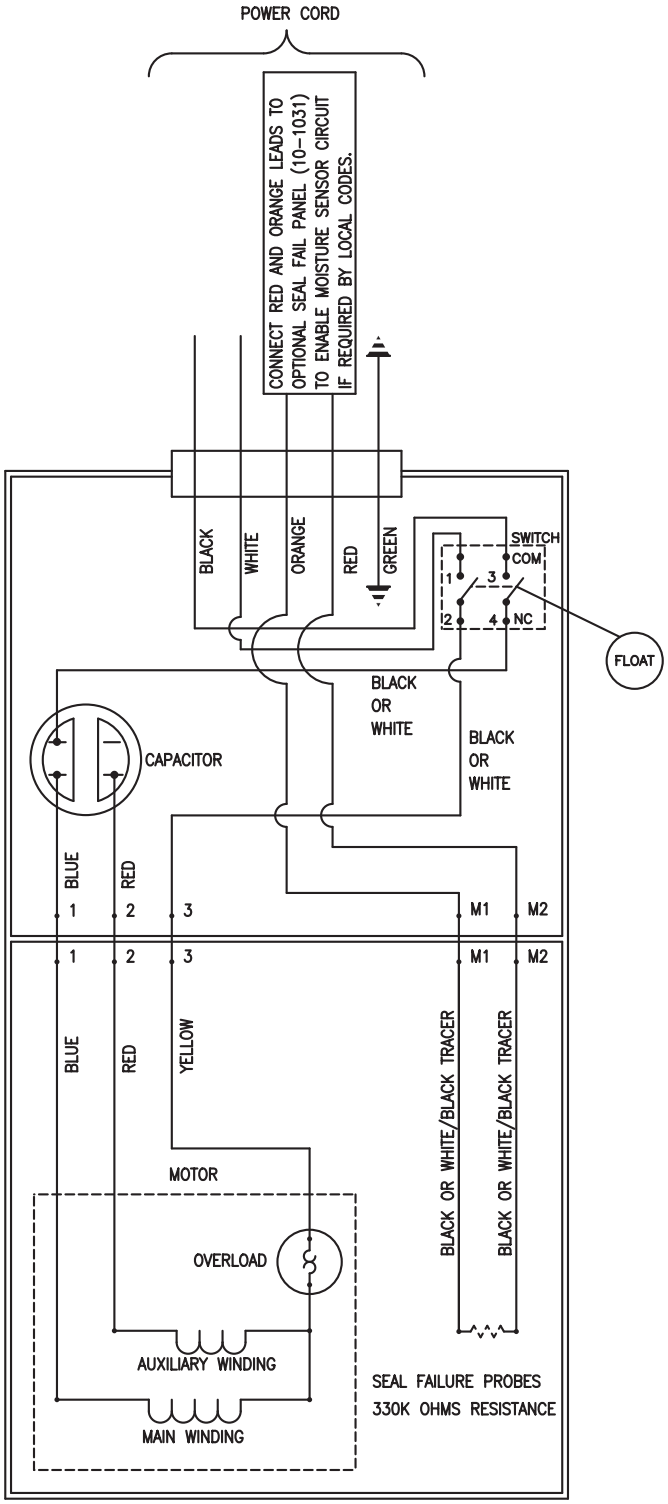
PUMP WIRING INSTRUCTIONS, continued

SINGLE PHASE AUTOMATIC MODEL X282



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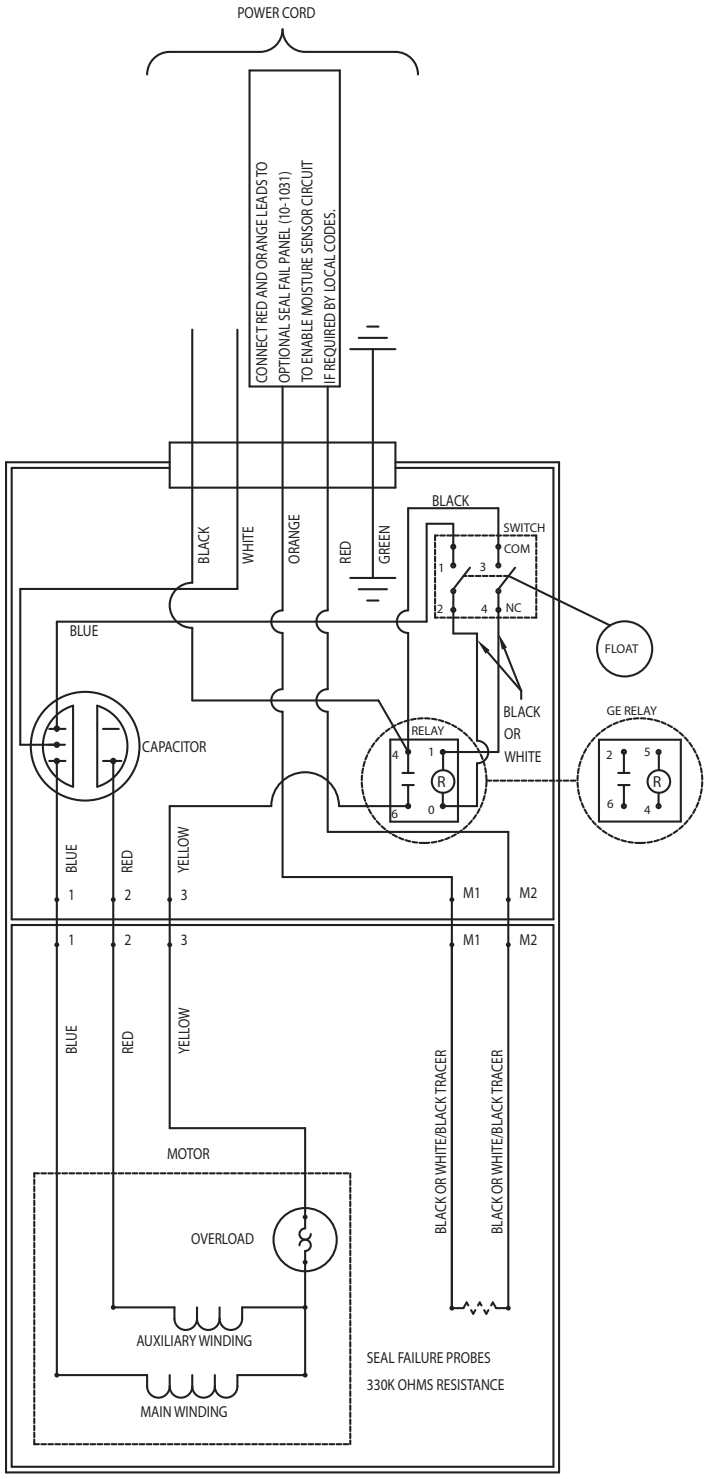
SINGLE PHASE AUTOMATIC MODELS X160 - X290



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INSTRUCTIONS FOR CHECKING ROTATION OF THREE PHASE UNITS

It is very important that these units be connected for proper rotation. Since no rotating parts are visible without removing the pump from the pit, the rotation on 3 phase units should be checked before installation into the pit as follows:

After the proper electrical connections are made, momentarily energize the pump observing the direction of kick back due to starting torque. The rotation is correct if the kick back is in the opposite direction of the rotation arrow. If the rotation is not correct, disconnect power and switch any two power leads. Turn power back on and retest for proper rotation.

SENSOR WIRES (See pages 8 and 9)

The power and sensor wires are contained in the same cord. The green wire is a ground connection. All wires must terminate in the control panel.

The following should be noted:

(1) The thermal sensors are normally closed and mounted adjacent to the motor windings. If internal temperatures exceed a maximum limit, the pump will deactivate. On 3 phase models connect the white and red wires with the black tracer to the control panel's thermal cut-out terminals. The pump is able to restart once the motor cools down. Continued deactivation of this circuit requires the attention from maintenance personnel.

(2) The seal failure wires are connected to a 330K ohm moisture detection circuit. An indicator light will activate whenever water is present in the shaft seal cavity or cord cap assembly. Whenever the seal leak light is activated, indicating the entry of moisture into the pump, it should be removed and serviced in order to avoid damage to the motor. Moisture sensor circuit can be checked for continuity (complete circuit) with a (Volt-OHM-Meter). Set the VOM to read resistance and connect the VOM leads to the moisture sensor wires. The VOM should read approximately 330k Ohms. Resistance readings significantly lower indicates an entry of moisture into the pump. If VOM reading is open then a problem exists with moisture detection circuit.

(3) The green wire shall be connected to a ground lug in the panel. Check resistance between the green ground conductor and all other wires. This resistance reading should indicate an open circuit. If VOM reading returns a reading other than open, then a problem exists with the sensor circuit wiring or cordage and the pump should be taken to an approved repair station.

CONTROL PANELS

These pumps are nonautomatic and they require a control panel with intrinsically safe float and moisture sensor circuits. A motor starter circuit, control circuit, and high-water alarm circuit within the panel are standard features. Enclosures rated for outdoor use and alternating relays are often required. The following should be noted.

(1) The seal failure sensor and thermal sensor (3 phase only) protection require that interfacing terminals and functions be incorporated into the panel.

(2) All 3 phase pumps require overload protection in panel. Use with approved motor control that matches motor input in full load amperes with overload element(s) selected or adjusted in accordance with control instructions.

(3) Lightning arrestors, condensation heaters and elapsed-time meters are optional features that provide added protection.

GENERAL MAINTENANCE

⚠ NOTICE Repair and service must be performed by a firm approved by Zoeller Company to repair a pump with an explosion-proof motor in accordance to the guidelines listed in Policy # FM0212-3d. Contact the Zoeller Product Support Department for additional information.

⚠ NOTICE **If the motor housing or cord cap is disassembled or repaired by a firm NOT approved to work on explosion-proof motors, the explosion proof rating is void, and the cCSAus tag MUST BE REMOVED FROM THE PUMP.**

SAFETY PROCEDURES

⚠ WARNING For your protection, always disconnect pump and panel from its power source before handling.

⚠ WARNING Never enter the basin until it has been properly vented and tested. Any person entering a basin should be wearing a harness with safety rope extending to the surface so that they can be pulled out in case of asphyxiation. Sewage water gives off methane and hydrogen sulfide gases, both of which can be highly poisonous.

Installation and checking of electrical circuits and hardware should be performed by a qualified electrician.

Pump is never to be lifted by power cord.

⚠ WARNING Unit must be cleaned and disinfected, inside the pumping chamber and all exterior surfaces, prior to servicing.

GENERAL SYSTEM INSPECTION

Before the system is placed into operation, it should be inspected by a qualified technician.

⚠ WARNING Wiring and grounding must be in accordance with the National Electrical Code and all applicable local codes and ordinances.

LUBRICATION PROCEDURES

No lubrication is required.

If pumps are to be stored for more than six months, refer to short term storage procedure in the Operation section.

PREVENTIVE MAINTENANCE

Preventive maintenance is recommended to ensure a long service life from the product. Provided is a suggested maintenance schedule.

Every six months:

- Inspect and test system for proper operation.
- Check for proper and unobstructed float operation.
- Listen for proper check valve operation.

Every 5 years or 10,000 hours of operation:

- Remove pump, inspect and service using a Zoeller rebuild kit.
- Flush and clean basin.

OPERATION

GENERAL

Zoeller pumps are lubricated and tested at the factory prior to shipment and require minimum pre-start-up maintenance.

Maximum operating temperature of pump liquid must not exceed 104 °F (40 °C).

These units are not designed to handle liquids other than effluent: 160 and 180 or sanitary sewage: 280, 290 and 400. If pump is used to dewater areas with contaminated liquids with heavy or abrasive materials, the warranty will be voided.

NAMEPLATE DATA

The nameplate, located on the side of the pump, indicates specific information about the construction of the pump. The model number and date code information should be recorded on the front page in the "Owner's Information" section of this manual.

SHORT TERM STORAGE

When not in use, the pump should be stored and the following is advised:

- Store pump inside whenever possible or cover with some type of protective covering.
- Tape or seal in plastic bag the terminal ends of wire leads.
- Spray coat unpainted surfaces with rust inhibiting oil.
- The impeller should be rotated every six months in order to keep the seals lubricated and not develop a permanent set.

If panel is to be stored, the following is advised:

- Store the panel inside whenever possible and leave in the shipping box.
- All openings shall be sealed.
- Store in an upright position.
- Do not stack anything on top of panel.

START-UP PROCEDURE

Before placing the equipment into operation the following should be checked:

- Clean pit.
- Electrical boxes dry and securely installed.
- Floats positioned properly.
- Discharge valves open.
- 3/16" vent hole drilled in pipe between check valve and pump.

Once the above has been verified proceed with the following checks:

- Pump power cables and control floats properly installed and voltage verified.
- Conduit connections to panel are properly sealed.
- After installing the pump into the containment area, with adequate submergence, open the discharge valve fully. Start the unit using manual controls. If flow is appreciably less than rated performance, pump may be air locked. To expel trapped air, jog the unit several times, using the manual controls.
- Have a qualified electrician take voltage and current measurements with the pump running. Record these readings in the space provided in the **"Owner's Information"** section on page 1 of this manual for future reference.

ADJUSTMENT PROCEDURE

Pumps: No adjustments are required.

Floats: Nonautomatic - Refer to the system drawing or to the panel wiring schematic for the desired location of each float switch setting.

Automatic - Float is factory set to provide approximate on/off levels as follows:

SERIES	ON	OFF
X160/X190	19-1/2"	10"
X280	19-3/4"	10"
X290	19-1/2"	10"

NOTE: For non-automatic Class II, Div.1 (alternate Zone 20 designation) rated models, the float switch "off" level must be set to a minimum of 10 inches for the X160-X190, X280, X290 series and 13 inches for the X400 series.

A tighter pumping range can be set by moving the float stop closer to the float thereby lowering the "on" point.

Valves: Discharge valves should be placed in the fully open position. Systems should not be operated for extended periods of time with the discharge valves partially closed due to damaging the valve.

SHUTDOWN PROCEDURES

If a system is shutdown for more than six months, the following is recommended:

Pumps: If pit is to remain dry, then the pump can remain in the pit. With the pump in the pit, it should be operated for five minutes once every three months. If the pit is to remain wet, the pump should be removed and stored as noted above.

Panels: The panel should have all openings sealed to prevent moisture and dust from entering the enclosure. Prior to restarting system, the panel should be inspected for presence of moisture and any loose connections.

Valves: Consult the valve/actuator supplier for information concerning these systems components.

SERVICE CHECKLIST

⚠ WARNING Electrical precautions. Before servicing the pump, always shut off the main power circuit. Make sure you are wearing insulated protective sole shoes and not standing in water. Under flooded conditions, contact your local electric company or a qualified licensed electrician for disconnecting electrical service to the pump prior to removal.

⚠ WARNING Pumps contain oil which becomes pressurized and hot under operating conditions. Allow 2-1/2 hours after shut down before servicing pump.

Condition	Common Causes
A. Pump will not start or run.	Blown panel or circuit breaker fuse, low voltage, thermal overload open, impeller clogged, float switch held down or defective, incorrect wiring in control panel, water in cap assembly.
B. Motor overheats and trips on overload.	Incorrect voltage, impeller blocked, negative head (discharge lower than intake of pump). Pump runs continuously at low water level. Low oil level in motor shell.
C. Pump will not shut off.	Air lock, debris under float assembly, incoming sewage exceeds capacity of pump.
D. Pump operates but delivers little or no water.	Intake clogged with grease or sludge, pump air locked (clear vent hole), low or incorrect voltage, clogged discharge line, operating near shut-off head.
E. Pump starts and stops too often.	Check valve stuck open. Sump pit too small to handle incoming sewage. Level control out of adjustment. Thermal overload tripping.
F. Large red flashing light comes on at control box.	High water in pit. Check pump for clogging, or overload trip. See "A" and "D" above.
G. Grease and solids accumulate in pit around pump.	Break up solids and run pump with water running into the pit. Allow level to lower to the pump intake. Continue until solids are cleared from the pit. Do not drain kitchen grease down the sink.

ZOELLER® PUMP COMPANY

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SHIP TO: 3649 Cane Run Road • Louisville, KY 40211-1961
Tel: (502) 778-2731 • 1 (800) 928-PUMP

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Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1on page 23 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

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

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ D1. **Need for future indoor & structural pest control**		☒ **Note building design features that discourage entry of pests.**	☒ **Provide Integrated Pest Management information to owners, lessees, and operators.**
☒ D2. **Landscape/ Outdoor Pesticide Use**	☐ **Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.** ☐ **Show self-retaining landscape areas, if any.** ☒ **Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)**	**State that final landscape plans will accomplish all of the following.** ☒ **Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.** ☒ **Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.** ☒ **Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.** ☒ **Consider using pest-resistant plants, especially adjacent to hardscape.** **To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.**	☒ **Maintain landscaping using minimum or no pesticides.** ☒ **See applicable operational BMPs in "What you should know for…..Landscape and Gardening"** at http://rcflood.org/stormwater/**Error! Hyperlink reference not valid.** ☒ **Provide IPM information to new owners, lessees and operators.**

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

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ H. **Industrial processes.**	❑ **Show process area.**	❑ **If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."**	❑ **See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ I. **Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)**	❑ **Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.** ❑ **Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.** ❑ **Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.**	**Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.** **Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for:** ▪ **Hazardous Waste Generation** ▪ **Hazardous Materials Release Response and Inventory** ▪ **California Accidental Release (CalARP)** ▪ **Aboveground Storage Tank** ▪ **Uniform Fire Code Article 80 Section 103(b) & (c) 1991** ▪ **Underground Storage Tank** **www.cchealth.org/groups/hazmat/**	❑ **See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

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

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

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

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

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

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

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ P. **Plazas, sidewalks, and parking lots.**			☒ **Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.**

Appendix 9: O&M

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

Operation and Maintenance

Responsible Party	BMP	Description of BMP and Method of Implementation	Maintenance Schedule
Owner	Education for Property Owners and Tenants	The property owner shall familiarize him/herself with the WQMP document and content, including BMP educational materials in Appendix 6 this WQMP and shall ensure that all occupants are also educated on stormwater BMPs.	Yearly
Owner	Activity Restrictions	Owner shall control site activities to prevent or reduce runoff pollutant. Activity restriction listed per attachment in this WQMP and owner or owner's representative shall monitor all activities on site during business hours to prevent pollutants in site runoff.	N/A
Owner	Landscape Management	Maintenance shall be conducted by a landscape contractor on a weekly basis to verify that the irrigation system is functioning properly and to repair as needed. Landscape contractor will also verify that there are no leaks or run-off from landscape areas. Adjust irrigation heads and systems run times as necessary to prevent overwatering of vegetation, overspray or run-off from landscape areas to ensure the health and aesthetic quality of the landscape. Mowing and trimming waste shall be properly removed from the site and herbicides, pesticides and fertillizers shall be properly applied to prevent storm drainage contamination.	Weekly
Owner	BMP Maintenance	The owner and/or his maintenance contractor shall regularly inspect the proposed BMP systems for signs of erosion or sediment and debris buildup and clean/repair as needed (see form 5-1 for a listing of all BMP maintenance items).	As Needed
Owner	Spill Contingency Plan	All hazardous and non-hazardous material spills will be cleaned up and disposed of immediately. The Property Owner shall report all spill incidents to the City of Perris and County Fire Hazmat and shall provide Documentation, Education of Cleanup Procedure, Notify Responsible Agency.	Yearly
Owner	Litter/Debris Control Program	Litter and debris will be collected and deposited in appropriate covered receptacles as part of the regular sweeping/cleaning program. Any accumulated trash or debris onsite will be removed and disposed of properly on a weekly basis.	Weekly or as needed
Owner	Employee Training	The owner will ensure that tenants are also familiar with onsite BMPs and necessary maintenance required by the tenants/employees. Owner will check with City and County at least once a year to obtain new or updated educational materials and provide these materials to tenants/employees. Employees shall be trained to cleanup spills and participate in ongoing maintenance. The WQMP requires annual employee training and new hires within 2 months.	Yearly
Owner	Parking Lot Sweeping	The parking lots will be swept regularly. Private onsite street entrances and parking lots will be thoroughly swept annually before the rainy season and weekly to remove accumulated sediment and debris.	Weekly or as needed

Operation and Maintenance

Responsible Party	BMP	Description of BMP and Method of Implementation	Maintenance Schedule
Owner	Comply with all other applicable NPDES	During the construction phase of this project, the applicant shall file a Notice of Intent for coverage under the GCP and acquire a WDID # to demonstrate compliance with the General Construction Permit. As necessary, future occupants of this site shall apply for coverage under the General Industrial Permit or Region 8, Sector Specific Permit.	N/A
Owner	Storm Drain Signage	All on-site drainage inlets will be stenciled or signage will be provided that indicates "NO DUMPING, DRAINS TO RIVER" or equivalent.	Annually or as needed to maintain legibility
Owner	Trash Storage Area	All trash enclosures on this site shall have a solid roof cover to prevent dumpster contents and enclosure from coming into contact with rainwater. Shall comply with CASQA SD-32.	Weekly
Owner	Efficient Irrigation	The irrigation system will include devices to prevent low head drainage, overspray and run off through the use of pressure regulating devices, check valves, flow sensors, proper spacing, low precipitation emission devices and ET or weather based controllers. Landscaping and irrigation shall be consistent with the State Model Water Efficient Landscape Ordinance and the City of Perris Landscape Development Standards. Plants installed will be arranged according to similar hydro-zones and meet the required water budget for the site. Landscape areas used for water quality swales or infiltration areas shall have proper plants for saturated soils, drought tolerance and erosion control qualities. Shade trees shall be used to intercept rainwater and reduce heat gain on paving.	Weekly or as needed for repair
Owner	Site Design and Landscape Planning	Inspect side slope of basin for erosion. Repair eroded areas. Inspect riprap at basin, replace misplaced/missing rock. Inspect depth of riprap and replace as necessary.	Annually or after storm event
Owner	Biofiltration Basin (Private)	Identification and promotion of desired plant species. Remove any unwanted plant species. Remove any trash or debris build-up. Inspect for standing water to prevent mosquitos and other vector breeding. If ponding occurs, top layer of the planter may need to be replaced. If ponding continues to be an issue remove and replace media layer. Replace surface mulch layer as needed to maintain a 2-3 inch soil cover.	Semi-Annual, before Wet Season (October 1) and midway through the wet season or by Feb 1. Replace mulch as needed.
Owner	Sump Pump	Captured and Treated DCV will be discharged with subdrains to the sump pump System. The sump pump will pump the treated DCV to the Parkway drain which will convey the DCV to River Road.	Inspect sump pump on a quarterly basis, once being before the rainy season (oct. 1st). Make sure pump is operational and maintain per installed pump's manufacturers recommendations

			Maintenance Responsibility				Funding Mechanism for Maintenance			Maintenance Costs	
BMP	**Used**	**Not Used**	**Owner ****	**City**	**County**	**Flood District**	**Owner**	**Developer**	**Public ***	**1-year ($)**	**2-year ($)**
Hydro seeding & Mulching Private	☐	☒	☐	☐	☐	☐	☐	☐	☐	N/A	N/A
Landscape Private	☒	☐	☒	☐	☐	☐	☒	☐	☐	1000	2000
Landscape Public	☒	☐	☐	☒	☐	☐	☐	☐	☒	250	500
Lawns	☐	☒	☐	☐	☐	☐	☐	☐	☐	N/A	N/A
Impervious permanent cover (concrete/ asphalt) Private	☒	☐	☒	☐	☐	☐	☒	☐	☐	1,000	2,000
Impervious permanent cover (concrete/ asphalt) Public	☒	☐	☐	☒	☐	☐	☐	☐	☒	250	500
Pervious permanent cover (gravel)	☐	☒	☐	☐	☐	☐	☐	☐	☐	N/A	N/A
Down drains	☒	☐	☒	☐	☐	☐	☒	☐	☐	100	200
Ribbon Gutter Private	☐	☒	☐	☐	☐	☐	☐	☐	☐	N/A	N/A
Ribbon Gutter Public	☐	☒	☐	☐	☐	☐	☐	☐	☐	N/A	N/A
Curb & gutter Private	☒	☐	☒	☐	☐	☐	☒	☐	☐	250	500

Curb & gutter Public	☒	☐	☐	☒	☐	☐	☐	☐	☒	250	500
Storm Drain Private	☒	☐	☒	☐	☐	☐	☒	☐	☐	500	1000
Storm Drain Public	☐	☒	☐	☐	☐	☐	☐	☐	☐	N/A	N/A
Bio-Retention Basin	☐	☒	☐	☐	☐	☐	☐	☐	☐	N/A	N/A
Education Materials	☒	☐	☒	☐	☐	☐	☒	☐	☐	Free	Free
Vehicle Wash Area	☐	☒	☐	☐	☐	☐	☐	☐	☐	N/A	N/A
Catch Basin/Inlet Stenciling	☒	☐	☒	☐	☐	☐	☒	☐	☐	100	200

Post Construction – Operations and Maintenance

This O&M Plan describes the designated responsible party for implementation of this WQMP, including: operation and maintenance of all the structural BMP(s), conducting the training/educational program and duties, and any other necessary activities. The O&M Plan includes detailed inspection and maintenance requirements for all structural BMPs, including copies of any maintenance contract agreements, manufacturer's maintenance requirements, permits, etc.

1. Project Information

   APN: 417-220-009
   Address: EAST 1ST STREET, BEAUMONT, CA 92223
   Site Size: 43,020 S.F.

2. Responsible Party

   The responsible party (RP) for implementation of this WQMP is:

   Owner Name: LARRY AGUILERA
   Title: OWNER
   Company: AA FENCE
   Address: 320 E. 3RD STREET, BEAUMONT, CA 92223
   Telephone #: (951) 538-9424

3. Record Keeping

   Parties responsible for the O&M plan shall retain records for at least 5 years.

   All training and educational activities and BMP operation and maintenance shall be documented verify compliance with this O&M Plan. A sample Training Log and Inspection and Maintenance Log are included in Appendix 9 of this document.

   The BMP Operation & Maintenance Log form (Appendix 9) shall be completed accurately and retained as part of this document.

4. Vector Control

   Standing water which exists for longer than 72 hours may contribute to mosquito breeding areas. Best Management Practices (BMPs) shall be inspected for standing water on a regular basis. Standing water may indicate that the BMP is not functioning properly and proper action to remedy the situation shall be taken in a timely manner.
   elimination of standing water and managing garbage, lawn clippings, and pet droppings, can help decrease the presence of mosquitoes and flies in the area.
   The County Vector Control District may be contacted for more information and support.

5. Inspections

   The local jurisdiction may conduct a site inspection to evaluate compliance with the project specific WQMP. This document, including the appendix logs and the applicable WQMP should be shown to the inspector, as proof of maintenance.

6. Annual BMP Maintenance Budget

   Annual estimate is $460: 8 labor Hours @ $45/hour = $360 + Debris Removal/Haul-off = $100

Maintenance Responsibility

With AA FENCE WAREHOUSE development project site being in the City of Beaumonts's limits, the property owner's ongoing maintenance responsibilities, site design and treatment BMPs have been designed to keep maintenance efforts in line with project maintenance activities.

Maintenance Responsibilities: Bio-Retention Basin, Landscape maintenance of common areas, maintenance of parking areas.

General Operation and Maintenance Activities

Operation and maintenance (O&M) activities are described below. The categories of O&M activities are "routine" and "major" where routine refer to activity conducted on a regular schedule, whereas major refers to infrequent activities triggered mainly by need. Each category and its respective activities are described in the following sections.

Routine Operation and Maintenance Activities

O&M responsibility, initially by Developer/Builder until PROPERTY OWNER, O&M, normally performed by PROPERTY OWNER as part of normal/scheduled maintenance activities.

Site Inspection
The storm drain inlets will be inspected on a regular, scheduled basis to ensure that the facility is operating properly, to record observations, and to initiate any actions that may be required. While the frequency of site inspections may vary depending on the season, it will typically be on a monthly basis.

Trash & Debris Removal
Litter may be picked up at any time during site visits for other purposes. Regular, scheduled trash/debris removal will be performed at all sites on a quarterly basis and/or after storm events that result in heavy trash accumulations.

Minor Vegetation Removal/Thinning
Vegetation growth will be inspected annually, and removed or thinned as necessary. Vegetation at inlets and outlets will be manually or mechanically removed if vegetation is found to be clogging or otherwise affecting the operation of the facility. Access roads will remain clear of vegetation and obstructions. Significant vegetation removal is covered under the major maintenance activities section below.

Snag Removal
This work typically includes the removal of sticks, dead branches, brush, and small trees that block water flow or otherwise interfere with the operations. This work may be performed as needed on a quarterly basis.

Minor Sediment Removal
It is expected that there will be a minor amount of sediment deposition at points within the storm drain inlet. When such deposits obstruct water flow, the deposits will be removed.

Infiltration Basin:

Facility:	Bio-Retention Basin
Maintained By:	Property Owner
O&M:	Inspect inlet, remove trash and debris on a monthly basis. If 48 hour drawdown is not achieved, owner will re-scarify a minimum of 2” on bottom to provide fresh infiltration surface.

BMP OPERATION & MAINTENANCE LOG

AA FENCE WAREHOUSE

Today's Date: _____

Person Performing Activity (Printed): _____

Signature: _____

BMP Name (As Shown in O&M Plan)	Brief Description of Implementation, Maintenance, and Inspection Activity Performed

EDUCATIONAL LOG
AA FENCE WAREHOUSE

Date of Training/Educational Activity: _____

Person Performing Activity (Printed): _____

Signature: _____

Topic of Training/Educational Activity: _____

Name of Participant	Signature of Participant

Date of Training/Educational Activity: _____

Person Performing Activity (Printed): _____

Signature: _____

Topic of Training/Educational Activity: _____

Name of Participant	Signature of Participant

Appendix 10: Educational Materials

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

Site Design & Landscape Planning SD-10

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- ☑ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.

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Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.
- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.
- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and

regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Roof Runoff Controls SD-11

Rain Garden

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Description

Various roof runoff controls are available to address stormwater that drains off rooftops. The objective is to reduce the total volume and rate of runoff from individual lots, and retain the pollutants on site that may be picked up from roofing materials and atmospheric deposition. Roof runoff controls consist of directing the roof runoff away from paved areas and mitigating flow to the storm drain system through one of several general approaches: cisterns or rain barrels; dry wells or infiltration trenches; pop-up emitters, and foundation planting. The first three approaches require the roof runoff to be contained in a gutter and downspout system. Foundation planting provides a vegetated strip under the drip line of the roof.

Approach

Design of individual lots for single-family homes as well as lots for higher density residential and commercial structures should consider site design provisions for containing and infiltrating roof runoff or directing roof runoff to vegetative swales or buffer areas. Retained water can be reused for watering gardens, lawns, and trees. Benefits to the environment include reduced demand for potable water used for irrigation, improved stormwater quality, increased groundwater recharge, decreased runoff volume and peak flows, and decreased flooding potential.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Designing New Installations

Cisterns or Rain Barrels

One method of addressing roof runoff is to direct roof downspouts to cisterns or rain barrels. A cistern is an above ground storage vessel with either a manually operated valve or a permanently open outlet. Roof runoff is temporarily stored and then released for irrigation or infiltration between storms. The number of rain

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barrels needed is a function of the rooftop area. Some low impact developers recommend that every house have at least 2 rain barrels, with a minimum storage capacity of 1000 liters. Roof barrels serve several purposes including mitigating the first flush from the roof which has a high volume, amount of contaminants, and thermal load. Several types of rain barrels are commercially available. Consideration must be given to selecting rain barrels that are vector proof and childproof. In addition, some barrels are designed with a bypass valve that filters out grit and other contaminants and routes overflow to a soak-away pit or rain garden.

If the cistern has an operable valve, the valve can be closed to store stormwater for irrigation or infiltration between storms. This system requires continual monitoring by the resident or grounds crews, but provides greater flexibility in water storage and metering. If a cistern is provided with an operable valve and water is stored inside for long periods, the cistern must be covered to prevent mosquitoes from breeding.

A cistern system with a permanently open outlet can also provide for metering stormwater runoff. If the cistern outlet is significantly smaller than the size of the downspout inlet (say ¼ to ½ inch diameter), runoff will build up inside the cistern during storms, and will empty out slowly after peak intensities subside. This is a feasible way to mitigate the peak flow increases caused by rooftop impervious land coverage, especially for the frequent, small storms.

Dry wells and Infiltration Trenches

Roof downspouts can be directed to dry wells or infiltration trenches. A dry well is constructed by excavating a hole in the ground and filling it with an open graded aggregate, and allowing the water to fill the dry well and infiltrate after the storm event. An underground connection from the downspout conveys water into the dry well, allowing it to be stored in the voids. To minimize sedimentation from lateral soil movement, the sides and top of the stone storage matrix can be wrapped in a permeable filter fabric, though the bottom may remain open. A perforated observation pipe can be inserted vertically into the dry well to allow for inspection and maintenance.

In practice, dry wells receiving runoff from single roof downspouts have been successful over long periods because they contain very little sediment. They must be sized according to the amount of rooftop runoff received, but are typically 4 to 5 feet square, and 2 to 3 feet deep, with a minimum of 1-foot soil cover over the top (maximum depth of 10 feet).

To protect the foundation, dry wells must be set away from the building at least 10 feet. They must be installed in solids that accommodate infiltration. In poorly drained soils, dry wells have very limited feasibility.

Infiltration trenches function in a similar manner and would be particularly effective for larger roof areas. An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. These are described under Treatment Controls.

Pop-up Drainage Emitter

Roof downspouts can be directed to an underground pipe that daylights some distance from the building foundation, releasing the roof runoff through a pop-up emitter. Similar to a pop-up irrigation head, the emitter only opens when there is flow from the roof. The emitter remains flush to the ground during dry periods, for ease of lawn or landscape maintenance.

Foundation Planting

Landscape planting can be provided around the base to allow increased opportunities for stormwater infiltration and protect the soil from erosion caused by concentrated sheet flow coming off the roof. Foundation plantings can reduce the physical impact of water on the soil and provide a subsurface matrix of roots that encourage infiltration. These plantings must be sturdy enough to tolerate the heavy runoff sheet flows, and periodic soil saturation.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Supplemental Information

Examples

- City of Ottawa's Water Links Surface –Water Quality Protection Program
- City of Toronto Downspout Disconnection Program
- City of Boston, MA, Rain Barrel Demonstration Program

Other Resources

Hager, Marty Catherine, Stormwater, "Low-Impact Development", January/February 2003. www.stormh2o.com

Low Impact Urban Design Tools, Low Impact Development Design Center, Beltsville, MD. www.lid-stormwater.net

Start at the Source, Bay Area Stormwater Management Agencies Association, 1999 Edition

Efficient Irrigation SD-12

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

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- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Storm Drain Signage SD-13

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include "NO DUMPING

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– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.
- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Alternative Building Materials SD-21

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Source Control
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutant
- Collect and Convey

Description

Alternative building materials are selected instead of conventional materials for new construction and renovation. These materials reduce potential sources of pollutants in stormwater runoff by eliminating compounds that can leach into runoff, reducing the need for pesticide application, reducing the need for painting and other maintenance, or by reducing the volume of runoff.

Approach

Alternative building materials are available for use as lumber for decking, roofing materials, home siding, and paving for driveways, decks, and sidewalks.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Designing New Installations

Decking

One of the most common materials for construction of decks and other outdoor construction has traditionally been pressure treated wood, which is now being phased out. The standard treatment is called CCA, for chromated copper arsenate. The key ingredients are arsenic (which kills termites, carpenter ants and other insects), copper (which kills the fungi that cause wood to rot) and chromium (which reacts with the other ingredients to bind them to the wood). The amount of arsenic is far from trivial. A deck just 8 feet x 10 feet contains more than 1 1/3 pounds of this highly potent poison. Replacement materials include a new type of pressure treated wood, plastic and composite lumber.

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There are currently over 20 products in the market consisting of plastic or plastic-wood composites. Plastic lumber is made from 100% recycled plastic, # 2 HDPE and polyethylene plastic milk jugs and soap bottles. Plastic-wood composites are a combination of plastic and wood fibers or sawdust. These materials are a long lasting exterior weather, insect, and chemical resistant wood lumber replacement for non structural applications. Use it for decks, docks, raised garden beds and planter boxes, pallets, hand railings, outdoor furniture, animal pens, boat decks, etc.

New pressure treated wood uses a much safer recipe, ACQ, which stands for ammoniacal copper quartenary. It contains no arsenic and no chromium. Yet the American Wood Preservers Association has found it to be just as effective as the standard formula. ACQ is common in Japan and Europe.

Roofing

Several studies have indicated that metal used as roofing material, flashing, or gutters can leach metals into the environment. The leaching occurs because rainfall is slightly acidic and slowly dissolved the exposed metals. Common traditional applications include copper sheathing and galvanized (zinc) gutters.

Coated metal products are available for both roofing and gutter applications. These products eliminate contact of bare metal with rainfall, eliminating one source of metals in runoff. There are also roofing materials made of recycled rubber and plastic that resemble traditional materials.

A less traditional approach is the use of green roofs. These roofs are not just green, they're alive. Planted with grasses and succulents, low- profile green roofs reduce the urban heat island effect, stormwater runoff, and cooling costs, while providing wildlife habitat and a connection to nature for building occupants. These roofs are widely used on industrial facilities in Europe and have been established as experimental installations in several locations in the US, including Portland, Oregon. Their feasibility is questionable in areas of California with prolonged, dry, hot weather.

Paved Areas

Traditionally, concrete is used for construction of patios, sidewalks, and driveways. Although it is non-toxic, these paved areas reduce stormwater infiltration and increase the volume and rate of runoff. This increase in the amount of runoff is the leading cause of stream channel degradation in urban areas.

There are a number of alternative materials that can be used in these applications, including porous concrete and asphalt, modular blocks, and crushed granite. These materials, especially modular paving blocks, are widely available and a well established method to reduce stormwater runoff.

Building Siding

Wood siding is commonly used on the exterior of residential construction. This material weathers fairly rapidly and requires repeated painting to prevent rotting. Alternative “new” products for this application include cement-fiber and vinyl. Cement-fiber siding is a masonry product made from Portland cement, sand, and cellulose and will not burn, cup, swell, or shrink.

Pesticide Reduction
A common use of powerful pesticides is for the control of termites. Chlordane was used for many years for this purpose and is now found in urban streams and lakes nationwide. There are a number of physical barriers that can be installed during construction to help reduce the use of pesticides.

Sand barriers for subterranean termites are a physical deterrent because the termites cannot tunnel through it. Sand barriers can be applied in crawl spaces under pier and beam foundations, under slab foundations, and between the foundation and concrete porches, terraces, patios and steps. Other possible locations include under fence posts, underground electrical cables, water and gas lines, telephone and electrical poles, inside hollow tile cells and against retaining walls.

Metal termite shields are physical barriers to termites which prevent them from building invisible tunnels. In reality, metal shields function as a helpful termite detection device, forcing them to build tunnels on the outside of the shields which are easily seen. Metal termite shields also help prevent dampness from wicking to adjoining wood members which can result in rot, thus making the material more attractive to termites and other pests. Metal flashing and metal plates can also be used as a barrier between piers and beams of structures such as decks, which are particularly vulnerable to termite attack.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of "redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

There are no good, independent, comprehensive sources of information on alternative building materials for use in minimizing the impacts of stormwater runoff. Most websites or other references to "green" or "alternative" building materials focus on indoor applications, such as formaldehyde free plywood and low VOC paints, carpets, and pads. Some supplemental information on alternative materials is available from the manufacturers.

Fires are a source of concern in many areas of California. Information on the flammability of alternative decking materials is available from the University of California Forest Product Laboratory (UCFPL) website at: http://www.ucfpl.ucop.edu/WDDeckIntro.htm