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:

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 August 14th of 2024, by and between Meritage Homes of California, Inc., ("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 Sorenstam Dr & Ouimet Way (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,
9. 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.

10. 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.

11. 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.

12. 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.

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

14. 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:

By: ________	By: ________
Name: Nick Emsiel	Name: ________
Title: President	Title: ________
Organization: Meritage Homes	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~~ TEXAS)
County of ~~Riverside~~ BEXAR)

On August 14, 2024, before me, Rayanne Miller, notary public, personally appeared Nicholas Emsyk 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: RMiller (Seal)

NOTARY PUBLIC STATE OF TEXAS
RAYANNE NICOLE MILLER
Notary ID #132944616
My Commission Expires
February 26, 2025

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 ______________, 20___, before me, ___________________________, notary public, personally appeared ______________ who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

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

Signature: ______________________________ (Seal)

EXHIBIT "A"

LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF BEAUMONT, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

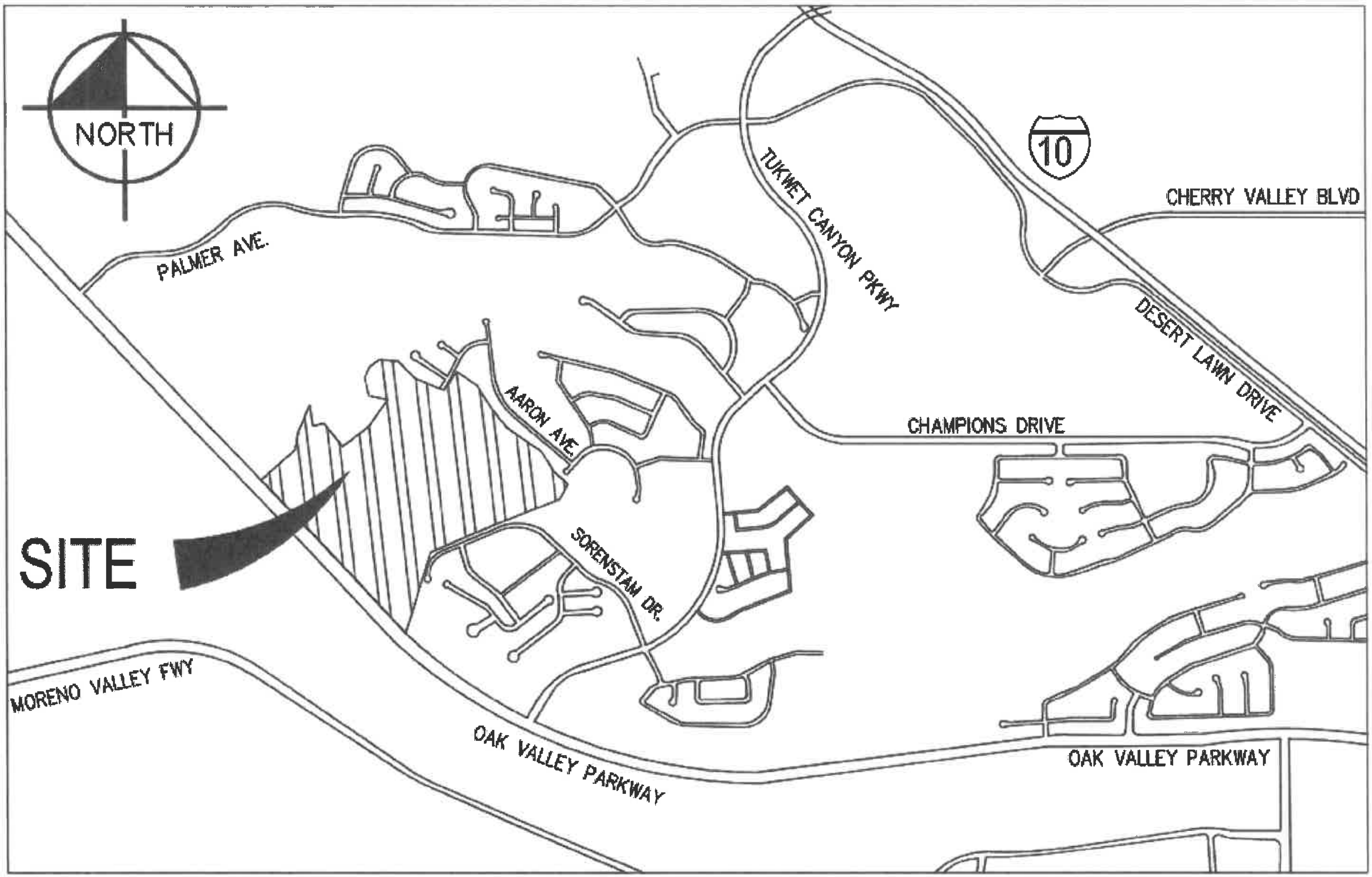
TRACT NO. 31462-17, BEING A DIVISION OF PARCEL 2 OF PARCEL MAP NO. 38953, IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, RECORDED IN BOOK 254, PAGES 97 THROUGH 103 INCLUSIVE OF PARCEL MAPS, RECORDS OF SAID COUNTY.

EXCEPTING THEREFROM THE ABOVE PARCEL ANY AND ALL NATURAL OIL, OIL RIGHTS, MINERALS, MINERAL RIGHTS, NATURAL GAS, NATURAL GAS RIGHTS AND OTHER HYDROCARBONS BY WHATSOEVER NAME KNOWN AND ALL RIGHTS THEREIN, GEOTHERMAL STEAM, AND ALL PRODUCTS DERIVED FROM ANY OF THE FOREGOING, THAT MAY BE WITHIN OR UNDER THE LAND, TOGETHER WITH THE PERPETUAL RIGHT OF DRILLING, MINING, EXPLORING AND OPERATING THEREFOR AND STORING IN AND REMOVING THE SAME FROM THE LAND OR ANY OTHER PROPERTY, INCLUDING THE RIGHT TO WHIPSTOCK OR DIRECTIONALLY DRILL AND MINE FROM PROPERTY OTHER THAN THE LAND, OIL OR GAS WELLS, TUNNELS AND SHAFTS INTO, THROUGH OR ACROSS THE SUBSURFACE OF THE LAND, AND TO BOTTOM SUCH WHIPSTOCKED OR DIRECTIONALLY DRILLED WELLS, TUNNELS AND SHAFTS UNDER AND BENEATH OR BEYOND THE EXTERIOR LIMITS THEREOF, AND TO REDRILL, RETUNNEL, EQUIP, MAINTAIN, REPAIR, DEEPEN AND OPERATE ANY SUCH WELLS, TUNNELS OR SHAFTS, WITHOUT THE RIGHT TO DRILL, MINE, STORE OR EXCAVATE THROUGH THE SURFACE OR THE UPPER 500 FEET OF THE SUBSURFACE OR THE LAND AS RESERVED BY OAK VALLEY PARTNERS, L.P., A TEXAS LIMITED PARTNERSHIP WHICH IS REGISTERED IN CALIFORNIA AS OVP, L.P., IN A GRANT DEED RECORDED NOVEMBER 14, 2003 AS INSTRUMENT NO. 2003-899365 OF OFFICIAL RECORDS.

ANY AND ALL WATER, WATER RIGHTS OR INTERESTS THEREIN APPURTENANT OR RELATING TO THE LAND OR OWNED OR USED BY GRANTOR IN CONNECTION WITH OR WITH RESPECT TO THE LAND (NO MATTER HOW ACQUIRED BY GRANTOR), WHETHER SUCH WATER RIGHTS SHALL BE RIPARIAN, OVERLYING, APPROPRIATIVE, LITTORAL, PERCOLATING, PRESCRIPTIVE, ADJUDICATED, STATUTORY OR CONTRACTUAL, TOGETHER WITH THE RIGHT AND POWER TO EXPLORE, DRILL, REMOVE AND RESTORE THE SAME FROM OR IN THE LAND OR TO DIVERT OR OTHERWISE UTILIZE SUCH WATER, RIGHTS OR INTERESTS ON ANY OTHER PROPERTY OWNED BY OR LEASED BY GRANTOR, WITHOUT THE RIGHT TO ENTER UPON THE SURFACE OF THE LAND IN THE EXERCISE OF SUCH RIGHTS; PROVIDED, HOWEVER, ONLY IF AND TO THE EXTENT THAT SUCH RIGHTS ARE NOT USED BY GRANTEE IN ITS USE AND ENJOYMENT OF THE LAND AS RESERVED BY OAK VALLEY PARTNERS, L.P., A TEXAS LIMITED PARTNERSHIP, WHICH IS REGISTERED IN CALIFORNIA AS OVP, L.P., IN A GRANT DEED RECORDED NOVEMBER 14, 2003 AS INSTRUMENT NO. 2003-899365 OF OFFICIAL RECORDS.

PORTION OF APN: 413-790-074

EXHIBIT "B"
DIAGRAM OF PROPERTY



VICINITY MAP

NOT TO SCALE

EXHIBIT "C"
WQMP

No further comments.
Scott Lyle/NV5
08/05/2024

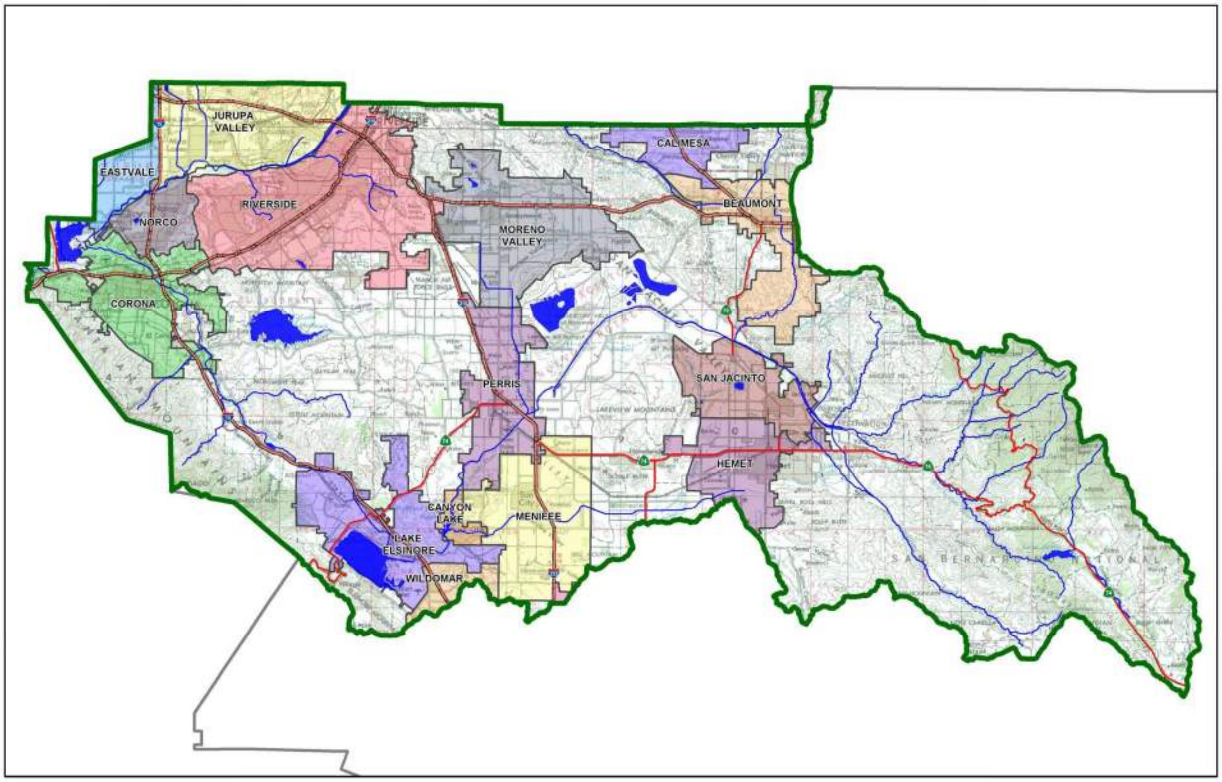
Project Specific Water Quality Management Plan

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

Project Title: MLC Fairway Canyon – 4C

Public Works No: PW2024-0020

Design Review/Case No: TBD



☐ Preliminary
☒ Final

Original Date Prepared: May 10, 2023

Revision Date(s): 7/17/2024, 8/26/2024

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

Contact Information:

Prepared for:
Meritage Homes of California, Inc.
5 Peters Canyon, Suite 310
Irvine, CA 92606
(408) 772-1774

Prepared by:
Michael Sutton
Kimley-Horn and Associates
3801 University Avenue, Suite 300
Riverside, CA 92501
(760) 565-5146

OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for Meritage Homes of California, Inc. by Kimley-Horn & Associates for the MLC Fairway Canyon Phase 4C project.

This WQMP is intended to comply with the requirements of the City of Beaumont for Ordinance No. 763, which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under the City of Beaumont Water Quality Ordinance (Municipal Code Section 13.24).

"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."

efrem joelson
Owner's Signature

8/26/24
Date

Efrem Joelson
Owner's Printed Name

Director, Forward Planning
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

8/26/24
Date

Mike Sutton
Preparer's Printed Name

Project Manager
Preparer's Title/Position

Preparer's Licensure:

REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

Exp: 12/31/25

Table of Contents

List of Tables

List of Appendices

Section A: Project and Site Information

PROJECT INFORMATION		
Type of Project:	Residential	
Planning Area:	Phase 4C	
Community Name:	Fairway Canyon	
Development Name:	Tract 31462-17, 18, 19 and Tract 31462-27,28,29	
PROJECT LOCATION		
Latitude & Longitude (DMS): 33.949108, -117.048025		
Project Watershed and Sub-Watershed: Santa Ana River; San Timoteo Creek Reach 3 (Yuicapa to headwaters)		
APN(s): 413-790-010		
Map Book and Page No.: MB 690		
PROJECT CHARACTERISTICS		
Proposed or Potential Land Use(s)		SFR-Residential
Proposed or Potential SIC Code(s)		1521, General Builder Contractor, single-family residential
Area of Impervious Project Footprint (SF) – Sum of existing and proposed impervious		2,550,316
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement		2,550,316
Does the project consist of offsite road improvements?		☐ Y ☒ N
Does the project propose to construct unpaved roads?		☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?		☒ Y ☐ N
EXISTING SITE CHARACTERISTICS		
Total area of existing Impervious Surfaces within the project limits (SF)		0
Is the project located within any MSHCP Criteria Cell?		☐ Y ☒ N
If so, identify the Cell number:		Not in a cell
Are there any natural hydrologic features on the project site?		☒ Y ☐ N
Is a Geotechnical Report attached?		☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)		B & C
What is the Water Quality Design Storm Depth for the project?		0.75

A.1 Maps and Site Plans

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

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

Phase 4C of the Fairway Canyon development will include the construction of residential development with associated residential landscaping, concrete hardscape, and asphalt paving streets. The proposed development is approximately 93.5 acres, of which 58.6 are impervious and is located north of the intersection of West Oak Valley Parkway and Tukewet Canyon Parkway, the City of Beaumont. The project site accepts approximately 58.76 acres of run-on pipe flow from the existing development located southeast of the project site and 6.37 acres of run-on from an undeveloped northwestern area. For water quality purposes, the total area accounted for is approximately 93.5 acres. The 93.5 acres accounts for DMA A, DMA A-Off, DMA B, and DMA F (self-treating landscape area), which treatment will be provided. The existing site is approximately 0% impervious. Once the site is developed, the project site will be approximately 58.6% impervious and 41.4% pervious.

The existing site is currently vacant and drains mostly in a southwesterly direction towards two existing basins. Under existing conditions, the site is accepting offsite flows from an undeveloped northwestern area.

The proposed site grading intends to maintain the existing flow pattern by predominantly draining in a southwesterly direction. DMA-A drains southwesterly where flows are collected via inlets and are routed to a proposed bioretention basin (Basin 2). Basin 2 captures and is sized for the offsite run-on from the westerly mountainous area (DMA-A-off). Basin 2 is designed for hydromodification control for both of these DMAs.

DMA-B, DMA-C, AND DMA-D will drain in a southwesterly direction, be captured by grate inlets and discharge to a proposed bioretention basin (Basin 1). Basin 1 is also designed for hydromodification control for DMA-B, DMA-C, and DMA-D (off-site run-on). However, DMA-C and DMA-D will provide their own respective LID BMPs for water quality treatment prior to discharging into Basin 1.

DMA-E drains in a northerly direction where flows are collected via inlets and are discharged to the existing storm drain system of the northern development (Tract 31462-8). Flows are adequately treated in existing grassy swales which have been constructed and approved under previous WQMP Report (Phase 2 – Tract 31462-7,-8 of the Oak Valley Specific Plan [No. 318]) and are tributary to an existing infiltration basin. See Appendix 6 for previously approved water quality swale calculations.

DMA-F drains south towards the San Timoteo Creek Reach. This area is considered self-treating as it is all natural.

The proposed BMP's are proposed for storm water quality treatment. The temporary infiltration basins were sized to the appropriate design flow required for water quality purposes.

Onsite flows will predominantly be intercepted by proposed concrete channels and catch basins which convey flows to their respective bioretention basin (Basins 1 and 2) as shown on the WQMP Site Plan. Pre-treatment will be provided in the form of three (3) full-trash capture Stormtek Connector Pipe Screens or approved equivalents, each placed within the most downstream manhole of the three mainlines connecting into the basins. The pipe screen will attach to the junction structure wall in front of the outflow pipe to the basin. Flows from the bioretention basins will be discharged towards the San Timoteo Creek Reach via control structures. Refer to Appendix 4 for existing storm drain as-builts.

A.2 Receiving Waters

In order of upstream to downstream, the receiving waters that the project site is tributary to are as follows. A map of the receiving waters is included in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	Hydrologic Unit	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Santa Ana River, Reach 4	801.21	Indicator Bacteria	GWR, REC1, REC2, WARM, WILD, RARE, SPWN	17 Miles

Santa Ana River, Reach 3	801.21	Copper, Lead, Indicator Bacteria	AGR, GWR, REC1, REC2, WARM, WILD, RARE, SPWN	21 Miles
Santa Ana River Reach 2	801.11, 801.12	N/A	AGR, GWR, REC1, REC2, WARM, WILD, RARE, SPWN	53 Miles
Santa Ana River Reach 1	801.11	N/A	WARM, WILD, REC1, REC2	N/A
San Timoteo Creek Reach 3	801.61	Indicator Bacteria	GWR, WARM, WILD, RARE, REC1, REC2	2 Miles
San Timoteo Creek Reach 2	801.61	Indicator Bacteria	GWR, WARM, WILD, RARE, REC1, REC2	3 Miles
San Timoteo Creek Reach 1A	801.52	Indicator Bacteria	AGR, REC1, REC2, WARM, WILD, RARE	14 Miles
Goldenstar Creek	801.27	Indicator Bacteria	MUN, REC1, REC2, WARM, WILD, RARE, SPWN	17 Miles
Prado Basin	802.21	pH	REC1, REC2, WARM, WILD, RARE	34 Miles
Warm Springs Creek	801.72	Phosphorus, iron, nitrogen, indicator bacteria, chlorpyrifos, manganese	GWR, REC1, REC2, COLD, WILD, RARE	31 Miles
Canyon Lake	802.11, 802.12	Nutrients	AGR, GWR, MUN, REC1, REC2, WARM, WILD, COMM	N/A
San Jacinto River	802.11	None	AGR, GWR, MUN, REC1, REC2, WARM, WILD, COMM	6 Miles

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

Table A.2 Other Applicable Permits

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

Section B: Optimize Site Utilization (LID Principles)

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

Site Optimization

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

Yes. The sites existing drainage patterns flow from northeast to southwest to an existing temporary basin at the southwestern boundary of the project site. In addition, existing on site storm drain systems follow this drainage pattern and proposed storm drain systems and their related BMPs shall be placed downstream of these systems.

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

Yes. The project identifies and protects existing vegetation. Residential lots have been designed around existing golf course landscaping and natural vegetation. All vegetation will remain untouched besides where development occurs.

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

Yes. The project identifies and preserves natural infiltration capacity. Bioretention basins have been placed in locations where infiltration rates are sufficient to support partial infiltration capabilities during grading. These areas are shown in the geotechnical report.

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

Yes. The project identifies and minimizes impervious area, street widths are minimized to the acceptable city standards and sidewalks include reduced widths.

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

Yes. The project identifies and disperses runoff to impervious areas. Surface drainage follows to side yard swales and street gutters to bioretention basins before exiting the site through a storm drain system.

Section C: Delineate Drainage Management Areas (DMAs)

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)	Area (Sq. Ft.)	DMA Type
DMA A	Roofs/Concrete/Asphalt/Landscape/Natural Soil B	2,151,428	D
DMA B	Roofs/Concrete/Asphalt/Landscape	1,808,176	D
DMA C	Roofs/Concrete/Asphalt/Landscape	549,727	D
DMA D	Roofs/Concrete/Asphalt/Landscape	2,559,586	D
DMA E	Roofs/Concrete/Asphalt/Landscape	425,581	N/A
DMA F	Landscape/Natural Soil B	121,097	A

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

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
DMA F	121,097	Vegetation	Drip

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

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

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

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

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

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

DMA Name or ID	BMP Name or ID
DMA A	Basin 2 – Bioretention Basin
DMA B	Basin 1 – Bioretention Basin
DMA C	Temporary Sediment Basin (A permanent LID BMP to be provided prior to discharging into Basin 1)
DMA D	Separate LID BMP to be provided prior to discharging into Basin 1
DMA E	Tract 31462-8 Grassy Swale LID BMP
DMA F	Self-Treating

Section D: Implement LID BMPs

D.1 Infiltration Applicability

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

Geotechnical Report

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

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

Infiltration Feasibility

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		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 B (Basin 1) – 0.5 in/hr		
…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: DMA A (Basin 2) – Engineered fill condition significantly decreases infiltration feasibility within Basin 2		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		X
Describe here:		

D.2 Harvest and Use Assessment

The following conditions apply*:*

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

☐ Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verified with the City of Beaumont).

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

☒ None of the above.

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: *35.45 acres*

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

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

Total Area of Impervious Surfaces: 137 acres

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

The project EIATIA factor: *1.59 (Design Storm Depth = 0.75 in)*

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: *217.83 acres*

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

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
217.83 acres	35.43 acres (insufficient)

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: 385 Users

Project Type: Residential

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

Total Area of Impervious Surfaces: 137 acres

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-1 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

The project TUTIA factor: 123 (Design Storm Depth = 0.75 in)

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: 16,851 Users

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)
16,851 Users	385 Users (insufficient)

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.

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

Average Daily Demand: N/A

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

Total Area of Impervious Surfaces: N/A

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

The project factor: N/A

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

Minimum required use: N/A

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

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

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

D.3 Bioretention and Biotreatment Assessment

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

For the project, the following applies:

☒ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (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 City of Beaumont to discuss this option. If you checked this box, then proceed to Section E to document your alternative compliance measures.

☐ None of the above.

D.4 Feasibility Assessment Summaries

Table D.2 LID Prioritization Summary Matrix

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

DMA A and DMA B will be treated onsite. DMA A will be routed to a bioretention basin (Basin 2), and DMA B will be routed to a bioretention basin (Basin 1) for water quality treatment before entering respective perforated basin underdrains and discharging to their respective proposed outlets along Oak Valley Parkway.

DMA C and DMA D will not be treated in this phase, however, runoff generated within these DMAs will be routed to Basin 1. Separate water quality treatment BMPs will be provided within these DMAs prior to discharging into Basin 1. Both DMAs are considered off-site for the proposed improvements. During this phase, a temporary sediment control basin will be provided within DMA C.

DMA E will be routed to an existing grassy swale water quality treatment BMP located within Tract 31462-8. Flows are adequately treated in existing grassy swales which have been constructed and approved under previous WQMP Report (Phase 2 – Tract 31462-7,-8 of the Oak Valley Specific Plan [No. 318]) and are tributary to an existing infiltration basin. See Appendix 6 for previously approved water quality swale calculations.

D.5 LID BMP Sizing

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First, calculate the Design Capture Volume for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second, design the LID BMP to meet the required V_{BMP} using a method approved by the City of Beaumont. Utilize the worksheets found in the LID BMP Design Handbook or consult with the City of Beaumont 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	*Basin 2*		
	[A]		[B]	[C]	[A] x [C]	*Design Storm Depth (in)*	*Design Capture Volume, **V_{BMP}** (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA A	*1,218,068*	*Concrete or Asphalt*	*1*	*0.89*	*1,086,517*			
DMA A	*655,883*	*Ornamental Landscaping*	*0.1*	*0.11*	*72,447.5*			
DMA A	*277,477*	*Natural (B Soil)*	*0.15*	*0.14*	*39,248*			
	2,151,428.4				1,198,212.4	0.75	74,888	890,918

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Basin 1*		
	[A]		[B]	[C]	[A] x [C]	*Design Storm Depth (in)*	*Design Capture Volume, **V_{BMP}** (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA B	*1,338,050*	*Concrete or Asphalt*	*1*	*0.89*	*1,193,540.6*			
DMA B	*470,126*	*Ornamental Landscaping*	*0.1*	*0.11*	*51,929.1*			
	1,808,176				1,245,469.7	0.75	77,841.9	495,927

*Note that Tract 31462-8 provides water quality treatment for DMA-E.

[B], [C] are obtained from Section 2.3.1 of the WQMP Guidance Document
[E] is obtained from Exhibit A of the WQMP Guidance Document
[G] is obtained from LID BMP design procedure sheet, placed in Appendix 6

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to confirmation of LID waiver approval by the Regional Board). For the project, the following applies:

☒ 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 Regional Board 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 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 Pollutants of Concern

Table E.1 Potential Pollutants by Land Use Type

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

P = Potential

N = Not Potential

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

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

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

(4) *Specifically petroleum hydrocarbons*

(5) *Specifically solvents*

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

E.2 Stormwater Credits - N/A Bioretention BMPs Used

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 - N/A Bioretention BMPs Used

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
	[A]		[B]	[C]	[A] x [C]
	$A_T = \Sigma[A]$				Σ= [D]

Enter BMP Name / Identifier Here			
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)*
[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 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

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 Referenced from Table E.1 above.
[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

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

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

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

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

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

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

Results included in Table F.1 below and hydrologic analysis included in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration (min)	15.92	16.62	-2.3%
Flow (CFS)	17.24	14.68	-2.56 cfs (mitigated)
Volume (Cubic Feet)	469,368	461,683	-7,685 CF (mitigated)

[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 (Prado Dam, Santa Ana River) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

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

F.2 HCOC Mitigation

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

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

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

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

☐ d. None of the above.

This project has been determined to be susceptible are for hydromodification concerns.

Section G: Source Control BMPs

The following table identifies the potential sources of runoff pollutants for this project and specifies how they are addressed through permanent controls and operational BMPs:

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
On-site storm drain inlets	Mark all inlets with the words "Only Rain Down the Storm Drain" or similar	Maintain and periodically repaint or replace inlet markings. 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."
Plazas, Sidewalks, and Parking Lots	N/A	Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.
Landscape/Outdoor Pesticide Use	Preserve existing native vegetation to the maximum extent possible. Design landscaping to minimize irrigation and runoff, promote surface infiltration, and minimize use of fertilizers and pesticides. Specify plants that are tolerant of saturated soil condition. Consider using pest-resistant plants.	Maintain landscaping using minimum or no pesticides. See applicable operational BMPs. Provide IPM information to new owners, lessees, and operators.

Miscellaneous drain roofing, gutters, and trim	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. 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.	
Refuse Areas	State how site refuse will be handled and provide supporting detail to what is shown on plans. State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.

Section H: Construction Plan Checklist

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Plan Sheet Number(s)
Basin 1	Bioretention Basins sized to capture the adequate Design Volume or HCOC Volume, whichever volume is greater.	Sheet 3-5 of Storm Drain Improvement Plans for Tract No. 31462-17
Basin 2	Bioretention Basins sized to capture the adequate Design Volume or HCOC Volume, whichever volume is greater.	Sheet 3-5 of Storm Drain Improvement Plans for Tract No. 31462-29

Section I: Operation, Maintenance and Funding

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

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred.
3. An outline of general maintenance requirements for the Stormwater BMPs selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance.

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

Maintenance Mechanism: Meritage Homes of California, Inc.

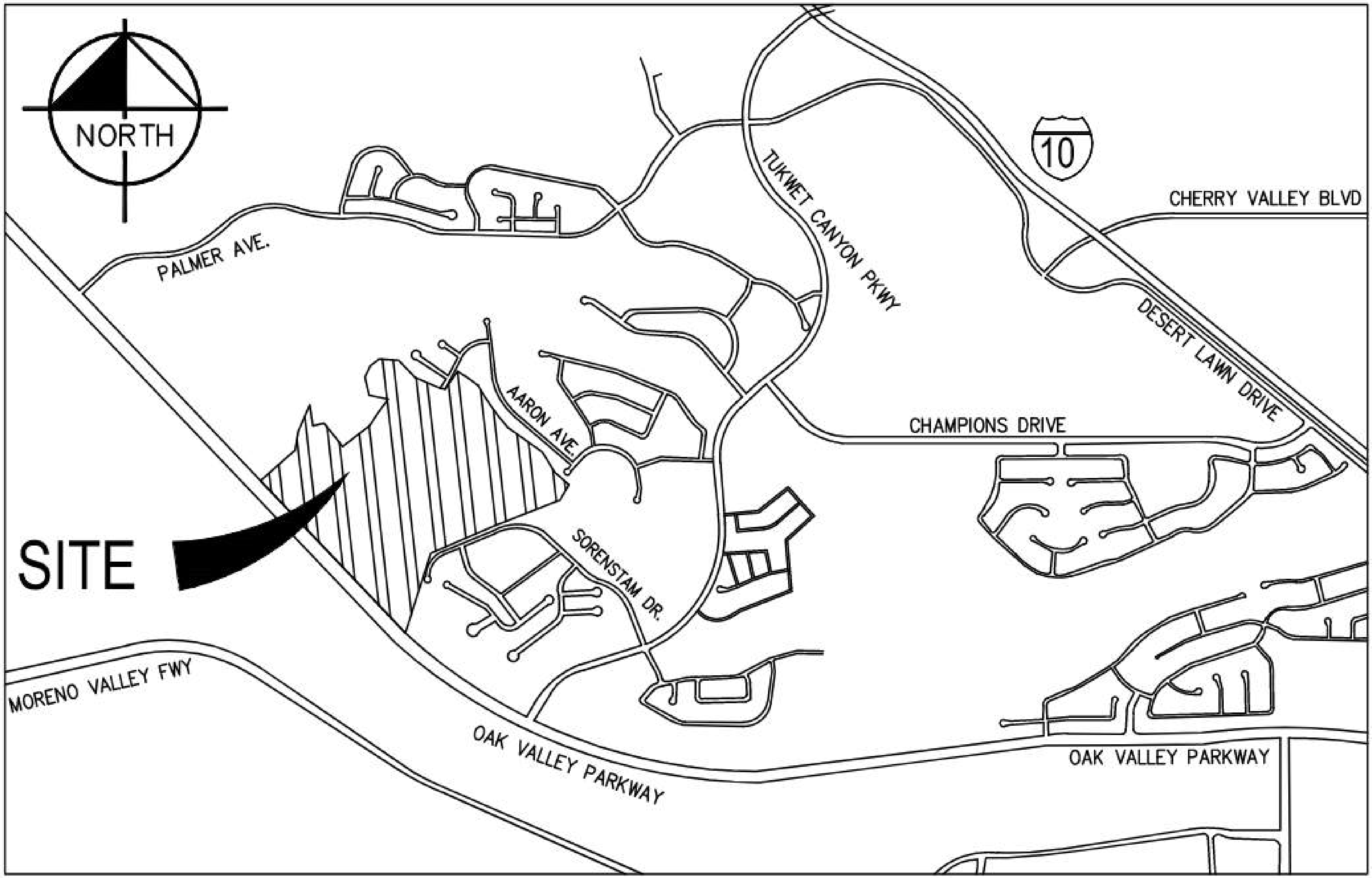
Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

☒ Y ☐ N

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

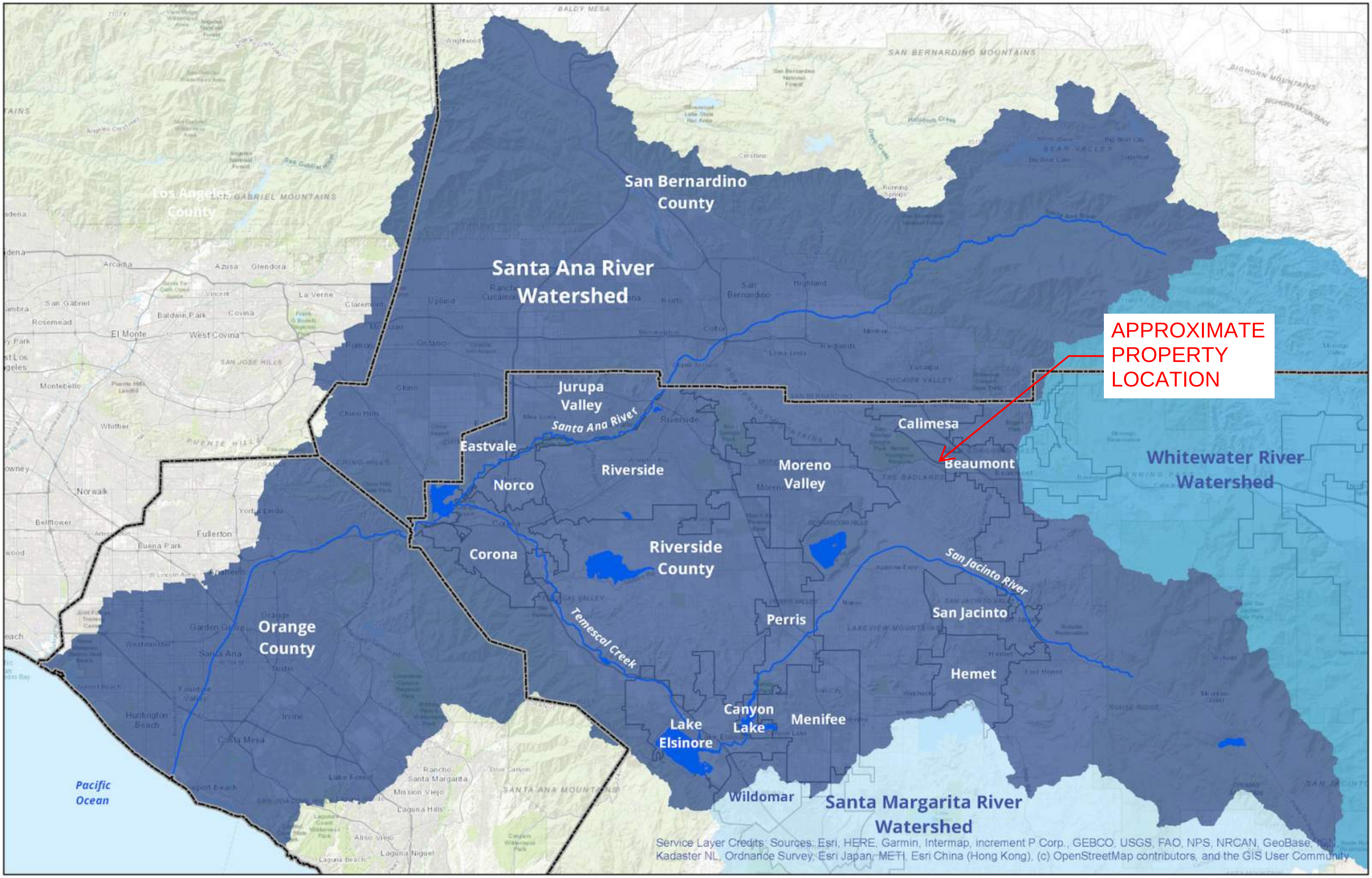
Appendix 1: Maps and Site Plans

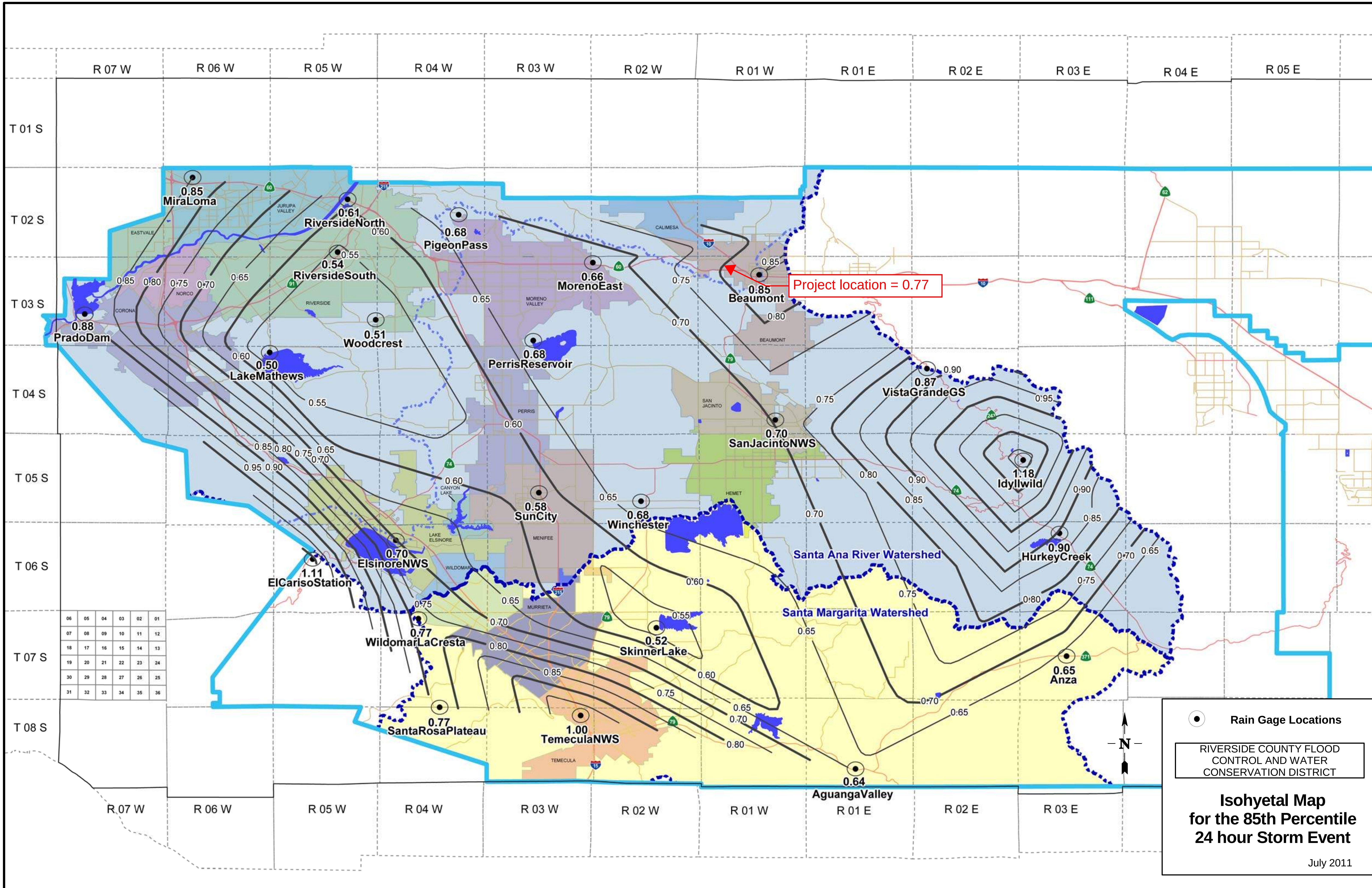
Location Map, WQMP Site Plan and Receiving Waters Map



VICINITY MAP

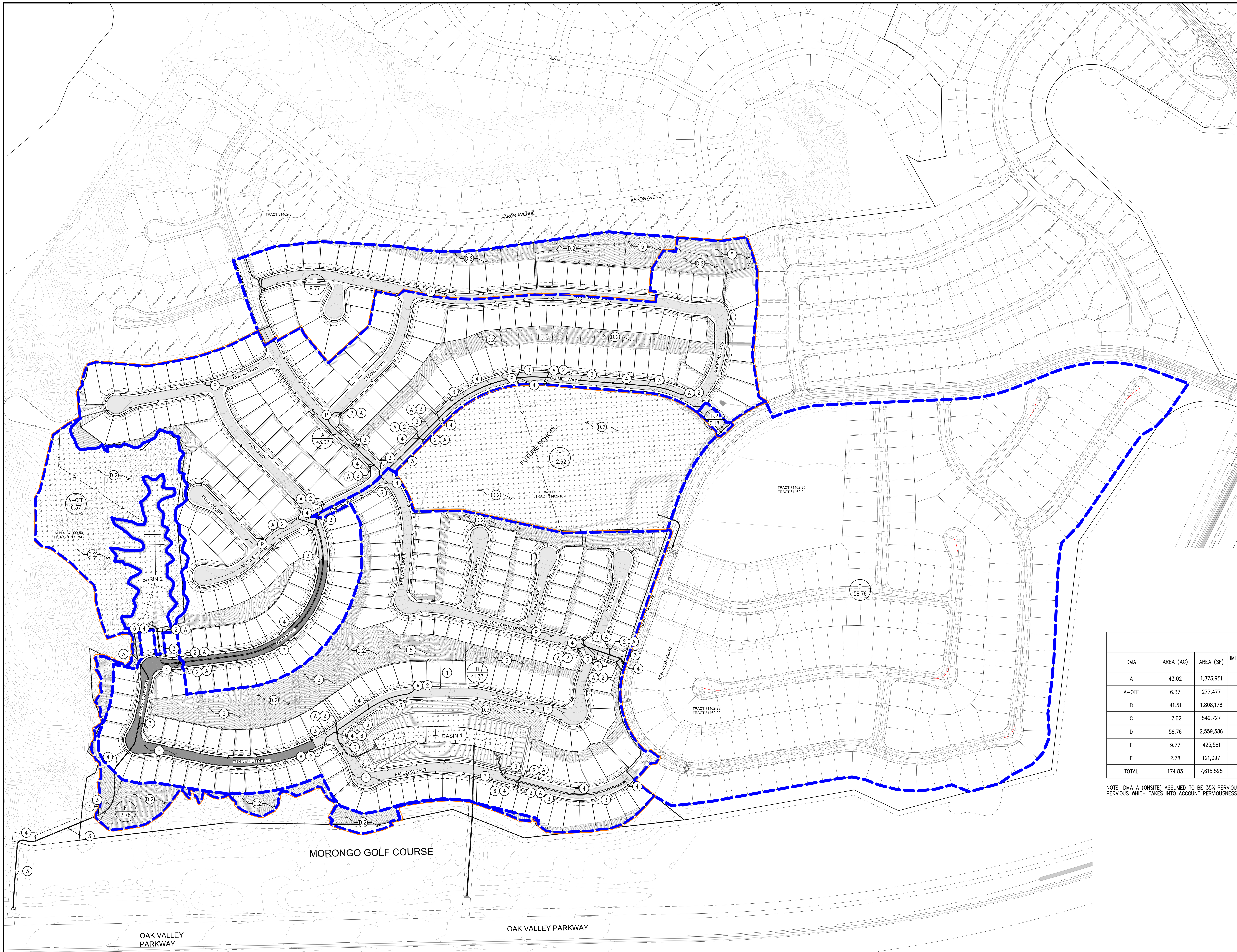
NOT TO SCALE


San Bernardino County
Santa Ana River Watershed
Los Angeles County
APPROXIMATE PROPERTY LOCATION
Jurupa Valley
Santa Ana River
Calimesa
Eastvale
Beaumont
Moreno Valley
Riverside
Norco
Whitewater River Watershed
Riverside County
Corona
San Jacinto River
Orange County
Temescal Creek
Perris
San Jacinto
Hemet
Canyon Lake
Lake Elsinore
Menifee
Pacific Ocean
Wildomar
Santa Margarita River Watershed
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



Isohyetal Map for the 85th Percentile 24 hour Storm Event

July 2011



LEGEND

— — 575 — —	CONTOUR
	PROPERTY LINE
	DMA BOUNDARY
	RIGHT-OF-WAY
DMA XX / XX AC	DRAINAGE MANAGEMENT AREA NAME / AREA (IN ACRES)
	PERFORATED BASIN UNDERDRAIN (6")
	PROJECT BOUNDARY
— > — > —	FLOW PATH
	LANDSCAPED AREA

STRUCTURAL BMP NOTES

1. PROPOSED BIORETENTION BASIN PER DETAIL 1 AND 2.
2. PROPOSED CATCH BASIN.
3. PROPOSED STORM DRAIN PIPE.
4. PROPOSED MANHOLE.
5. PROPOSED TERRACE DRAINS.
6. PROPOSED FULL-TRASH CAPTURE STORMTEK CONNECTOR PIPE SCREEN INSERT OR APPROVED EQUAL.

STRUCTURAL SOURCE CONTROL BMP NOTES

A STORM DRAIN INLET – MARK ALL INLETS WITH WORDS "ONLY RAIN DOWN THE STORM DRAIN" OR SIMILAR.

D.2 LANDSCAPE DESIGN TO MINIMIZE THE USE OF FERTILIZERS AND PESTICIDES: LANDSCAPE PALATE TO CONSIST OF PLANTS APPROPRIATE FOR SITE SOILS, SLOPES, CLIMATE, SUN, WIND, RAIN, AND LAND USE.

P PLAZAS, SIDEWALKS, AND PARKING LOTS TO BE SWEPT CLEAN REGULARLY TO PREVENT THE ACCUMULATION OF LITTER AND DEBRIS.

NOTE: SOURCE CONTROL BMPS MAY ALSO INCLUDE BUT ARE NOT LIMITED TO:

- G. REFUSE AREAS
- O. MISCELLANEOUS DRAIN OR WASH WATER OR OTHER SOURCES (ROOFING, GUTTERS, AND TRIM)

NOTES

1. DRAINAGE MANAGEMENT AREA C (DMA C) WILL NOT BE TREATED DURING THIS PHASE OF CONSTRUCTION. THE AREA HAS BEEN RESERVED FOR A FUTURE SCHOOL DEVELOPMENT. A SEDIMENT BASIN WAS SIZED FOR TEMPORARY SEDIMENT CONTROL DURING MASS GRADING.
2. DRAINAGE MANAGEMENT AREA D (DMA D) WILL NOT BE TREATED WITHIN THIS WQMP. FLOWS FROM DMA D ARE CONSIDERED PROJECT RUN-ON AND HAVE BEEN ACCOUNTED FOR WITHIN BASIN ROUTING CALCULATIONS. DMA D WILL PROVIDE THEIR OWN RESPECTIVE LID BMPS FOR WATER QUALITY TREATMENT PRIOR TO DISCHARGING INTO BASIN 1.
3. DRAINAGE MANAGEMENT AREA E (DMA E) DRAINS TO THE EXISTING STORM DRAIN SYSTEM CONNECTED TO THE NORTHERN ADJACENT DEVELOPMENT (TRACT 31462-8). FLOWS ARE TREATED WITHIN THE EXISTING GRASSY SWALES UNDER PREVIOUS WQMP REPORT (PHASE 2 – TRACT 31462-7, 31462-8 OF THE OAK VALLEY SPECIFIC PLAN [NO. 318] AND TRIBUTARY TO AN EXISTING INFILTRATION BASIN. REFER TO WQMP APPENDIX 6 FOR THE PREVIOUSLY APPROVED WATER QUALITY SWALE CALCULATIONS.

WATER QUALITY SUMMARY

DMA	AREA (AC)	AREA (SF)	IMPERVIOUS AREA (SF)	PERVIOUS AREA (SF)	IMPERVIOUS %	BMP ID	WATER QUALITY VOLUME (CF)	VOLUME PROVIDED (CF)
A	43.02	1,873,951	1,218,068	655,883	65	BASIN 2	74,888	890,918
A-OFF	6.37	277,477	0	277,477	0	BASIN 2		
B	41.51	1,808,176	1,338,050	470,126	74	BASIN 1	77,504	495,927
C	12.62	549,727	406,798	142,929	74	N/A	–	–
D	58.76	2,559,586	1,791,710	767,876	70	N/A		–
E	9.77	425,581	276,628	148,953	65	N/A	–	–
F	2.78	121,097	0	121,097	0	SELF-TREATING	–	–
TOTAL	174.83	7,615,595	5,031,254	2584341	66	–	152,392	1,386,845

NOTE: DMA A (ONSITE) ASSUMED TO BE 35% PERVIOUS WHICH TAKES INTO ACCOUNT PERVIOUSNESS FROM RESPECTIVE DMA LOT AREAS. DMA B ASSUMED TO BE 36% PERVIOUS WHICH TAKES INTO ACCOUNT PERVIOUSNESS FROM RESPECTIVE DMA LOT AREAS.

NORTH

GRAPHIC SCALE IN FEET
0 75 150 300

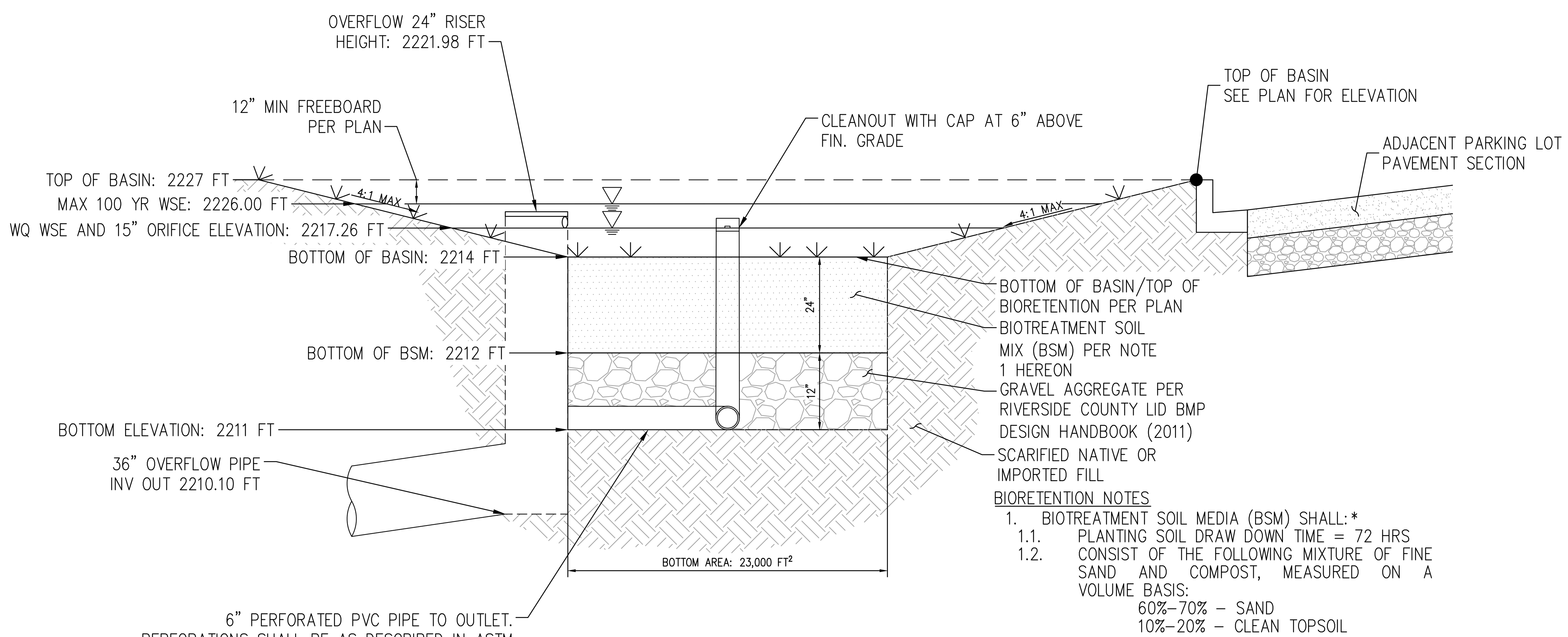
REVISIONS	DATE	BY

FAIRWAY_CANYON_PHASE_4C

WQMP–EXHIBIT

SCALE: 1"=150'	Kimley»Horn	PROJ. #195261012
DATE: 6/3/2024	3801 UNIVERSITY AVE, SUITE 300, RIVERSIDE, CA 92501	SHEET 1 OF 1 SHEETS
DESIGNED: AG	PHONE: (951) 543-9868 WWW.KIMLEY-HORN.COM	DWG. NO.
CHECKED: LAC		
PLN CK REF:		
F.B.		

K:\RIV_LDEV\195261012 – MLC FAIRWAY CANYON 4C\CAD\EXHIBITS\H&H\WQMP EXHIBIT.DWG 8/26/2024 4:11:54 PM



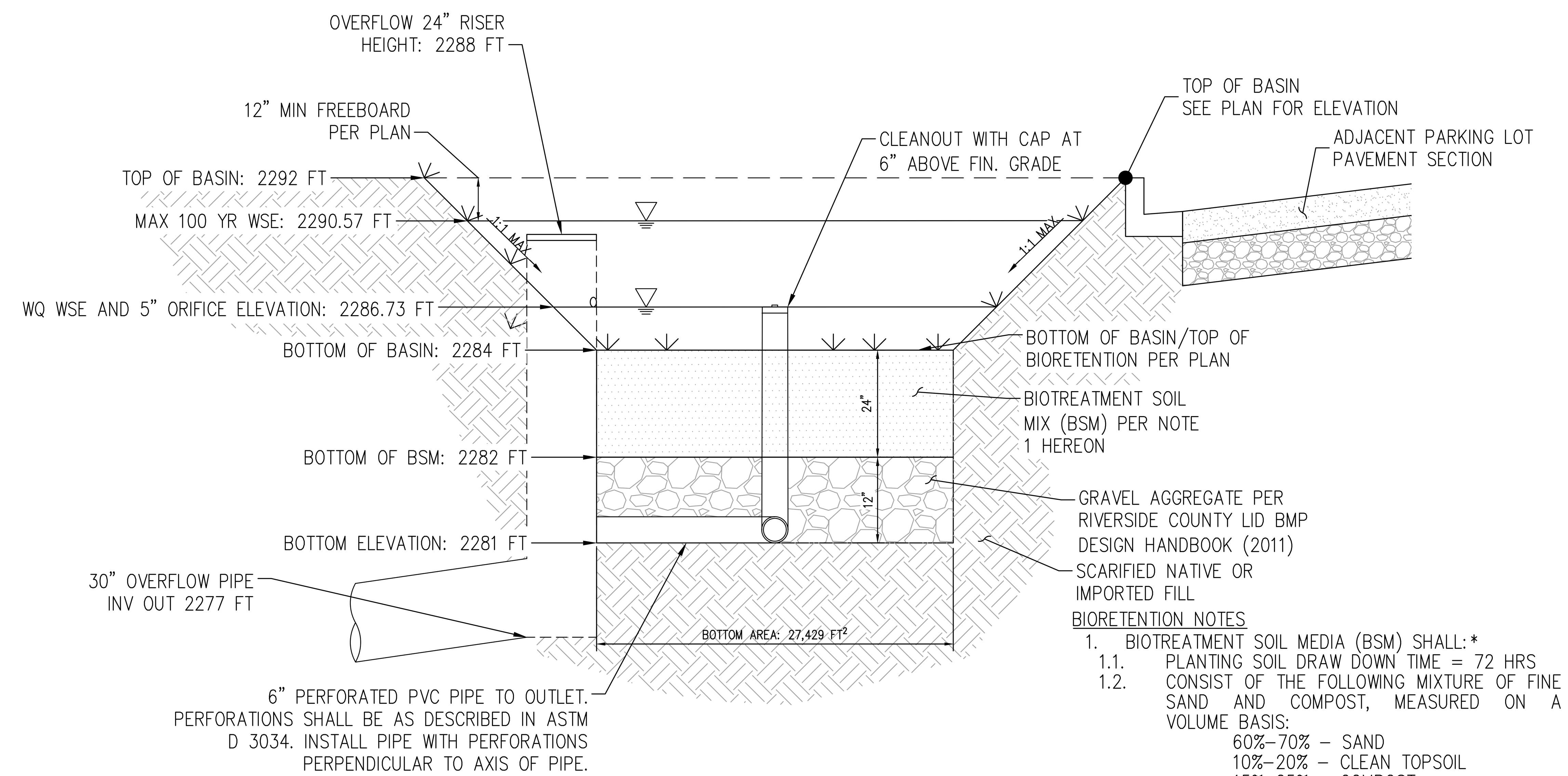
BIORETENTION AREA - BASIN 1

N.T.S.

BIORETENTION NOTES

1. BIOTREATMENT SOIL MEDIA (BSM) SHALL:*
   1.1. PLANTING SOIL DRAW DOWN TIME = 72 HRS
   1.2. CONSIST OF THE FOLLOWING MIXTURE OF FINE SAND AND COMPOST, MEASURED ON A VOLUME BASIS:
      60%-70% – SAND
      10%-20% – CLEAN TOPSOIL
      15%-25% – COMPOST

*REFERENCE THE RIVERSIDE COUNTY LID BMP DESIGN HANDBOOK (2011)



BIORETENTION AREA - BASIN 2

N.T.S.

BIORETENTION NOTES

1. BIOTREATMENT SOIL MEDIA (BSM) SHALL:*
   1.1. PLANTING SOIL DRAW DOWN TIME = 72 HRS
   1.2. CONSIST OF THE FOLLOWING MIXTURE OF FINE SAND AND COMPOST, MEASURED ON A VOLUME BASIS:
      60%-70% – SAND
      10%-20% – CLEAN TOPSOIL
      15%-25% – COMPOST

*REFERENCE THE RIVERSIDE COUNTY LID BMP DESIGN HANDBOOK (2011)

REVISIONS	DATE	BY

FAIRWAY_CANYON_PHASE_4C

WQMP–DETAIL–1

SCALE: 1"=150'
DATE: 8/27/2024
DESIGNED: AG
CHECKED: LAC
PLN CK REF:
F.B.

Kimley»Horn
3801 UNIVERSITY AVE, SUITE 300, RIVERSIDE, CA 92501
PHONE: (951) 543-9868 WWW.KIMLEY-HORN.COM

PROJ. #195261012
SHEET 1
OF 1 SHEETS
DWG. NO.

\\RVFP01\CA_RIV2\RIV_LDEV\195261012 – MLC FAIRWAY CANYON 4C\CAD\EXHIBITS\Wet\WQMP EXHIBIT_RECOVER.DWG 8/26/2024 5:57:18 PM

Appendix 2: Construction Plans

Grading and Drainage Plans

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS
TRACT NO. 31462-19
LINE "H-1" & LINE "H-2"

GENERAL NOTES

1. THE CONTRACTOR SHALL CONSTRUCT THE DRAINAGE IMPROVEMENT SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT DESIGN MANUAL STANDARD DRAWINGS, RECENT EDITION, AND IN CONFORMANCE WITH THE REQUIREMENTS OF THE BEAUMONT DRAINAGE MANAGEMENT PLAN.
2. THE CONTRACTOR IS REQUIRED TO CONTACT ALL UTILITY AGENCIES REGARDING TEMPORARY SUPPORT AND SHORING REQUIREMENTS FOR THE VARIOUS UTILITIES SHOWN IN THE PLANS.
3. CONSTRUCTION INSPECTION WILL BE PERFORMED BY CITY OF BEAUMONT. CONTACT (951) 769-8520. THE CITY MUST BE NOTIFIED ONE WEEK PRIOR TO CONSTRUCTION.
4. ALL STATIONING REFERS TO THE CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
5. STATIONING FOR LATERALS AND CONNECTOR PIPE REFER TO THE CENTERLINE-CENTERLINE-INTERSECTION STATION.
6. FORTY-EIGHT HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT 1-800-227-2600.
7. ALL CROSS SECTIONS ARE TAKEN LOOKING UPSTREAM.
8. ELEVATIONS AND LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE UNLESS OTHERWISE NOTED. ALL UTILITIES SHOWN ARE TO BE PROTECTED IN PLACE UNLESS OTHERWISE NOTED.
9. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6 INCHES OF CLASS "B" CONCRETE.
10. PIPE CONNECTED TO THE MAINLINE PIPE SHALL CONFORM TO JUNCTION STRUCTURE NO. 4 (JS 229) UNLESS OTHERWISE NOTED.
11. PIPE BEDDING SHALL CONFORM TO R.C.F.C. & W.C.D. STD. DWG. M 815.
12. V" IS THE DEPTH OF INLET AT THE CATCH BASINS MEASURED FROM THE TOP OF THE CURB TO THE INVERT OF CONNECTOR PIPE.
13. ALL CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS, AND OTHER EXISTING IMPROVEMENTS TO BE RECONSTRUCTED IN KIND PER LATEST COUNTY STANDARD AND AT THE SAME ELEVATION AND LOCATION AS THE EXISTING IMPROVEMENTS UNLESS OTHERWISE NOTED. FOR PAVEMENT OVERLAY, 0.10' MIN. FOR FULL LANE WIDTH IS REQUIRED.
14. HYDRAULIC GRADE LINES SHOWN IN PROFILES ARE FOR 100 YEAR FREQUENCY FLOWS, UNLESS OTHERWISE NOTED.
15. THE CONTRACTOR SHALL COMPLY WITH THE STATE AND LOCAL SAFETY CODES DURING THE PROGRESS OF WORK.
16. THE CONTRACTOR SHALL MAINTAIN ADJACENT STREETS IN A NEAT, SAFE, CLEAN AND SANITARY CONDITION AT ALL TIMES AND TO THE SATISFACTION OF THE COUNTY'S OR DISTRICT'S INSPECTOR. THE ADJACENT STREETS SHALL BE KEPT CLEAN OF DEBRIS, WITH DUST AND OTHER NUISANCE BEING CONTROLLED AT ALL TIMES. THE DEVELOPER SHALL BE RESPONSIBLE FOR ANY CLEAN UP ON ADJACENT STREETS AFFECTED BY HIS CONSTRUCTION. METHOD OF STREET CLEANING SHALL BE DRY SWEEPING OF ALL PAVED AREAS.
17. THE CONTRACTOR AGREES THAT HE/SHE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER, CITY OF BEAUMONT, AND THE DEVELOPER'S ENGINEER, HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNERS OR THE DEVELOPER'S ENGINEER.
18. ALL PIPE LENGTHS ARE HORIZONTAL PROJECTIONS (NOT TRUE LENGTHS OF PIPE) AND ARE THE BASIS OF THE ESTIMATES OF QUANTITIES. THE CONTRACTOR SHALL DETERMINE THE TRUE QUANTITY OF PIPE REQUIRED FOR THIS PROJECT PRIOR TO PLACING THE ORDER.
19. ALL ELEVATIONS SHOWN ARE TO THE INVERTS OF PIPE, EXCEPT WHERE OTHERWISE NOTED.
20. AT THE DISCRETION OF THE ENGINEER AND THE CITY OF BEAUMONT, THE CONTRACTOR MAY BE REQUIRED TO VERIFY, BY POTHOLING, THE LOCATION OF POTENTIALLY AFFECTED UTILITIES.
21. . CONTRACTOR SHALL DISPOSE OF ALL EXCESS EXCAVATED MATERIAL AT MANDATORY DISPOSAL.
22. ALL BACKFILL AND BEDDING AROUND STRUCTURES AND PIPES SHALL BE COMPACTED TO NOT LESS THAN 90 PERCENT RELATIVE COMPACTION EXCEPT WHERE SUCH MATERIAL IS PLACED UNDER EXISTING PAVED ROADWAYS. THE TOP 3 FEET, MEASURED FROM THE FINISH PAVING, SHALL BE COMPACTED TO 95 PERCENT RELATIVE COMPACT.
23. ALL SURVEY MONUMENTS SHALL BE REPLACED AS REQUIRED. MONUMENTS SHALL BE TIED OUT PRIOR TO CONSTRUCTION AND REPLACED UPON COMPLETION OF CONSTRUCTION.
24. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/OWNER OR CONTRACTOR TO APPLY TO THE DIRECTOR OF PUBLIC WORKS, CITY OF BEAUMONT FOR AN ENCROACHMENT PERMIT FOR ALL WORK PERFORMED WITHIN PUBLIC RIGHT-OF-WAY, DEDICATED AND ACCEPTED FOR PUBLIC USE; AND TO BE RESPONSIBLE FOR SATISFACTORY COMPLIANCE FOR ALL CURRENT ENVIRONMENTAL REGULATIONS DURING THE LIFE OF CONSTRUCTION ACTIVITIES FOR THIS PROJECT. ADDITIONAL STUDIES AND/OR PERMITS MAY BE REQUIRED.
25. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEARING OF THE PROPOSED WORK AREA, AND RELOCATION COSTS OF ALL EXISTING UTILITIES. PERMITTEE MUST INFORM CITY OF CONSTRUCTION SCHEDULE AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
26. ALL UNDERGROUND FACILITIES WITH LATERALS SHALL BE IN PLACE PRIOR TO PAVING THE STREET, INCLUDING BUT NOT LIMITED TO, THE FOLLOWING: SEWER, WATER, ELECTRIC, STORM DRAINS.
27. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR CONTRACTOR TO INSTALL AND MAINTAIN DURING CONSTRUCTION, REGULATORY GUIDE AND WARNING SIGNS WITHIN THE PROJECT LIMITS AND ITS SURROUNDINGS TO PROVIDE SAFE PASSAGE FOR THE TRAVELING PUBLIC AND WORKERS UNTIL THE FINAL COMPLETION AND ACCEPTANCE OF THE PROJECT BY THE CITY OF BEAUMONT.
28. CONSTRUCTION PROJECTS THAT DISTURB MORE THAN ONE ACRE MUST OBTAIN A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT. OWNER/DEVELOPERS ARE REQUIRED TO FILE A NOTICE OF INTENT (NOI) WITH THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) AND COMPLY WITH ALL REQUIREMENTS OF THE BEAUMONT DRAINAGE MANAGEMENT PLAN. BEAUMONT IS CO-PERMITTEE WITH R.C.F.C. & W.C.D.
29. ALL STORM DRAINS, CATCH BASINS, AND STORM WATER RUNOFF STRUCTURES WILL BE PROVIDED WITH ADEQUATE CAPABILITIES TO FILTER AND RETAIN SEDIMENT AND DIRT, OIL, AND GREASE, TO PREVENT POLLUTION IN STORM WATER RUNOFF IN COMPLIANCE WITH THE CITY OF BEAUMONT'S BEST MANAGEMENT PRACTICES AND THE BEAUMONT DRAINAGE MASTER PLAN FOR STORM WATER AS WELL AS BEST MANAGEMENT PRACTICES IDENTIFIED IN THE CURRENT REPORT OF WASTE DISCHARGE FOR RIVERSIDE COUNTY PERMITTEE.
30. DEVELOPER SHALL BE FULLY RESPONSIBLE IN ASSURING THAT PROPOSED IMPROVEMENTS CONFORM TO THE APPROVED PLANS, SPECIFICATIONS AND CITY OF BEAUMONT STANDARDS. WHERE DEVIATIONS EXIST, DEVELOPER SHALL PROPOSE CORRECTIVE MEASURES FOR REVIEW AND APPROVAL BY THE CITY.

NOTE:

1. APPROVAL OF THESE PLANS APPLY ONLY WITHIN THE JURISDICTION OF THE CITY OF BEAUMONT.
2. TRENCHING FOR UTILITIES AND STRUCTURES IS NOT ALLOWED UNTIL SOIL COMPACTION REPORT IS SUBMITTED AND APPROVED BY THE PUBLIC WORK DEPARTMENT.
3. THE CITY RESERVES THE RIGHT TO REQUIRE REVISION OF THE APPROVED PLANS TO CONFORM WITH CURRENT STANDARDS AND TO POST A NEW BOND IF CONSTRUCTION HAS NOT COMMENCED WITHIN TWO YEARS AFTER PLANS WERE APPROVED.
4. HE DEVELOPER SHALL HAVE GEOTECHNICAL/SOILS ENGINEERING FIRM OBSERVE TRENCHING, BACKFILLING, AND SOIL COMPACTION OF ALL UTILITY TRENCHES WITHIN ALL EASEMENTS AND ROAD RIGHTS OF WAY. TWO SETS OF COMPACTION REPORTS CERTIFYING THAT WORKS WERE DONE IN CONFORMANCE TO STANDARDS AND GEOTECHNICAL REPORT SHALL BE SUBMITTED AFTER EACH UTILITY TRENCH IS COMPLETED AND CERTIFIED. COMPACTION REPORT MUST BE SUBMITTED TO THE DEPT. OF PUBLIC WORKS AT LEAST TWO WORKING DAYS BEFORE AGGREGATE BASE MATERIALS ARE PLACED ONSITE.

SEE SHEET NO. 2 FOR INDEX MAP

*RCP NOTES:

1. THE CONCRETE COATING ON THE INSIDE OF ALL REINFORCED CONCRETE PIPES MUST BE INCREASED TO PROVIDE A MINIMUM OF 1-1/2"OVER THE REINFORCING WHEN THE DESIGN VELOCITIES EXCEED 20 FEET PER SECOND. THE CONCRETE DESIGN STRENGTH IN THESE REACHES SHALL BE $f'c$ = 5,000 PSI FOR VELOCITIES EXCEEDING 20 FEET PER SECOND AND $f'c$ = 6,000 PSI FOR VELOCITIES EXCEEDING 30 FPS.
2. THE JOINTS FOR REINFORCED CONCRETE PIPES UNDER PRESSURE FLOW CONDITIONS SHALL BE WATERTIGHT IN CONFORMANCE WITH ASTM C443.

DECLARATION OF RESPONSIBLE CHARGE:

I HEREBY DECLARE THAT I AM THE ENGINEER OF RECORD FOR THIS PROJECT AND THAT THE DESIGN OF THE IMPROVEMENTS SHOWN ON THESE PLANS COMPLIES WITH ALL PROFESSIONAL ENGINEERING STANDARDS AND PRACTICES. I ASSUME FULL RESPONSIBILITY FOR ALL ASPECTS OF THE DESIGN OF THE IMPROVEMENTS. WITH RESPECT TO THE PLAN CHECK PERFORMED BY THE CITY OF BEAUMONT, I UNDERSTAND AND ACKNOWLEDGE THE FOLLOWING: (1) THE PLAN CHECK IS A REVIEW FOR THE LIMITED PURPOSE OF ENSURING THE PLANS COMPLY WITH THE CITY'S STANDARDS, PROCEDURES, POLICIES, AND ORDINANCES; (2) THE PLAN CHECK IS NOT A DETERMINATION OF THE TECHNICAL ADEQUACY OF THE DESIGN OF THE IMPROVEMENTS; AND, (3) THE PLAN CHECK DOES NOT RELIEVE ME OF MY LEGAL AND PROFESSIONAL RESPONSIBILITY FOR THE DESIGN OF THE IMPROVEMENTS. TO THE FULL EXTENT PERMITTED BY LAW, I AGREE TO DEFEND, INDEMNIFY, AND HOLD HARMLESS THE CITY, ITS ELECTED OFFICIALS, EMPLOYEES, AND AGENTS FROM ANY AND ALL ACTUAL OR ALLEGED CLAIMS, DEMANDS, CAUSES OF ACTION, LIABILITY, LOSS, DAMAGE, OR INJURY TO PROPERTY OR PERSONS, INCLUDING WRONGFUL DEATH, WHETHER IMPOSED BY A COURT OF LAW OR BY ADMINISTRATIVE ACTION OF ANY FEDERAL, STATE OR LOCAL GOVERNMENTAL AGENCY, TO THE EXTENT ARISING OUT OF OR INCIDENT TO ANY NEGLIGENT ACTS, OMISSIONS, OR ERRORS BY THE ENGINEER OF RECORD, ITS EMPLOYEES, CONSULTANTS, OR AGENTS.

FIRM: KIMLEY HORN & ASSOCIATES, INC.
ADDRESS: 3801 UNIVERSITY AVE. SUITE 300
CITY, ST.: RIVERSIDE,CA 92501
TELEPHONE: (760) 565-5146
BY: MIKE SUTTON, R.C.E. NO.:C57667 DATE: 7/16/2024
(NAME OF ENGINEER & RCE)

PRIVATE ENGINEERS NOTICE TO CONTRACTOR(S)

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT THOSE SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE ALL PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN, AND ANY OTHER LINES OR STRUCTURES NOT SHOWN ON THESE PLANS AND IS RESPONSIBLE FOR THE PROTECTION OF, AND ANY DAMAGE TO THESE LINES OR STRUCTURES
2. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO NOTIFY THE OWNER OF ALL UTILITIES OR STRUCTURES CONCERNED BEFORE STARTING WORK.
3. QUANTITIES SHOWN HEREON ARE PROVIDED FOR BIDDING PURPOSES ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES PRIOR TO BIDDING FOR CONSTRUCTION.
4. THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER CITY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE CITY.

LEGAL DESCRIPTION

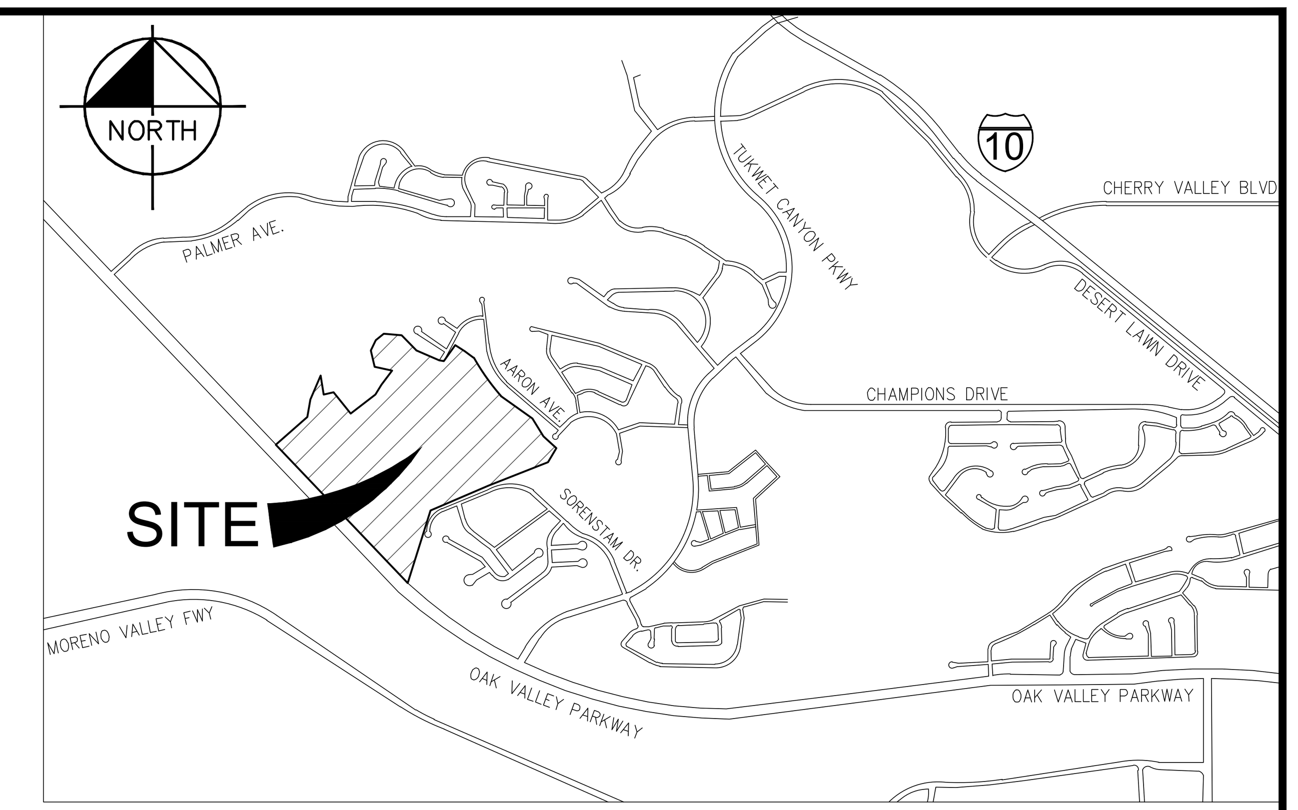
THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF BEAUMONT, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

THE DESIGNATED REMAINDER PARCEL OF PARCEL MAP NO. 38090, IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 254, PAGES 97 THROUGH 103, INCLUSIVE, OF PARCEL MAPS, RECORDS OF SAID COUNTY.

EXCEPTING THEREFROM THE ABOVE PARCEL ANY AND ALL NATURAL OIL, OIL RIGHTS, MINERALS, MINERAL RIGHTS, NATURAL GAS, NATURAL GAS RIGHTS AND OTHER HYDROCARBONS BY WHATSOEVER NAME KNOWN AND ALL RIGHTS THEREIN, GEOTHERMAL STEAM, AND ALL PRODUCTS DERIVED FROM ANY OF THE FOREGOING, THAT MAY BE WITHIN OR UNDER THE LAND, TOGETHER WITH THE PERPETUAL RIGHT OF DRILLING, MINING, EXPLORING AND OPERATING THEREFOR AND STORING IN AND REMOVING THE SAME FROM THE LAND OR ANY OTHER PROPERTY, INCLUDING THE RIGHT TO WHIPSTOCK OR DIRECTIONALLY DRILL AND MINE FROM PROPERTY OTHER THAN THE LAND, OIL OR GAS WELLS, TUNNELS AND SHAFTS INTO, THROUGH OR ACROSS THE SUBSURFACE OF THE LAND, AND TO BOTTOM SUCH WHIPSTOCKED OR DIRECTIONALLY DRILLED WELLS, TUNNELS AND SHAFTS UNDER AND BENEATH OR BEYOND THE EXTERIOR LIMITS THEREOF, AND TO REDRILL, RETUNNEL, EQUIP, MAINTAIN, REPAIR, DEEPEN AND OPERATE ANY SUCH WELLS, TUNNELS OR SHAFTS, WITHOUT THE RIGHT TO DRILL, MINE, STORE OR EXCAVATE THROUGH THE SURFACE OR THE UPPER 500 FEET OF THE SUBSURFACE OR THE LAND AS RESERVED BY OAK VALLEY PARTNERS, L.P. A TEXAS LIMITED PARTNERSHIP WHICH IS REGISTERED IN CALIFORNIA AS OVP, L.P., IN A GRANT DEED RECORDED NOVEMBER 14, 2003, AS INSTRUMENT NO. 2003-899365 OF OFFICIAL RECORDS.

ANY AND ALL WATER, WATER RIGHTS OR INTERESTS THEREIN APPURTENANT OR RELATING TO THE LAND OR OWNED OR USED BY GRANTOR IN CONNECTION WITH OR WITH RESPECT TO THE LAND (NO MATTER HOW ACQUIRED BY GRANTOR), WHETHER SUCH WATER RIGHTS SHALL BE RIPARIAN, OVERLYING, APPROPRIATIVE, LITTORAL, PERCOLATING, PRESCRIPTIVE, ADJUDICATED, STATUTORY OR CONTRACTUAL, TOGETHER WITH THE RIGHT AND POWER TO EXPLORE, DRILL, REMOVE AND RESTORE THE SAME FROM OR IN THE LAND OR TO DIVERT OR OTHERWISE UTILIZE SUCH WATER, RIGHTS OR INTERESTS ON ANY OTHER PROPERTY OWNED BY OR LEASED BY GRANTOR, WITHOUT THE RIGHT TO ENTER UPON THE SURFACE OF THE LAND IN THE EXERCISE OF SUCH RIGHTS; PROVIDED, HOWEVER, ONLY IF AND TO THE EXTENT THAT SUCH RIGHTS ARE NOT USED BY GRANTEE IN ITS USE AND ENJOYMENT OF THE LAND AS RESERVED BY OAK VALLEY PARTNERS, L.P., A TEXAS LIMITED PARTNERSHIP, WHICH IS REGISTERED IN CALIFORNIA AS OVP, L.P., IN A GRANT DEED RECORDED NOVEMBER 14, 2003 AS INSTRUMENT NO. 2003-899365 OF OFFICIAL RECORDS.

APN: 413-790-010



VICINITY MAP
NOT TO SCALE

CONSTRUCTION NOTES

CONSTRUCTION NOTES	QUANTITIES
(1) CONSTRUCT 18" RCP (SEE PROFILE FOR D-LOAD).	*42 LF*
(10) CONSTRUCT MANHOLE NO. 4 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH254	*1 EA*
(12) CONSTRUCT CURB INLET CATCH BASIN AND LOCAL DEPRESSION PER COUNTY OF RIVERSIDE STD. NO. 300 (W & V PER PLAN).	*2 EA*

ENGINEER

KIMLEY HORN & ASSOCIATES, INC.
3801 UNIVERSITY AVE. SUITE 300
RIVERSIDE, CA 92501
ATTN: MICHAEL SUTTON
PHONE: (760) 565-5146
EMAIL: MIKE.SUTTON@KIMLEY-HORN.COM

OWNER/DEVELOPER

MERITAGE HOMES OF CALIFORNIA,
A CALIFORNIA CORPORATION
5 PETERS CANYON ROAD, SUITE 310
IRVINE, CA 92606
ATTN: JOHANNA CROOKER
PHONE: (408) 772-1774

ABBREVIATIONS

C/L	CENTERLINE
CIPCP	CAST IN PLACE CONCRETE PIPE
CB	CATCH BASIN
GB	GRADE BREAK
EX/EXIST	EXISTING
FG	FINISH GRADE
FS	FINISHED SURFACE
FL	FLOWLINE
INV	INVERT OF PIPE
LP	LOW POINT
HP	HIGH POINT
HGL	HYDRAULIC GRADE LINE
INV	INVERT
CL	CENTERLINE
R/W	RIGHT-OF-WAY
LAT	LATERAL
STA	STATION
PROP	PROPOSED
PUE	PUBLIC UTILITY EASEMENT
L	LENGTH
N.T.S.	NOT TO SCALE
CMP	CORRUGATED METAL PIPE
ELEV.	ELEVATION
MIN.	MINIMUM
MAX.	MAXIMUM
PRC	POINT OF REVERSE CURVE
PCC	POINT OF COMPOUND CURVE
PROP	PROPOSED
RCP	REINFORCED CONC. PIPE
SS	SEWER
SD	STORM DRAIN
TYP.	TYPICAL
TC	TOP OF CURB
TOP	TOP OF PIPE
W	WATER

LEGEND

TRACT BOUNDARY
RIGHT OF WAY
CENTERLINE
EXIST. RIGHT OF WAY
PROP. STORM DRAIN
EX. STORM DRAIN
PROP. STORM STRUCTURE
PROP. CATCH BASIN
EXIST. ELEV. (1217.58) INV
PROP. ELEV. 1217.58 INV

ASSESSOR'S PARCEL NO.

413-790-010

STORM DRAIN NOTES

1. THE CONTRACTOR SHALL CONSTRUCT THE FLOOD CONTROL IMPROVEMENTS SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S (DISTRICT) M.O.U. STANDARD SPECIFICATIONS DATED MARCH 2020 AND DISTRICT STANDARD DRAWINGS. FOR THE LATEST STANDARD DRAWINGS, PLEASE REFER TO THE "ENGINEERING TOOLS" PAGE FOUND ON THE "BUSINESS" SECTION OF THE DISTRICT'S WEBSITE.
2. CONTACT THE ENCROACHMENT PERMIT ENGINEER AT 951.955.1266 IF AN ENCROACHMENT PERMIT IS REQUIRED FROM THE DISTRICT. AFTER THE PERMIT IS ISSUED, THE DISTRICT MUST BE NOTIFIED ONE (1) WEEK PRIOR TO CONSTRUCTION.
3. CONTACT CONSTRUCTION MANAGEMENT AT 951.955.1288 IF CONSTRUCTION INSPECTION WILL BE PERFORMED BY THE DISTRICT. THE DISTRICT MUST BE NOTIFIED TWENTY (20) DAYS PRIOR TO CONSTRUCTION.
4. ALL STATIONING REFERS TO CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
5. STATIONING FOR LATERALS AND CONNECTOR PIPES REFER TO THE CENTERLINE INTERSECTION STATIONS.
6. FORTY-EIGHT (48) HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT AT 1.800.227.2600.
7. ALL ELEVATIONS SHOWN ARE IN FEET AND DECIMALS THEREOF BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD 88).
8. ALL COORDINATES ARE SHOWN IN FEET AND DECIMALS THEREOF BASED ON THE NORTH AMERICAN DATUM (NAD 83), CALIFORNIA COORDINATE SYSTEM (CCS), ZONE 6 AND EPOCH _____.
9. ALL CROSS SECTIONS ARE TAKEN LOOKING DOWNSTREAM.
10. ELEVATIONS OF UTILITIES ARE APPROXIMATE UNLESS OTHERWISE NOTED.
11. UNLESS OTHERWISE SPECIFIED, MINIMUM STREET RECONSTRUCTION SHALL BE 4" TYPE "A" HOT MIX ASPHALT OVER 6 " CLASS 2 AGGREGATE BASE OR AS SPECIFIED BY THE ENGINEER.
12. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6" OF CLASS "B" CONCRETE.
13. PIPE CONNECTED TO THE MAINLINE PIPE SHALL CONFORM TO JUNCTION STRUCTURE NO. 4 (JS 229) UNLESS OTHERWISE NOTED.
14. PIPE BEDDING SHALL CONFORM TO DISTRICT STANDARD DRAWING NO. M815.
15. BH-1 INDICATES SOIL BORING LOCATIONS BASED ON THE SOILS REPORT DATED _________. LOCATIONS SHOWN ARE APPROXIMATE.
16. "V" IS THE DEPTH OF CATCH BASINS MEASURED FROM THE TOP OF CURB TO INVERT OF CONNECTOR PIPE.
17. CATCH BASINS SHALL BE LOCATED SO THAT LOCAL DEPRESSION SHALL BEGIN AT EXISTING CURB RETURN JOINT, UNLESS OTHERWISE SPECIFIED.
18. ALL CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS AND OTHER EXISTING IMPROVEMENTS ARE TO BE RECONSTRUCTED IN KIND AND AT THE SAME ELEVATION AND LOCATION AS THE EXISTING IMPROVEMENTS UNLESS OTHERWISE NOTED.
19. STANDARD DRAWINGS CALLED FOR ON THE PLAN AND PROFILE SHALL CONFORM TO DISTRICT STANDARD DRAWINGS UNLESS NOTED OTHERWISE.
20. THE CONTRACTOR IS REQUIRED TO CALL ALL UTILITY AGENCIES REGARDING TEMPORARY SHORING AND SUPPORT REQUIREMENTS FOR THE VARIOUS UTILITY LINES SHOWN ON THESE PLANS.
21. DURING ROUGH GRADING OPERATIONS AND PRIOR TO CONSTRUCTION OF PERMANENT DRAINAGE STRUCTURES, TEMPORARY DRAINAGE CONTROL SHOULD BE PROVIDED TO PREVENT PONDING WATER AND DAMAGE TO ADJACENT PROPERTIES.
22. APPROVAL OF THESE PLANS BY DISTRICT DOES NOT RELIEVE THE DEVELOPER'S ENGINEER OF RESPONSIBILITY FOR THE ENGINEERING DESIGN. IF FIELD CHANGES ARE REQUIRED, IT WILL BE THE RESPONSIBILITY OF THE DESIGN ENGINEER TO MAKE THE NECESSARY CORRECTIONS.
23. THE CONTRACTOR OR DEVELOPER SHALL SECURE ALL REQUIRED ENCROACHMENT AND/OR STATE AND FEDERAL REGULATORY PERMITS PRIOR TO THE COMMENCEMENT OF ANY WORK.
24. THE CONCRETE COATING ON THE INSIDE OF ALL REINFORCED CONCRETE PIPES AND STRUCTURES MUST BE INCREASED TO PROVIDE A MINIMUM OF 1-1/2" OVER THE REINFORCING STEEL AND INCREASED TO A MINIMUM OF 3 1/2" OVER REINFORCING STEEL FOR BOX CULVERT, WHEN DESIGN VELOCITIES EXCEED 20' PER SECOND. THE CONCRETE DESIGN STRENGTH IN THESE REACHES SHALL BE F'C=5,000 PSI FOR VELOCITIES EXCEEDING 20' PER SECOND AND F'C=6,000 PSI FOR VELOCITIES EXCEEDING 30' PER SECOND.
25. CONSTRUCTION JOINTS FOR CALTRANS STANDARD REINFORCED CONCRETE BOX SHALL BE PLACED ACCORDING TO DISTRICT STANDARD DRAWING NO. BOX 401.
26. ROCK FOR ACCESS ROADS, TURN AROUNDS AND OTHER AREAS WITHIN DISTRICT RIGHT OF WAY AS SHOWN ON THE PROJECT DRAWINGS AND AS DIRECTED BY THE ENGINEER SHALL MEET THE REQUIREMENTS FOR 1" X NO. 4 COARSE AGGREGATE AS PER SECTION 90-1.02C(4)(B) OF THE CALTRANS SPECIFICATIONS. X VALUES FOR ROCK GRADATION SHALL BE 75 AND 15 FOR 3/4" AND 3/8" RESPECTIVELY. ROCK SHALL ADDITIONALLY MEET THE SPREADING AND COMPACTION REQUIREMENTS OF SECTIONS 26-1.03D AND 26-1.03E OF THE CALTRANS SPECIFICATIONS. FURTHERMORE, ROCK DEPTH SHALL NOT EXCEED 3" AND SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER. ROCK SHALL NOT CONTAIN RECYCLED CONCRETE PRODUCTS.

WORK TO BE DONE

THE IMPROVEMENT WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING DOCUMENTS, CURRENT AT THE TIME OF CONSTRUCTION, AS DIRECTED BY THE CITY ENGINEER.

1. BEAUMONT MUNICIPAL CODE.
2. FOR STREETS: RIVERSIDE COUNTY ORDINANCE NO. 461.
   FLOOD CONTROL FACILITIES: THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S STANDARDS FOR FLOOD CONTROL FACILITIES.
   SANITARY SEWER FACILITIES: THE EASTERN MUNICIPAL WATER DISTRICT'S STANDARDS FOR SANITARY SEWER FACILITIES.
   ALL OTHER PUBLIC WORKS: THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREEN BOOK).
3. THIS SET OF PLANS.
4. RESOLUTION NO ____________, DATED __________.
5. SOILS REPORT AND RECOMMENDATIONS BY ALTA CALIFORNIA GEOTECHNICAL, INC., DATED 04/12/2023.

SHEET LIST TABLE	
SHEET NO.	SHEET TITLE
1	TITLE SHEET
2	INDEX SHEET
3	LINE H-1 & H-2

DIGALERT
Call 2 Working Days Before You Dig!
811

BASIS OF BEARINGS:
DESCRIPTION:
THE BASIS OF COORDINATES FOR THIS MAP IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, 1983, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "REST" AND "RABBIT".
BEARING: N 27°39'52" E

BENCHMARK:
USGS - MONUMENT "REST" BENCHMARK DISK SET IN TOP OF CONCRETE MONUMENT STAMPED "REST 1972" ON DESERT LAWN DR. ACROSS THE DRIVE CENTERLINE 24.9 FT. SOUTHWEST OF THE SOUTHWEST EDGE OF THE SOUTHEAST BOUND LANES OF INTERSTATE HIGHWAY 10
88 DATUM
ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS		CITY

Kimley»Horn

3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON 07/16/2024
R.C.E. NO.: C57667 DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: AM
CHECKED BY: MS
SCALE: AS NOTED
DATE: 7/16/2024
JOB NUMBER:

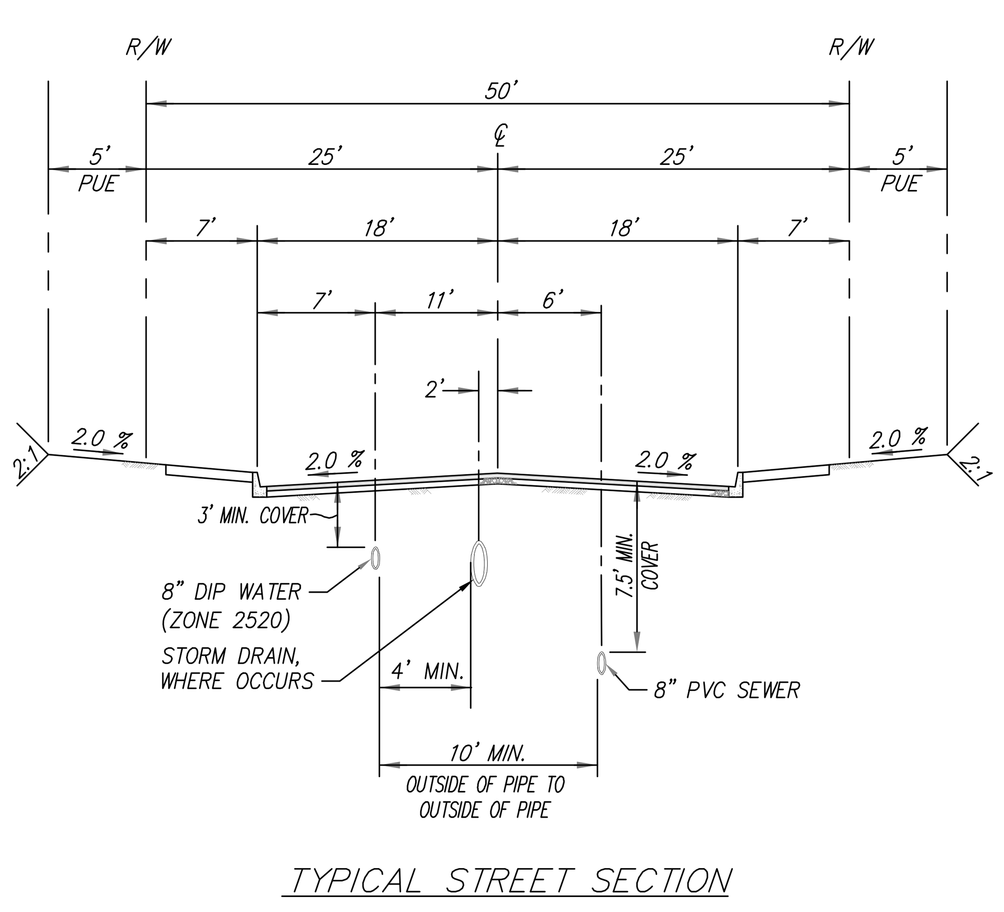
REVIEWED BY: ______________ DATE: ________
STAFF ENGINEER
RECOMMENDED FOR APPROVAL BY: ______________ DATE: ________
APPROVED BY: ______________ DATE: ________
CITY ENGINEER

CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR:
TRACT NO. 31462-19
TITLE SHEET

FOR: MERITAGE HOMES

SHEET 1 OF 3 SHEETS
FILE NO: 3500
PW2024-0025



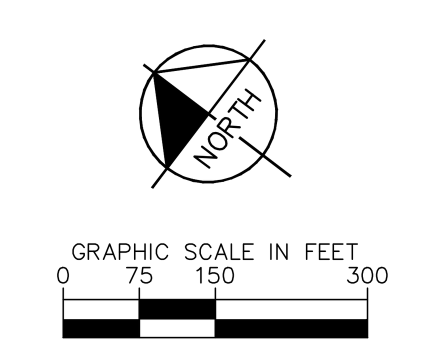
TYPICAL STREET SECTION

N.T.S.

LEGEND

SHEET MATCHLINE

TRACT MATCHLINE



DIGALERT — Call 2 Working Days Before You Dig! 811

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BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS	CITY	

Kimley»Horn

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PHONE: 951-543-9868

MIKE S. SUTTON
R.C.E. NO.: C57667

07/16/2024
DATE

SEAL: REGISTERED PROFESSIONAL ENGINEER — MICHAEL S. SUTTON — No. C57667 — CIVIL — STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: AM
CHECKED BY: MS
SCALE: AS NOTED
DATE: 7/16/2024
JOB NUMBER:

REVIEWED BY: ______ STAFF ENGINEER DATE: ______
RECOMMENDED FOR APPROVAL BY: ______ DATE: ______
APPROVED BY: ______ CITY ENGINEER DATE: ______

CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA

STORM DRAIN IMPROVEMENT PLANS FOR:
TRACT NO. 31462-19

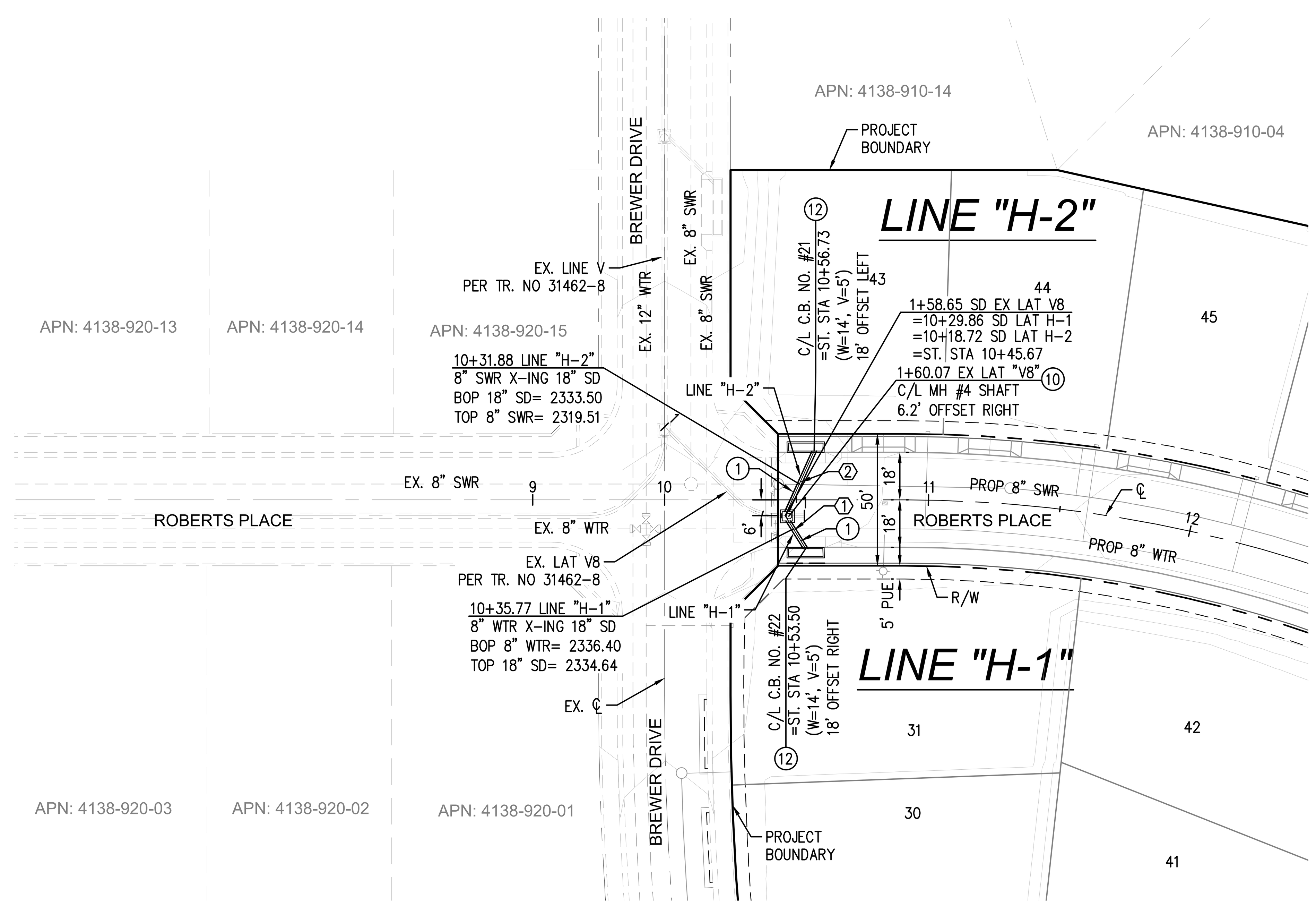
INDEX SHEET

FOR: MERITAGE HOMES

SHEET 2 OF 3 SHEETS

FILE NO: 3500

PW2024-0025



CONSTRUCTION NOTES

1. CONSTRUCT 18" RCP (SEE PROFILE FOR D-LOAD).
10. CONSTRUCT MANHOLE NO. 4 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH254
12. CONSTRUCT CURB INLET CATCH BASIN AND LOCAL DEPRESSION PER COUNTY OF RIVERSIDE STD. NO. 300 (W & V PER PLAN).

MANHOLE & JUNCTION STRUCTURE DATA TABLE

STRUCTURE	MAIN LINE	LATERAL LEFT					LATERAL RIGHT					D_1	D_2
		NAME	A	B	C	L	NAME	A	B	C	L		
M.H. #1 1+58.65	EX. LINE V8	LINE H-2	65°41'41"	1.5'	8"	4.0'	LINE H-1	57°57'26"	1.5'	8"	4.0'	18"	18"

DATA

#	BEARING/DELTA	RADIUS	LENGTH	TANGENT
1	S 2°58'07" E	-	14.76'	-
2	N 53°22'46" E	-	26.87'	-

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

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Kimley»Horn

3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON
R.C.E. NO.: C57667
07/16/2024
DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: AM
CHECKED BY: MS
SCALE: 1"=40'
DATE: 7/16/2024
JOB NUMBER:

REVIEWED BY: ______ STAFF ENGINEER DATE: ______
RECOMMENDED FOR APPROVAL BY: ______ DATE: ______
APPROVED BY: ______ CITY ENGINEER DATE: ______
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR:
TRACT NO. 31462-19
LINE "H-1" & LINE "H-2"

FOR: MERITAGE HOMES

SHEET 3 OF 3 SHEETS
FILE NO: 3500
PW2024-0025

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS
TRACT NO. 31462-29
LINE "F", LINE "D", LINE "D-1", LINE "D-2", & LINE "D-3"

GENERAL NOTES

1. THE CONTRACTOR SHALL CONSTRUCT THE DRAINAGE IMPROVEMENT SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT DESIGN MANUAL STANDARD DRAWINGS, RECENT EDITION, AND IN CONFORMANCE WITH THE REQUIREMENTS OF THE BEAUMONT DRAINAGE MANAGEMENT PLAN.
2. THE CONTRACTOR IS REQUIRED TO CONTACT ALL UTILITY AGENCIES REGARDING TEMPORARY SUPPORT AND SHORING REQUIREMENTS FOR THE VARIOUS UTILITIES SHOWN IN THE PLANS.
3. CONSTRUCTION INSPECTION WILL BE PERFORMED BY CITY OF BEAUMONT. CONTACT (951) 769-8520. THE CITY MUST BE NOTIFIED ONE WEEK PRIOR TO CONSTRUCTION.
4. ALL STATIONING REFERS TO THE CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
5. STATIONING FOR LATERALS AND CONNECTOR PIPE REFER TO THE CENTERLINE-CENTERLINE-INTERSECTION STATION.
6. FORTY-EIGHT HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT 1-800-227-2600.
7. ALL CROSS SECTIONS ARE TAKEN LOOKING UPSTREAM.
8. ELEVATIONS AND LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE UNLESS OTHERWISE NOTED. ALL UTILITIES SHOWN ARE TO BE PROTECTED IN PLACE UNLESS OTHERWISE NOTED.
9. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6 INCHES OF CLASS "B" CONCRETE.
10. PIPE CONNECTED TO THE MAINLINE PIPE SHALL CONFORM TO JUNCTION STRUCTURE NO. 4 (JS 229) UNLESS OTHERWISE NOTED.
11. PIPE BEDDING SHALL CONFORM TO R.C.F.C. & W.C.D. STD. DWG. M 815.
12. V" IS THE DEPTH OF INLET AT THE CATCH BASINS MEASURED FROM THE TOP OF THE CURB TO THE INVERT OF CONNECTOR PIPE.
13. ALL CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS, AND OTHER EXISTING IMPROVEMENTS TO BE RECONSTRUCTED IN KIND PER LATEST COUNTY STANDARD AND AT THE SAME ELEVATION AND LOCATION AS THE EXISTING IMPROVEMENTS UNLESS OTHERWISE NOTED. FOR PAVEMENT OVERLAY, 0.10' MIN. FOR FULL LANE WIDTH IS REQUIRED.
14. HYDRAULIC GRADE LINES SHOWN IN PROFILES ARE FOR 100 YEAR FREQUENCY FLOWS, UNLESS OTHERWISE NOTED.
15. THE CONTRACTOR SHALL COMPLY WITH THE STATE AND LOCAL SAFETY CODES DURING THE PROGRESS OF WORK.
16. THE CONTRACTOR SHALL MAINTAIN ADJACENT STREETS IN A NEAT, SAFE, CLEAN AND SANITARY CONDITION AT ALL TIMES AND TO THE SATISFACTION OF THE COUNTY'S OR DISTRICT'S INSPECTOR. THE ADJACENT STREETS SHALL BE KEPT CLEAN OF DEBRIS, WITH DUST AND OTHER NUISANCE BEING CONTROLLED AT ALL TIMES. THE DEVELOPER SHALL BE RESPONSIBLE FOR ANY CLEAN UP ON ADJACENT STREETS AFFECTED BY HIS CONSTRUCTION. METHOD OF STREET CLEANING SHALL BE DRY SWEEPING OF ALL PAVED AREAS.
17. THE CONTRACTOR AGREES THAT HE/SHE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT. INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER, CITY OF BEAUMONT, AND THE DEVELOPER'S ENGINEER, HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNERS OR THE DEVELOPER'S ENGINEER.
18. ALL PIPE LENGTHS ARE HORIZONTAL PROJECTIONS (NOT TRUE LENGTHS OF PIPE) AND ARE THE BASIS OF THE ESTIMATES OF QUANTITIES. THE CONTRACTOR SHALL DETERMINE THE TRUE QUANTITY OF PIPE REQUIRED FOR THIS PROJECT PRIOR TO PLACING THE ORDER.
19. ALL ELEVATIONS SHOWN ARE TO THE INVERTS OF PIPE, EXCEPT WHERE OTHERWISE NOTED.
20. AT THE DISCRETION OF THE ENGINEER AND THE CITY OF BEAUMONT, THE CONTRACTOR MAY BE REQUIRED TO VERIFY, BY POTHOLING, THE LOCATION OF POTENTIALLY AFFECTED UTILITIES.
21. . CONTRACTOR SHALL DISPOSE OF ALL EXCESS EXCAVATED MATERIAL AT MANDATORY DISPOSAL.
22. ALL BACKFILL AND BEDDING AROUND STRUCTURES AND PIPES SHALL BE COMPACTED TO NOT LESS THAN 90 PERCENT RELATIVE COMPACTION EXCEPT WHERE SUCH MATERIAL IS PLACED UNDER EXISTING PAVED ROADWAYS. THE TOP 3 FEET, MEASURED FROM THE FINISH PAVING, SHALL BE COMPACTED TO 95 PERCENT RELATIVE COMPACT.
23. ALL SURVEY MONUMENTS SHALL BE REPLACED AS REQUIRED. MONUMENTS SHALL BE TIED OUT PRIOR TO CONSTRUCTION AND REPLACED UPON COMPLETION OF CONSTRUCTION.
24. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/OWNER OR CONTRACTOR TO APPLY TO THE DIRECTOR OF PUBLIC WORKS, CITY OF BEAUMONT FOR AN ENCROACHMENT PERMIT FOR ALL WORK PERFORMED WITHIN PUBLIC RIGHT-OF-WAY, DEDICATED AND ACCEPTED FOR PUBLIC USE; AND TO BE RESPONSIBLE FOR SATISFACTORY COMPLIANCE FOR ALL CURRENT ENVIRONMENTAL REGULATIONS DURING THE LIFE OF CONSTRUCTION ACTIVITIES FOR THIS PROJECT. ADDITIONAL STUDIES AND/OR PERMITS MAY BE REQUIRED.
25. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEARING OF THE PROPOSED WORK AREA, AND RELOCATION COSTS OF ALL EXISTING UTILITIES. PERMITTEE MUST INFORM CITY OF CONSTRUCTION SCHEDULE AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
26. ALL UNDERGROUND FACILITIES WITH LATERALS SHALL BE IN PLACE PRIOR TO PAVING THE STREET, INCLUDING BUT NOT LIMITED TO, THE FOLLOWING: SEWER, WATER, ELECTRIC, STORM DRAINS.
27. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR CONTRACTOR TO INSTALL AND MAINTAIN DURING CONSTRUCTION, REGULATORY GUIDE AND WARNING SIGNS WITHIN THE PROJECT LIMITS AND ITS SURROUNDINGS TO PROVIDE SAFE PASSAGE FOR THE TRAVELING PUBLIC AND WORKERS UNTIL THE FINAL COMPLETION AND ACCEPTANCE OF THE PROJECT BY THE CITY OF BEAUMONT.
28. CONSTRUCTION PROJECTS THAT DISTURB MORE THAN ONE ACRE MUST OBTAIN A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT. OWNER/DEVELOPERS ARE REQUIRED TO FILE A NOTICE OF INTENT (NOI) WITH THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) AND COMPLY WITH ALL REQUIREMENTS OF THE BEAUMONT DRAINAGE MANAGEMENT PLAN. BEAUMONT IS CO-PERMITTEE WITH R.C.F.C. & W.C.D.
29. ALL STORM DRAINS, CATCH BASINS, AND STORM WATER RUNOFF STRUCTURES WILL BE PROVIDED WITH ADEQUATE CAPABILITIES TO FILTER AND RETAIN SEDIMENT AND DIRT, OIL, AND GREASE, TO PREVENT POLLUTION IN STORM WATER RUNOFF IN COMPLIANCE WITH THE CITY OF BEAUMONT'S BEST MANAGEMENT PRACTICES AND THE BEAUMONT DRAINAGE MASTER PLAN FOR STORM WATER AS WELL AS BEST MANAGEMENT PRACTICES IDENTIFIED IN THE CURRENT REPORT OF WASTE DISCHARGE FOR RIVERSIDE COUNTY PERMITTEE.
30. DEVELOPER SHALL BE FULLY RESPONSIBLE IN ASSURING THAT PROPOSED IMPROVEMENTS CONFORM TO THE APPROVED PLANS, SPECIFICATIONS AND CITY OF BEAUMONT STANDARDS. WHERE DEVIATIONS EXIST, DEVELOPER SHALL PROPOSE CORRECTIVE MEASURES FOR REVIEW AND APPROVAL BY THE CITY.

NOTE:

1. APPROVAL OF THESE PLANS APPLY ONLY WITHIN THE JURISDICTION OF THE CITY OF BEAUMONT.
2. TRENCHING FOR UTILITIES AND STRUCTURES IS NOT ALLOWED UNTIL SOIL COMPACTION REPORT IS SUBMITTED AND APPROVED BY THE PUBLIC WORK DEPARTMENT.
3. THE CITY RESERVES THE RIGHT TO REQUIRE REVISION OF THE APPROVED PLANS TO CONFORM WITH CURRENT STANDARDS AND TO POST A NEW BOND IF CONSTRUCTION HAS NOT COMMENCED WITHIN TWO YEARS AFTER PLANS WERE APPROVED.
4. HE DEVELOPER SHALL HAVE GEOTECHNICAL/SOILS ENGINEERING FIRM OBSERVE TRENCHING, BACKFILLING, AND SOIL COMPACTION OF ALL UTILITY TRENCHES WITHIN ALL EASEMENTS AND ROAD RIGHTS OF WAY. TWO SETS OF COMPACTION REPORTS CERTIFYING THAT WORKS WERE DONE IN CONFORMANCE TO STANDARDS AND GEOTECHNICAL REPORT SHALL BE SUBMITTED AFTER EACH UTILITY TRENCH IS COMPLETED AND CERTIFIED. COMPACTION REPORT MUST BE SUBMITTED TO THE DEPT. OF PUBLIC WORKS AT LEAST TWO WORKING DAYS BEFORE AGGREGATE BASE MATERIALS ARE PLACED ONSITE.

SEE SHEET NO. 2 FOR INDEX MAP

*RCP NOTES:

1. THE CONCRETE COATING ON THE INSIDE OF ALL REINFORCED CONCRETE PIPES MUST BE INCREASED TO PROVIDE A MINIMUM OF 1-1/2" OVER THE REINFORCING WHEN THE DESIGN VELOCITIES EXCEED 20 FEET PER SECOND. THE CONCRETE DESIGN STRENGTH IN THESE REACHES SHALL BE f'c = 5,000 PSI FOR VELOCITIES EXCEEDING 20 FEET PER SECOND AND f'c = 6,000 PSI FOR VELOCITIES EXCEEDING 30 FPS.
2. THE JOINTS FOR REINFORCED CONCRETE PIPES UNDER PRESSURE FLOW CONDITIONS SHALL BE WATERTIGHT IN CONFORMANCE WITH ASTM C443.

DECLARATION OF RESPONSIBLE CHARGE:

I HEREBY DECLARE THAT I AM THE ENGINEER OF RECORD FOR THIS PROJECT AND THAT THE DESIGN OF THE IMPROVEMENTS SHOWN ON THESE PLANS COMPLIES WITH ALL PROFESSIONAL ENGINEERING STANDARDS AND PRACTICES. I ASSUME FULL RESPONSIBILITY FOR ALL ASPECTS OF THE DESIGN OF THE IMPROVEMENTS. WITH RESPECT TO THE PLAN CHECK PERFORMED BY THE CITY OF BEAUMONT, I UNDERSTAND AND ACKNOWLEDGE THE FOLLOWING: (1) THE PLAN CHECK IS A REVIEW FOR THE LIMITED PURPOSE OF ENSURING THE PLANS COMPLY WITH THE CITY'S STANDARDS, PROCEDURES, POLICIES, AND ORDINANCES; (2) THE PLAN CHECK IS NOT A DETERMINATION OF THE TECHNICAL ADEQUACY OF THE DESIGN OF THE IMPROVEMENTS; AND, (3) THE PLAN CHECK DOES NOT RELIEVE ME OF MY LEGAL AND PROFESSIONAL RESPONSIBILITY FOR THE DESIGN OF THE IMPROVEMENTS. TO THE FULL EXTENT PERMITTED BY LAW, I AGREE TO DEFEND, INDEMNIFY, AND HOLD HARMLESS THE CITY, ITS ELECTED OFFICIALS, EMPLOYEES, AND AGENTS FROM ANY AND ALL ACTUAL OR ALLEGED CLAIMS, DEMANDS, CAUSES OF ACTION, LIABILITY, LOSS, DAMAGE, OR INJURY TO PROPERTY OR PERSONS, INCLUDING WRONGFUL DEATH, WHETHER IMPOSED BY A COURT OF LAW OR BY ADMINISTRATIVE ACTION OF ANY FEDERAL, STATE OR LOCAL GOVERNMENTAL AGENCY, TO THE EXTENT ARISING OUT OF OR INCIDENT TO ANY NEGLIGENT ACTS, OMISSIONS, OR ERRORS BY THE ENGINEER OF RECORD, ITS EMPLOYEES, CONSULTANTS, OR AGENTS.

FIRM: KIMLEY HORN & ASSOCIATES, INC.
ADDRESS: 3801 UNIVERSITY AVE. SUITE 300
CITY, ST.: RIVERSIDE,CA 92501
TELEPHONE: (760) 565-5146
BY: MIKE SUTTON, R.C.E. NO.:C57667 DATE: 7/16/2024
(NAME OF ENGINEER & RCE)

PRIVATE ENGINEERS NOTICE TO CONTRACTOR(S)

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT THOSE SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE ALL PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN, AND ANY OTHER LINES OR STRUCTURES NOT SHOWN ON THESE PLANS AND IS RESPONSIBLE FOR THE PROTECTION OF, AND ANY DAMAGE TO THESE LINES OR STRUCTURES
2. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO NOTIFY THE OWNER OF ALL UTILITIES OR STRUCTURES CONCERNED BEFORE STARTING WORK.
3. QUANTITIES SHOWN HEREON ARE PROVIDED FOR BIDDING PURPOSES ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES PRIOR TO BIDDING FOR CONSTRUCTION.
4. THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER CITY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE CITY.

LEGAL DESCRIPTION

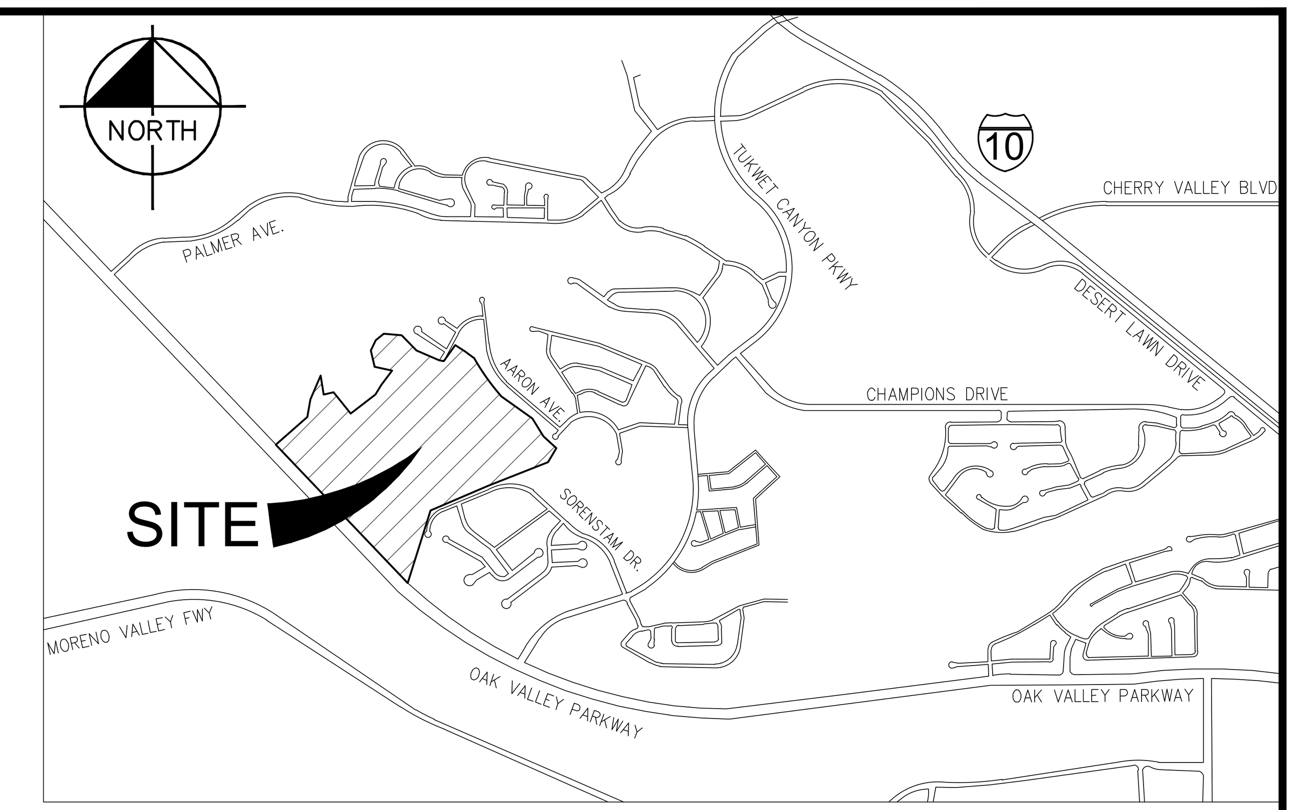
THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF BEAUMONT, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

THE DESIGNATED REMAINDER PARCEL OF PARCEL MAP NO. 38090, IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 254, PAGES 97 THROUGH 103, INCLUSIVE, OF PARCEL MAPS, RECORDS OF SAID COUNTY.

EXCEPTING THEREFROM THE ABOVE PARCEL ANY AND ALL NATURAL OIL, OIL RIGHTS, MINERALS, MINERAL RIGHTS, NATURAL GAS, NATURAL GAS RIGHTS AND OTHER HYDROCARBONS BY WHATSOEVER NAME KNOWN AND ALL RIGHTS THEREIN, GEOTHERMAL STEAM, AND ALL PRODUCTS DERIVED FROM ANY OF THE FOREGOING, THAT MAY BE WITHIN OR UNDER THE LAND, TOGETHER WITH THE PERPETUAL RIGHT OF DRILLING, MINING, EXPLORING AND OPERATING THEREFOR AND STORING IN AND REMOVING THE SAME FROM THE LAND OR ANY OTHER PROPERTY, INCLUDING THE RIGHT TO WHIPSTOCK OR DIRECTIONALLY DRILL AND MINE FROM PROPERTY OTHER THAN THE LAND, OIL OR GAS WELLS, TUNNELS AND SHAFTS INTO, THROUGH OR ACROSS THE SUBSURFACE OF THE LAND, AND TO BOTTOM SUCH WHIPSTOCKED OR DIRECTIONALLY DRILLED WELLS, TUNNELS AND SHAFTS UNDER AND BENEATH OR BEYOND THE EXTERIOR LIMITS THEREOF, AND TO REDRILL, RETUNNEL, EQUIP, MAINTAIN, REPAIR, DEEPEN AND OPERATE ANY SUCH WELLS, TUNNELS OR SHAFTS, WITHOUT THE RIGHT TO DRILL, MINE, STORE OR EXCAVATE THROUGH THE SURFACE OR THE UPPER 500 FEET OF THE SUBSURFACE OR THE LAND AS RESERVED BY OAK VALLEY PARTNERS, L.P. A TEXAS LIMITED PARTNERSHIP WHICH IS REGISTERED IN CALIFORNIA AS OVP, L.P., IN A GRANT DEED RECORDED NOVEMBER 14, 2003, AS INSTRUMENT NO. 2003-899365 OF OFFICIAL RECORDS.

ANY AND ALL WATER, WATER RIGHTS OR INTERESTS THEREIN APPURTENANT OR RELATING TO THE LAND OR OWNED OR USED BY GRANTOR IN CONNECTION WITH OR WITH RESPECT TO THE LAND (NO MATTER HOW ACQUIRED BY GRANTOR), WHETHER SUCH WATER RIGHTS SHALL BE RIPARIAN, OVERLYING, APPROPRIATIVE, LITTORAL, PERCOLATING, PRESCRIPTIVE, ADJUDICATED, STATUTORY OR CONTRACTUAL, TOGETHER WITH THE RIGHT AND POWER TO EXPLORE, DRILL, REMOVE AND RESTORE THE SAME FROM OR IN THE LAND OR TO DIVERT OR OTHERWISE UTILIZE SUCH WATER, RIGHTS OR INTERESTS ON ANY OTHER PROPERTY OWNED BY OR LEASED BY GRANTOR, WITHOUT THE RIGHT TO ENTER UPON THE SURFACE OF THE LAND IN THE EXERCISE OF SUCH RIGHTS; PROVIDED, HOWEVER, ONLY IF AND TO THE EXTENT THAT SUCH RIGHTS ARE NOT USED BY GRANTEE IN ITS USE AND ENJOYMENT OF THE LAND AS RESERVED BY OAK VALLEY PARTNERS, L.P., A TEXAS LIMITED PARTNERSHIP, WHICH IS REGISTERED IN CALIFORNIA AS OVP, L.P., IN A GRANT DEED RECORDED NOVEMBER 14, 2003 AS INSTRUMENT NO. 2003-899365 OF OFFICIAL RECORDS.

APN: 413-790-010



VICINITY MAP
NOT TO SCALE

CONSTRUCTION NOTES / QUANTITIES

	CONSTRUCTION NOTES	QUANTITIES
1	CONSTRUCT 18" RCP (SEE PROFILE FOR D-LOAD).	72 LF
3	CONSTRUCT 30" RCP (SEE PROFILE FOR D-LOAD).	1,504 LF
6	CONSTRUCT 48" RCP (SEE PROFILE FOR D-LOAD).	1,009 LF
9	CONSTRUCT MANHOLE NO. 1 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH251	4 EA
12	CONSTRUCT CURB INLET CATCH BASIN AND LOCAL DEPRESSION PER COUNTY OF RIVERSIDE STD. NO. 300 (W & V PER PLAN).	2 EA
13	INSTALL RIP-RAP (SIZING PER PLAN).	36.29 CY
14	CONSTRUCT CONCRETE HEADWALL PER CALTRANS STD. D90 (SIZING PER PLAN).	2 EA
15	CONSTRUCT MANHOLE NO. 2 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH252.	3 EA
16	CONSTRUCT INLET TYPE X PER R.C.F.C. & W.C.D. STD. DWG. NO. CB108.	1 EA
17	CONSTRUCT 4'X4' DROP INLET.	1 EA
18	CONSTRUCT PIPE ANCHORS PER DETAIL ON SHEET 2.	12 EA
19	INSTALL STORMTEK FULL TRASH CAPTURE DEVICE PER STORM WATER INSPECTION & MAINTENANCE SERVICES.	1 EA

STORM DRAIN NOTES

1. THE CONTRACTOR SHALL CONSTRUCT THE FLOOD CONTROL IMPROVEMENTS SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S (DISTRICT) M.O.U. STANDARD SPECIFICATIONS DATED MARCH 2020 AND DISTRICT STANDARD DRAWINGS. FOR THE LATEST STANDARD DRAWINGS, PLEASE REFER TO THE "ENGINEERING TOOLS" PAGE FOUND ON THE "BUSINESS" SECTION OF THE DISTRICT'S WEBSITE.
2. CONTACT THE ENCROACHMENT PERMIT ENGINEER AT 951.955.1266 IF AN ENCROACHMENT PERMIT IS REQUIRED FROM THE DISTRICT. AFTER THE PERMIT IS ISSUED, THE DISTRICT MUST BE NOTIFIED ONE (1) WEEK PRIOR TO CONSTRUCTION.
3. CONTACT CONSTRUCTION MANAGEMENT AT 951.955.1288 IF CONSTRUCTION INSPECTION WILL BE PERFORMED BY THE DISTRICT. THE DISTRICT MUST BE NOTIFIED TWENTY (20) DAYS PRIOR TO CONSTRUCTION.
4. ALL STATIONING REFERS TO CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
5. STATIONING FOR LATERALS AND CONNECTOR PIPES REFER TO THE CENTERLINE INTERSECTION STATIONS.
6. FORTY-EIGHT (48) HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT AT 1.800.227.2600.
7. ALL ELEVATIONS SHOWN ARE IN FEET AND DECIMALS THEREOF BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD 88).
8. ALL COORDINATES ARE SHOWN IN FEET AND DECIMALS THEREOF BASED ON THE NORTH AMERICAN DATUM (NAD 83), CALIFORNIA COORDINATE SYSTEM (CCS), ZONE 6 AND EPOCH ____.
9. ALL CROSS SECTIONS ARE TAKEN LOOKING DOWNSTREAM.
10. ELEVATIONS OF UTILITIES ARE APPROXIMATE UNLESS OTHERWISE NOTED.
11. UNLESS OTHERWISE SPECIFIED, MINIMUM STREET RECONSTRUCTION SHALL BE 4" TYPE "A" HOT MIX ASPHALT OVER 6 " CLASS 2 AGGREGATE BASE OR AS SPECIFIED BY THE ENGINEER.
12. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6" OF CLASS "B" CONCRETE.
13. PIPE CONNECTED TO THE MAINLINE PIPE SHALL CONFORM TO JUNCTION STRUCTURE NO. 4 (JS 229) UNLESS OTHERWISE NOTED.
14. PIPE BEDDING SHALL CONFORM TO DISTRICT STANDARD DRAWING NO. M815.
15. BH-1 INDICATES SOIL BORING LOCATIONS BASED ON THE SOILS REPORT DATED ________. LOCATIONS SHOWN ARE APPROXIMATE.
16. "V" IS THE DEPTH OF CATCH BASINS MEASURED FROM THE TOP OF CURB TO INVERT OF CONNECTOR PIPE.
17. CATCH BASINS SHALL BE LOCATED SO THAT LOCAL DEPRESSION SHALL BEGIN AT EXISTING CURB RETURN JOINT, UNLESS OTHERWISE SPECIFIED.
18. ALL CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS AND OTHER EXISTING IMPROVEMENTS ARE TO BE RECONSTRUCTED IN KIND AND AT THE SAME ELEVATION AND LOCATION AS THE EXISTING IMPROVEMENTS UNLESS OTHERWISE NOTED.
19. STANDARD DRAWINGS CALLED FOR ON THE PLAN AND PROFILE SHALL CONFORM TO DISTRICT STANDARD DRAWINGS UNLESS NOTED OTHERWISE.
20. THE CONTRACTOR IS REQUIRED TO CALL ALL UTILITY AGENCIES REGARDING TEMPORARY SHORING AND SUPPORT REQUIREMENTS FOR THE VARIOUS UTILITY LINES SHOWN ON THESE PLANS.
21. DURING ROUGH GRADING OPERATIONS AND PRIOR TO CONSTRUCTION OF PERMANENT DRAINAGE STRUCTURES, TEMPORARY DRAINAGE CONTROL SHOULD BE PROVIDED TO PREVENT PONDING WATER AND DAMAGE TO ADJACENT PROPERTIES.
22. APPROVAL OF THESE PLANS BY DISTRICT DOES NOT RELIEVE THE DEVELOPER'S ENGINEER OF RESPONSIBILITY FOR THE ENGINEERING DESIGN. IF FIELD CHANGES ARE REQUIRED, IT WILL BE THE RESPONSIBILITY OF THE DESIGN ENGINEER TO MAKE THE NECESSARY CORRECTIONS.
23. THE CONTRACTOR OR DEVELOPER SHALL SECURE ALL REQUIRED ENCROACHMENT AND/OR STATE AND FEDERAL REGULATORY PERMITS PRIOR TO THE COMMENCEMENT OF ANY WORK.
24. THE CONCRETE COATING ON THE INSIDE OF ALL REINFORCED CONCRETE PIPES AND STRUCTURES MUST BE INCREASED TO PROVIDE A MINIMUM OF 1-1/2" OVER THE REINFORCING STEEL AND INCREASED TO A MINIMUM OF 3 1/2" OVER REINFORCING STEEL FOR BOX CULVERT, WHEN DESIGN VELOCITIES EXCEED 20' PER SECOND. THE CONCRETE DESIGN STRENGTH IN THESE REACHES SHALL BE F'C=5,000 PSI FOR VELOCITIES EXCEEDING 20' PER SECOND AND F'C=6,000 PSI FOR VELOCITIES EXCEED 30' PER SECOND.
25. CONSTRUCTION JOINTS FOR CALTRANS STANDARD REINFORCED CONCRETE BOX SHALL BE PLACED ACCORDING TO DISTRICT STANDARD DRAWING NO. BOX 401.
26. ROCK FOR ACCESS ROADS, TURN AROUNDS AND OTHER AREAS WITHIN DISTRICT RIGHT OF WAY AS SHOWN ON THE PROJECT DRAWINGS AND AS DIRECTED BY THE ENGINEER SHALL MEET THE REQUIREMENTS FOR 1" X NO. 4 COARSE AGGREGATE AS PER SECTION 90-1.02C(4)(B) OF THE CALTRANS SPECIFICATIONS. X VALUES FOR ROCK GRADATION SHALL BE 75 AND 15 FOR 3/4" AND 3/8" RESPECTIVELY. ROCK SHALL ADDITIONALLY MEET THE SPREADING AND COMPACTION REQUIREMENTS OF SECTIONS 26-1.03D AND 26-1.03E OF THE CALTRANS SPECIFICATIONS. FURTHERMORE, ROCK DEPTH SHALL NOT EXCEED 3" AND SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER. ROCK SHALL NOT CONTAIN RECYCLED CONCRETE PRODUCTS.

ENGINEER

KIMLEY HORN & ASSOCIATES, INC.
3801 UNIVERSITY AVE. SUITE 300
RIVERSIDE, CA 92501
ATTN: MICHAEL SUTTON
PHONE: (760) 565-5146
EMAIL: MIKE.SUTTON@KIMLEY-HORN.COM

OWNER/DEVELOPER

MERITAGE HOMES OF CALIFORNIA,
A CALIFORNIA CORPORATION
5 PETERS CANYON ROAD, SUITE 310
IRVINE, CA 92606
ATTN: JOHANNA CROOKER
PHONE: (408) 772-1774

ABBREVIATIONS

C/L	CENTERLINE
CIPCP	CAST IN PLACE CONCRETE PIPE
CB	CATCH BASIN
GB	GRADE BREAK
EX/EXIST	EXISTING
FG	FINISH GRADE
FS	FINISHED SURFACE
FL	FLOWLINE
INV	INVERT OF PIPE
LP	LOW POINT
HP	HIGH POINT
HGL	HYDRAULIC GRADE LINE
INV	INVERT
CL	CENTERLINE
R/W	RIGHT-OF-WAY
LAT	LATERAL
STA	STATION
PROP	PROPOSED
PUE	PUBLIC UTILITY EASEMENT
L	LENGTH
N.T.S.	NOT TO SCALE
CMP	CORRUGATED METAL PIPE
ELEV.	ELEVATION
MIN.	MINIMUM
MAX.	MAXIMUM
PRC	POINT OF REVERSE CURVE
PCC	POINT OF COMPOUND CURVE
PROP	PROPOSED
RCP	REINFORCED CONC. PIPE
SS	SEWER
SD	STORM DRAIN
TYP.	TYPICAL
TC	TOP OF CURB
TOP	TOP OF PIPE
W	WATER

LEGEND

TRACT BOUNDARY
RIGHT OF WAY
CENTERLINE
EXIST. RIGHT OF WAY
PROP. STORM DRAIN
EX. STORM DRAIN
PROP. STORM STRUCTURE
PROP. CATCH BASIN
EXIST. ELEV. (1217.58) INV
PROP. ELEV. 1217.58 INV

ASSESSOR'S PARCEL NO.

413-790-010

WORK TO BE DONE

THE IMPROVEMENT WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING DOCUMENTS, CURRENT AT THE TIME OF CONSTRUCTION, AS DIRECTED BY THE CITY ENGINEER.

1. BEAUMONT MUNICIPAL CODE.
2. FOR STREETS: RIVERSIDE COUNTY ORDINANCE NO. 461.
   FLOOD CONTROL FACILITIES: THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S STANDARDS FOR FLOOD CONTROL FACILITIES.
   SANITARY SEWER FACILITIES: THE EASTERN MUNICIPAL WATER DISTRICT'S STANDARDS FOR SANITARY SEWER FACILITIES.
   ALL OTHER PUBLIC WORKS: THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREEN BOOK).
3. THIS SET OF PLANS.
4. RESOLUTION NO ____________, DATED ____________.
5. SOILS REPORT AND RECOMMENDATIONS BY ALTA CALIFORNIA GEOTECHNICAL, INC., DATED 04/12/2023.

DIGALERT
Call 2 Working Days Before You Dig!
811

BASIS OF BEARINGS:
DESCRIPTION:
THE BASIS OF COORDINATES FOR THIS MAP IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, 1983, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "REST" AND "RABBIT".
BEARING: N 27°39'52" E

BENCHMARK:
USGS - MONUMENT "REST" BENCHMARK DISK SET IN TOP OF CONCRETE MONUMENT STAMPED "REST 1972" ON DESERT LAWN DR. ACROSS THE DRIVE CENTERLINE 24.9 FT. SOUTHWEST OF THE SOUTHWEST EDGE OF THE SOUTHEAST BOUND LANES OF INTERSTATE HIGHWAY 10
88 DATUM
ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS	CITY	

Kimley»Horn

3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON 07/16/2024
R.C.E. NO.: C57667 DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: AM
CHECKED BY: MS
SCALE: AS NOTED
DATE: 7/16/2024
JOB NUMBER:

REVIEWED BY: ______________ DATE: ________
STAFF ENGINEER
RECOMMENDED FOR APPROVAL BY: ______________ DATE: ________
APPROVED BY: ______________ DATE: ________
CITY ENGINEER
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR:
TRACT NO. 31462-29
TITLE SHEET
FOR: MERITAGE HOMES

SHEET 1 OF 6 SHEETS
FILE NO: 3502
PW2024-0030

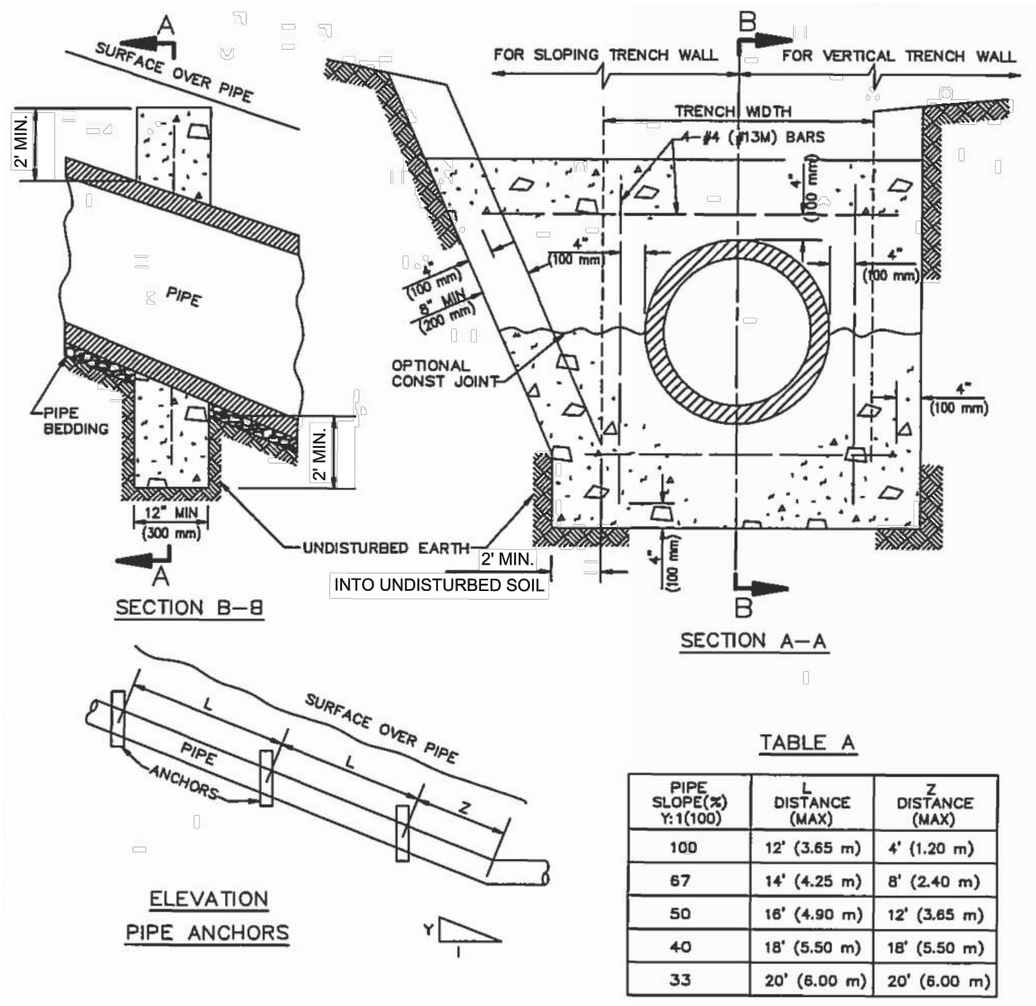


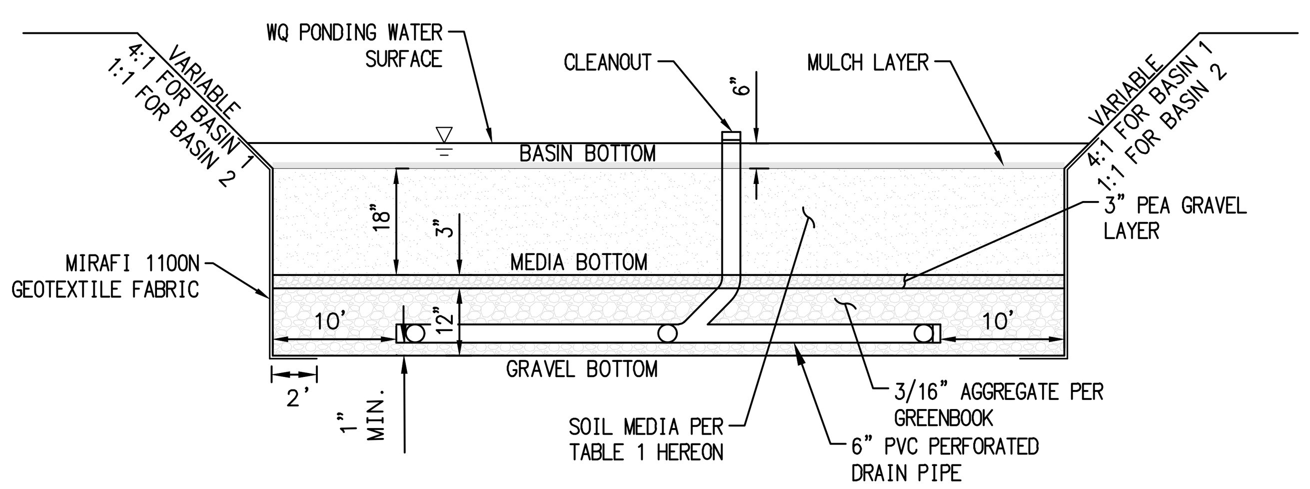
TABLE A

PIPE SLOPE(%) Y:1(100)	L DISTANCE (MAX)	Z DISTANCE (MAX)
100	12' (3.65 m)	4' (1.20 m)
67	14' (4.25 m)	8' (2.40 m)
50	16' (4.90 m)	12' (3.65 m)
40	18' (5.50 m)	18' (5.50 m)
33	20' (6.00 m)	20' (6.00 m)

PIPE ANCHOR DETAIL

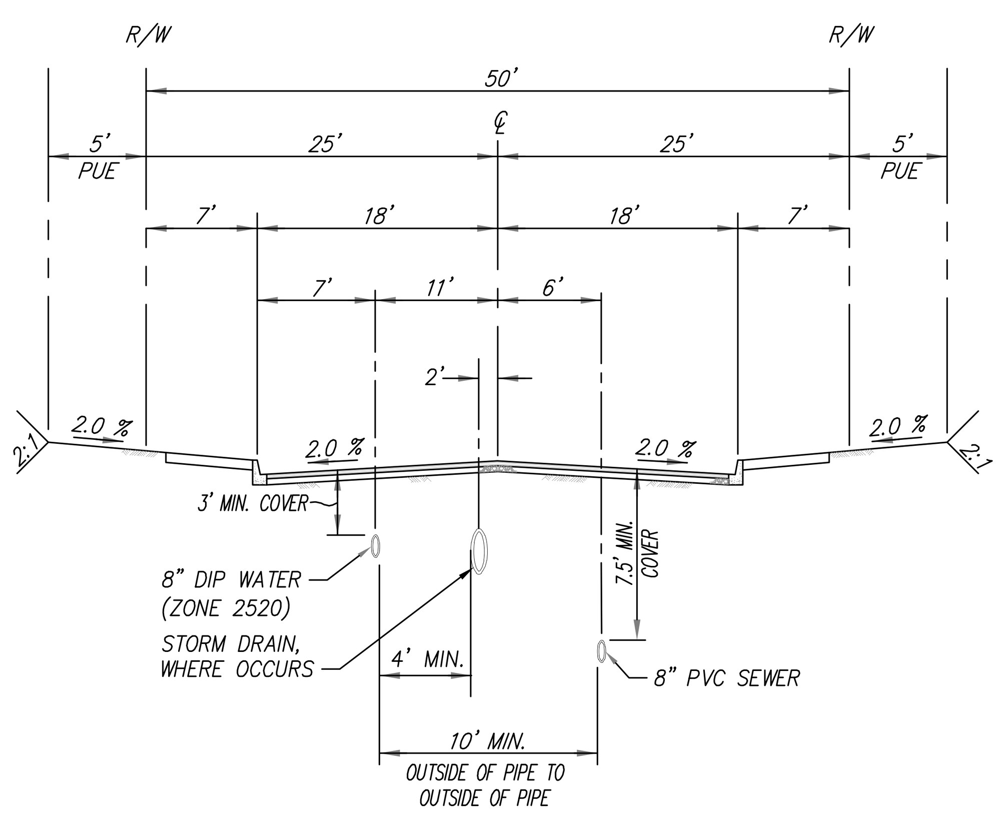
NOTES:

1. ANCHORS SHALL BE CLASS 450-C-2000 (265-C-14) CONCRETE.
2. FOR CLAY PIPE, ANCHORS SHALL NOT BE PLACED WITHIN 6" (150 mm) OF THE PIPE JOINT.
3. TRENCH SHALL BE BACKFILL PER NOTE 4 ON SHEET 2.
4. SPACING OF ANCHORS FOR PIPE SLOPES BETWEEN VALUES SHOWN IN TABLE "A" MAY BE PROPORTIONED.



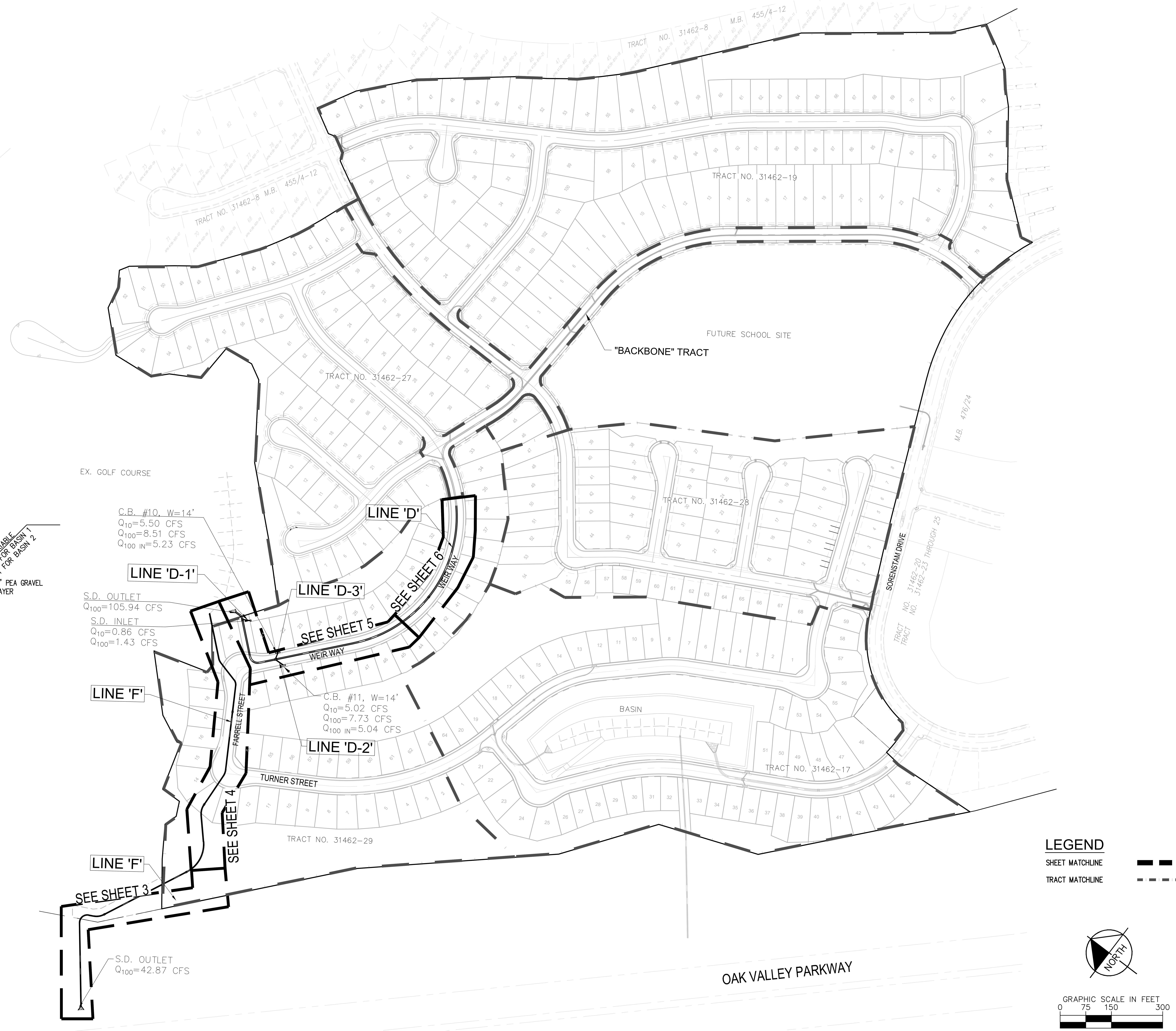
BASIN 1 AND BASIN 2 BOTTOM MEDIA DETAIL

NTS



TYPICAL STREET SECTION

N.T.S.



LEGEND

SHEET MATCHLINE

TRACT MATCHLINE

GRAPHIC SCALE IN FEET

0 75 150 300

DIGALERT

Call 2 Working Days Before You Dig!

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BASIS OF BEARINGS:

DESCRIPTION:

THE BASIS OF COORDINATES FOR THIS MAP IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, 1983, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "REST" AND "RABBIT".

BEARING: N 27°39'52'' E

BENCHMARK:

USGS – MONUMENT "REST" BENCHMARK DISK SET IN TOP OF CONCRETE MONUMENT STAMPED "REST 1972" ON DESERT LAWN DR. ACROSS THE DRIVE CENTERLINE 24.9 FT. SOUTHWEST OF THE SOUTHWEST EDGE OF THE SOUTHEAST BOUND LANES OF INTERSTATE HIGHWAY 10

88 DATUM

ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
	1			
ENGINEER		REVISIONS	CITY	

Kimley»Horn

3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501

PHONE: 951–543–9868

MIKE S. SUTTON

R.C.E. NO.: C57667

07/16/2024

DATE

SEAL

REGISTERED PROFESSIONAL ENGINEER MICHAEL S. SUTTON No. C57667 CIVIL STATE OF CALIFORNIA

DESIGN BY: RS

DRAWN BY: AM

CHECKED BY: MS

SCALE: AS NOTED

DATE: 7/16/2024

JOB NUMBER:

REVIEWED BY: ____ STAFF ENGINEER DATE: ____

RECOMMENDED FOR APPROVAL BY: ____ DATE: ____

APPROVED BY: ____ CITY ENGINEER DATE: ____

CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA

STORM DRAIN IMPROVEMENT PLANS FOR: TRACT NO. 31462–29

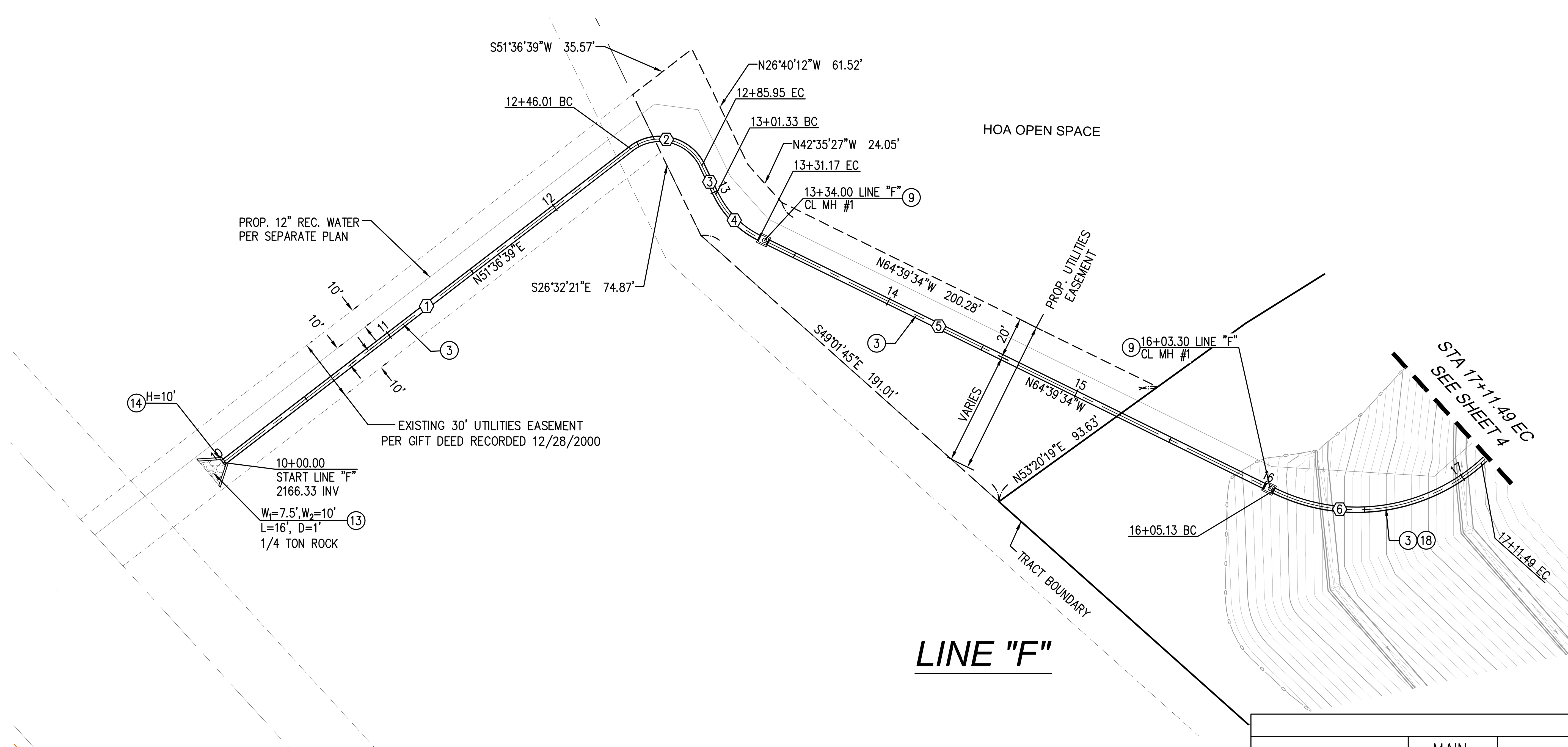
INDEX SHEET

FOR: MERITAGE HOMES

SHEET 2 OF 6 SHEETS

FILE NO: 3502

PW2024-0030



CONSTRUCTION NOTES

3. CONSTRUCT 30" RCP (SEE PROFILE FOR D-LOAD).
9. CONSTRUCT MANHOLE NO. 1 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH251
13. INSTALL RIP-RAP (SIZING PER PLAN).
14. CONSTRUCT CONCRETE HEADWALL PER CALTRANS STD. D90 (SIZING PER PLAN).
18. CONSTRUCT PIPE ANCHORS PER DETAIL ON SHEET 2.

DATA

#	BEARING/DELTA	RADIUS	LENGTH	TANGENT
1	N 51°36'39" E	-	246.01'	-
2	Δ=101° 43' 09"	22.50'	39.95'	27.65'
3	N 26°40'12" W	-	15.38'	-
4	Δ=37° 59' 22"	45.00'	29.84'	15.49'
5	N 64°39'34" W	-	273.97'	-
6	Δ=67° 42' 27"	90.00'	106.35'	60.37'

MANHOLE & JUNCTION STRUCTURE DATA TABLE

STRUCTURE	MAIN LINE	LATERAL LEFT					LATERAL RIGHT					D_1	D_2
		NAME	A	B	C	L	NAME	A	B	C	L		
M.H. #1 13+34.00	LINE F					4.0'						24"	24"
M.H. #1 16+03.30	LINE F					4.0'						24"	24"

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

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BASIS OF BEARINGS:
DESCRIPTION:
THE BASIS OF COORDINATES FOR THIS MAP IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, 1983, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "REST" AND "RABBIT".
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88 DATUM
ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS		CITY

Kimley»Horn

3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON
R.C.E. NO.: C57667
07/16/2024
DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: AM
CHECKED BY: MS
SCALE: 1"=40'
DATE: 7/16/2024
JOB NUMBER:

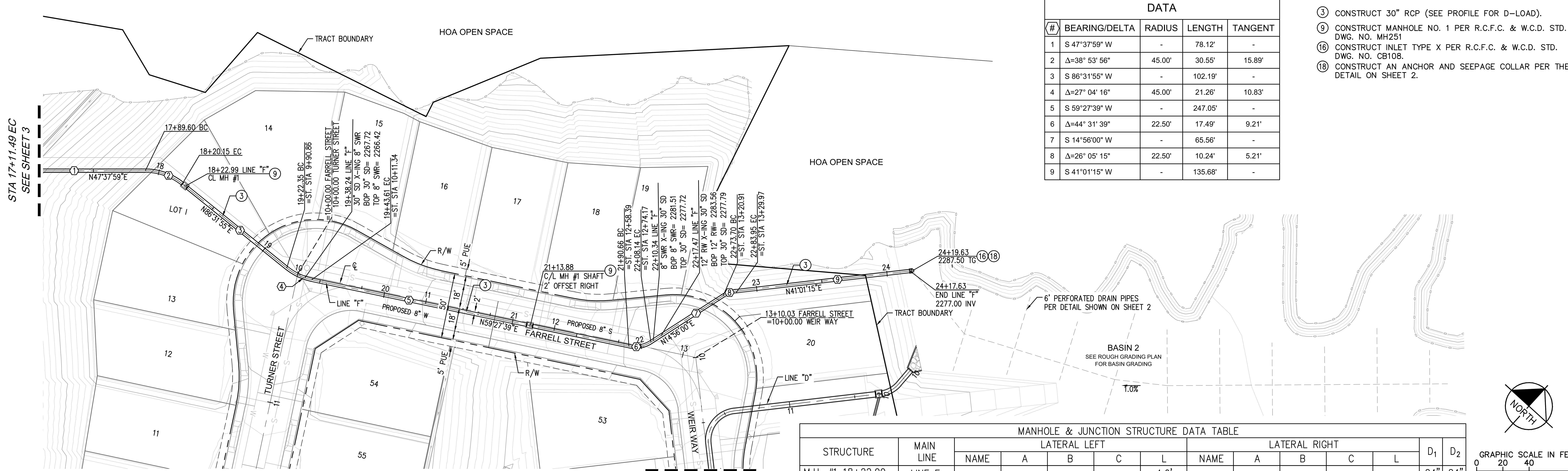
REVIEWED BY: ______ STAFF ENGINEER DATE: ______
RECOMMENDED FOR APPROVAL BY: ______ DATE: ______
APPROVED BY: ______ CITY ENGINEER DATE: ______
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR:
TRACT NO. 31462-29

LINE "F"

FOR: MERITAGE HOMES

SHEET 3 OF 6 SHEETS
FILE NO: 3502
PW2024-0030



LINE "F"

DATA

#	BEARING/DELTA	RADIUS	LENGTH	TANGENT
1	S 47°37'59" W	-	78.12'	-
2	Δ=38° 53' 56"	45.00'	30.55'	15.89'
3	S 86°31'55" W	-	102.19'	-
4	Δ=27° 04' 16"	45.00'	21.26'	10.83'
5	S 59°27'39" W	-	247.05'	-
6	Δ=44° 31' 39"	22.50'	17.49'	9.21'
7	S 14°56'00" W	-	65.56'	-
8	Δ=26° 05' 15"	22.50'	10.24'	5.21'
9	S 41°01'15" W	-	135.68'	-

CONSTRUCTION NOTES

(3) CONSTRUCT 30" RCP (SEE PROFILE FOR D-LOAD).
(9) CONSTRUCT MANHOLE NO. 1 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH251
(16) CONSTRUCT INLET TYPE X PER R.C.F.C. & W.C.D. STD. DWG. NO. CB108.
(18) CONSTRUCT AN ANCHOR AND SEEPAGE COLLAR PER THE DETAIL ON SHEET 2.

MANHOLE & JUNCTION STRUCTURE DATA TABLE

STRUCTURE	MAIN LINE	LATERAL LEFT NAME	A	B	C	L	LATERAL RIGHT NAME	A	B	C	L	D_1	D_2
M.H. #1 18+22.99	LINE F					4.0'						24"	24"
M.H. #1 21+13.88	LINE F					4.0'						24"	24"

GRAPHIC SCALE IN FEET 0 20 40 80

DIGALERT Call 2 Working Days Before You Dig! 811

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88 DATUM
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BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS		CITY

Kimley»Horn

3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501 PHONE: 951-543-9868

MIKE S. SUTTON R.C.E. NO.: C57667 07/16/2024 DATE

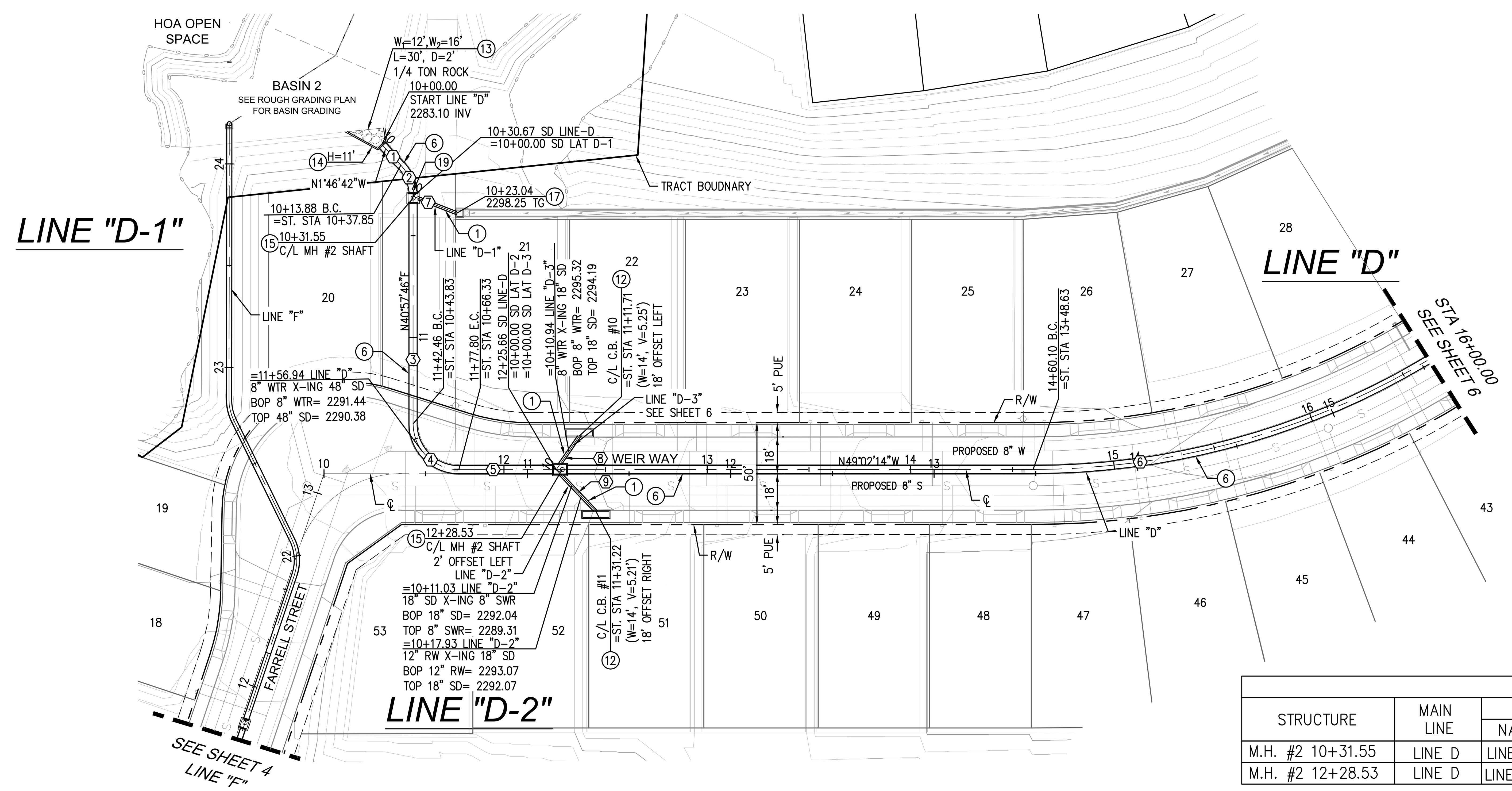
SEAL: REGISTERED PROFESSIONAL ENGINEER MICHAEL S. SUTTON No. C57667 CIVIL STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: AM
CHECKED BY: MS
SCALE: 1"=40'
DATE: 7/16/2024
JOB NUMBER:

REVIEWED BY: ____ STAFF ENGINEER DATE: ____
RECOMMENDED FOR APPROVAL BY: ____ DATE: ____
APPROVED BY: ____ CITY ENGINEER DATE: ____
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR: TRACT NO. 31462-29
LINE "F"
FOR: MERITAGE HOMES

SHEET 4 OF 6 SHEETS
FILE NO.: 3502
PW2024-0030



DATA				
#	BEARING/DELTA	RADIUS	LENGTH	TANGENT
1	S 1°46'42" E	-	13.88'	-
2	Δ=42° 44' 29"	22.50'	16.78'	8.80'
3	S 40°57'46" W	-	111.79'	-
4	Δ=90° 00' 00"	22.50'	35.34'	22.50'
5	S 49°02'14" E	-	282.30'	-
6	Δ=21° 18' 52"	378.00'	140.62'	71.13'
7	S 27°56'26" E	-	23.04'	-
8	N 75°37'06" E	-	20.06'	-
9	S 2°32'57" E	-	28.27'	-

CONSTRUCTION NOTES

1. CONSTRUCT 18" RCP (SEE PROFILE FOR D-LOAD).
6. CONSTRUCT 48" RCP (SEE PROFILE FOR D-LOAD).
12. CONSTRUCT CURB INLET CATCH BASIN AND LOCAL DEPRESSION PER COUNTY OF RIVERSIDE STD. NO. 300 (W & V PER PLAN).
13. INSTALL RIP-RAP (SIZING PER PLAN).
14. CONSTRUCT CONCRETE HEADWALL PER CALTRANS STD. D90 (SIZING PER PLAN).
15. CONSTRUCT MANHOLE NO. 2 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH252.
17. CONSTRUCT 4'X4' DROP INLET.
19. INSTALL STORMTEK FULL TRASH CAPTURE DEVICE PER STORM WATER INSPECTION & MAINTENANCE SERVICES.

MANHOLE & JUNCTION STRUCTURE DATA TABLE

STRUCTURE	MAIN LINE	LATERAL LEFT					LATERAL RIGHT					D_1	D_2
		NAME	A	B	C	L	NAME	A	B	C	L		
M.H. #2 10+31.55	LINE D	LINE D-1	68°54'13"	1.5'	23.04	4.16'						48"	48"
M.H. #2 12+28.53	LINE D	LINE D-3	55°20'41"	1.5'	20.06	6.16'	LINE D-2	46°29'17"	1.5'	28.27	6.16'	48"	48"

GRAPHIC SCALE IN FEET
0 20 40 80

NORTH

DIGALERT
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BASIS OF BEARINGS:
DESCRIPTION:
THE BASIS OF COORDINATES FOR THIS MAP IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, 1983, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "REST" AND "RABBIT".
BEARING: N 27°39'52" E

BENCHMARK:
USGS – MONUMENT "REST" BENCHMARK DISK SET IN TOP OF CONCRETE MONUMENT STAMPED "REST 1972" ON DESERT LAWN DR. ACROSS THE DRIVE CENTERLINE 24.9 FT. SOUTHWEST OF THE SOUTHWEST EDGE OF THE SOUTHEAST BOUND LANES OF INTERSTATE HIGHWAY 10
88 DATUM
ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
	1			
ENGINEER		REVISIONS	CITY	

Kimley»Horn

3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON
R.C.E. NO.: C57667
07/16/2024
DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: AM
CHECKED BY: MS
SCALE: 1"=40'
DATE: 7/16/2024
JOB NUMBER:

REVIEWED BY: ______ DATE: ______
STAFF ENGINEER
RECOMMENDED FOR APPROVAL BY: ______ DATE: ______
APPROVED BY: ______ DATE: ______
CITY ENGINEER
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR:
TRACT NO. 31462-29

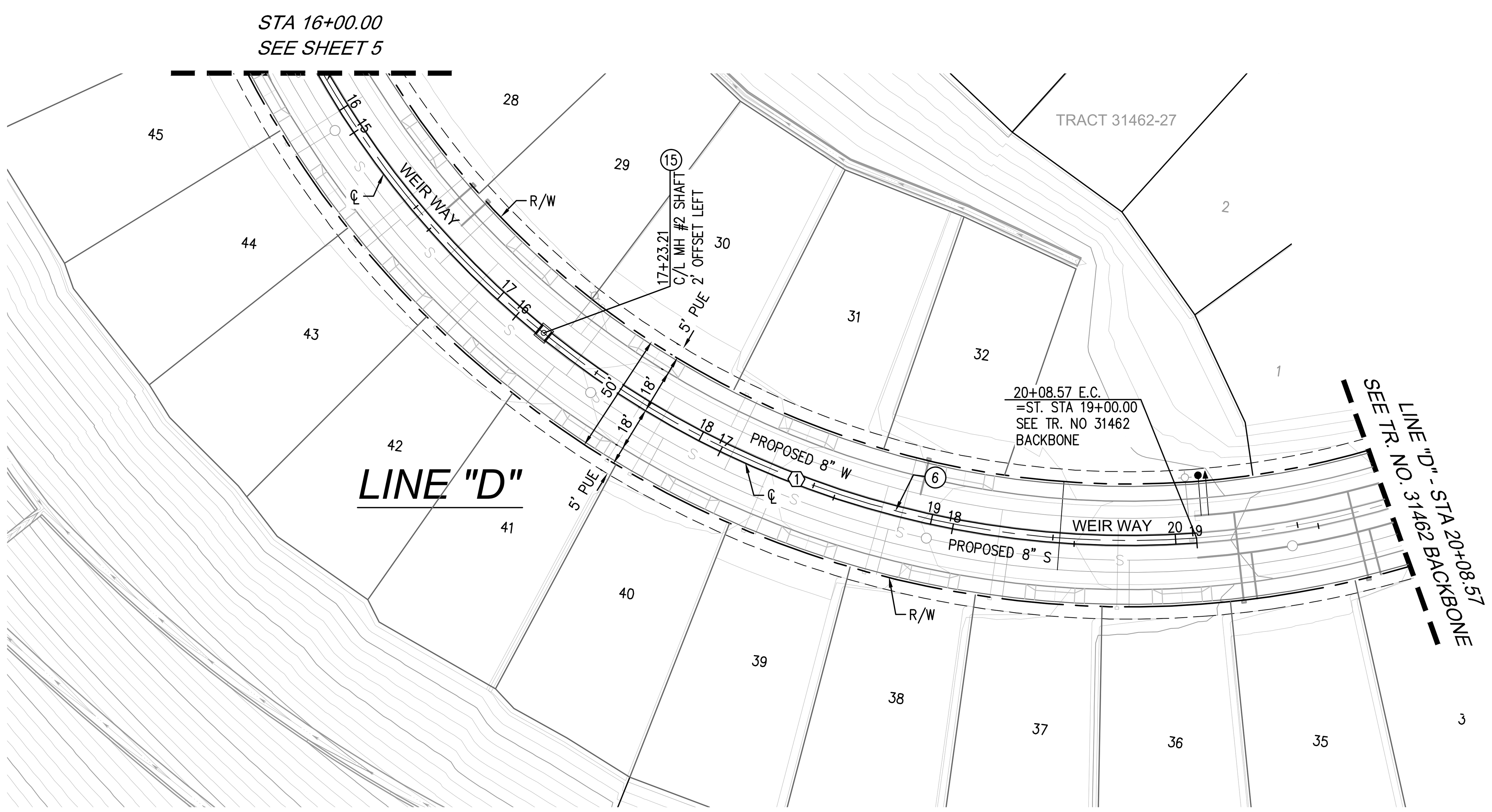
LINE "D", LINE "D-1", & LINE "D-2"

FOR: MERITAGE HOMES

SHEET 5 OF 6 SHEETS
FILE NO: 3502
PW2024-0030

CONSTRUCTION NOTES

6. CONSTRUCT 48" RCP (SEE PROFILE FOR D-LOAD).
15. CONSTRUCT MANHOLE NO. 2 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH252.



DATA

#	BEARING/DELTA	RADIUS	LENGTH	TANGENT
1	Δ=61° 49' 15"	378.00'	407.85'	226.32'

MANHOLE & JUNCTION STRUCTURE DATA TABLE

STRUCTURE	MAIN LINE	LATERAL LEFT NAME	A	B	C	L	LATERAL RIGHT NAME	A	B	C	L	D_1	D_2
M.H. #2 17+23.21	LINE D					4.16						48"	48"

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

DIGALERT
Call 2 Working Days Before You Dig!
811

BASIS OF BEARINGS:
DESCRIPTION:
THE BASIS OF COORDINATES FOR THIS MAP IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, 1983, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "REST" AND "RABBIT".
BEARING: N 27°39'52" E

BENCHMARK:
USGS – MONUMENT "REST" BENCHMARK DISK SET IN TOP OF CONCRETE MONUMENT STAMPED "REST 1972" ON DESERT LAWN DR. ACROSS THE DRIVE CENTERLINE 24.9 FT. SOUTHWEST OF THE SOUTHWEST EDGE OF THE SOUTH BOUND LANES OF INTERSTATE HIGHWAY 10
88 DATUM
ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS	CITY	

Kimley»Horn
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3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON
R.C.E. NO.: C57667
07/16/2024
DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: AM
CHECKED BY: MS
SCALE: 1"=40'
DATE: 7/16/2024
JOB NUMBER:

REVIEWED BY: ____ STAFF ENGINEER DATE: ____
RECOMMENDED FOR APPROVAL BY: ____ DATE: ____
APPROVED BY: ____ CITY ENGINEER DATE: ____
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR:
TRACT NO. 31462-29
LINE "D" & LINE "D-3"
FOR: MERITAGE HOMES

SHEET 6 OF 6 SHEETS
FILE NO: 3502
PW2024-0030

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS
BACKBONE - FAIRWAY CANYON 4C
LINE "D", LINE "D-1", LINE "D-2", LINE "D-3", LINE "D-4", LINE "D-5", LINE "D-6", LINE "D-7", LINE "D-8", LINE "D-9", LINE "E", LINE "E-1", & LINE "I"

GENERAL NOTES

1. THE CONTRACTOR SHALL CONSTRUCT THE DRAINAGE IMPROVEMENT SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT DESIGN MANUAL STANDARD DRAWINGS, RECENT EDITION, AND IN CONFORMANCE WITH THE REQUIREMENTS OF THE BEAUMONT DRAINAGE MANAGEMENT PLAN.
2. THE CONTRACTOR IS REQUIRED TO CONTACT ALL UTILITY AGENCIES REGARDING TEMPORARY SUPPORT AND SHORING REQUIREMENTS FOR THE VARIOUS UTILITIES SHOWN IN THE PLANS.
3. CONSTRUCTION INSPECTION WILL BE PERFORMED BY CITY OF BEAUMONT. CONTACT (951) 769-8520. THE CITY MUST BE NOTIFIED ONE WEEK PRIOR TO CONSTRUCTION.
4. ALL STATIONING REFERS TO THE CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
5. STATIONING FOR LATERALS AND CONNECTOR PIPE REFER TO THE CENTERLINE-CENTERLINE-INTERSECTION STATION.
6. FORTY-EIGHT HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT 1-800-227-2600.
7. ALL CROSS SECTIONS ARE TAKEN LOOKING UPSTREAM.
8. ELEVATIONS AND LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE UNLESS OTHERWISE NOTED. ALL UTILITIES SHOWN ARE TO BE PROTECTED IN PLACE UNLESS OTHERWISE NOTED.
9. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6 INCHES OF CLASS "B" CONCRETE.
10. PIPE CONNECTED TO THE MAINLINE PIPE SHALL CONFORM TO JUNCTION STRUCTURE NO. 4 (JS 229) UNLESS OTHERWISE NOTED.
11. PIPE BEDDING SHALL CONFORM TO R.C.F.C. & W.C.D. STD. DWG. M 815.
12. V" IS THE DEPTH OF INLET AT THE CATCH BASINS MEASURED FROM THE TOP OF THE CURB TO THE INVERT OF CONNECTOR PIPE.
13. ALL CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS, AND OTHER EXISTING IMPROVEMENTS TO BE RECONSTRUCTED IN KIND PER LATEST COUNTY STANDARD AND AT THE SAME ELEVATION AND LOCATION AS THE EXISTING IMPROVEMENTS UNLESS OTHERWISE NOTED. FOR PAVEMENT OVERLAY, 0.10' MIN. FOR FULL LANE WIDTH IS REQUIRED.
14. HYDRAULIC GRADE LINES SHOWN IN PROFILES ARE FOR 100 YEAR FREQUENCY FLOWS, UNLESS OTHERWISE NOTED.
15. THE CONTRACTOR SHALL COMPLY WITH THE STATE AND LOCAL SAFETY CODES DURING THE PROGRESS OF WORK.
16. THE CONTRACTOR SHALL MAINTAIN ADJACENT STREETS IN A NEAT, SAFE, CLEAN AND SANITARY CONDITION AT ALL TIMES AND TO THE SATISFACTION OF THE COUNTY'S OR DISTRICT'S INSPECTOR. THE ADJACENT STREETS SHALL BE KEPT CLEAN OF DEBRIS, WITH DUST AND OTHER NUISANCE BEING CONTROLLED AT ALL TIMES. THE DEVELOPER SHALL BE RESPONSIBLE FOR ANY CLEAN UP ON ADJACENT STREETS AFFECTED BY HIS CONSTRUCTION. METHOD OF STREET CLEANING SHALL BE DRY SWEEPING OF ALL PAVED AREAS.
17. THE CONTRACTOR AGREES THAT HE/SHE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER, CITY OF BEAUMONT, AND THE DEVELOPER'S ENGINEER, HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNERS OR THE DEVELOPER'S ENGINEER.
18. ALL PIPE LENGTHS ARE HORIZONTAL PROJECTIONS (NOT TRUE LENGTHS OF PIPE) AND ARE THE BASIS OF THE ESTIMATES OF QUANTITIES. THE CONTRACTOR SHALL DETERMINE THE TRUE QUANTITY OF PIPE REQUIRED FOR THIS PROJECT PRIOR TO PLACING THE ORDER.
19. ALL ELEVATIONS SHOWN ARE TO THE INVERTS OF PIPE, EXCEPT WHERE OTHERWISE NOTED.
20. AT THE DISCRETION OF THE ENGINEER AND THE CITY OF BEAUMONT, THE CONTRACTOR MAY BE REQUIRED TO VERIFY, BY POTHOLING, THE LOCATION OF POTENTIALLY AFFECTED UTILITIES.
21. . CONTRACTOR SHALL DISPOSE OF ALL EXCESS EXCAVATED MATERIAL AT MANDATORY DISPOSAL.
22. ALL BACKFILL AND BEDDING AROUND STRUCTURES AND PIPES SHALL BE COMPACTED TO NOT LESS THAN 90 PERCENT RELATIVE COMPACTION EXCEPT WHERE SUCH MATERIAL IS PLACED UNDER EXISTING PAVED ROADWAYS. THE TOP 3 FEET, MEASURED FROM THE FINISH PAVING, SHALL BE COMPACTED TO 95 PERCENT RELATIVE COMPACT.
23. ALL SURVEY MONUMENTS SHALL BE REPLACED AS REQUIRED. MONUMENTS SHALL BE TIED OUT PRIOR TO CONSTRUCTION AND REPLACED UPON COMPLETION OF CONSTRUCTION.
24. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/OWNER OR CONTRACTOR TO APPLY TO THE DIRECTOR OF PUBLIC WORKS, CITY OF BEAUMONT FOR AN ENCROACHMENT PERMIT FOR ALL WORK PERFORMED WITHIN PUBLIC RIGHT-OF-WAY, DEDICATED AND ACCEPTED FOR PUBLIC USE; AND TO BE RESPONSIBLE FOR SATISFACTORY COMPLIANCE FOR ALL CURRENT ENVIRONMENTAL REGULATIONS DURING THE LIFE OF CONSTRUCTION ACTIVITIES FOR THIS PROJECT. ADDITIONAL STUDIES AND/OR PERMITS MAY BE REQUIRED.
25. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEARING OF THE PROPOSED WORK AREA, AND RELOCATION COSTS OF ALL EXISTING UTILITIES. PERMITTEE MUST INFORM CITY OF CONSTRUCTION SCHEDULE AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
26. ALL UNDERGROUND FACILITIES WITH LATERALS SHALL BE IN PLACE PRIOR TO PAVING THE STREET, INCLUDING BUT NOT LIMITED TO, THE FOLLOWING: SEWER, WATER, ELECTRIC, STORM DRAINS.
27. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR CONTRACTOR TO INSTALL AND MAINTAIN DURING CONSTRUCTION, REGULATORY GUIDE AND WARNING SIGNS WITHIN THE PROJECT LIMITS AND ITS SURROUNDINGS TO PROVIDE SAFE PASSAGE FOR THE TRAVELING PUBLIC AND WORKERS UNTIL THE FINAL COMPLETION AND ACCEPTANCE OF THE PROJECT BY THE CITY OF BEAUMONT.
28. CONSTRUCTION PROJECTS THAT DISTURB MORE THAN ONE ACRE MUST OBTAIN A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT. OWNER/DEVELOPERS ARE REQUIRED TO FILE A NOTICE OF INTENT (NOI) WITH THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) AND COMPLY WITH ALL REQUIREMENTS OF THE BEAUMONT DRAINAGE MANAGEMENT PLAN. BEAUMONT IS CO-PERMITTEE WITH R.C.F.C. & W.C.D.
29. ALL STORM DRAINS, CATCH BASINS, AND STORM WATER RUNOFF STRUCTURES WILL BE PROVIDED WITH ADEQUATE CAPABILITIES TO FILTER AND RETAIN SEDIMENT AND DIRT, OIL, AND GREASE, TO PREVENT POLLUTION IN STORM WATER RUNOFF IN COMPLIANCE WITH THE CITY OF BEAUMONT'S BEST MANAGEMENT PRACTICES AND THE BEAUMONT DRAINAGE MASTER PLAN FOR STORM WATER AS WELL AS BEST MANAGEMENT PRACTICES IDENTIFIED IN THE CURRENT REPORT OF WASTE DISCHARGE FOR RIVERSIDE COUNTY PERMITTEE.
30. DEVELOPER SHALL BE FULLY RESPONSIBLE IN ASSURING THAT PROPOSED IMPROVEMENTS CONFORM TO THE APPROVED PLANS, SPECIFICATIONS AND CITY OF BEAUMONT STANDARDS. WHERE DEVIATIONS EXIST, DEVELOPER SHALL PROPOSE CORRECTIVE MEASURES FOR REVIEW AND APPROVAL BY THE CITY.

NOTE:

1. APPROVAL OF THESE PLANS APPLY ONLY WITHIN THE JURISDICTION OF THE CITY OF BEAUMONT.
2. TRENCHING FOR UTILITIES AND STRUCTURES IS NOT ALLOWED UNTIL SOIL COMPACTION REPORT IS SUBMITTED AND APPROVED BY THE PUBLIC WORK DEPARTMENT.
3. THE CITY RESERVES THE RIGHT TO REQUIRE REVISION OF THE APPROVED PLANS TO CONFORM WITH CURRENT STANDARDS AND TO POST A NEW BOND IF CONSTRUCTION HAS NOT COMMENCED WITHIN TWO YEARS AFTER PLANS WERE APPROVED.
4. HE DEVELOPER SHALL HAVE GEOTECHNICAL/SOILS ENGINEERING FIRM OBSERVE TRENCHING, BACKFILLING, AND SOIL COMPACTION OF ALL UTILITY TRENCHES WITHIN ALL EASEMENTS AND ROAD RIGHTS OF WAY. TWO SETS OF COMPACTION REPORTS CERTIFYING THAT WORKS WERE DONE IN CONFORMANCE TO STANDARDS AND GEOTECHNICAL REPORT SHALL BE SUBMITTED AFTER EACH UTILITY TRENCH IS COMPLETED AND CERTIFIED. COMPACTION REPORT MUST BE SUBMITTED TO THE DEPT. OF PUBLIC WORKS AT LEAST TWO WORKING DAYS BEFORE AGGREGATE BASE MATERIALS ARE PLACED ONSITE.

SEE SHEET NO. 2 FOR INDEX MAP

*RCP NOTES:

1. THE CONCRETE COATING ON THE INSIDE OF ALL REINFORCED CONCRETE PIPES MUST BE INCREASED TO PROVIDE A MINIMUM OF 1-1/2"OVER THE REINFORCING WHEN THE DESIGN VELOCITIES EXCEED 20 FEET PER SECOND. THE CONCRETE DESIGN STRENGTH IN THESE REACHES SHALL BE f'c = 5,000 PSI FOR VELOCITIES EXCEEDING 20 FEET PER SECOND AND f'c = 6,000 PSI FOR VELOCITIES EXCEEDING 30 FPS.
2. THE JOINTS FOR REINFORCED CONCRETE PIPES UNDER PRESSURE FLOW CONDITIONS SHALL BE WATERTIGHT IN CONFORMANCE WITH ASTM C443.

DECLARATION OF RESPONSIBLE CHARGE:

I HEREBY DECLARE THAT I AM THE ENGINEER OF RECORD FOR THIS PROJECT AND THAT THE DESIGN OF THE IMPROVEMENTS SHOWN ON THESE PLANS COMPLIES WITH ALL PROFESSIONAL ENGINEERING STANDARDS AND PRACTICES. I ASSUME FULL RESPONSIBILITY FOR ALL ASPECTS OF THE DESIGN OF THE IMPROVEMENTS. WITH RESPECT TO THE PLAN CHECK PERFORMED BY THE CITY OF BEAUMONT, I UNDERSTAND AND ACKNOWLEDGE THE FOLLOWING: (1) THE PLAN CHECK IS A REVIEW FOR THE LIMITED PURPOSE OF ENSURING THE PLANS COMPLY WITH THE CITY'S STANDARDS, PROCEDURES, POLICIES, AND ORDINANCES; (2) THE PLAN CHECK IS NOT A DETERMINATION OF THE TECHNICAL ADEQUACY OF THE DESIGN OF THE IMPROVEMENTS; AND, (3) THE PLAN CHECK DOES NOT RELIEVE ME OF MY LEGAL AND PROFESSIONAL RESPONSIBILITY FOR THE DESIGN OF THE IMPROVEMENTS. TO THE FULL EXTENT PERMITTED BY LAW, I AGREE TO DEFEND, INDEMNIFY, AND HOLD HARMLESS THE CITY, ITS ELECTED OFFICIALS, EMPLOYEES, AND AGENTS FROM ANY AND ALL ACTUAL OR ALLEGED CLAIMS, DEMANDS, CAUSES OF ACTION, LIABILITY, LOSS, DAMAGE, OR INJURY TO PROPERTY OR PERSONS, INCLUDING WRONGFUL DEATH, WHETHER IMPOSED BY A COURT OF LAW OR BY ADMINISTRATIVE ACTION OF ANY FEDERAL, STATE OR LOCAL GOVERNMENTAL AGENCY, TO THE EXTENT ARISING OUT OF OR INCIDENT TO ANY NEGLIGENT ACTS, OMISSIONS, OR ERRORS BY THE ENGINEER OF RECORD, ITS EMPLOYEES, CONSULTANTS, OR AGENTS.

FIRM: KIMLEY HORN & ASSOCIATES, INC.
ADDRESS: 3801 UNIVERSITY AVE. SUITE 300
CITY, ST.: RIVERSIDE,CA 92501
TELEPHONE: (760) 565-5146
BY: MIKE SUTTON, R.C.E. NO.:C57667 DATE: 06/27/2024
(NAME OF ENGINEER & RCE)

PRIVATE ENGINEERS NOTICE TO CONTRACTOR(S)

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT THOSE SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE ALL PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN, AND ANY OTHER LINES OR STRUCTURES NOT SHOWN ON THESE PLANS AND IS RESPONSIBLE FOR THE PROTECTION OF, AND ANY DAMAGE TO THESE LINES OR STRUCTURES
2. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO NOTIFY THE OWNER OF ALL UTILITIES OR STRUCTURES CONCERNED BEFORE STARTING WORK.
3. QUANTITIES SHOWN HEREON ARE PROVIDED FOR BIDDING PURPOSES ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES PRIOR TO BIDDING FOR CONSTRUCTION.
4. THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER CITY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE CITY.

LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF BEAUMONT, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

THE DESIGNATED REMAINDER PARCEL OF PARCEL MAP NO. 38090, IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 254, PAGES 97 THROUGH 103, INCLUSIVE, OF PARCEL MAPS, RECORDS OF SAID COUNTY.

EXCEPTING THEREFROM THE ABOVE PARCEL ANY AND ALL NATURAL OIL, OIL RIGHTS, MINERALS, MINERAL RIGHTS, NATURAL GAS, NATURAL GAS RIGHTS AND OTHER HYDROCARBONS BY WHATSOEVER NAME KNOWN AND ALL RIGHTS THEREIN, GEOTHERMAL STEAM, AND ALL PRODUCTS DERIVED FROM ANY OF THE FOREGOING, THAT MAY BE WITHIN OR UNDER THE LAND, TOGETHER WITH THE PERPETUAL RIGHT OF DRILLING, MINING, EXPLORING AND OPERATING THEREFOR AND STORING IN AND REMOVING THE SAME FROM THE LAND OR ANY OTHER PROPERTY, INCLUDING THE RIGHT TO WHIPSTOCK OR DIRECTIONALLY DRILL AND MINE FROM PROPERTY OTHER THAN THE LAND, OIL OR GAS WELLS, TUNNELS AND SHAFTS INTO, THROUGH OR ACROSS THE SUBSURFACE OF THE LAND, AND TO BOTTOM SUCH WHIPSTOCKED OR DIRECTIONALLY DRILLED WELLS, TUNNELS AND SHAFTS UNDER AND BENEATH OR BEYOND THE EXTERIOR LIMITS THEREOF, AND TO REDRILL, RETUNNEL, EQUIP, MAINTAIN, REPAIR, DEEPEN AND OPERATE ANY SUCH WELLS, TUNNELS OR SHAFTS, WITHOUT THE RIGHT TO DRILL, MINE, STORE OR EXCAVATE THROUGH THE SURFACE OR THE UPPER 500 FEET OF THE SUBSURFACE OF THE LAND AS RESERVED BY OAK VALLEY PARTNERS, L.P. A TEXAS LIMITED PARTNERSHIP WHICH IS REGISTERED IN CALIFORNIA AS OVP, L.P., IN A GRANT DEED RECORDED NOVEMBER 14, 2003, AS INSTRUMENT NO. 2003-899365 OF OFFICIAL RECORDS.

ANY AND ALL WATER, WATER RIGHTS OR INTERESTS THEREIN APPURTENANT OR RELATING TO THE LAND OR OWNED OR USED BY GRANTOR IN CONNECTION WITH OR WITH RESPECT TO THE LAND (NO MATTER HOW ACQUIRED BY GRANTOR), WHETHER SUCH WATER RIGHTS SHALL BE RIPARIAN, OVERLYING, APPROPRIATIVE, LITTORAL, PERCOLATING, PRESCRIPTIVE, ADJUDICATED, STATUTORY OR CONTRACTUAL, TOGETHER WITH THE RIGHT AND POWER TO EXPLORE, DRILL, REMOVE AND RESTORE THE SAME FROM OR IN THE LAND OR TO DIVERT OR OTHERWISE UTILIZE SUCH WATER, RIGHTS OR INTERESTS ON ANY OTHER PROPERTY OWNED BY OR LEASED BY GRANTOR, WITHOUT THE RIGHT TO ENTER UPON THE SURFACE OF THE LAND IN THE EXERCISE OF SUCH RIGHTS; PROVIDED, HOWEVER, ONLY IF AND TO THE EXTENT THAT SUCH RIGHTS ARE NOT USED BY GRANTEE IN ITS USE AND ENJOYMENT OF THE LAND AS RESERVED BY OAK VALLEY PARTNERS, L.P., A TEXAS LIMITED PARTNERSHIP, WHICH IS REGISTERED IN CALIFORNIA AS OVP, L.P., IN A GRANT DEED RECORDED NOVEMBER 14, 2003 AS INSTRUMENT NO. 2003-899365 OF OFFICIAL RECORDS.

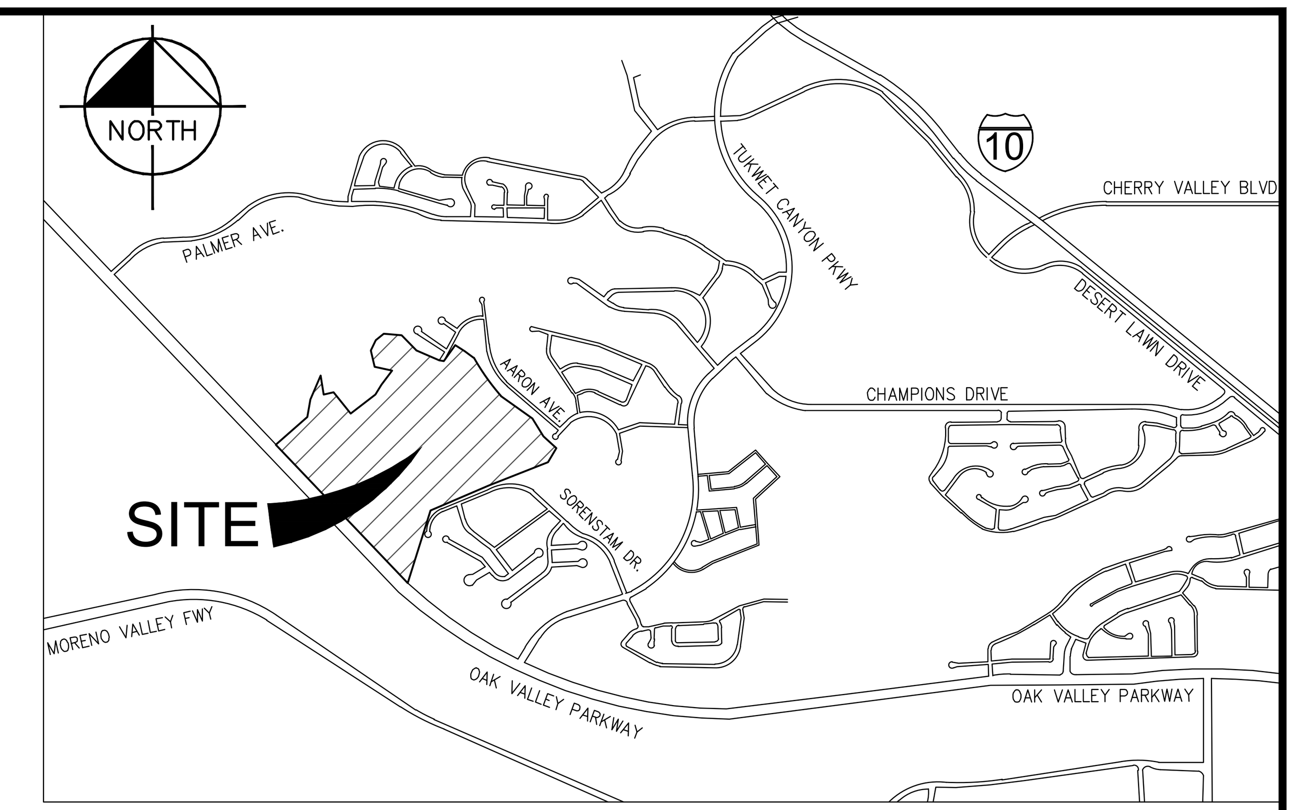
APN: 413-790-010

CONSTRUCTION NOTES

NO.	CONSTRUCTION NOTES	QUANTITIES
1	CONSTRUCT 18" RCP (SEE PROFILE FOR D-LOAD).	722 LF
2	CONSTRUCT 24" RCP (SEE PROFILE FOR D-LOAD).	650 LF
3	CONSTRUCT 30" RCP (SEE PROFILE FOR D-LOAD).	134 LF
4	CONSTRUCT 36" RCP (SEE PROFILE FOR D-LOAD).	222 LF
5	CONSTRUCT 42" RCP (SEE PROFILE FOR D-LOAD).	25 LF
6	CONSTRUCT 48" RCP (SEE PROFILE FOR D-LOAD).	438 LF
9	CONSTRUCT MANHOLE NO. 1 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH251	3 EA
10	CONSTRUCT MANHOLE NO. 4 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH254	5 EA
11	CONSTRUCT CONCRETE COLLAR PER R.C.F.C. & W.C.D. STD. DWG. NO. M803.	1 EA
12	CONSTRUCT CURB INLET CATCH BASIN AND LOCAL DEPRESSION PER COUNTY OF RIVERSIDE STD. NO. 300 (W & V PER PLAN).	9 EA
15	CONSTRUCT MANHOLE NO. 2 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH252.	2 EA
17	CONSTRUCT TRANSITION STRUCTURE NO. 3 PER R.C.F.C. & W.C.D. STD. DWG. NO. TS303.	1 EA
20	CONSTRUCT TEMPORARY SEDIMENT BASIN PER DETAIL ON SHEET 2.	1 EA
21	CONSTRUCT 24" RISER W/ HOOD & TRASH RACK W/4" ORIFICES, 4 ORIFICES PER ROW, 4 ROWS. 1ST ROW 1' ABOVE BASIN BOTTOM. SPACE ROWS 6" APART.	1 EA

STORM DRAIN NOTES

1. THE CONTRACTOR SHALL CONSTRUCT THE FLOOD CONTROL IMPROVEMENTS SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S (DISTRICT) M.O.U. STANDARD SPECIFICATIONS DATED MARCH 2020 AND DISTRICT STANDARD DRAWINGS. FOR THE LATEST STANDARD DRAWINGS, PLEASE REFER TO THE "ENGINEERING TOOLS" PAGE FOUND ON THE "BUSINESS" SECTION OF THE DISTRICT'S WEBSITE.
2. CONTACT THE ENCROACHMENT PERMIT ENGINEER AT 951.955.1266 IF AN ENCROACHMENT PERMIT IS REQUIRED FROM THE DISTRICT. AFTER THE PERMIT IS ISSUED, THE DISTRICT MUST BE NOTIFIED ONE (1) WEEK PRIOR TO CONSTRUCTION.
3. CONTACT CONSTRUCTION MANAGEMENT AT 951.955.1288 IF CONSTRUCTION INSPECTION WILL BE PERFORMED BY THE DISTRICT. THE DISTRICT MUST BE NOTIFIED TWENTY (20) DAYS PRIOR TO CONSTRUCTION.
4. ALL STATIONING REFERS TO CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
5. STATIONING FOR LATERALS AND CONNECTOR PIPES REFER TO THE CENTERLINE INTERSECTION STATIONS.
6. FORTY-EIGHT (48) HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT AT 1.800.227.2600.
7. ALL ELEVATIONS SHOWN ARE IN FEET AND DECIMALS THEREOF BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD 88).
8. ALL COORDINATES ARE SHOWN IN FEET AND DECIMALS THEREOF BASED ON THE NORTH AMERICAN DATUM (NAD 83), CALIFORNIA COORDINATE SYSTEM (CCS), ZONE 6 AND EPOCH _____.
9. ALL CROSS SECTIONS ARE TAKEN LOOKING DOWNSTREAM.
10. ELEVATIONS OF UTILITIES ARE APPROXIMATE UNLESS OTHERWISE NOTED.
11. UNLESS OTHERWISE SPECIFIED, MINIMUM STREET RECONSTRUCTION SHALL BE 4" TYPE "A" HOT MIX ASPHALT OVER 6 " CLASS 2 AGGREGATE BASE OR AS SPECIFIED BY THE ENGINEER.
12. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6" OF CLASS "B" CONCRETE.
13. PIPE CONNECTED TO THE MAINLINE PIPE SHALL CONFORM TO JUNCTION STRUCTURE NO. 4 (JS 229) UNLESS OTHERWISE NOTED.
14. PIPE BEDDING SHALL CONFORM TO DISTRICT STANDARD DRAWING NO. M815.
15. BH-1 INDICATES SOIL BORING LOCATIONS BASED ON THE SOILS REPORT DATED _________. LOCATIONS SHOWN ARE APPROXIMATE.
16. "V" IS THE DEPTH OF CATCH BASINS MEASURED FROM THE TOP OF CURB TO INVERT OF CONNECTOR PIPE.
17. CATCH BASINS SHALL BE LOCATED SO THAT LOCAL DEPRESSION SHALL BEGIN AT EXISTING CURB RETURN JOINT, UNLESS OTHERWISE SPECIFIED.
18. ALL CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS AND OTHER EXISTING IMPROVEMENTS ARE TO BE RECONSTRUCTED IN KIND AND AT THE SAME ELEVATION AND LOCATION AS THE EXISTING IMPROVEMENTS UNLESS OTHERWISE NOTED.
19. STANDARD DRAWINGS CALLED FOR ON THE PLAN AND PROFILE SHALL CONFORM TO DISTRICT STANDARD DRAWINGS UNLESS NOTED OTHERWISE.
20. THE CONTRACTOR IS REQUIRED TO CALL ALL UTILITY AGENCIES REGARDING TEMPORARY SHORING AND SUPPORT REQUIREMENTS FOR THE VARIOUS UTILITY LINES SHOWN ON THESE PLANS.
21. DURING ROUGH GRADING OPERATIONS AND PRIOR TO CONSTRUCTION OF PERMANENT DRAINAGE STRUCTURES, TEMPORARY DRAINAGE CONTROL SHOULD BE PROVIDED TO PREVENT PONDING WATER AND DAMAGE TO ADJACENT PROPERTIES.
22. APPROVAL OF THESE PLANS BY DISTRICT DOES NOT RELIEVE THE DEVELOPER'S ENGINEER OF RESPONSIBILITY FOR THE ENGINEERING DESIGN. IF FIELD CHANGES ARE REQUIRED, IT WILL BE THE RESPONSIBILITY OF THE DESIGN ENGINEER TO MAKE THE NECESSARY CORRECTIONS.
23. THE CONTRACTOR OR DEVELOPER SHALL SECURE ALL REQUIRED ENCROACHMENT AND/OR STATE AND FEDERAL REGULATORY PERMITS PRIOR TO THE COMMENCEMENT OF ANY WORK.
24. THE CONCRETE COATING ON THE INSIDE OF ALL REINFORCED CONCRETE PIPES AND STRUCTURES MUST BE INCREASED TO PROVIDE A MINIMUM OF 1-1/2" OVER THE REINFORCING STEEL AND INCREASED TO A MINIMUM OF 3 1/2" OVER REINFORCING STEEL FOR BOX CULVERT, WHEN DESIGN VELOCITIES EXCEED 20' PER SECOND. THE CONCRETE DESIGN STRENGTH IN THESE REACHES SHALL BE F'C=5,000 PSI FOR VELOCITIES EXCEEDING 20' PER SECOND AND F'C=6,000 PSI FOR VELOCITIES EXCEEDING 30' PER SECOND.
25. CONSTRUCTION JOINTS FOR CALTRANS STANDARD REINFORCED CONCRETE BOX SHALL BE PLACED ACCORDING TO DISTRICT STANDARD DRAWING NO. BOX 401.
26. ROCK FOR ACCESS ROADS, TURN AROUNDS AND OTHER AREAS WITHIN DISTRICT RIGHT OF WAY AS SHOWN ON THE PROJECT DRAWINGS AND AS DIRECTED BY THE ENGINEER SHALL MEET THE REQUIREMENTS FOR 1" X NO. 4 COARSE AGGREGATE AS PER SECTION 90-1.02C(4)(B) OF THE CALTRANS SPECIFICATIONS. X VALUES FOR ROCK GRADATION SHALL BE 75 AND 15 FOR 3/4" AND 3/8" RESPECTIVELY. ROCK SHALL ADDITIONALLY MEET THE SPREADING AND COMPACTION REQUIREMENTS OF SECTIONS 26-1.03D AND 26-1.03E OF THE CALTRANS SPECIFICATIONS. FURTHERMORE, ROCK DEPTH SHALL NOT EXCEED 3" AND SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER. ROCK SHALL NOT CONTAIN RECYCLED CONCRETE PRODUCTS.



VICINITY MAP
NOT TO SCALE

ENGINEER

KIMLEY HORN & ASSOCIATES, INC.
3801 UNIVERSITY AVE. SUITE 300
RIVERSIDE, CA 92501
ATTN: MICHAEL SUTTON
PHONE: (760) 565-5146
EMAIL: MIKE.SUTTON@KIMLEY-HORN.COM

OWNER/DEVELOPER

MERITAGE HOMES OF CALIFORNIA,
A CALIFORNIA CORPORATION
5 PETERS CANYON ROAD, SUITE 310
IRVINE, CA 92606
ATTN: JOHANNA CROOKER
PHONE: (408) 772-1774

ABBREVIATIONS

C/L	CENTERLINE
CIPCP	CAST IN PLACE CONCRETE PIPE
CB	CATCH BASIN
GB	GRADE BREAK
EX/EXIST	EXISTING
FG	FINISH GRADE
FS	FINISHED SURFACE
FL	FLOWLINE
INV	INVERT OF PIPE
LP	LOW POINT
HP	HIGH POINT
HGL	HYDRAULIC GRADE LINE
INV	INVERT
CL	CENTERLINE
R/W	RIGHT-OF-WAY
LAT	LATERAL
STA	STATION
PROP	PROPOSED
PUE	PUBLIC UTILITY EASEMENT
L	LENGTH
N.T.S.	NOT TO SCALE
CMP	CORRUGATED METAL PIPE
ELEV.	ELEVATION
MIN.	MINIMUM
MAX.	MAXIMUM
PRC	POINT OF REVERSE CURVE
PCC	POINT OF COMPOUND CURVE
PROP	PROPOSED
RCP	REINFORCED CONC. PIPE
SS	SEWER
SWR	SEWER
SD	STORM DRAIN
TYP.	TYPICAL
TC	TOP OF CURB
TOP	TOP OF PIPE
W	WATER

LEGEND

TRACT BOUNDARY
RIGHT OF WAY
CENTERLINE
EXIST. RIGHT OF WAY
PROP. STORM DRAIN
EX. STORM DRAIN
PROP. STORM STRUCTURE
PROP. CATCH BASIN
EXIST. ELEV. (1217.58) INV
PROP. ELEV. 1217.58 INV

ASSESSOR'S PARCEL NO.

413-790-010

SHEET LIST TABLE

SHEET NO.	SHEET TITLE
1	TITLE SHEET
2	INDEX SHEET
3	STORM DRAIN LINE D
4	STORM DRAIN LINE D
5	STORM DRAIN LINE D
6	STORM DRAIN LINE E
7	STORM DRAIN LINE I

DIGALERT
Call 2 Working Days Before You Dig!
811

BASIS OF BEARINGS:
DESCRIPTION:
THE BASIS OF COORDINATES FOR THIS MAP IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, 1983, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "REST" AND "RABBIT".
BEARING: N 27°39'52'' E

BENCHMARK:
USGS - MONUMENT "REST" BENCHMARK DISK SET IN TOP OF CONCRETE MONUMENT STAMPED "REST 1972" ON DESERT LAWN DR. ACROSS THE DRIVE CENTERLINE 24.9 FT. SOUTHWEST OF THE SOUTHWEST EDGE OF THE SOUTHEAST BOUND LANES OF INTERSTATE HIGHWAY 10
88 DATUM
ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
	1			
ENGINEER		REVISIONS	CITY	

Kimley»Horn

3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON 06/27/2024
R.C.E. NO.: C57667 DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: RS
CHECKED BY: MS
SCALE: AS SHOWN
DATE: 06/27/2024
JOB NUMBER: 195261012

REVIEWED BY: ______ DATE: ______
STAFF ENGINEER
RECOMMENDED FOR APPROVAL BY: ______ DATE: ______
APPROVED BY: ______ DATE: ______
CITY ENGINEER

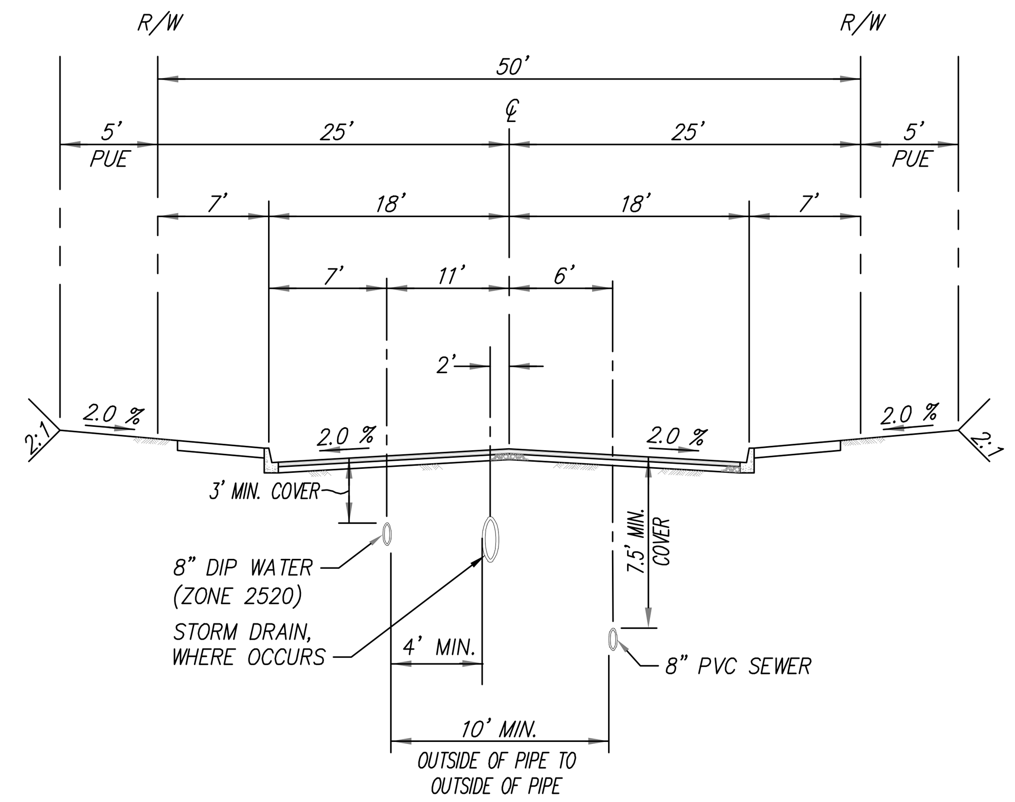
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR:
BACKBONE - FAIRWAY CANYON 4C

TITLE SHEET

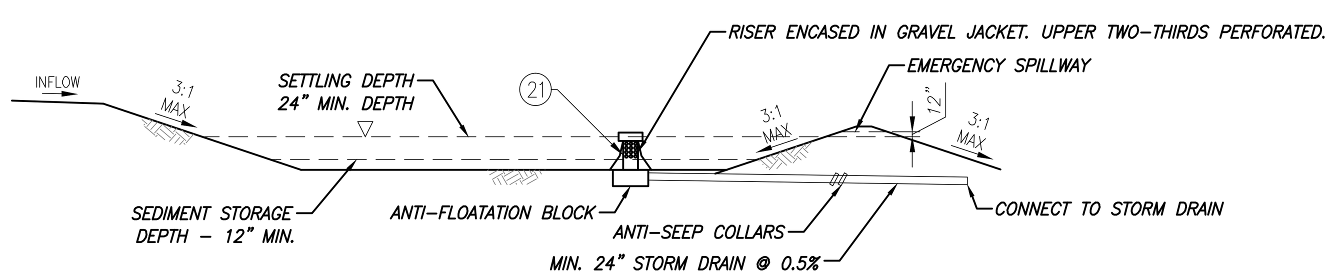
FOR: MERITAGE HOMES

SHEET 1 OF 7 SHEETS
FILE NO: 3493
PW2024-0019



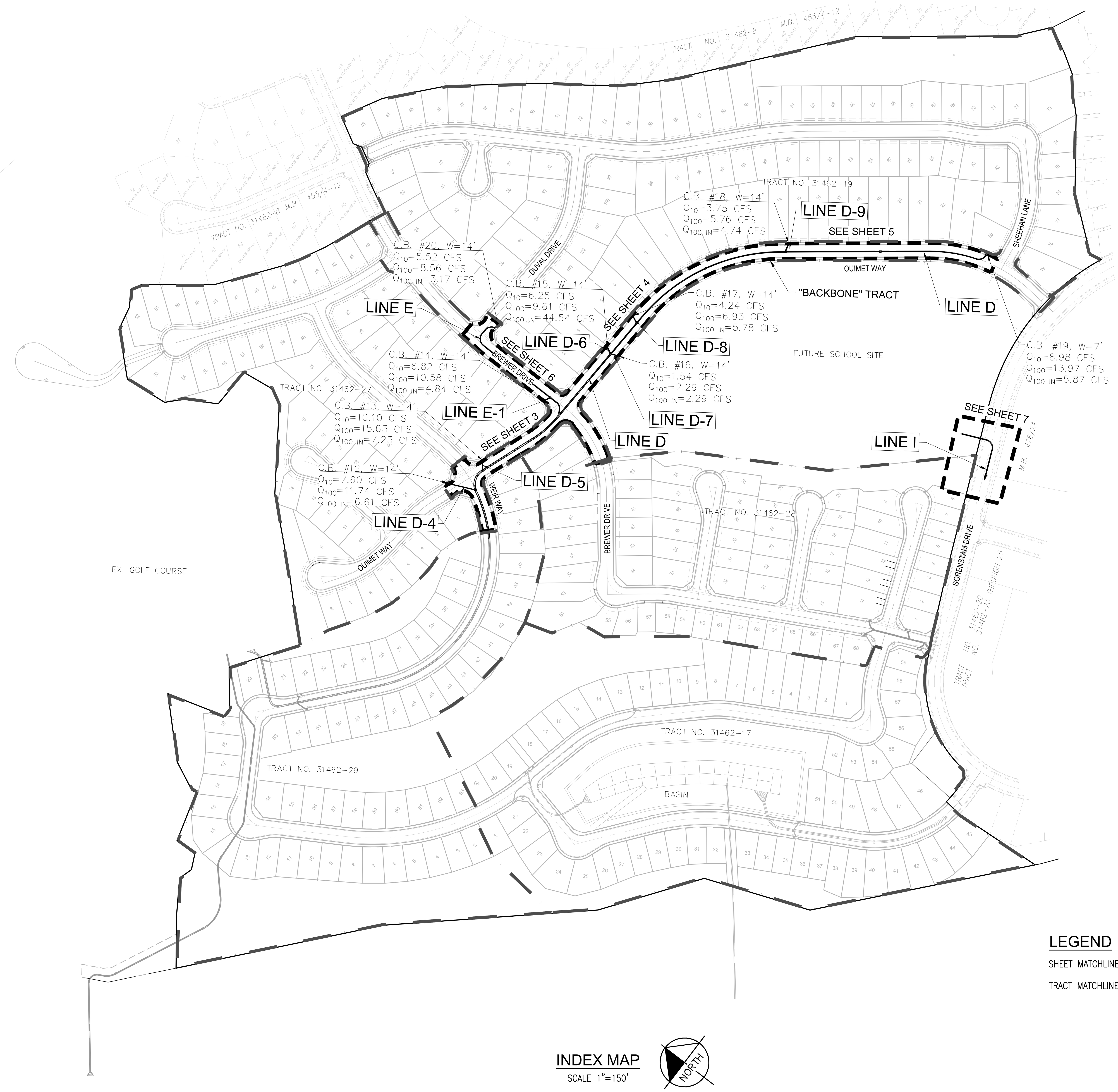
TYPICAL STREET SECTION

NTS



20 TEMPORARY SEDIMENT BASIN

NTS



LEGEND

SHEET MATCHLINE

TRACT MATCHLINE

INDEX MAP

SCALE 1"=150'

DIGALERT

Call 2 Working Days Before You Dig! 811

BASIS OF BEARINGS:

DESCRIPTION:

THE BASIS OF COORDINATES FOR THIS MAP IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, 1983, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "REST" AND "RABBIT".

BEARING: N 27°39'52" E

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USGS – MONUMENT "REST" BENCHMARK DISK SET IN TOP OF CONCRETE MONUMENT STAMPED "REST 1972" ON DESERT LAWN DR. ACROSS THE DRIVE CENTERLINE 24.9 FT. SOUTHWEST OF THE SOUTHWEST EDGE OF THE SOUTHEAST BOUND LANES OF INTERSTATE HIGHWAY 10

88 DATUM

ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS	CITY	

Kimley»Horn

3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501

PHONE: 951–543–9868

MIKE S. SUTTON R.C.E. NO.: C57667 — 06/27/2024 DATE

SEAL: REGISTERED PROFESSIONAL ENGINEER MICHAEL S. SUTTON No. C57667 CIVIL STATE OF CALIFORNIA

DESIGN BY: RS

DRAWN BY: RS

CHECKED BY: MS

SCALE: AS SHOWN

DATE: 06/27/2024

JOB NUMBER: 195261012

REVIEWED BY: ______ STAFF ENGINEER DATE: ______

RECOMMENDED FOR APPROVAL BY: ______ DATE: ______

APPROVED BY: ______ CITY ENGINEER DATE: ______

CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA

STORM DRAIN IMPROVEMENT PLANS FOR: BACKBONE – FAIRWAY CANYON 4C

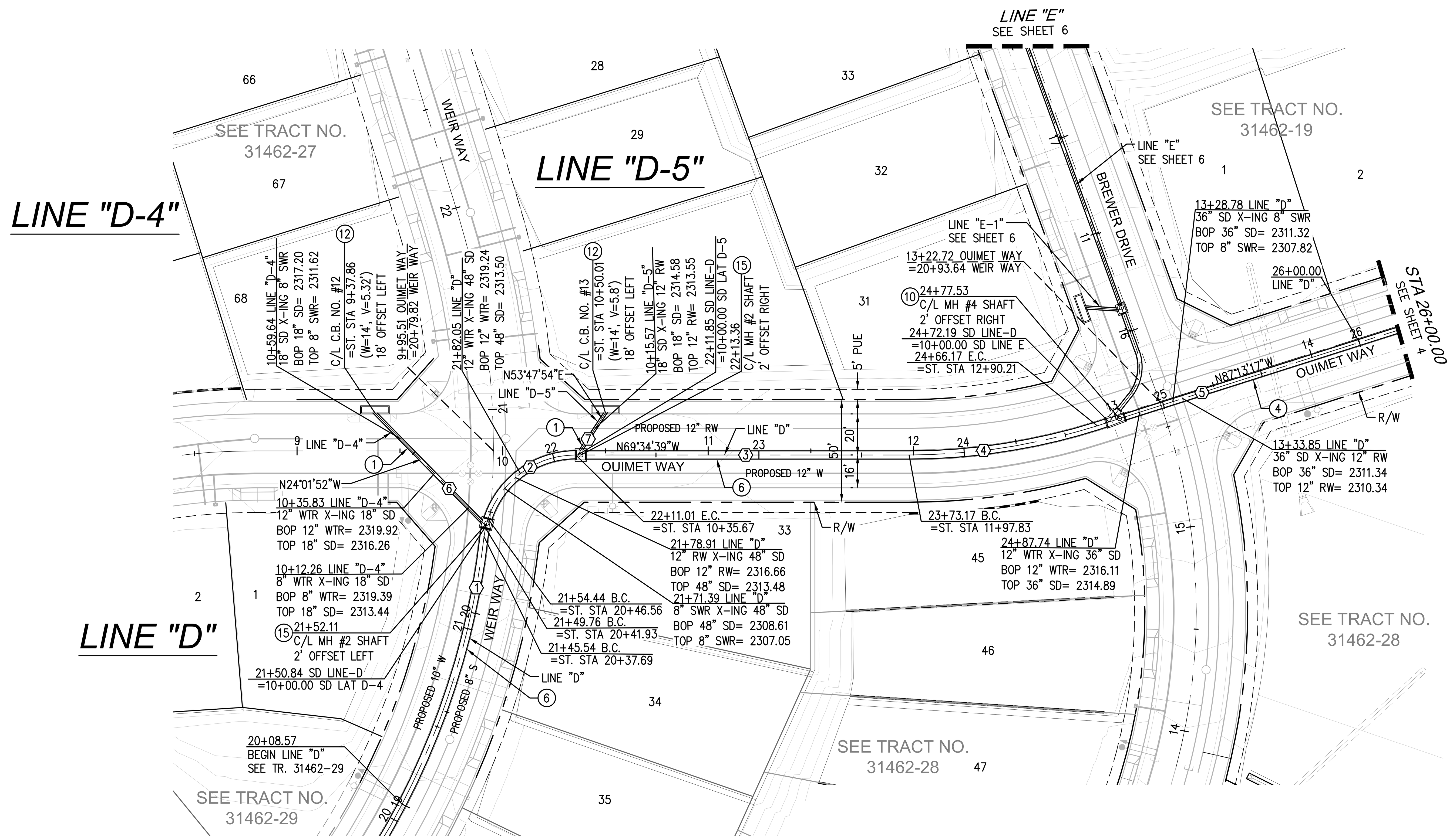
INDEX & DETAILS SHEET

FOR: MERITAGE HOMES

SHEET 2 OF 7 SHEETS

FILE NO: 3493

PW2024-0019



CONSTRUCTION NOTES

1. CONSTRUCT 18" RCP (SEE PROFILE FOR D-LOAD).
4. CONSTRUCT 36" RCP (SEE PROFILE FOR D-LOAD).
6. CONSTRUCT 48" RCP (SEE PROFILE FOR D-LOAD).
10. CONSTRUCT MANHOLE NO. 4 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH254
12. CONSTRUCT CURB INLET CATCH BASIN AND LOCAL DEPRESSION PER COUNTY OF RIVERSIDE STD. NO. 300 (W & V PER PLAN).
15. CONSTRUCT MANHOLE NO. 2 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH252.

DATA

#	BEARING/DELTA	RADIUS	LENGTH	TANGENT
1	Δ=20° 45' 41"	378.00'	136.97'	69.24'
2	Δ=83° 21' 22"	45.00'	65.47'	40.06'
3	S 69°34'39" E	-	162.16'	-
4	Δ=17° 38' 38"	302.00'	93.00'	46.87'
5	S 87°13'17" E	-	133.83'	-
6	N 24°01'52" W	-	77.16'	-
7	N 53°47'54" E	-	24.55'	-

MANHOLE & JUNCTION STRUCTURE DATA TABLE

STRUCTURE	MAIN LINE	LATERAL LEFT					LATERAL RIGHT					D_1	D_2
		NAME	A	B	C	L	NAME	A	B	C	L		
M.H. #2 21+50.84	LINE D	LAT D-4	58°57'39"	1.5'	3.55'	4.16'						48"	48"
M.H. #2 22+11.85	LINE D	LAT D-4	56°37'27"	1.5'	3.69'	4.16'						48"	48"
M.H. #4 24+72.19	LINE D	LINE E	34°16'48"	1.5'	8.04'	8.72'						48"	36"

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

DIGALERT
Call 2 Working Days Before You Dig! 811

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88 DATUM
ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS		CITY

MIKE S. SUTTON
R.C.E. NO.: C57667
06/27/2024
DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: RS
CHECKED BY: MS
SCALE: AS SHOWN
DATE: 06/27/2024
JOB NUMBER: 195261012

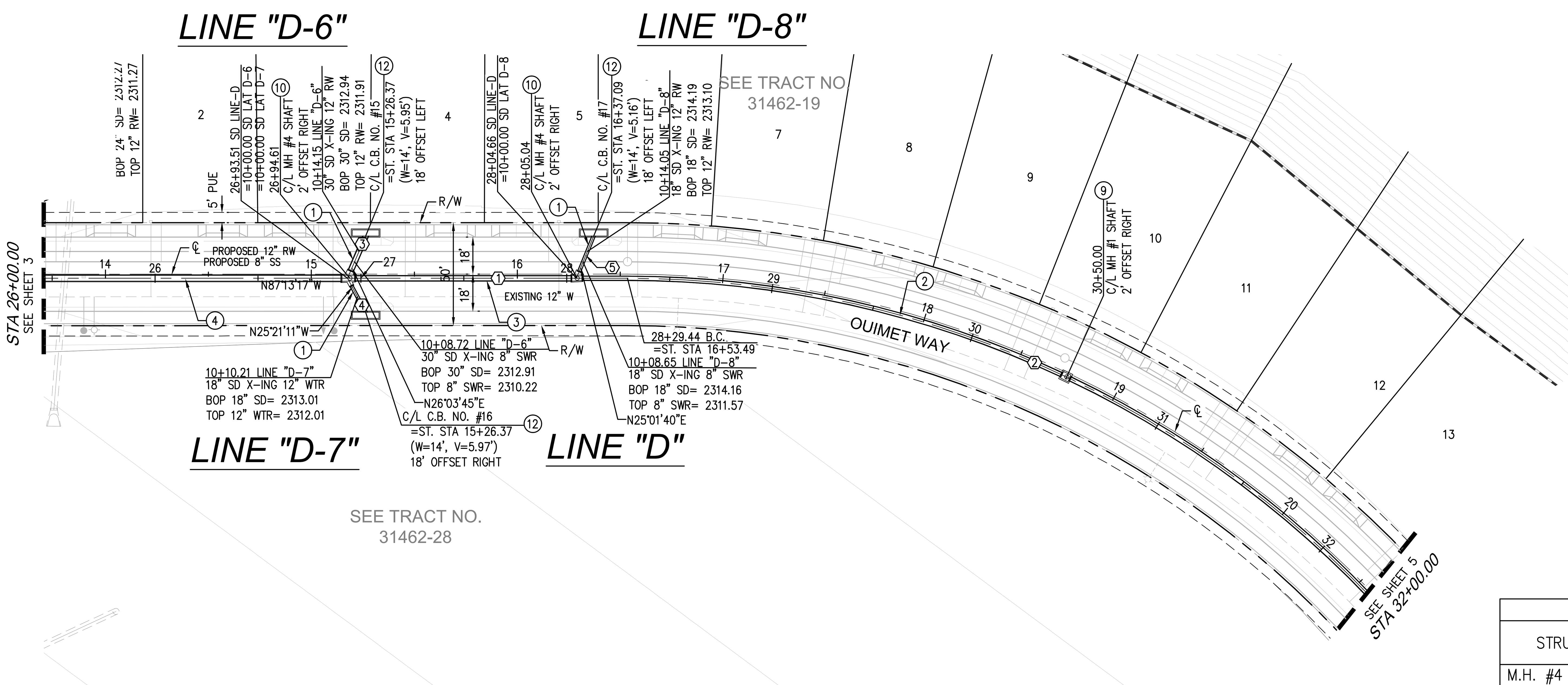
REVIEWED BY: ________ STAFF ENGINEER DATE: ________
RECOMMENDED FOR APPROVAL BY: ________ DATE: ________
APPROVED BY: ________ CITY ENGINEER DATE: ________
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR: BACKBONE – FAIRWAY CANYON 4C

LINE "D", LINE "D-4, & LINE "D-5"

FOR: MERITAGE HOMES

SHEET 3 OF 7 SHEETS
FILE NO: 3493
PW2024-0019



CONSTRUCTION NOTES

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15. CONSTRUCT MANHOLE NO. 2 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH252.

DATA

#	BEARING/DELTA	RADIUS	LENGTH	TANGENT
1	S 87°13'17" E	-	229.44'	-
2	Δ=42° 38' 00"	498.00'	370.56'	194.33'
3	N 26°03'45" E	-	22.32'	-
4	S 25°21'11" E	-	18.71'	-
5	N 25°01'40" E	-	22.15'	-

MANHOLE & JUNCTION STRUCTURE DATA TABLE

STRUCTURE	MAIN LINE	LATERAL LEFT					LATERAL RIGHT					D_1	D_2
		NAME	A	B	C	L	NAME	A	B	C	L		
M.H. #4 26+93.51	LINE D	LAT D-6	66°42'58"	1.5'	4.24'	6.16'	LAT D-7	61°45'03"	1.5'	4.37'	6.16'	36"	30"
M.H. #4 28+04.66	LINE D	LAT D-8	61°52'06"	1.5'	3.69'	3.82'						30"	24"
M.H. #1 30+50.00	LINE D					4.0'						24"	24"

NORTH

GRAPHIC SCALE IN FEET 0 20 40 80

DIGALERT Call 2 Working Days Before You Dig! 811

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BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS		CITY

Kimley»Horn

3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON R.C.E. NO.: C57667 06/27/2024 DATE

SEAL: REGISTERED PROFESSIONAL ENGINEER MICHAEL S. SUTTON No. C57667 CIVIL STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: RS
CHECKED BY: MS
SCALE: AS SHOWN
DATE: 06/27/2024
JOB NUMBER: 195261012

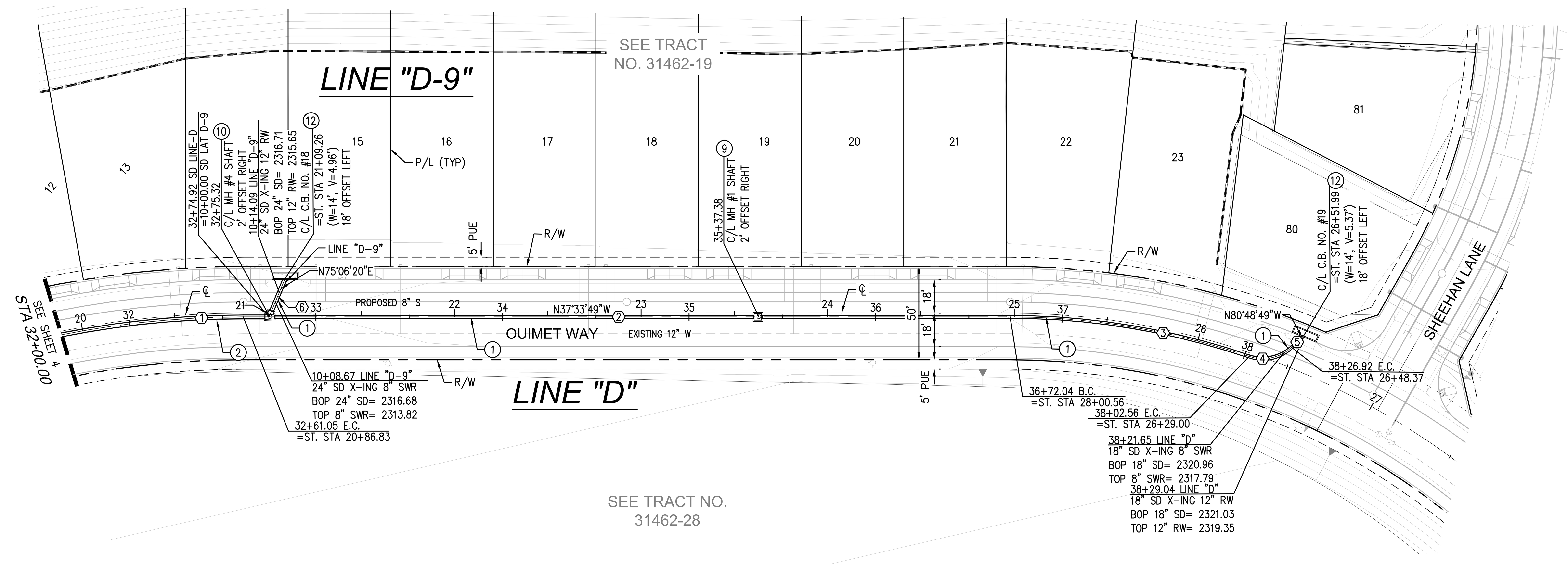
REVIEWED BY: ______ STAFF ENGINEER DATE: ______
RECOMMENDED FOR APPROVAL BY: ______ DATE: ______
APPROVED BY: ______ CITY ENGINEER DATE: ______
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR: BACKBONE – FAIRWAY CANYON 4C

LINE "D", LINE "D-6, LINE "D-7", & LINE "D-8"

FOR: MERITAGE HOMES

SHEET 4 OF 7 SHEETS
FILE NO: 3493
PW2024-0019



CONSTRUCTION NOTES

1. CONSTRUCT 18" RCP (SEE PROFILE FOR D-LOAD).
2. CONSTRUCT 24" RCP (SEE PROFILE FOR D-LOAD).
9. CONSTRUCT MANHOLE NO. 1 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH251
10. CONSTRUCT MANHOLE NO. 4 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH254
12. CONSTRUCT CURB INLET CATCH BASIN AND LOCAL DEPRESSION PER COUNTY OF RIVERSIDE STD. NO. 300 (W & V PER PLAN).

DATA

#	BEARING/DELTA	RADIUS	LENGTH	TANGENT
1	Δ=7° 01' 28"	498.00'	61.05'	30.57'
2	S 37°33'49" E	-	410.98'	-
3	Δ=18° 47' 23"	398.00'	130.52'	65.85'
4	Δ=62° 02' 48"	22.50'	24.36'	13.53'
5	S 80°48'49" E	-	8.90'	-
6	N 75°06'20" E	-	22.22'	-

MANHOLE & JUNCTION STRUCTURE DATA TABLE

STRUCTURE	MAIN LINE	LATERAL LEFT					LATERAL RIGHT					D_1	D_2
		NAME	A	B	C	L	NAME	A	B	C	L		
M.H. #4 32+74.92	LINE D	LAT D-9	67°19'51"	1.5'	3.79'	4.86'						30"	24"
M.H. #1 35+37.38	LINE D					4.0'						24"	24"

GRAPHIC SCALE IN FEET
0 20 40 80

DIGALERT
Call 2 Working Days Before You Dig!
811

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ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS		CITY

Kimley»Horn
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3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON
R.C.E. NO.: C57667
06/27/2024
DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: RS
CHECKED BY: MS
SCALE: AS SHOWN
DATE: 06/27/2024
JOB NUMBER: 195261012

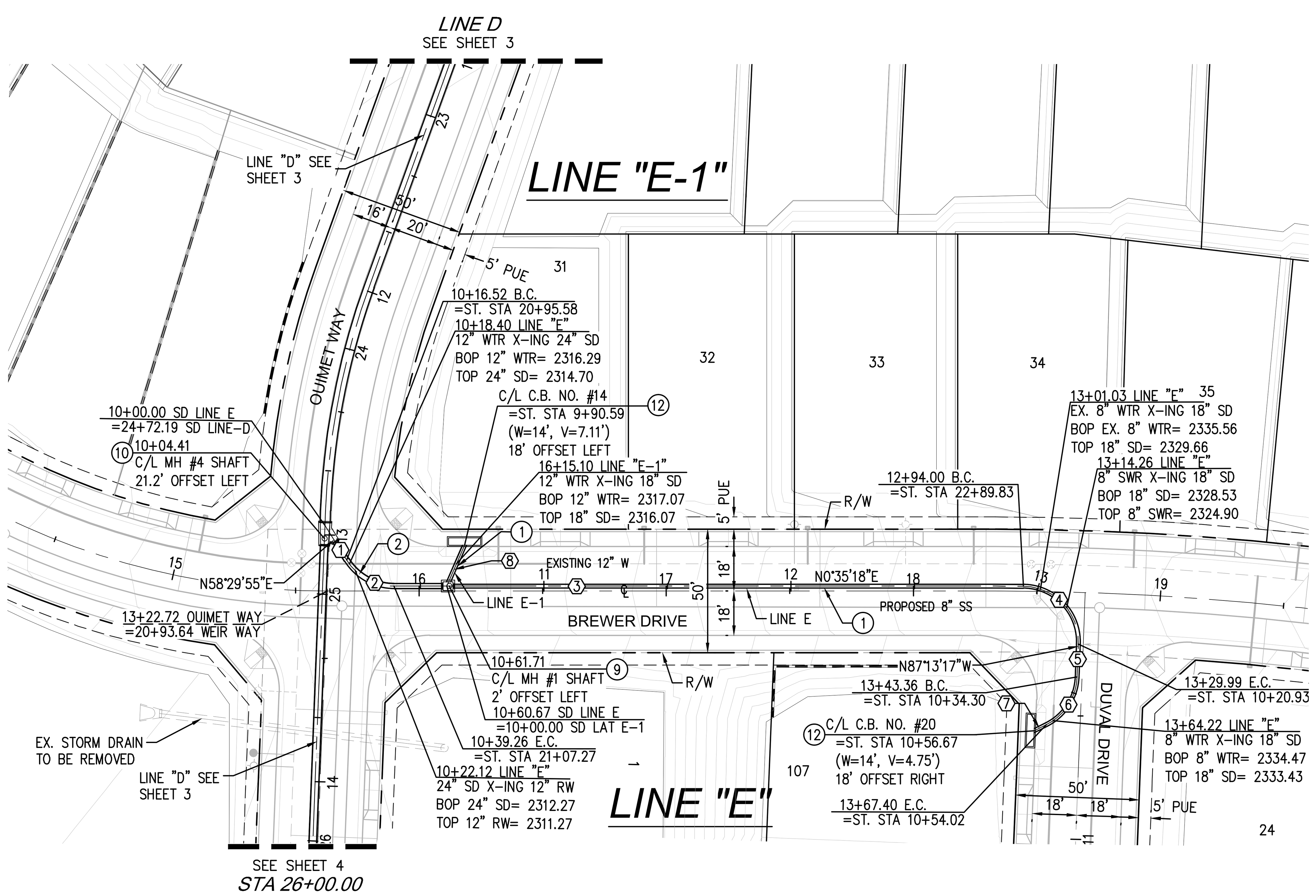
REVIEWED BY: ________ STAFF ENGINEER DATE: ________
RECOMMENDED FOR APPROVAL BY: ________ DATE: ________
APPROVED BY: ________ CITY ENGINEER DATE: ________
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR:
BACKBONE - FAIRWAY CANYON 4C
LINE "D" & LINE "D-9"
FOR: MERITAGE HOMES

SHEET 5 OF 7 SHEETS
FILE NO: 3493
PW2024-0019

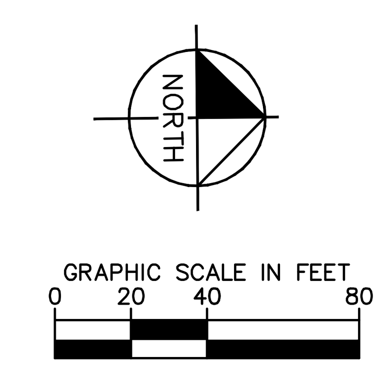
CONSTRUCTION NOTES

1. CONSTRUCT 18" RCP (SEE PROFILE FOR D-LOAD).
2. CONSTRUCT 24" RCP (SEE PROFILE FOR D-LOAD).
9. CONSTRUCT MANHOLE NO. 1 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH251
10. CONSTRUCT MANHOLE NO. 4 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH254
12. CONSTRUCT CURB INLET CATCH BASIN AND LOCAL DEPRESSION PER COUNTY OF RIVERSIDE STD. NO. 300 (W & V PER PLAN).



DATA

#	BEARING/DELTA	RADIUS	LENGTH	TANGENT
1	N 58°29'55" E	-	16.52'	-
2	Δ=57° 55' 23"	22.50'	22.75'	12.45'
3	N 0°35'18" E	-	254.74'	-
4	Δ=91° 37' 52"	22.50'	35.98'	23.15'
5	S 87°13'17" E	-	13.37'	-
6	Δ=61° 14' 11"	22.50'	24.05'	13.32'
7	S 25°59'06" E	-	5.51'	-
8	N 65°49'29" W	-	18.01'	-



MANHOLE & JUNCTION STRUCTURE DATA TABLE

STRUCTURE	MAIN LINE	LATERAL LEFT NAME	A	B	C	L	LATERAL RIGHT NAME	A	B	C	L	D_1	D_2
M.H. #4 12+96.23	LINE D	LINE E	34°16'48"	1.5'	8.04'	8.72'						48"	24"
M.H. #1 16+12.21	LINE E					4.0'						24"	18"

DIGALERT
Call 2 Working Days Before You Dig!
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BASIS OF BEARINGS:
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88 DATUM
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BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS		CITY

Kimley»Horn

3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON
R.C.E. NO.: C57667
06/27/2024
DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
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CHECKED BY: MS
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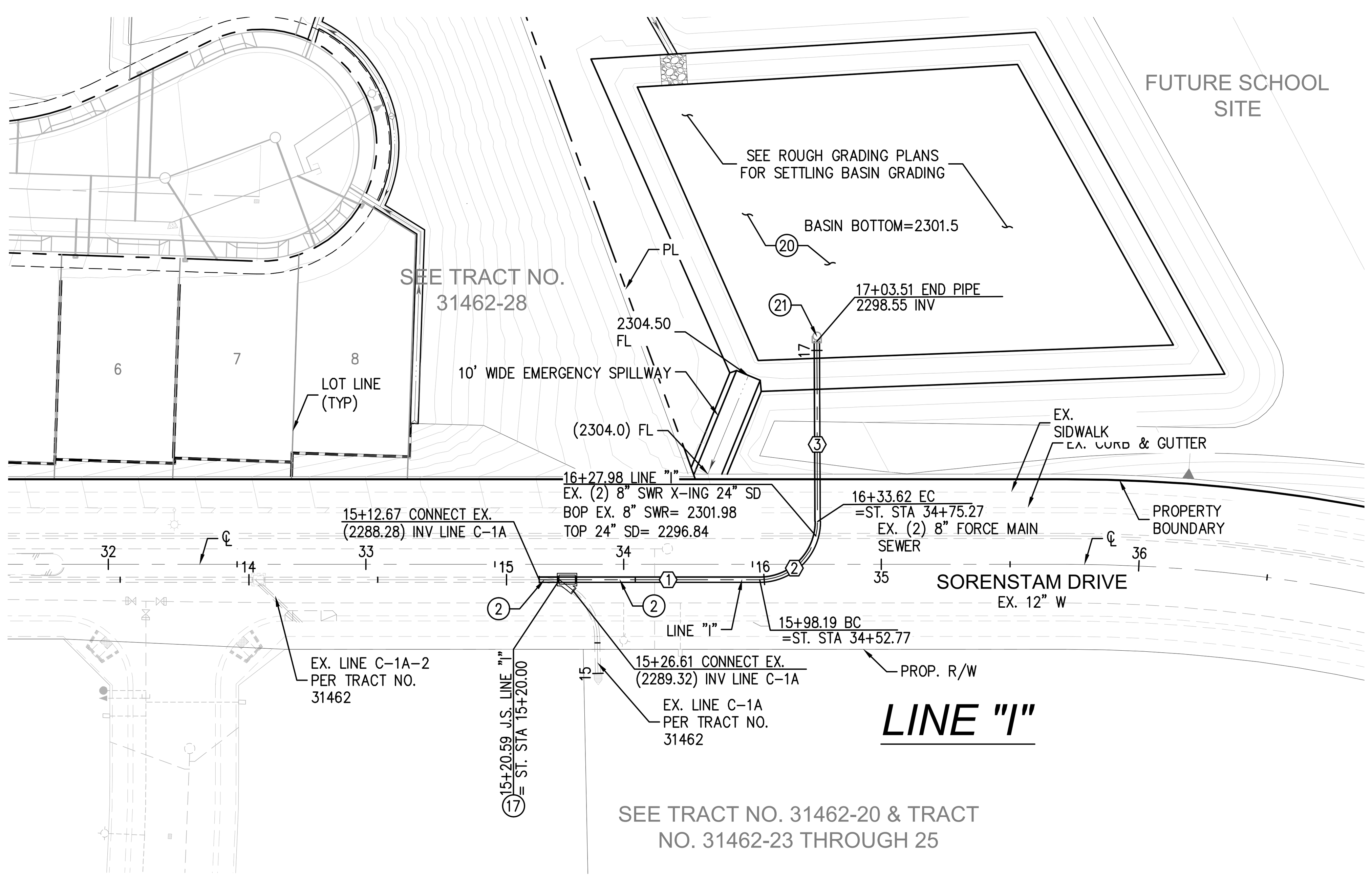
REVIEWED BY: ______ STAFF ENGINEER DATE: ______
RECOMMENDED FOR APPROVAL BY: ______ DATE: ______
APPROVED BY: ______ CITY ENGINEER DATE: ______
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR:
BACKBONE - FAIRWAY CANYON 4C

LINE "E" & LINE "E-1"

FOR: MERITAGE HOMES

SHEET 6 OF 7 SHEETS
FILE NO: 3493
PW2024-0019



CONSTRUCTION NOTES

2. CONSTRUCT 24" RCP (SEE PROFILE FOR D-LOAD).
17. CONSTRUCT TRANSITION STRUCTURE NO. 3 PER R.C.F.C. & W.C.D. STD. DWG. NO. TS303.
20. CONSTRUCT TEMPORARY SEDIMENT BASIN PER DETAIL ON SHEET 2.
21. CONSTRUCT 24" RISER W/ HOOD & TRASH RACK 4" ORIFICES, 4 ORIFICES PER ROW, 4 ROWS. 1ST ROW 1' ABOVE BASIN BOTTOM. SPACE ROWS 6" APART.

DATA

#	BEARING/DELTA	RADIUS	LENGTH	TANGENT
1	N 66°53'19" E	-	85.52'	-
2	Δ=90° 13' 27"	22.50'	35.43'	22.59'
3	N 23°20'08" W	-	69.89'	-

MANHOLE & JUNCTION STRUCTURE DATA TABLE

STRUCTURE	MAIN LINE	LATERAL LEFT					LATERAL RIGHT					D_1	D_2
		NAME	A	B	C	L	NAME	A	B	C	L		
T.S. #3 15+20.59	LINE I						EX. LINE C-A1	38°47'14"	2.0'	6.63'	6.29'	24"	24"

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

DIGALERT
Call 2 Working Days Before You Dig!
811

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ELEV. = 2494.16

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	1			
ENGINEER		REVISIONS	CITY	

Kimley»Horn

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PHONE: 951–543–9868

MIKE S. SUTTON
R.C.E. NO.: C57667
06/27/2024
DATE

SEAL
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MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

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CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR:
BACKBONE – FAIRWAY CANYON 4C

LINE "I"

FOR: MERITAGE HOMES

SHEET 7 OF 7 SHEETS
FILE NO: 3493
PW2024-0019

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS
TRACT NO. 31462-17
LINE "A", "A-1", "A-2", "B", "B-1", "B-2", "G"

GENERAL NOTES

1. THE CONTRACTOR SHALL CONSTRUCT THE DRAINAGE IMPROVEMENT SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT DESIGN MANUAL STANDARD DRAWINGS, RECENT EDITION, AND IN CONFORMANCE WITH THE REQUIREMENTS OF THE BEAUMONT DRAINAGE MANAGEMENT PLAN.
2. THE CONTRACTOR IS REQUIRED TO CONTACT ALL UTILITY AGENCIES REGARDING TEMPORARY SUPPORT AND SHORING REQUIREMENTS FOR THE VARIOUS UTILITIES SHOWN IN THE PLANS.
3. CONSTRUCTION INSPECTION WILL BE PERFORMED BY CITY OF BEAUMONT. CONTACT (951) 769-8520. THE CITY MUST BE NOTIFIED ONE WEEK PRIOR TO CONSTRUCTION.
4. ALL STATIONING REFERS TO THE CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
5. STATIONING FOR LATERALS AND CONNECTOR PIPE REFER TO THE CENTERLINE-CENTERLINE-INTERSECTION STATION.
6. FORTY-EIGHT HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT 1-800-227-2600.
7. ALL CROSS SECTIONS ARE TAKEN LOOKING UPSTREAM.
8. ELEVATIONS AND LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE UNLESS OTHERWISE NOTED. ALL UTILITIES SHOWN ARE TO BE PROTECTED IN PLACE UNLESS OTHERWISE NOTED.
9. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6 INCHES OF CLASS "B" CONCRETE.
10. PIPE CONNECTED TO THE MAINLINE PIPE SHALL CONFORM TO JUNCTION STRUCTURE NO. 4 (JS 229) UNLESS OTHERWISE NOTED.
11. PIPE BEDDING SHALL CONFORM TO R.C.F.C. & W.C.D. STD. DWG. M 815.
12. V" IS THE DEPTH OF INLET AT THE CATCH BASINS MEASURED FROM THE TOP OF THE CURB TO THE INVERT OF CONNECTOR PIPE.
13. ALL CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS, AND OTHER EXISTING IMPROVEMENTS TO BE RECONSTRUCTED IN KIND PER LATEST COUNTY STANDARD AND AT THE SAME ELEVATION AND LOCATION AS THE EXISTING IMPROVEMENTS UNLESS OTHERWISE NOTED. FOR PAVEMENT OVERLAY, 0.10' MIN. FOR FULL LANE WIDTH IS REQUIRED.
14. HYDRAULIC GRADE LINES SHOWN IN PROFILES ARE FOR 100 YEAR FREQUENCY FLOWS, UNLESS OTHERWISE NOTED.
15. THE CONTRACTOR SHALL COMPLY WITH THE STATE AND LOCAL SAFETY CODES DURING THE PROGRESS OF WORK.
16. THE CONTRACTOR SHALL MAINTAIN ADJACENT STREETS IN A NEAT, SAFE, CLEAN AND SANITARY CONDITION AT ALL TIMES AND TO THE SATISFACTION OF THE COUNTY'S OR DISTRICT'S INSPECTOR. THE ADJACENT STREETS SHALL BE KEPT CLEAN OF DEBRIS, WITH DUST AND OTHER NUISANCE BEING CONTROLLED AT ALL TIMES. THE DEVELOPER SHALL BE RESPONSIBLE FOR ANY CLEAN UP ON ADJACENT STREETS AFFECTED BY HIS CONSTRUCTION. METHOD OF STREET CLEANING SHALL BE DRY SWEEPING OF ALL PAVED AREAS.
17. THE CONTRACTOR AGREES THAT HE/SHE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER, CITY OF BEAUMONT, AND THE DEVELOPER'S ENGINEER, HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNERS OR THE DEVELOPER'S ENGINEER.
18. ALL PIPE LENGTHS ARE HORIZONTAL PROJECTIONS (NOT TRUE LENGTHS OF PIPE) AND ARE THE BASIS OF THE ESTIMATES OF QUANTITIES. THE CONTRACTOR SHALL DETERMINE THE TRUE QUANTITY OF PIPE REQUIRED FOR THIS PROJECT PRIOR TO PLACING THE ORDER.
19. ALL ELEVATIONS SHOWN ARE TO THE INVERTS OF PIPE, EXCEPT WHERE OTHERWISE NOTED.
20. AT THE DISCRETION OF THE ENGINEER AND THE CITY OF BEAUMONT, THE CONTRACTOR MAY BE REQUIRED TO VERIFY, BY POTHOLING, THE LOCATION OF POTENTIALLY AFFECTED UTILITIES.
21. . CONTRACTOR SHALL DISPOSE OF ALL EXCESS EXCAVATED MATERIAL AT MANDATORY DISPOSAL.
22. ALL BACKFILL AND BEDDING AROUND STRUCTURES AND PIPES SHALL BE COMPACTED TO NOT LESS THAN 90 PERCENT RELATIVE COMPACTION EXCEPT WHERE SUCH MATERIAL IS PLACED UNDER EXISTING PAVED ROADWAYS. THE TOP 3 FEET, MEASURED FROM THE FINISH PAVING, SHALL BE COMPACTED TO 95 PERCENT RELATIVE COMPACT.
23. ALL SURVEY MONUMENTS SHALL BE REPLACED AS REQUIRED. MONUMENTS SHALL BE TIED OUT PRIOR TO CONSTRUCTION AND REPLACED UPON COMPLETION OF CONSTRUCTION.
24. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/OWNER OR CONTRACTOR TO APPLY TO THE DIRECTOR OF PUBLIC WORKS, CITY OF BEAUMONT FOR AN ENCROACHMENT PERMIT FOR ALL WORK PERFORMED WITHIN PUBLIC RIGHT-OF-WAY, DEDICATED AND ACCEPTED FOR PUBLIC USE; AND TO BE RESPONSIBLE FOR SATISFACTORY COMPLIANCE FOR ALL CURRENT ENVIRONMENTAL REGULATIONS DURING THE LIFE OF CONSTRUCTION ACTIVITIES FOR THIS PROJECT. ADDITIONAL STUDIES AND/OR PERMITS MAY BE REQUIRED.
25. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEARING OF THE PROPOSED WORK AREA, AND RELOCATION COSTS OF ALL EXISTING UTILITIES. PERMITTEE MUST INFORM CITY OF CONSTRUCTION SCHEDULE AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
26. ALL UNDERGROUND FACILITIES WITH LATERALS SHALL BE IN PLACE PRIOR TO PAVING THE STREET, INCLUDING BUT NOT LIMITED TO, THE FOLLOWING: SEWER, WATER, ELECTRIC, STORM DRAINS.
27. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR CONTRACTOR TO INSTALL AND MAINTAIN DURING CONSTRUCTION, REGULATORY GUIDE AND WARNING SIGNS WITHIN THE PROJECT LIMITS AND ITS SURROUNDINGS TO PROVIDE SAFE PASSAGE FOR THE TRAVELING PUBLIC AND WORKERS UNTIL THE FINAL COMPLETION AND ACCEPTANCE OF THE PROJECT BY THE CITY OF BEAUMONT.
28. CONSTRUCTION PROJECTS THAT DISTURB MORE THAN ONE ACRE MUST OBTAIN A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT. OWNER/DEVELOPERS ARE REQUIRED TO FILE A NOTICE OF INTENT (NOI) WITH THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) AND COMPLY WITH ALL REQUIREMENTS OF THE BEAUMONT DRAINAGE MANAGEMENT PLAN. BEAUMONT IS CO-PERMITTEE WITH R.C.F.C. & W.C.D.
29. ALL STORM DRAINS, CATCH BASINS, AND STORM WATER RUNOFF STRUCTURES WILL BE PROVIDED WITH ADEQUATE CAPABILITIES TO FILTER AND RETAIN SEDIMENT AND DIRT, OIL, AND GREASE, TO PREVENT POLLUTION IN STORM WATER RUNOFF IN COMPLIANCE WITH THE CITY OF BEAUMONT'S BEST MANAGEMENT PRACTICES AND THE BEAUMONT DRAINAGE MASTER PLAN FOR STORM WATER AS WELL AS BEST MANAGEMENT PRACTICES IDENTIFIED IN THE CURRENT REPORT OF WASTE DISCHARGE FOR RIVERSIDE COUNTY PERMITTEE.
30. DEVELOPER SHALL BE FULLY RESPONSIBLE IN ASSURING THAT PROPOSED IMPROVEMENTS CONFORM TO THE APPROVED PLANS, SPECIFICATIONS AND CITY OF BEAUMONT STANDARDS. WHERE DEVIATIONS EXIST, DEVELOPER SHALL PROPOSE CORRECTIVE MEASURES FOR REVIEW AND APPROVAL BY THE CITY.

NOTE:

1. APPROVAL OF THESE PLANS APPLY ONLY WITHIN THE JURISDICTION OF THE CITY OF BEAUMONT.
2. TRENCHING FOR UTILITIES AND STRUCTURES IS NOT ALLOWED UNTIL SOIL COMPACTION REPORT IS SUBMITTED AND APPROVED BY THE PUBLIC WORK DEPARTMENT.
3. THE CITY RESERVES THE RIGHT TO REQUIRE REVISION OF THE APPROVED PLANS TO CONFORM WITH CURRENT STANDARDS AND TO POST A NEW BOND IF CONSTRUCTION HAS NOT COMMENCED WITHIN TWO YEARS AFTER PLANS WERE APPROVED.
4. HE DEVELOPER SHALL HAVE GEOTECHNICAL/SOILS ENGINEERING FIRM OBSERVE TRENCHING, BACKFILLING, AND SOIL COMPACTION OF ALL UTILITY TRENCHES WITHIN ALL EASEMENTS AND ROAD RIGHTS OF WAY. TWO SETS OF COMPACTION REPORTS CERTIFYING THAT WORKS WERE DONE IN CONFORMANCE TO STANDARDS AND GEOTECHNICAL REPORT SHALL BE SUBMITTED AFTER EACH UTILITY TRENCH IS COMPLETED AND CERTIFIED. COMPACTION REPORT MUST BE SUBMITTED TO THE DEPT. OF PUBLIC WORKS AT LEAST TWO WORKING DAYS BEFORE AGGREGATE BASE MATERIALS ARE PLACED ONSITE.

SEE SHEET NO. 2 FOR INDEX MAP

*RCP NOTES:

1. THE CONCRETE COATING ON THE INSIDE OF ALL REINFORCED CONCRETE PIPES MUST BE INCREASED TO PROVIDE A MINIMUM OF 1-1/2" OVER THE REINFORCING WHEN THE DESIGN VELOCITIES EXCEED 20 FEET PER SECOND. THE CONCRETE DESIGN STRENGTH IN THESE REACHES SHALL BE f'c = 5,000 PSI FOR VELOCITIES EXCEEDING 20 FEET PER SECOND AND f'c = 6,000 PSI FOR VELOCITIES EXCEEDING 30 FPS.
2. THE JOINTS FOR REINFORCED CONCRETE PIPES UNDER PRESSURE FLOW CONDITIONS SHALL BE WATERTIGHT IN CONFORMANCE WITH ASTM C443.

DECLARATION OF RESPONSIBLE CHARGE:

I HEREBY DECLARE THAT I AM THE ENGINEER OF RECORD FOR THIS PROJECT AND THAT THE DESIGN OF THE IMPROVEMENTS SHOWN ON THESE PLANS COMPLIES WITH ALL PROFESSIONAL ENGINEERING STANDARDS AND PRACTICES. I ASSUME FULL RESPONSIBILITY FOR ALL ASPECTS OF THE DESIGN OF THE IMPROVEMENTS. WITH RESPECT TO THE PLAN CHECK PERFORMED BY THE CITY OF BEAUMONT, I UNDERSTAND AND ACKNOWLEDGE THE FOLLOWING: (1) THE PLAN CHECK IS A REVIEW FOR THE LIMITED PURPOSE OF ENSURING THE PLANS COMPLY WITH THE CITY'S STANDARDS, PROCEDURES, POLICIES, AND ORDINANCES; (2) THE PLAN CHECK IS NOT A DETERMINATION OF THE TECHNICAL ADEQUACY OF THE DESIGN OF THE IMPROVEMENTS; AND, (3) THE PLAN CHECK DOES NOT RELIEVE ME OF MY LEGAL AND PROFESSIONAL RESPONSIBILITY FOR THE DESIGN OF THE IMPROVEMENTS. TO THE FULL EXTENT PERMITTED BY LAW, I AGREE TO DEFEND, INDEMNIFY, AND HOLD HARMLESS THE CITY, ITS ELECTED OFFICIALS, EMPLOYEES, AND AGENTS FROM ANY AND ALL ACTUAL OR ALLEGED CLAIMS, DEMANDS, CAUSES OF ACTION, LIABILITY, LOSS, DAMAGE, OR INJURY TO PROPERTY OR PERSONS, INCLUDING WRONGFUL DEATH, WHETHER IMPOSED BY A COURT OF LAW OR BY ADMINISTRATIVE ACTION OF ANY FEDERAL, STATE OR LOCAL GOVERNMENTAL AGENCY, TO THE EXTENT ARISING OUT OF OR INCIDENT TO ANY NEGLIGENT ACTS, OMISSIONS, OR ERRORS BY THE ENGINEER OF RECORD, ITS EMPLOYEES, CONSULTANTS, OR AGENTS.

FIRM: KIMLEY HORN & ASSOCIATES, INC.
ADDRESS: 3801 UNIVERSITY AVE. SUITE 300
CITY, ST.: RIVERSIDE,CA 92501
TELEPHONE: (760) 565-5146
BY: MIKE SUTTON, R.C.E. NO.: C57667 DATE: 7/16/2024
(NAME OF ENGINEER & RCE)

PRIVATE ENGINEERS NOTICE TO CONTRACTOR(S)

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT THOSE SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE ALL PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN, AND ANY OTHER LINES OR STRUCTURES NOT SHOWN ON THESE PLANS AND IS RESPONSIBLE FOR THE PROTECTION OF, AND ANY DAMAGE TO THESE LINES OR STRUCTURES.
2. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO NOTIFY THE OWNER OF ALL UTILITIES OR STRUCTURES CONCERNED BEFORE STARTING WORK.
3. QUANTITIES SHOWN HEREON ARE PROVIDED FOR BIDDING PURPOSES ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES PRIOR TO BIDDING FOR CONSTRUCTION.
4. THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER CITY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE CITY.

LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF BEAUMONT, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

THE DESIGNATED REMAINDER PARCEL OF PARCEL MAP NO. 38090, IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 254, PAGES 97 THROUGH 103, INCLUSIVE, OF PARCEL MAPS, RECORDS OF SAID COUNTY.

EXCEPTING THEREFROM THE ABOVE PARCEL ANY AND ALL NATURAL OIL, OIL RIGHTS, MINERALS, MINERAL RIGHTS, NATURAL GAS, NATURAL GAS RIGHTS AND OTHER HYDROCARBONS BY WHATSOEVER NAME KNOWN AND ALL RIGHTS THEREIN, GEOTHERMAL STEAM, AND ALL PRODUCTS DERIVED FROM ANY OF THE FOREGOING, THAT MAY BE WITHIN OR UNDER THE LAND, TOGETHER WITH THE PERPETUAL RIGHT OF DRILLING, MINING, EXPLORING AND OPERATING THEREFOR AND STORING IN AND REMOVING THE SAME FROM THE LAND OR ANY OTHER PROPERTY, INCLUDING THE RIGHT TO WHIPSTOCK OR DIRECTIONALLY DRILL AND MINE FROM PROPERTY OTHER THAN THE LAND, OIL OR GAS WELLS, TUNNELS AND SHAFTS INTO, THROUGH OR ACROSS THE SUBSURFACE OF THE LAND, AND TO BOTTOM SUCH WHIPSTOCKED OR DIRECTIONALLY DRILLED WELLS, TUNNELS AND SHAFTS UNDER AND BENEATH OR BEYOND THE EXTERIOR LIMITS THEREOF, AND TO REDRILL, RETUNNEL, EQUIP, MAINTAIN, REPAIR, DEEPEN AND OPERATE ANY SUCH WELLS, TUNNELS OR SHAFTS, WITHOUT THE RIGHT TO DRILL, MINE, STORE OR EXCAVATE THROUGH THE SURFACE OR THE UPPER 500 FEET OF THE SUBSURFACE OF THE LAND AS RESERVED BY OAK VALLEY PARTNERS, L.P. A TEXAS LIMITED PARTNERSHIP WHICH IS REGISTERED IN CALIFORNIA AS OVP, L.P., IN A GRANT DEED RECORDED NOVEMBER 14, 2003, AS INSTRUMENT NO. 2003-899365 OF OFFICIAL RECORDS.

ANY AND ALL WATER, WATER RIGHTS OR INTERESTS THEREIN APPURTENANT OR RELATING TO THE LAND OR OWNED OR USED BY GRANTOR IN CONNECTION WITH OR WITH RESPECT TO THE LAND (NO MATTER HOW ACQUIRED BY GRANTOR), WHETHER SUCH WATER RIGHTS SHALL BE RIPARIAN, OVERLYING, APPROPRIATIVE, LITTORAL, PERCOLATING, PRESCRIPTIVE, ADJUDICATED, STATUTORY OR CONTRACTUAL, TOGETHER WITH THE RIGHT AND POWER TO EXPLORE, DRILL, REMOVE AND RESTORE THE SAME FROM OR IN THE LAND OR TO DIVERT OR OTHERWISE UTILIZE SUCH WATER, RIGHTS OR INTERESTS ON ANY OTHER PROPERTY OWNED BY OR LEASED BY GRANTOR, WITHOUT THE RIGHT TO ENTER UPON THE SURFACE OF THE LAND IN THE EXERCISE OF SUCH RIGHTS; PROVIDED, HOWEVER, ONLY IF AND TO THE EXTENT THAT SUCH RIGHTS ARE NOT USED BY GRANTEE IN ITS USE AND ENJOYMENT OF THE LAND AS RESERVED BY OAK VALLEY PARTNERS, L.P., A TEXAS LIMITED PARTNERSHIP, WHICH IS REGISTERED IN CALIFORNIA AS OVP, L.P., IN A GRANT DEED RECORDED NOVEMBER 14, 2003 AS INSTRUMENT NO. 2003-899365 OF OFFICIAL RECORDS.

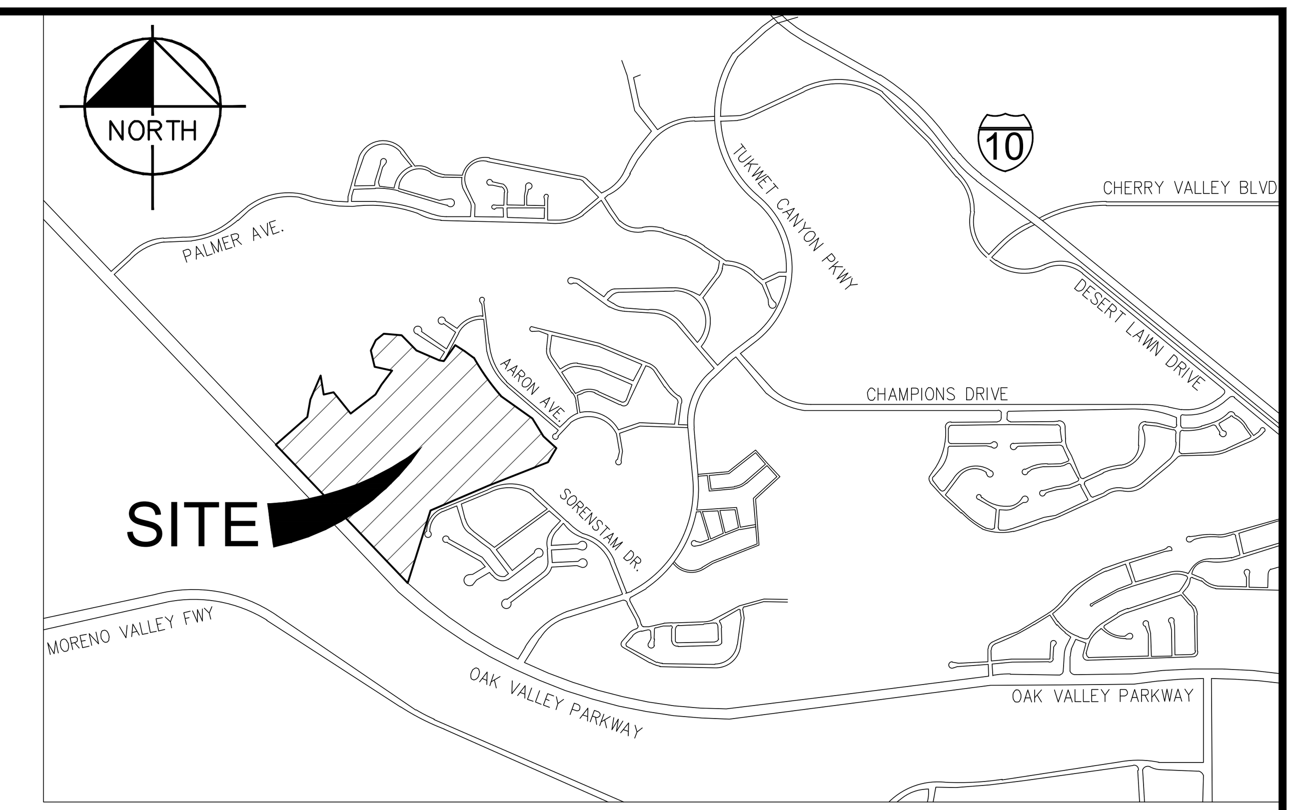
APN: 413-790-010

CONSTRUCTION NOTES

	CONSTRUCTION NOTES	QUANTITIES
1	CONSTRUCT 18" RCP (SEE PROFILE FOR D-LOAD).	432 LF
2	CONSTRUCT 24" RCP (SEE PROFILE FOR D-LOAD).	43 LF
3	CONSTRUCT 30" RCP (SEE PROFILE FOR D-LOAD).	30 LF
4	CONSTRUCT 36" RCP (SEE PROFILE FOR D-LOAD).	798 LF
8	CONSTRUCT 66" RCP (SEE PROFILE FOR D-LOAD).	569 LF
9	CONSTRUCT MANHOLE NO. 1 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH251	1 EA
10	CONSTRUCT MANHOLE NO. 4 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH254	1 EA
11	CONSTRUCT CONCRETE COLLAR PER R.C.F.C. & W.C.D. STD. DWG. NO. M803.	1 EA
12	CONSTRUCT CURB INLET CATCH BASIN AND LOCAL DEPRESSION PER COUNTY OF RIVERSIDE STD. NO. 300 (W & V PER PLAN).	5 EA
13	INSTALL RIP-RAP.	88.78 CY
14	CONSTRUCT CONCRETE HEADWALL PER CALTRANS STD. D90 (SIZING PER PLAN).	3 EA
15	CONSTRUCT MANHOLE NO. 2 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH252.	3 EA
16	CONSTRUCT INLET TYPE X PER R.C.F.C. & W.C.D. STD. DWG. NO. CB108.	1 EA
19	INSTALL STORMTEK FULL TRASH CAPTURE DEVICE PER STORM WATER INSPECTION & MAINTENANCE SERVICES.	2 EA

STORM DRAIN NOTES

1. THE CONTRACTOR SHALL CONSTRUCT THE FLOOD CONTROL IMPROVEMENTS SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S (DISTRICT) M.O.U. STANDARD SPECIFICATIONS DATED MARCH 2020 AND DISTRICT STANDARD DRAWINGS. FOR THE LATEST STANDARD DRAWINGS, PLEASE REFER TO THE "ENGINEERING TOOLS" PAGE FOUND ON THE "BUSINESS" SECTION OF THE DISTRICT'S WEBSITE.
2. CONTACT THE ENCROACHMENT PERMIT ENGINEER AT 951.955.1266 IF AN ENCROACHMENT PERMIT IS REQUIRED FROM THE DISTRICT. AFTER THE PERMIT IS ISSUED, THE DISTRICT MUST BE NOTIFIED ONE (1) WEEK PRIOR TO CONSTRUCTION.
3. CONTACT CONSTRUCTION MANAGEMENT AT 951.955.1288 IF CONSTRUCTION INSPECTION WILL BE PERFORMED BY THE DISTRICT. THE DISTRICT MUST BE NOTIFIED TWENTY (20) DAYS PRIOR TO CONSTRUCTION.
4. ALL STATIONING REFERS TO CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
5. STATIONING FOR LATERALS AND CONNECTOR PIPES REFER TO THE CENTERLINE INTERSECTION STATIONS.
6. FORTY-EIGHT (48) HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT AT 1.800.227.2600.
7. ALL ELEVATIONS SHOWN ARE IN FEET AND DECIMALS THEREOF BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD 88).
8. ALL COORDINATES ARE SHOWN IN FEET AND DECIMALS THEREOF BASED ON THE NORTH AMERICAN DATUM (NAD 83), CALIFORNIA COORDINATE SYSTEM (CCS), ZONE 6 AND EPOCH _____.
9. ALL CROSS SECTIONS ARE TAKEN LOOKING DOWNSTREAM.
10. ELEVATIONS OF UTILITIES ARE APPROXIMATE UNLESS OTHERWISE NOTED.
11. UNLESS OTHERWISE SPECIFIED, MINIMUM STREET RECONSTRUCTION SHALL BE 4" TYPE "A" HOT MIX ASPHALT OVER 6 " CLASS 2 AGGREGATE BASE OR AS SPECIFIED BY THE ENGINEER.
12. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6" OF CLASS "B" CONCRETE.
13. PIPE CONNECTED TO THE MAINLINE PIPE SHALL CONFORM TO JUNCTION STRUCTURE NO. 4 (JS 229) UNLESS OTHERWISE NOTED.
14. PIPE BEDDING SHALL CONFORM TO DISTRICT STANDARD DRAWING NO. M815.
15. BH-1 INDICATES SOIL BORING LOCATIONS BASED ON THE SOILS REPORT DATED __________. LOCATIONS SHOWN ARE APPROXIMATE.
16. "V" IS THE DEPTH OF CATCH BASINS MEASURED FROM THE TOP OF CURB TO INVERT OF CONNECTOR PIPE.
17. CATCH BASINS SHALL BE LOCATED SO THAT LOCAL DEPRESSION SHALL BEGIN AT EXISTING CURB RETURN JOINT, UNLESS OTHERWISE SPECIFIED.
18. ALL CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS AND OTHER EXISTING IMPROVEMENTS ARE TO BE RECONSTRUCTED IN KIND AND AT THE SAME ELEVATION AND LOCATION AS THE EXISTING IMPROVEMENTS UNLESS OTHERWISE NOTED.
19. STANDARD DRAWINGS CALLED FOR ON THE PLAN AND PROFILE SHALL CONFORM TO DISTRICT STANDARD DRAWINGS UNLESS NOTED OTHERWISE.
20. THE CONTRACTOR IS REQUIRED TO CALL ALL UTILITY AGENCIES REGARDING TEMPORARY SHORING AND SUPPORT REQUIREMENTS FOR THE VARIOUS UTILITY LINES SHOWN ON THESE PLANS.
21. DURING ROUGH GRADING OPERATIONS AND PRIOR TO CONSTRUCTION OF PERMANENT DRAINAGE STRUCTURES, TEMPORARY DRAINAGE CONTROL SHOULD BE PROVIDED TO PREVENT PONDING WATER AND DAMAGE TO ADJACENT PROPERTIES.
22. APPROVAL OF THESE PLANS BY DISTRICT DOES NOT RELIEVE THE DEVELOPER'S ENGINEER OF RESPONSIBILITY FOR THE ENGINEERING DESIGN. IF FIELD CHANGES ARE REQUIRED, IT WILL BE THE RESPONSIBILITY OF THE DESIGN ENGINEER TO MAKE THE NECESSARY CORRECTIONS.
23. THE CONTRACTOR OR DEVELOPER SHALL SECURE ALL REQUIRED ENCROACHMENT AND/OR STATE AND FEDERAL REGULATORY PERMITS PRIOR TO THE COMMENCEMENT OF ANY WORK.
24. THE CONCRETE COATING ON THE INSIDE OF ALL REINFORCED CONCRETE PIPES AND STRUCTURES MUST BE INCREASED TO PROVIDE A MINIMUM OF 1-1/2" OVER THE REINFORCING STEEL AND INCREASED TO A MINIMUM OF 3 1/2" OVER REINFORCING STEEL FOR BOX CULVERT, WHEN DESIGN VELOCITIES EXCEED 20' PER SECOND. THE CONCRETE DESIGN STRENGTH IN THESE REACHES SHALL BE F'C=5,000 PSI FOR VELOCITIES EXCEEDING 20' PER SECOND AND F'C=6,000 PSI FOR VELOCITIES EXCEEDING 30' PER SECOND.
25. CONSTRUCTION JOINTS FOR CALTRANS STANDARD REINFORCED CONCRETE BOX SHALL BE PLACED ACCORDING TO DISTRICT STANDARD DRAWING NO. BOX 401.
26. ROCK FOR ACCESS ROADS, TURN AROUNDS AND OTHER AREAS WITHIN DISTRICT RIGHT OF WAY AS SHOWN ON THE PROJECT DRAWINGS AND AS DIRECTED BY THE ENGINEER SHALL MEET THE REQUIREMENTS FOR 1" X NO. 4 COARSE AGGREGATE AS PER SECTION 90-1.02C(4)(B) OF THE CALTRANS SPECIFICATIONS. X VALUES FOR ROCK GRADATION SHALL BE 75 AND 15 FOR 3/4" AND 3/8" RESPECTIVELY. ROCK SHALL ADDITIONALLY MEET THE SPREADING AND COMPACTION REQUIREMENTS OF SECTIONS 26-1.03D AND 26-1.03E OF THE CALTRANS SPECIFICATIONS. FURTHERMORE, ROCK DEPTH SHALL NOT EXCEED 3" AND SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER. ROCK SHALL NOT CONTAIN RECYCLED CONCRETE PRODUCTS.



VICINITY MAP
NOT TO SCALE

ENGINEER

KIMLEY HORN & ASSOCIATES, INC.
3801 UNIVERSITY AVE. SUITE 300
RIVERSIDE, CA 92501
ATTN: MICHAEL SUTTON
PHONE: (760) 565-5146
EMAIL: MIKE.SUTTON@KIMLEY-HORN.COM

OWNER/DEVELOPER

MERITAGE HOMES OF CALIFORNIA,
A CALIFORNIA CORPORATION
5 PETERS CANYON ROAD, SUITE 310
IRVINE, CA 92606
ATTN: JOHANNA CROOKER
PHONE: (408) 772-1774

ABBREVIATIONS

C/L	CENTERLINE
CIPCP	CAST IN PLACE CONCRETE PIPE
CB	CATCH BASIN
GB	GRADE BREAK
EX/EXIST	EXISTING
FG	FINISH GRADE
FS	FINISHED SURFACE
FL	FLOWLINE
INV	INVERT OF PIPE
LP	LOW POINT
HP	HIGH POINT
HGL	HYDRAULIC GRADE LINE
INV	INVERT
CL	CENTERLINE
R/W	RIGHT-OF-WAY
LAT	LATERAL
STA	STATION
PROP	PROPOSED
PUE	PUBLIC UTILITY EASEMENT
L	LENGTH
N.T.S.	NOT TO SCALE
CMP	CORRUGATED METAL PIPE
ELEV.	ELEVATION
MIN.	MINIMUM
MAX.	MAXIMUM
PRC	POINT OF REVERSE CURVE
PCC	POINT OF COMPOUND CURVE
PROP	PROPOSED
RCP	REINFORCED CONC. PIPE
SS	SEWER
SD	STORM DRAIN
TYP.	TYPICAL
TC	TOP OF CURB
TOP	TOP OF PIPE
W	WATER

LEGEND

TRACT BOUNDARY
RIGHT OF WAY
CENTERLINE
EXIST. RIGHT OF WAY
PROP. STORM DRAIN
EX. STORM DRAIN
PROP. STORM STRUCTURE
PROP. CATCH BASIN
EXIST. ELEV. (1217.58) INV
PROP. ELEV. 1217.58 INV

ASSESSOR'S PARCEL NO.

413-790-010

WORK TO BE DONE

THE IMPROVEMENT WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING DOCUMENTS, CURRENT AT THE TIME OF CONSTRUCTION, AS DIRECTED BY THE CITY ENGINEER.

1. BEAUMONT MUNICIPAL CODE.
2. FOR STREETS: RIVERSIDE COUNTY ORDINANCE NO. 461.
   FLOOD CONTROL FACILITIES: THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S STANDARDS FOR FLOOD CONTROL FACILITIES.
   SANITARY SEWER FACILITIES: THE EASTERN MUNICIPAL WATER DISTRICT'S STANDARDS FOR SANITARY SEWER FACILITIES.
   ALL OTHER PUBLIC WORKS: THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREEN BOOK).
3. THIS SET OF PLANS.
4. RESOLUTION NO _____________, DATED __________.
5. SOILS REPORT AND RECOMMENDATIONS BY ALTA CALIFORNIA GEOTECHNICAL, INC., DATED 04/12/2023.

SHEET LIST TABLE	
SHEET NO.	SHEET TITLE
1	TITLE SHEET
2	INDEX SHEET
3	STORM DRAIN LINE A
4	STORM DRAIN LINE B
5	STORM DRAIN LINE G

DIGALERT
Call 2 Working Days Before You Dig!
811

BASIS OF BEARINGS:
DESCRIPTION:
THE BASIS OF COORDINATES FOR THIS MAP IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, 1983, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "REST" AND "RABBIT".
BEARING: N 27°39'52" E

BENCHMARK:
USGS - MONUMENT "REST" BENCHMARK DISK SET IN TOP OF CONCRETE MONUMENT STAMPED "REST 1972" ON DESERT LAWN DR. ACROSS THE DRIVE CENTERLINE 24.9 FT. SOUTHWEST OF THE SOUTHWEST EDGE OF THE SOUTHEAST BOUND LANES OF INTERSTATE HIGHWAY 10
88 DATUM
ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
	1			
ENGINEER		REVISIONS	CITY	

Kimley»Horn

3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON 07/16/2024
R.C.E. NO.: C57667 DATE

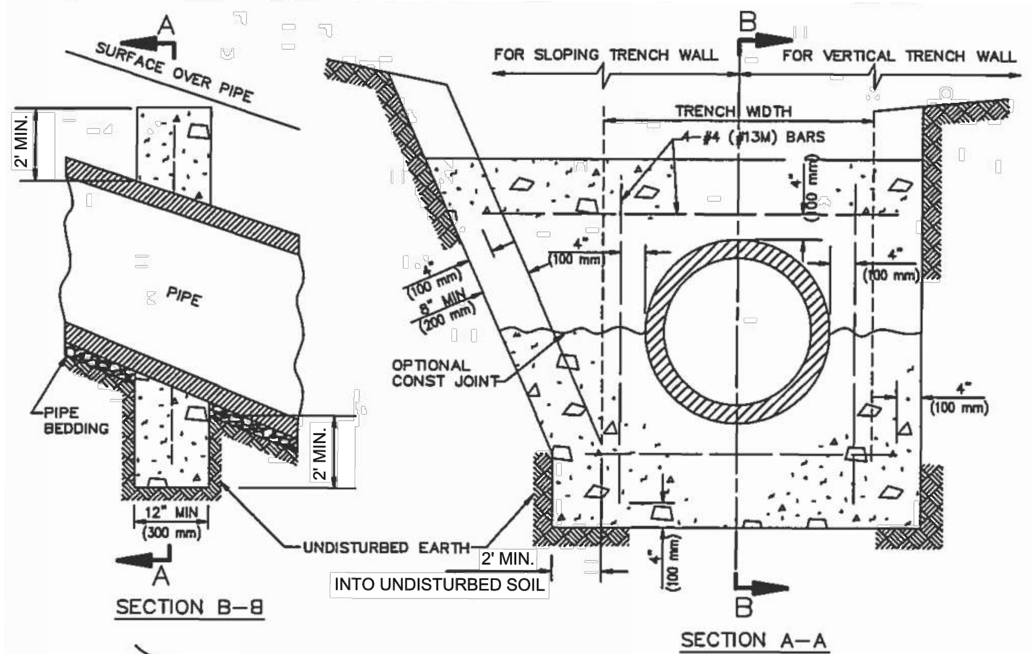
SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: AM
CHECKED BY: MS
SCALE: AS NOTED
DATE: 7/16/2024
JOB NUMBER:

REVIEWED BY: ______________________ DATE: ________
STAFF ENGINEER
RECOMMENDED FOR APPROVAL BY: ______________________ DATE: ________
APPROVED BY: ______________________ DATE: ________
CITY ENGINEER
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR:
TRACT NO. 31462-17
TITLE SHEET
FOR: MERITAGE HOMES

SHEET 1 OF 5 SHEETS
FILE NO: 3499
PW2024-0023



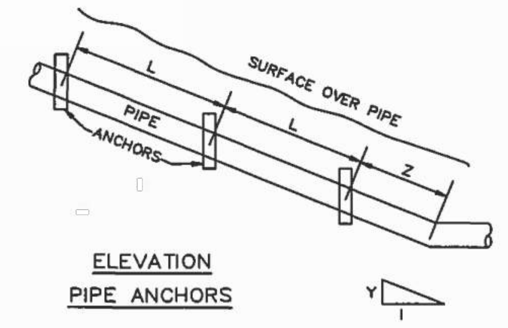


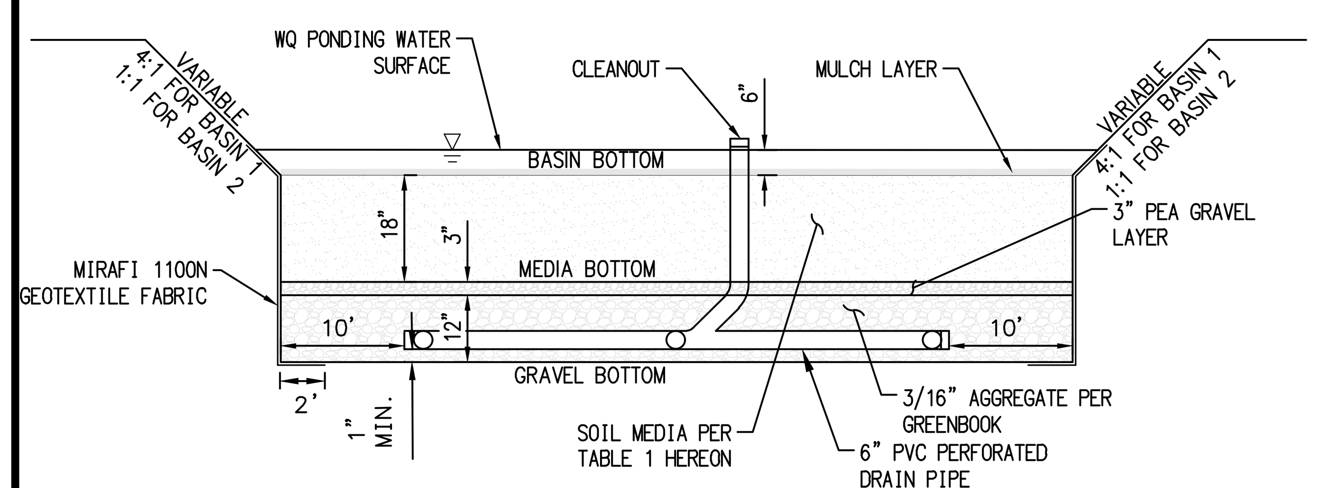
TABLE A

PIPE SLOPE(%) Y:1(100)	L DISTANCE (MAX)	Z DISTANCE (MAX)
100	12' (3.65 m)	4' (1.20 m)
67	14' (4.25 m)	8' (2.40 m)
50	16' (4.90 m)	12' (3.65 m)
40	18' (5.50 m)	18' (5.50 m)
33	20' (6.00 m)	20' (6.00 m)

ANCHORS/SEEPAGE COLLAR

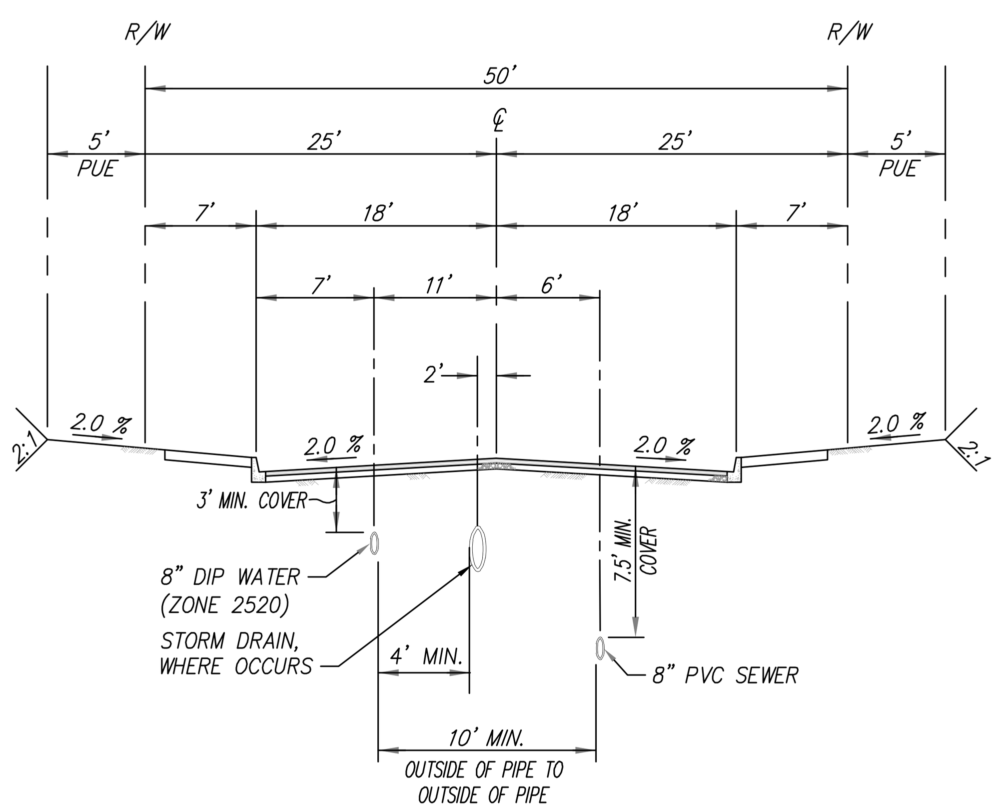
NOTES:

1. ANCHORS SHALL BE CLASS 450-C-2000 (265-C-14) CONCRETE.
2. FOR CLAY PIPE, ANCHORS SHALL NOT BE PLACED WITHIN 6" (150 mm) OF THE PIPE JOINT.
3. TRENCH SHALL BE BACKFILL PER NOTE 4 ON SHEET 2.
4. SPACING OF ANCHORS FOR PIPE SLOPES BETWEEN VALUES SHOWN IN TABLE "A" MAY BE PROPORTIONED.



BASIN 1 AND BASIN 2 BOTTOM MEDIA DETAIL

NTS



TYPICAL STREET SECTION

N.T.S.

LEGEND

SHEET MATCHLINE

TRACT MATCHLINE

NORTH

GRAPHIC SCALE IN FEET

0 75 150 300

DIGALERT Call 2 Working Days Before You Dig! 811

BASIS OF BEARINGS:

DESCRIPTION:

THE BASIS OF COORDINATES FOR THIS MAP IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, 1983, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "REST" AND "RABBIT".

BEARING: N 27°39'52" E

BENCHMARK:

USGS - MONUMENT "REST" BENCHMARK DISK SET IN TOP OF CONCRETE MONUMENT STAMPED "REST 1972" ON DESERT LAWN DR. ACROSS THE DRIVE CENTERLINE 24.9 FT. SOUTHWEST OF THE SOUTHWEST EDGE OF THE SOUTHEAST BOUND LANES OF INTERSTATE HIGHWAY 10

88 DATUM

ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS		CITY

Kimley»Horn

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3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON 07/16/2024
R.C.E. NO.: C57667 DATE

SEAL

REGISTERED PROFESSIONAL ENGINEER MICHAEL S. SUTTON No. C57667 CIVIL STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: AM
CHECKED BY: MS
SCALE: AS NOTED
DATE: 7/16/2024
JOB NUMBER:

REVIEWED BY: ______ STAFF ENGINEER DATE: ______

RECOMMENDED FOR APPROVAL BY: ______ DATE: ______

APPROVED BY: ______ CITY ENGINEER DATE: ______

CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA

STORM DRAIN IMPROVEMENT PLANS FOR: TRACT NO. 31462-17

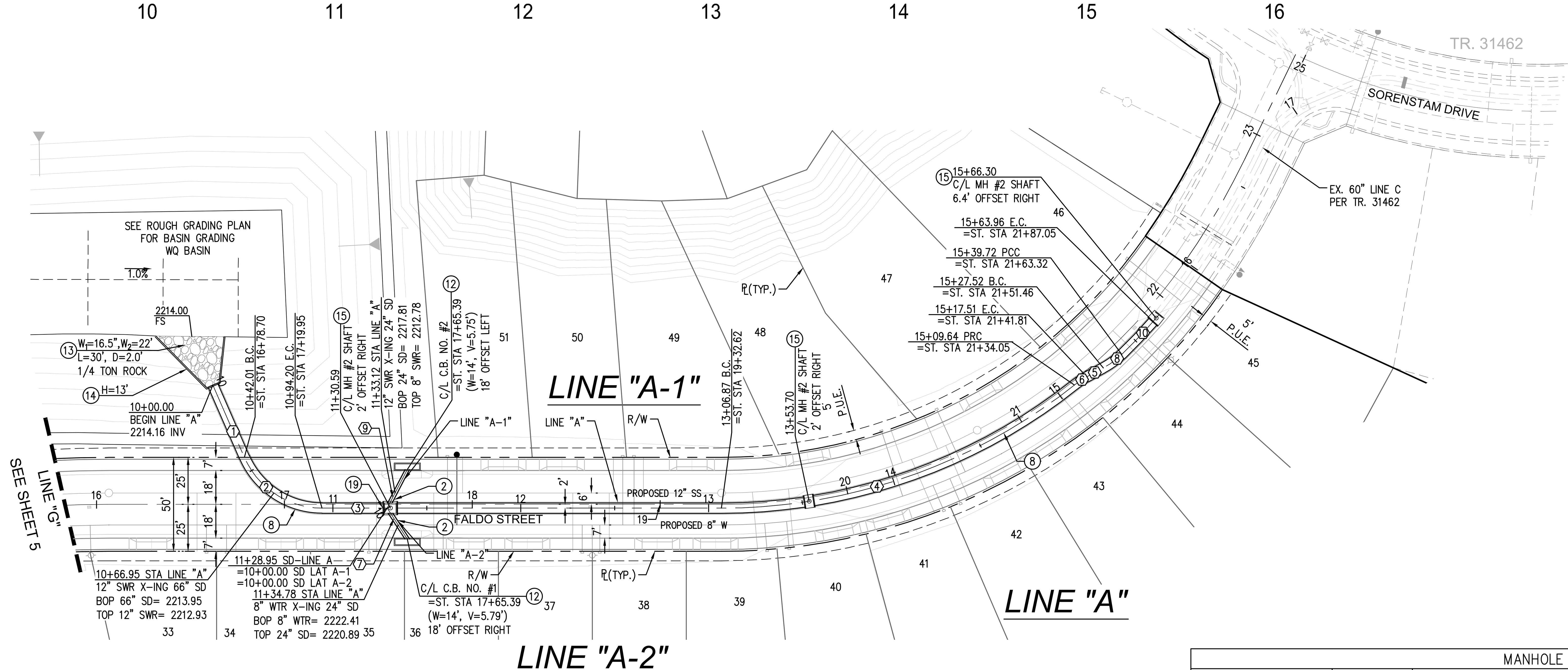
INDEX SHEET

FOR: MERITAGE HOMES

SHEET 2 OF 5 SHEETS

FILE NO: 3499

PW2024-0023



CONSTRUCTION NOTES

(2) CONSTRUCT 24" RCP (SEE PROFILE FOR D-LOAD).
(8) CONSTRUCT 66" RCP (SEE PROFILE FOR D-LOAD).
(12) CONSTRUCT CURB INLET CATCH BASIN AND LOCAL DEPRESSION PER COUNTY OF RIVERSIDE STD. NO. 300 (W & V PER PLAN).
(13) INSTALL RIP-RAP (SIZING PER PLAN).
(14) CONSTRUCT CONCRETE HEADWAL PER CALTRANS STD. D90 (SIZING PER PLAN).
(15) CONSTRUCT MANHOLE NO. 2 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH252.
(19) INSTALL STORMTEK FULL TRASH CAPTURE DEVICE PER STORM WATER INSPECTION & MAINTENANCE SERVICES.

DATA

#	BEARING/DELTA	RADIUS	LENGTH	TANGENT
1	S 38°15'42" W	-	42.01'	-
2	Δ=66° 26' 37"	45.00'	52.18'	29.47'
3	S 28°10'55" E	-	212.67'	-
4	Δ=38° 28' 09"	302.00'	202.77'	105.37'
5	S 56°37'49" E	-	10.01'	-
6	Δ=10° 01' 15"	45.00'	7.87'	3.95'
7	S 28°54'25" W	-	19.65'	-
8	Δ=15° 32' 28"	45.00'	12.21'	6.14'
9	N 89°20'01" E	-	23.11'	-
10	Δ=5° 24' 50"	306.00'	28.91'	14.47'

MANHOLE & JUNCTION STRUCTURE DATA TABLE

STRUCTURE	MAIN LINE	LATERAL LEFT					LATERAL RIGHT					D_1	D_2
		NAME	A	B	C	L	NAME	A	B	C	L		
M.H. #2 11+30.59	LINE A	LINE A-1	62°29'03"	2.0'	–	6.16'	LINE A-1	57°5'21"	2.0'	–	6.16'	66"	66"
M.H. #2 13+53.70	LINE A					4.67'						66"	66"
M.H. #2 15+66.30	LINE A					4.79'						66"	60"

GRAPHIC SCALE IN FEET
0 20 40 80

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BASIS OF BEARINGS:
DESCRIPTION:
THE BASIS OF COORDINATES FOR THIS MAP IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, 1983, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "REST" AND "RABBIT".
BEARING: N 27°39'52" E

BENCHMARK:
USGS – MONUMENT "REST" BENCHMARK DISK SET IN TOP OF CONCRETE MONUMENT STAMPED "REST 1972" ON DESERT LAWN DR. ACROSS THE DRIVE CENTERLINE 24.9 FT. SOUTHWEST OF THE SOUTHWEST EDGE OF THE SOUTHEAST BOUND LANES OF INTERSTATE HIGHWAY 10
88 DATUM
ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS		CITY

Kimley»Horn
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3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON
R.C.E. NO.: C57667
07/16/2024
DATE

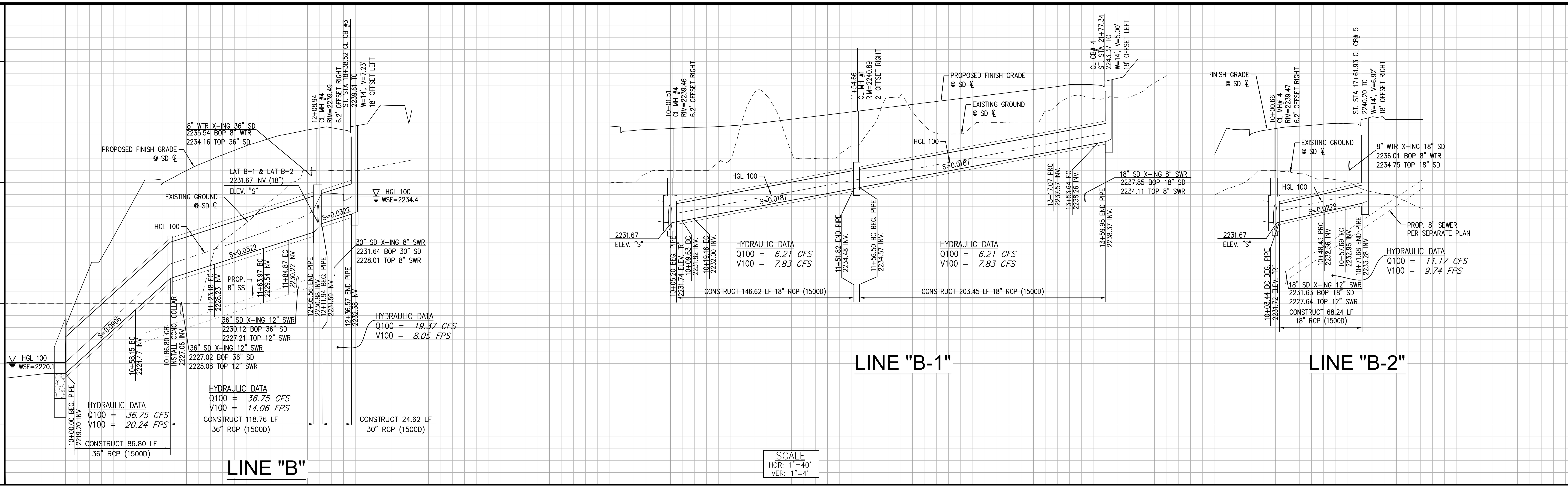
SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: AM
CHECKED BY: MS
SCALE: 1"=40'
DATE: 7/16/2024
JOB NUMBER:

REVIEWED BY: ____ STAFF ENGINEER DATE: ____
RECOMMENDED FOR APPROVAL BY: ____ DATE: ____
APPROVED BY: ____ CITY ENGINEER DATE: ____
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR:
TRACT NO. 31462-17
LINE "A", LINE "A-1", & LINE "A-2"
FOR: MERITAGE HOMES

SHEET 3 OF 5 SHEETS
FILE NO: 3499
PW2024-0023

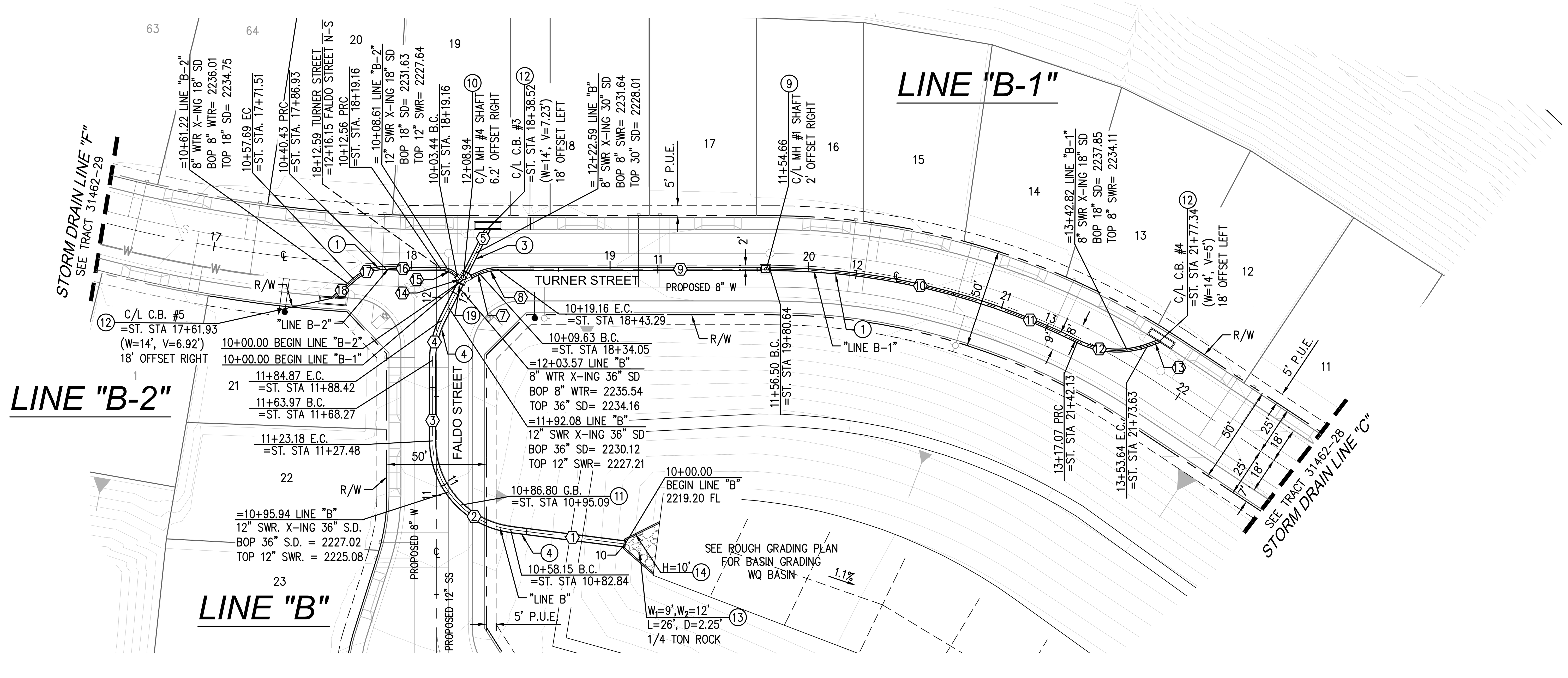


CONSTRUCTION NOTES

1. CONSTRUCT 18" RCP (SEE PROFILE FOR D-LOAD).
3. CONSTRUCT 30" RCP (SEE PROFILE FOR D-LOAD).
4. CONSTRUCT 36" RCP (SEE PROFILE FOR D-LOAD).
9. CONSTRUCT MANHOLE NO. 1 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH251
10. CONSTRUCT MANHOLE NO. 4 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH254
11. CONSTRUCT CONCRETE COLLAR PER R.C.F.C. & W.C.D. STD. DWG. NO. M803.
12. CONSTRUCT CURB INLET CATCH BASIN AND LOCAL DEPRESSION PER COUNTY OF RIVERSIDE STD. NO. 300 (W & V PER PLAN).
13. INSTALL RIP-RAP (SIZING PER PLAN).
14. CONSTRUCT CONCRETE HEADWAL PER CALTRANS STD. D90 (SIZING PER PLAN).
19. INSTALL STORMTEK FULL TRASH CAPTURE DEVICE PER STORM WATER INSPECTION & MAINTENANCE SERVICES.

DATA

#	BEARING/DELTA	RADIUS	LENGTH	TANGENT
1	N 69°26'48" W	-	57.48'	-
2	Δ=82° 48' 06"	45.00'	65.03'	39.67'
3	N 13°21'17" E	-	40.78'	-
4	Δ=26° 36' 50"	45.00'	20.90'	10.64'
5	N 39°58'07" E	-	51.70'	-
7	N 79°05'48" E	-	9.63'	-
8	Δ=24° 15' 29"	22.50'	9.53'	4.84'
9	S 76°38'43" E	-	137.34'	-
10	Δ=26° 26' 14"	348.00'	160.57'	81.74'
11	Δ=26° 26' 14"	348.00'	160.57'	81.74'
12	Δ=46° 33' 33"	45.00'	36.57'	19.36'
13	N 83°13'59" E	-	6.31'	-
14	N 30°25'11" W	-	3.44'	-
15	Δ=46° 25' 35"	11.26'	9.12'	4.83'
16	N 75°41'09" W	-	27.86'	-
17	Δ=43° 58' 00"	22.49'	17.26'	9.08'
18	S 61°34'23" W	-	14.00'	-



MANHOLE & JUNCTION STRUCTURE DATA TABLE

STRUCTURE	MAIN LINE	LATERAL LEFT					LATERAL RIGHT					D_1	D_2
		NAME	A	B	C	L	NAME	A	B	C	L		
M.H. #4 12+08.94	LINE B	LINE B-2	70°23'18"	1.92'	3.85'	5.86'	LINE B-1	39°7'21"	1.92'	5.61'	5.86'	36"	30"
M.H. #1 11+54.66	LINE B-1					4.00'						18"	18"

GRAPHIC SCALE IN FEET
0 20 40 80

DIGALERT
Call 2 Working Days Before You Dig!
811

BASIS OF BEARINGS:
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BEARING: N 27°39'52" E

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88 DATUM
ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS		CITY

Kimley»Horn

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PHONE: 951-543-9868

MIKE S. SUTTON
R.C.E. NO.: C57667
07/16/2024
DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: AM
CHECKED BY: MS
SCALE: 1"=40'
DATE: 7/16/2024
JOB NUMBER:

REVIEWED BY: ______ STAFF ENGINEER DATE: ______
RECOMMENDED FOR APPROVAL BY: ______ DATE: ______
APPROVED BY: ______ CITY ENGINEER DATE: ______
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION

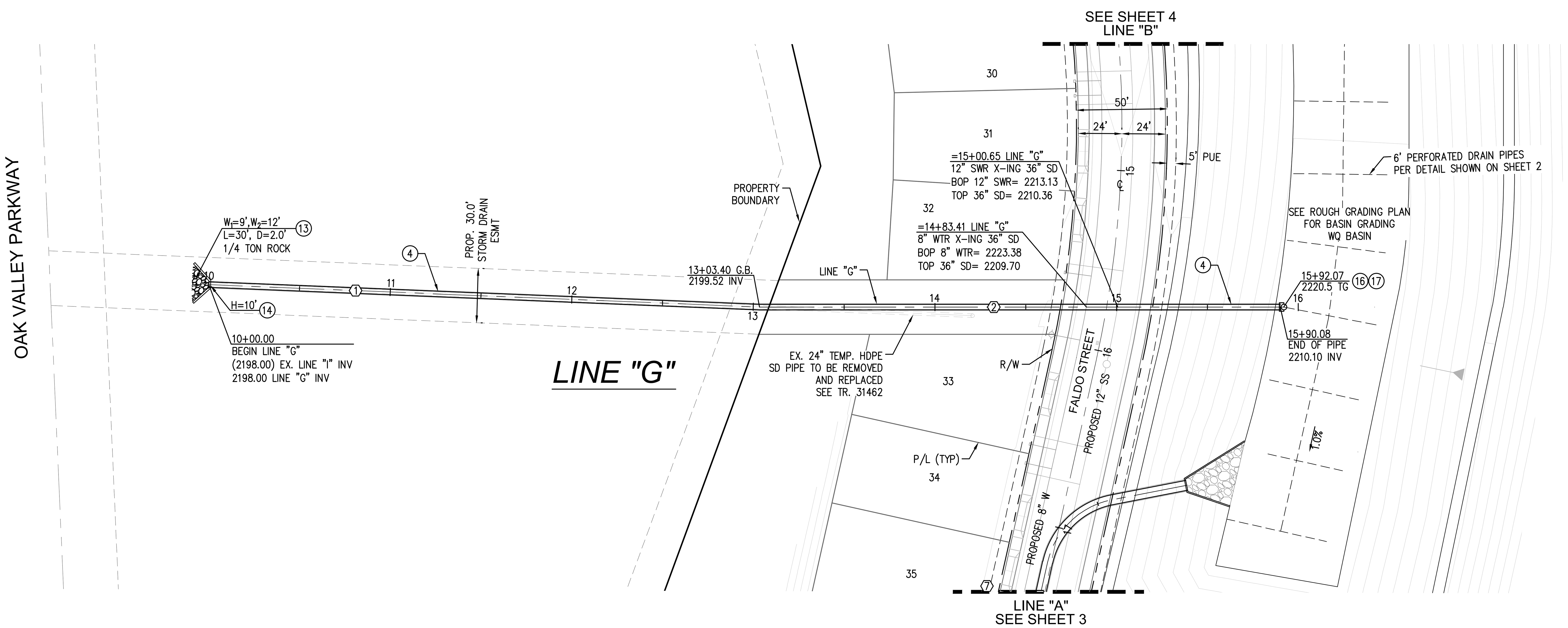
CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR: TRACT NO. 31462-17
LINE "B", LINE "B-1", & LINE "B-2"
FOR: MERITAGE HOMES

SHEET 4 OF 5 SHEETS
FILE NO: 3499
PW2024-0023

CONSTRUCTION NOTES

4. CONSTRUCT 36" RCP (SEE PROFILE FOR D-LOAD).
13. INSTALL RIP-RAP (SIZING PER PLAN).
14. CONSTRUCT CONCRETE HEADWAL PER CALTRANS STD. D90 (SIZING PER PLAN).
16. CONSTRUCT INLET TYPE X PER R.C.F.C. & W.C.D. STD. DWG. NO. CB108.
17. CONSTUCT AN ANCHOR AND SEEPAGE COLLAR PER THE DETAIL ON SHEET 2.

DATA				
#	BEARING/DELTA	RADIUS	LENGTH	TANGENT
1	N 51°36'39" E	-	303.40'	-
2	N 49°16'46" E	-	286.68'	-



NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

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811

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MIKE S. SUTTON
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07/16/2024
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CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR:
TRACT NO. 31462-17
LINE "G"
FOR: MERITAGE HOMES

SHEET 5 OF 5 SHEETS
FILE NO: 3499
PW2024-0023

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS
TRACT NO. 31462-28
LINE "C", LINE "C-1", LINE "C-2", & LINE "C-3"

GENERAL NOTES

1. THE CONTRACTOR SHALL CONSTRUCT THE DRAINAGE IMPROVEMENT SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT DESIGN MANUAL STANDARD DRAWINGS, RECENT EDITION, AND IN CONFORMANCE WITH THE REQUIREMENTS OF THE BEAUMONT DRAINAGE MANAGEMENT PLAN.
2. THE CONTRACTOR IS REQUIRED TO CONTACT ALL UTILITY AGENCIES REGARDING TEMPORARY SUPPORT AND SHORING REQUIREMENTS FOR THE VARIOUS UTILITIES SHOWN IN THE PLANS.
3. CONSTRUCTION INSPECTION WILL BE PERFORMED BY CITY OF BEAUMONT. CONTACT (951) 769-8520. THE CITY MUST BE NOTIFIED ONE WEEK PRIOR TO CONSTRUCTION.
4. ALL STATIONING REFERS TO THE CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
5. STATIONING FOR LATERALS AND CONNECTOR PIPE REFER TO THE CENTERLINE-CENTERLINE-INTERSECTION STATION.
6. FORTY-EIGHT HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT 1-800-227-2600.
7. ALL CROSS SECTIONS ARE TAKEN LOOKING UPSTREAM.
8. ELEVATIONS AND LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE UNLESS OTHERWISE NOTED. ALL UTILITIES SHOWN ARE TO BE PROTECTED IN PLACE UNLESS OTHERWISE NOTED.
9. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6 INCHES OF CLASS "B" CONCRETE.
10. PIPE CONNECTED TO THE MAINLINE PIPE SHALL CONFORM TO JUNCTION STRUCTURE NO. 4 (JS 229) UNLESS OTHERWISE NOTED.
11. PIPE BEDDING SHALL CONFORM TO R.C.F.C. & W.C.D. STD. DWG. M 815.
12. V" IS THE DEPTH OF INLET AT THE CATCH BASINS MEASURED FROM THE TOP OF THE CURB TO THE INVERT OF CONNECTOR PIPE.
13. ALL CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS, AND OTHER EXISTING IMPROVEMENTS TO BE RECONSTRUCTED IN KIND PER LATEST COUNTY STANDARD AND AT THE SAME ELEVATION AND LOCATION AS THE EXISTING UNLESS OTHERWISE NOTED. FOR PAVEMENT OVERLAY, 0.10' MIN. FOR FULL LANE WIDTH IS REQUIRED.
14. HYDRAULIC GRADE LINES SHOWN IN PROFILES ARE FOR 100 YEAR FREQUENCY FLOWS, UNLESS OTHERWISE NOTED.
15. THE CONTRACTOR SHALL COMPLY WITH THE STATE AND LOCAL SAFETY CODES DURING THE PROGRESS OF WORK.
16. THE CONTRACTOR SHALL MAINTAIN ADJACENT STREETS IN A NEAT, SAFE, CLEAN AND SANITARY CONDITION AT ALL TIMES AND TO THE SATISFACTION OF THE COUNTY'S OR DISTRICT'S INSPECTOR. THE ADJACENT STREETS SHALL BE KEPT CLEAN OF DEBRIS, WITH DUST AND OTHER NUISANCE BEING CONTROLLED AT ALL TIMES. THE DEVELOPER SHALL BE RESPONSIBLE FOR ANY CLEAN UP ON ADJACENT STREETS AFFECTED BY HIS CONSTRUCTION. METHOD OF STREET CLEANING SHALL BE DRY SWEEPING OF ALL PAVED AREAS.
17. THE CONTRACTOR AGREES THAT HE/SHE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER, CITY OF BEAUMONT, AND THE DEVELOPER'S ENGINEER, HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNERS OR THE DEVELOPER'S ENGINEER.
18. ALL PIPE LENGTHS ARE HORIZONTAL PROJECTIONS (NOT TRUE LENGTHS OF PIPE) AND ARE THE BASIS OF THE ESTIMATES OF QUANTITIES. THE CONTRACTOR SHALL DETERMINE THE TRUE QUANTITY OF PIPE REQUIRED FOR THIS PROJECT PRIOR TO PLACING THE ORDER.
19. ALL ELEVATIONS SHOWN ARE TO THE INVERTS OF PIPE, EXCEPT WHERE OTHERWISE NOTED.
20. AT THE DISCRETION OF THE ENGINEER AND THE CITY OF BEAUMONT, THE CONTRACTOR MAY BE REQUIRED TO VERIFY, BY POTHOLING, THE LOCATION OF POTENTIALLY AFFECTED UTILITIES.
21. . CONTRACTOR SHALL DISPOSE OF ALL EXCESS EXCAVATED MATERIAL AT MANDATORY DISPOSAL.
22. ALL BACKFILL AND BEDDING AROUND STRUCTURES AND PIPES SHALL BE COMPACTED TO NOT LESS THAN 90 PERCENT RELATIVE COMPACTION EXCEPT WHERE SUCH MATERIAL IS PLACED UNDER EXISTING PAVED ROADWAYS. THE TOP 3 FEET, MEASURED FROM THE FINISH PAVING, SHALL BE COMPACTED TO 95 PERCENT RELATIVE COMPACT.
23. ALL SURVEY MONUMENTS SHALL BE REPLACED AS REQUIRED. MONUMENTS SHALL BE TIED OUT PRIOR TO CONSTRUCTION AND REPLACED UPON COMPLETION OF CONSTRUCTION.
24. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/OWNER OR CONTRACTOR TO APPLY TO THE DIRECTOR OF PUBLIC WORKS, CITY OF BEAUMONT FOR AN ENCROACHMENT PERMIT FOR ALL WORK PERFORMED WITHIN PUBLIC RIGHT-OF-WAY, DEDICATED AND ACCEPTED FOR PUBLIC USE; AND TO BE RESPONSIBLE FOR SATISFACTORY COMPLIANCE FOR ALL CURRENT ENVIRONMENTAL REGULATIONS DURING THE LIFE OF CONSTRUCTION ACTIVITIES FOR THIS PROJECT. ADDITIONAL STUDIES AND/OR PERMITS MAY BE REQUIRED.
25. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEARING OF THE PROPOSED WORK AREA, AND RELOCATION COSTS OF ALL EXISTING UTILITIES. PERMITTEE MUST INFORM CITY OF CONSTRUCTION SCHEDULE AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
26. ALL UNDERGROUND FACILITIES WITH LATERALS SHALL BE IN PLACE PRIOR TO PAVING THE STREET, INCLUDING BUT NOT LIMITED TO, THE FOLLOWING: SEWER, WATER, ELECTRIC, STORM DRAINS.
27. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR CONTRACTOR TO INSTALL AND MAINTAIN DURING CONSTRUCTION, REGULATORY GUIDE AND WARNING SIGNS WITHIN THE PROJECT LIMITS AND ITS SURROUNDINGS TO PROVIDE SAFE PASSAGE FOR THE TRAVELING PUBLIC AND WORKERS UNTIL THE FINAL COMPLETION AND ACCEPTANCE OF THE PROJECT BY THE CITY OF BEAUMONT.
28. CONSTRUCTION PROJECTS THAT DISTURB MORE THAN ONE ACRE MUST OBTAIN A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT. OWNER/DEVELOPERS ARE REQUIRED TO FILE A NOTICE OF INTENT (NOI) WITH THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) AND COMPLY WITH ALL REQUIREMENTS OF THE BEAUMONT DRAINAGE MANAGEMENT PLAN. BEAUMONT IS CO-PERMITTEE WITH R.C.F.C. & W.C.D.
29. ALL STORM DRAINS, CATCH BASINS, AND STORM WATER RUNOFF STRUCTURES WILL BE PROVIDED WITH ADEQUATE CAPABILITIES TO FILTER AND RETAIN SEDIMENT AND DIRT, OIL, AND GREASE, TO PREVENT POLLUTION IN STORM WATER RUNOFF IN COMPLIANCE WITH THE CITY OF BEAUMONT'S BEST MANAGEMENT PRACTICES AND THE BEAUMONT DRAINAGE MASTER PLAN FOR STORM WATER AS WELL AS BEST MANAGEMENT PRACTICES IDENTIFIED IN THE CURRENT REPORT OF WASTE DISCHARGE FOR RIVERSIDE COUNTY PERMITTEE.
30. DEVELOPER SHALL BE FULLY RESPONSIBLE IN ASSURING THAT PROPOSED IMPROVEMENTS CONFORM TO THE APPROVED PLANS, SPECIFICATIONS AND CITY OF BEAUMONT STANDARDS. WHERE DEVIATIONS EXIST, DEVELOPER SHALL PROPOSE CORRECTIVE MEASURES FOR REVIEW AND APPROVAL BY THE CITY.

NOTE:

1. APPROVAL OF THESE PLANS APPLY ONLY WITHIN THE JURISDICTION OF THE CITY OF BEAUMONT.
2. TRENCHING FOR UTILITIES AND STRUCTURES IS NOT ALLOWED UNTIL SOIL COMPACTION REPORT IS SUBMITTED AND APPROVED BY THE PUBLIC WORK DEPARTMENT.
3. THE CITY RESERVES THE RIGHT TO REQUIRE REVISION OF THE APPROVED PLANS TO CONFORM WITH CURRENT STANDARDS AND TO POST A NEW BOND IF CONSTRUCTION HAS NOT COMMENCED WITHIN TWO YEARS AFTER PLANS WERE APPROVED.
4. HE DEVELOPER SHALL HAVE GEOTECHNICAL/SOILS ENGINEERING FIRM OBSERVE TRENCHING, BACKFILLING, AND SOIL COMPACTION OF ALL UTILITY TRENCHES WITHIN ALL EASEMENTS AND ROAD RIGHTS OF WAY. TWO SETS OF COMPACTION REPORTS CERTIFYING THAT WORKS WERE DONE IN CONFORMANCE TO STANDARDS AND GEOTECHNICAL REPORT SHALL BE SUBMITTED AFTER EACH UTILITY TRENCH IS COMPLETED AND CERTIFIED. COMPACTION REPORT MUST BE SUBMITTED TO THE DEPT. OF PUBLIC WORKS AT LEAST TWO WORKING DAYS BEFORE AGGREGATE BASE MATERIALS ARE PLACED ONSITE.

SEE SHEET NO. 2
FOR INDEX MAP

*RCP NOTES:

1. THE CONCRETE COATING ON THE INSIDE OF ALL REINFORCED CONCRETE PIPES MUST BE INCREASED TO PROVIDE A MINIMUM OF 1-1/2" OVER THE REINFORCING WHEN THE DESIGN VELOCITIES EXCEED 20 FEET PER SECOND. THE CONCRETE DESIGN STRENGTH IN THESE REACHES SHALL BE f'c = 5,000 PSI FOR VELOCITIES EXCEEDING 20 FEET PER SECOND AND f'c = 6,000 PSI FOR VELOCITIES EXCEEDING 30 FPS.
2. THE JOINTS FOR REINFORCED CONCRETE PIPES UNDER PRESSURE FLOW CONDITIONS SHALL BE WATERTIGHT IN CONFORMANCE WITH ASTM C443.

DECLARATION OF RESPONSIBLE CHARGE:

I HEREBY DECLARE THAT I AM THE ENGINEER OF RECORD FOR THIS PROJECT AND THAT THE DESIGN OF THE IMPROVEMENTS SHOWN ON THESE PLANS COMPLIES WITH ALL PROFESSIONAL ENGINEERING STANDARDS AND PRACTICES. I ASSUME FULL RESPONSIBILITY FOR ALL ASPECTS OF THE DESIGN OF THE IMPROVEMENTS. WITH RESPECT TO THE PLAN CHECK BY THE CITY OF BEAUMONT, I UNDERSTAND AND ACKNOWLEDGE THE FOLLOWING: (1) THE PLAN CHECK IS A REVIEW FOR THE LIMITED PURPOSE OF ENSURING THE PLANS COMPLY WITH THE CITY'S STANDARDS, PROCEDURES, POLICIES, AND ORDINANCES; (2) THE PLAN CHECK IS NOT A DETERMINATION OF THE TECHNICAL ADEQUACY OF THE DESIGN OF THE IMPROVEMENTS; AND, (3) THE PLAN CHECK DOES NOT RELIEVE ME OF MY LEGAL AND PROFESSIONAL RESPONSIBILITY FOR THE DESIGN OF THE IMPROVEMENTS. TO THE FULL EXTENT PERMITTED BY LAW, I AGREE TO DEFEND, INDEMNIFY, AND HOLD HARMLESS THE CITY, ITS ELECTED OFFICIALS, EMPLOYEES, AND AGENTS FROM ANY AND ALL ACTUAL OR ALLEGED CLAIMS, DEMANDS, CAUSES OF ACTION, LIABILITY, LOSS, DAMAGE, OR INJURY TO PROPERTY OR PERSONS, INCLUDING WRONGFUL DEATH, WHETHER IMPOSED BY A COURT OF LAW OR BY ADMINISTRATIVE ACTION OF ANY FEDERAL, STATE OR LOCAL GOVERNMENTAL AGENCY, TO THE EXTENT ARISING OUT OF OR INCIDENT TO ANY NEGLIGENT ACTS, OMISSIONS, OR ERRORS BY THE ENGINEER OF RECORD, ITS EMPLOYEES, CONSULTANTS, OR AGENTS.

FIRM: KIMLEY HORN & ASSOCIATES, INC.
ADDRESS: 3801 UNIVERSITY AVE. SUITE 300
CITY, ST.: RIVERSIDE,CA 92501
TELEPHONE: (760) 565-5146
BY: MIKE SUTTON, R.C.E. NO.:C57667 DATE: 7/16/2024
(NAME OF ENGINEER & RCE)

PRIVATE ENGINEERS NOTICE TO CONTRACTOR(S)

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT THOSE SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE ALL PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN, AND ANY OTHER LINES OR STRUCTURES NOT SHOWN ON THESE PLANS AND IS RESPONSIBLE FOR THE PROTECTION OF, AND ANY DAMAGE TO THESE LINES OR STRUCTURES.
2. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO NOTIFY THE OWNER OF ALL UTILITIES OR STRUCTURES CONCERNED BEFORE STARTING WORK.
3. QUANTITIES SHOWN HEREON ARE PROVIDED FOR BIDDING PURPOSES ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES PRIOR TO BIDDING FOR CONSTRUCTION.
4. THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER CITY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE CITY.

LEGAL DESCRIPTION

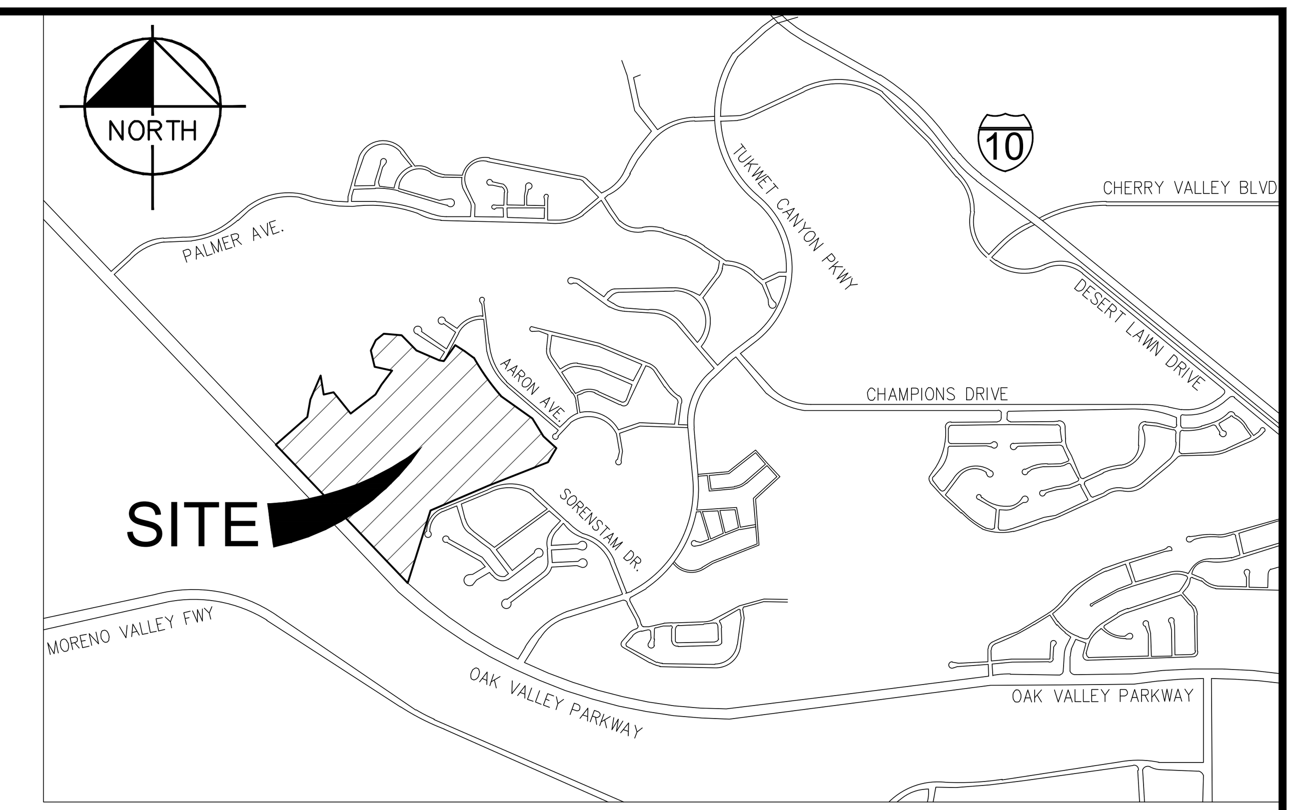
THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF BEAUMONT, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

THE DESIGNATED REMAINDER PARCEL OF PARCEL MAP NO. 38090, IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 254, PAGES 97 THROUGH 103, INCLUSIVE, OF PARCEL MAPS, RECORDS OF SAID COUNTY.

EXCEPTING THEREFROM THE ABOVE PARCEL ANY AND ALL NATURAL OIL, OIL RIGHTS, MINERALS, MINERAL RIGHTS, NATURAL GAS, NATURAL GAS RIGHTS AND OTHER HYDROCARBONS BY WHATSOEVER NAME KNOWN AND ALL RIGHTS THEREIN, GEOTHERMAL STEAM, AND ALL PRODUCTS DERIVED FROM ANY OF THE FOREGOING, THAT MAY BE WITHIN OR UNDER THE LAND, TOGETHER WITH THE PERPETUAL RIGHT OF DRILLING, MINING, EXPLORING AND OPERATING THEREFOR AND STORING IN AND REMOVING THE SAME FROM THE LAND OR ANY OTHER PROPERTY, INCLUDING THE RIGHT TO WHIPSTOCK OR DIRECTIONALLY DRILL AND MINE FROM PROPERTY OTHER THAN THE LAND, OIL OR GAS WELLS, TUNNELS AND SHAFTS INTO, THROUGH OR ACROSS THE SUBSURFACE OF THE LAND, AND TO BOTTOM SUCH WHIPSTOCKED OR DIRECTIONALLY DRILLED WELLS, TUNNELS AND SHAFTS UNDER AND BENEATH OR BEYOND THE EXTERIOR LIMITS THEREOF, AND TO REDRILL, RETUNNEL, EQUIP, MAINTAIN, REPAIR, DEEPEN AND OPERATE ANY SUCH WELLS, TUNNELS OR SHAFTS, WITHOUT THE RIGHT TO DRILL, MINE, STORE OR EXCAVATE THROUGH THE SURFACE OR THE UPPER 500 FEET OF THE SUBSURFACE OF THE LAND AS RESERVED BY OAK VALLEY PARTNERS, L.P. A TEXAS LIMITED PARTNERSHIP WHICH IS REGISTERED IN CALIFORNIA AS OVP, L.P., IN A GRANT DEED RECORDED NOVEMBER 14, 2003, AS INSTRUMENT NO. 2003-899365 OF OFFICIAL RECORDS.

ANY AND ALL WATER, WATER RIGHTS OR INTERESTS THEREIN APPURTENANT OR RELATING TO THE LAND OR OWNED OR USED BY GRANTOR IN CONNECTION WITH OR WITH RESPECT TO THE LAND (NO MATTER HOW ACQUIRED BY GRANTOR), WHETHER SUCH WATER RIGHTS SHALL BE RIPARIAN, OVERLYING, APPROPRIATIVE, LITTORAL, PERCOLATING, PRESCRIPTIVE, ADJUDICATED, STATUTORY OR CONTRACTUAL, TOGETHER WITH THE RIGHT AND POWER TO EXPLORE, DRILL, REMOVE AND RESTORE THE SAME FROM OR IN THE LAND OR TO DIVERT OR OTHERWISE UTILIZE SUCH WATER, RIGHTS OR INTERESTS ON ANY OTHER PROPERTY OWNED BY OR LEASED BY GRANTOR, WITHOUT THE RIGHT TO ENTER UPON THE SURFACE OF THE LAND IN THE EXERCISE OF SUCH RIGHTS; PROVIDED, HOWEVER, ONLY IF AND TO THE EXTENT THAT SUCH RIGHTS ARE NOT USED BY GRANTEE IN ITS USE AND ENJOYMENT OF THE LAND AS RESERVED BY OAK VALLEY PARTNERS, L.P., A TEXAS LIMITED PARTNERSHIP, WHICH IS REGISTERED IN CALIFORNIA AS OVP, L.P., IN A GRANT DEED RECORDED NOVEMBER 14, 2003 AS INSTRUMENT NO. 2003-899365 OF OFFICIAL RECORDS.

APN: 413-790-010



VICINITY MAP
NOT TO SCALE

CONSTRUCTION NOTES / QUANTITIES

	CONSTRUCTION NOTES	QUANTITIES
1	CONSTRUCT 18" RCP (SEE PROFILE FOR D-LOAD).	30 LF
2	CONSTRUCT 24" RCP (SEE PROFILE FOR D-LOAD).	67 LF
3	CONSTRUCT 30" RCP (SEE PROFILE FOR D-LOAD).	140 LF
5	CONSTRUCT 42" RCP (SEE PROFILE FOR D-LOAD).	25 LF
9	CONSTRUCT MANHOLE NO. 1 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH251	1 EA
10	CONSTRUCT MANHOLE NO. 4 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH254	1 EA
12	CONSTRUCT CURB INLET CATCH BASIN AND LOCAL DEPRESSION PER COUNTY OF RIVERSIDE STD. NO. 300 (W & V PER PLAN).	4 EA
17	CONSTRUCT JUNCTION STRUCTURE NO. 3 PER R.C.F.C. & W.C.D. STD. DWG. NO. M803.	1 EA

STORM DRAIN NOTES

1. THE CONTRACTOR SHALL CONSTRUCT THE FLOOD CONTROL IMPROVEMENTS SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S (DISTRICT) M.O.U. STANDARD SPECIFICATIONS DATED MARCH 2020 AND DISTRICT STANDARD DRAWINGS. FOR THE LATEST STANDARD DRAWINGS, PLEASE REFER TO THE "ENGINEERING TOOLS" PAGE FOUND ON THE "BUSINESS" SECTION OF THE DISTRICT'S WEBSITE.
2. CONTACT THE ENCROACHMENT PERMIT ENGINEER AT 951.955.1266 IF AN ENCROACHMENT PERMIT IS REQUIRED FROM THE DISTRICT. AFTER THE PERMIT IS ISSUED, THE DISTRICT MUST BE NOTIFIED ONE (1) WEEK PRIOR TO CONSTRUCTION.
3. CONTACT CONSTRUCTION MANAGEMENT AT 951.955.1288 IF CONSTRUCTION INSPECTION WILL BE PERFORMED BY THE DISTRICT. THE DISTRICT MUST BE NOTIFIED TWENTY (20) DAYS PRIOR TO CONSTRUCTION.
4. ALL STATIONING REFERS TO CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
5. STATIONING FOR LATERALS AND CONNECTOR PIPES REFER TO THE CENTERLINE INTERSECTION STATIONS.
6. FORTY-EIGHT (48) HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT AT 1.800.227.2600.
7. ALL ELEVATIONS SHOWN ARE IN FEET AND DECIMALS THEREOF BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD 88).
8. ALL COORDINATES ARE SHOWN IN FEET AND DECIMALS THEREOF BASED ON THE NORTH AMERICAN DATUM (NAD 83), CALIFORNIA COORDINATE SYSTEM (CCS), ZONE 6 AND EPOCH _____.
9. ALL CROSS SECTIONS ARE TAKEN LOOKING DOWNSTREAM.
10. ELEVATIONS OF UTILITIES ARE APPROXIMATE UNLESS OTHERWISE NOTED.
11. UNLESS OTHERWISE SPECIFIED, MINIMUM STREET RECONSTRUCTION SHALL BE 4" TYPE "A" HOT MIX ASPHALT OVER 6 " CLASS 2 AGGREGATE BASE OR AS SPECIFIED BY THE ENGINEER.
12. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6" OF CLASS "B" CONCRETE.
13. PIPE CONNECTED TO THE MAINLINE PIPE SHALL CONFORM TO JUNCTION STRUCTURE NO. 4 (JS 229) UNLESS OTHERWISE NOTED.
14. PIPE BEDDING SHALL CONFORM TO DISTRICT STANDARD DRAWING NO. M815.
15. BH-1 INDICATES SOIL BORING LOCATIONS BASED ON THE SOILS REPORT DATED _________. LOCATIONS SHOWN ARE APPROXIMATE.
16. "V" IS THE DEPTH OF CATCH BASINS MEASURED FROM THE TOP OF CURB TO INVERT OF CONNECTOR PIPE.
17. CATCH BASINS SHALL BE LOCATED SO THAT LOCAL DEPRESSION SHALL BEGIN AT EXISTING CURB RETURN JOINT, UNLESS OTHERWISE SPECIFIED.
18. ALL CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS AND OTHER EXISTING IMPROVEMENTS ARE TO BE RECONSTRUCTED IN KIND AND AT THE SAME ELEVATION AND LOCATION AS THE EXISTING IMPROVEMENTS UNLESS OTHERWISE NOTED.
19. STANDARD DRAWINGS CALLED FOR ON THE PLAN AND PROFILE SHALL CONFORM TO DISTRICT STANDARD DRAWINGS UNLESS NOTED OTHERWISE.
20. THE CONTRACTOR IS REQUIRED TO CALL ALL UTILITY AGENCIES REGARDING TEMPORARY SHORING AND SUPPORT REQUIREMENTS FOR THE VARIOUS UTILITY LINES SHOWN ON THESE PLANS.
21. DURING ROUGH GRADING OPERATIONS AND PRIOR TO CONSTRUCTION OF PERMANENT DRAINAGE STRUCTURES, TEMPORARY DRAINAGE CONTROL SHOULD BE PROVIDED TO PREVENT PONDING WATER AND DAMAGE TO ADJACENT PROPERTIES.
22. APPROVAL OF THESE PLANS BY DISTRICT DOES NOT RELIEVE THE DEVELOPER'S ENGINEER OF RESPONSIBILITY FOR THE ENGINEERING DESIGN. IF FIELD CHANGES ARE REQUIRED, IT WILL BE THE RESPONSIBILITY OF THE DESIGN ENGINEER TO MAKE THE NECESSARY CORRECTIONS.
23. THE CONTRACTOR OR DEVELOPER SHALL SECURE ALL REQUIRED ENCROACHMENT AND/OR STATE AND FEDERAL REGULATORY PERMITS PRIOR TO THE COMMENCEMENT OF ANY WORK.
24. THE CONCRETE COATING ON THE INSIDE OF ALL REINFORCED CONCRETE PIPES AND STRUCTURES MUST BE INCREASED TO PROVIDE A MINIMUM OF 1-1/2" OVER THE REINFORCING STEEL AND INCREASED TO A MINIMUM OF 3 1/2" OVER REINFORCING STEEL FOR BOX CULVERT, WHEN DESIGN VELOCITIES EXCEED 20' PER SECOND. THE CONCRETE DESIGN STRENGTH IN THESE REACHES SHALL BE F'C=5,000 PSI FOR VELOCITIES EXCEEDING 20' PER SECOND AND F'C=6,000 PSI FOR VELOCITIES EXCEEDING 30' PER SECOND.
25. CONSTRUCTION JOINTS FOR CALTRANS STANDARD REINFORCED CONCRETE BOX SHALL BE PLACED ACCORDING TO DISTRICT STANDARD DRAWING NO. BOX 401.
26. ROCK FOR ACCESS ROADS, TURN AROUNDS AND OTHER AREAS WITHIN DISTRICT RIGHT OF WAY AS SHOWN ON THE PROJECT DRAWINGS AND AS DIRECTED BY THE ENGINEER SHALL MEET THE REQUIREMENTS FOR 1" X NO. 4 COARSE AGGREGATE AS PER SECTION 90-1.02C(4)(B) OF THE CALTRANS SPECIFICATIONS. X VALUES FOR ROCK GRADATION SHALL BE 75 AND 15 FOR 3/4" AND 3/8" RESPECTIVELY. ROCK SHALL ADDITIONALLY MEET THE SPREADING AND COMPACTION REQUIREMENTS OF SECTIONS 26-1.03D AND 26-1.03E OF THE CALTRANS SPECIFICATIONS. FURTHERMORE, ROCK DEPTH SHALL NOT EXCEED 3" AND SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER. ROCK SHALL NOT CONTAIN RECYCLED CONCRETE PRODUCTS.

ENGINEER

KIMLEY HORN & ASSOCIATES, INC.
3801 UNIVERSITY AVE. SUITE 300
RIVERSIDE, CA 92501
ATTN: MICHAEL SUTTON
PHONE: (760) 565-5146
EMAIL: MIKE.SUTTON@KIMLEY-HORN.COM

OWNER/DEVELOPER

MERITAGE HOMES OF CALIFORNIA,
A CALIFORNIA CORPORATION
5 PETERS CANYON ROAD, SUITE 310
IRVINE, CA 92606
ATTN: JOHANNA CROOKER
PHONE: (408) 772-1774

ABBREVIATIONS

C/L	CENTERLINE
CIPCP	CAST IN PLACE CONCRETE PIPE
CB	CATCH BASIN
GB	GRADE BREAK
EX/EXIST	EXISTING
FG	FINISH GRADE
FS	FINISHED SURFACE
FL	FLOWLINE
INV	INVERT OF PIPE
LP	LOW POINT
HP	HIGH POINT
HGL	HYDRAULIC GRADE LINE
INV	INVERT
CL	CENTERLINE
R/W	RIGHT-OF-WAY
LAT	LATERAL
STA	STATION
PROP	PROPOSED
PUE	PUBLIC UTILITY EASEMENT
L	LENGTH
N.T.S.	NOT TO SCALE
CMP	CORRUGATED METAL PIPE
ELEV.	ELEVATION
MIN.	MINIMUM
MAX.	MAXIMUM
PRC	POINT OF REVERSE CURVE
PCC	POINT OF COMPOUND CURVE
PROP	PROPOSED
RCP	REINFORCED CONC. PIPE
SS	SEWER
SD	STORM DRAIN
TYP.	TYPICAL
TC	TOP OF CURB
TOP	TOP OF PIPE
W	WATER

LEGEND

TRACT BOUNDARY
RIGHT OF WAY
CENTERLINE
EXIST. RIGHT OF WAY
PROP. STORM DRAIN
EX. STORM DRAIN
PROP. STORM STRUCTURE
PROP. CATCH BASIN
EXIST. ELEV. (1217.58) INV
PROP. ELEV. 1217.58 INV

ASSESSOR'S PARCEL NO.

413-790-010

WORK TO BE DONE

THE IMPROVEMENT WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING DOCUMENTS, CURRENT AT THE TIME OF CONSTRUCTION, AS DIRECTED BY THE CITY ENGINEER.

1. BEAUMONT MUNICIPAL CODE.
2. FOR STREETS: RIVERSIDE COUNTY ORDINANCE NO. 461.
   FLOOD CONTROL FACILITIES: THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S STANDARDS FOR FLOOD CONTROL FACILITIES.
   SANITARY SEWER FACILITIES: THE EASTERN MUNICIPAL WATER DISTRICT'S STANDARDS FOR SANITARY SEWER FACILITIES.
   ALL OTHER PUBLIC WORKS: THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREEN BOOK).
3. THIS SET OF PLANS.
4. RESOLUTION NO ______________, DATED __________.
5. SOILS REPORT AND RECOMMENDATIONS BY ALTA CALIFORNIA GEOTECHNICAL, INC., DATED 04/12/2023.

SHEET LIST TABLE	
SHEET NO.	SHEET TITLE
1	TITLE SHEET
2	INDEX SHEET
3	STORM DRAIN LINE C

DIGALERT
Call 2 Working Days Before You Dig!
811

BASIS OF BEARINGS:
DESCRIPTION:
THE BASIS OF COORDINATES FOR THIS MAP IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, 1983, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "REST" AND "RABBIT".
BEARING: N 27°39'52" E

BENCHMARK:
USGS - MONUMENT "REST" BENCHMARK DISK SET IN TOP OF CONCRETE MONUMENT STAMPED "REST 1972" ON DESERT LAWN DR. ACROSS THE DRIVE CENTERLINE 24.9 FT. SOUTHWEST OF THE SOUTHWEST EDGE OF THE SOUTHEAST BOUND LANES OF INTERSTATE HIGHWAY 10
88 DATUM
ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
	1			
ENGINEER		REVISIONS	CITY	

Kimley»Horn

3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON 07/16/2024
R.C.E. NO.: C57667 DATE

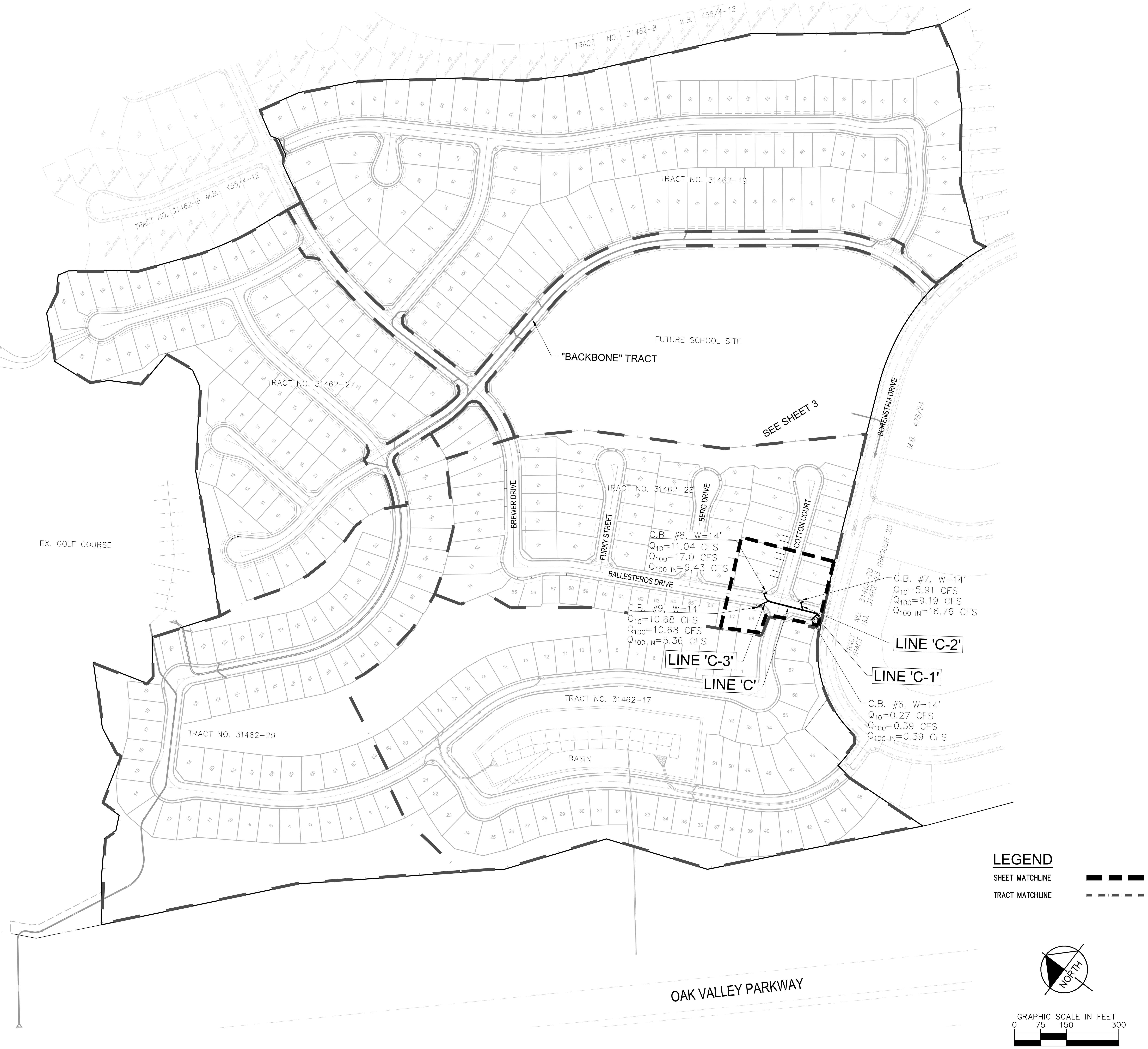
SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

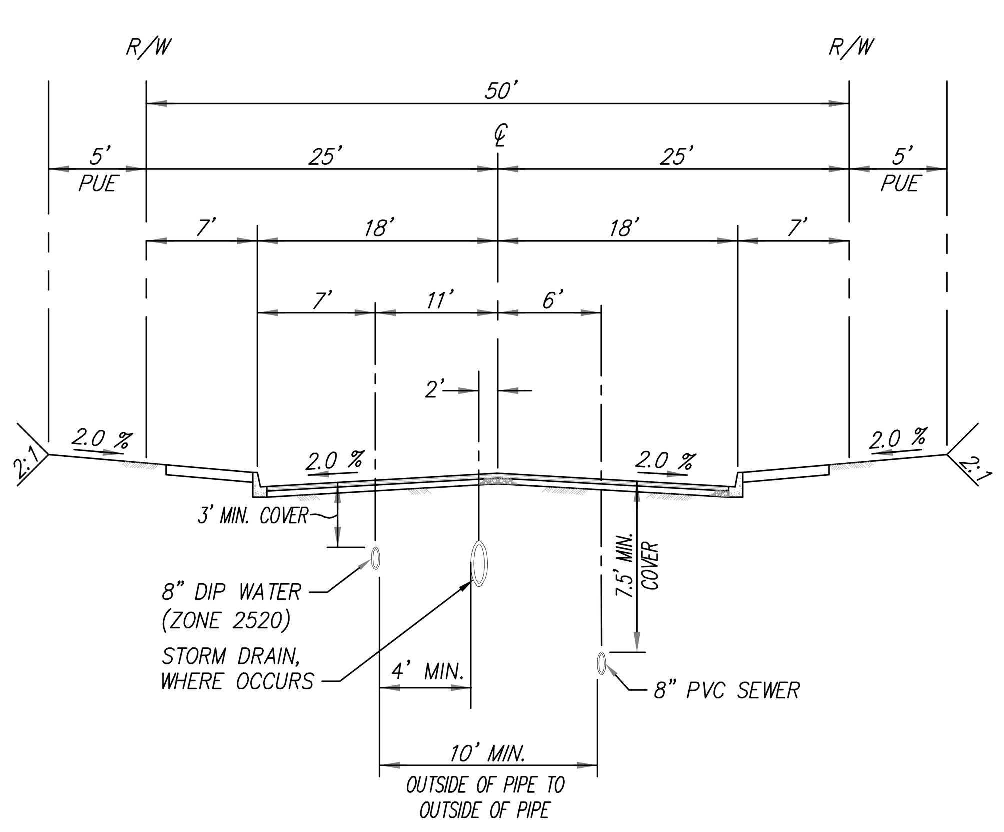
DESIGN BY: RS
DRAWN BY: AM
CHECKED BY: MS
SCALE: AS NOTED
DATE: 7/16/2024
JOB NUMBER:

REVIEWED BY: ______________ DATE: ________
STAFF ENGINEER
RECOMMENDED FOR APPROVAL BY: ______________ DATE: ________
APPROVED BY: ______________ DATE: ________
CITY ENGINEER
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR:
TRACT NO. 31462-28
TITLE SHEET
FOR: MERITAGE HOMES

SHEET 1 OF 3 SHEETS
FILE NO: 3501
PW2024-0028





TYPICAL STREET SECTION

N.T.S.

DIGALERT
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811

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BEARING: N 27°39'52" E

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88 DATUM
ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS	CITY	

Kimley»Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

07/16/2024
MIKE S. SUTTON DATE
R.C.E. NO.: C57667

SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: AM
CHECKED BY: MS
SCALE: AS NOTED
DATE: 7/16/2024
JOB NUMBER:

REVIEWED BY: ____________ DATE: ________
STAFF ENGINEER
RECOMMENDED FOR APPROVAL BY: ____________ DATE: ________
APPROVED BY: ____________ DATE: ________
CITY ENGINEER
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR:
TRACT NO. 31462-28

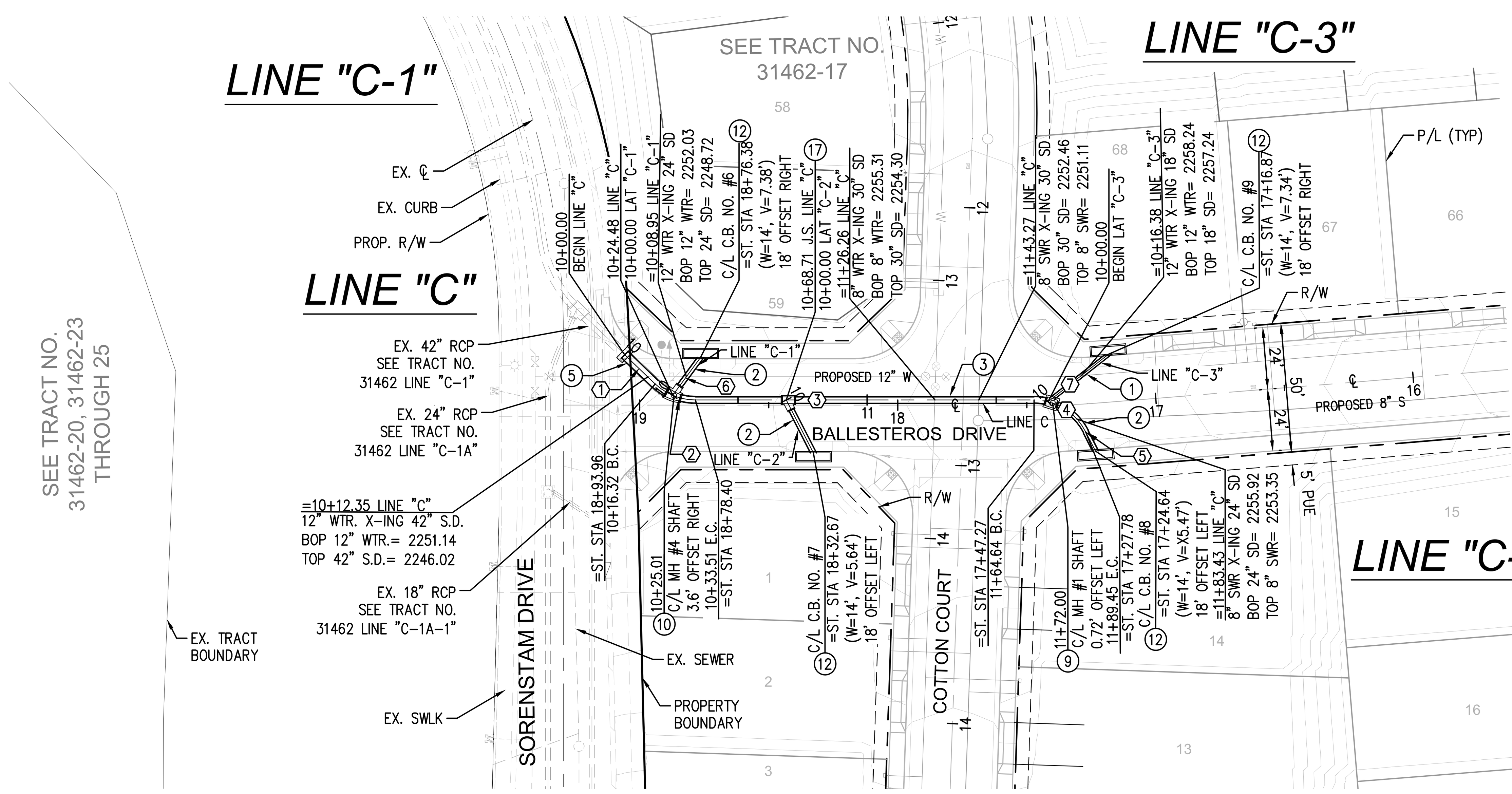
INDEX SHEET

FOR: MERITAGE HOMES

SHEET 2 OF 3 SHEETS
FILE NO: 3501
PW2024-0028

CONSTRUCTION NOTES

1. CONSTRUCT 18" RCP (SEE PROFILE FOR D-LOAD).
2. CONSTRUCT 24" RCP (SEE PROFILE FOR D-LOAD).
3. CONSTRUCT 30" RCP (SEE PROFILE FOR D-LOAD).
5. CONSTRUCT 42" RCP (SEE PROFILE FOR D-LOAD).
9. CONSTRUCT MANHOLE NO. 1 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH251
10. CONSTRUCT MANHOLE NO. 4 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH254
12. CONSTRUCT CURB INLET CATCH BASIN AND LOCAL DEPRESSION PER COUNTY OF RIVERSIDE STD. NO. 300 (W & V PER PLAN).
17. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER R.C.F.C. & W.C.D. STD. DWG. NO. M803.



DATA				
#	BEARING/DELTA	RADIUS	LENGTH	TANGENT
1	N 20°38'36" E	-	16.32'	-
2	Δ=43° 45' 17"	22.50'	17.18'	9.03'
3	N 23°06'41" W	-	131.13'	-
4	Δ=63° 11' 29"	22.50'	24.82'	13.84'
5	Δ=63° 11' 29"	22.50'	24.82'	13.84'
6	S 76°48'48" E	-	18.26'	-
7	N 61°16'33" W	-	29.76'	-

MANHOLE & JUNCTION STRUCTURE DATA TABLE

STRUCTURE	MAIN LINE	LATERAL LEFT					LATERAL RIGHT					D_1	D_2
		NAME	A	B	C	L	NAME	A	B	C	L		
M.H. #4 10+25.01	LINE C	LAT C-1	82°32'36"	2.0'	4.81'	5.7'						42"	30"
J.S. #3 10+68.74	LINE C						LAT C-2	45°00'00"	2.0'	4.48'	4.64'	30"	24"
M.H. #1 11+72.00	LINE C	LAT C-3	141°50'8"	1.5'	3"	4.0'	LINE C	62°29'03"	2.0'	3"	4.0'	30"	24"

GRAPHIC SCALE IN FEET
0 20 40 80

DIGALERT
Call 2 Working Days Before You Dig!
811

BASIS OF BEARINGS:
DESCRIPTION:
THE BASIS OF COORDINATES FOR THIS MAP IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, 1983, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "REST" AND "RABBIT".
BEARING: N 27°39'52" E

BENCHMARK:
USGS – MONUMENT "REST" BENCHMARK DISK SET IN TOP OF CONCRETE MONUMENT STAMPED "REST 1972" ON DESERT LAWN DR. ACROSS THE DRIVE CENTERLINE 24.9 FT. SOUTHWEST OF THE SOUTHWEST EDGE OF THE SOUTHEAST BOUND LANES OF INTERSTATE HIGHWAY 10
88 DATUM
ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS		CITY

Kimley»Horn
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3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON
R.C.E. NO.: C57667
07/16/2024
DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
DRAWN BY: AM
CHECKED BY: MS
SCALE: 1"=40'
DATE: 7/16/2024
JOB NUMBER:

REVIEWED BY: ______ STAFF ENGINEER DATE: ______
RECOMMENDED FOR APPROVAL BY: ______ DATE: ______
APPROVED BY: ______ CITY ENGINEER DATE: ______
CITY OF BEAUMONT, PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION

CITY OF BEAUMONT, CALIFORNIA
STORM DRAIN IMPROVEMENT PLANS FOR: TRACT NO. 31462-28
LINE "C", LINE "C-1", LINE "C-2", & LINE "C-3"
FOR: MERITAGE HOMES

SHEET 3 OF 3 SHEETS
FILE NO: 3501
PW2024-0028

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

ALTA CALIFORNIA
GEOTECHNICAL INC.

170 North Maple Street, Suite 108
Corona, CA 92880
www.altageotechnical.com

MERITAGE HOMES OF CALIFORNIA
5 Peters Canyon, Suite 310
Irvine, California 92606

May 14, 2024
Project No. 1-0160-K

Attention: Mr. Efrem Joelson

Subject: ***UPDATED GEOTECHNICAL LETTER***
Tract Nos. 31462-17, -18, -19, -27, -28, and -29,
Phase 4C of the Fairway Canyon Development
City of Beaumont, Riverside County, California

References:
1. Alta California Geotechnical, Inc., 2024, Rough Grading Plan Review, Tract Nos. 31462-17, -18, -19, -27, -28, and -29, Phase 4C of the Fairway Canyon Development, City of Beaumont, Riverside County, California, dated February 15, 2024 (Project No. 1-0160-K).
2. Alta California Geotechnical, Inc., 2023, Updated Geotechnical Report, Tract Nos. 31462-17 through 31462-20, Planning Area 20, Phase 4 of the Fairway Canyon Development, City of Beaumont, Riverside County, California, dated April 12, 2023 (Project Number 1-0160-K).

Dear Mr. Joelson:

Presented herein is Alta California Geotechnical, Inc.'s (Alta) updated geotechnical letter for Tract Nos. 31462-17, -18, -19, -27, -28, and -29, Phase 4C of the Fairway Canyon Development, located in the City of Beaumont, California. This report is based on the recommendations presented in the referenced report.

Alta previously prepared an updated geotechnical report for Tract Nos. 31462-17 through 31462-20 (Reference 2). Rough grading plans reviewed by Alta (Reference 1) included Tract Nos. 31462-17, -18, -19, -27, -28, and -29, revised the division of the tracts between the referenced reports. The recommendations presented in the updated geotechnical report remain applicable to the subject tracts.

Alta California Geotechnical, Inc. appreciates the opportunity to be of service to you and your organization. Should you have any questions or need additional information, please contact the undersigned at our Corona office.

Sincerely,
Alta California Geotechnical, Inc.

LOGAN A. MARQUETTE
Civil Engineering Associate
Project Manager

SCOTT A. GRAY/RGE 2857
Reg. Exp.: 12-31-24
Registered Geotechnical Engineer
President

Distribution: (1) Addressee

SAG: 1-0160-K, May 14, 2024 (Updated Geotechnical Letter, Fairway 4C)

ALTA CALIFORNIA
GEOTECHNICAL INC.

170 North Maple Street, Suite 108
Corona, CA 92880
www.altageotechnical.com

MERITAGE HOMES OF CALIFORNIA
5 Peters Canyon, Suite 310
Irvine, California, 92606

July 25, 2024
Project No. 1-0160-K

Attention: Mr. Efrem Joelson

Subject: ***REVISED BASIN SLOPE RECOMMENDATIONS***
Tract Nos. 31462-17, -18, -19, -27, -28, and -29,
Phase 4C of the Fairway Canyon Development,
City of Beaumont, Riverside County, California

Reference: Alta California Geotechnical, Inc., 2023, Updated Geotechnical Report, Tract Nos. 31462-17 through 31462-20, Planning Area 20, Phase 4 of the Fairway Canyon Development, City of Beaumont, Riverside County, California, dated April 12, 2023 (Project No. 1-0160-K).

Dear Mr. Joelson:

Presented herein is Alta California Geotechnical, Inc.'s (Alta) revised basin slope recommendations for Basin 2 associated with Tract Nos. 31462-17, -18, -19, -27, -28, and -29, Phase 4C of the Fairway Canyon Development, located in the City of Beaumont, Riverside County, California. The following recommendations are based on the information presented in the referenced report.

Basin 2 was designed utilizing slope ratios steeper than 4:1, with the steepest slope being 1:1. The basin slopes shall be composed of San Timoteo Formation, which is a sandstone. Per the referenced report, slopes composed of San Timoteo Formation are anticipated to be grossly and surficially stable. Stability calculations assuming saturated conditions and steepened conditions are presented as the attached Figure 1. Based on the calculations, the proposed slopes for Basin 2 are considered stable for their intended use, from a geotechnical standpoint.

Slopes shall be observed during grading by the Project Geotechnical Consultant. If adverse bedding, fracture patterns, or other unstable geological conditions are exposed, then the proposed slopes may need to be replaced with stabilization fills. The basin should be designed so that water shall not overtop the slopes in concentrated locations.

Alta California Geotechnical, Inc. appreciates the opportunity to be of service to you and your organization. Should you have any questions or need additional information, please contact the undersigned at our Corona office.

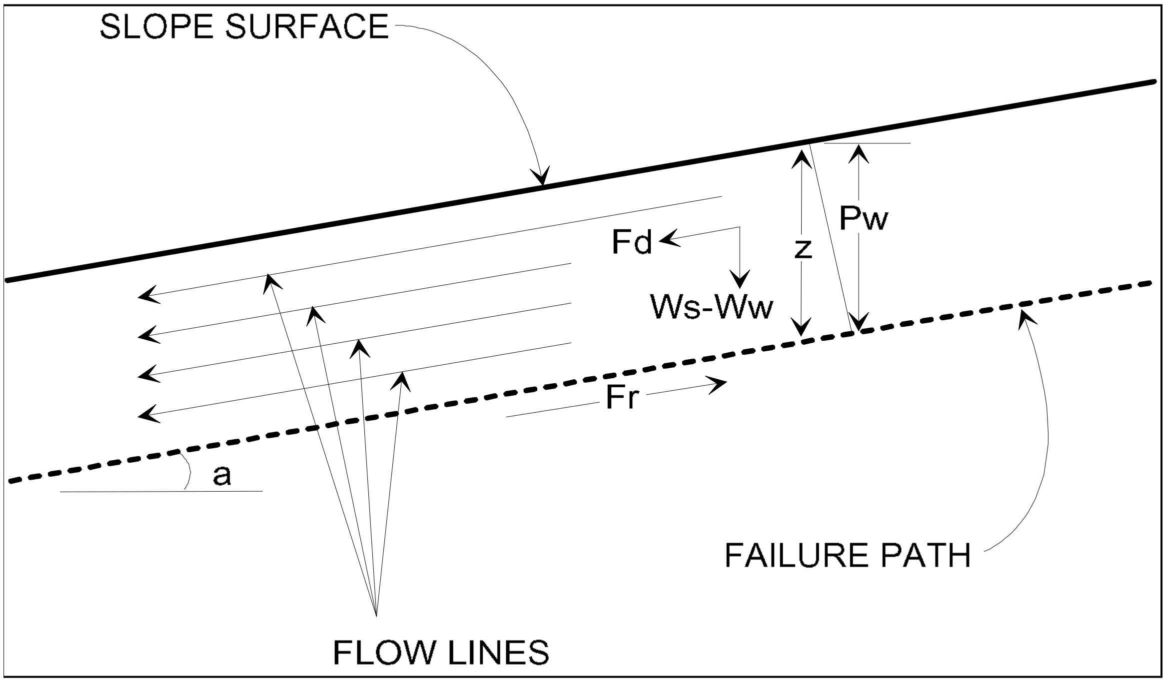
Sincerely,
Alta California Geotechnical, Inc.

SCOTT A. GRAY/RGE 2857
Reg. Exp.: 12-31-24
Registered Geotechnical Engineer
President

Distribution: (1) Addressee

SAG:: 1-0160-K, July 25, 2024 (Revised Basin Slope Recommendation, Fairway 4C)

SURFICIAL SLOPE STABILITY



Assume: (1) Saturation To Slope Surface
(2) Sufficient Permeability To Establish Water Flow

Pw = Water Pressure Head=(z)(cos^2(a))
Ws = Saturated Soil Unit Weight
Ww = Unit Weight of Water (62.4 lb/cu.ft.)
u = Pore Water Pressure=(Ww)(z)(cos^2(a))
z = Layer Thickness
a = Angle of Slope
phi = Angle of Friction
c = Cohesion
Fd = (0.5)(z)(Ws)(sin(2a))
Fr = (z)(Ws-Ww)(cos^2(a))(tan(phi)) + c
Factor of Safety (FS) = Fr/Fd

Given:

Ws (pcf)	z (ft)	a (degrees)	(radians)	phi (degrees)	(radians)	c (psf)
125	4	45	0.7853982	36	0.6283185	350

Calculations:

Pw	u	Fd	Fr	**FS**
2.00	124.80	250.00	440.96	**1.76**

Figure 1

ALTA CALIFORNIA GEOTECHNICAL INC.

170 North Maple Street, Suite 108
Corona, CA 92880
www.altageotechnical.com

MERITAGE HOMES OF CALIFORNIA
5 Peters Canyon, Suite 310
Irvine, California 92606

June 4, 2024
Project No. 1-0160-K

Attention: Mr. Efrem Joelson

Subject: **SUMMARY OF INFILTRATION TESTING**
Tract Nos. 31462-17, -18, -19, -27, -28, and -29,
Phase 4C of the Fairway Canyon Development
City of Beaumont, Riverside County, California

References:

1. Alta California Geotechnical, Inc., 2024, Rough Grading Plan Review, Tract Nos. 31462-17, -18, -19, -27, -28, and -29, Phase 4C of the Fairway Canyon Development, City of Beaumont, Riverside County, California, dated February 15, 2024 (Project No. 1-0160-K).
2. Alta California Geotechnical, Inc., 2023, Updated Geotechnical Report, Tract Nos. 31462-17 through 31462-20, Planning Area 20, Phase 4 of the Fairway Canyon Development, City of Beaumont, Riverside County, California, dated April 12, 2023 (Project Number 1-0160-K).

Dear Mr. Joelson:

Presented herein is Alta California Geotechnical, Inc.'s (Alta) summary of infiltration testing for Tract Nos. 31462-17, -18, -19, -27, -28, and -29, Phase 4C of the Fairway Canyon Development, located in the City of Beaumont, California. Alta performed infiltration testing onsite within proposed Basins 1 and 2 as identified on the rough grading plans.

Presented below is a summary of our infiltration testing, and conclusions and recommendations based on our infiltration testing.

Infiltration Testing

Four infiltration tests were conducted at locations shown on Plate 1, identified as P-1 through P-4. Borings P-1 and P-2 were logged to depths of up to twenty (20) feet below the ground surface, and borings P-3 and P-4 were drilled to depths of five (5) feet below the ground surface. The boring logs for P-1 through P-4 are presented in Appendix A. Infiltration testing utilized falling-head borehole infiltration test methods in accordance with the County of Riverside WQMP Technical Guidance Document.

An 8-inch diameter hollow-stem auger was utilized to excavate test P-1 and P-2, and hand equipment was utilized for P-3 and P-4. A 3-inch diameter PVC pipe was then inserted into the excavated borings. Gravel was placed for the entire depths in each installed well surrounding the perforated pipe and boring wall. During testing for all borings, wells were filled with water to the top and water level readings were recorded for every 10 to 30 minutes until readings stabilized. The borings were filled back to the initial water depth after every water level reading. The resulting data was used to provide an infiltration rate utilizing the Porchet Method.

A summary of the test results is presented in Table A. The results do <u>not</u> include a factor of safety.

Table A-Summary of Infiltration Testing
(No Factor of Safety)

Test Designation	P-1	P-2	P-3	P-4
Approximate Depth	20.0 ft	20.0 ft	5.0 ft	5.0 ft
Time Interval	30 min	30 min	10 min	10 min
Radius of Test Hole	4 in	4 in	4 in	4 in
Infiltration Rate	0.6 in/hr	0.5 in/hr	3.0 in/hr	3.1 in/hr

Conclusions and Recommendations

The proposed WQMP system consists of two basins. Basin 1 is underlain by engineered fill placed during previous grading operations, which overlays saturated alluvium and San Timoteo Formation. Based on the results for P-1 and P-2 and the underlying conditions, infiltration rates are anticipated to be low. Basin 2 is underlain by alluvium, which overlays San Timoteo Formation. Based the results for P-3 and P-4, use of an infiltration system is feasible within the alluvium with an appropriate factor of safety per the County of Riverside requirements. Fill placed within Basin 2 should utilize granular material and be placed uncompacted, except for the access road or design fill slopes which should be placed to project specifications.

From a geotechnical perspective, allowing storm water to infiltrate the onsite soil in concentrated areas increases the potential for settlement, liquefaction, and water-related damage to structures/improvements, such as wet slabs or pumping subgrade. Care should be taken in designing systems that control the storm water as much as possible. A methodology for dealing with overflow should be infiltration system become clogged or full should be developed and maintained.

It is recommended that the Project Geotechnical Consultant review the WQMP plans and observe the WQMP excavations during construction to verify that the infiltration rates presented herein are appropriate. If it is determined that rates may be variable, additional infiltration testing should be undertaken. Given the proposed fill within Basin 2, additional infiltration testing shall be conducted upon completion of grading to verify the results.

Limitations

The conclusions and recommendations presented in this report are based on our infiltration test results and experience with similar soil conditions on similar projects. Materials adjacent to or beneath those observed may have different characteristics than those observed, and no precise representations are made as to the quality or extent of the materials not observed.

Alta appreciates the opportunity to provide geotechnical consulting services for your project.

Respectfully submitted,
Alta California Geotechnical, Inc.

SCOTT A. GRAY/RGE 2857
Reg. Exp.: 12-31-24
Registered Geotechnical Engineer
President

Distribution: (1) Addressee

SAG: 1-0160-K, June 4, 2024 (Summary of Additional Infiltration Testing, Fairway 4C)

APPENDIX A

Boring Logs

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0160-K	PROJECT NAME	Fairway 4C		
DATE STARTED	5/20/24	GROUND ELEV.		BORING DESIG.	P-1
DATE FINISHED	5/20/24	GW DEPTH (FT)		LOGGED BY	YH
DRILLER	2-R	DRIVE WT.	VARIES*	NOTE	
TYPE OF DRILL RIG	Hollow-Stem	DROP	12 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SM	ENGINEERED ARTIFCIAL FILL (afe): SILTY SAND, fine grained, tan brown, slightly moist, medium dense, trace gravel.				
						@ 2.5 ft. slightly moist to moist.				
5						@ 5-ft. some gravel, trace clay.				
10										
15						@ 15 ft. fine to medium grained, brown, some gravel.				
20						TOTAL DEPTH 20-FT. NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0160-K	PROJECT NAME	Fairway 4C		
DATE STARTED	5/20/24	GROUND ELEV.		BORING DESIG.	P-2
DATE FINISHED	5/20/24	GW DEPTH (FT)		LOGGED BY	YH
DRILLER	2-R	DRIVE WT.	VARIES*	NOTE	
TYPE OF DRILL RIG	Hollow-Stem	DROP	12 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
0					SM	ENGINEERED ARTIFCIAL FILL (afe): SILTY SAND, fine grained, tan brown, slightly moist, medium dense, some gravel.				
						@ 2.5 ft. brown, slightly moist to moist, trace clay.				
5						@ 5-ft. greenish brown.				
10										
15										
20						TOTAL DEPTH 20-FT. NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0160-K PLATE A-2

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0160-K	PROJECT NAME	Fairway 4C		
DATE STARTED	5/29/24	GROUND ELEV.		BORING DESIG.	P-3
DATE FINISHED	5/29/24	GW DEPTH (FT)		LOGGED BY	LM
DRILLER	LM	DRIVE WT.	VARIES*	NOTE	
TYPE OF DRILL RIG	Hand Equip	DROP	12 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SM	ALLUVIUM (Qal): SILTY SAND, fine to coarse grained, brown, slightly moist, loose to medium dense.				
5										
						TOTAL DEPTH 5-FT. NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0160-K PLATE A-3

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0160-K	PROJECT NAME	Fairway 4C		
DATE STARTED	5/30/24	GROUND ELEV.		BORING DESIG.	P-4
DATE FINISHED	5/30/24	GW DEPTH (FT)		LOGGED BY	SG
DRILLER	SG	DRIVE WT.	VARIES*	NOTE	
TYPE OF DRILL RIG	Hand Equip	DROP	12 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SM	ALLUVIUM (Qal): SILTY SAND, fine to coarse grained, brown, slightly moist, loose to medium dense.				
5										
						TOTAL DEPTH 5-FT. NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

WORK TO BE DONE

THE IMPROVEMENTS CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS AND THE SPECIFICATIONS AND STANDARD DRAWINGS OF THE CITY OF BEAUMONT.

STANDARD SPECIFICATIONS:

DESCRIPTION

1. CITY OF BEAUMONT STANDARD SPECIFICATIONS
2. STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREENBOOK), LATEST EDITION
3. CALIFORNIA DEPARTMENT OF TRANSPORTATION MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, 2014 EDITION
4. CALIFORNIA DEPARTMENT OF TRANSPORTATION U.S CUSTOMARY STANDARD SPECIFICATIONS, LATEST EDITION

STANDARD DRAWINGS:

DESCRIPTION

1. CITY OF BEAUMONT STANDARD DRAWINGS
2. COUNTY OF RIVERSIDE STANDARD DRAWINGS

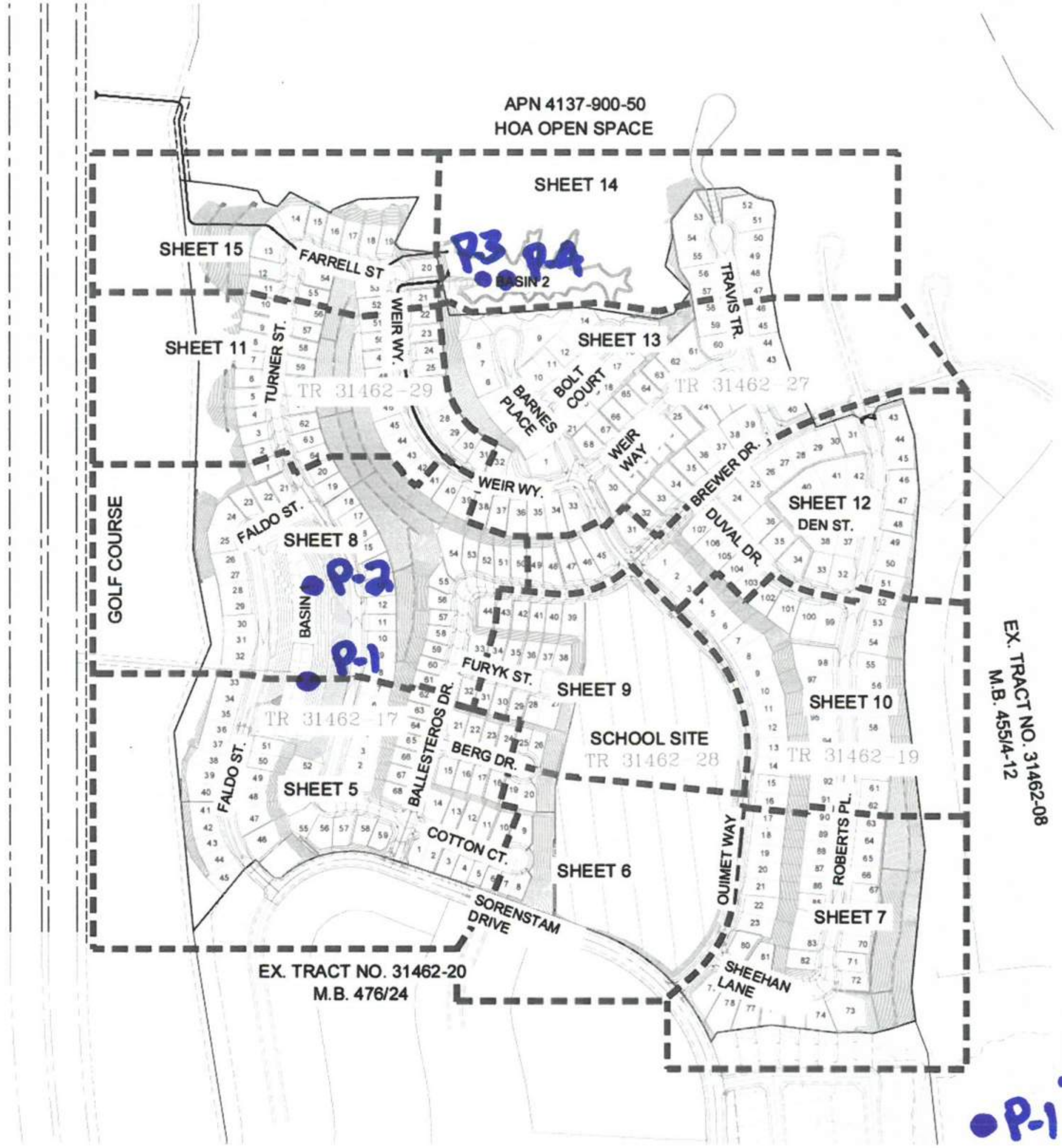
CONSTRUCTION NPDES NOTES

WHEN ONE ACRE OR MORE IS BEING DISTURBED OR ON SITES THAT ARE PART OF A LARGER COMMON PLAN OF DEVELOPMENT THAT DISTURBS ONE ACRE OR MORE:

1. DEVELOPER/CONTRACTOR IS RESPONSIBLE FOR THE IMPLEMENTATION OF THE REQUIREMENTS OF THE ONSITE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) (TITLE) BY (NAME) DATED (DATE); AND THE REQUIREMENTS OF THIS DOCUMENT: WDID # . THE DEVELOPER/CONTRACTOR SHALL BE RESPONSIBLE TO INSTALL AND MAINTAIN ALL TEMPORARY BEST MANAGEMENT PRACTICES (BMPS), SHOWN IN THE APPROVED EROSION CONTROL PLANS, THROUGHOUT THE TIME OF CONSTRUCTION. A COPY OF THE SWPPP AND THE APPROVED EROSION CONTROL PLANS SHALL BE KEPT AT THE JOB SITE AT ALL TIMES. THE IMPLEMENTATION AND MAINTENANCE OF SITE BMPS IS REQUIRED TO MINIMIZE JOBSITE EROSION AND SEDIMENTATION. BMPS SHALL BE REQUIRED TO REMAIN IN PLACE THROUGHOUT THE YEAR TO MINIMIZE EROSION AND SEDIMENTATION.
2. IMPLEMENT AND MAINTAIN EROSION CONTROL BMPS TO MINIMIZE THE ENTRAINMENT OF SOIL IN RUNOFF FROM DISTURBED SOIL AREAS ON CONSTRUCTION SITES.
3. IMPLEMENT AND MAINTAIN YEAR-ROUND SEDIMENT CONTROL BMPS TO MINIMIZE THE TRANSPORT OF SOIL FROM THE CONSTRUCTION SITE.
4. PHASE GRADING TO LIMIT THE AMOUNT OF DISTURBED AREAS EXPOSED TO THE EXTENT FEASIBLE.
5. LIMIT AREAS THAT ARE CLEARED AND GRADED TO ONLY THE PORTION OF THE SITE THAT IS NECESSARY FOR CONSTRUCTION. MANAGE THE CONSTRUCTION SITE TO MINIMIZE THE EXPOSURE TIME OF DISTURBED SOIL AREAS THROUGH PHASING AND SCHEDULING OF GRADING AND THE USE OF TEMPORARY AND PERMANENT SOIL STABILIZATION.
6. AT ANY TIME DURING THE YEAR, STABILIZE SLOPES PRIOR TO A PREDICTED STORM EVENT. ONCE DISTURBED, STABILIZE SLOPES (TEMPORARY OR PERMANENT) IF THEY WILL NOT BE WORKED WITHIN 14 DAYS. RE-VEGETATE CONSTRUCTION SITES AS EARLY AS FEASIBLE AFTER SOIL DISTURBANCE.
7. CONTAIN STOCKPILES OF SOIL TO ELIMINATE OR REDUCE SEDIMENT TRANSPORT FROM THE SITE VIA RUNOFF, VEHICLE TRACKING, OR WIND.
8. MAINTAIN CONSTRUCTION SITES TO ENSURE THAT A STORM DOES NOT CARRY WASTES OR POLLUTANTS OFF THE SITE. DISCHARGES OTHER THAN STORMWATER (NON-STORMWATER DISCHARGES) ARE PROHIBITED, EXCEPT AS AUTHORIZED BY AN INDIVIDUAL NPDES PERMIT, THE STATEWIDE GENERAL PERMIT-CONSTRUCTION ACTIVITY.
9. CONTAIN RUNOFF FROM EQUIPMENT AND VEHICLE WASHING AT CONSTRUCTION SITE TO PREVENT DISCHARGING TO RECEIVING WATERS OR THE LOCAL STORM DRAIN SYSTEM.
10. IMPLEMENT BMPS FOR CONSTRUCTION-RELATED MATERIALS, WASTES, SPILLS OR RESIDUES TO ELIMINATE OR REDUCE TRANSPORT FROM THE SITE TO STREETS, DRAINAGE FACILITIES, OR ADJOINING PROPERTIES BY WIND OR RUNOFF.
11. ENSURE CONSTRUCTION CONTRACTORS AND SUBCONTRACTOR PERSONNEL ARE AWARE OF THE REQUIRED BMPS, MAINTENANCE, AND GOOD HOUSEKEEPING MEASURES FOR THE PROJECT SITE AND ANY ASSOCIATED CONSTRUCTION STAGING AREAS.
12. MAINTAIN BMPS AT ALL TIMES. INSPECT BMPS PRIOR TO PREDICTED STORM EVENTS, DURING AND FOLLOWING STORM EVENTS.
13. COLLECT AND PROPERLY DISPOSE OF IN TRASH OR RECYCLE BINS AT THE END OF EACH DAY OF CONSTRUCTION ACTIVITY, CONSTRUCTION DEBRIS AND WASTE MATERIALS.
14. 24 HOUR EMERGENCY NPDES CONTACT: FOR THE PERSON RESPONSIBLE FOR IMPLEMENTING, INSPECTING, AND MAINTAINING THE SITE'S EROSION CONTROL BMP'S.

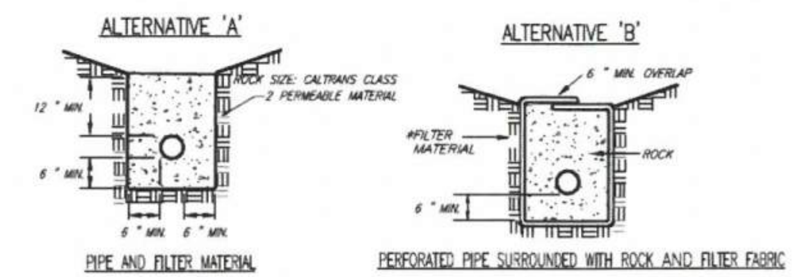
NAME: MIKE RUST (MERITAGE HOMES)
ADDRESS: 5 PETERS CANYON ROAD, STE 310
IRVINE, CA 92606
PHONE: (951) 595-1806

CHANGE OF SUCH PERSON, ADDRESS OR PHONE NUMBER SHALL BE FILED WITHIN 24 HOURS WITH THE CITY OF BEAUMONT ENGINEERING DEPARTMENT AND THE PROJECT INSPECTOR, AND SHALL INCLUDE THE GRADING PERMIT NUMBER.



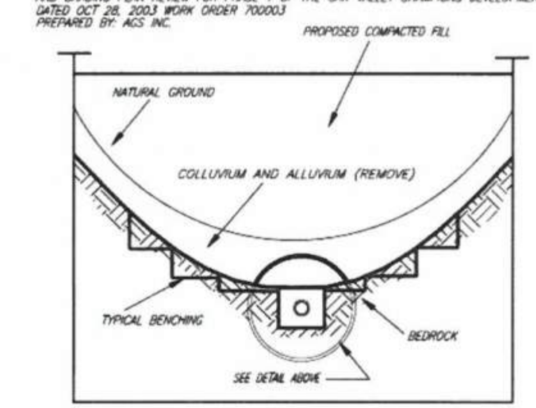
CONSTRUCTION NOTES

CONSTRUCTION NOTES	QUANTITIES
① CONSTRUCT 3' CONCRETE V-DITCH PER DETAIL ON SHEET 4.	5,628 L.F.
② CONSTRUCT 6' TERRACE DRAIN PER DETAIL ON SHEET 4.	5,628 L.F.
③ CONSTRUCT DOWN DRAIN PER DETAIL ON SHEET 4.	860 L.F.
④ CONSTRUCT DOWN DRAIN INTERSECTION PER DETAIL ON SHEET 4.	10 EA.
⑤ CONSTRUCT CONCRETE SPLASH WALL PER DETAIL ON SHEET 4.	285 L.F.
⑥ PROPOSED GEOGRID WALL PER SEPARATE PLAN AND PERMIT.	281 L.F.
⑦ PROPOSED RETAINING WALL PER SEPARATE PLAN AND PERMIT.	4,572 L.F.
⑧ INSTALL RIP RAP PER STORM DRAIN PLAN.	105 C.Y.
⑨ CONSTRUCT HEADWALL PER CALTRANS STANDARDS.	—
⑩ INSTALL DROP INLET PER RCFC&WCD STD. DWG. CB108, TYPE X.	2 EA.
⑪ INSTALL 4'X4' DROP INLET PER RCFC&WCD STD. DWG. CB110.	1 EA.
⑫ CONSTRUCT INTERCEPTOR DITCH PER DETAIL ON SHEET 4.	986 L.F.
⑬ CONSTRUCT DOWNDRAIN TO PIPE TRANSITION PER DETAIL ON SHEET 4.	1 EA.
⑭ REMOVE AND REPLACE GOLF CART PATH BY OTHERS.	366 S.F.
⑮ CONSTRUCT UNDER SIDEWALK DRAIN PER RIV. CO. STD. NO. 309.	10 EA.
⑯ EXISTING 6" AND 8" CANYON SUBDRAIN TO BE PROTECTED IN PLACE.	—
⑰ INSTALL 8" CANYON SUBDRAIN PER DETAIL ON SHEET 2.	1,010 L.F.



ALTERNATIVE A OR B TO BE USED AT THE DISCRETION OF THE SOILS ENGINEER

NOTE: SUBDRAIN DETAILS AND LOCATIONS PER GEOTECHNICAL INVESTIGATION AND GRADING PLAN REVIEW FOR PHASE 1 OF THE OAK VALLEY CHAMPIONS DEVELOPMENT DATED OCT 28, 2003 WORK ORDER 700003 PREPARED BY: AGS INC.



SUBDRAIN DETAIL
N.T.S.

Legend

Plate 1

● P-1 Approximate Location of Infitration Test

NORTH

GRAPHIC SCALE IN FEET
0 100 200 400

Reference system definition - LatLong

DIGALERT
Call 2 Working Days Before You Dig!
811

BENCHMARK:
USGS — MONUMENT "REST"
BENCHMARK DISK SET IN TOP OF CONCRETE MONUMENT STAMPED "REST 1972" ON DESERT LAWN DR. ACROSS THE DRIVE CENTERLINE 24.9 FT. SOUTHWEST OF THE SOUTHWEST EDGE OF THE SOUTHEAST BOUND LANES OF INTERSTATE HIGHWAY 10
88 DATUM
ELEV. = 2494.16

BY	MARK	DESCRIPTION	APPR.	DATE
	△			
ENGINEER		REVISIONS		CITY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
3801 UNIVERSITY AVE. SUITE 300, RIVERSIDE, CA 92501
PHONE: 951-543-9868

MIKE S. SUTTON DATE
R.C.E. NO.: C57667

SEAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. SUTTON
No. C57667
CIVIL
STATE OF CALIFORNIA

DESIGN BY: RS
CAD DSGN BY: RS
CHECKED BY: MS
SCALE: AS SHOWN
DATE: 01/11/2024
JOB NUMBER: 195261012

BEAUMONT
CALIFORNIA
PUBLIC WORKS DEPARTMENT
550 E. 6TH ST. BEAUMONT, CA 92223

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

CITY OF BEAUMONT, CALIFORNIA
ROUGH GRADING PLANS FOR:
TR. 31462-17, 31462-18, 31462-19, 31462-27, 31462-28 AND 31462-29
FAIRWAY CANYON - 4C

INDEX SHEET

SHEET
2
OF 15 SHEETS
FILE NO:

ALTA CALIFORNIA
GEOTECHNICAL INC.

170 North Maple Street, Suite 108
Corona, CA 92878
www.altageotechnical.com

SDC FAIRWAY CANYON, LLC
2392 Morse Avenue
Irvine, California 92614

August 27, 2020
Project No. 1-0160-H

Attention: Ms. Cherryl Thompson

Subject: ***GEOTECHNICAL REVIEW***
Tract No. 31462, Planning Area 22
Phase 4 of the Fairway Canyon Development
City of Beaumont, California

References: See Appendix A

Dear Ms. Thompson:

Presented herein is Alta California Geotechnical, Inc.'s (Alta) geotechnical review of Tract No. 31462, Phase 4 of the Fairway Canyon Development, Planning Area 22, located in the City of Beaumont, California. This report is based on Alta's subsurface investigations, previous subsurface investigations, review of the referenced reports, and review of the 40-scale grading plans (enclosed Plates 1 through 8) prepared by Proactive Engineering Consultants West, Inc. (Proactive).

Alta's review of the data and plans indicates that the proposed development is feasible from a geotechnical standpoint, provided that the recommendations presented in this report and previous reports are implemented during site development. Included in this report are:

- Discussion of the site geotechnical conditions:
- Recommendations for unsuitable soil removals/reconditioning:
- Discussion of site construction recommendations:
- Foundation and improvement design parameters.

If you have any questions or should you require any additional information, please contact the undersigned at (951) 509-7090. Alta appreciates the opportunity to provide geotechnical consulting services for your project.

Sincerely,
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TABLE OF CONTENTS

1.0 INTRODUCTION

The following report presents our geotechnical review and recommendations for Tract No. 31462, the Fairway Canyon Development, Planning Area 22, located in the City of Beaumont, California.

1.1 Purpose

The purpose of this report is to review the referenced geotechnical reports and plans for the site with respect to the proposed development, and to provide supplemental recommendations for grading and improvement design/construction purposes. This report presents relevant geologic and engineering characteristics for site grading/construction. A complete discussion of the geotechnical aspects of the project is presented in PSE, 2007.

1.2 Scope of Work

Alta's scope of work for this geotechnical investigation included the following:

- Review of published geologic information on the site.
- Review of the referenced geotechnical reports.
- Compile relevant subsurface investigation information from the previous reports.
- Evaluate geologic and laboratory data to develop recommendations for remedial site grading, foundations, and utilities.
- Prepare seismic design parameters utilizing the requirements presented in the 2019 CBC.
- Prepare foundation design recommendations based on the requirements presented in the 2019 CBC.
- Prepare this report and accompanying exhibits.

1.3 Report Limitations

The conclusions and recommendations in this report are based on the information generated during the previous investigation, our review of the referenced reports, and our review of the 40-scale grading plans (Plates 1 through

8) prepared by Proactive. The materials adjacent to or beneath those observed may have different characteristics than those observed, and no representations are made as to the quality or extent of the materials not observed.

2.0 PROJECT DESCRIPTION

2.1 Background

The subject site is located in the City of Beaumont, California, and is a portion of the Fairway Canyon Development. Planning Area 22 is located in the eastern portion of Phase 4, Northwest of Tukwet Canyon Parkway. Phases 1 through 3 of the Fairway Canyon development were previously graded. Portions of Phase 4 were utilized as an export site for previous grading operations, although not within the confines of PA 22.

PSE prepared a Grading Plan Review for the overall Phase 4 development in 2007 (PSE, 2007). Alta prepared an updated geotechnical review of the site in 2016 (Alta, 2016) as well as recommendations for the proposed golf cart tunnels. Alta prepared a geotechnical review of PA 26 in 2018 (Alta, 2018a and b) and a geotechnical review of PA 25 in 2019 (Alta, 2019).

2.2 Proposed Development

It is Alta's understanding that cut/fill grading techniques will be utilized to develop 231 single-family residential lots, roads, a park area, and infrastructure. Cut and fill slopes have been designed at a slope ratio of 2:1 (horizontal to vertical) or flatter. The maximum design fill section is approximately 44-feet below the southern corner of the park area adjacent Lot 15 and the maximum design depth of cut is 64 below Lot 42 located on Sorenstam Drive. The highest proposed fill slope is 28-feet located adjacent to Lot 12 on Lopez Lane and the highest design cut slope is 70-feet located on the North side of Sorenstam Drive adjacent the park area.

3.0 SITE INVESTIGATION

3.1 Previous Site Investigations

The site was previously investigated by PSE, as documented in PSE, 2007. Their investigation included excavating, logging and sampling hollow-stem auger borings, bucket auger borings, cone penetrometer borings, and backhoe test pits. Alta has complied the relevant subsurface and laboratory information for PA 22, and the logs and lab data are presented in Appendices B-2 and C, respectively. Locations of the subsurface excavations are presented on the enclosed Plates 1 through 8. Note that Test Pit numbers 21, 29, 35, 37, and 40 are included with the PSE logs, however, they are not located withing the project area and are not included on Plates 1 through 8.

3.2 Current Site Investigations

Alta excavated, logged, and sampled seven (7) hollow-stem auger borings within the limits of PA 22 in January of 2017 (Borings BH-03 through BH-09). The logs for the borings are presented in Appendix B-1, with moisture/density laboratory data presented on the logs.

4.0 GEOLOGIC CONDITIONS

A full description of the geologic conditions onsite is presented in the PSE, 2007 report. Alta has reviewed the referenced report and concurs with the geologic conditions. Presented herein are geologic site conditions that specifically affect the development of the project.

4.1 Stratigraphy

The site is primarily underlain by alluvium and the San Timoteo Formation. The approximate distribution of the geologic units is presented on the enclosed Plates 1 through 8.

4.2 Groundwater

Groundwater was encountered during Alta's subsurface investigation in borings BH-3, BH-4, BH-6 and BH-9, the ground water elevations varied from approximately 18 to 27 feet below the ground surface. In PSE's subsurface investigation borings B-11, B-14, B-15, and B-16 encountered ground water that varied from 20 to 34 feet below the ground surface. Although precipitation in 2019 exceeded normal, the very sparse precipitation over the last several years suggest that the shallow groundwater is not entirely seasonal and that saturated conditions within the vicinity of these borings will likely be encountered during remedial grading operations.

4.3 Seismic Hazards

4.3.1 Surface Rupture

Active faults are not known to exist within the project and a review of Special Publication 42 indicates the site is not within the California State designated Alquist-Priolo earthquake fault zones. A review of the Riverside County Information Technology site indicates the site is not within a County of Riversides designated fault zone. Accordingly, the potential for fault surface rupture on the subject site is very low.

4.3.2 Seismicity

Ground shaking hazards caused by earthquakes along active regional faults do exist. The 2019 California Building Code requires use-modified spectral accelerations and velocities for most structural designs. Seismic design parameters using soil profile types identified in the 2019 California Building Code are presented in Section 7.3.

4.3.3 Liquefaction

Seismic agitation of relatively loose saturated sands, silty sands, and some silts can result in a buildup of pore pressure. If the pore pressure exceeds the overburden stresses, a temporary quick condition known as liquefaction can occur. Liquefaction effects can manifest in several ways including: 1) loss of bearing; 2) lateral spread; 3) dynamic settlement;

and 4) flow failure. Lateral spreading has typically been the most damaging mode of failure.

In general, the more recent that a sediment has been deposited, the more likely it will be susceptible to liquefaction. Other factors that must be considered are groundwater, confining stresses, relative density, and the intensity and duration of seismically-induced ground shaking.

PSE conducted fifteen (15) CPT soundings within PA 22 to determine the potential for liquefaction in the underlying soils. Ground water was encountered in the CPT soundings as shallow as nine (9) feet below the existing ground surface. Liquefaction calculations are presented in Appendix E. The CPT soundings revealed that a sizable percentage of the underlying soils are fine grained with minimal susceptibility to liquefaction. There are, however, liquefiable layers within the younger alluvium. The following are the potential consequences of liquefaction at the site. The San Timoteo Formation is considered not susceptible to liquefaction.

- **Loss of Bearing:**
  Liquefaction can potentially cause foundation bearing failure due to ground softening and near-failure in bearing. Based on the removal recommendations presented in this report, Alta anticipates that the potential for loss of bearing will be minimal.
- **Lateral Spreading:**
  The lateral displacement of surficial blocks of sediment can occur as a result of liquefaction in a subsurface layer. The most pervasive forms of lateral spreading typically involve sites located near a "free-face" (large slopes, channels, etc.), however, it has been noted that lateral spreading can occur on sites with gently sloping (1% or more) ground, such as portions of subject site.

  Determination of the potential for lateral spread is based on the presence of continuous potentially liquefiable soil layers underneath the structures, the presence of lateral confinement, and various analyses such as empirical modeling. Bartlett, Hansen and Youd (2002) states that surface manifestation of lateral spread is typically limited to sites with liquefiable soils within 10 meters (32 feet) of grade, and that sites underlain by soils with $(N1)_{60}$ values 15 and greater do not experience significant displacements from earthquakes with magnitudes less than 8.

Based on previous CPT data (PSE, 2007), and our current investigation, there are limited liquefiable layers with $(N1)_{60}$ values less than 15 within the upper 32 feet of existing grade, and those layers do not appear to be continuous across the site. Additionally, based on the proposed design fill depths and recommended unsuitable soil removals, the structures shall be underlain by a minimum of 25 to 30 feet of fill. Therefore, the potential for lateral spread impacting the proposed residential structures is considered low.

- **Settlement:**

  Settlement due to seismic shaking can occur because of liquefaction of saturated sediments and/or rearrangement of dry sand particles. Our liquefaction analysis is presented in Appendix E. In summary, the analysis showed that the amount of dynamic settlement within 50-feet below existing grade varies from negligible to as much as 3-inches upon completion of the unsuitable soil removals presented herein. Additional discussions concerning design recommendations for improvements are presented in Section 6.8.

- **Flow/Rotational Failure:**

  We have evaluated the potential for flow/rotational failure in the vicinity of Lots 10 through 15 and 17 through 19. Utilizing the data presented in Appendix E and the method presented by Olsen and Stark, 2002, we estimated the undrained shear strength of the liquefied sands and used the results in a slope stability analysis. The resultant factor of safety for the current design condition is 1.68. The results of this analysis are presented on Plates D-8 through D-11 in Appendix D. In addition, upon reviewing the liquefaction analysis results, the underlying soils are generally not subject to lateral spread (per discussion above). Based on the resulting factors of safety and the minimal potential for lateral spread, the current design limits the potential for flow failure to an acceptable level of risk as defined by the State of California (SP-117).

4.3.4 Dry Sand Settlement

Dry sand settlement is the process of non-uniform settlement of the ground surface during a seismic event. Based on the unsuitable soil removal recommendations, the potential for dry sand settlement to occur onsite is considered nil upon the completion of grading.

4.3.5 Seismically Induced Landsliding

Upon completion of the remedial grading recommendations presented in Section 6.0, seismically induced landsliding is not anticipated to pose a danger to the site. Alta recommends that during grading, areas be observed in order to verify that these post-graded stable conditions exist.

5.0 ENGINEERING PROPERTIES AND ANALYSIS

Engineering properties of the onsite soils were previously presented in the referenced reports. Presented below are properties relevant to the proposed development.

5.1 Materials Properties

Presented herein is a general discussion of the engineering properties of the onsite materials that will be encountered during construction of the proposed project.

5.1.1 Excavation Characteristics

Based on the data provided from the referenced reports and Alta's knowledge of, and previous experience with, the geologic units, it is our opinion that the majority of the onsite materials possess favorable excavation characteristics. Light to moderate ripping may be required in deeper excavations within the San Timoteo Formation.

5.1.2 Moisture

The alluvium that will require removal and recompaction as discussed in Section 6.1.2 is typically under-optimum and will require moisture conditioning for compaction.

5.1.3 Hydro-Consolidation

Hydro-consolidation is the effect of introducing water into soil that is prone to collapse. Upon loading and initial wetting, the soil structure and apparent strength are altered resulting in almost immediate settlement. That settlement can have adverse impacts on engineered structures, particularly in areas where it is manifested differentially. Differential settlements are typically associated with differential wetting, irregularities in the subsurface soil conditions, or irregular loading patterns.

Based on a review of the laboratory testing (Appendix C), there is a potential for hydro-collapse in the alluvium onsite. It is recommended to utilize unsuitable soil removals (Section 6.1.2) to address the hydro-collapse potential.

5.1.4 Compressibility

All unsaturated alluvium and the uppermost portions of the San Timoteo Formation are considered compressible and unsuitable in their present condition to support the proposed improvements. Unsuitable soil removal/recompaction recommendations are presented in Section 6.1.2.

5.1.5 Expansion Potential

Expansion index testing was performed on samples taken during previous investigations. Based on the results, the majority of soils onsite are "very low" to "low" in expansion potential ($0 \leq EI \leq 50$, Appendix C) when tested per ASTM D: 4829. Some "medium" expansive soils may be present within the alluvium.

5.1.6 Shear Strength Characteristics

Direct shear testing was previously performed to assist in the development of shear strength characteristics of the onsite soils. The values presented in Table 5-1 are based on laboratory testing and our previous experience in the area.

TABLE 5-1 Shear Strength Characteristics		
Geologic Unit	Cohesion, C (psf)	Friction Angle, ϕ (degrees)
Engineered Artificial Fill	200	34
QTst	350	36

5.1.7 Earthwork Adjustments

The values presented in Table 5-2 are deemed appropriate for estimating purposes and may be used in an effort to balance earthwork quantities. As is the case with every project, contingencies should be made to adjust the earthwork balance when grading is in-progress and actual conditions are better defined.

TABLE 5-2 Earthwork Adjustment Factors	
Geologic Unit	Adjustment Factor Range
Topsoil (0 to 2'±)	18% to 22% Shrink
Alluvium (Qal)	14% to 17% Shrink
San Timoteo Formation	0% to 4% Bulk
Subsidence	0.5 feet

5.1.8 Chemical Analyses

Chemical testing performed on samples of material underlying the proposed site indicate that the soluble sulfate concentrations of the soils are classified as negligible (Class S0) per ACI 318-14. Negligible chloride levels were detected in the onsite soils. Resistivity testing conducted as part of the previous investigation, indicates that the soils are "corrosive" to buried metals (per Romanoff, 1989). Additional discussions on corrosion are presented in Section 7.8.

5.2 Engineering Analysis

Presented below is a general discussion of the engineering analysis methods that were utilized to develop the conclusions and recommendations presented in this report.

5.2.1 Bearing Capacity and Lateral Earth Pressures

Ultimate bearing capacity values were obtained using the graphs and formula presented in NAVFAC DM-7.1. Allowable bearing was determined by applying a factor of safety of at least 3 to the ultimate bearing capacity. Static lateral earth pressures were calculated using Rankine methods for active and passive cases. If it is desired to use Coulomb forces, a separate analysis specific to the application can be conducted.

5.2.2 Slope Stability

Slope stability analyses were performed using STEDwin in conjunction with GSTABL7V2 computer code. Slope stability analyses have been conducted on anticipated cut and fill slopes. Slope stability calculation results are presented on Plates D-1 through D-11.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on Alta's findings during the subsurface investigation, our staff's previous experience in the area, and a review of the proposed plans and referenced reports, it is Alta's opinion that the development of the site is feasible from a geotechnical perspective. We concur with the conclusions and recommendations presented in the PSE, 2007 report. Earthwork specifications and Grading Details that may be utilized for the project are presented in Appendices F and G.

Presented below is a summary of the unsuitable soil removal recommendations for the project.

6.1 Site Preparation and Removals

All grading shall be accomplished under the observation and testing of the project geotechnical engineer and engineering geologist in accordance with the recommendations contained herein, the current Grading Manual of the City of Beaumont and this firm's Earthwork Specifications (Appendix F).

Guidelines to determine the depth of removals are presented below; however, the exact extent of the removals must be determined in the field during grading, when observation and evaluation of the greater detail afforded by those exposures can be performed by the Geotechnical Engineer and/or Engineering Geologist. In general, removed soils will be suitable for reuse as compacted fill when free of deleterious materials and after moisture conditioning.

Removal of unsuitable soils should be established minimally at a 1:1 projection to competent soils outside the design toe of fill slopes. Front cuts should be made no steeper than 1:1, thus removals should be initiated at approximately twice the distance of the anticipated removal depth, outside the design toe. The bottoms of all removal areas should be observed, mapped, and approved by the Engineering Geologist prior to fill placement.

Seepage, if encountered during grading, should be evaluated by the Project Geotechnical Engineer and/or Engineering Geologist.

6.1.1 Stripping and Trash Removal

Vegetation, debris, and other deleterious materials are unsuitable as structural fill material and should be disposed of off-site prior to commencing removals and placement of compacted fills.

6.1.2 Unsuitable Soil Removals

6.1.2.1 Topsoil (no map symbol)

Topsoil should be completely removed before the placement of compacted fill. Removal depths are expected to range from approximately one (1) to three (3) feet.

6.1.2.2 Alluvium (map symbol Qal)

All alluvium within proposed structural fill areas and/or where exposed in cuts should be removed to expose saturated alluvium or competent San Timoteo Formation. Alluvial removals are estimated to range in depth from five (5) to approximately fifty (50) feet. The approximate limits of mapped alluvium are shown on the enclosed plans. Estimated depths of required removals are also presented based upon the closest available data point. Where saturated alluvium is left in-place, settlement monitoring will be required as discussed in Section 6.5 of this report.

6.1.2.3 San Timoteo Formation (map symbol QTst)

The San Timoteo Formation is dry, highly weathered, and visibly porous in the upper 2 to 4 feet and is generally moist and competent below that. In areas where fill placement or shallow cut grading is proposed to achieve design grade, the highly weathered profile should be removed to expose competent bedrock.

6.1.3 Removals Along Property Boundaries

Removals of unsuitable soils will be required below design fill areas adjacent to the property lines. Where the recommended removal geometry is not possible due to property line restrictions, removals could be initiated at the property line at a 1:1 ratio inward to competent materials. If this reduced removal criterion is implemented, periodic slope maintenance may be required.

6.2 Subsurface Drainage

6.2.1 Subdrains

Canyon subdrains (6-inch and 8-inch) will be required on this project below all canyon areas as depicted on the enclosed plans. The drains are to be placed along the lowest alignment of the canyons and alluvium removal areas to intercept, transport and dispose of infiltrating water. Final determination of drain locations will be made in the field, based on exposed conditions. Outletting of subdrain systems will require coordination with the project Civil Engineer in determining suitable facilities to accept the drain water. Where available outlet elevations are above the remedial grading depths, fill placed below the subdrains should be placed as discussed on Plate G-4 of this report. All drains should be constructed in accordance with the details shown on Plates G-3 and G-4. Outletting should be at the lowest available location.

6.2.2 Backdrains

Backdrains will be required in all fill keys, and skin-fill/skin-cut remediations. Backdrains should be constructed in accordance with the details shown on Plate G-8.

6.3 Overexcavation

6.3.1 Residential Lots

Over-excavation of cut areas and/or shallow fill areas and replacement with compacted blanket fill (Cap) will be required in building pads where any of the following conditions are created by design or remedial grading.

- Cut/fill transitions within building pads.
- Cut pads exposing dissimilar materials.

- Cut pads exposing highly expansive material.
- Cut pads exposing porous or other unsuitable material.
- Cut lots superjacent to stabilization fills

The cut portion of the transition building pad should be over-excavated to provide at least one-third of the maximum fill depth below the pad. Pads identified as requiring replacement with compacted fill caps due to cut/fill transitions are indicated with a © on the enclosed Plates 1 through 8.

Additional lots may need to be capped based on the above criteria and are best determined based on exposed conditions during grading. Undercuts on all lots should be tilted toward the street or canyon drainage.

6.4 Earthwork Considerations

6.4.1 Compaction Standards

All fill and processed natural ground shall be compacted to a minimum relative compaction of 90 percent, as determined by ASTM Test Method: D-1557. Fill material should be moisture conditioned to optimum moisture or above, and as generally discussed in Alta's Earthwork Specification Section presented in Appendix F. Compaction shall be achieved with the use of sheepsfoot rollers or similar kneading type equipment. Mixing and moisture conditioning will be required in order to achieve the recommended moisture conditions.

6.4.2 Groundwater/Seepage

Surface seeps, seasonal saturated soils zones and/or perched water conditions may be encountered during grading and improvement construction, depending on seasonal precipitation and the time of year of construction.

6.4.3 Documentation of Removals

All removal/over-excavation bottoms should be observed and approved by the project Geotechnical Consultant prior to fill placement. Removal bottoms and undercuts should be surveyed after approval by the geotechnical consultant and prior to the placement of fill. Staking should be provided in order to verify undercut locations and depths.

6.4.4 Treatment of Removal Bottoms

At the completion of removals/over-excavation, the exposed removal bottom should be ripped to a minimum depth of eight inches, moisture-conditioned to above optimum moisture content and compacted in-place to the project standards.

6.4.5 Fill Placement

After removals, scarification, and compaction of in-place materials are completed, additional fill may be placed. Fill should be placed in eight-inch bulk maximum lifts, moisture conditioned to optimum moisture content or above, compacted and tested as grading/construction progresses until final grades are attained.

6.4.6 Benching

Where the natural slope is steeper than 5-horizontal to 1-vertical and where designated by the project Geotechnical Consultant, compacted fill material shall be keyed and benched into competent bedrock or firm compacted fill (Plate G-6 in Appendix F).

6.4.7 Mixing

Mixing of materials may be necessary to prevent layering of different soil types and/or different moisture contents. The mixing should be accomplished prior to and as part of compaction of each fill lift.

6.4.8 Import Soils

Import soils, if required, should consist of clean, structural quality, compactable materials similar to the on-site soils and should be free of trash, debris or other objectionable materials. The project Geotechnical Consultant should be notified not less than 72 hours in advance of the locations of any soils proposed for import. Import sources should be sampled, tested, and approved by the project Geotechnical Consultant at the source prior to the importation of the soils to the site. The project Civil Engineer should include these requirements on plans and specifications for the project.

6.4.9 Fill Slope Construction

Fill slopes should be overfilled to an extent determined by the contractor, but not less than two (2) feet measured perpendicular to the slope face, so that when trimmed back to the compacted core a minimum 90 percent relative compaction is achieved.

Compaction of each fill lift should extend out to the temporary slope face. Back-rolling during mass filling at intervals not exceeding four (4) feet in height is recommended, unless more extensive overfilling is undertaken.

As an alternative to overfilling, fill slopes may be built to the finish slope face in accordance with the following recommendations:

1. Compaction of each fill lift should extend to the face of the slopes.
2. Back-rolling during mass grading should be undertaken at intervals not exceeding four (4) feet in height. Back-rolling at more frequent intervals may be required.
3. Care should be taken to avoid spillage of loose materials down the face of any slopes during grading. Spill fill will require complete removal prior to compaction, shaping, and grid rolling.

4. At completion of mass filling, the slope surface should be watered, shaped, and compacted by track walking with a D-8 bulldozer, or equivalent, such that compaction to project standards is achieved to the slope face.

Proper seeding and planting of the slopes should follow as soon as practical to inhibit erosion and deterioration of the slope surfaces. Proper moisture control will enhance the long-term stability of the finish slope surface.

6.4.10 Utility Trenches

6.4.10.1 Excavation

Utility trenches should be supported, either by laying back excavations or shoring in accordance with applicable OSHA standards. In general, existing site soils are classified as Soil Types "B" and "C" per OSHA standards. Upon completion of the recommended removals and recompaction, the artificial fill will be classified as Soil Type "B". The Project Geotechnical Consulting should be consulted if geologic conditions vary from what is presented in this report. Flatter backcuts or shoring may be required depending on the depth of the utility lines and local conditions.

6.4.10.2 Backfill

Trench backfill should be compacted to at least 90 percent of maximum dry density as determined by ASTM D-1557. Onsite soils will not be suitable for use as bedding material but will be suitable for use in backfill provided over-sized materials are removed. No surcharge loads should be imposed above excavations. This includes spoil piles, lumber, concrete trucks, or other construction materials and equipment. Drainage above excavations should be directed away from the banks. Care should be taken to avoid saturation of the soils. Compaction should be accomplished by mechanical means. Jetting of native soils will not be acceptable.

Under-slab trenches should also be compacted to project specifications. The soil engineer should be notified for inspection before placement of the membrane and slab reinforcement.

6.4.11 Backcut Stability

Temporary backcuts, if required during unsuitable soil removals, should be made no steeper than 1:1 without review and approval of the geotechnical consultant. Flatter backcuts may be necessary where geologic conditions dictate and where minimum width dimensions are to be maintained.

Care should be taken during remedial grading operations in order to minimize risk of failure. Should failure occur, complete removal of the disturbed material will be required.

In consideration of the inherent instability created by temporary construction backcuts for stabilization fills and removals, it is imperative that grading schedules are coordinated to minimize the unsupported exposure time of these excavations. Once started, these excavations and subsequent fill operations should be maintained to completion without intervening delays imposed by avoidable circumstances. In cases where five-day workweeks comprise a normal schedule, grading should be planned to avoid exposing at-grade or near-grade excavations through a non-work weekend. Where improvements may be affected by temporary instability, either on or offsite, further restrictions such as slot cutting, extending work days, implementing weekend schedules, and/or other requirements considered critical to serving specific circumstances may be imposed.

6.5 Settlement and Settlement Monitoring

Deeper fills (>50 feet) as well as fill placed over saturated alluvium will be subject to settlements as a result of placement of overlying fills. Those settlements are anticipated to be complete within 1 to 2 months after rough grade accomplishment. Settlement monuments should be placed on lots shown on the enclosed Plates 1 through 8. Determinations relative to release for construction should be made based upon the settlement data and the relationship of the as-graded configuration to the proposed improvement.

The monuments should be installed upon rough grade accomplishment and surveyed weekly until data substantiates completion of the settlement process. Final release for construction will be made based upon the results of the survey data. It is likely that less settlement-sensitive structures such as utilities can begin construction prior to residential unit release.

6.6 Slope Stability

The following is a discussion of slope stability onsite, based on the rough grading plans.

6.6.1 Fill Slopes

Fill slope stability can be affected by several factors including underlying geologic structure, strength of materials, height, inclination, and orientation of design slopes. It is anticipated that fill slopes on the project will be designed at a slope ratio of 2:1 (horizontal to vertical) with the highest slope being approximately 28-feet. Fill slopes, when properly constructed with onsite materials, are expected to be grossly stable as designed. Stability calculations supporting this conclusion are presented on Plates D-1 through D-3 in Appendix D.

Keys should be constructed at the toe of all fill slopes. Key widths should be at least one-half the height of the slope and not less than 15 feet. Minimum key depths at the toe should be 2 feet. Removals at the toe of the slope should be extended from the catch point of the design toe outward at a minimum 1:1 projection into approved material.

Skin-fill slope conditions should be avoided. If these conditions exist or are created during grading, they should be evaluated. Typical remediation for skin fill conditions are shown on Plate G-11 (Appendix G).

6.6.2 <u>Cut Slopes</u>

The rough grading plans depicts proposed cut slopes at the site, and we anticipate that they will be primarily excavated in the San Timoteo Formation. The cut slopes within the tract will be inclined at 2:1 or flatter, the measured slope heights are up to approximately 24-feet for 2:1 slopes and approximately 70-feet for 3:1 slopes. Alta has performed a slope stability analysis on both the highest 2:1 and 3:1 cut slope and the results are presented on Plates D-4 and D-7 in Appendix D. The calculations indicate that the slope as well as lesser height slopes in similar materials will be grossly stable.

All cut slopes should be observed during grading by the Project Geotechnical Consultant. If adverse bedding, fracture patterns, or other unstable geological conditions are exposed, the cut slopes may need to be replaced with a drained stabilization fill, as generally depicted on Plates G-8, G-9 and G-10 in Appendix G.

For fill over cut slopes, the cut slope portion should be evaluated prior to the placement of fill. Fill over cut slopes should be constructed in general conformance with Plate G-7.

6.7 Well and Septic System Abandonment

Groundwater wells and septic systems, such as seepage pits, if located in the proposed grading areas, should be abandoned in accordance with the requirements of the County of Riverside Department of Environmental Health, prior to initiation of grading activities.

6.8 Liquefaction

As discussed in Section 4.3.3 of this report, there is a potential for liquefaction to occur in areas underlain by saturated alluvium during seismic shaking. More specifically, liquefaction could cause differential settlement and/or lateral spreading at the site. Alta's calculations indicate that as much as 3.0 inches of vertical settlement may occur. Typically, half of that settlement should be considered differential (California Division of Mines and Geology, 2008, *Special Publication 117a*). For lightly-loaded, well-constructed structures underlain by a non-liquefiable layer over the liquefiable layers, such as will be developed at the site, the ultimate differential settlement across the structure may be more limited (Idriss and Boulinger, 2008). In consideration of the proposed removal and recompaction of the upper soils, and the relatively uniform thickness of the liquefiable layers under an individual residential structure, it is Alta's opinion that a differential settlement of 1.5-inches in 40 feet can be utilized in the design. It is recommended to utilize post-tensioned foundation systems for lots underlain by saturated alluvium.

Conducting unsuitable soil removals and utilizing post-tensioned slabs are intended to reduce the effects of liquefaction on the structures to acceptable levels of risk. However, settlement can still affect other improvements onsite, such as pavement and utilities. Further discussion on this topic is presented in Section 7.11.

7.0 DESIGN CONSIDERATIONS

It is anticipated that one to two-story, wood-frame residential structures with slab on-grade and shallow foundations will be constructed. Either conventional or post-tensioned slabs can be utilized for the project, although lots underlain by saturated alluvium shall utilize either post-tensioned or mat slabs. Upon the completion of rough grading, finish grade samples should be collected and tested in order to provide specific recommendations as they relate to individual building pads. These test results and corresponding design recommendations should be presented in a final rough grading report. Final slab and foundation design recommendations should be made based upon specific structure sitings, loading conditions, and as-graded soil conditions.

It is anticipated that the majority of onsite soils will possess "very low" to "low" expansion potential when tested in general accordance with ASTM Test Method D: 4829. For budgeting purposes, the following foundation design requirements for a range of potential expansion characteristics are presented.

7.1 Foundation Design

Foundations may be preliminary designed based on the values presented in Table 7-1 below.

Table 7-1 Foundation Design Parameters*	
Allowable Bearing	2000 lbs/ft^2 (assuming a minimum embedment depth and width of 12 inches)
Lateral Bearing	250 lbs/ft^2 at a depth of 12 inches plus 250 lbs/ft^2 for each additional 12 inches of embedment to a maximum of 2000 lbs/ft^2.
Sliding Coefficient	0.35
Settlement	Differential Static=1/2 inch in 40 feet Dynamic=1/2 inch in 40 feet or Dynamic=1.5 inches in 40 feet for lots underlain by saturated alluvium

*These values may be increased as allowed by Code to resist transient loads such as wind or seismic. Building code and structural design considerations may govern depth and reinforcement requirements and should be evaluated.

7.1.1 Conventional Foundation Systems

Based on the onsite soils conditions and information supplied by the CBC 2019, conventional foundation systems may be designed in accordance with Tables 7-1 and 7-2.

TABLE 7-2 CONVENTIONAL FOUNDATION DESIGN PARAMETERS	
Expansion Potential	*Very Low to Low*
Soil Category	I
Design Plasticity Index	12
Minimum Footing Embedment	12 inches*
*The minimum footing embedments presented herein are based on expansion indexes. The structural engineer should determine minimum embedments based on the number of floors supported by the footings, the structural loading, and the requirements of the latest California Building Code.	
Minimum Footing Width	12-inches-The structural engineer should determine the minimum footing width based on loading and the latest California Building Code.
Footing Reinforcement	No. 4 rebar, one (1) on top, one (1) on bottom
Slab Thickness	4 inches (actual)
Slab Reinforcement	No. 3 rebar spaced 18 inches on center, each way
Under-Slab Requirement	See Section 7.2
Slab Subgrade Moisture	Minimum of 110 percent of optimum moisture to a depth of 12 inches prior to placing concrete.
Footing Embedment Adjacent to Swales and Slopes	If exterior footings adjacent to drainage swales are to exist within five (5) feet horizontally of the swale, the footing should be embedded sufficiently to assure embedment below the swale bottom is maintained. Footings adjacent to slopes should be embedded such that at least five- (5) feet is provided horizontally from edge of the footing to the face of the slope.
Garages	A grade beam reinforced continuously with the garage footings shall be constructed across the garage entrance, tying together the ends of the perimeter footings and between individual spread footings. This grade beam should be embedded at the same depth as the adjacent perimeter footings. A thickened slab, separated by a cold joint from the garage beam, should be provided at the garage entrance. Minimum dimensions of the thickened edge shall be six (6) inches deep. Footing depth, width and reinforcement should be the same as the structure. Slab thickness, reinforcement and under-slab treatment should be the same as the structure.

7.1.2 Post-Tensioned Slabs/Foundation Design Recommendations

Post-tensioned slabs for the project may be designed utilizing the parameters presented in Tables 7-1 and 7-3. The parameters presented herein are based on methodology provided in the Design of Post-Tensioned Slabs-On-Ground, Third Edition, by the Post-Tensioning Institute, in accordance with the 2019 CBC. Lots underlain by saturated alluvium shall utilize either post-tensioned or mat slabs.

TABLE 7-3 POST-TENSION SLAB DESIGN PARAMETERS						
Category	Expansion Potential	Minimum Embedment	Edge Lift		Center Lift	
			Em (ft)	Ym (inch)	Em (ft)	Ym (inch)
I	Very Low to Low	12 inches*	5.4	0.61	9.0	0.26
Slab Subgrade Moisture						
Category I	Minimum 110% of optimum moisture to a depth of 12 inches prior to pouring concrete					
Embedment*						
The minimum footing embedments presented herein are based on expansion indexes. The structural engineer should determine minimum embedments based on the number of floors supported by the footings, the structural loading, and the requirements of the latest California Building Code. If mat slabs are utilized, alternate embedment depths can be provided.						
Moisture Barrier						
A moisture barrier should be provided in accordance with the recommendations presented in Section 7.2						
The parameters presented herein are based on procedures presented in the Design of Post-Tensioned Slabs-On-Ground, Third Edition. No corrections for vertical barriers at the edge of the slab, or for adjacent vegetation have been assumed. The design parameters are based on a Constant Suction Value of 3.9 pF.						

7.2 Moisture Barrier

A moisture and vapor retarding system should be placed below the slabs-on-grade in portions of the structure considered to be moisture sensitive and should be capable of effectively preventing the migration of water and reducing the transmission of water vapor to acceptable levels. Historically, a 10-mil plastic membrane, such as Visqueen, placed between two to four inches of clean sand, has been used for this purpose. The use of this system or other systems can be considered, at the discretion of the designer, provided the system reduces the vapor transmission rates to acceptable levels.

7.3 Seismic Design

In accordance with the requirements in Section 11.4.8 of ASCE 7-16, Alta has performed a site-specific ground motion analysis for the subject project. The analysis was performed in accordance with Chapter 21 of ASCE 7-16, the 2019 CBC, and the 2014 USGS Ground Acceleration Maps. The USGS Unified Hazard Tool (https://earthquake.usgs.gov/hazards/interactive/index.php) and the USGS National Seismic Hazard Map source model was utilized to perform the analysis.

The site class was determined based on the subsurface investigation and published geologic maps in the area in general conformance with Chapter 20 of ASCE 7-16. Based on the subsurface investigations onsite and the anticipated remedial grading operations, a Site Class of D was selected (shear wave velocity of 257 m/s) for lots underlain by engineered fill and San Timoteo Formation. For lots underlain by saturated alluvium, there is a potential for liquefaction onsite which would result in a Site Class of F. However, it is assumed that the proposed structures onsite will have a fundamental period of vibration equal to or less than 0.5s. As such, per Section 20.3.1 of ASCE 7-16, a Site Class of E may be utilized for lots underlain by saturated alluvium. The structural engineer shall verify the fundamental period of vibration of the proposed structures. Final determination on site class shall be made on a lot-by-lot basis upon the completion of grading.

Probabilistic (MCER) ground motions were determined in accordance with Method 2 of Section 21.2.1 of ACE 7-16. The site specific MCER was taken as the lesser of the probabilistic and deterministic ground motions.

The design response spectrum was determined per Section 21.3 of ASCE 7-16. Design acceleration parameters were determined per Section 21.4 of ASCE 7-16 and the results are presented in Table 7-4. These parameters should be verified by the structural engineer. Additional parameters should be determined by the structural engineer based on the Occupancy Category of the proposed structures.

TABLE 7-4 Seismic Ground Motion Values 2019 CBC and ASCE 7-16		
Parameter	*Value*	
Site Latitude	33.9490	
Site Longitude	-117.0491	
Underlying Soil Conditions	Engineered Fill over San Timoteo Formation	Engineered Fill over Saturated Alluvium
Site Class	D	E (assuming structures fundamental period of vibration is equal to or less than 0.5s)
Spectral Response Acceleration Parameter, S_S	1.803	1.803
Spectral Response Acceleration Parameter, S_1	0.69	0.69
Site Coefficient, F_a	1.0	-
Site Coefficient, F_v (Per Table 11.4-2 of ASCE 7-16. Site Specific Parameters Govern)	1.7	-
Site Specific Parameters Per Chapter 21 of ASCE 7-16		
MCE Spectral Response Acceleration Parameter, S_{MS}	1.803	1.593
MCE Spectral Response Acceleration Parameter, S_{M1}	1.256	1.580
Design Spectral Response Acceleration Parameter, S_{DS}	1.202	1.062
Design Spectral Response Acceleration Parameter, S_{D1}	0.837	1.053
Peak Ground Acceleration, PGA_M	0.936	0.808

7.4 Footing Excavations

Soils from the footing excavations should not be placed in slab-on-grade areas unless properly compacted and tested. The excavations should be cleaned of all loose/sloughed materials and be neatly trimmed at the time of concrete placement.

7.5 Retaining Wall Design

Retaining walls should be founded on compacted fill and should be backfilled with granular soils that allow for drainage behind the wall. Foundations may be designed in accordance with the recommendations presented in Table 7-1, above. Unrestrained walls, free to rotate at least 0.001 radians, may be designed to resist lateral pressures imposed by a fluid with a unit weight determined in accordance with the Table 7-5 below. The table also presents design parameters for restrained retaining walls. These parameters may be used to design retaining walls that may be considered as restrained due to the method of construction or location (corner sections of unrestrained retaining walls).

TABLE 7-5
Equivalent Fluid Pressures for 90% Compacted Select Fill

Backfill	Active Pressure (psf/ft)	At-Rest Pressure (psf/ft)
Level	35	55
2:1	52	100

Per the requirements of the CBC, the seismic force acting on the retaining walls with backfill exceeding 6-feet in height may be resolved utilizing the formula $29.5H^2$ lb/lineal ft (H=height of the wall). This force acts at approximately 0.6H above the base of the wall (inverted triangle). The seismic value can be converted as required by the retaining wall engineer.

- Restrained retaining walls should be designed for "at-rest" conditions, utilizing at-rest pressure.
- The design loads presented in the above table are to be applied on the retaining wall in a horizontal fashion and as such friction between wall and retained soils should not be allowed in the retaining wall analyses.
- Additional allowances should be made in the retaining wall design to account for the influence of construction loads, temporary loads, and possible nearby structural footing loads.
- Select backfill should be granular, structural quality backfill with a Sand Equivalent of 20 or better and an ASCE Expansion Index of 20 or less. The backfill must encompass the full active wedge area. The upper one foot of backfill should be comprised of native on-site soils (see Plate A).
- The wall design should include waterproofing (where appropriate) and backdrains or weep holes for relieving possible hydrostatic pressures. The backdrain should be comprised of a 4-inch perforated PVC pipe in a 1 ft. by 1 ft., ¾-inch gravel matrix, wrapped with a geofabric. The backdrain should be installed with a minimum gradient of 2 percent and should be outletted to an appropriate location.
- No backfill should be placed against concrete until minimum design strengths are achieved.

It should be noted that the passive resistance and allowable bearing values presented in Table 7-1 are based on level conditions at the toe. Modified design parameters can be presented for retaining walls with sloping conditions at or near the toe.

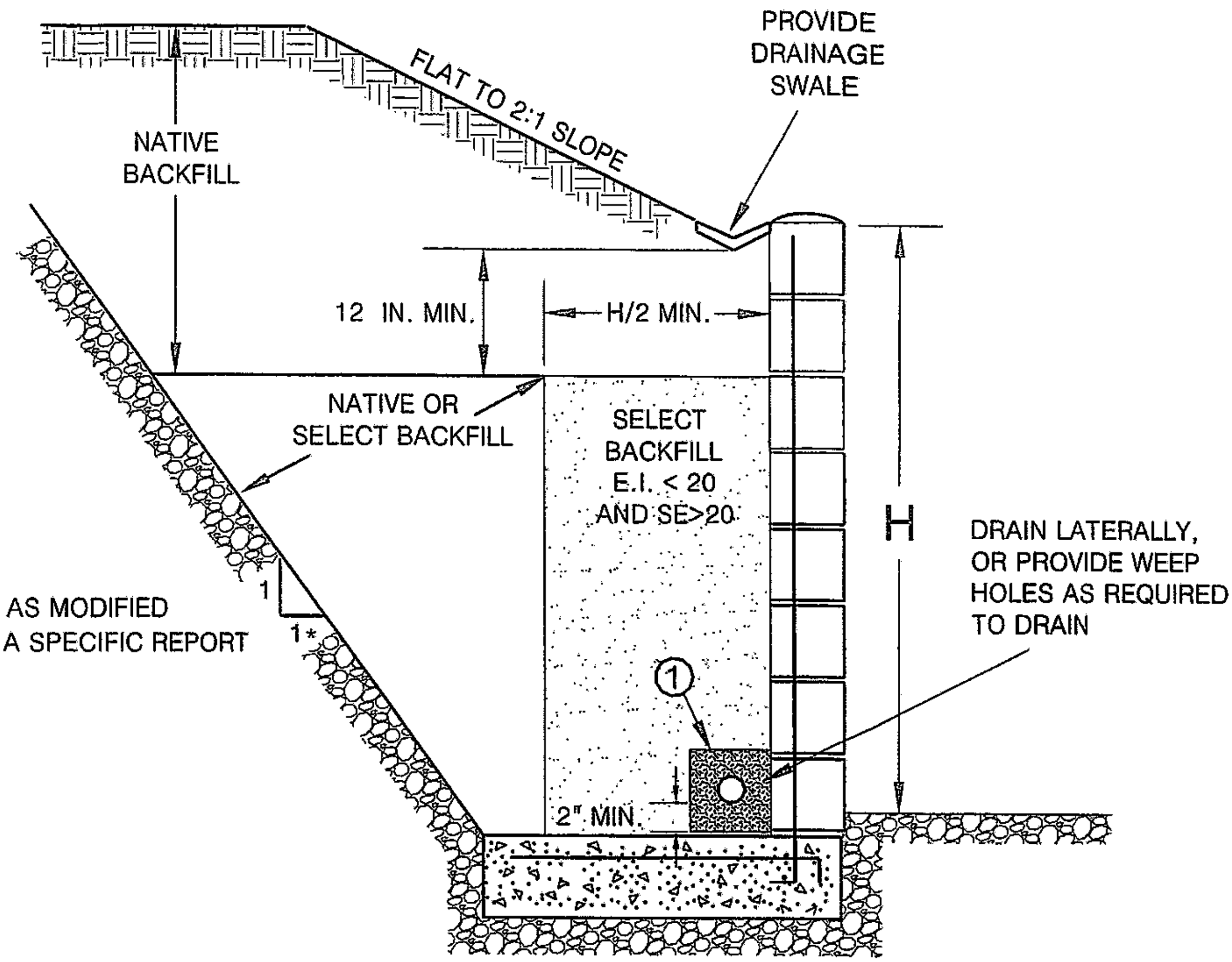
7.6 Exterior Slabs and Walkways

Exterior concrete slabs and walkways should be designed and constructed in consideration of the following recommendations.

7.6.1 Subgrade Compaction

The subgrade below exterior concrete slabs should be compacted to a minimum of 90 percent relative compaction as determined by ASTM Test Method: D 1557.

RETAINING WALL BACKFILL DETAIL



1

PIPE: 4-INCH PERFORATED PVC, SCHEDULE 40, SDR35 OR APPROVED ALTERNATE MINIMUM 8 PERFORATIONS (1/4-IN. DIA.) PER LINEAL FT. IN BOTTOM HALF OF PIPE

ROCK: MINIMUM VOLUME OF 1 CU. FT. OF 3/4-IN. MAX. ROCK PER. LINEAL FOOT OF PIPE, OR APPROVED ALTERNATE

FILTER FABRIC: MIRAFI 140 FILTER FABRIC OR APPROVED EQUIVALENT

7.6.2 Subgrade Moisture

The subgrade below concrete slabs should be moisture conditioned to a minimum of 110 percent of optimum moisture content prior to concrete placement.

7.6.3 Concrete Slab Thickness

Concrete flatwork and driveways should be designed utilizing four-inch minimum thickness.

7.6.4 Concrete Slab Reinforcement

Utilization of reinforcement for flatwork and driveways is subject to a cost/benefit analysis for the developer. Reinforcement will decrease the amount of cracking that may occur in flatwork, however, planning for occasional repairs may be more cost effective. The majority of the soils onsite are classified as very low to low in expansion potential. Consideration should be given to reinforcing flatwork with irregular (non-square/rectangular) shapes.

7.6.5 Control Joints

Weakened plane joints should be installed on walkways at intervals of approximately eight feet. Exterior slabs should be designed to withstand shrinkage of the concrete.

7.7 Concrete Design

As stated in Section 5.1.8, negligible concentrations of sulfates were detected in the samples previously tested. The use of sulfate resistant concrete shall not be required on lots with negligible concentrations of sulfates. Upon completion of grading, finish grade samples should be taken and tested for sulfate content in order to formulate final concrete design recommendations.

7.8 Corrosion

Based on previous resistivity testing, the onsite soils are corrosive to buried metal objects. Buried ferrous metals should be protected against the effects of corrosive soils in accordance with the manufacturer's recommendations. Typical measures may include using non-corrosive backfill, protective coatings, wrapping, plastic pipes, or a combination of these methods. A corrosion engineer should be consulted if specific design recommendations are required by the improvement designer.

Per ACI 318-14, an exposure class of C1 would be applicable to metals encased in concrete (rebar in footings) due to being exposed to moisture from surrounding soils. Per Table 19.3.2.1 of ACI 318-14, the requirements for concrete with an exposure class of C1 are a minimum compressive strength of 2500 psi and a maximum water-soluble chloride ion content in concrete of 0.30 (percent by weight of cement).

7.9 Pavement Design

Pavement sections for the proposed streets shall be designed based on laboratory testing conducted on samples taken from the soil subgrade. Preliminarily, based on an assumed R-Value of 30, the pavement may be designed utilizing the sections presented in Table 7-6. These sections should be verified upon the completion of grading, based on R-Value testing. The ultimate pavement section design for public streets is under the City of Beaumont's purview.

Table 7-6 Preliminary Pavement Sections		
Traffic Index	Pavement Section Options OR	
5.0	3-inch AC on 6-inch AB	4-inch AC on 6-inch AB
5.5	3-inch AC on 7-inch AB	4-inch AC on 6-inch AB
6.0	3.5-inch AC on 7.5-inch AB	4-inch AC on 6.5-inch AB
AC-Asphalt Concrete AB-Caltrans Class II Base City of Beaumont Minimum is 3" AC over 6" AB		

The underlying subgrade soil should be suitably moisture conditioned, processed and compacted to a minimum 95 percent of the laboratory maximum density (ASTM: D 1557) to at least twelve (12) inches below subgrade. After subgrade compaction, the exposed grade should then be "proof"-rolled with heavy equipment to ensure the grade does not "pump" and is verified as non-yielding.

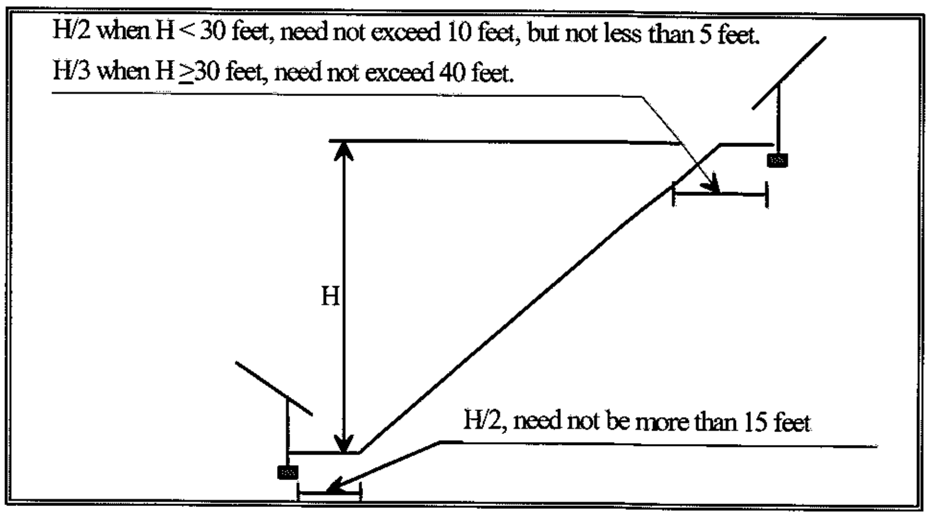
Preparation for compaction operations and pavement construction operations should be accomplished in accordance with the current requirements of the City of Beaumont and under the observation and testing of the project geotechnical consultant.

7.10 Site Drainage

Positive drainage away from the proposed structures should be provided and maintained. Roof, pad and lot drainage should be collected and directed away from the structures toward approved disposal areas through drainage terraces, gutters, down drains, and other devices. Design fine grade elevations should be maintained through the life of the structure or if design fine grade elevations are altered, adequate area drains should be installed in order to provide rapid discharge of water, away from structures. Residents and Homeowner Associations should be made aware that they are responsible for maintenance and cleaning of all drainage terraces, down drains, and other devices that have been installed to promote site and structure drainage.

7.11 Deepened Footings and Setbacks

It is generally recognized that improvements constructed in proximity to properly constructed slopes can, over a period of time, be affected by natural processes including gravity forces, weathering of surficial soils and long term (secondary) settlement. Most building codes, including the California Building Code (CBC), require that structures be setback or footings deepened, where subject to the influence of these natural processes. For the subject site, where foundations for residential structures are to exist in proximity to slopes, the footings should be embedded to satisfy the requirements presented in the following figure.



Consideration of these natural processes should be undertaken in the design and construction of other improvements. Homeowners are advised to consult with qualified geotechnical engineers, designers, and contractors in the design and construction of future improvements. Each lot and proposed improvement should be evaluated in relation to the specific site conditions, accounting for the specific soil conditions.

7.12 Improvement Design Recommendations

As noted in Section 6.8, there is a potential for liquefaction to occur in the saturated alluvium which may cause differential settlement. A combination of removals and structural design has been proposed to protect the residential structures onsite, however, other improvements, such as utility lines and street pavement may be affected by liquefaction. Consideration should be given to designing utility lines with flexible connections to assist in accommodating the potential settlement. Repair and remedial work should be anticipated after a liquefaction event.

8.0 SLOPE AND LOT MAINTENANCE

Ongoing maintenance of the improvements is essential to the long-term performance of structures and slopes. As such, the owners must implement certain maintenance procedures. The following recommendations should be implemented.

8.1 Slope Planting

Slope planting should consist of ground cover, shrubs, and trees that possess deep, dense root structures and require a minimum of irrigation. The residents or Homeowner Association should be advised of their responsibility to maintain such planting.

8.2 Lot Drainage

Roof, pad and lot drainage should be collected and directed away from structures and slopes and toward approved disposal areas. Design fine grade elevations should be maintained through the life of the structure or if design fine grade elevations are altered, adequate area drains should be installed in order to provide rapid discharge of water, away from structures and slopes. Residents should be made aware that they are responsible for maintenance and cleaning of all drainage terraces, down drains, and other devices that have been installed to promote structure and slope stability.

8.3 Slope Irrigation

The resident or owner should be advised of their responsibility to maintain irrigation systems. Leaks should be repaired immediately. Sprinklers should be adjusted to provide maximum uniform coverage with a minimum of water usage and overlap. Overwatering with consequent wasteful run-off and serious ground saturation should be avoided. If automatic sprinkler systems are installed, their use must be adjusted to account for natural rainfall conditions.

8.4 Burrowing Animals

Residents or owners should undertake a program for the elimination of burrowing animals. This should be an ongoing program in order to maintain slope stability.

9.0 FUTURE PLAN REVIEWS

This report represents a geotechnical review of the plans and referenced reports. As the project design progresses, site specific geologic and geotechnical issues need to be considered in the design and construction of the project. Consequently, future plan reviews may be necessary. These reviews may include reviews of:

- Precise Grading Plans
- Foundation plans

These plans should be forwarded to the Project Geotechnical Consultant for review.

10.0 CLOSURE

10.1 Geotechnical Review

For the purposes of this report, multiple working hypotheses were established for the project, utilizing the available data and the most probable model is used for the analysis. Future information collected during the proposed grading operations is intended to evaluate the hypothesis and as such, some of the assumptions summarized in this report may need to be changed. Some modifications of the grading recommendations may become necessary, should the conditions encountered in the field differ from the conditions hypothesized in this report.

Plans and sections of the project specifications should be reviewed by Alta, to evaluate conformance with the intent of the recommendations contained in this report. If the project description or final design varies from that described in herein, Alta must be consulted regarding the applicability of the recommendations contained herein and whether any changes are required. Alta accepts no liability for any use of its recommendations if the project description or final design varies and Alta is not consulted regarding the alterations.

10.2 Limitations

This report is based on the following: 1) the information obtained from the previous subsurface investigation at the approximate locations indicated on the plans included herein; and 2) from the information presented in the referenced reports. The findings and recommendations are based on the results of the subsurface investigation, laboratory testing, and office analysis combined with an interpolation and extrapolation of conditions between and beyond the subsurface excavation locations. The findings are also based on information from previous investigations/geotechnical reports contained in the included references. The results reflect an interpretation of the direct evidence obtained. Work performed by Alta has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the geotechnical profession currently practicing in the same locality under similar conditions. No other representation, either expressed or implied, and no warranty or guarantee is included or intended.

The recommendations presented in this report are based on the assumption that an appropriate level of field review will be provided by a geotechnical consultant who is familiar with the design and site geologic conditions. That field review shall be sufficient to confirm that geotechnical and geologic conditions exposed during grading are consistent with the geologic representations and corresponding recommendations presented in this report.

The conclusions and recommendations included in this report are applicable to the specific design of this project as discussed in this report. They have no applicability to any other project or to any other location and any and all subsequent users accept any and all liability resulting from any use or reuse of the data, opinions, and recommendations without the prior written consent of Alta.

Alta has no responsibility for construction means, methods, techniques, sequences, procedures, safety precautions, programs in connection with the construction, acts or omissions of the CONTRACTOR or any other person performing any of the construction, or for the failure of any of them to carry out the construction in accordance with the final design drawings and specifications.

APPENDIX A

REFERENCES

APPENDIX A

Selected References

1. ATC, 2020, Hazards by Location (https://hazards.atcouncil.org/#/)
2. Bartlett, Hansen and Youd (2002), Revised Multilinear Regression Equations for Prediction of Lateral Spread Displacement, Journal of Geotechnical and Geoenvironmental Engineering, December 2002.
3. Boulanger, P.W. and Idriss, I.M. (2014), CPT and SPT Based Liquefaction Triggering Procedures, Center for Geotechnical Modeling, University of California Davis; Report No. UCD/CGM-14/01, April 2014.
4. Alta California Geotechnical, Inc. 2019, Geotechnical Review, Tracts Nos. 37696, 37697 and 37698, Planning Area 25, Phase 4 of the Fairway Canyon Development, City of Beaumont, California, dated June 3, 2019 (Project No. 1-160).
5. Alta California Geotechnical, Inc. 2018b, Supplemental Geotechnical Report, Summary of Recent Subsurface Investigation, Tracts Nos. 31462-21 and -22, Planning Area 26, Phase 4 of the Fairway Canyon Development, City of Beaumont, California, dated April 17, 2018 (Project No. 1-160).
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7. Alta California Geotechnical, Inc., 2016b, Updated Geotechnical Review, Phase 4 of the Fairway Canyon project, City of Beaumont, California, February 17, 2016 (Project Number 1-0160).
8. Alta California Geotechnical, Inc., 2016a, Updated Foundation Design Recommendations, Proposed Golf Cart Tunnels A and B, Associated with Phase 4 of the Fairway Canyon project, City of Beaumont, California, January 12, 2016 (Project Number 1-0160).
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10. California Division of Mines and Geology, 2008, Guidelines for evaluating and mitigating seismic hazards in California: Department of Conservation, Special Publication 117a.
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12. Olsen, S.M. and Stark, D.S., 2002, Liquified Strength ratio from liquefication flow failure case histories, Canada Geotech J. 629-647

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14. Romanoff, Melvin, 1989, Underground Corrosion, NBS Circular 579, Reprinted by NACE, Houston, TX, 1989.

15. California Geological Survey, 2018, Earthquake Fault Zones, A Guide For Government Agencies, Property Owners/Developers, and Geoscience Practitioners For Assessing Fault Rupture Hazards in California, Special Publication 42, revised 2018.

16. Riverside County Information Technology, 2020, https://gis.countyofriverside.us/Html5viewer/??viewer=MMC_Public

APPENDIX B-1

Subsurface Investigation

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions		grf	ltr	Description
Coarse Grained Soils More than 50% retained on No. 200 sieve	Gravel and Gravelly Soils More than 50% of coarse fraction retained on No,. 4 sieve		GW	Well-graded gravels or gravel sand mixtures, little or no fines
			GP	Poorly-graded gravels or gravel sand mixture, little or no fines
			GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	Sand and Sandy Soils More than 50% of coarse fraction passes on No,. 4 sieve		SW	Well-graded sands or gravelly sands, little or no fines
			SP	Poorly-graded sands or gravelly sands, little or no fines
			SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, and-clay mixtures

Major Divisions		grf	ltr	
Fine Grained Soils More than 50% passes on No. 200 sieve	Silts And Clays LL,<50		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and organic silt-clays of low plasticity
	Silts And Clays LL,<50		MH	Inorganic silts, micaceous or diatomaceous fine or silty soils, elastic silts
			VH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat and other highly organic soils

BOUNDARY CLASSIFICATION: Soils possessing characteristics of two groups are designated by combinations of group symbols.

PARTICLE SIZE LIMITS

U.S. STANDARD SERIES SIEVE — 200, 40, 10, 4

CLEAR SQUARE SIEVE OPENINGS — 3/4", 3", 12"

Silts and Clays	Sand			Gravel		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

RELATIVE DENSITY

Sands and Gravels	Blows/Foot (SPT)
Very Loose	<4
Loose	4-10
Medium Dense	11-30
Dense	31-50
Very Dense	>50

CONSISTENCY CLASSIFICATION

Silts and Clays	Criteria
Very Soft	Thumb penetrates soil >1 in.
Soft	Thumb penetrates soil 1 in.
Firm	Thumb penetrates soil 1/4 in.
Stiff	Readily indented with thumbnail
Very Stiff	Thumbnail will not indent soil

HARDNESS

Bedrock
Soft
Moderately Hard
Hard
Very Hard

LABORATORY TESTS

Symbol	Test
DS	Direct Shear
DSR	Direct Shear (Remolded)
CON	
SA	Sieve Analysis
MAX	Maximum Density
RV	Resistance (R) Value
EI	Expansion Index
SE	Sand Equivalent
AL	Atterberg Limits
CHEM	Chemical Analysis
HY	Hydrometer Analysis

SOIL MOISTURE

Increasing Visual Moisture Content

- Dry - Dry to touch
- Moist - Damp, but no visible free water
- wet - Visible free water

SIZE PROPORTIONS

Trace - <5%

Few - 5 to 10%

Some - 15 to 25%

KEY TO EXPLORATORY BORING LOGS

ALTA CALIFORNIA GEOTECHNICAL INC.

PLATE B

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0160	PROJECT NAME	Fairway		
DATE STARTED	1/16/17	GROUND ELEV.	2246	BORING DESIG.	BH-03
DATE FINISHED	1/16/17	GW DEPTH (FT)	27	LOGGED BY	TM, JC
DRILLER	2R	DRIVE WT.	140 lbs	NOTE	
TYPE OF DRILL RIG	Hollow Stem Auger	DROP	30 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
	2245				ML	**ALLUVIUM** (Qal): SANDY SILT, very fine grained, orangish tan, slightly moist, soft.				
5	2240									
10	2235									
15	2230									
20	2225									
		R	16			@ 22.0 ft. firm, trace Clay.	10.5	117	67	
25	2220									
		R	10		ML	@ 27.0 ft. SANDY CLAYEY SILT, fine to medium grained, reddish brown, wet, soft, Groundwater encountered.	19.9	108	97	

TOTAL DEPTH 28.0 FEET
GROUNDWATER ENCOUNTERED AT 27.0 FEET
NO CAVING OBSERVED

SAMPLE TYPES:
C CONTINUOUS CORE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0160

PLATE B-3

GEOTECHNICAL BORING LOG

PROJECT NO. 1-0160
DATE STARTED 1/16/17
DATE FINISHED 1/16/17
DRILLER 2R
TYPE OF DRILL RIG Hollow Stem Auger

PROJECT NAME Fairway
GROUND ELEV. 2237
GW DEPTH (FT) 27
DRIVE WT. 140 lbs
DROP 30 in.

BORING DESIG. BH-04
LOGGED BY TM, JC
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
0	2237				ML	**ALLUVIUM** (Qal): SANDY SILT, very fine grained, orangish tan, slightly moist, soft.				
5	2232				ML	@ 5.0 ft. SILT, tan, slightly moist, soft, trace Clay.				
15	2222	R	13		ML	@ 15.0 ft. SANDY SILT, very fine grained, orangish tan, moist to wet, soft, trace Clay and Roots.	8.9	111	49	
20	2217	R	15			@ 20.0 ft. dark orange, wet, soft.	13.5	117	85	
25	2212	R	8			@ 25.0 ft. No Recovery.				
27	2210					@ 27.0 ft. Groundwater encountered.				
30	2207	R	22				17.4			

TOTAL DEPTH 31.0 FEET
GROUNDWATER ENCOUNTERED AT 27.0 FEET
NO CAVING OBSERVED

SAMPLE TYPES:
C CONTINUOUS CORE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0160 PLATE B-4

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0160	PROJECT NAME	Fairway
DATE STARTED	1/16/17	GROUND ELEV.	2226
DATE FINISHED	1/16/17	GW DEPTH (FT)	
DRILLER	2R	DRIVE WT.	140 lbs
TYPE OF DRILL RIG	Hollow Stem Auger	DROP	30 in.

BORING DESIG. BH-05
LOGGED BY TM, JC
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
	2225				ML	**ALLUVIUM** (Qal): SANDY SILT, very fine grained, orangish tan, slightly moist, soft.				
5	2220					@ 5.0 ft. tan, dry to slightly moist, soft, trace Gravel.				
10	2215	R	19			@ 10.0 ft. yellowish tan, dry to slightly moist.	7.3	116	45	
15	2210	R	11		ML	@ 15.0 ft. CLAYEY SILT, yellowish tan, dry to slightly moist, soft.	12.9	117	82	
						@ 18.0 ft. **SAN TIMOTEO FORMATION** (QTst): CLAYEY SILTSTONE, light tan, slightly moist, hard.				
20	2205	R	80				19.8	110	98	

TOTAL DEPTH 21.0 FEET
NO GROUNDWATER ENCOUNTERED
NO CAVING OBSERVED

SAMPLE TYPES:
C CONTINUOUS CORE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0160

PLATE B-5

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0160	PROJECT NAME	Fairway		
DATE STARTED	1/16/17	GROUND ELEV.	2221	BORING DESIG.	BH-06
DATE FINISHED	1/16/17	GW DEPTH (FT)	18	LOGGED BY	TM, JC
DRILLER	2R	DRIVE WT.	140 lbs	NOTE	
TYPE OF DRILL RIG	Hollow Stem Auger	DROP	30 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
	2220				ML	**ALLUVIUM** (Qal): SANDY SILT, very fine grained, orangish tan, slightly moist, soft.				
5	2215				ML	@ 5.0 ft. SILT, yellowish tan, slightly moist, soft.				
10	2210									
15	2205	R	11		CL	@ 15.0 ft. SANDY SILTY CLAY, fine grained, yellowish brown, moist, soft, coarse grained Lithics.	14.6	103	63	
						@ 18.0 ft. Groundwater encountered.				
20	2200	R	9		SC	@ 20.0 ft. CLAYEY SAND, coarse grained, tan, wet, moderately dense.	18.9	109	98	
						TOTAL DEPTH 21.0 FEET GROUNDWATER ENCOUNTERED AT 18.0 FEET NO CAVING OBSERVED.				

SAMPLE TYPES:
C CONTINUOUS CORE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

▼ GROUNDWATER
➤ SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0160	PROJECT NAME	Fairway		
DATE STARTED	1/17/17	GROUND ELEV.	2243	BORING DESIG.	BH-07
DATE FINISHED	1/17/17	GW DEPTH (FT)		LOGGED BY	TM, JC
DRILLER	2R	DRIVE WT.	140 lbs	NOTE	
TYPE OF DRILL RIG	Hollow Stem Auger	DROP	30 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					ML	**ALLUVIUM** (Qal): SANDY SILT, very fine grained, orangish tan, slightly moist, soft.				
	2240									
5										
	2235									
10										
	2230									
15						@ 15.0 ft. yellowish tan, dry to slightly moist.				
	2225									
20										
	2220									
25										
	2215									
30										
	2210									
35						@ 35.0 ft. trace Gravel.				
						@ 37.0 ft. soft to firm.				
	2205									
						Continued.				

SAMPLE TYPES:
C CONTINUOUS CORE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0160	PROJECT NAME	Fairway
DATE STARTED	1/17/17	GROUND ELEV.	2243
DATE FINISHED	1/17/17	GW DEPTH (FT)	
DRILLER	2R	DRIVE WT.	140 lbs
TYPE OF DRILL RIG	Hollow Stem Auger	DROP	30 in.

BORING DESIG. BH-07
LOGGED BY TM, JC
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
		R	37		CL	**ALLUVIUM** (Qal): Continued. @ 40.0 ft. SANDY SILTY CLAY, very fine grained, tan, slightly moist, firm to stiff, trace Gravel.	21.6	104	98	
	2200					@ 41.0 ft. **SAN TIMOTEO FORMATION** ~~(QTst): SILTY CLAYSTONE,~~ light greenish gray, slightly moist, hard, carbonate film. Solid				
45		R	75				16.1	112	90	
						TOTAL DEPTH 46.0 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED				

SAMPLE TYPES:
- C CONTINUOUS CORE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0160	PROJECT NAME	Fairway
DATE STARTED	1/17/17	GROUND ELEV.	2237
DATE FINISHED	1/17/17	GW DEPTH (FT)	
DRILLER	2R	DRIVE WT.	140 lbs
TYPE OF DRILL RIG	Hollow Stem Auger	DROP	30 in.

BORING DESIG. BH-08
LOGGED BY TM, JC
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
0	2237				ML	**ALLUVIUM** (Qal): SANDY SILT, very fine grained, yellowish tan, dry to slightly moist, soft, trace Clay.				
	2235									
5										
	2230									
10										
	2225									
15										
	2220									
20						@ 20.0 ft. tan.				
	2215									
25										
	2210									
30		R	36			@ 30.0 ft. yellowish tan, trace Gravel and Clay.	6.6			
	2205					@ 33.0 ft. Gravel lens.				
35		R	50			@ 34.0 ft. **SAN TIMOTEO FORMATION** (QTst): CLAYEY SILTSTONE, orangish tan, dry to slightly moist, hard, granitic fragments.	7.4	120	51	
	2200									
						TOTAL DEPTH 38.0 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED.				

SAMPLE TYPES:
C CONTINUOUS CORE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE   T TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0160 PLATE B-8

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0160	PROJECT NAME	Fairway		
DATE STARTED	1/17/17	GROUND ELEV.	2210	BORING DESIG.	BH-09
DATE FINISHED	1/17/17	GW DEPTH (FT)	18	LOGGED BY	TM, JC
DRILLER	2R	DRIVE WT.	140 lbs	NOTE	
TYPE OF DRILL RIG	Hollow Stem Auger	DROP	30 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
	2210				ML	**ALLUVIUM** (Qal): SANDY SILT, very fine grained, yellowish tan, dry to slightly moist, soft.				
5	2205									
10	2200					@ 10.0 ft. some Clay.				
15	2195									
						@ 18.0 ft. Groundwater Encountered.				
20	2190	R	9		CL	@ 20.0 ft. SANDY CLAY, tan, wet, soft, with Silt.	20.4	104	93	
25	2185	R	11			@ 25.0 ft. No Recovery.				
						TOTAL DEPTH 26.0 FEET GROUNDWATER ENCOUNTERED AT 18.0 FEET NO CAVING OBSERVED				

SAMPLE TYPES:
- C CONTINUOUS CORE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

APPENDIX B-2

Previous Subsurface Investigation (PSE, 2007)

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions		grf	ltr	Description
Coarse Grained Soils (More than 50% retained on No. 200 sieve)	Gravel and Gravelly Soils (More than 50% of coarse fraction retained on No. 4 sieve)		GW	Well-graded gravels or gravel sand mixtures, little or no fines
			GP	Poorly-graded gravels or gravel sand mixture, little or no fines
			GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	Sand and Sandy Soils (More than 50% of coarse fraction passes No. 4 sieve)		SW	Well-graded sands or gravelly sands, little or no fines
			SP	Poorly-graded sands or gravelly sands, little or no fines
			SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, and-clay mixtures

Major Divisions		grf	ltr	Description
Fine Grained Soils (Less than 50% passes No. 200 sieve)	Silts And Clays LL < 50		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and organic silt-clays of low plasticity
	Silts And Clays LL > 50		MH	Inorganic silts, micaceous or diatomaceous fine or silty soils, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat and other highly organic soils

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

PARTICLE SIZE LIMITS

U.S. STANDARD SERIES SIEVE — 200, 40, 10, 4
CLEAR SQUARE SIEVE OPENINGS — 3/4", 3", 12"

Silts and Clays	Sand			Gravel		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

RELATIVE DENSITY

Sands and Gravels	Blows/Foot (SPT)
Very Loose	< 4
Loose	4 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

CONSISTENCY CLASSIFICATION

Silts and Clays	Criteria
Very Soft	Thumb penetrates soil >1 in.
Soft	Thumb penetrates soil 1 in.
Firm	Thumb penetrates soil 1/4 in.
Stiff	Readily indented with thumbnail
Very Stiff	Thumbnail will not indent soil

HARDNESS

Bedrock
Soft
Moderately Hard
Hard
Very Hard

LABORATORY TESTS

Symbol	Test
DS	Direct Shear
DSR	Direct Shear (Remolded)
CON	Consolidation
SA	Sieve Analysis
MAX	Maximum Density
RV	Resistance (R) Value
EI	Expansion Index
SE	Sand Equivalent
AL	Atterberg Limits
CHEM	Chemical Analysis
HY	Hydrometer Analysis

SOIL MOISTURE

Increasing Visual Moisture Content

- Dry - Dry to touch
- Moist - Damp, but no visible free water
- Wet - Visible free water

SIZE PROPORTIONS

Trace - < 5 %

Few - 5 to 10 %

Some - 15 to 25 %

KEY TO EXPLORATORY BORING LOGS

PACIFIC SOILS ENGINEERING, INC.

PLATE B

GEOTECHNICAL BORING LOG

PROJECT NO. 700003-G4
DATE STARTED 5/12/03
DATE FINISHED 5/12/03
DRILLER JET
TYPE OF DRILL RIG 6" Hollow-Stem Auger

PROJECT NAME Fairway Canyon, Phase 4
GROUND ELEV. 2278
GW DEPTH (FT)
DRIVE WT. 140 lbs.
DROP 30 in.

BORING DESIG. B-08
LOGGED BY SJD
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SM	**TOPSOIL** (No Map Symbol): SILTY SAND, fine-grained, brown, slightly moist				
					SM	**ALLUVIUM** (Qal): SILTY SAND, fine- to coarse-grained, trace CLAY, trace GRAVEL, brown, slightly moist, moderately dense				
	2275									
5		R	9				8.9	111	48	
	2270	R	14				8.7	103	38	
10		R	12			@ 10 ft. fine-grained, some CLAY, slightly porous	9.0	110	47	CON, HY
	2265									
15		R	13			@ 15.0 ft. tan caliche stringers.	8.4	108	42	
	2260									
20		R	17				8.7	117	55	CON, HY
	2255									
25		R	20			@ 25.0 ft. dense	3.5	122	26	
	2250									
30		R	41			**SAN TIMOTEO FORMATION** (QTst): SANDSTONE, fine to coarse-grained, trace GRAVEL, light brown, moderately hard	9.4	117	60	CON, HY
	2245									
35		R	56			@ 35.0 ft. SILTY SANDSTONE, fine to coarse-grained, with fine to coarse GRAVEL, light brown, slightly moist, moderately hard to hard.	12.2	108	60	
						TOTAL DEPTH 36 FEET NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

PACIFIC SOILS ENGINEERING, INC.

GEOTECHNICAL BORING LOG

PROJECT NO. 700003-G4
DATE STARTED 5/12/03
DATE FINISHED 5/12/03
DRILLER JET
TYPE OF DRILL RIG 6" Hollow-Stem Auger

PROJECT NAME Fairway Canyon, Phase 4
GROUND ELEV. 2242
GW DEPTH (FT) 34
DRIVE WT. 140 lbs.
DROP 30 in.

BORING DESIG. B-11
LOGGED BY SJD
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
0	2242				SM	TOPSOIL (No Map Symbol): SILTY SAND, fine to coarse-grained, trace GRAVEL, brown, moist, loose				
2	2240				SM	ALLUVIUM (Qal): (Qal): SILTY SAND, fine to coarse-grained, trace GRAVEL, brown, slightly moist, medium dense, slightly porous				
5		R	23				6.4	118	42	
	2235									
		R	21				7.7	106	36	CON, HY
10		R	20			@ 10.0 ft. tan caliche stringers	6.8	114	40	
	2230									
15		R	15				7.7	108	39	
	2225									
20		R	24			@ 20.0 ft. moist.	10.6	115	65	
	2220									
25		R	18				11.6	109	59	CON, HY
	2215									
30		R	42			SAN TIMOTEO FORMATION (QTst): SILTY SANDSTONE, fine to coarse-grained, trace CLAY, reddish-brown, very moist, moderately hard	13.3	117	85	
	2210									
34						@ 34 ft. - groundwater encountered				
35		R	38				20.9	104	95	
	2205									
40		S	11,18,20			@ 40.0 ft. olive brown to grayish brown, wet.				
41						@ 41.0 ft. SILTSTONE, olive brown to olive gray, wet, moderately hard.				
						TOTAL DEPTH 41.5 FEET GROUNDWATER ENCOUNTERED @ 34 FEET				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

PACIFIC SOILS ENGINEERING, INC.

GEOTECHNICAL BORING LOG

PROJECT NO.	700003-G4	PROJECT NAME	Fairway Canyon, Phase 4
DATE STARTED	5/12/03	GROUND ELEV.	2288
DATE FINISHED	5/12/03	GW DEPTH (FT)	
DRILLER	JET	DRIVE WT.	140 lbs.
TYPE OF DRILL RIG	6" Hollow-Stem Auger	DROP	30 in.

BORING DESIG. B-12
LOGGED BY SJD
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SM	**TOPSOIL** (No Map Symbol): SILTY SAND, fine to coarse-grained, brown, slightly moist, moderately dense				
	2285				SM	**ALLUVIUM** (Qal): SILTY SAND, fine to coarse-grained, mostly fine-grained, trace CLAY, trace fine GRAVEL, brown, slightly moist				
5		R	12			@ 5.0 ft. moderately dense.	9.8	116	60	
		B								MAX, DSR, HY
	2280	R	29			@ 7.5 ft. tan caliche stringers	4.8	105	22	CON, HY
10		R	27				3.4	108	17	
	2275									
15		R	62		ML	@ 15.0 ft. SANDY SILT, fine-grained SAND, light brown, several tan caliche stringers, slightly moist, stiff	8.3	107	40	CON, HY
	2270									
20		R	38		SM	@ 20.0 ft. SILTY SAND, fine to coarse-grained , with fine to coarse GRAVEL, light brown, dry to slightly moist, dense	3.9	117	25	
	2265									
25		R	35		ML	@ 25.0 ft. SANDY SILT, fine-grained SAND, light brown, caliche stringers, slightly moist, very stiff	7.9	108	40	CON, HY
	2260									
30		R	48		SM	@ 30.0 ft. SILTY SAND, fine to coarse-grained, with fine to coarse gravel, light brown, dry, dense	3.1	117	20	

TOTAL DEPTH 31 FEET
NO GROUNDWATER ENCOUNTERED

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

PACIFIC SOILS ENGINEERING, INC.

GEOTECHNICAL BORING LOG

PROJECT NO.	700003-G4	PROJECT NAME	Fairway Canyon, Phase 4
DATE STARTED	5/12/03	GROUND ELEV.	2300
DATE FINISHED	5/12/03	GW DEPTH (FT)	
DRILLER	JET	DRIVE WT.	140 lbs.
TYPE OF DRILL RIG	6" Hollow-Stem Auger	DROP	30 in.

BORING DESIG. B-13
LOGGED BY SJD
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
	2300				SM	**ALLUVIUM** (Qal): SILTY SAND, fine to coarse-grained, mostly fine-grained, brown, slightly moist				
5	2295	R	19			@ 5.0 ft. some fine to coarse GRAVEL, caliche stringers, medium dense	8.1	108	40	
		R	13				7.8	106	37	
10	2290	R	14			@ 20.0 ft. brown to light brown	9.5	113	54	CON, HY
15	2285	R	23				10.4	110	54	
20	2280	R	20				12.7	101	52	
25	2275	R	29				4.6	110	24	CON, HY
30	2270	R	56			**SAN TIMOTEO FORMATION** (QTst): SILTY SANDSTONE, fine to coarse-grained, some fine to coarse GRAVEL, light brown, slightly moist, moderately hard.	9.9	115	60	
						TOTAL DEPTH 31 FEET NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

PACIFIC SOILS ENGINEERING, INC.

GEOTECHNICAL BORING LOG

PROJECT NO.	700003-G4	PROJECT NAME	Fairway Canyon, Phase 4		
DATE STARTED	5/13/03	GROUND ELEV.	2255	BORING DESIG.	B-14
DATE FINISHED	5/13/03	GW DEPTH (FT)	34	LOGGED BY	SJD
DRILLER	JET	DRIVE WT.	140 lbs.	NOTE	
TYPE OF DRILL RIG	6" Hollow-Stem Auger	DROP	30 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
	2255				SM	**TOPSOIL** (No Map Symbol): SILTY SAND, fine to coarse-grained, loose				
					SM	**ALLUVIUM** (Qal): SILTY SAND, fine to coarse-grained, trace CLAY, brown, moist, medium dense				
		B								
5	2250	R	14				10.6	117	68	
		R	25			@ 7.5 ft. some fine to coarse GRAVEL, reddish-brown, slightly moist, porous, pores to 1/8"	6.7	113	39	
10	2245	R	22				6.8	117	43	CON, HY
15	2240	R	22			@ 15.0 ft. caliche stringers.	7.6	111	41	
20	2235	R	23				8.7	109	44	
25	2230	R	26				6.8	112	38	
30	2225	R	44			@ 30.0 ft. trace CLAY, trace fine GRAVEL	10.2	120	72	
						@ 34 ft. - groundwater encountered				
35	2220	R	8		SC	@ 35.0 ft. CLAYEY SAND, fine grained, trace medium to coarse-grained, brown, wet, moderately dense	26.9	100	98	
	2215					Continued.				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

PACIFIC SOILS ENGINEERING, INC.

GEOTECHNICAL BORING LOG

PROJECT NO.	700003-G4	PROJECT NAME	Fairway Canyon, Phase 4		
DATE STARTED	5/13/03	GROUND ELEV.	2255	BORING DESIG.	B-14
DATE FINISHED	5/13/03	GW DEPTH (FT)	34	LOGGED BY	SJD
DRILLER	JET	DRIVE WT.	140 lbs.	NOTE	
TYPE OF DRILL RIG	6" Hollow-Stem Auger	DROP	30 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
	2215	R	21		SM	**ALLUVIUM** (Qal): Continued: SILTY SAND, fine to coarse-grained, trace fine GRAVEL, trace CLAY, brown, wet, moderately dense	17.8	112	96	
45	2210	R	23		SC	@ 45.0 ft. CLAYEY SAND, fine to coarse-grained, trace GRAVEL, brown, wet	16.7	113	96	
						TOTAL DEPTH 46 FEET GROUNDWATER ENCOUNTERED @ 34 FEET				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

PACIFIC SOILS ENGINEERING, INC.

GEOTECHNICAL BORING LOG

PROJECT NO. 700003-G4
DATE STARTED 5/13/03
DATE FINISHED 5/13/03
DRILLER JET
TYPE OF DRILL RIG 6" Hollow-Stem Auger

PROJECT NAME Fairway Canyon, Phase 4
GROUND ELEV. 2236
GW DEPTH (FT) 21
DRIVE WT. 140 lbs.
DROP 30 in.

BORING DESIG. B-15
LOGGED BY SJD
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
0	2235				ML	**TOPSOIL** (No Map Symbol): SANDY SILT, brown, moist				
		B			ML	**ALLUVIUM** (Qal): SANDY SILT, brown, moist				
5	2230	R	21		CL	@ 5.0 ft. SANDY CLAY, mottled brown, olive brown, moist, stiff	15.6	97	59	
		R	24		CL	@ 7.5 ft. SILTY CLAY, trace SAND, mottled brown, olive brown, moist, stiff, slightly porous, 1/8" pores	17.2	94	59	CON, HY
10	2225	R	20		CL	@ 10.0 ft. CLAY, trace SAND, mottled brown, olive brown, moist, stiff, slightly porous, 1/8" pores	20.2	102	87	
15	2220	R	20			@ 15.0 ft. brown, very moist	20.6	101	86	
20	2215	S	3,3,3		SM	@ 20.0 ft. SILTY SAND, fine to coarse grained, some CLAY, brown, very moist to wet @ 21 ft. - groundwater encountered				HY
25	2210	R	35			@ 25.0 ft. brown, wet, dense, trace gravel.	15.6	119	94	
30	2205	S	17,27,18			@ 30.0 ft. fine-grained, some medium to coarse-grained, trace GRAVEL, some CLAY, brown to reddish-brown, wet.				
35	2200	R	92			@ 35 ft. - No Recovery				
						TOTAL DEPTH 36 FEET GROUNDWATER ENCOUNTERED @ 21 FEET				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

PACIFIC SOILS ENGINEERING, INC.

GEOTECHNICAL BORING LOG

PROJECT NO. 700003-G4
DATE STARTED 5/13/03
DATE FINISHED 5/13/03
DRILLER JET
TYPE OF DRILL RIG 6" Hollow-Stem Auger

PROJECT NAME Fairway Canyon, Phase 4
GROUND ELEV. 2220
GW DEPTH (FT) 20
DRIVE WT. 140 lbs.
DROP 30 in.

BORING DESIG. B-16
LOGGED BY SJD
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
0	2220				ML	**TOPSOIL** (No Map Symbol): SANDY SILT, fine-grained SAND, mottled brown, olive brown, moist				
					ML	**ALLUVIUM** (Qal): SANDY SILT, fine-grained SAND, mottled brown, olive brown, moist				
		B								
5	2215	R	20			@ 5.0 ft. stiff, slightly porous	10.4	94	37	
		R	22				10.4	103	46	
10	2210	R	18				17.7	104	79	
15	2205	R	13			@ 15.0 ft. very moist, firm	17.4	109	89	CON, HY
20	2200	S	0,0,1			@ 20 ft. - groundwater encountered				
25	2195	R	6			@ 25.0 ft. wet, soft	18.7	113	96	
30	2190	S	0,1,1							
35	2185	R	10		SP	@ 35.0 ft. SAND, fine to coarse-grained, light grayish brown, wet, moderately dense	12.7	123	96	HY
	2180					Continued.				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

PACIFIC SOILS ENGINEERING, INC.

GEOTECHNICAL BORING LOG

PROJECT NO. 700003-G4
DATE STARTED 5/13/03
DATE FINISHED 5/13/03
DRILLER JET
TYPE OF DRILL RIG 6" Hollow-Stem Auger

PROJECT NAME Fairway Canyon, Phase 4
GROUND ELEV. 2220
GW DEPTH (FT) 20
DRIVE WT. 140 lbs.
DROP 30 in.

BORING DESIG. B-16
LOGGED BY SJD
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
	2180	S	7,9,11		SC	**ALLUVIUM** (Qal): Continued; CLAYEY SAND, fine-grained, with interbedded layers of fine to coarse-grained CLAYEY SAND, brown, wet, moderately dense				
45	2175	S	10,15,17		SM	@ 45.0 ft. SILTY SAND, fine to coarse grained, brown, wet medium dense.				
50	2170	S	10,17,19			@ 50.0 ft. interbedded layers of medium to coarse-grained SAND with SILT				
						TOTAL DEPTH 51 FEET GROUNDWATER ENCOUNTERED @ 20 FEET				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE   T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR   RS: RUPTURE SURFACE

PACIFIC SOILS ENGINEERING, INC.

GEOTECHNICAL BORING LOG

PROJECT NO.	700003-G4	PROJECT NAME	Fairway Canyon, Phase 4		
DATE STARTED	11/30/06	GROUND ELEV.	2392	BORING DESIG.	BA-63
DATE FINISHED	12/1/06	GW DEPTH (FT)		LOGGED BY	FE
DRILLER	Ledezma	DRIVE WT.	See Note	NOTE	0-24'=3548 lbs 24-47'=2577 lbs 47-73'=1648 lbs
TYPE OF DRILL RIG	30" Bucket Auger	DROP	12 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
						SAN TIMOTEO FORMATION(QTst): Continued.				
	2345									
50		R	17				10.8	121	79	
	2340					@ 52.0 ft. common discontinuous cemented beds, fine to coarse grained. @ 53.0 ft.fine to coarse grained.				
55										
	2335									
60		R	18			@ 60.0 ft. fine grained, light medium brown, moist, moderately hard to hard, some fine gravel sized concretions, micaceous, massive.	15.8	119	92	
	2330									
65										
	2325									
70		R	20				12.1	125	90	DS, HY
	2320					@ 73.0 fine to coarse grained, common fine gravel.				
75										
	2315					@ 76.0 becoming fine SANDY SILTSTONE to SILTY fine SANDSTONE, light orange brown, moist, moderately hard, massive, trace fine gravel.				
80		R	40 FOR 7"				20.4	107	98	
						TOTAL DEPTH 80.6 FT NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

PACIFIC SOILS ENGINEERING, INC.

GEOTECHNICAL BORING LOG

PROJECT NO. 700003-G4
DATE STARTED 12/1/06
DATE FINISHED 12/1/06
DRILLER Ledezma
TYPE OF DRILL RIG 30" Bucket Auger

PROJECT NAME Fairway Canyon, Phase 4
GROUND ELEV. 2297
GW DEPTH (FT)
DRIVE WT. See Note
DROP 12 in.

BORING DESIG. BA-64
LOGGED BY FE
NOTE 0-24'=3548 lbs
24-47'=2577 lbs
47-73'=1648 lbs

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SM	**ALLUVIUM**(Qal): SILTY SAND, fine to medium grained, medium brown, slightly moist to moist, loose, rootlets.				
	2295									
						@ 3.0 ft. trace fine gravel.				
5		R	PUSH				7.8	104	35	
	2290					@ 6.0 ft. common fine gravel, trace of small cobbles.				
						@ 8.5 ft. fine to coarse gravel, trace of small cobbles.				
10		R	1				8.5	110	45	
	2285									
15		R	PUSH			@ 15.0 ft. highly porous, fine rootlets, trace calcium carbonate, slightly moist.	11.4	96	42	CON, HY
	2280									
20		R	1			@ 20.0 ft. loose to moderately dense, slightly porous.	7.4	95	26	
	2275									
25		R	2				8.0	99	32	
	2270					@ 26.0 ft fine to moderately grained, highly porous.				
30		R	3			@ 30.0 ft. slightly porous, slightly moist to moist, moderately dense, trace fine gravel.	8.7	99	34	CON, HY
	2265	B								
						@ 34.0 ft. drilling is more difficult.				
35		R	7			**SAN TIMOTEO FORMATION**(QTst): SILTY SANDSTONE, fine grained, light orange, brown, slightly moist to moist, moderately hard, moderately weathered.	7.3	115	44	CON, HY
	2260									
40		~~R~~	3 FOR 3"			@ 40.0 ft. slightly weathered.				
						TOTAL DEPTH 40.4 FT NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
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PACIFIC SOILS ENGINEERING, INC.

PLATEB-42

GEOTECHNICAL BORING LOG

PROJECT NO.	700003-G4	PROJECT NAME	Fairway Canyon, Phase 4
DATE STARTED	12/6/06	GROUND ELEV.	2370
DATE FINISHED	12/6/06	GW DEPTH (FT)	
DRILLER	Ledezma	DRIVE WT.	See Note
TYPE OF DRILL RIG	30" Bucket Auger	DROP	12 in.

BORING DESIG. BA-70
LOGGED BY FE
NOTE 0-24'=3548 lbs
24-47'=2577 lbs
47-73'=1648 lbs

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
	2370				SM	**ALLUVIUM**(Qal): SILTY SAND, yellow brown, slightly moist, loose, fine to coarse gravel, visible porosity.				
		R	PUSH				10.0	100	41	
5	2365									
						@ 8.0 ft. some CLAY				
10	2360	R	PUSH		SM/ML	@ 10.0 ft. SANDY SILT to SILTY SAND, light grey, light yellow brown to brown, soft, some carbonate staining.	12.9	105	59	CON, HY
15	2355					@ 15.0 ft. moist, some CLAY.				
20	2350	R	1			@ 20.0 ft. medium yellow brown, moist, loose to moderately dense, fine to very fine grained.	14.3	102	62	CON, HY
		B								
25	2345									
					SM	@ 27.0 ft. SILTY SAND, light yellow brown, moist, moderately dense, fine to medium gravel, some subrounded quartzite clasts to 2" in diameter.				
30	2340	R	2			@ 30.0 ft. abundant subangular gravel to 1/4" in diameter.	9.3	111	50	
35	2335									
						@ 38.0 ft. moist to very moist.				
	2330					Continued.				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

PACIFIC SOILS ENGINEERING, INC.

GEOTECHNICAL BORING LOG

PROJECT NO.	700003-G4	PROJECT NAME	Fairway Canyon, Phase 4
DATE STARTED	12/6/06	GROUND ELEV.	2370
DATE FINISHED	12/6/06	GW DEPTH (FT)	
DRILLER	Ledezma	DRIVE WT.	See Note
TYPE OF DRILL RIG	30" Bucket Auger	DROP	12 in.

BORING DESIG. BA-70
LOGGED BY FE
NOTE 0-24'=3548 lbs
24-47'=2577 lbs
47-73'=1648 lbs

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
	2330					**ALLUVIUM**(Qal): Continued; @ 40.0 ft. some subrounded quartzite clasts to 3" in diameter.				
45	2325				ML	@ 45 ft. SANDY SILT, medium yellow brown, very moist, fine to coarse grained SAND, some CLAY, moderately dense.				
50	2320					**SAN TIMOTEO FORMATION**(QTst): fine SANDY SILTSTONE, gray brown, orange, 1" oxide staining, moist, moderately hard.				
						TOTAL DEPTH 51.0 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED.				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

PACIFIC SOILS ENGINEERING, INC.

PLATEB-48

GEOTECHNICAL BORING LOG

PROJECT NO.	700003-G4	PROJECT NAME	Fairway Canyon, Phase 4		
DATE STARTED	12/6/06	GROUND ELEV.	2298	BORING DESIG.	BA-72
DATE FINISHED	12/6/06	GW DEPTH (FT)		LOGGED BY	FE
DRILLER	Ledezma	DRIVE WT.	See Note	NOTE	0-24'=3548 lbs 24-47'=2577 lbs 47-73'=1648 lbs
TYPE OF DRILL RIG	30" Bucket Auger	DROP	12 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
0	2298				SM	**ALLUVIUM**(Qal): SILTY SAND, light yellow brown, slightly moist, loose.				
2	2295									
5										
7	2290									
10		R	1				9.1	100	37	
12	2285									
15						@ 15.0 ft moist.				
17	2280									
20		R B	1		SP	@ 20.0 GRAVELLY SAND, light grey, dry to slightly moist, moderately dense, fine to coarse grained.	6.1	104	27	CON, HY
22	2275									
24						@ 24.0 ft. some subangular gravel to 2" in diameter.				
25										
27	2270					**SAN TIMOTEO FORMATION**(QTst): fine to medium grained SANDSTONE, light grey, dry, moderately hard, some SILT.				
29		R	8				2.9	114	17	
30						TOTAL DEPTH 30.0 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

PACIFIC SOILS ENGINEERING, INC.

GEOTECHNICAL BORING LOG

PROJECT NO.	700003-G4	PROJECT NAME	Fairway Canyon, Phase 4		
DATE STARTED	12/7/06	GROUND ELEV.	2377	BORING DESIG.	BA-73
DATE FINISHED	12/7/06	GW DEPTH (FT)		LOGGED BY	FE
DRILLER	Ledezma	DRIVE WT.	See Note	NOTE	0-24'=3548 lbs 24-47'=2577 lbs 47-73'=1648 lbs
TYPE OF DRILL RIG	30" Bucket Auger	DROP	12 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
	2375					**SAN TIMOTEO FORMATION**(QTst): CLAYEY SANDSTONE, brownish red, dry, highly weathered, fine to coarse grained, some subrounded granitic clasts to 2" in diameter, abundant roots.				
5						@ 3.0 ft. CONGLOMERATE, subrounded metamorphic clasts to 1" in diameter in a silty fine to coarse gravel SANDSTONE matrix, slightly moist, hard.				
	2370					@ 5.5 ft. SILTY SANDSTONE, light grey, fine gravel, moist, hard, poorly bedded. @ 6.0 ft. N60W, 15 NE bedded.				
10		R	7 FOR 6"			@ 9.0 ft. grades to fine SANDY SILTSTONE, light grey, massive, slightly fractured carbonates along fractures.	22.2	103	96	
	2365									
15										
	2360	B				@ 16.0 ft. E-W, 8N, 2" to 8" thick carbonate cement SANDSTONE bed (concretion) very hard, white, very fine gravel. @ 16.0 ft. SILTY SANDSTONE, light yellow brown, fine grained, massive, some gravely sand lenses.				DSR, MAX, EI, HY, CHEM
20						@ 20.0 ft. fine SANDY SILTSTONE, light yellow brown, very hard, massive, some CLAY.				
	2355									
25										
	2350					@ 26.0 ft. N75W, 22NE, bedding black mangane oxide under iron oxide staining, fine to medium grained SAND, leave 1.5" thick over CLAYEY SILTSTONE. @ 27.0 ft. CLAYEY SILTSTONE, olive grey to grey brown, hard, massive.				
30		R	14 FOR 6"				8.8	129	82	DS, HY
	2345					@ 32.0 ft. grades to SILTY SANDSTONE.				
35						@ 35.0 ft. some GRAVEL.				
	2340					@ 36.0 ft. SANDSTONE, light grey, fine to medium grey, hard, some gravely SAND lenses, 2.0 ft. thick grades clasts, subrounded to 0.5".				
						Continued.				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

- GROUNDWATER
- SEEPAGE
- J: JOINTING C: CONTACT
- B: BEDDING F: FAULT
- S: SHEAR RS: RUPTURE SURFACE

PACIFIC SOILS ENGINEERING, INC.

GEOTECHNICAL BORING LOG

PROJECT NO.	700003-G4	PROJECT NAME	Fairway Canyon, Phase 4
DATE STARTED	12/7/06	GROUND ELEV.	2377
DATE FINISHED	12/7/06	GW DEPTH (FT)	
DRILLER	Ledezma	DRIVE WT.	See Note
TYPE OF DRILL RIG	30" Bucket Auger	DROP	12 in.

BORING DESIG. BA-73
LOGGED BY FE
NOTE 0-24'=3548 lbs
24-47'=2577 lbs
47-73'=1648 lbs

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
						SAN TIMOTEO FORMATION(QTst): Continued.				
	2335									
45						@ 44.0 ft. N80W, 18NE bedding.				
						@ 44.0 ft. CLAYEY SILTSTONE, light olive grey, moist, hard, massive.				
	2330	R	8			@ 47.0 ft. grades to fine SANDY SILTSTONE, grey brown, moist, very hard.	20.6	104	92	DS, HY
50						@ 50.0 ft. iron oxide staining.				
	2325					@ 52.0 ft. grading in and out fine CLAYEY SILTSTONE, to fine SANDY SILTSTONE, very hard, moist, massive to very poorly bedded.				
55						@ 54.0 ft. N70W, 20 NE approximate bedding.				
	2320					@ 57.0 ft. CONGLOMERATE, subangular metamorphic clasts to 0.5" in diameter in a silty fine to coarse grained SANDSTONE matrix, hard, massive.				
60						@ 59.0 ft. subrounded to rounded shist clasts to 5" in diameter.				
	2315									

TOTAL DEPTH 62.0 FT.
NO GROUNDWATER ENCOUNTERED
REFUSAL ON ROUNDED COBBLES TO 4" IN DIAMETER

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE   T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR   RS: RUPTURE SURFACE

PACIFIC SOILS ENGINEERING, INC.

TABLE I cont.

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
TP-7	0 – 6.5	SM	**ALLUVIUM (Qal):** SILTY SAND, brown, moist, medium dense to dense @ 3 ft. – dense @ 4 ft. – trace fine random calcium carbonate stringers
	6.5 – 11.5		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine-grained, tannish-brown, highly fractured, calcium carbonate cementation, pervasive carbonate weathering/stringers @ 10.5 ft. grayish-brown, moderately hard, moderately cemented TOTAL DEPTH 11.5 FEET NO GROUNDWATER ENCOUNTERED
TP-8	0 – 17.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained, (predominantly fine-grained), brown, moist, loose to medium dense, Some small roots to 6', trace to some pinhole porosity @ 7.0 ft. dense, some pinhole porosity @ 12.0 ft. very dense TOTAL DEPTH 17 FEET NO GROUNDWATER ENCOUNTERED

TABLE I cont.

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
TP-12	0 – 8.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained, (predominantly fine-grained), trace fine to coarse GRAVEL, brown, moist, medium dense, some small roots to 5' some pinhole porosity @ 3 ft. – dense, pinhole porosity continues
	8.0 – 13.5		**SAN TIMOTEO FORMATION (QT_{ST}):** SILTY SANDSTONE, fine-grained, tannish-brown, highly weathered, weak, massive, weakly cemented (calcium carbonate cement), highly fractured, pervasive carbonate stringers @ 11.0 ft. grayish-brown, moderately hard, fine-to medium-grained. TOTAL DEPTH 13.5 FEET NO GROUNDWATER ENCOUNTERED
TP-13	0 – 19.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained, (predominantly fine-grained), trace fine to coarse GRAVEL, brown, moist, loose to medium dense, some pinhole porosity, roots to 5 ft.
		SP	@ 12.0 ft. grades to GRAVELLY SAND, some fine to coarse GRAVEL, small to large cobbles, (rounded to sub-angular), very dense, pinhole porosity TOTAL DEPTH 19 FEET NO GROUNDWATER ENCOUNTERED

TABLE I cont.

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
TP-14	0 – 10.5	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained, (predominantly fine-grained), brown, moist, medium dense, trace to some pinhole porosity @ 8.0 ft. dense, pinhole porosity, trace fine to coarse GRAVEL and small cobbles (rounded to sub-angular)
	10.5 – 13.0		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine-grained, tannish-brown, highly weathered, soft, massive, highly fractured, weakly cemented, pervasive calcium carbonate stringers @ 12.0 ft. grayish-brown, moderately hard, moderately well-cemented TOTAL DEPTH 13 FEET NO GROUNDWATER ENCOUNTERED
TP-15	0 – 2.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-grained, brown, moist, medium dense, trace to some small randomly oriented calcium carbonate stringers
	2.0 – 5.5		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine-grained, light yellow-brown, moderately hard to soft, massive, highly fractured, some calcium carbonate stringers to 2.5 ft. @ 2.5 ft. grayish-brown, some carbonate development, moderately hard.. TOTAL DEPTH 5.5 FEET NO GROUNDWATER ENCOUNTERED

TABLE I cont.

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
TP-16	0 – 13.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained, (predominantly fine-grained), brown, moist, medium dense, some pinhole porosity, trace voids (<1mm) @ 6.0 ft. dense, some small, randomly oriented calcium carbonate stringers, pinhole porosity continues
	13.0 – 14.0		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine-grained, light yellow-brown, soft to moderately hard, massive, moderately fractured, pervasive calcium carbonate stringers @ 14 ft. - grayish brown, moderately hard, no calcium carbonated stringers TOTAL DEPTH 14 FEET NO GROUNDWATER ENCOUNTERED
TP-17	0 – 3.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-grained, brown, slightly moist, loose, trace pinhole porosity
	3.0 – 6.0		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine-grained, light yellow-brown, slightly moist, soft to moderately hard, massive, highly fractured, slightly cemented (calcium carbonate cementation) @ 3.5 ft. (fine-to medium-grained) grayish-brown, no carbonates @ 6 ft. – moderately hard, moderately well-cemented, moderately fractured TOTAL DEPTH 6 FEET NO GROUNDWATER ENCOUNTERED

TABLE I cont.

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
TP-20	0 – 6.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained, (predominantly fine-grained), trace fine to coarse GRAVEL (rounded to sub-rounded), brown, moist, medium dense, trace to some pinhole porosity, @ 6.0 ft. dense
	8.0 – 9.0		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine-grained, grayish-brown, soft to moderately hard, massive, moderately fractured @ 9 ft. - fine-to medium-grained
			TOTAL DEPTH 9 FEET NO GROUNDWATER ENCOUNTERED
TP-21	0 – 9.5	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained (predominantly fine-grained), trace fine to coarse GRAVEL and small cobbles (rounded to sub-rounded), brown, moist, medium dense, trace to some pinhole porosity; trace voids (<1mm) @ 6 ft. - dense,
			TOTAL DEPTH 9.5 FEET NO GROUNDWATER ENCOUNTERED

TABLE I cont.

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
TP-22	0 – 4.0	SP	**ALLUVIUM (Qal):** SAND; fine to coarse-grained, some silt and GRAVEL (round to sub-rounded), brown/reddish-brown, slightly moist, dense, trace small cobbles
	4.0 – 7.0		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine-to medium-grained, grayish-brown, moderately hard, massive, moderately fractured, no carbonate development
			TOTAL DEPTH 7 FEET NO GROUNDWATER ENCOUNTERED

- -

Test Pit No.	Depth (ft.)	USCS	Description
TP-23	0 – 4.5	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-grained, trace fine to coarse GRAVEL (rounded to sub-rounded), brown, slightly moist, medium dense, trace to some pinhole porosity
		SP	@ 3.0 ft. SAND; fine-to medium-grained, brown, medium dense, some silt and fine, randomly oriented calcium carbonate stringers
	4.5 – 9.0		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine-to medium-grained, grayish-brown, massive, soft to moderately hard, slightly fractured, some small randomly oriented calcium carbonate stringers extending to 6'
			@ 7.0 ft. moderately hard, calcium carbonate stringers extending to 8', oxidized
			TOTAL DEPTH 9 FEET NO GROUNDWATER ENCOUNTERED

TABLE I cont.

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
TP-24	0 – 8.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained, brown, moist, medium dense, trace small roots to 5', trace to some pinhole porosity, trace voids to (<1mm)
			@ 8.0 ft. dense
	12.0 – 14.0		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine-to medium-grained, grayish-brown, soft to moderately hard, poorly bedded, moderately fractured.
			@ 13.0 ft. moderately hard
			TOTAL DEPTH 14 FEET NO GROUNDWATER ENCOUNTERED

- -

Test Pit No.	Depth (ft.)	USCS	Description
TP-25	0- 2.5	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-grained, brown, moist, medium dense, trace pinhole porosity
	2.5 – 6.0		**SAN TIMOTEO FORMATION (QTst):** SILTSTONE, grayish-brown, soft to moderately hard, poorly bedded, highly fractured, pervasive calcium carbonate stringers to 4 ft.
			@ 4.0 ft. grayish-brown, soft to moderately hard, no calcium carbonate development, @ 5 ft. N83W, 39SW – approximate bedding @ 6.0 ft. moderately hard
			TOTAL DEPTH 6 FEET NO GROUNDWATER ENCOUNTERED

TABLE I cont.

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
TP-26	0 – 14.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained, (predominantly fine-grained), trace fine to coarse GRAVEL and rounded to sub-rounded (small cobbles), brown, moist, medium dense, trace to some pinhole porosity @ 6 ft. - dense
	14.0 – 15.0		**SAN TIMOTEO FORMATION (QTst):** SANDSTONE, medium-grained, brownish-gray, soft, moderately fractured, massive @ 15 ft. – moderately hard TOTAL DEPTH 15.0 FEET NO GROUNDWATER ENCOUNTERED

- -

Test Pit No.	Depth (ft.)	USCS	Description
TP-27	0 – 11.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained, (predominantly fine-grained), trace fine to coarse GRAVEL (rounded to sub-rounded), brown, moist, medium dense, some pinhole porosity @ 6.0 ft. dense, pinhole porosity continues
	11.0 – 12.5		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine-to medium-grained, light yellow-brown, poorly bedded to massive, moist, soft, highly fractured, pervasive calcium carbonate stringers @ 12.0 ft - grayish-brown, moderately hard, no calcium carbonate stringers. TOTAL DEPTH 12.5 FEET NO GROUNDWATER ENCOUNTERED NO CAVING

TABLE I cont.

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
TP-28	0 – 13.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-grained, trace fine to coarse GRAVEL (rounded to sub-rounded), brown, moist, medium dense, trace to some pinhole porosity, some fine roots to 5' @ 5.0 ft. moderately dense, pinhole porosity continues
	13.0 – 13.5		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine-grained, light yellow-brown, thickly bedded, moderately fractured, moderately hard, pervasive calcium carbonate stringers @ 13.5 ft. – refusal TOTAL DEPTH 13.5 FEET NO GROUNDWATER ENCOUNTERED NO CAVING

- -

Test Pit No.	Depth (ft.)	USCS	Description
TP-29	0 – 9.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained, trace fine to coarse GRAVEL (rounded to sub-rounded), brown, moist, medium dense, trace to some pinhole porosity, trace voids (<1mm)
	9.0 – 12.0		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine-grained, light yellow-brown, moist, thickly bedded to massive, soft, some calcium carbonate stringers @ 11 ft. grayish-brown, moderately hard, no calcium carbonate stringers TOTAL DEPTH 12 FEET NO GROUNDWATER ENCOUNTERED NO CAVING

TABLE I cont.

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
TP-32	0 – 4.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained, (predominantly fine-grained), trace fine to coarse GRAVEL, brown, slightly moist, medium dense, small cobbles, trace to some pinhole porosity, trace voids to 2mm, trace fine randomly oriented calcium carbonate stringers @ 4 ft. – dense
	4.0 – 16.0		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine to medium-grained, brownish-gray, moderately hard, slightly moist. @ 16 ft. – refusal TOTAL DEPTH 16 FEET NO GROUNDWATER ENCOUNTERED NO CAVING
TP-33	0 – 17.5	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained, trace fine to coarse GRAVEL (rounded to sub-rounded), brown, moist, medium dense, small cobbles, some pinhole porosity, some calcium carbonate stringers to 11 ft. @ 8 ft. – dense TOTAL DEPTH 17.5 FEET NO GROUNDWATER ENCOUNTERED NO CAVING

TABLE I cont.

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
TP-34	0 – 3.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained (predominantly fine-grained), trace fine to coarse GRAVEL, brown, moist, medium dense, trace to some pinhole porosity.
	3.0 – 11.0		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine-to medium-grained, grayish-brown, highly weathered, slightly moist, thickly bedded, soft, moderately fractured, moderately well-cemented, (calcium carbonate cement), pervasive calcium carbonate stringers
			@ 6.5 ft. moderately hard, some calcium carbonate stringers
			@ 8.0 ft. trace calcium carbonate stringers
			@ 10.0 ft. no calcium carbonate stringers TOTAL DEPTH 11 FEET NO GROUNDWATER ENCOUNTERED NO CAVING
TP-35	0 – 9.5	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained, trace fine to coarse GRAVEL, brown, slightly moist to moist, medium dense, small cobbles, some fine randomly oriented calcium carbonate stringers, trace to some pinhole porosity
	9.5 – 11.5		**SAN TIMOTEO FORMATION (QTst):** SANDY SILTSTONE, fine-grained, grayish-brown, moist, moderately hard, thinly bedded, moderately fractured, (iron oxide cementation), highly oxidized @ 11.5 ft. – refusal
			TOTAL DEPTH 11.5 FEET NO GROUNDWATER ENCOUNTERED NO CAVING

TABLE I cont.

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
TP-37	0 – 10.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained, trace fine to coarse GRAVEL (rounded to sub-rounded), brown, moist, medium dense, some pinhole porosity, trace voids to 3mm @ 2.5 ft. some fine randomly oriented calcium carbonate stringers @ 6.0 ft. abundant calcium carbonate stringers, some voids to 1mm, trace voids to 5mm, all calcium carbonate lined
	10.0 – 11.0		**SAN TIMOTEO FORMATION (QTst):** SILTSTONE, fine-grained, brown, highly weathered, moist, moderately hard, thinly bedded, moderately fractured, pervasive calcium carbonate stringers TOTAL DEPTH 11 FEET NO GROUNDWATER ENCOUNTERED NO CAVING
TP-38	0.0-13.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained (predominantly fine-grained), trace fine to coarse GRAVEL (rounded to sub-rounded), brown, moist, medium dense, trace to some pinhole porosity, trace voids to 2mm @ 2.0 ft. some calcium carbonate stringers, dense, pinhole porosity continues
	13.0-14.0		**SAN TIMOTEO FORMATION (QTst):** SANDY SILTSTONE, fine-grained, grayish-brown, highly weathered, moist, moderately hard, moderately bedded, moderately fractured, moderately cemented (calcium carbonate cement), pervasive calcium carbonate stringers, refusal @ 14.0 ft. TOTAL DEPTH 14 FEET NO GROUNDWATER ENCOUNTERED NO CAVING

TABLE I cont.

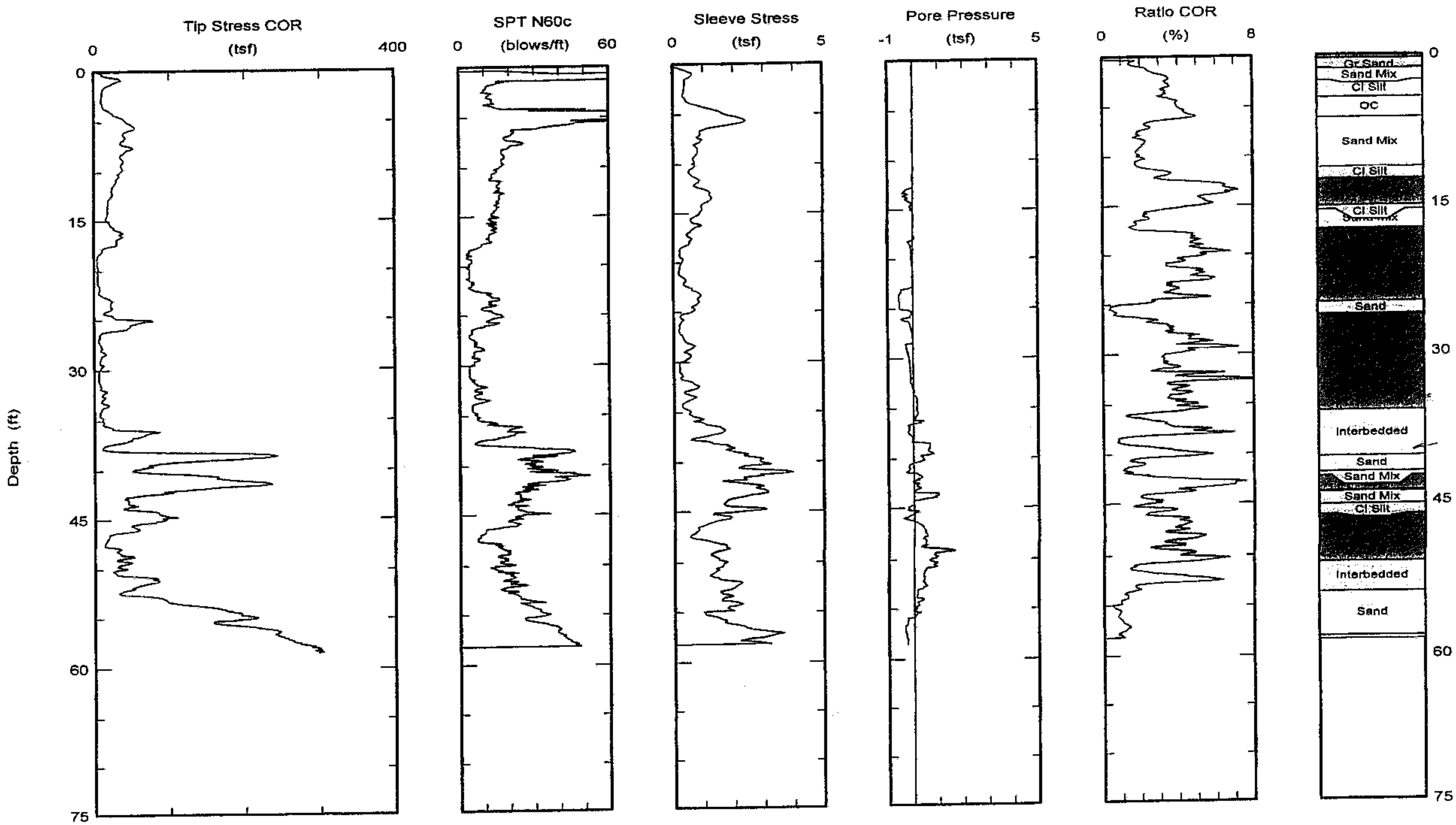
LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
TP-39	0 – 15.0	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained (predominantly fine-grained), trace fine to coarse GRAVEL (rounded to sub-rounded), brown, moist, medium dense, trace to some pinhole porosity.
		SP	@ 9.0 ft. GRAVELLY SAND, fine-to coarse-grained, grayish-brown, dry, dense, slightly cemented, some cobbles up to 6"
		SM	@ 12.0 ft. SILTY SAND, fine-to medium-grained, brown, moist, dense
	15.0 – 17.0		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine to medium-grained, grayish-brown, slightly moist, thickly bedded, highly fractured, some calcium carbonate stringers
			TOTAL DEPTH 17 FEET NO GROUNDWATER ENCOUNTERED NO CAVING

- -

Test Pit No.	Depth (ft.)	USCS	Description
TP-40	0 – 5.5	SM	**ALLUVIUM (Qal):** SILTY SAND, fine-to medium-grained, trace fine to coarse GRAVEL, brown, moist, medium dense, trace to some pinhole porosity
	5.5 – 12.0		**SAN TIMOTEO FORMATION (QTst):** SILTY SANDSTONE, fine to medium grained, light yellow-brown, dry to slightly moist, moderately hard, thickly bedded to massive, moderately fractured, some iron oxidation staining @12.0 ft.- light gray, hard, Refusal @ 12 ft. TOTAL DEPTH 12 FEET NO GROUNDWATER ENCOUNTERED NO CAVING

Kehoe Testing & Engineering Office: (714) 901-7220 Fax: (714) 901-7289 Email: skehoe@msn.com	Northing: Easting: Elevation: Client: Pacific Soils Site: Oak Valley, Beaumont	Date: 12/May/2003 Test ID: C-11 Project: Suncal



Maximum depth: 58.51 (ft)

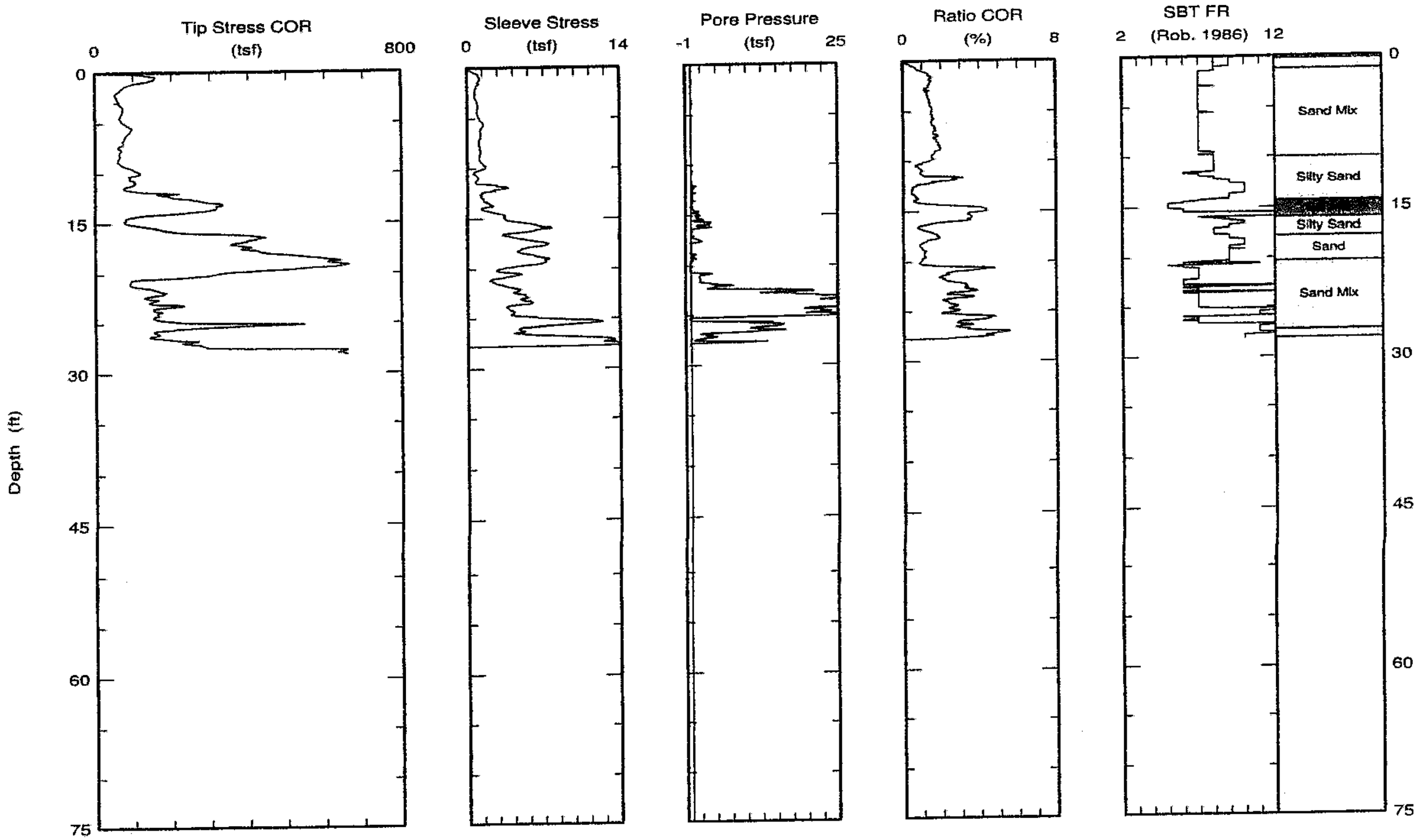
Test ID: C-11
File: C12Y0310C.ECP

Kehoe Testing & Engineering
Office: (714) 901-7270
Fax: (714) 901-7289
skehoe@msn.com

CPT Data
30 ton rig

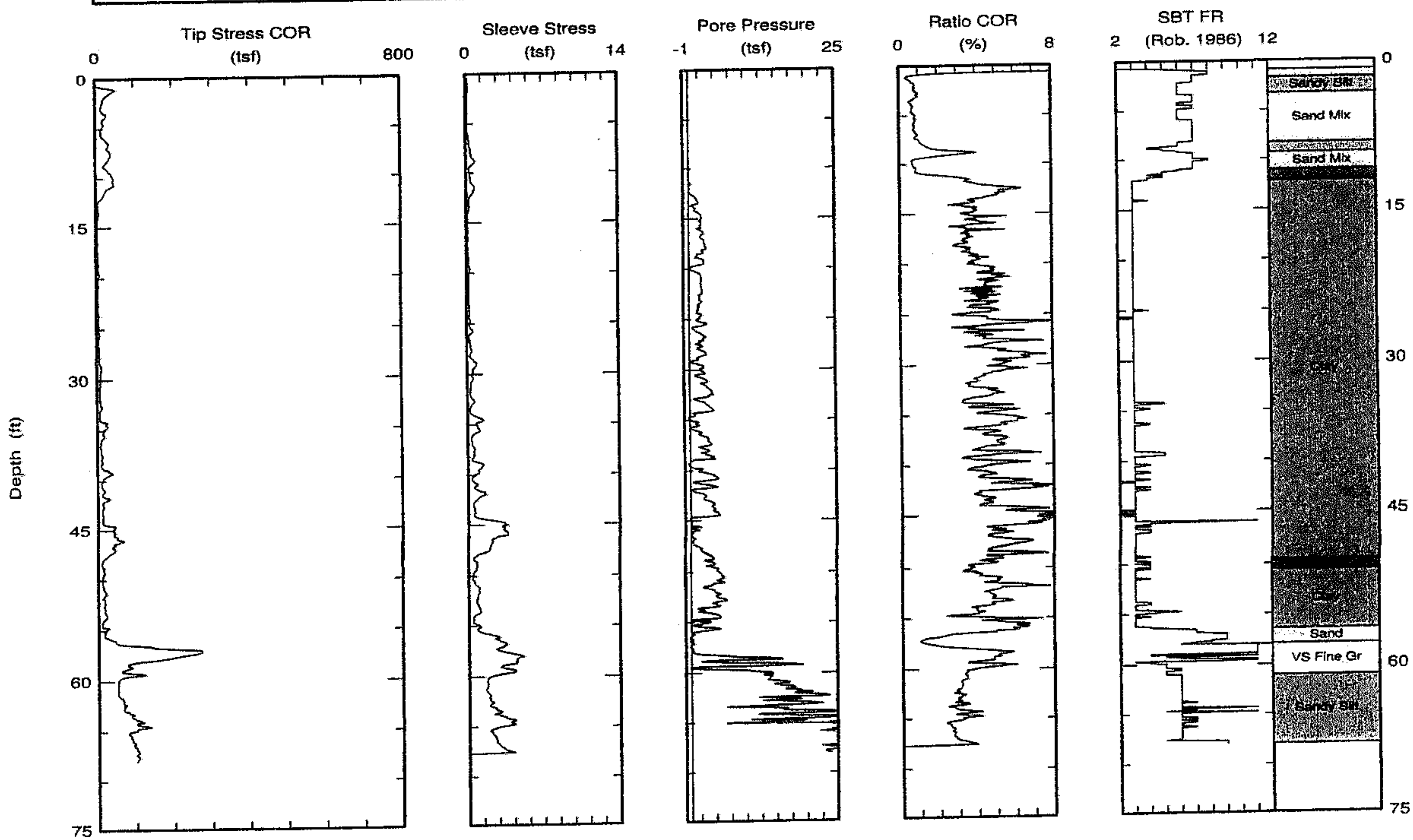
Date: 14/Nov/2006
Test ID: CPT-5
Project: Beaumont

Customer: Pacific Soils
Job Site: Phase 4-Fairway Canyon



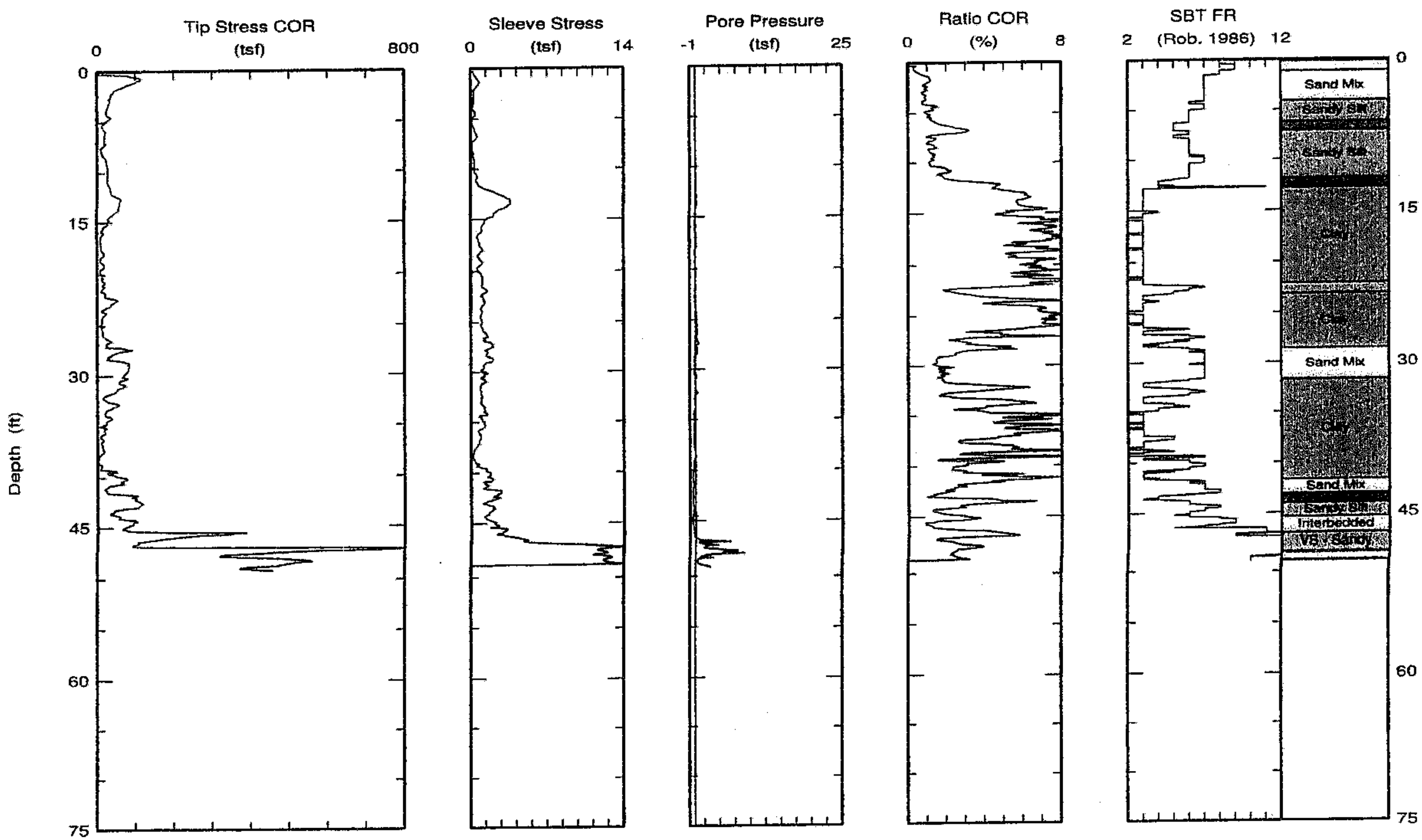
Maximum depth: 28.16 (ft)

Kehoe Testing & Engineering Office: (714) 901-7270 Fax: (714) 901-7289 skehoe@msn.com	CPT Data 30 ton rig	Date: 14/Nov/2006 Test ID: CPT-6 Project: Beaumont
	Customer: Pacific Soils Job Site: Phase 4-Fairway Canyon	



Maximum depth: 67.98 (ft)

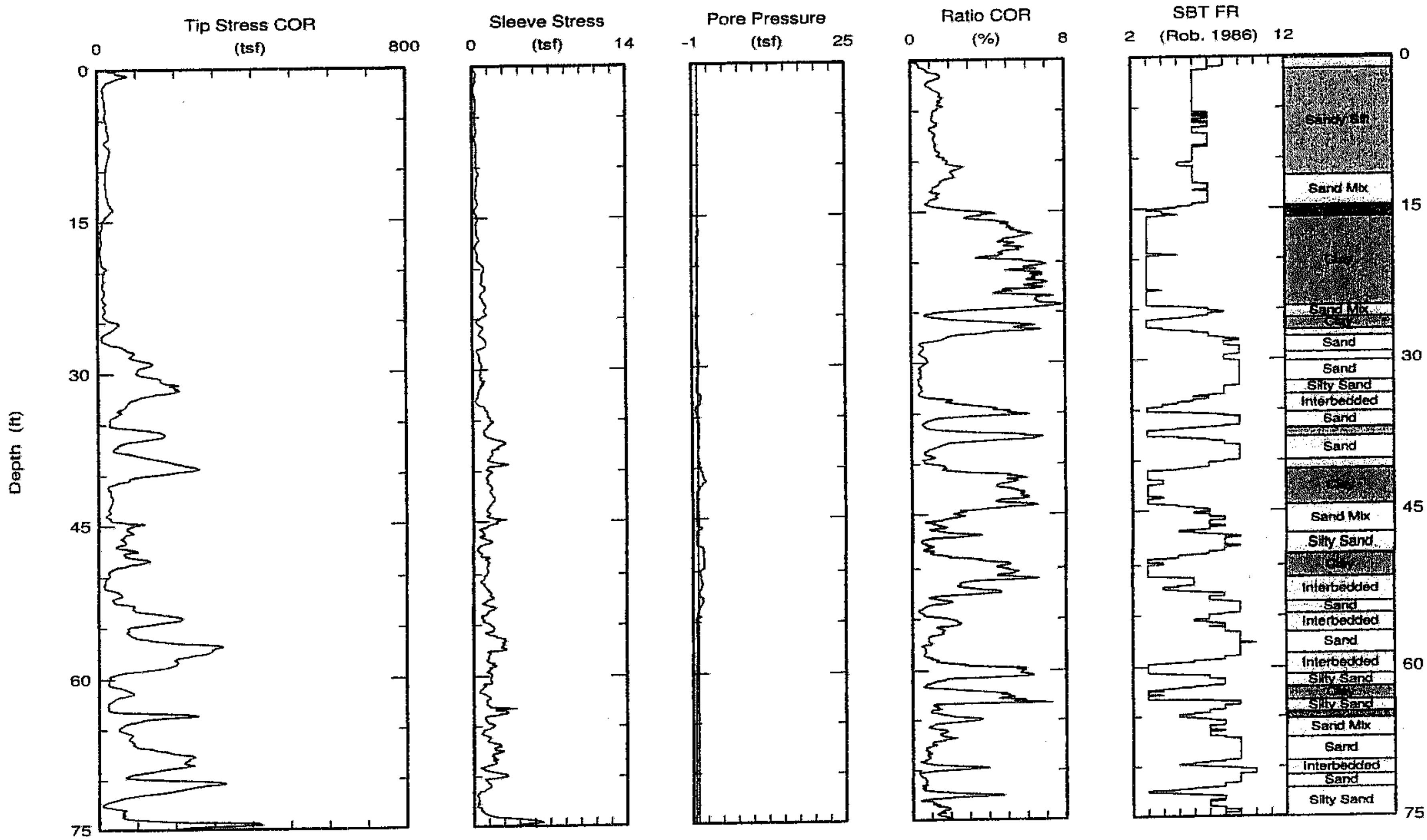
KTE Kehoe Testing & Engineering Office: (714) 901-7270 Fax: (714) 901-7289 skehoe@msn.com	CPT Data 30 ton rig	Date: 14/Nov/2006 Test ID: CPT-7 Project: Beaumont
	Customer: Pacific Soils Job Site: Phase 4-Fairway Canyon	



Maximum depth: 49.22 (ft)

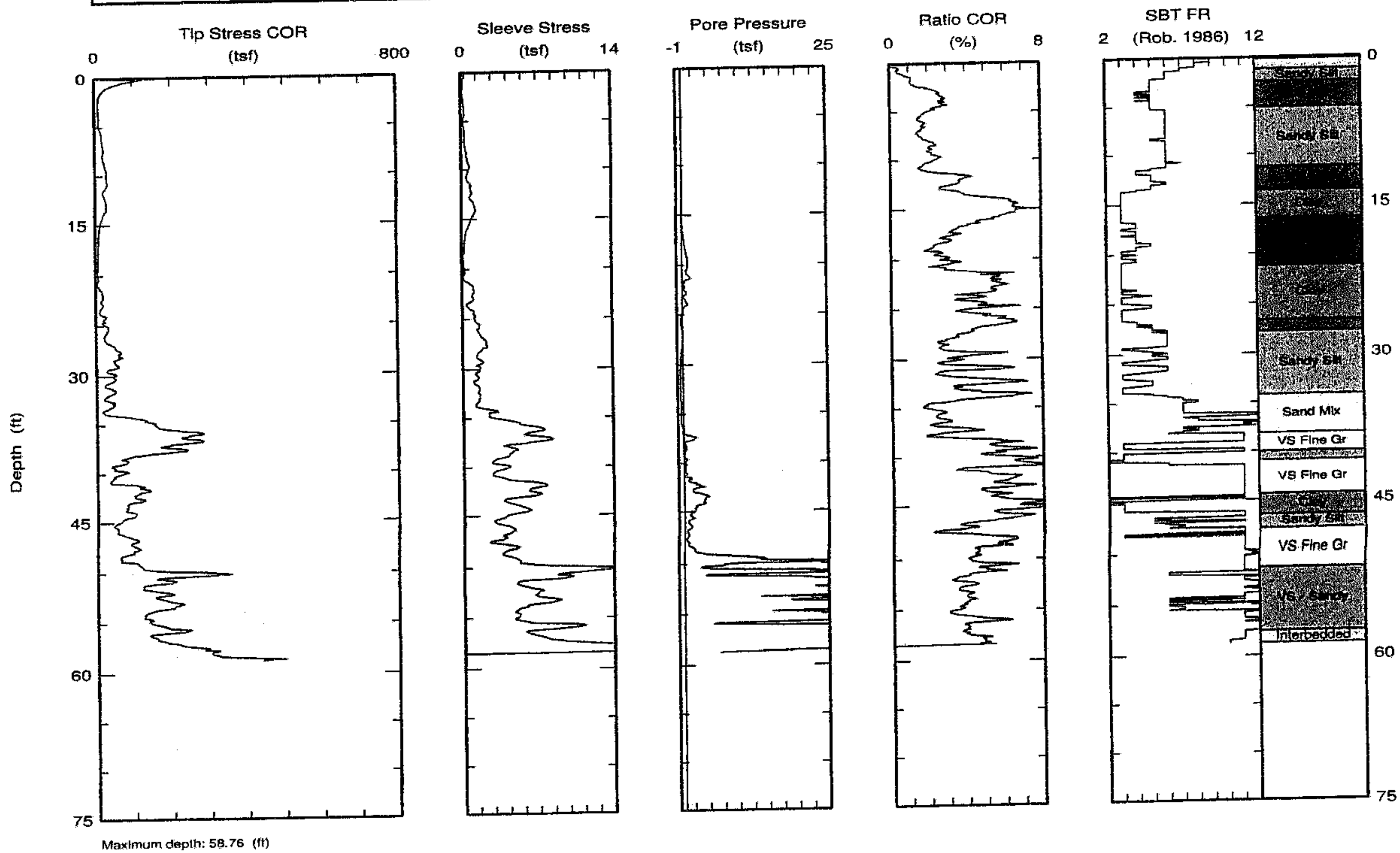
Kehoe Testing & Engineering
Office: (714) 901-7270
Fax: (714) 901-7289
skehoe@msn.com

CPT Data 30 ton rig	Date: 14/Nov/2006 Test ID: CPT-8 Project: Beaumont
Customer: Pacific Soils Job Site: Phase 4-Fairway Canyon	



Maximum depth: 77.10 (ft)
Page 1 of 2

Kehoe Testing & Engineering Office: (714) 901-7270 Fax: (714) 901-7289 skehoe@msn.com	CPT Data 30 ton rig	Date: 14/Nov/2006 Test ID: CPT-9 Project: Beaumont
	Customer: Pacific Soils Job Site: Phase 4-Fairway Canyon	

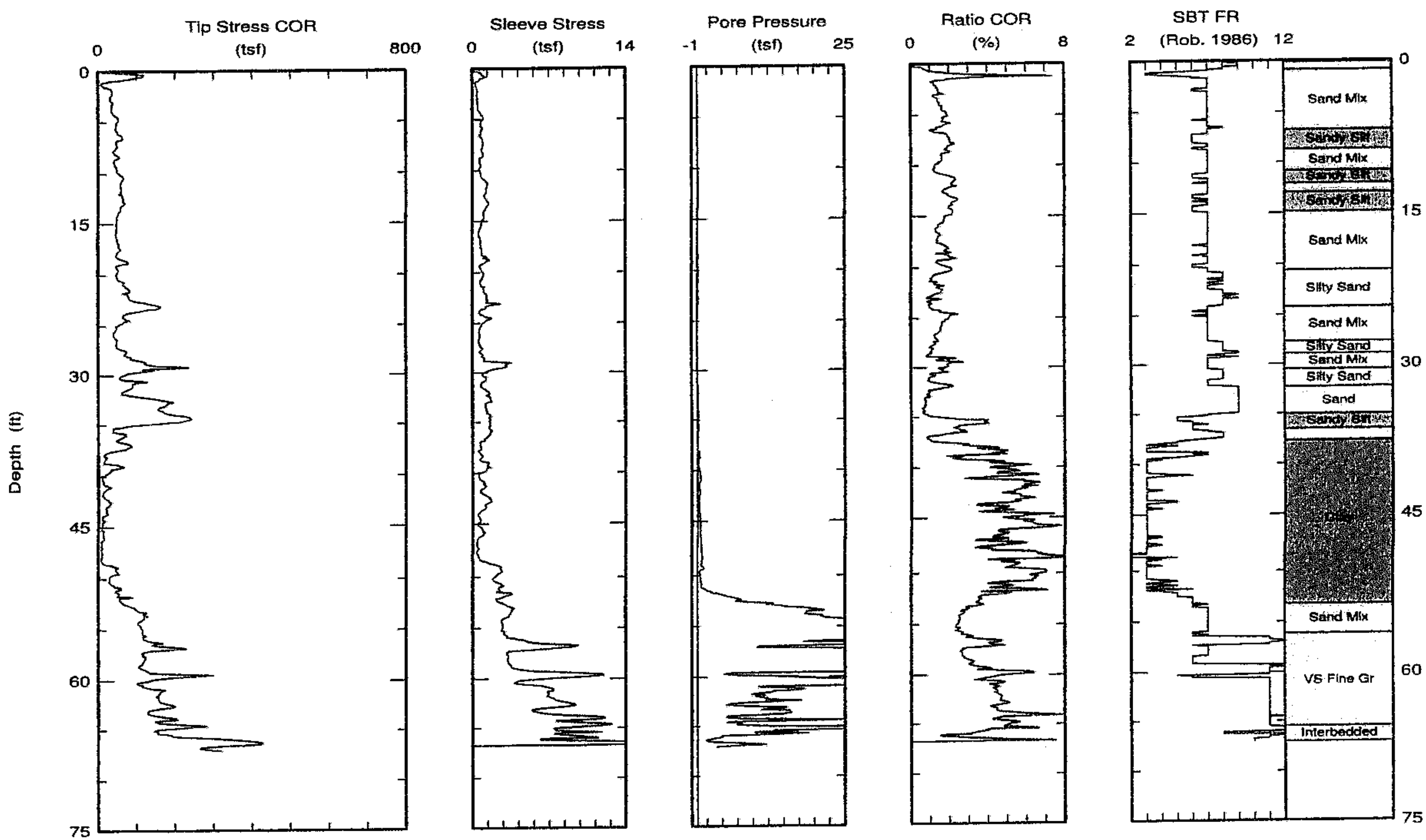


Kehoe Testing & Engineering
Office: (714) 901-7270
Fax: (714) 901-7289
skehoe@msn.com

CPT Data
30 ton rig

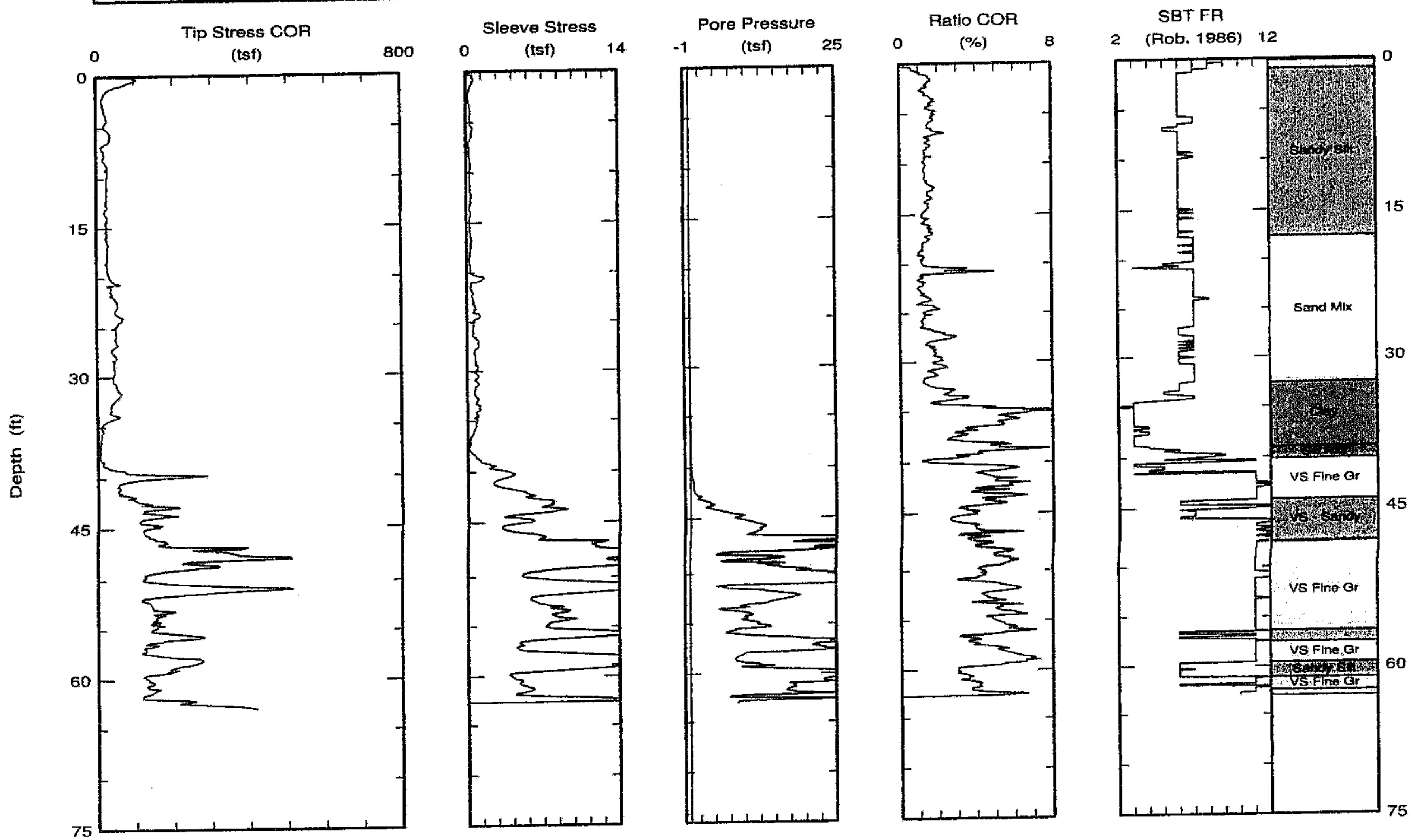
Date: 14/Nov/2006
Test ID: CPT-10
Project: Beaumont

Customer: Pacific Soils
Job Site: Phase 4-Fairway Canyon



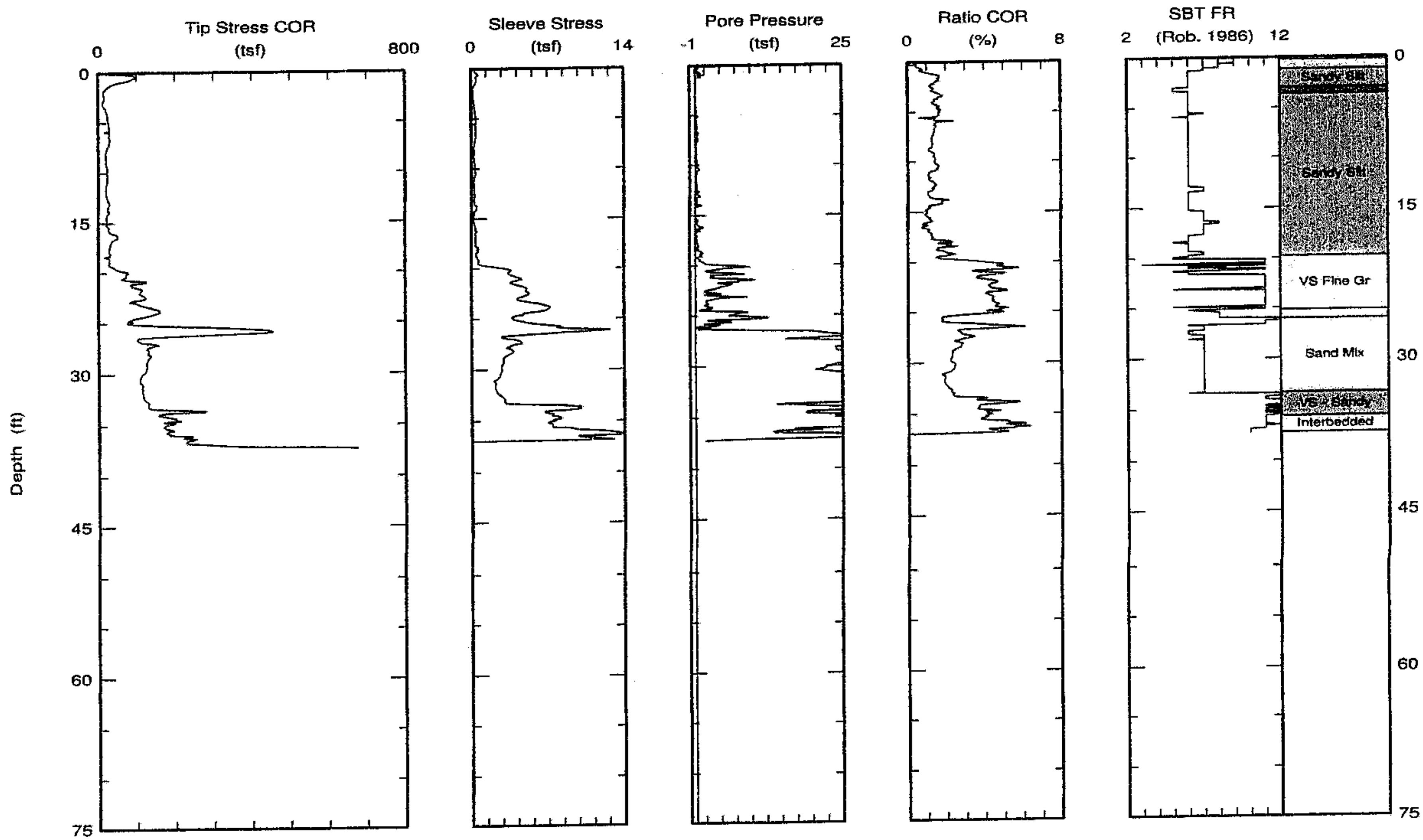
Maximum depth: 67.05 (ft)

KTE Kehoe Testing & Engineering Office: (714) 901-7270 Fax: (714) 901-7289 skehoe@msn.com	CPT Data 30 ton rig	Date: 14/Nov/2006 Test ID: CPT-11 Project: Beaumont
	Customer: Pacific Soils Job Site: Phase 4-Fairway Canyon	



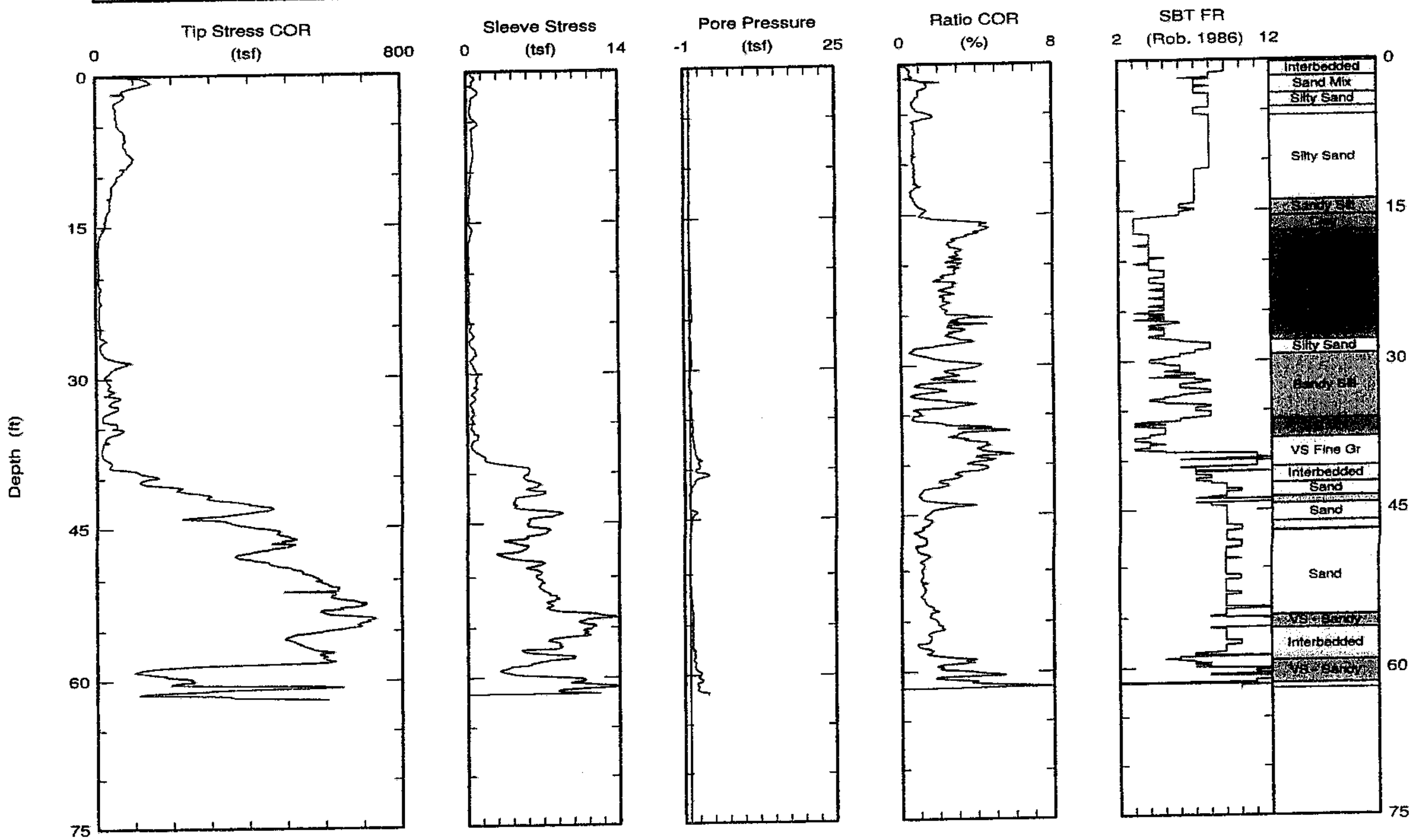
Maximum depth: 63.04 (ft)

Kehoe Testing & Engineering Office: (714) 901-7270 Fax: (714) 901-7289 skehoe@msn.com	CPT Data 30 ton rig	Date: 14/Nov/2006 Test ID: CPT-12 Project: Beaumont
	Customer: Pacific Soils Job Site: Phase 4-Fairway Canyon	



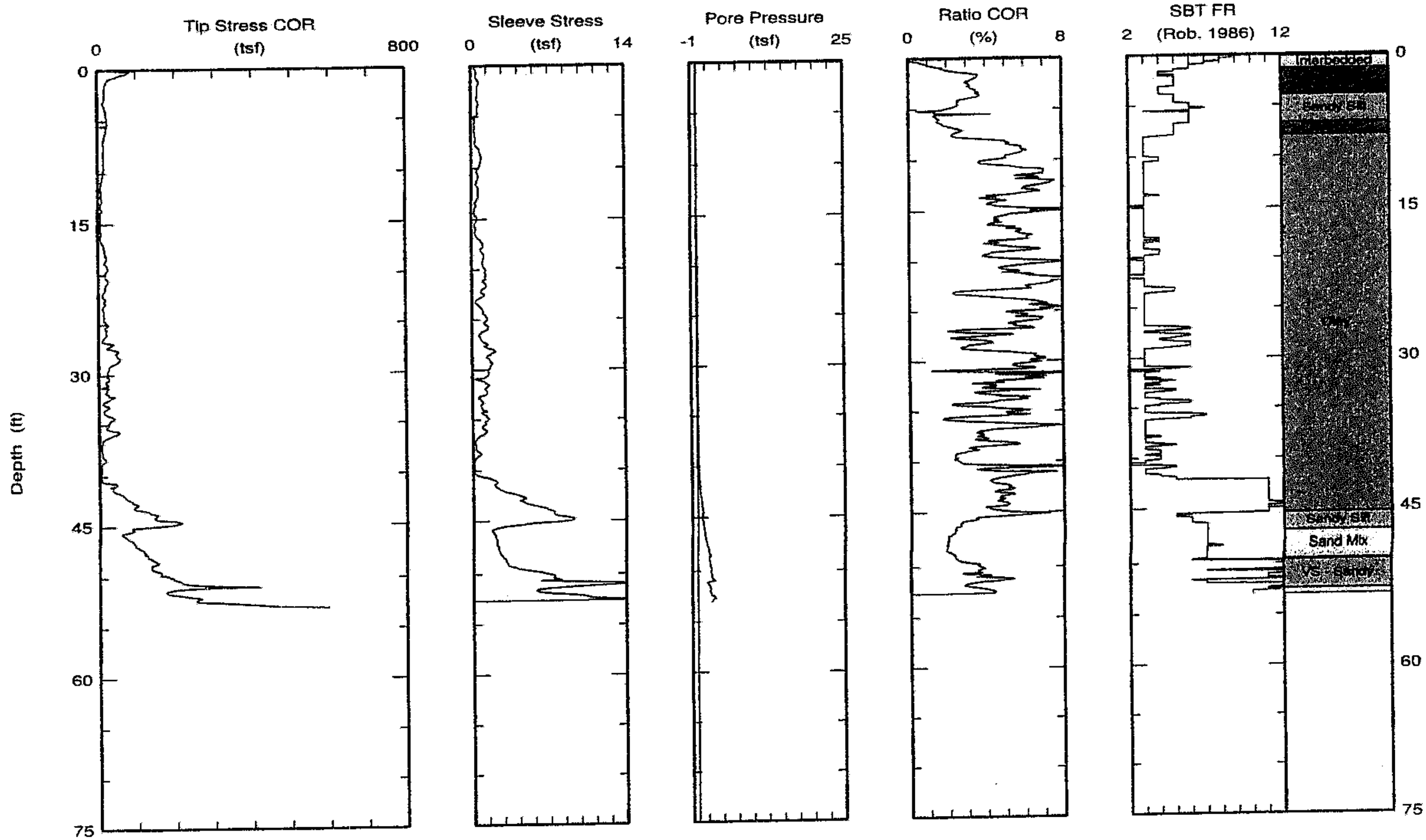
Maximum depth: 37.34 (ft)

Kehoe Testing & Engineering Office: (714) 901-7270 Fax: (714) 901-7289 skehoe@msn.com	CPT Data 30 ton rig	Date: 17/Nov/2006 Test ID: CPT-13 Project: Beaumont
	Customer: Pacific Soils Job Site: Phase-4 Fairway Canyon	



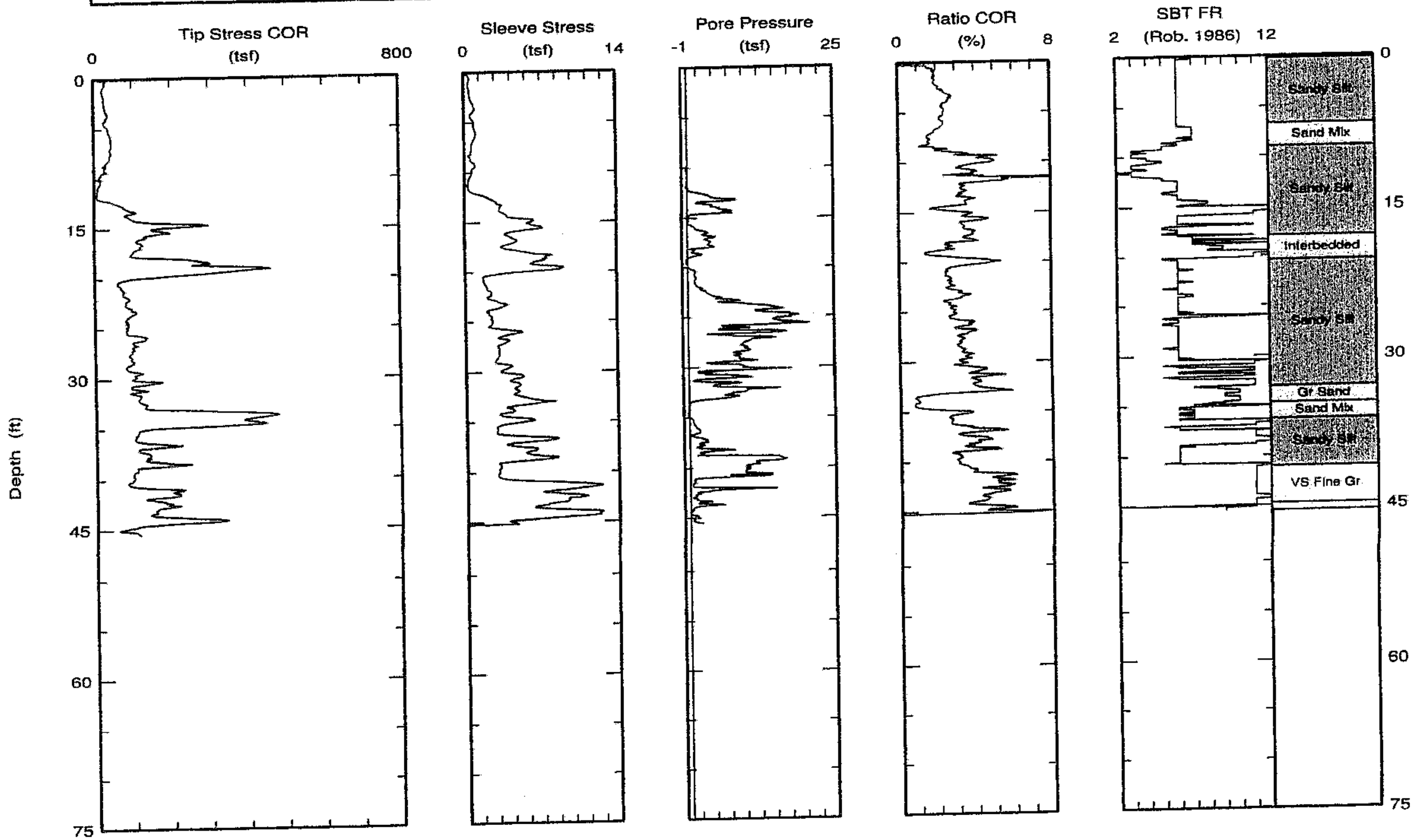
Maximum depth: 62.05 (ft)

Kehoe Testing & Engineering Office: (714) 901-7270 Fax: (714) 901-7289 skehoe@msn.com	CPT Data 30 ton rig	Date: 17/Nov/2006 Test ID: CPT-14 Project: Beaumont
	Customer: Pacific Soils Job Site: Phase-4 Fairway Canyon	



Maximum depth: 53.01 (ft)

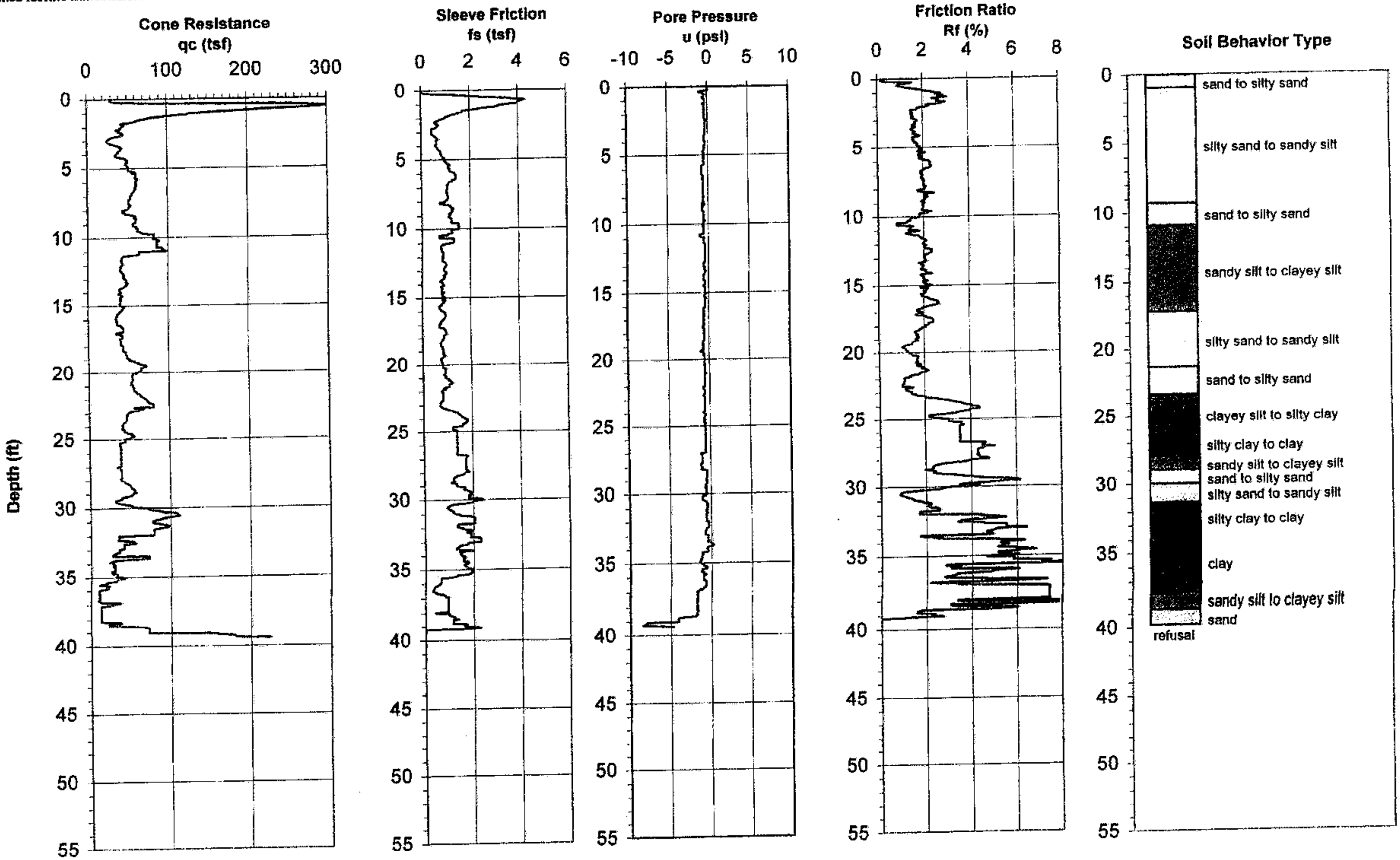
Kehoe Testing & Engineering Office: (714) 901-7270 Fax: (714) 901-7289 skehoe@msn.com	CPT Data 30 ton rig	Date: 17/Nov/2006 Test ID: CPT-16 Project: Beaumont
	Customer: Pacific Soils Job Site: Phase-4 Fairway Canyon	



Maximum depth: 45.54 (ft)

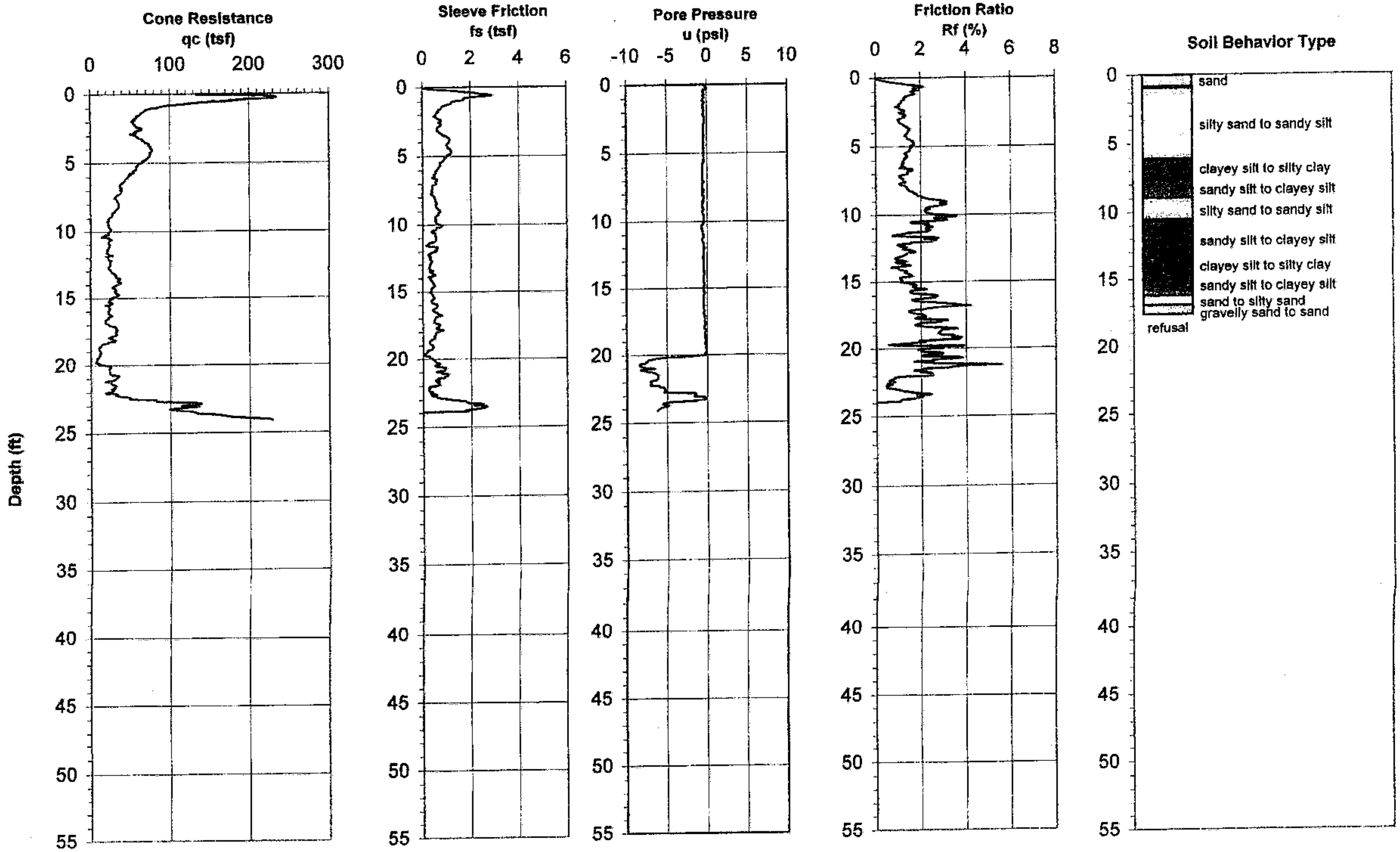
KEHOE TESTING & ENGINEERING

Project :	Desert Lawn & Cherry Valley, Beaumont, CA	Client :	Pacific Soils
Location :	CPT-18	CPT Date :	11/20/06



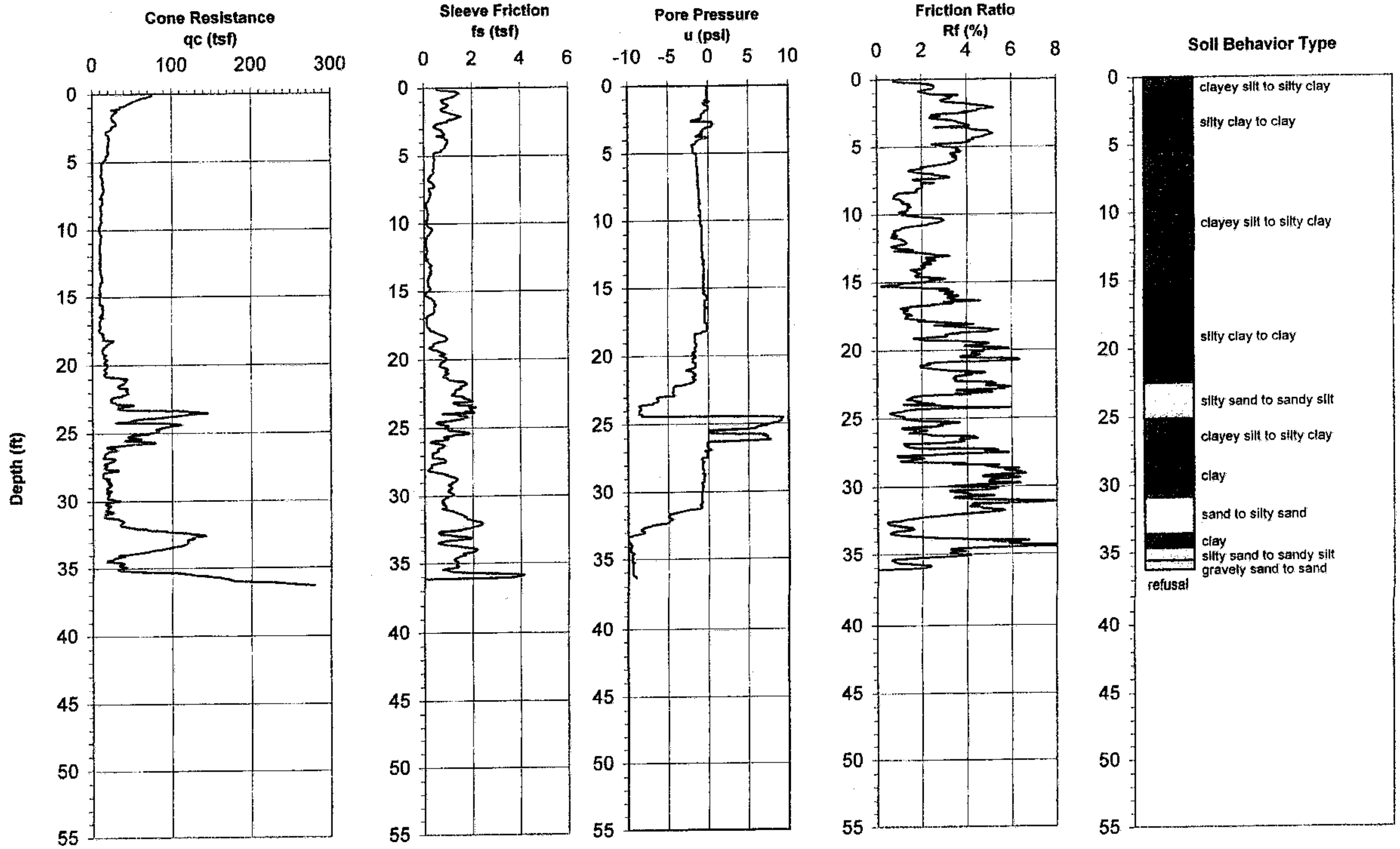
KEHOE TESTING & ENGINEERING

Project :	Desert Lawn & Cherry Valley, Beaumont, CA	Client :	Pacific Soils
Location :	CPT-19	CPT Date :	11/20/06



KEHOE TESTING & ENGINEERING

Project :	Desert Lawn & Cherry Valley, Beaumont, CA	Client :	Pacific Soils
Location :	CPT-20	CPT Date :	11/20/06



APPENDIX C

Previous Laboratory Testing
(PSE, 2007)

Corrosivity Testing

Corrosivity tests were performed to analyze the corrosion potential of the on-site soils on ferrous metals and concrete. Sulfate contents were determined and are shown on Plates C-78 through C-82. Borings BA-26 and BA-27 were renumbered after the sulfate tests were conducted. Plates C-78 and C-79 reflect the original numberings with the revised numbering in parenthesis.

The pH and electrical resistivity were also determined and are summarized in the following table.

Electrical Resistivity and pH			
Boring No.	**Depth**	**Electrical Resistivity (ohms-cm)**	**pH**
~~BA-26~~	~~32~~	~~2560~~	~~6.9~~
~~BA-28~~	~~39~~	~~1840~~	~~7.0~~
~~BA-60~~	~~9~~	~~7790~~	~~8.3~~
BA-63	13	8600	7.6
~~BA-65~~	~~11~~	~~10020~~	~~7.6~~
~~BA-69~~	~~11~~	~~3050~~	~~8.2~~
BA-73	17	540	7.7

TABLE C-1
SUMMARY OF LABORATORY TEST DATA
W.O. 700003-G4

BORING	DEPTH (FEET)	SOIL DESCRIPTION	GROUP SYMBOL	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)	DIRECT SHEAR	PLUS NO.4 SEIVE (plus 4.76mm) (%)	SAND (4.76mm-0.075mm) (%)	SILT (0.075mm-0.005mm) (%)	CLAY (minus 0.005mm) (%)	EXPANSION INDEX UBC 18-2	OTHER TESTS REMARKS
B-08	10	Silty Sand (Qal)	SM				3	50	29	18		Consolidation - Plate C-1
B-08	20	Silty Sand (Qal)	SM				4	62	23	11		Consolidation - Plate C-2
B-08	30	Sandstone (QTst)					13	74	9	4		Consolidation - Plate C-3
~~B-09~~	~~3~~	~~Silty Sand (Qal)~~	~~SM~~	~~129.0~~	~~9.5~~		~~1~~	~~58~~	~~24~~	~~17~~		
~~B-09~~	~~7.5~~	~~Silty Sand (Qal)~~	~~SM~~				~~2~~	~~67~~	~~21~~	~~10~~		~~Consolidation - Plate C-4~~
~~B-09~~	~~25~~	~~Silty Sand (Qal)~~	~~SM~~				~~4~~	~~53~~	~~27~~	~~16~~		~~Consolidation - Plate C-5~~
~~B-10~~	~~7.5~~	~~Silty Sand (Qal)~~	~~SM~~				~~6~~	~~58~~	~~22~~	~~14~~		~~Consolidation - Plate C-6~~
~~B-10~~	~~15~~	~~Silty Sand (Qal)~~	~~SM~~				~~10~~	~~49~~	~~27~~	~~14~~		~~Consolidation - Plate C-7~~
B-11	7.5	Silty Sand (Qal)	SM				5	49	25	21		Consolidation - Plate C-8
B-11	25	Silty Sand (Qal)	SM				0	58	25	17		Consolidation - Plate C-9
B-12	6	Silty Sand (Qal)	SM	131.5	8.0	SEE PLATE C-68	10	59	17	14		
B-12	7.5	Silty Sand (Qal)	SM				2	52	30	16		Consolidation - Plate C-10
B-12	15	Sandy Silt (Qal)	ML				0	35	50	15		Consolidation - Plate C-11
B-12	25	Sandy Silt (Qal)	ML				1	48	31	20		Consolidation - Plate C-12
B-13	10	Silty Sand (Qal)	SM				2	59	23	16		Consolidation - Plate C-13
B-13	25	Silty Sand (Qal)	SM				1	81	11	7		Consolidation - Plate C-14
B-14	10	Silty Sand (Qal)	SM				0	60	27	13		Consolidation - Plate C-15
B-15	7.5	Silty Clay (Qal)	CL				0	12	53	35		Consolidation - Plate C-16
B-15	20	Silty Sand (Qal)	SM				2	57	28	13		
B-16	15	Sandy Silt (Qal)	SM-ML				0	50	28	22		Consolidation - Plate C-17
B-16	35	Sand (Qal)	SP				0	95	3	2		
~~BA-04~~	~~10~~	~~Silty Sand (Qoa)~~	~~SM~~				~~6~~	~~60~~	~~25~~	~~9~~		~~Consolidation - Plate C-18~~

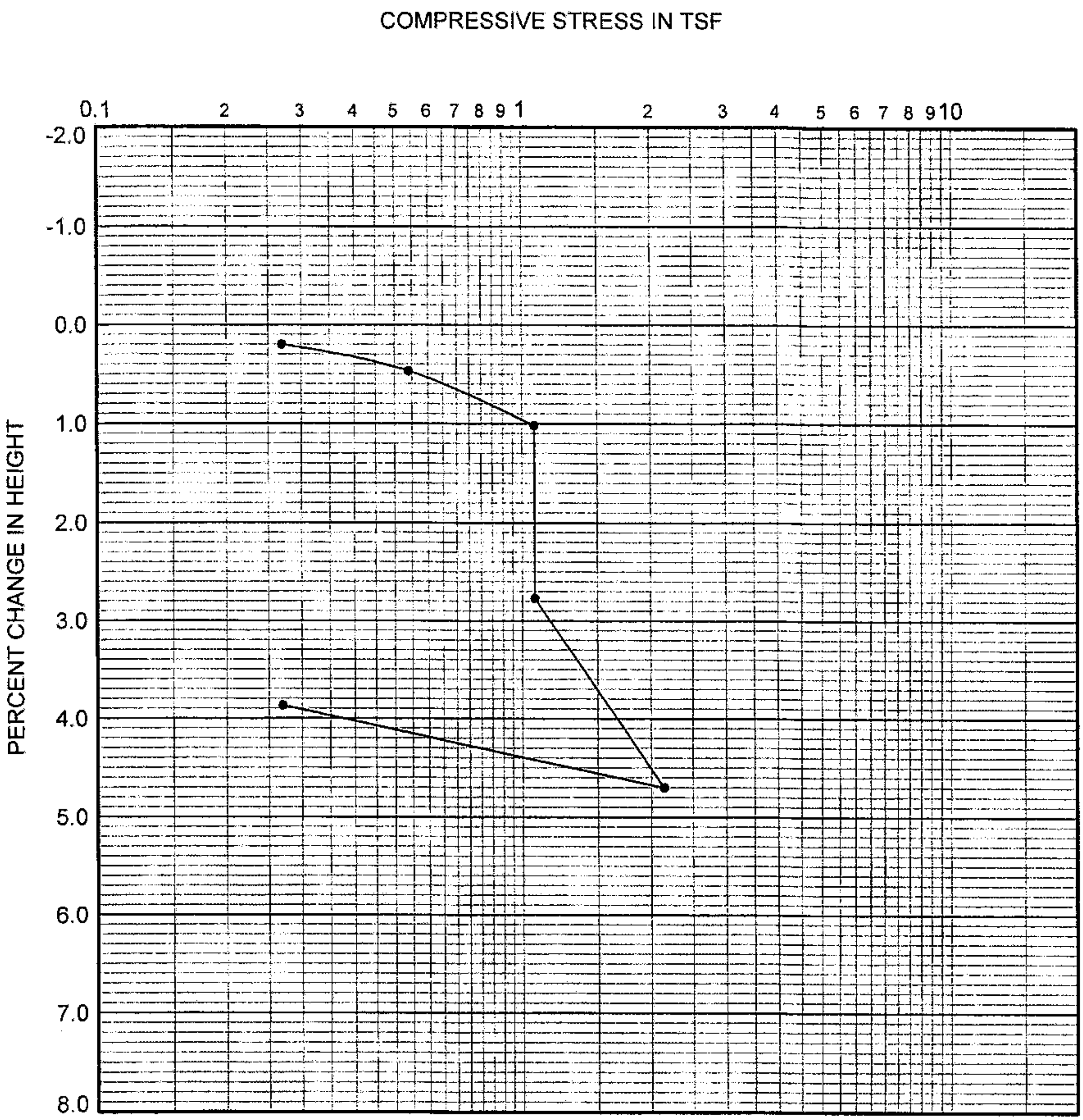
Pacific Soils Engineering, Inc.

TABLE C-1
SUMMARY OF LABORATORY TEST DATA
W.O. 700003-G4

BORING	DEPTH (FEET)	SOIL DESCRIPTION	GROUP SYMBOL	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)	DIRECT SHEAR	PLUS NO.4 SEIVE (plus 4.76mm) (%)	SAND (4.76mm-0.075mm) (%)	SILT (0.075mm-0.005mm) (%)	CLAY (minus 0.005mm) (%)	EXPANSION INDEX UBC 18-2	OTHER TESTS REMARKS
~~BA-59~~	~~30~~	~~Silty Sand (Qal)~~	~~SM~~				~~0~~	~~68~~	~~18~~	~~14~~		~~Consolidation - Plate C-46~~
~~BA-59~~	~~10~~	~~Silty Sand (Qal)~~	~~SM~~				~~8~~	~~77~~	~~12~~	~~3~~		~~Consolidation - Plate C-47~~
~~BA-59~~	~~37~~	~~Silty Sandstone (QTst)~~					~~1~~	~~46~~	~~40~~	~~13~~		~~Consolidation - Plate C-48~~
~~BA-60~~	~~9~~	~~Silty Sand (Qal)~~	~~SM~~	~~124.4~~	~~10.0~~	SEE PLATE C-77	~~4~~	~~60~~	~~28~~	~~8~~	~~4~~	~~Chemical - Plate C-88 Resistivity=7790, pH=8.3~~
~~BA-60~~	~~20~~	~~Silty Sand (Qal)~~	~~SM~~				~~0~~	~~60~~	~~35~~	~~5~~		~~Consolidation - Plate C-49~~
~~BA-60~~	~~50~~	~~Silty Sandstone (QTst)~~					~~0~~	~~60~~	~~33~~	~~7~~		~~Consolidation - Plate C-50~~
~~BA-61~~	~~10~~	~~Gravelly Sand (Qoa)~~	~~SP~~				~~10~~	~~75~~	~~4~~	~~1~~		~~Consolidation - Plate C-51~~
~~BA-61~~	~~25~~	~~Silty Sand (Qoa)~~	~~SM~~				~~1~~	~~61~~	~~31~~	~~7~~		~~Consolidation - Plate C-52~~
~~BA-62~~	~~50~~	~~Clayey Siltstone (QTst)~~				~~SEE PLATE C-78~~	~~0~~	~~22~~	~~38~~	~~40~~		
~~BA-62~~	~~60~~	~~Sandy Siltstone (QTst)~~				~~SEE PLATE C-79~~	~~0~~	~~30~~	~~50~~	~~20~~		
BA-63	13	Gravelly Sandstone (QTst)		125.1	9.2		7	82	3	8	0	Chemical - Plate C-89 Resistivity=8600, pH=7.6
BA-63	70	Silty Sandstone (QTst)				SEE PLATE C-80	2	65	26	7		
BA-64	15	Silty Sand (Qal)	SM				2	51	29	18		Consolidation - Plate C-53
BA-64	30	Silty Sand (Qal)	SM				2	49	31	18		Consolidation - Plate C-54
BA-64	35	Silty Sandstone (QTst)					1	58	31	10		Consolidation - Plate C-55
~~BA-65~~	~~10~~	~~Silty Sand (Qal)~~	~~SM~~				~~0~~	~~57~~	~~30~~	~~13~~		~~Consolidation - Plate C-56~~
~~BA-65~~	~~11~~	~~Silty Sand (Qal)~~	~~SM~~	~~130.7~~	~~8.8~~	SEE PLATE C-81	~~1~~	~~54~~	~~32~~	~~13~~	~~0~~	~~Chemical - Plate C-90 Resistivity=10020, pH=7.6~~
~~BA-65~~	~~43~~	~~Gravelly Sandstone (QTst)~~					~~7~~	~~75~~	~~13~~	~~5~~		~~Consolidation - Plate C-57~~
~~BA-66~~	~~20~~	~~Silty Sand (Qal)~~	~~SM~~				~~1~~	~~59~~	~~30~~	~~10~~		~~Consolidation - Plate C-58~~
~~BA-66~~	~~30~~	~~Silty Sandstone (QTst)~~					~~8~~	~~72~~	~~17~~	~~3~~		~~Consolidation - Plate C-59~~
~~BA-67~~	~~30~~	~~Silty Sand (Qoa)~~	~~SM~~				~~0~~	~~65~~	~~30~~	~~5~~		~~Consolidation - Plate C-60~~
~~BA-67~~	~~40~~	~~Silty Sand (Qoa)~~	~~SM~~				~~2~~	~~48~~	~~39~~	~~11~~		~~Consolidation - Plate C-61~~

TABLE C-1
SUMMARY OF LABORATORY TEST DATA
W.O. 700003-G4

BORING	DEPTH (FEET)	SOIL DESCRIPTION	GROUP SYMBOL	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)	DIRECT SHEAR	PLUS NO.4 SEIVE (plus 4.76mm) (%)	SAND (4.76mm-0.075mm) (%)	SILT (0.075mm-0.005mm) (%)	CLAY (minus 0.005mm) (%)	EXPANSION INDEX UBC 18-2	OTHER TESTS REMARKS
~~BA-68~~	~~25~~	~~Clayey Siltstone (QTst)~~					~~0~~	~~33~~	~~43~~	~~25~~		~~Consolidation - Plate C-62~~
~~BA-69~~	~~11~~	~~Silty Sand (Qal)~~	~~SM~~	~~125.0~~	~~10.5~~	SEE PLATE C-82	~~12~~	~~49~~	~~24~~	~~15~~	~~23~~	~~Chemical - Plate C-88 Resistivity=3050, pH=8.2~~
~~BA-69~~	~~26~~	~~Siltstone (QTst)~~					~~0~~	~~45~~	~~37~~	~~18~~		~~Consolidation - Plate C-63~~
BA-70	10	Silty Sand (Qal)	SM				2	52	28	18		Consolidation - Plate C-64
BA-70	20	Sandy Silt (Qal)	ML				0	47	36	17		Consolidation - Plate C-65
~~BA-71~~	~~30~~	~~Silty Sand (Qal)~~	~~SM~~				~~1~~	~~59~~	~~28~~	~~12~~		~~Consolidation - Plate C-66~~
BA-72	20	Gravelly Sand (Qal)	SP				10	81	6	3		Consolidation - Plate C-67
BA-73	17	Sandy Siltstone (QTst)		122.8	11.1	SEE PLATE C-83	5	61	22	12	29	Chemical - Plate C-88 Resistivity=540, pH=7.7
BA-73	30	Clayey Siltstone (QTst)				SEE PLATE C-84	6	61	27	6		
BA-73	47	Sandstone (QTst)				SEE PLATE C-85	0	28	58	14		
~~HS-1~~	~~20~~	~~Silty Sand (Qal)~~	~~SM~~				~~7~~	~~65~~	~~17~~	~~11~~		
~~HS-1~~	~~30~~	~~Silty Sand (Qal)~~	~~SM~~				~~0~~	~~68~~	~~22~~	~~10~~		
~~HS-1~~	~~35~~	~~Sandy Silt (Qal)~~	~~ML~~				~~5~~	~~41~~	~~38~~	~~16~~		
~~HS-1~~	~~55~~	~~Silty Sand (Qal)~~	~~SM~~				~~3~~	~~63~~	~~23~~	~~11~~		
~~HS-1~~	~~70~~	~~Silty Sand (Qal)~~	~~SM~~				~~0~~	~~57~~	~~30~~	~~13~~		



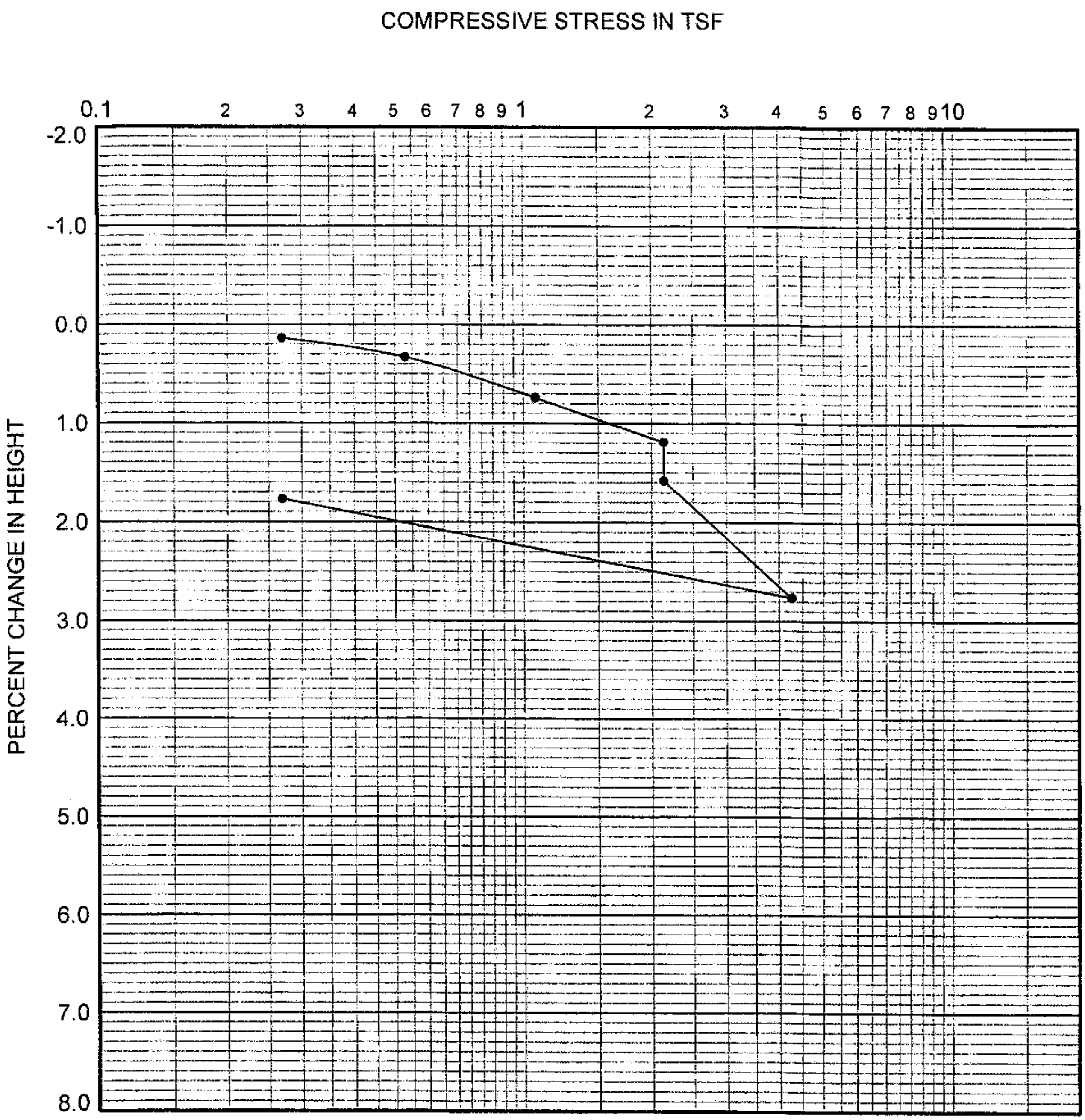
boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-08	10.0	110	9.0	47	47	SM	Silty Sand (Qal)

REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-1



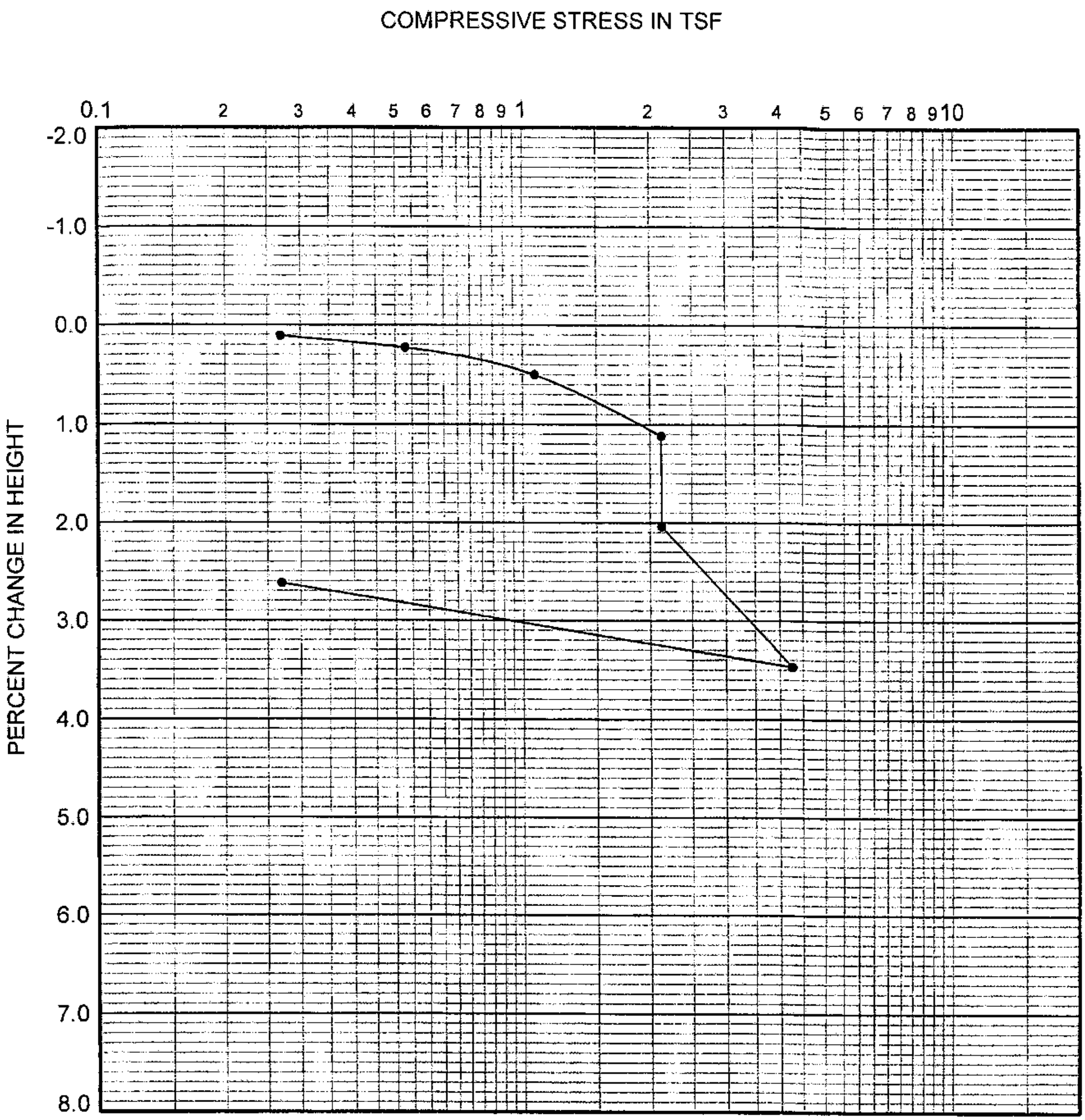
boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-08	20.0	117	8.7	55	34	SM	Silty Sand (Qal)

REMARKS: WATER ADDED AT 2.13 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-2



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-08	30.0	117	9.4	60	13		Sandstone (QTst)

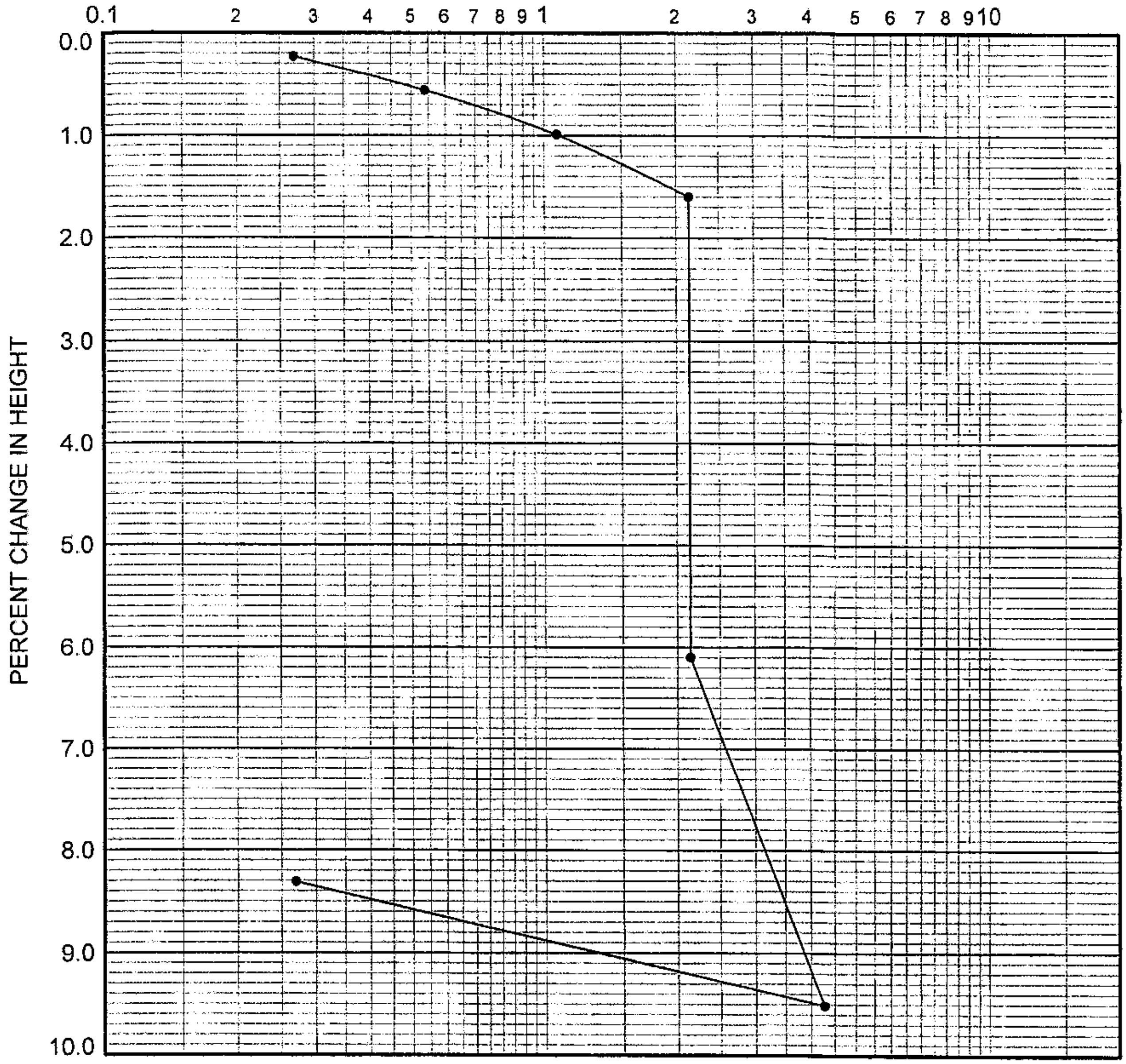
REMARKS: WATER ADDED AT 2.13 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-3

COMPRESSIVE STRESS IN TSF



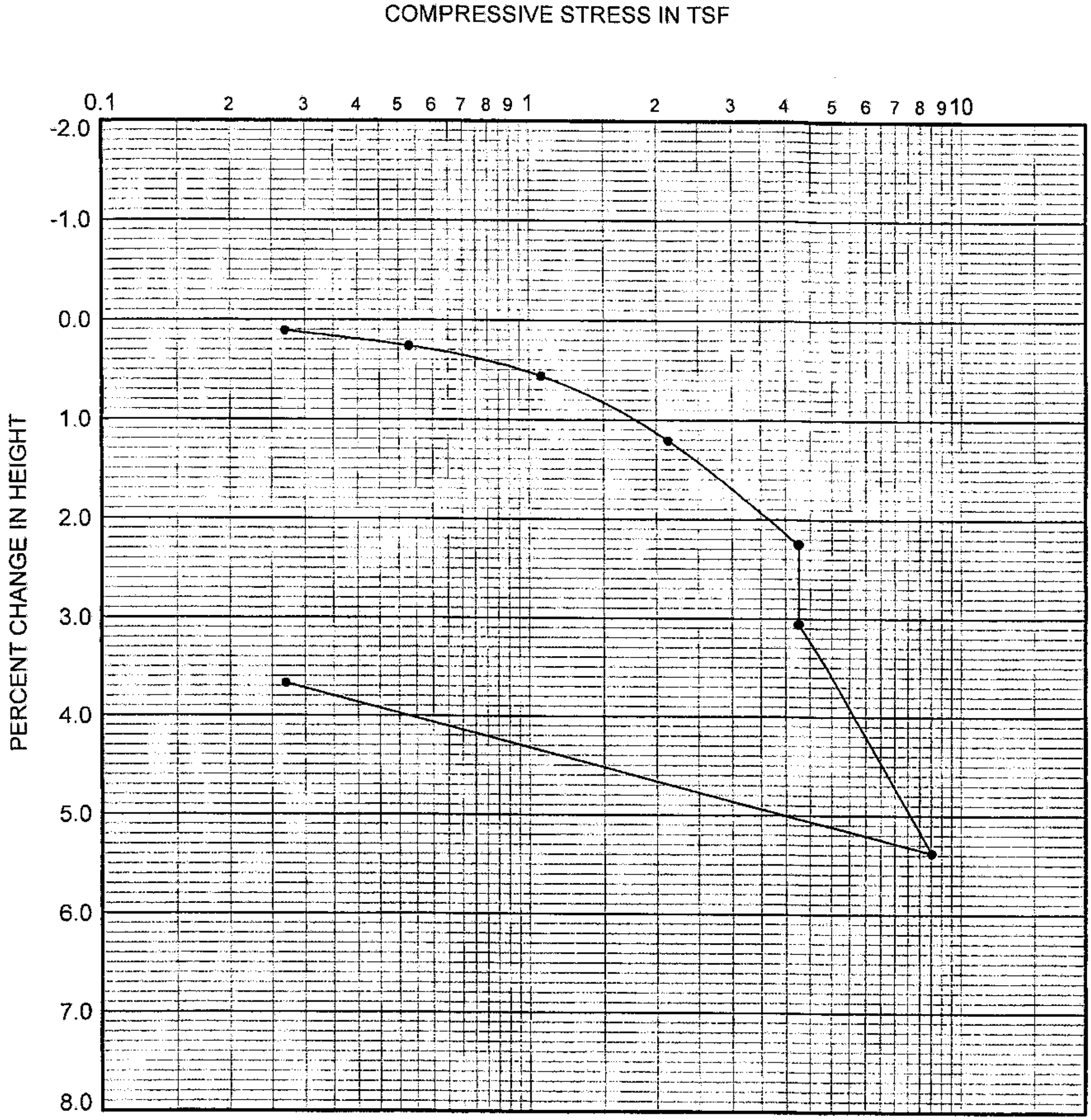
boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-11	7.5	106	7.7	36	46	SM	Silty Sand (Qal)

REMARKS: WATER ADDED AT 2.14 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-8



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-11	25.0	109	11.6	59	42	SM	Silty Sand (Qal)

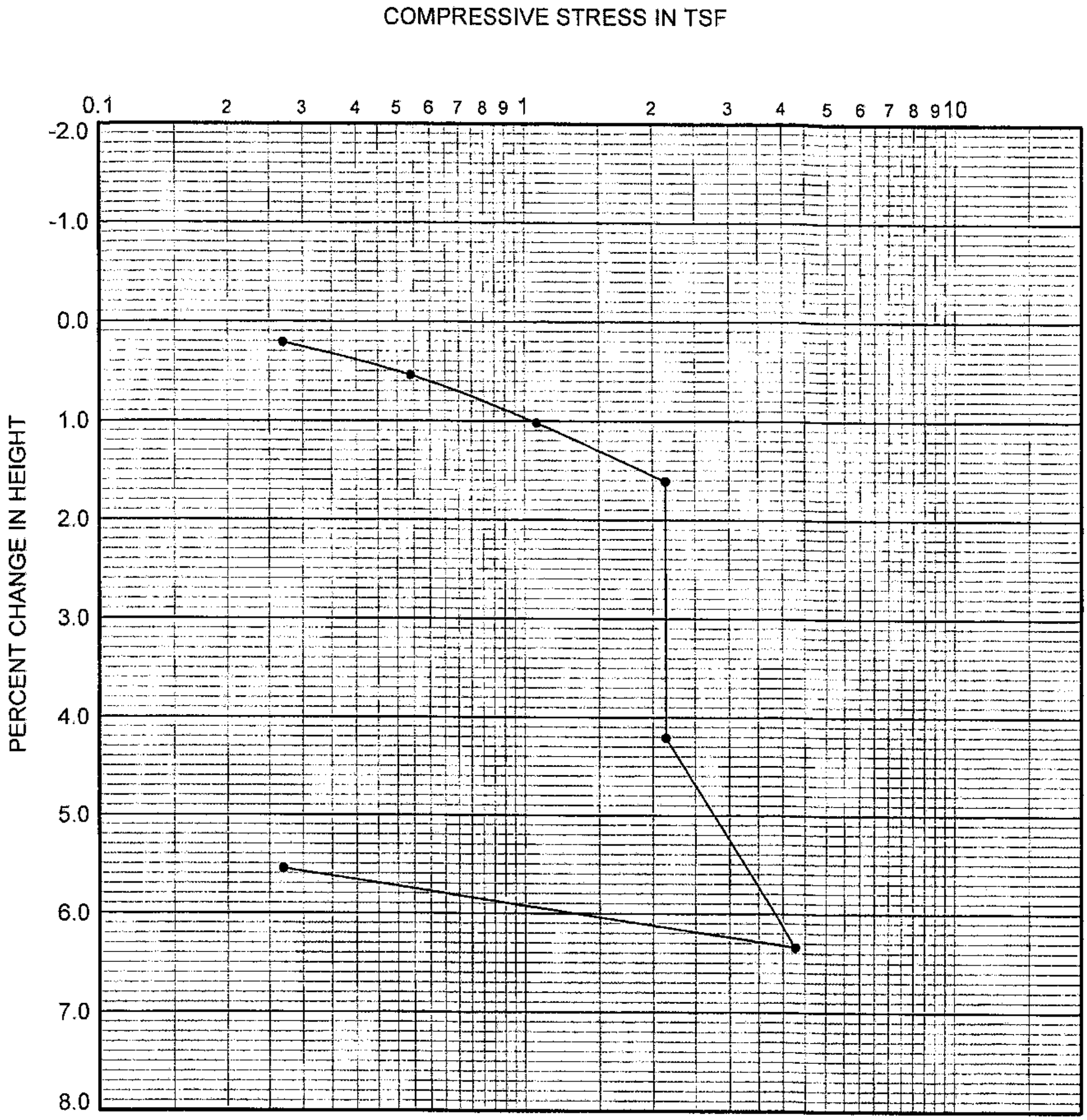
REMARKS: WATER ADDED AT 4.27 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4

PLATE C-9



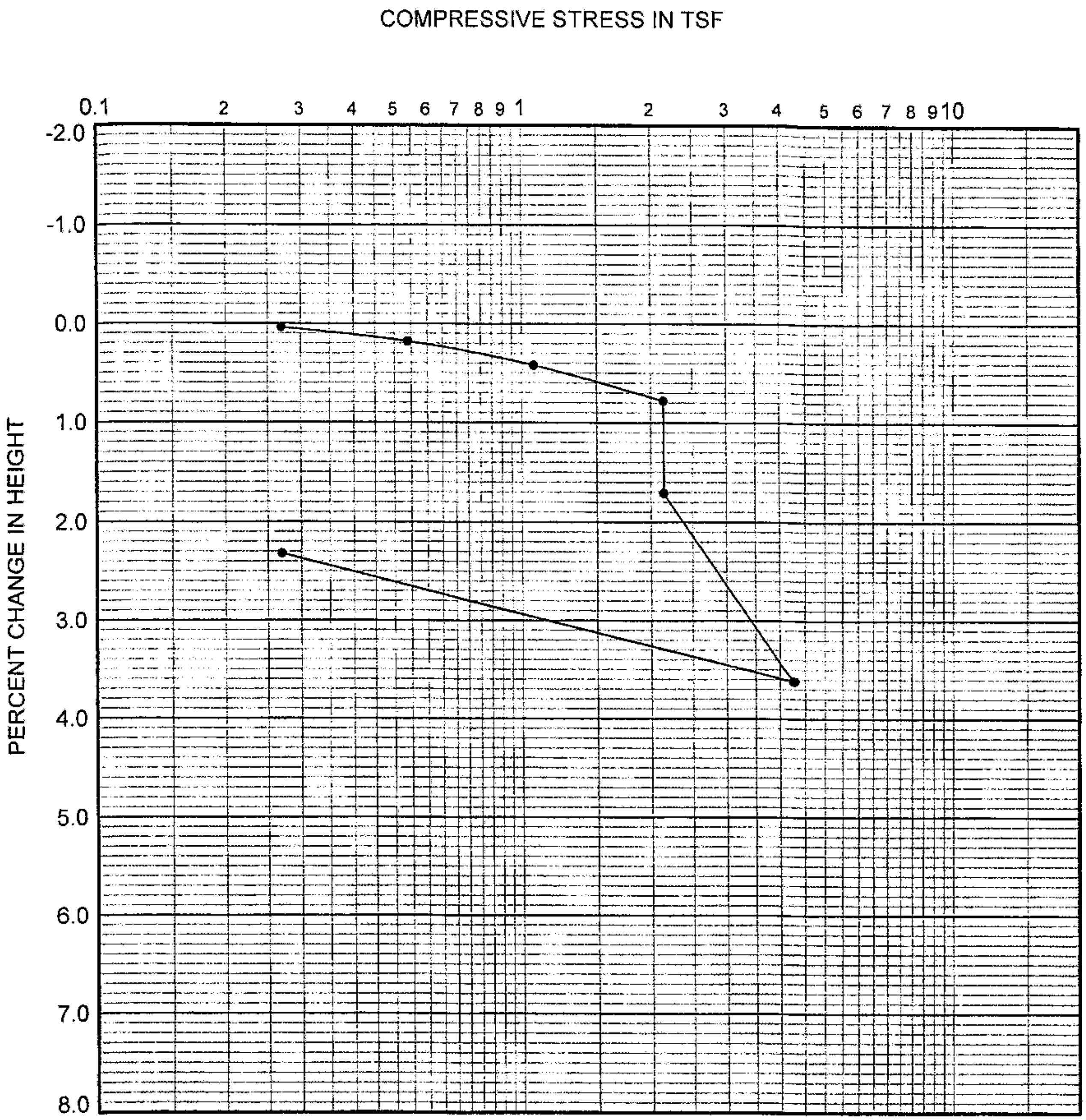
boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-12	7.5	105	4.8	22	46	SM	Silty Sand (Qal)

REMARKS: WATER ADDED AT 2.14 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-10



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-12	15.0	107	8.3	40	65	ML	Sandy Silt (Qal)

REMARKS: WATER ADDED AT 2.14 TSF

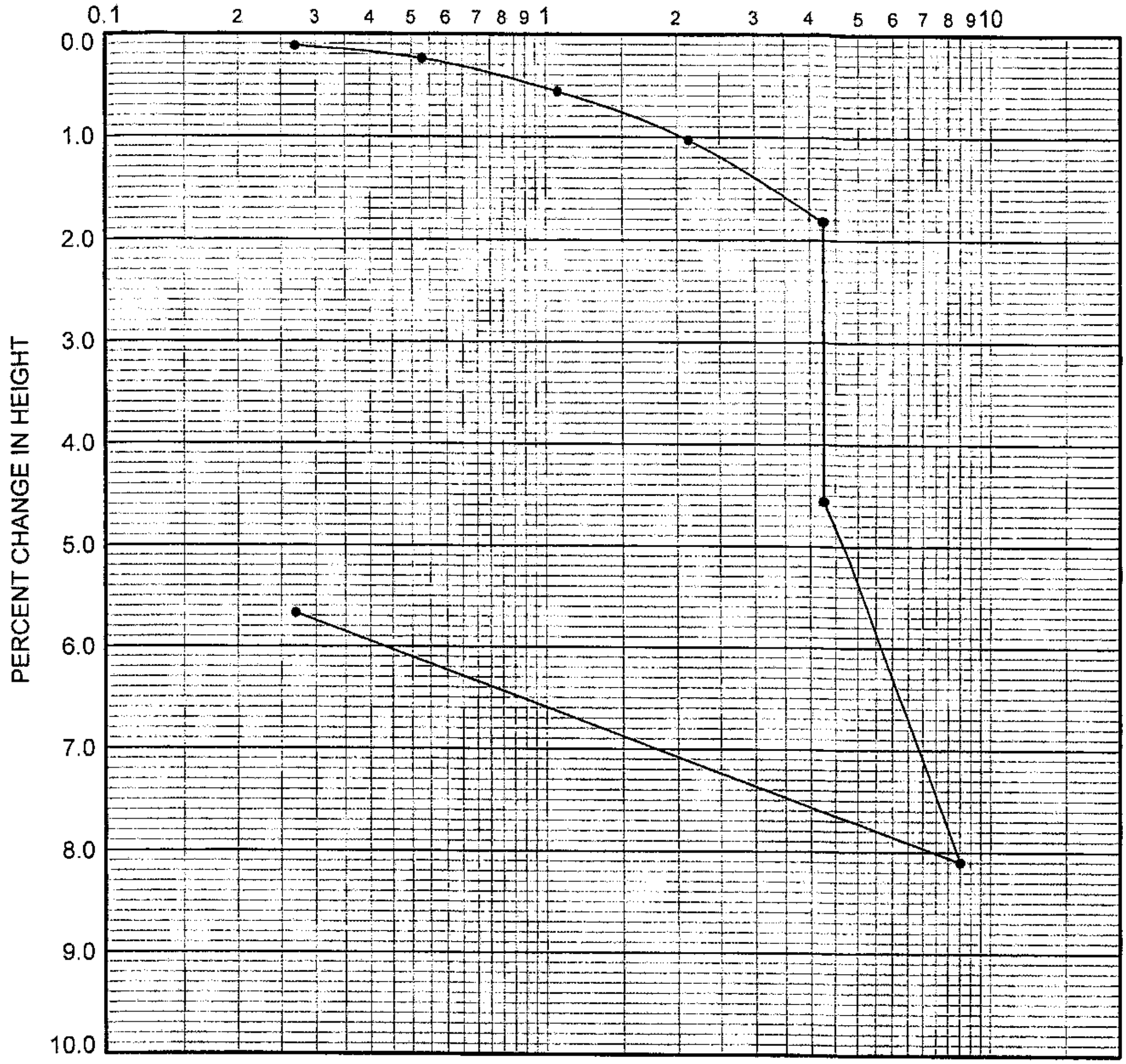
CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4

PLATE C-11

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-12	25.0	108	7.9	40	51	ML	Sandy Silt (Qal)

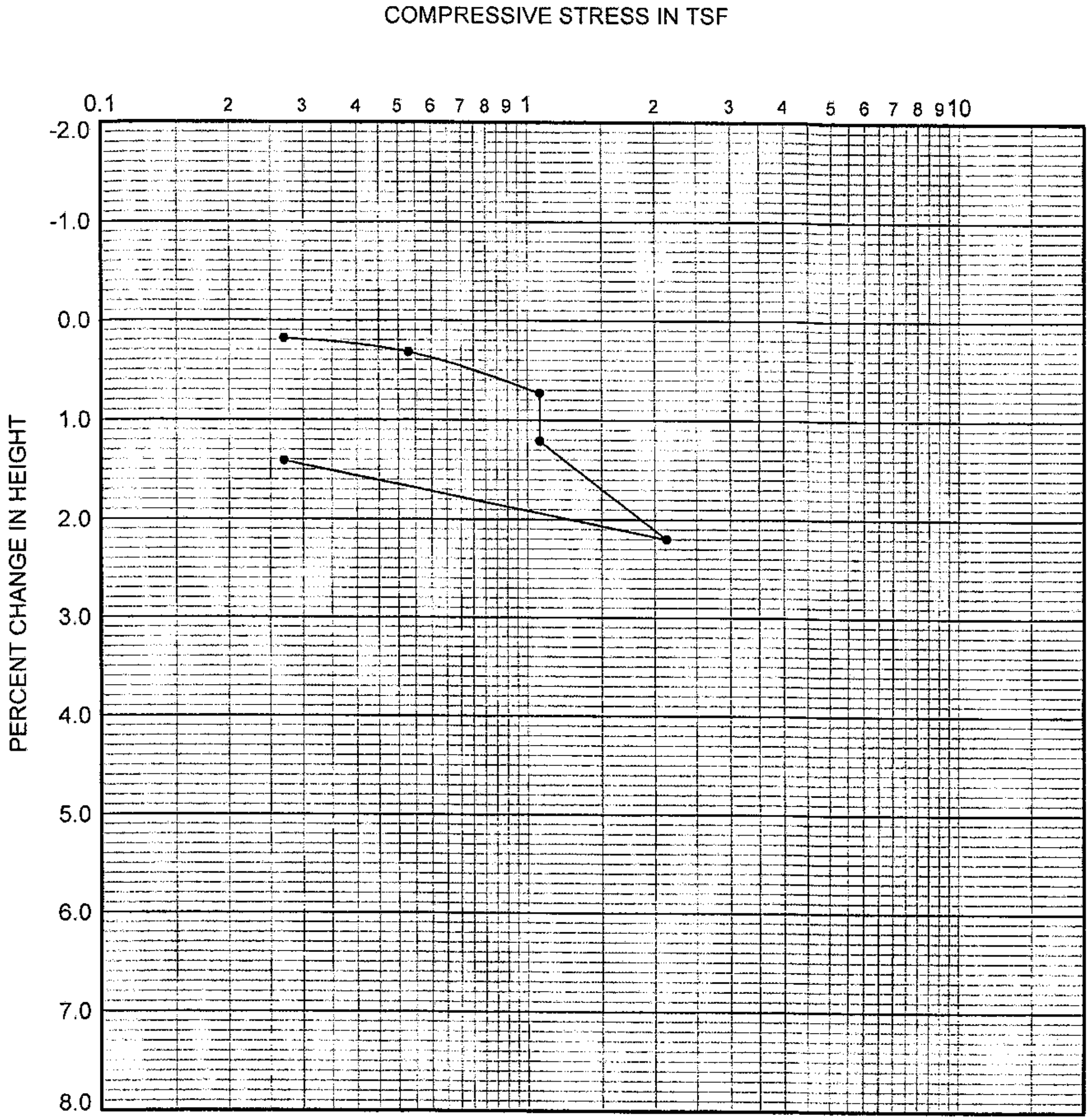
REMARKS: WATER ADDED AT 4.27 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4

PLATE C-12



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-13	10.0	113	9.5	54	39	SM	Silty Sand (Qal)

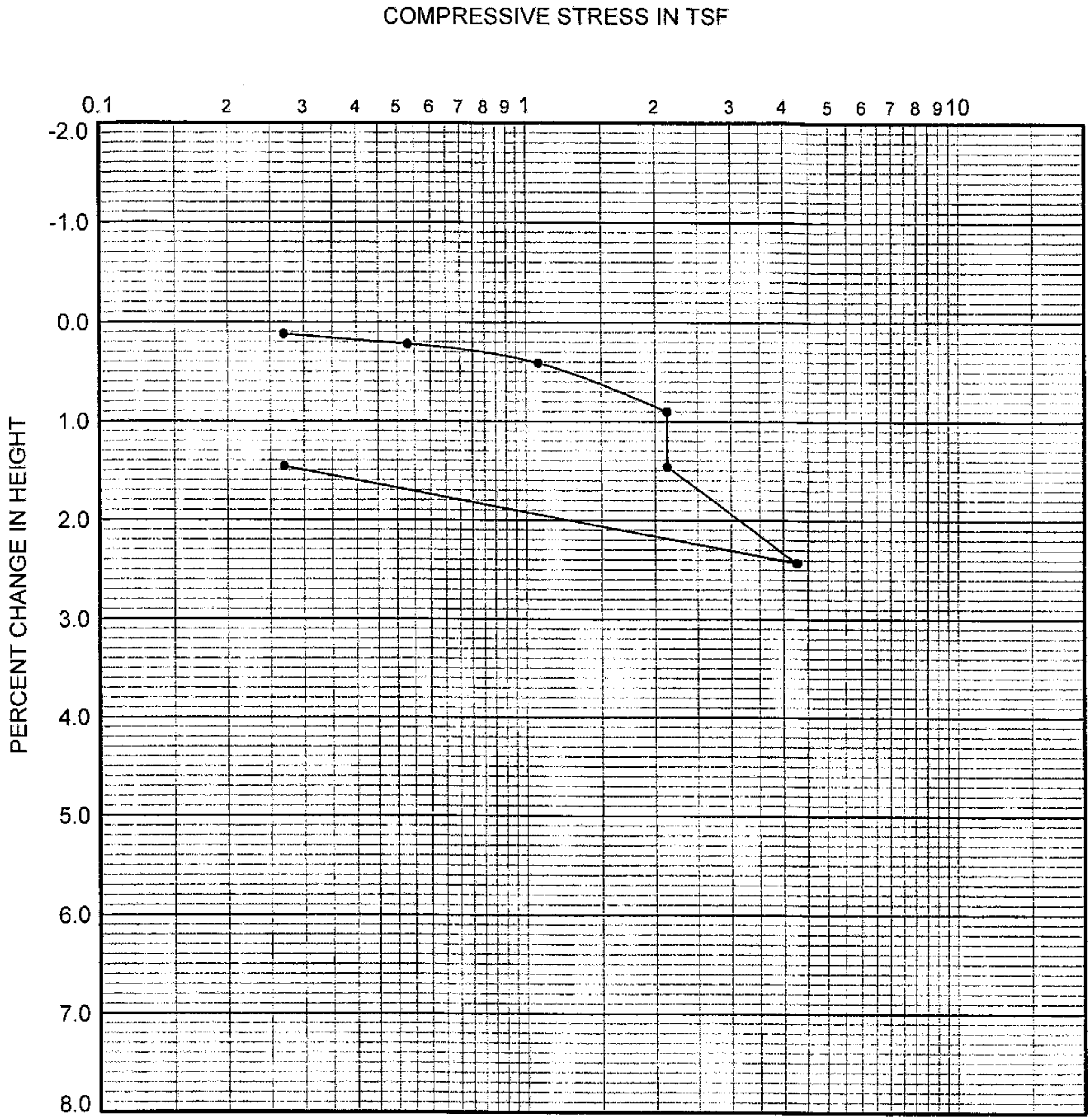
REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4

PLATE C-13



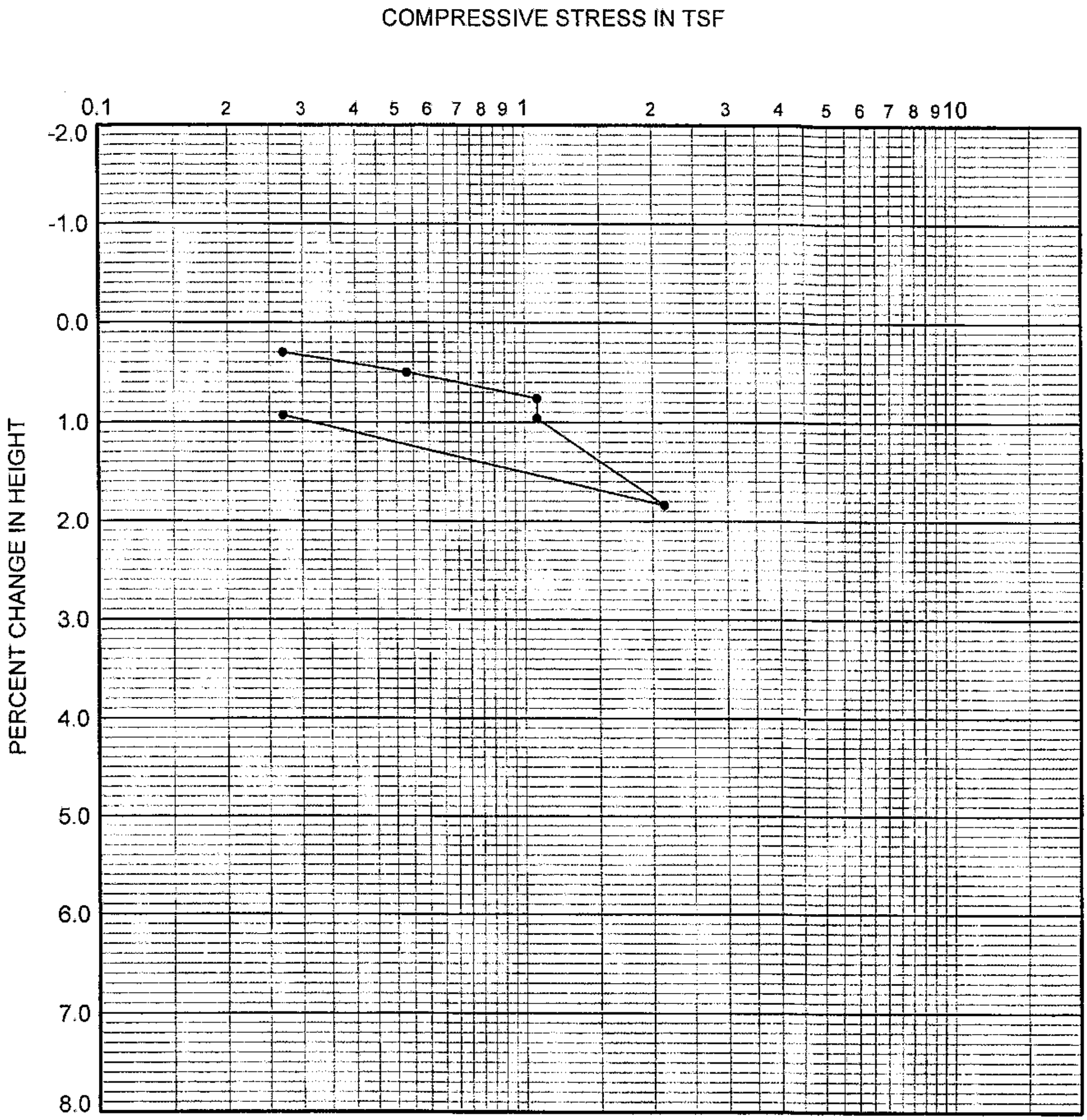
boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-13	25.0	110	4.6	24	18	SM	Silty Sand (Qal)

REMARKS: WATER ADDED AT 2.13 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-14



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-14	10.0	117	6.8	43	40	SM	Silty Sand (Qal)

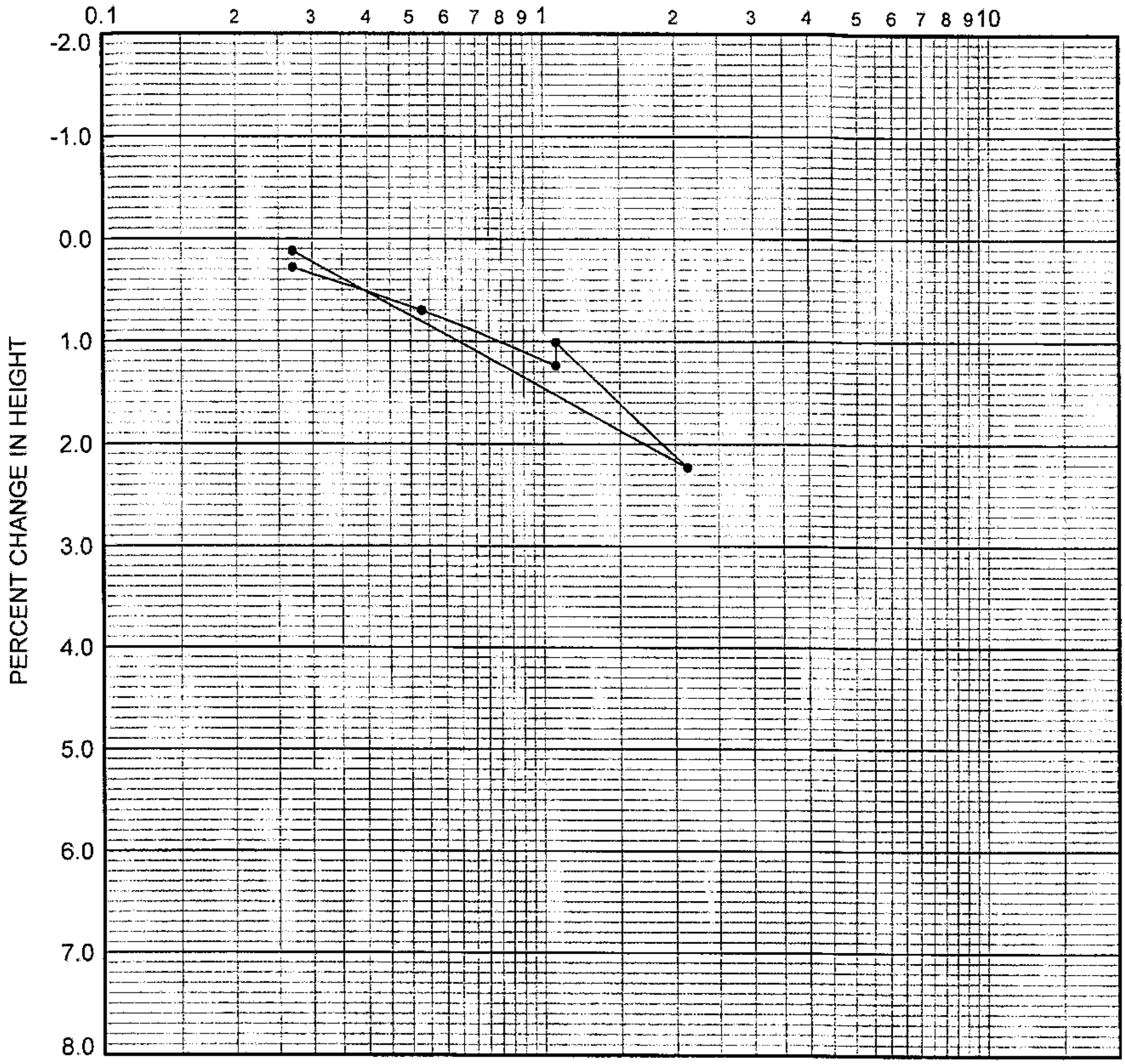
REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-15

COMPRESSIVE STRESS IN TSF



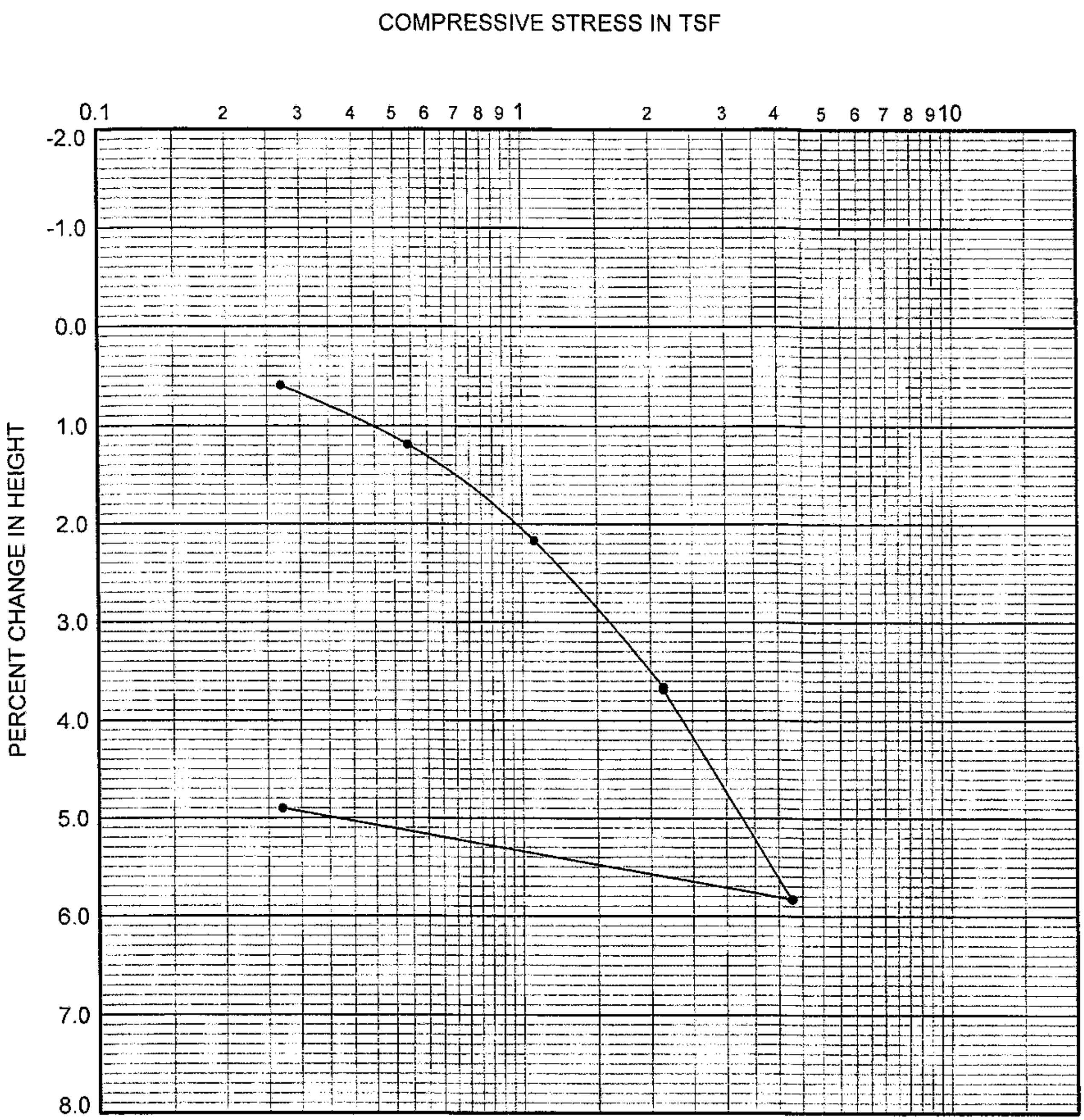
boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-15	7.5	94	17.2	59	88	CL	Silty Clay (Qal)

REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-16



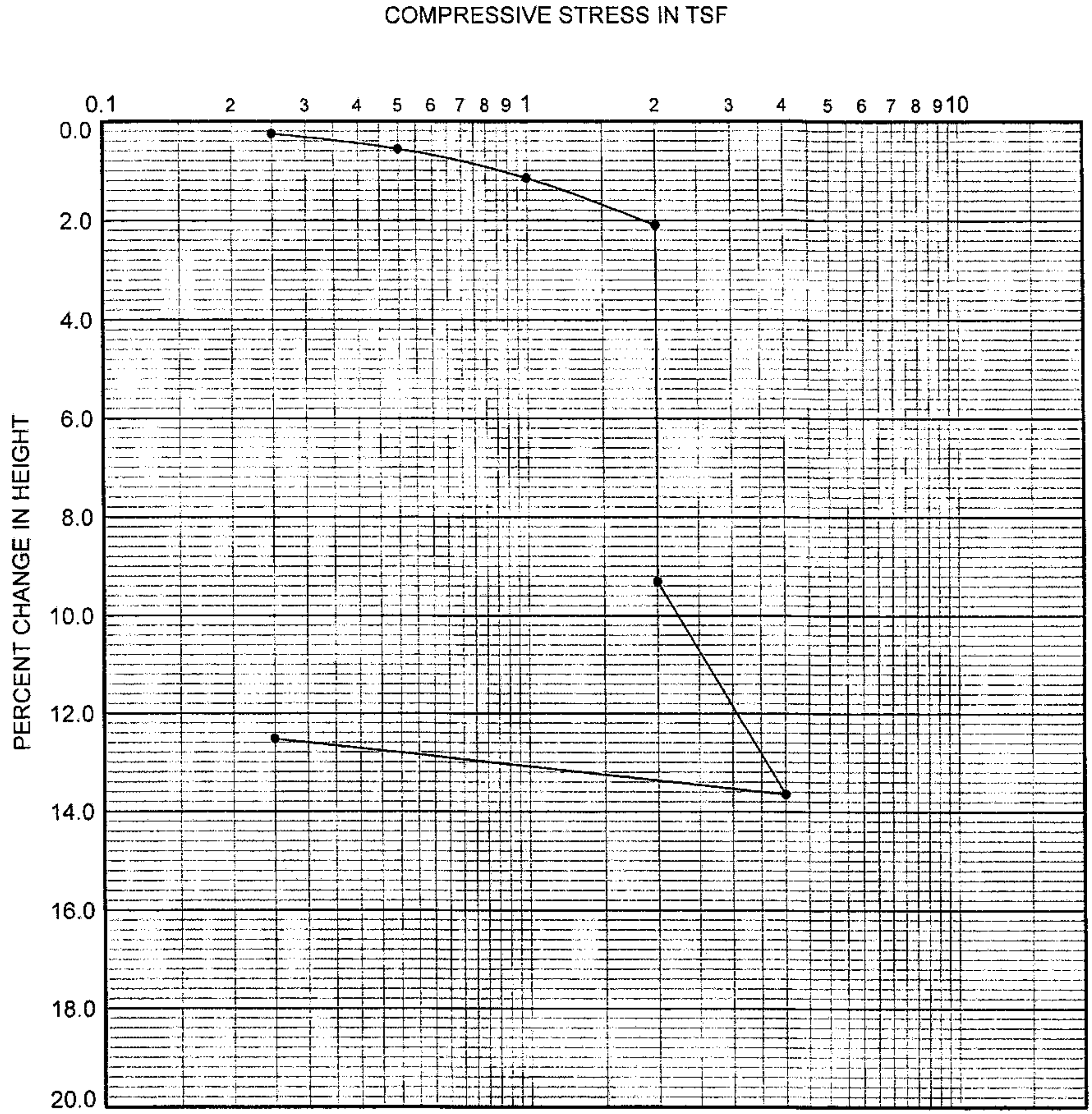
boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-16	15.0	109	17.4	89	50	SM-ML	Sandy Silt (Qal)

REMARKS: WATER ADDED AT 2.14 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-17



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
BA-64	15.0	96	11.4	42	47	SM	Silty Sand (Qal)

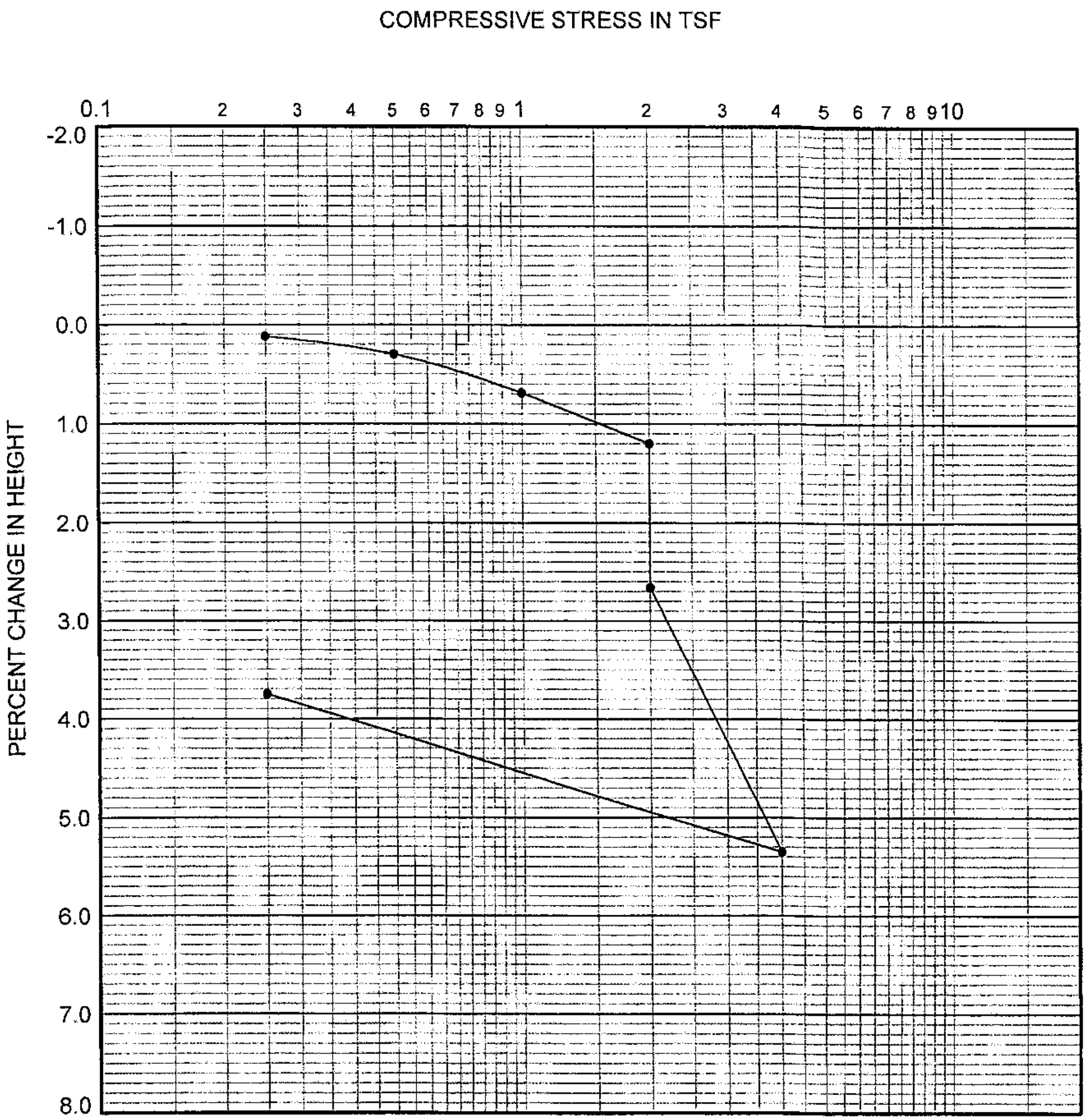
REMARKS: WATER ADDED AT 2.0 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4

PLATE C-53



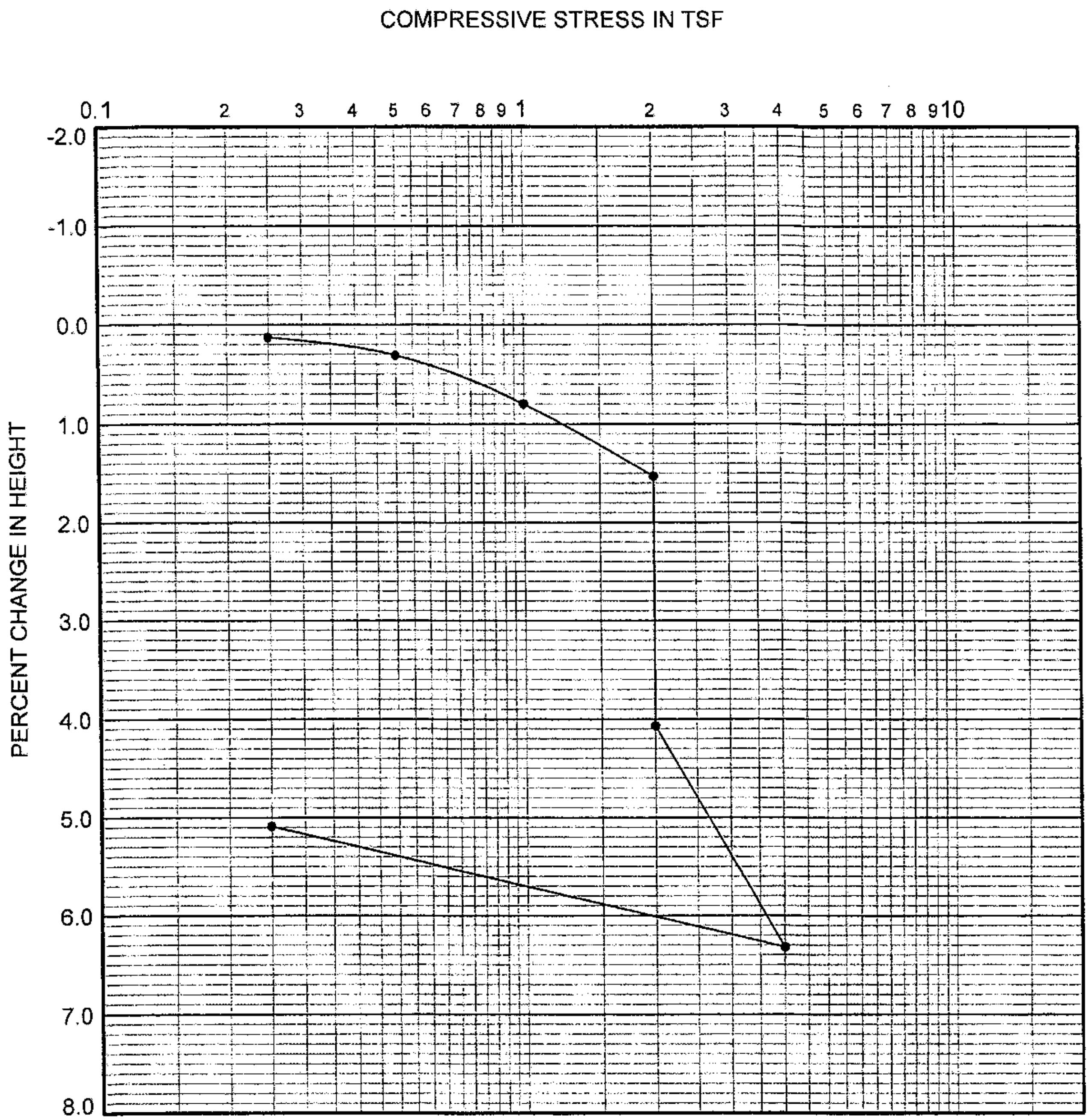
boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
BA-64	30.0	99	8.7	34	49	SM	Silty Sand (Qal)

REMARKS: WATER ADDED AT 2.0 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-54



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
BA-64	35.0	115	7.3	44	41		Silty Sandstone (QTst)

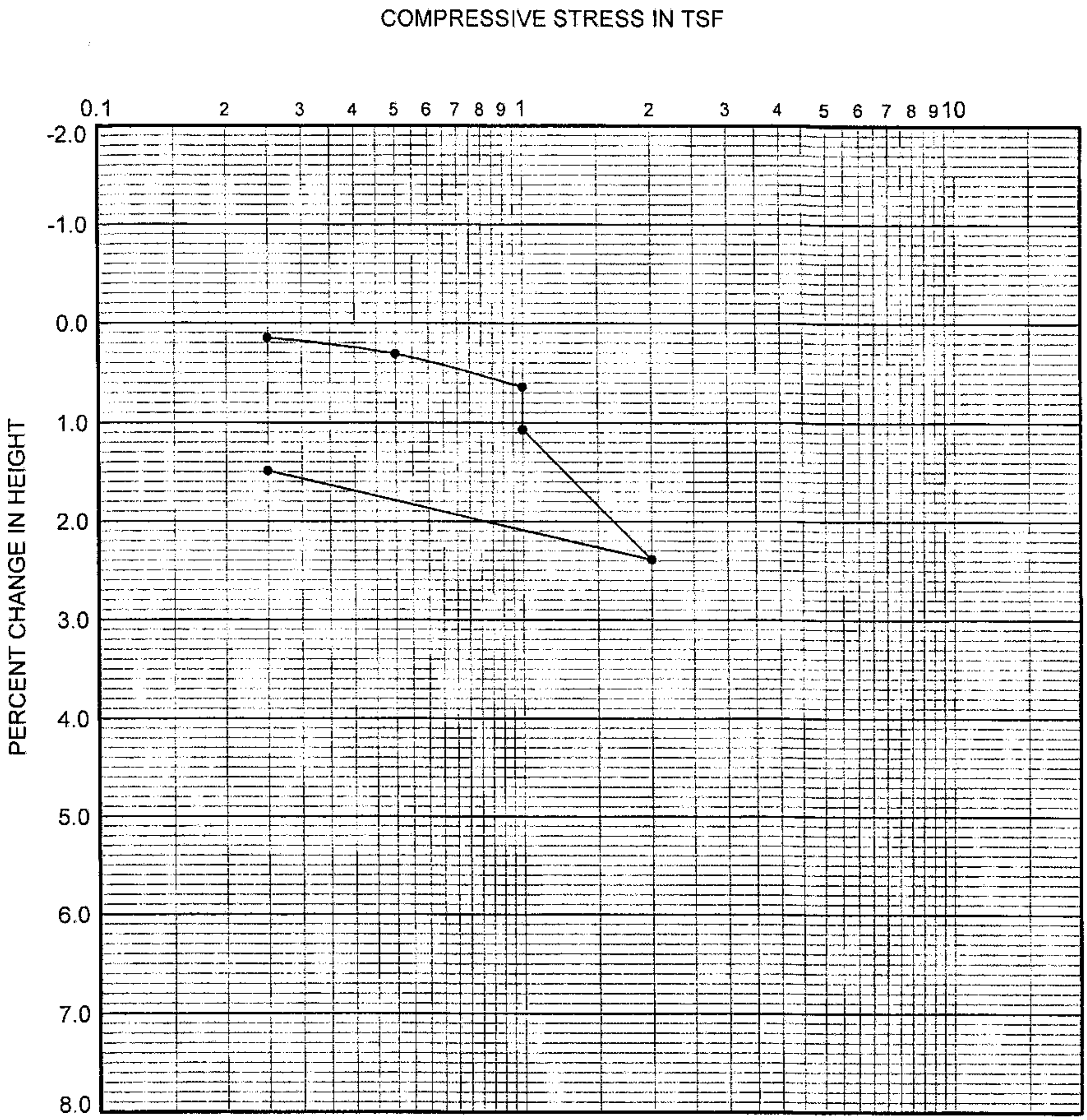
REMARKS: WATER ADDED AT 2.0 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4

PLATE C-55



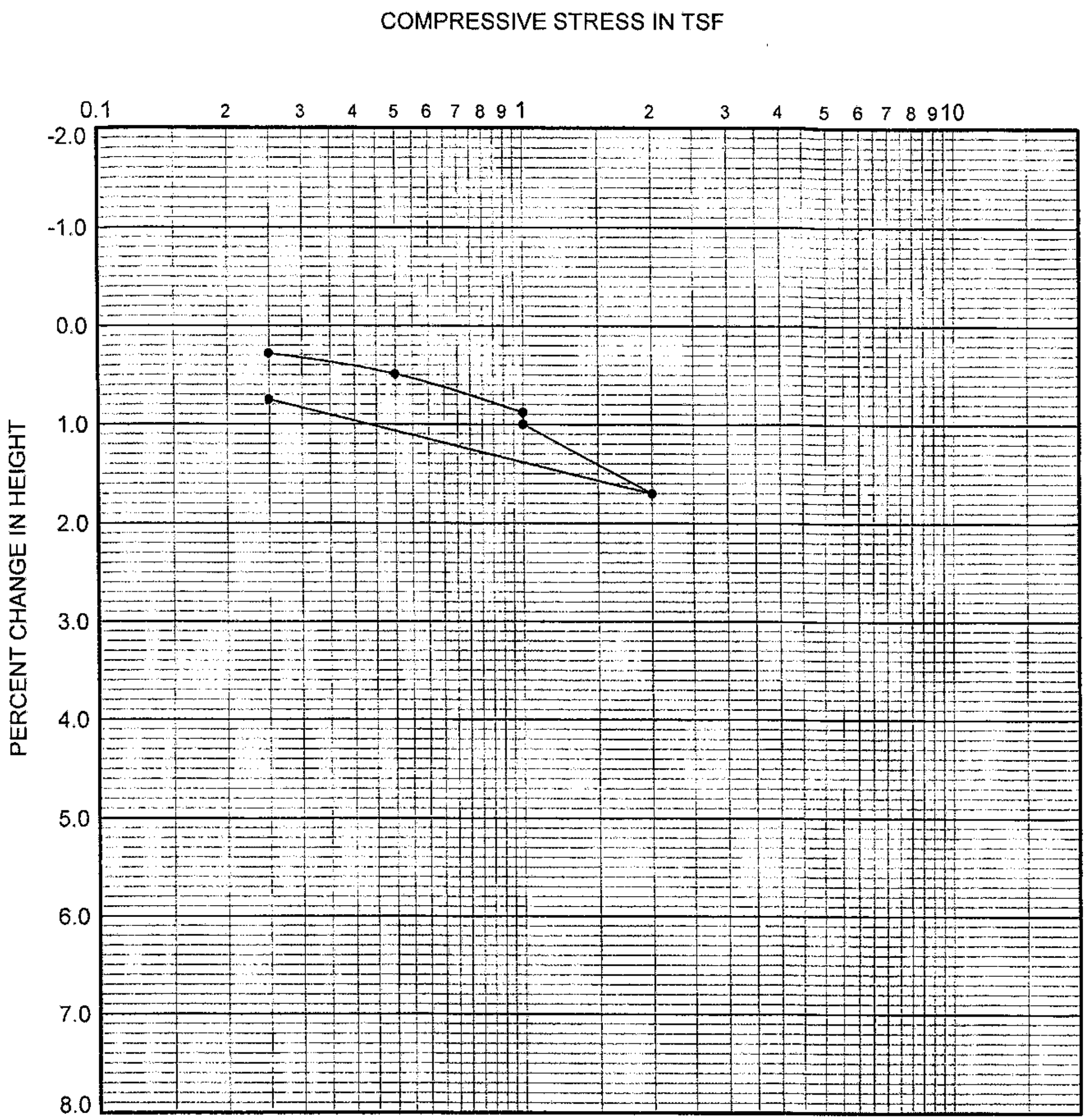
boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
BA-70	10.0	105	12.9	59	46	SM	Silty Sand (Qal)

REMARKS: WATER ADDED AT 1.0 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-64



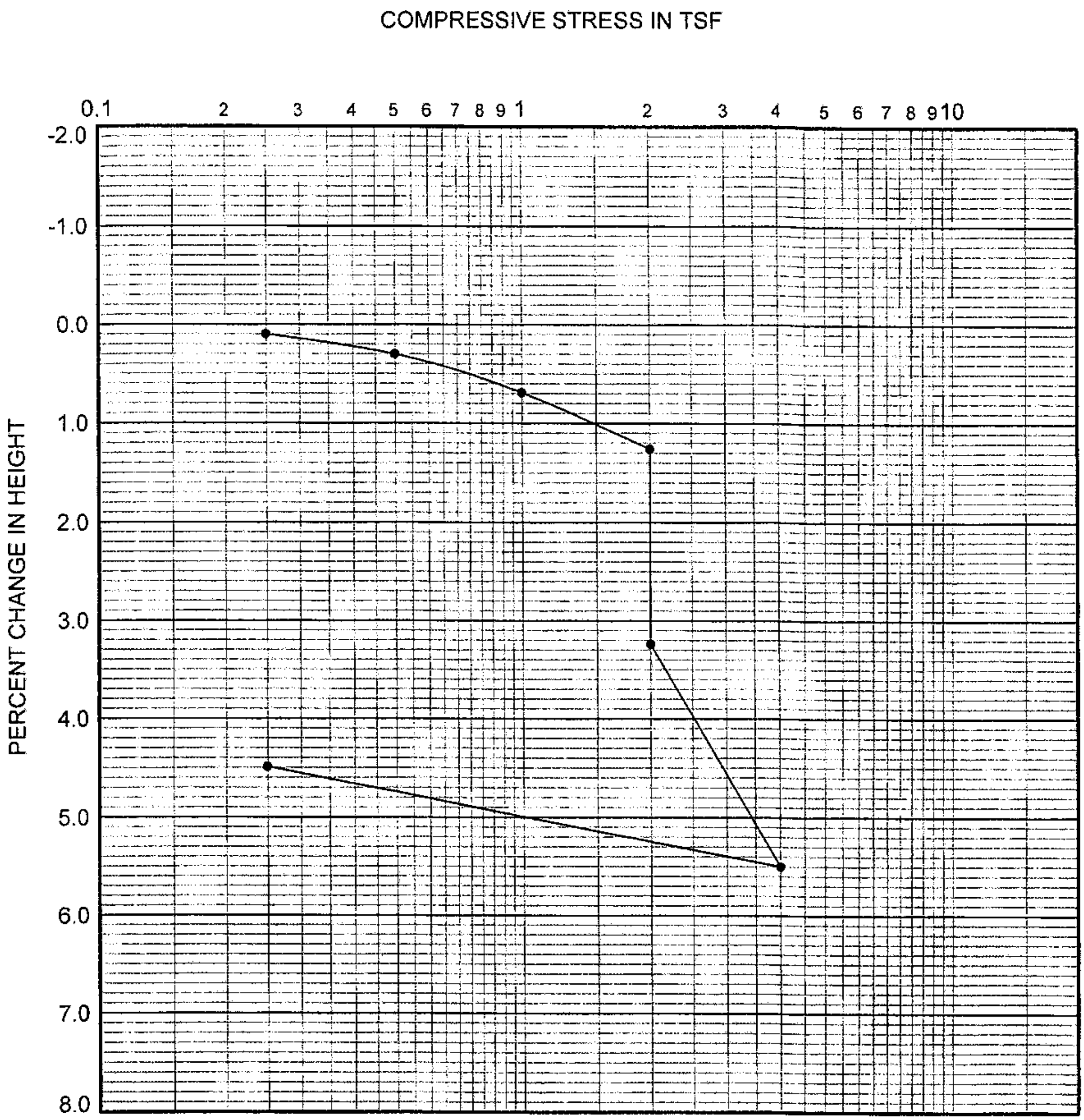
boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
BA-70	20.0	102	14.3	62	53	ML	Sandy Silt (Qal)

REMARKS: WATER ADDED AT 1.0 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-65



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
BA-72	20.0	104	6.1	27	9	SP	Gravelly Sand (Qal)

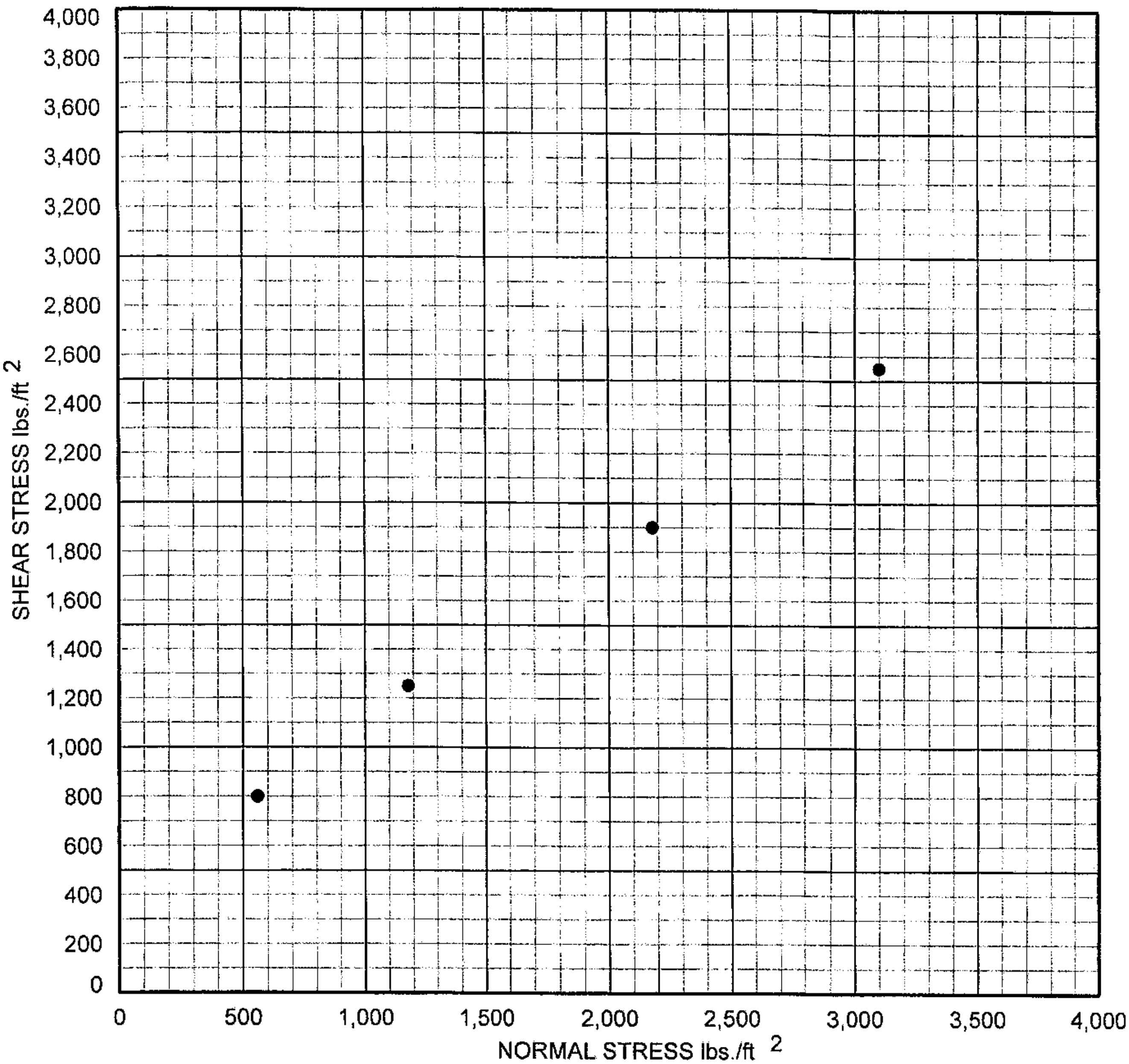
REMARKS: WATER ADDED AT 2.0 TSF

CONSOLIDATION CURVE

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-67

DIRECT SHEAR TEST
Remolded at 90% Relative Compaction



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	-200 sieve (%)	group symbol	typical names
B-12	6.0			31	SM	Silty Sand (Qal)

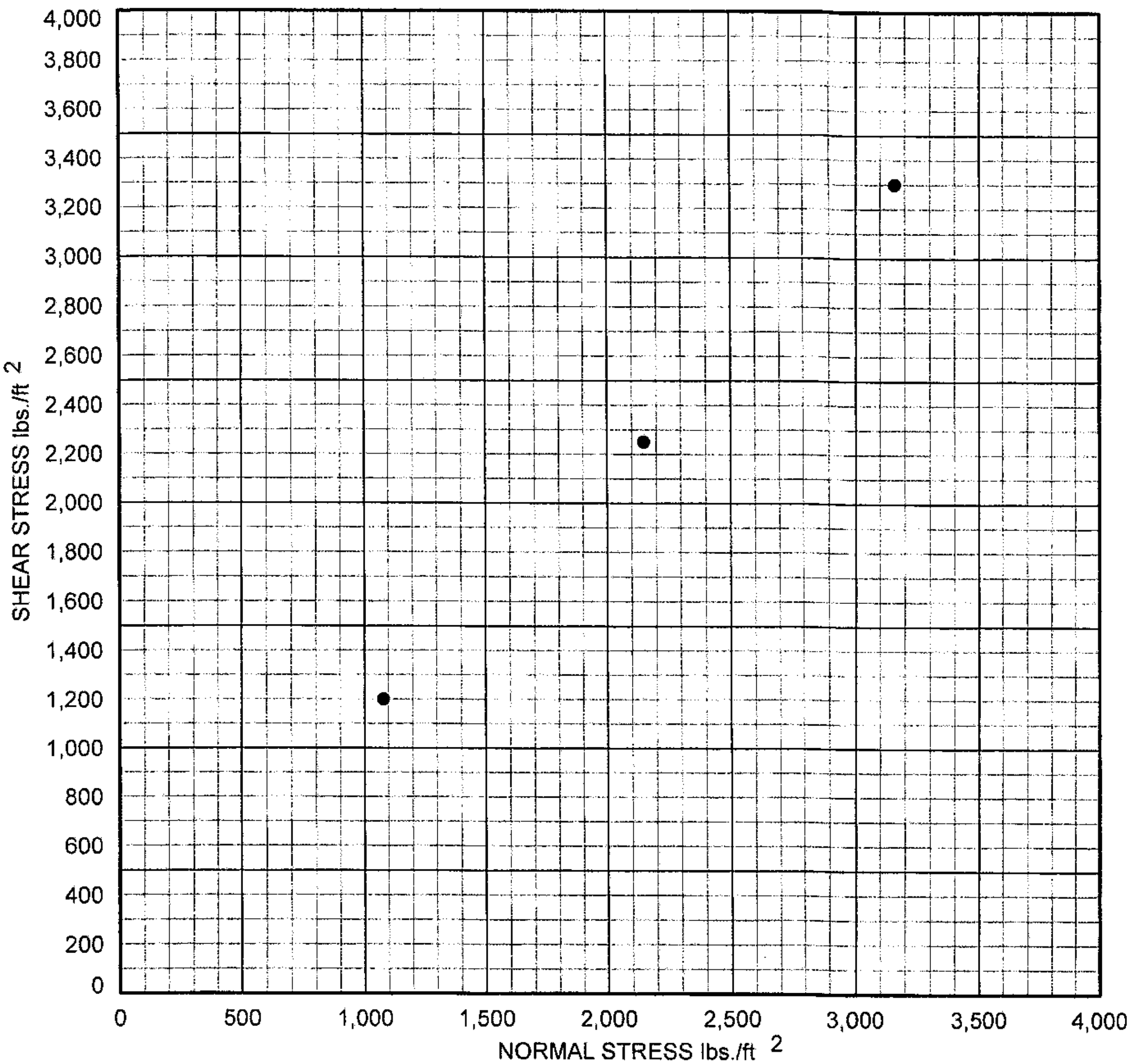
COHESION	425	psf.
FRICTION ANGLE	34.0	degrees

DIRECT SHEAR TEST

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-68

DIRECT SHEAR TEST
Undisturbed



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	-200 sieve (%)	group symbol	typical names
BA-63	70.0	125	12.1	33		Silty Sandstone (QTst)

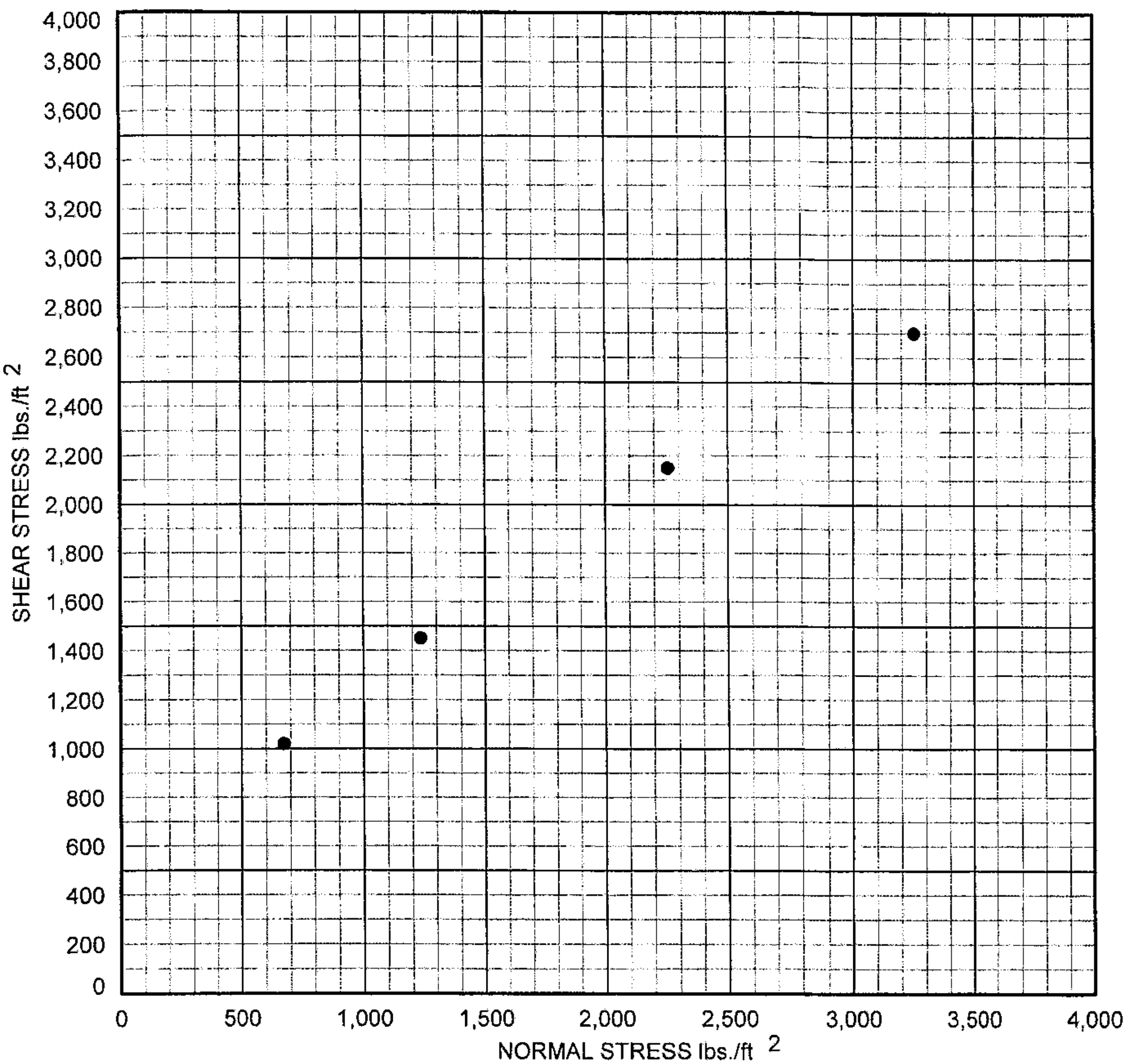
COHESION	100	psf.
FRICTION ANGLE	45.0	degrees

DIRECT SHEAR TEST

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-80

DIRECT SHEAR TEST
Remolded at 90% Relative Compaction



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	-200 sieve (%)	group symbol	typical names
BA-73	17.0			34		Sandy Siltstone (QTst)

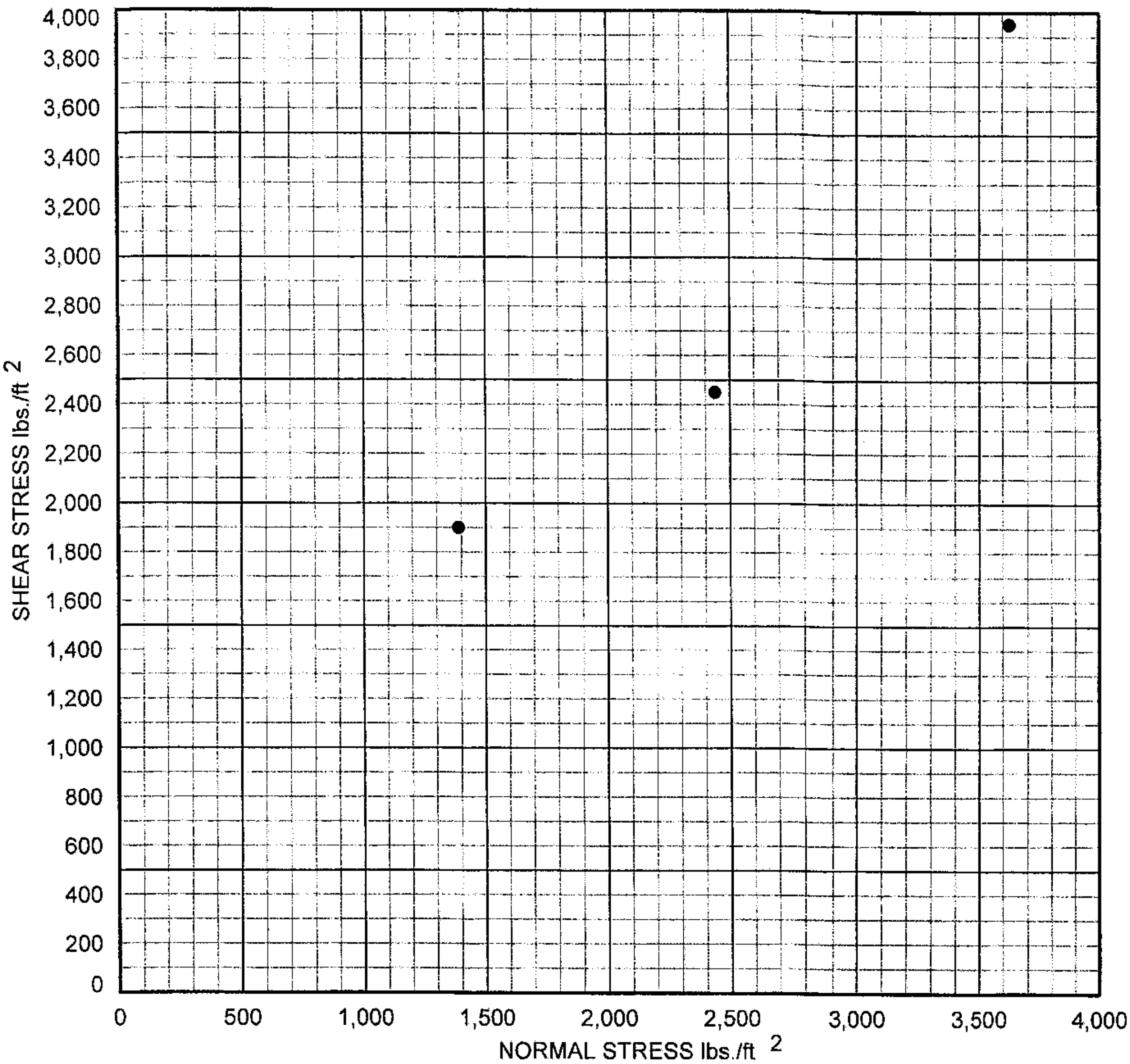
COHESION	620	psf.
FRICTION ANGLE	33.0	degrees

DIRECT SHEAR TEST

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-83

DIRECT SHEAR TEST
Undisturbed



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	-200 sieve (%)	group symbol	typical names
BA-73	30.0	129	8.8	33		Clayey Siltstone (QTst)

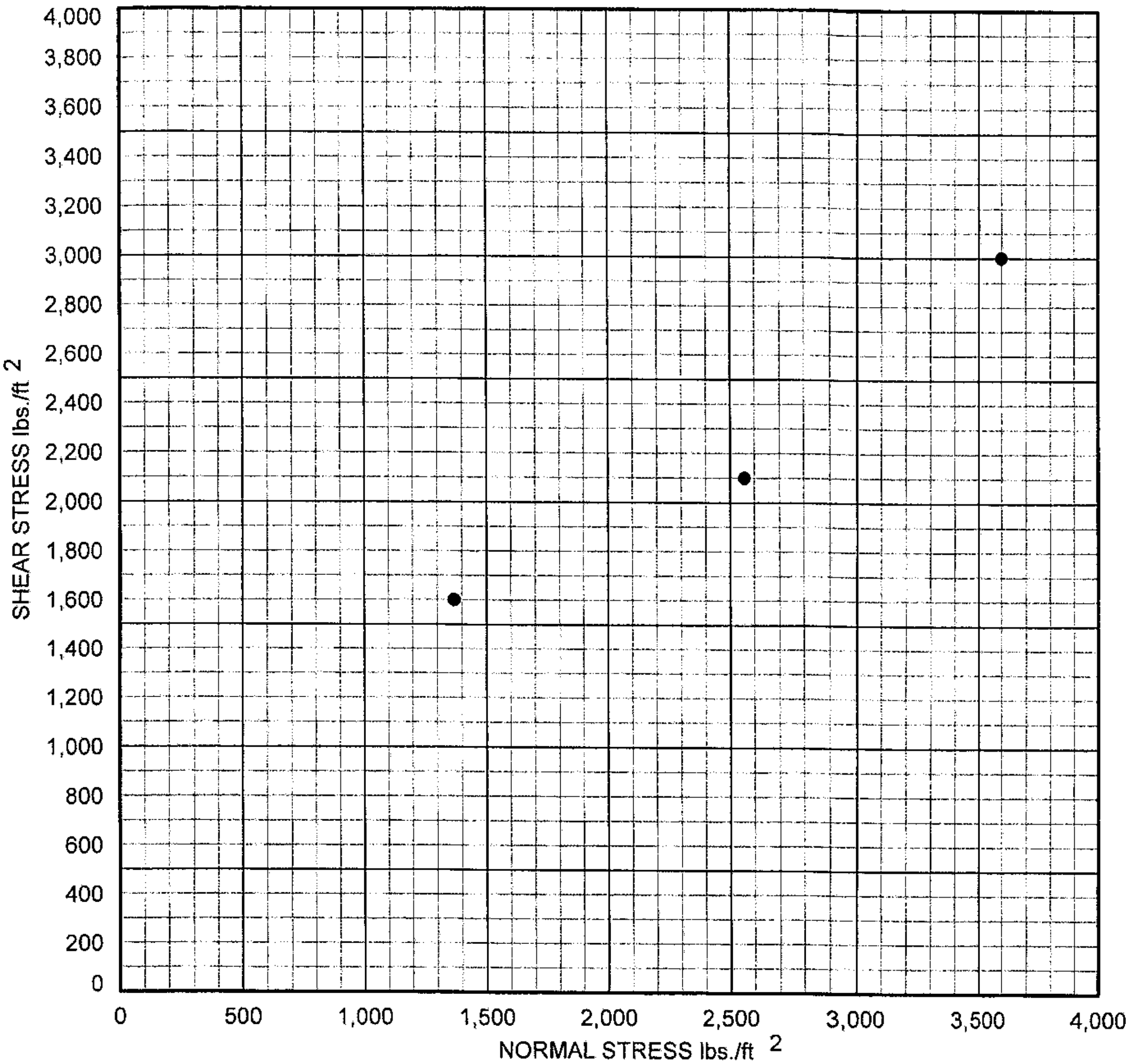
COHESION	470	psf.
FRICTION ANGLE	43.0	degrees

DIRECT SHEAR TEST

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-84

DIRECT SHEAR TEST
Undisturbed



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	-200 sieve (%)	group symbol	typical names
BA-73	47.0	104	20.6	72		Sandstone (QTst)

COHESION	670	psf.
FRICTION ANGLE	32.0	degrees

DIRECT SHEAR TEST

PACIFIC SOILS ENGINEERING, INC.

W.O. 700003-G4 PLATE C-85

KYH Co. Analytical Laboratory

3621 W. MacArthur Blvd., #118, Santa Ana, CA 92704 Tel: (714) 549-5824 Fax: (714) 549-8375

ANALYTICAL REPORT

Client Name:	Pacific Soils Engineering, Inc.	Report Number:	**267989R**
Address:	710 E. Parkridge Avenue, Suite 105 Corona, CA 92879	PSE W.O. Number:	700003-G4
Contact Person:	Mr. Duane Irwin	P.O. Number:	Verbal

SAMPLE RESULTS

Client Sample ID	Lab ID	Date Requested	Analysis	Method	Result (% wt)	MDL (% wt)
B-69, (11)	26813	12-12-2006	Alkalinity	SM 2320	0.038	0.001
			Chloride Content	CalTrans 422	0.001	0.001
			Sulfate Content	CalTrans 417	<0.001	0.001
BA-73, (17)	26814	12-12-2006	Alkalinity	SM 2320	0.025	0.001
			Chloride Content	CalTrans 422	0.054	0.001
			Sulfate Content	CalTrans 417	<0.001	0.001
BA-60, (9)	26815	12-13-2006	Alkalinity	SM 2320	0.013	0.001
			Chloride Content	CalTrans 422	0.002	0.001
			Sulfate Content	CalTrans 417	<0.001	0.001

Keshengt Huang

Authorized Signature

December 14, 2006

Report Date

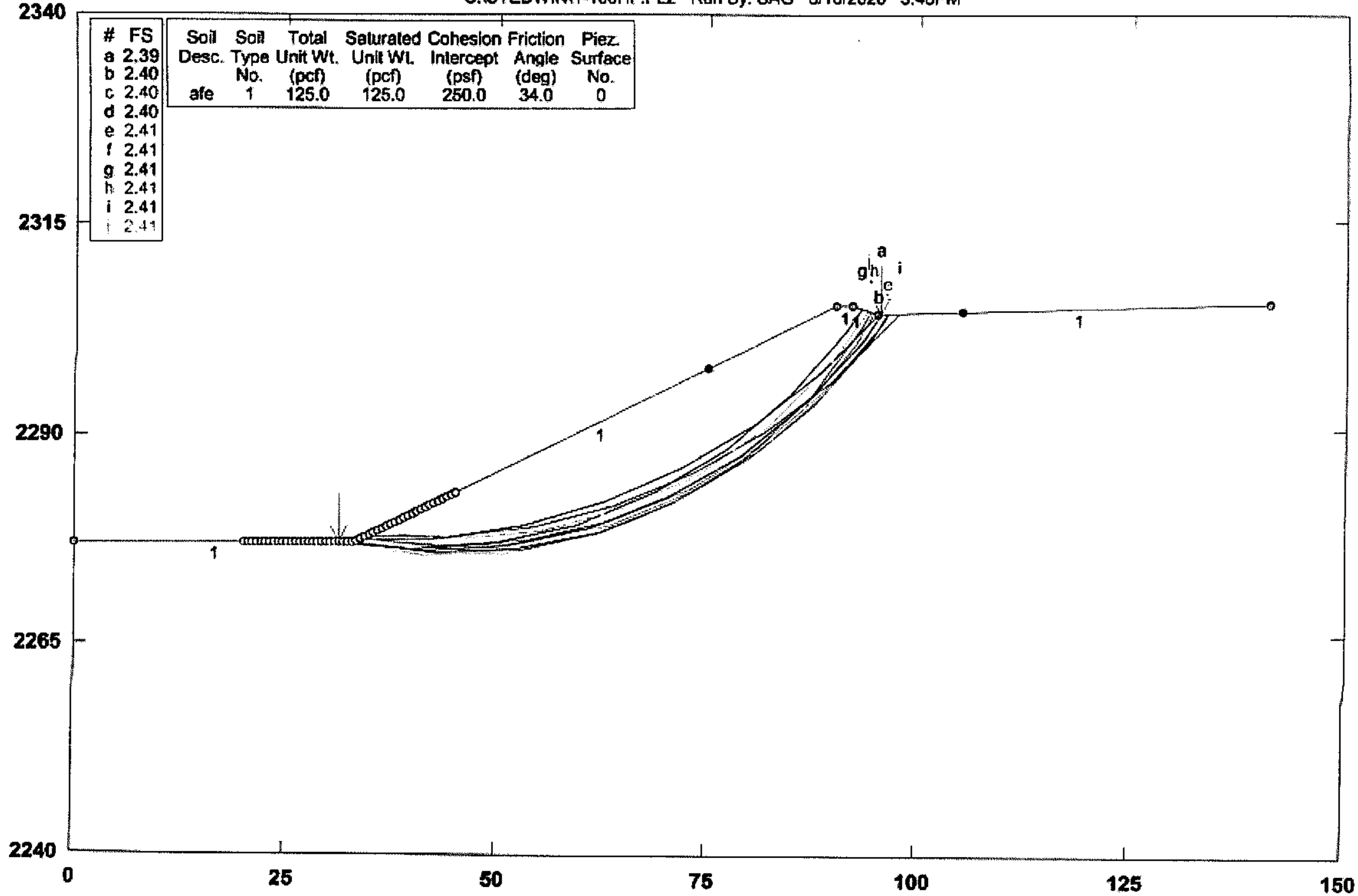
PLATE C-88

APPENDIX D

Slope Stability Calculations

1-0160-H 2:1 28' Fill Slope Adj Lot 12 Static Analysis

C:\STEDWIN\1-160HF.PL2 Run By: SAG 8/10/2020 5:48PM



GSTABL7 v.2 FSmin=2.39

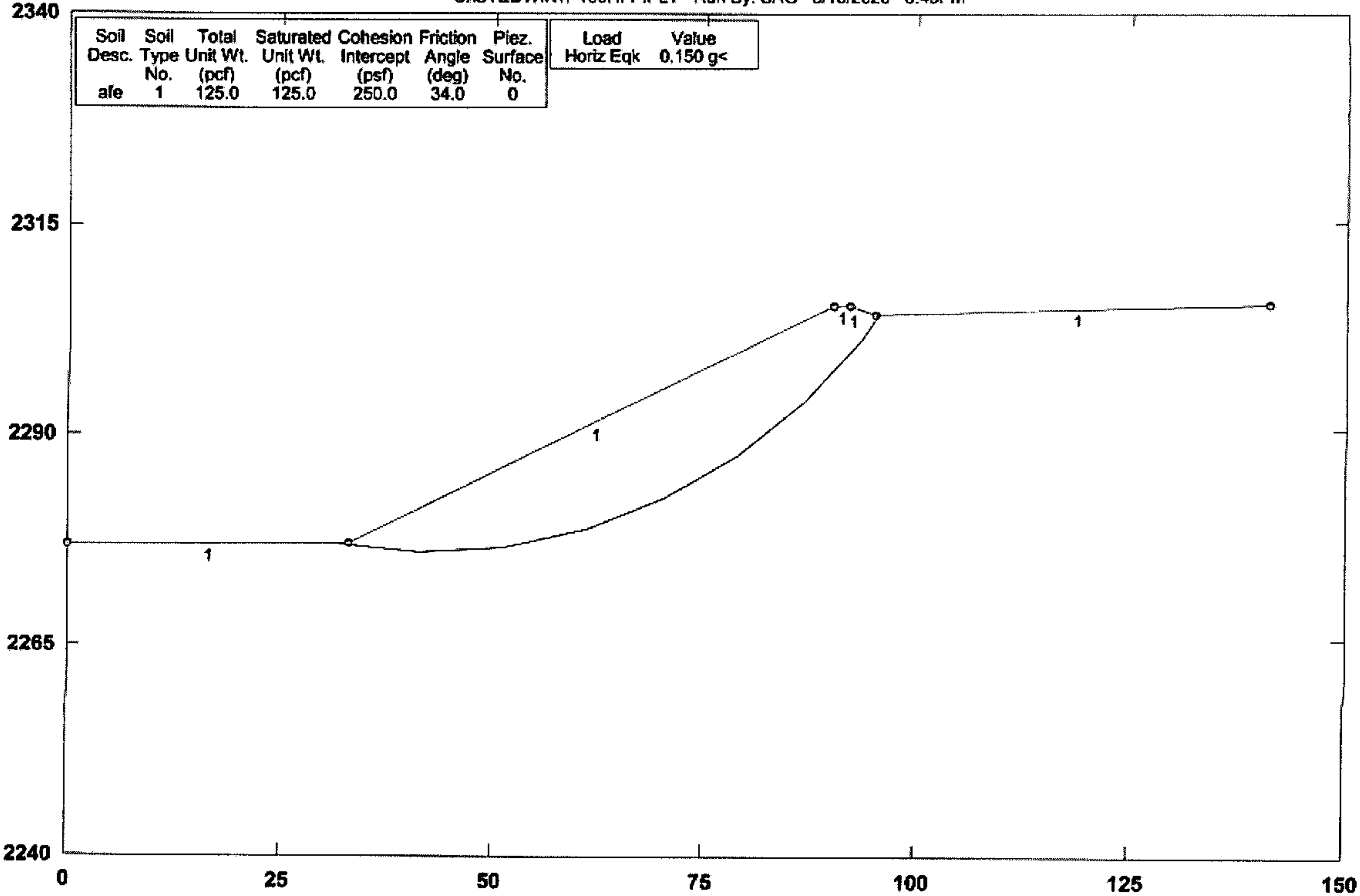
Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

PLATE D-1

1-0160-H 2:1 28' Fill Slope Adj Lot 12 Psuedostatic Analysis

C:\STEDWIN\1-160HFP.PLT Run By: SAG 8/10/2020 5:49PM



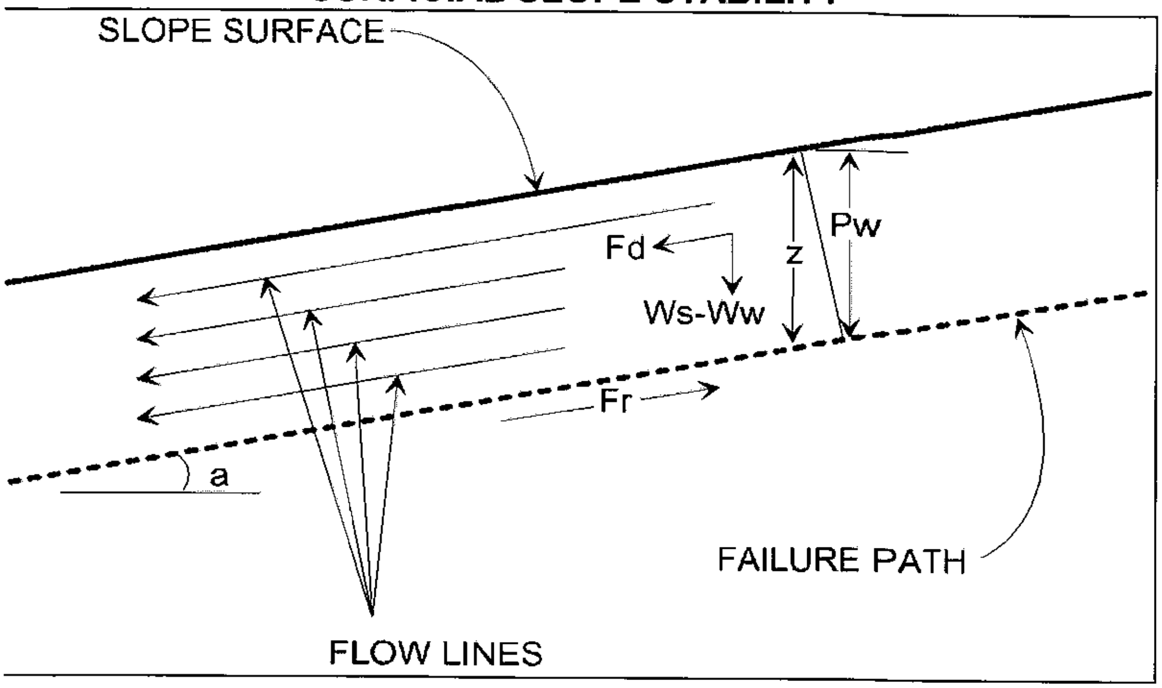
GSTABL7 v.2 FSmin=1.61

Factor Of Safety Is Calculated By The Simplified Janbu Method

GSTABL7

PLATE D-2

SURFICIAL SLOPE STABILITY



Assume: (1) Saturation To Slope Surface
(2) Sufficient Permeability To Establish Water Flow

Pw = Water Pressure Head=(z)(cos^2(a))
Ws = Saturated Soil Unit Weight
Ww = Unit Weight of Water (62.4 lb/cu.ft.)
u = Pore Water Pressure=(Ww)(z)(cos^2(a))
z = Layer Thickness
a = Angle of Slope
phi = Angle of Friction
c = Cohesion
Fd = (0.5)(z)(Ws)(sin(2a))
Fr = (z)(Ws-Ww)(cos^2(a))(tan(phi)) + c
Factor of Safety (FS) = Fr/Fd

Given:

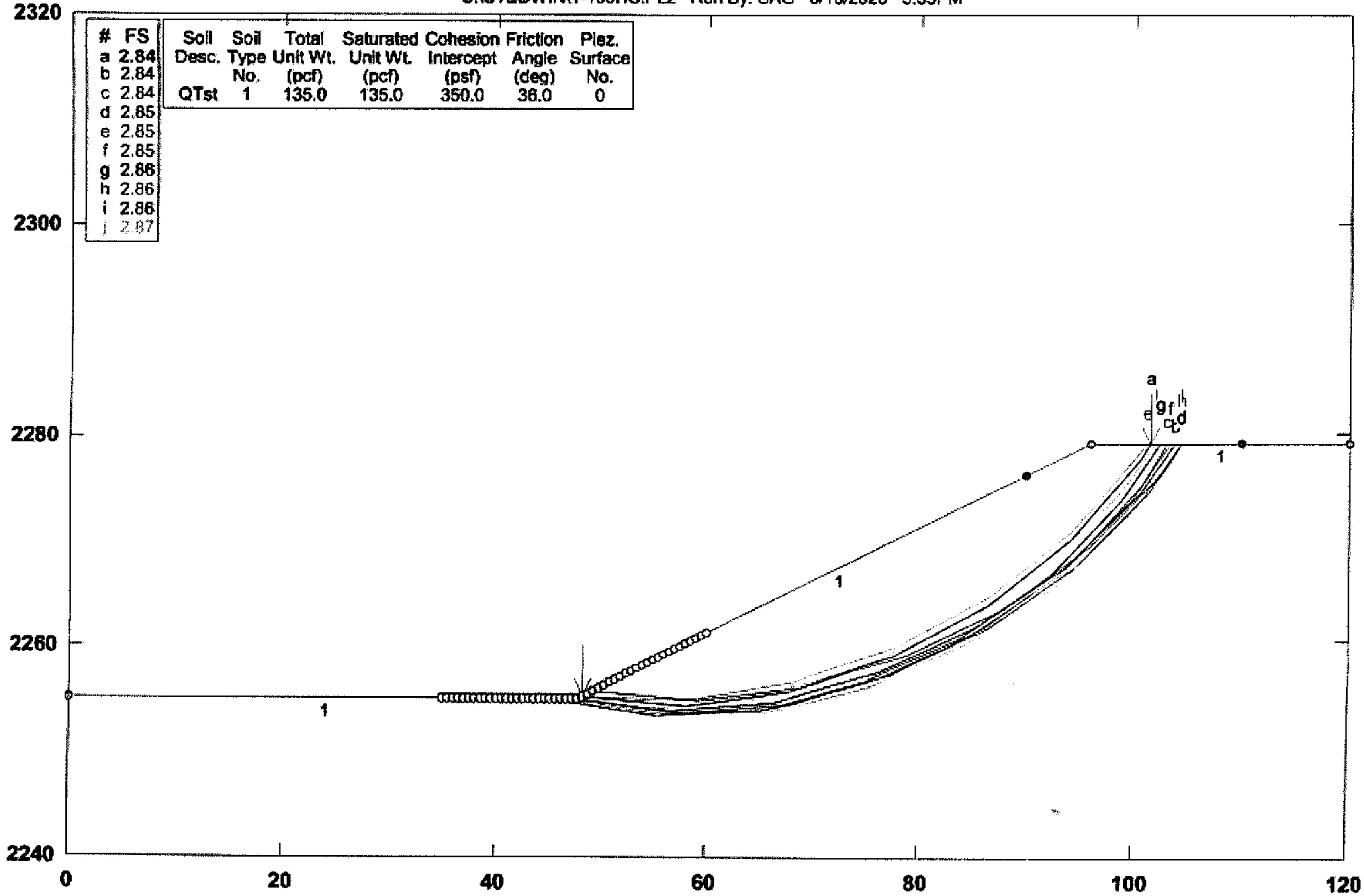
Ws (pcf)	z (ft)	a (degrees)	(radians)	phi (degrees)	(radians)	c (psf)
125	4	26.565051	0.4636476	34	0.5934119	250

Calculations:

Pw	u	Fd	Fr	**FS**
3.20	199.68	200.00	385.12	**1.93**

1-0160-H 2:1 24' Cut Slope Adj Lot 33 Static Analysis

C:\STEDWIN\1-160HC.PL2 Run By: SAG 8/10/2020 5:55PM



GSTABL7 v.2 FSmin=2.84

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

PLATE D-4

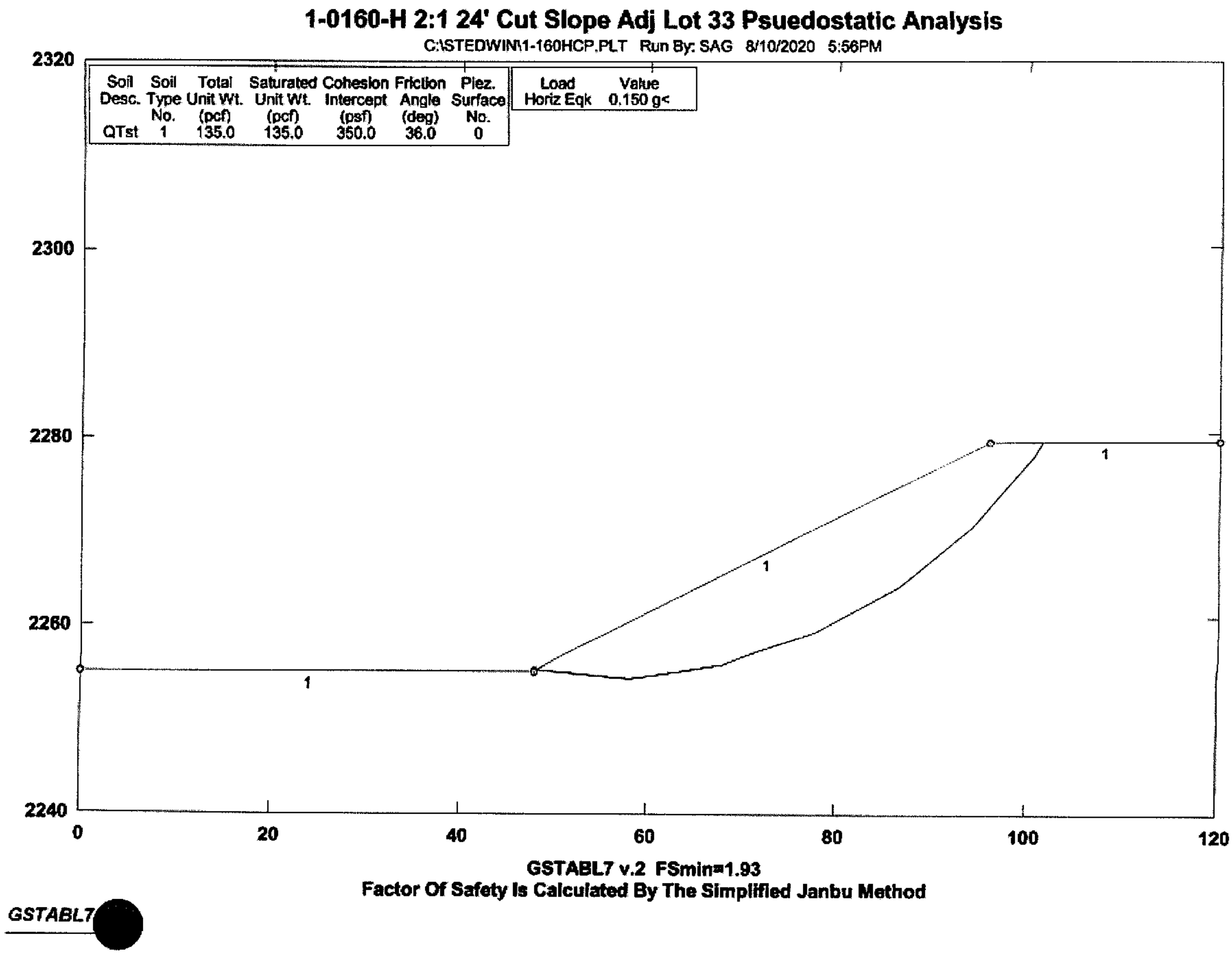

1-0160-H 2:1 24' Cut Slope Adj Lot 33 Psuedostatic Analysis
C:\STEDWIN\1-160HCP.PLT Run By: SAG 8/10/2020 5:56PM
Soil Desc. | Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Piez. Surface No.
QTst | 1 | 135.0 | 135.0 | 350.0 | 36.0 | 0
Load | Value
Horiz Eqk | 0.150 g<
2320
2300
2280
2260
2240
0
20
40
60
80
100
120
1
1
1
GSTABL7 v.2 FSmin=1.93
Factor Of Safety Is Calculated By The Simplified Janbu Method
GSTABL7

PLATE D-5

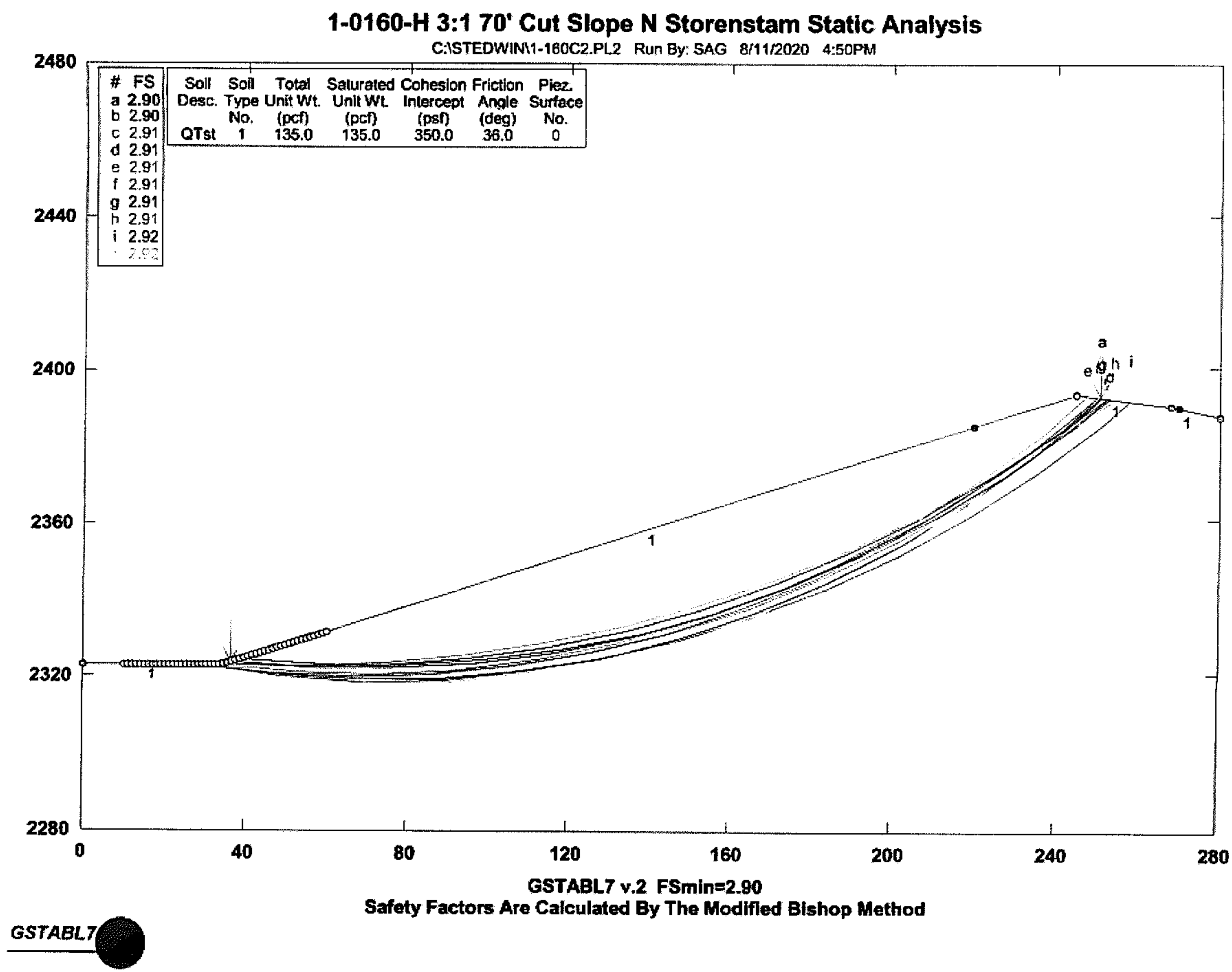
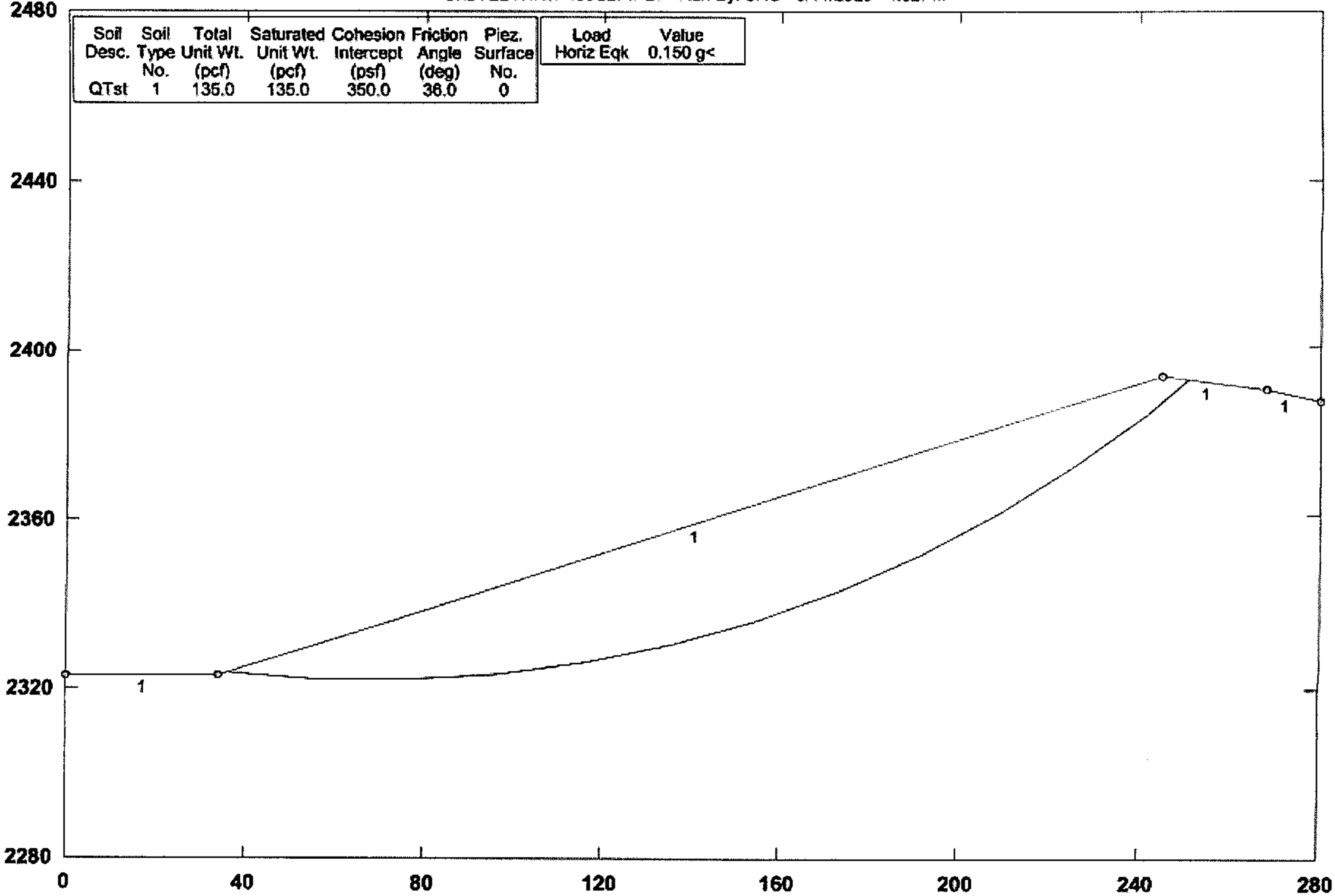

1-0160-H 3:1 70' Cut Slope N Storenstam Static Analysis
C:\STEDWIN\1-160C2.PL2 Run By: SAG 8/11/2020 4:50PM
FS
a 2.90
b 2.90
c 2.91
d 2.91
e 2.91
f 2.91
g 2.91
h 2.91
i 2.92
Soil Desc. | Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Piez. Surface No.
QTst | 1 | 135.0 | 135.0 | 350.0 | 36.0 | 0
2480
2440
2400
2360
2320
2280
0
40
80
120
160
200
240
280
GSTABL7 v.2 FSmin=2.90
Safety Factors Are Calculated By The Modified Bishop Method
GSTABL7

PLATE D-6

1-0160-H 3:1 70' Cut Slope N Storenstam Psuedostatic Analysis

C:\STEDWIN\1-160C2P.PLT Run By: SAG 8/11/2020 4:52PM



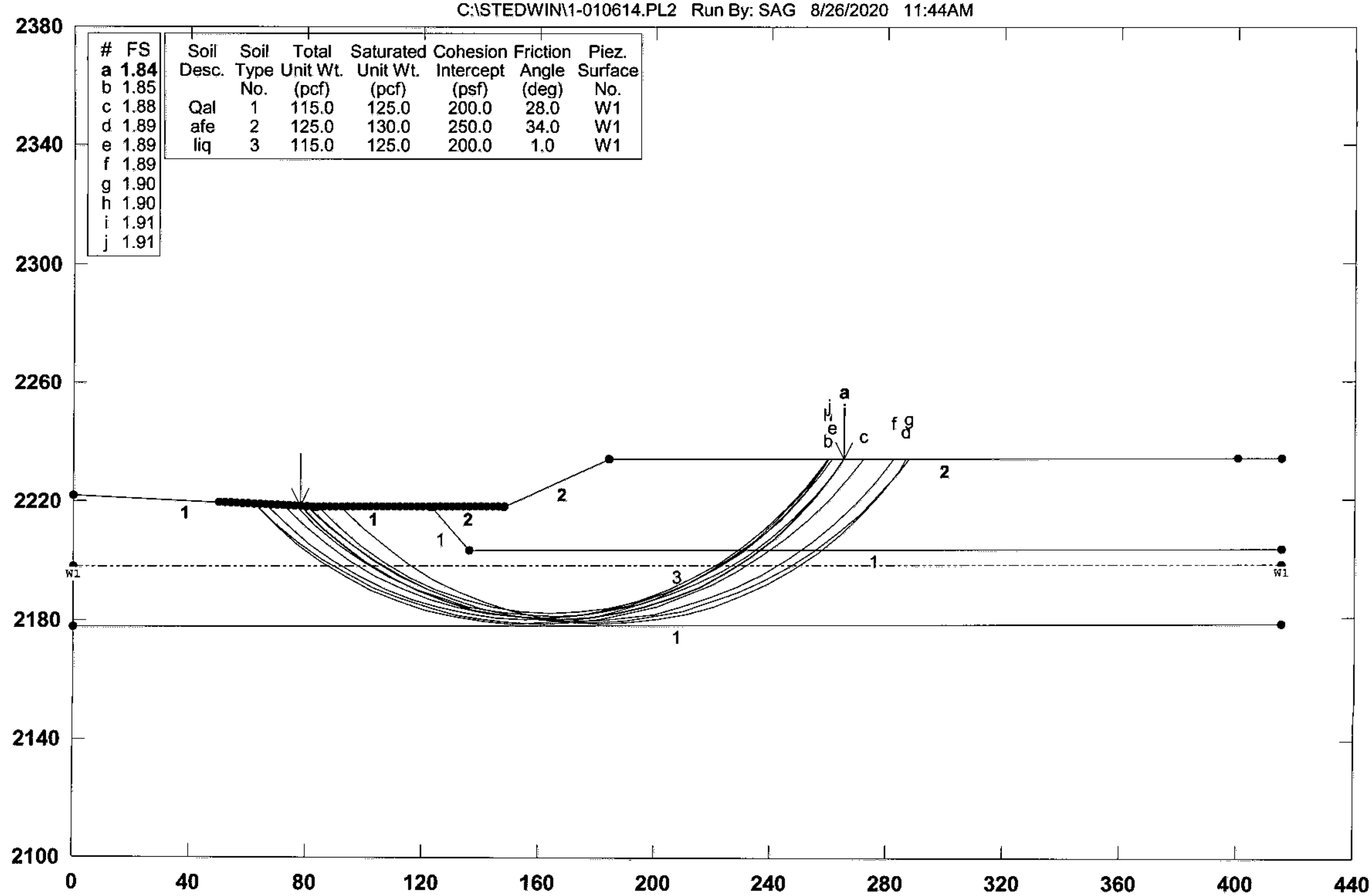
GSTABL7 v.2 FSmin=1.84
Factor Of Safety Is Calculated By The Simplified Janbu Method

GSTABL7

PLATE D-7

1-0160-H Adj Lot 14 Liquef. Slope Stability

C:\STEDWIN\1-010614.PL2 Run By: SAG 8/26/2020 11:44AM



GSTABL7 v.2 FSmin=1.84

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

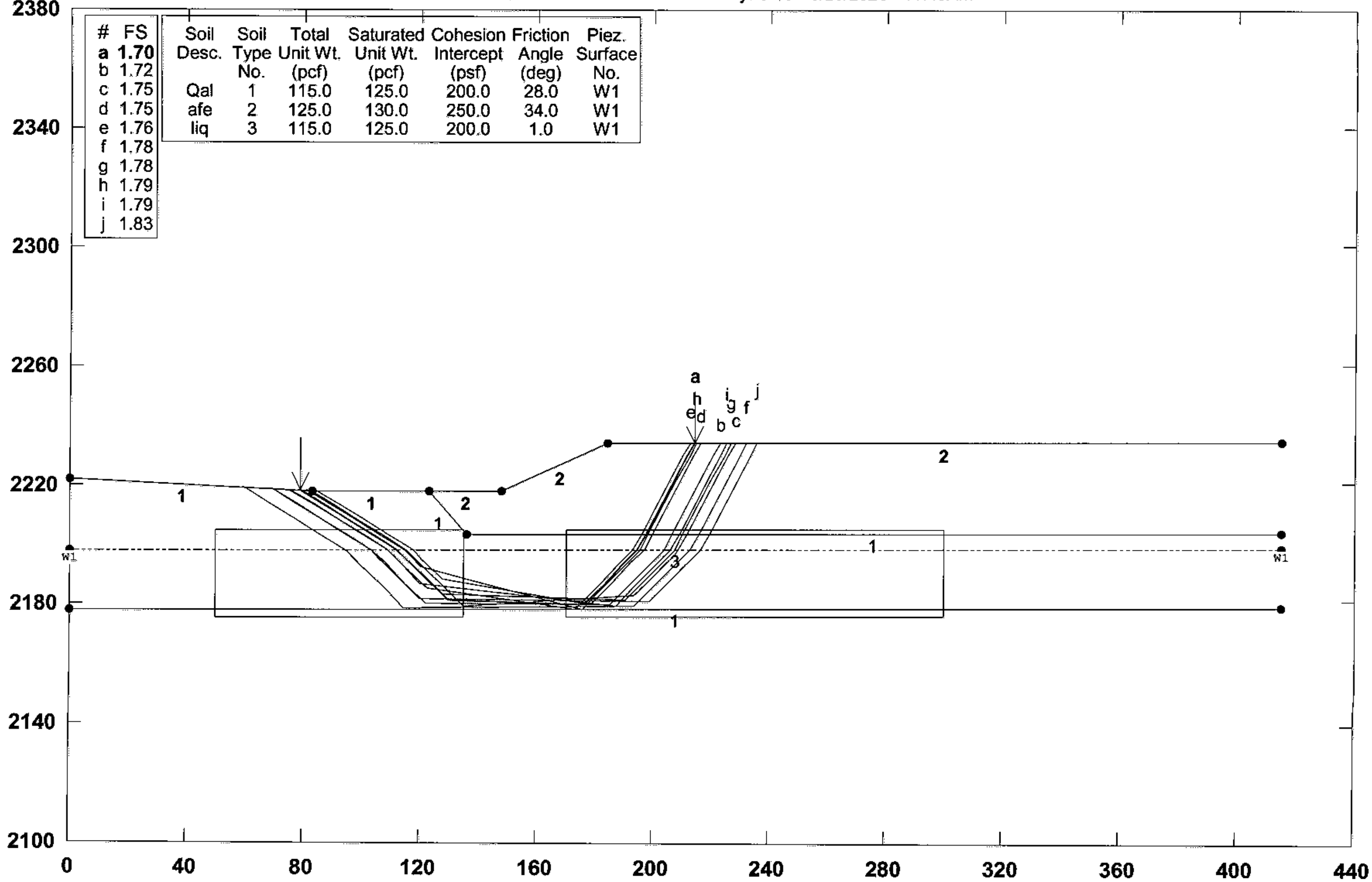
PLATE D-8

1-0160-H Adj Lot 14 Liquef. Slope Stability

C:\STEDWIN\1-010614.PL2 Run By: SAG 8/26/2020 11:49AM

#	FS
a	**1.70**
b	1.72
c	1.75
d	1.75
e	1.76
f	1.78
g	1.78
h	1.79
i	1.79
j	1.83

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Qal	1	115.0	125.0	200.0	28.0	W1
afe	2	125.0	130.0	250.0	34.0	W1
liq	3	115.0	125.0	200.0	1.0	W1



GSTABL7 v.2 FSmin=1.70

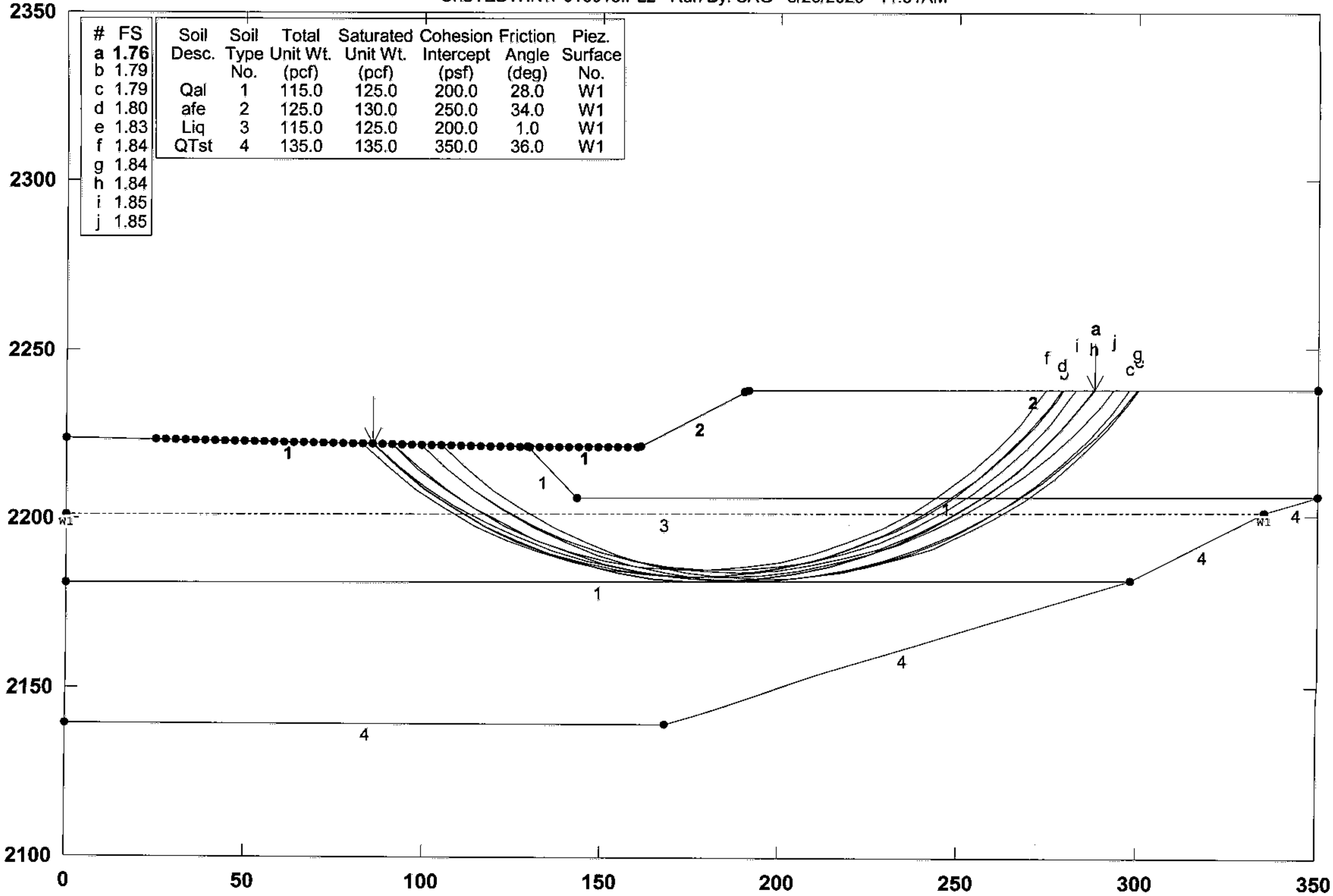
Safety Factors Are Calculated By The Simplified Janbu Method

GSTABL7

PLATE D-9

1-0160-H Adj Lot 18 Lique. Slope Stability

C:\STEDWIN\1-016018.PL2 Run By: SAG 8/26/2020 11:51AM



#	FS
a	**1.76**
b	1.79
c	1.79
d	1.80
e	1.83
f	1.84
g	1.84
h	1.84
i	1.85
j	1.85

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Qal	1	115.0	125.0	200.0	28.0	W1
afe	2	125.0	130.0	250.0	34.0	W1
Liq	3	115.0	125.0	200.0	1.0	W1
QTst	4	135.0	135.0	350.0	36.0	W1

GSTABL7 v.2 FSmin=1.76

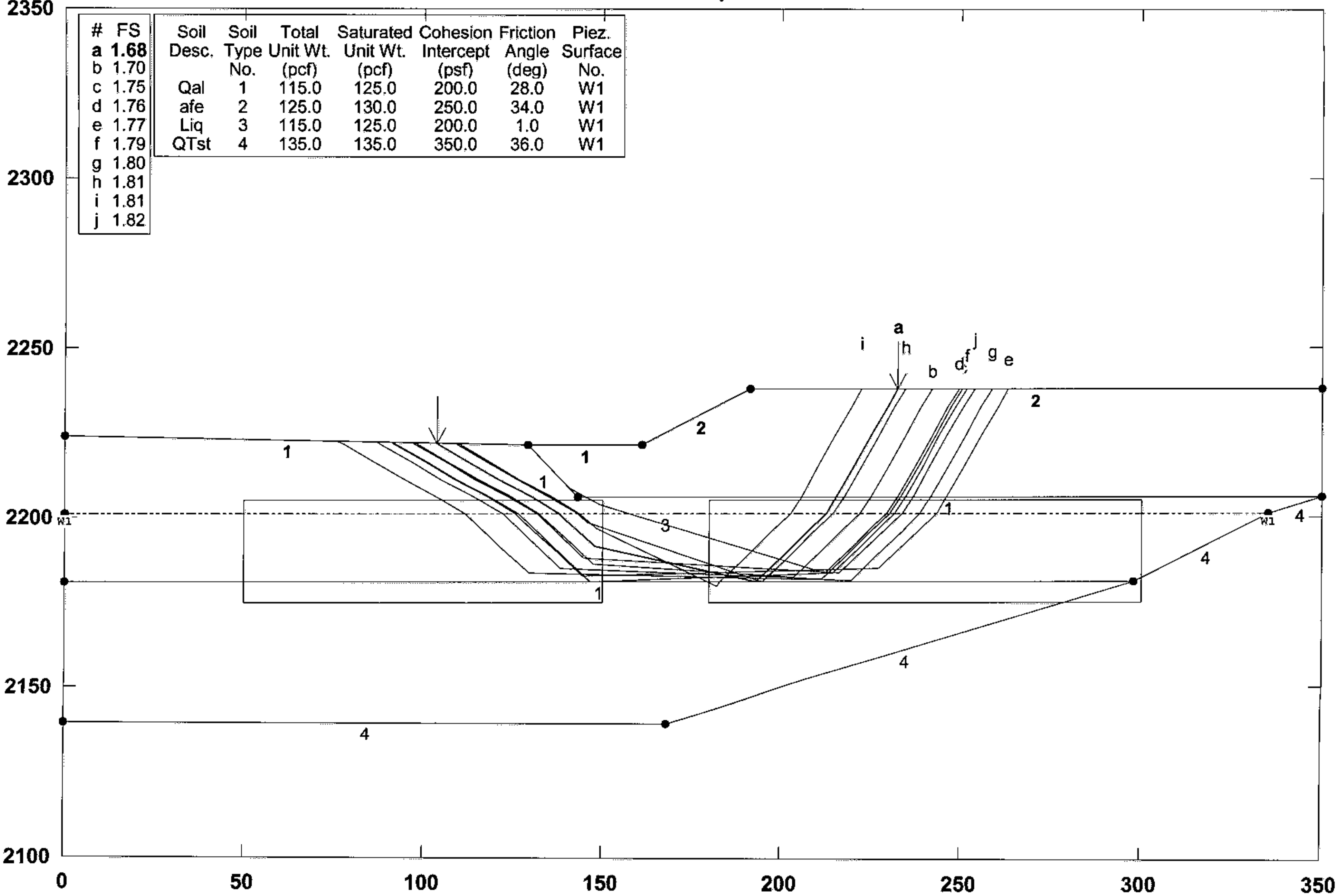
Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

PLATE D-10

1-0160-H Adj Lot 18 Lique. Slope Stability

C:\STEDWIN\1-016018.PL2 Run By: SAG 8/26/2020 11:53AM



#	FS
a	**1.68**
b	1.70
c	1.75
d	1.76
e	1.77
f	1.79
g	1.80
h	1.81
i	1.81
j	1.82

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Qal	1	115.0	125.0	200.0	28.0	W1
afe	2	125.0	130.0	250.0	34.0	W1
Liq	3	115.0	125.0	200.0	1.0	W1
QTst	4	135.0	135.0	350.0	36.0	W1

GSTABL7 v.2 FSmin=1.68

Safety Factors Are Calculated By The Simplified Janbu Method

GSTABL7

PLATE D-11

APPENDIX E

Liquefaction Calculations

APPENDIX E

LIQUEFACTION ANALYSIS

A liquefaction analysis was performed for the site based on CPT data presented in the enclosed logs by Kehoe Testing & Engineering. The Ishihara/Yoshimine method was used to analyze dynamic settlement for the CPT data. The calculations used the following constants: 0.98g for site acceleration and 8.1 for the magnitude of the earthquake. A factor of safety of 1.3 was utilized. The results are presented on Plates E-1 through E-15.

LIQUEFACTION ANALYSIS

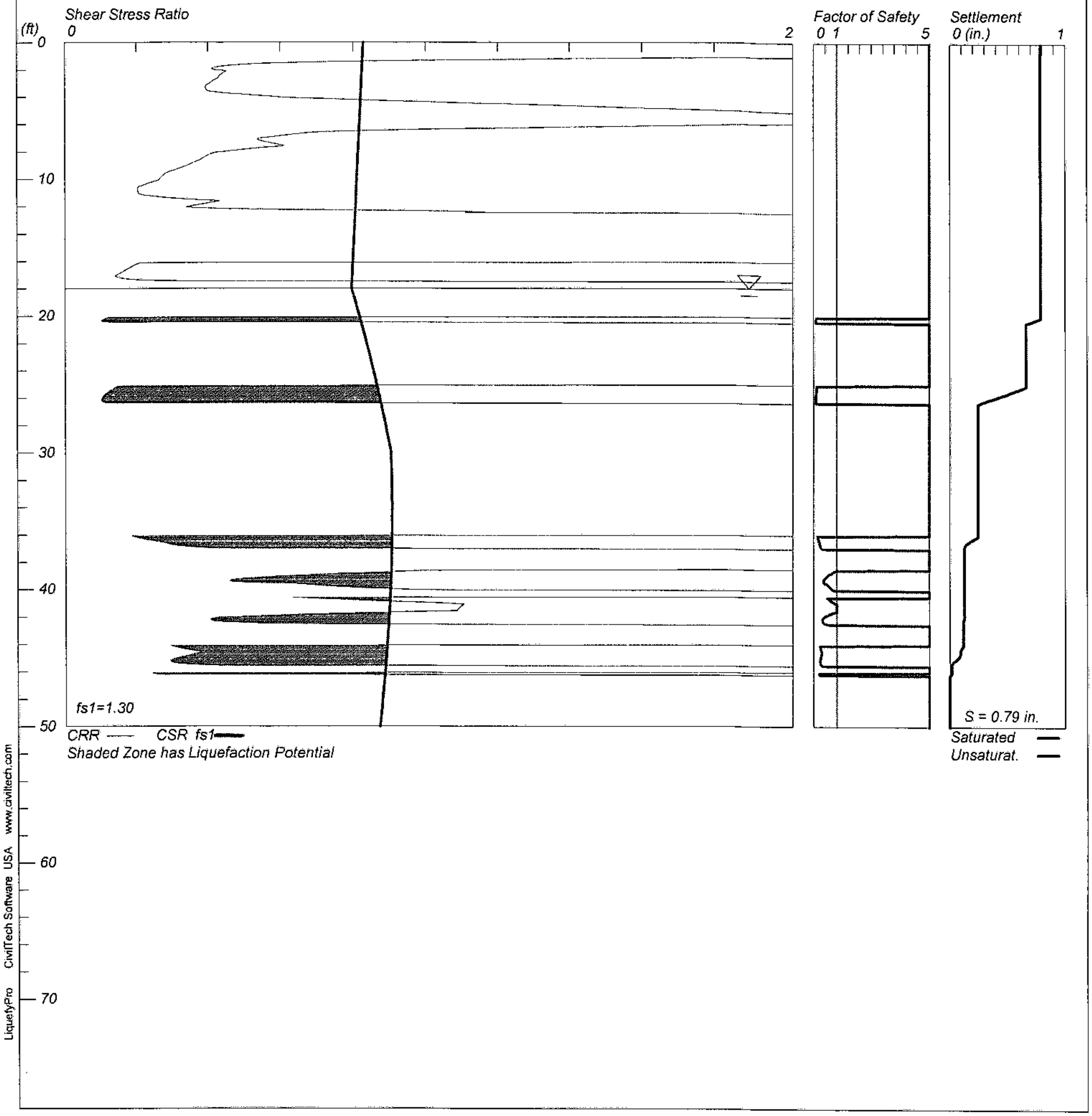
Fairway Canyon PA-22

Hole No.=C-11 Water Depth=18 ft Surface Elev.=2221

Ground Improvement of Fill=14 ft

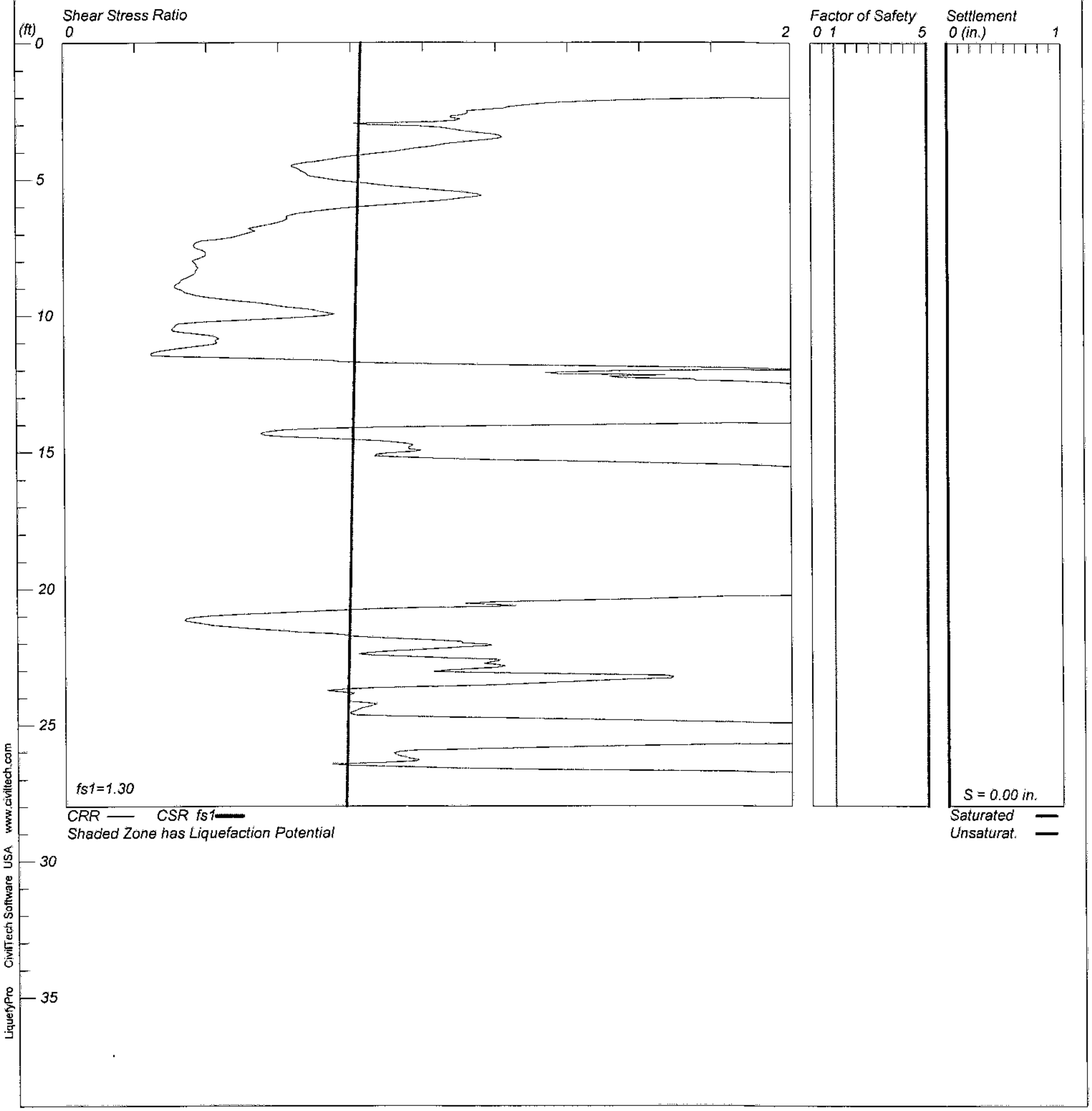
Magnitude=8.1

Acceleration=0.98g



LIQUEFACTION ANALYSIS
Fairway Canyon PA-22

Hole No.=CPT-5 Water Depth=40 ft Surface Elev.=2248 ***Magnitude=8.1***
Ground Improvement of Fill=2 ft ***Acceleration=0.98g***



LIQUEFACTION ANALYSIS

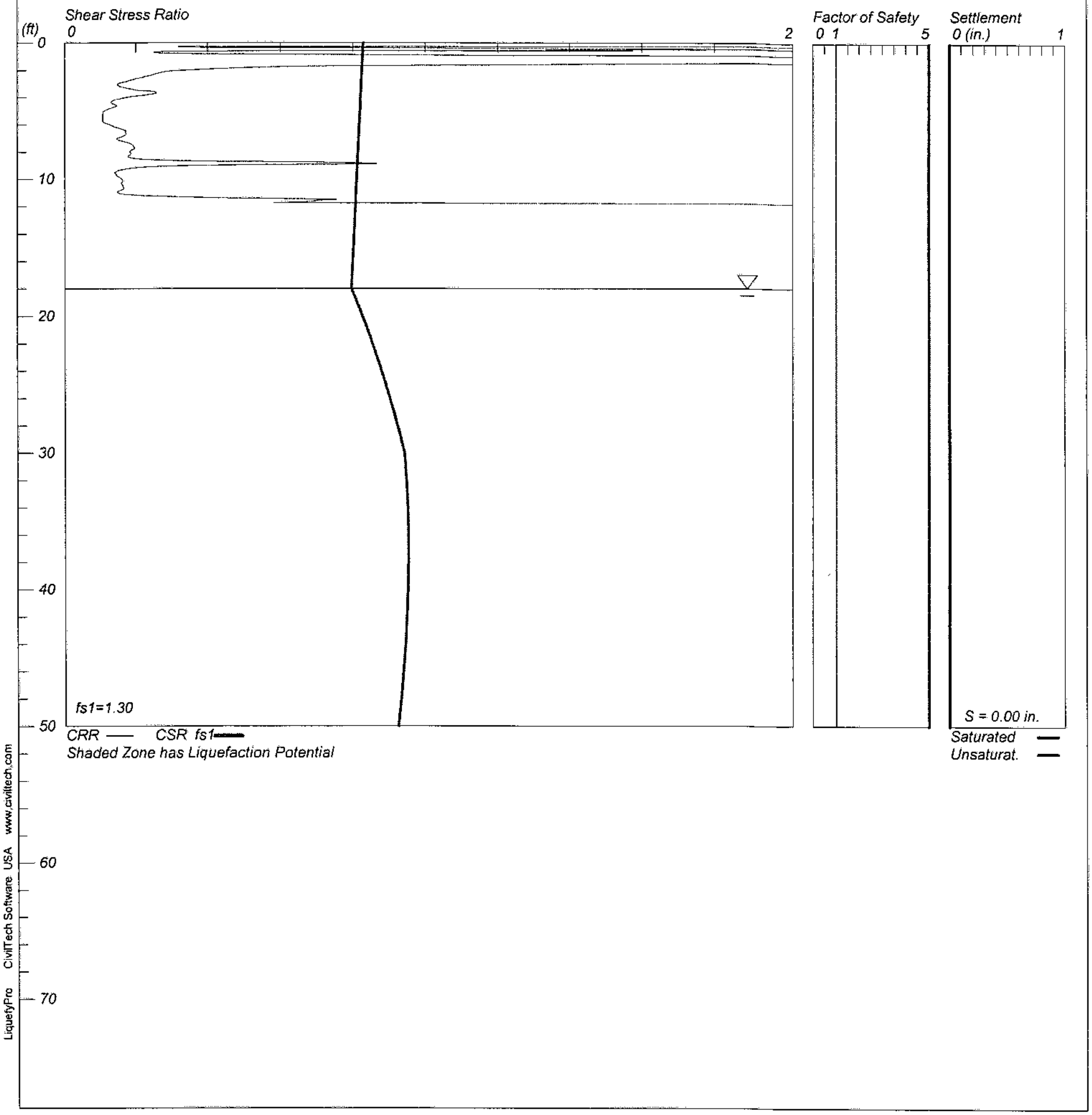
Fairway Canyon PA-22

Hole No.=CPT-6 Water Depth=18 ft Surface Elev.=2218

Ground Improvement of Fill=6 ft

Magnitude=8.1

Acceleration=0.98g

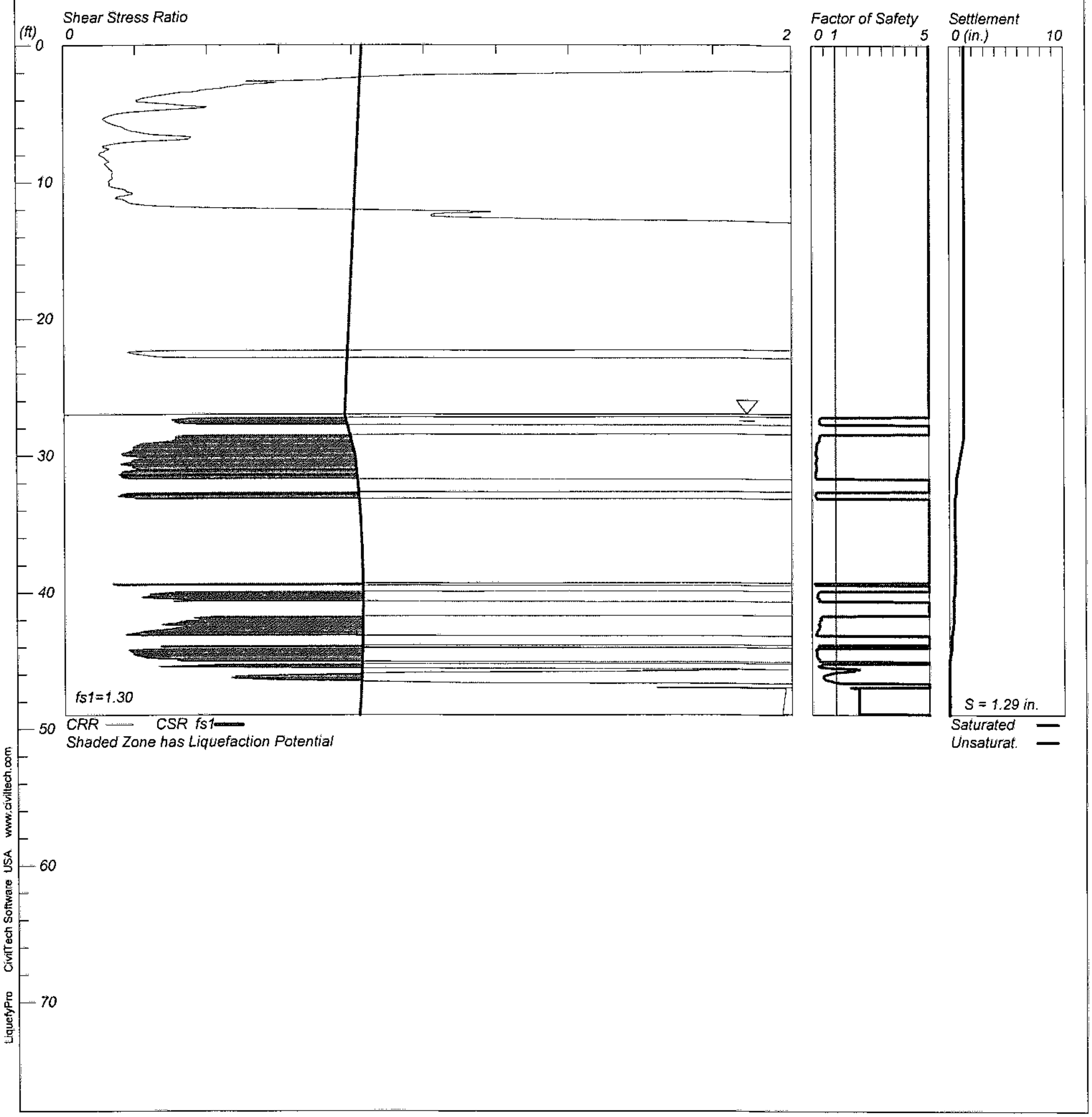


LIQUEFACTION ANALYSIS

Fairway Canyon PA-22

Hole No.=CPT-7 Water Depth=27 ft Surface Elev.=2227 ***Magnitude=8.1***

Ground Improvement of Fill=7 ft ***Acceleration=0.98g***



LIQUEFACTION ANALYSIS

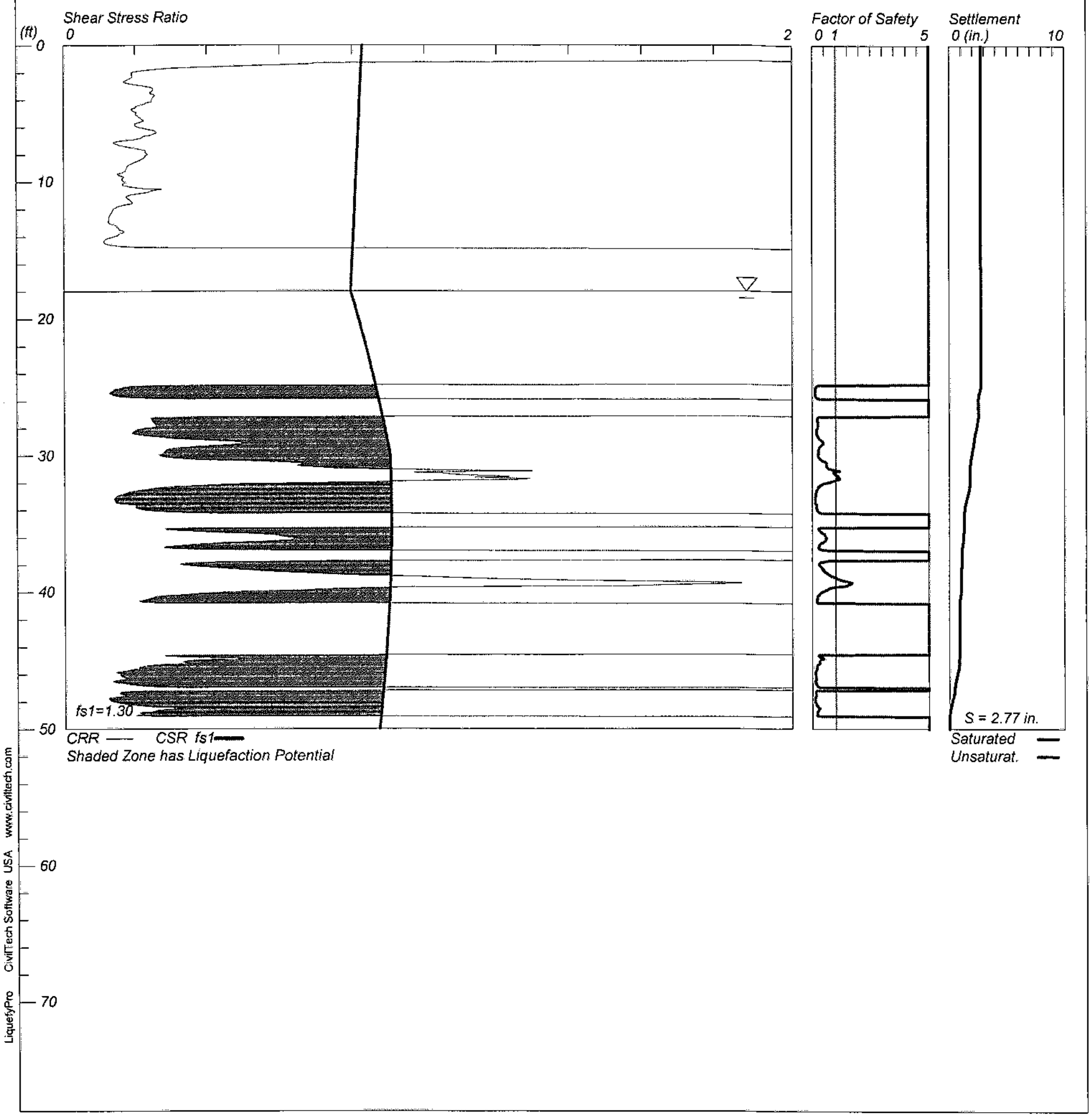
Fairway Canyon PA-22

Hole No.=CPT-8 Water Depth=18 ft Surface Elev.=2221

Ground Improvement of Fill=14 ft

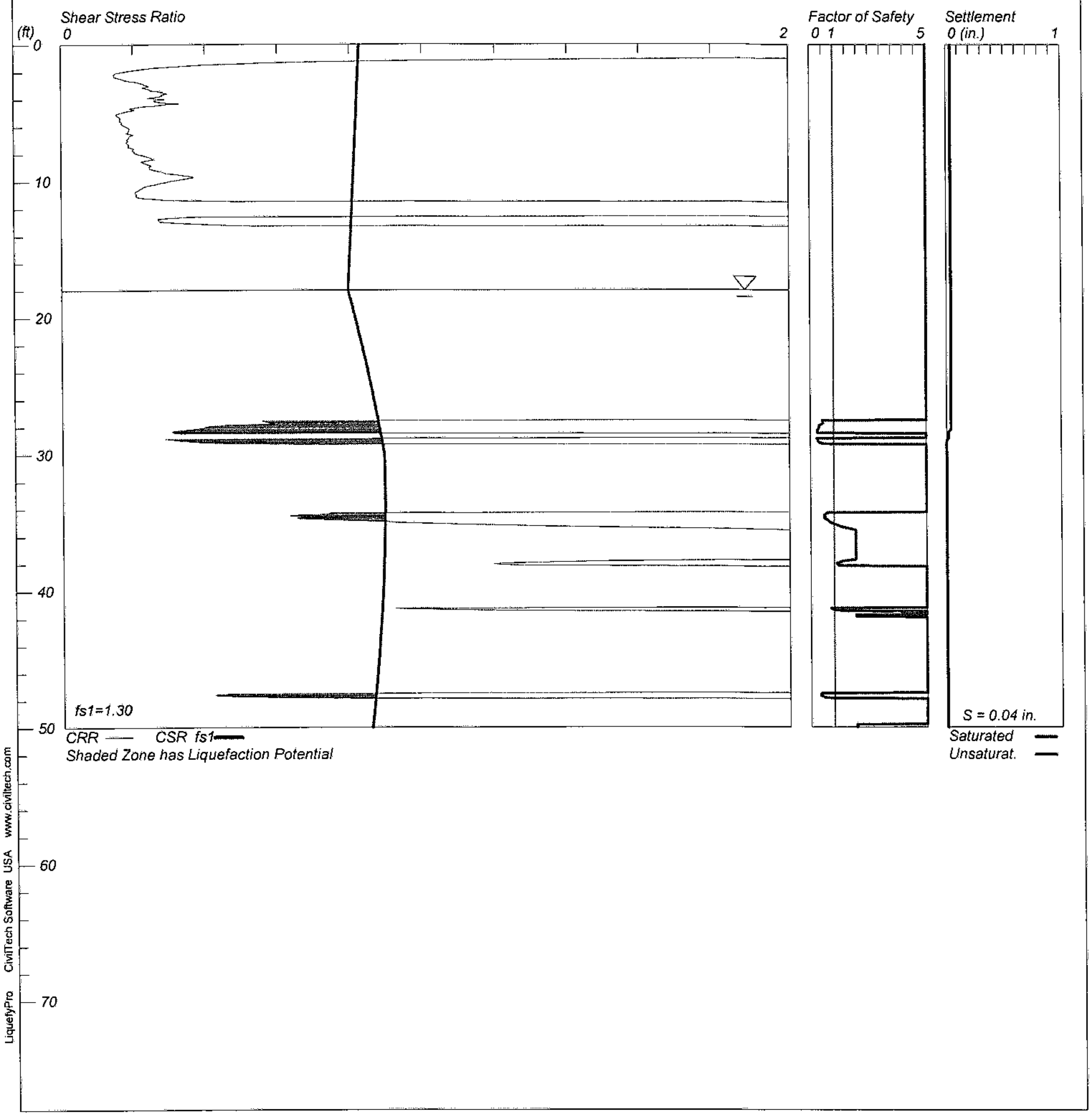
Magnitude=8.1

Acceleration=0.98g



LIQUEFACTION ANALYSIS
Fairway Canyon PA-22

Hole No.=CPT-9   Water Depth=18 ft   Surface Elev.=2222   ***Magnitude=8.1***
Ground Improvement of Fill=17 ft   ***Acceleration=0.98g***

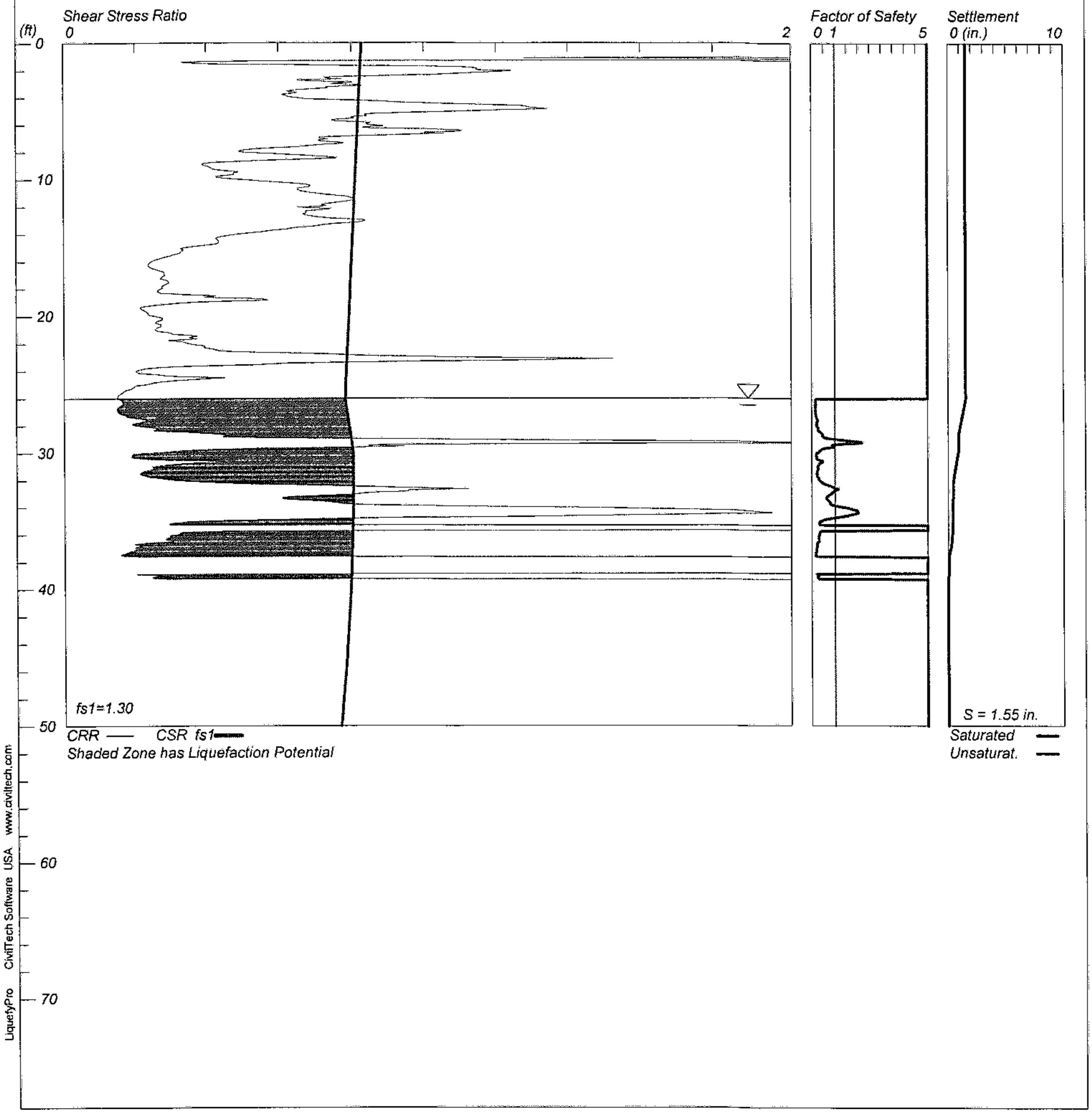


LIQUEFACTION ANALYSIS

Fairway Canyon PA-22

Hole No.=CPT-10 Water Depth=26 ft Surface Elev.=2227 *Magnitude=8.1*

Ground Improvement of Fill=26 ft *Acceleration=0.98g*

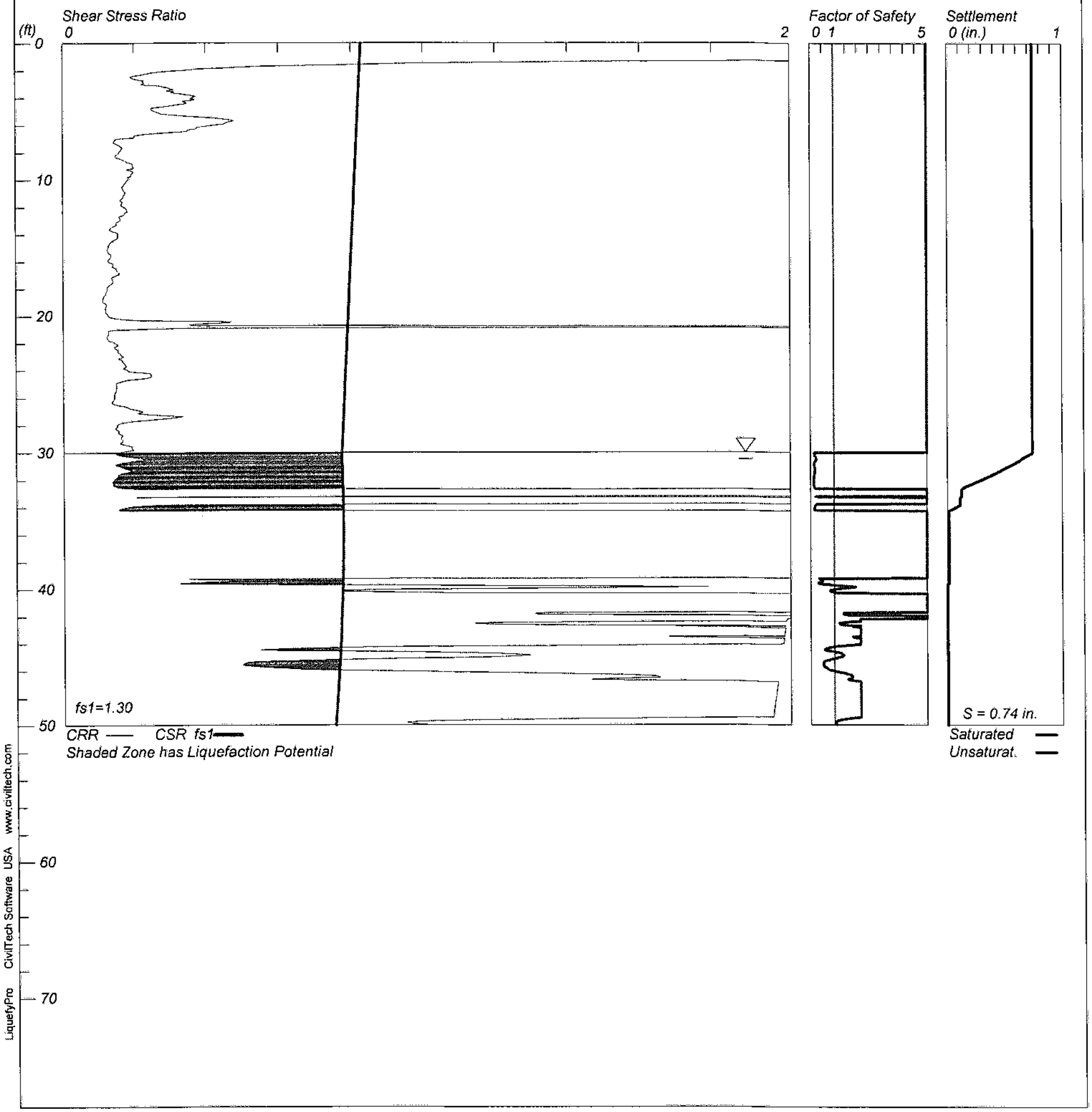


LIQUEFACTION ANALYSIS

Fairway Canyon PA-22

Hole No.=CPT-11 Water Depth=30 ft Surface Elev.=2232 ***Magnitude=8.1***

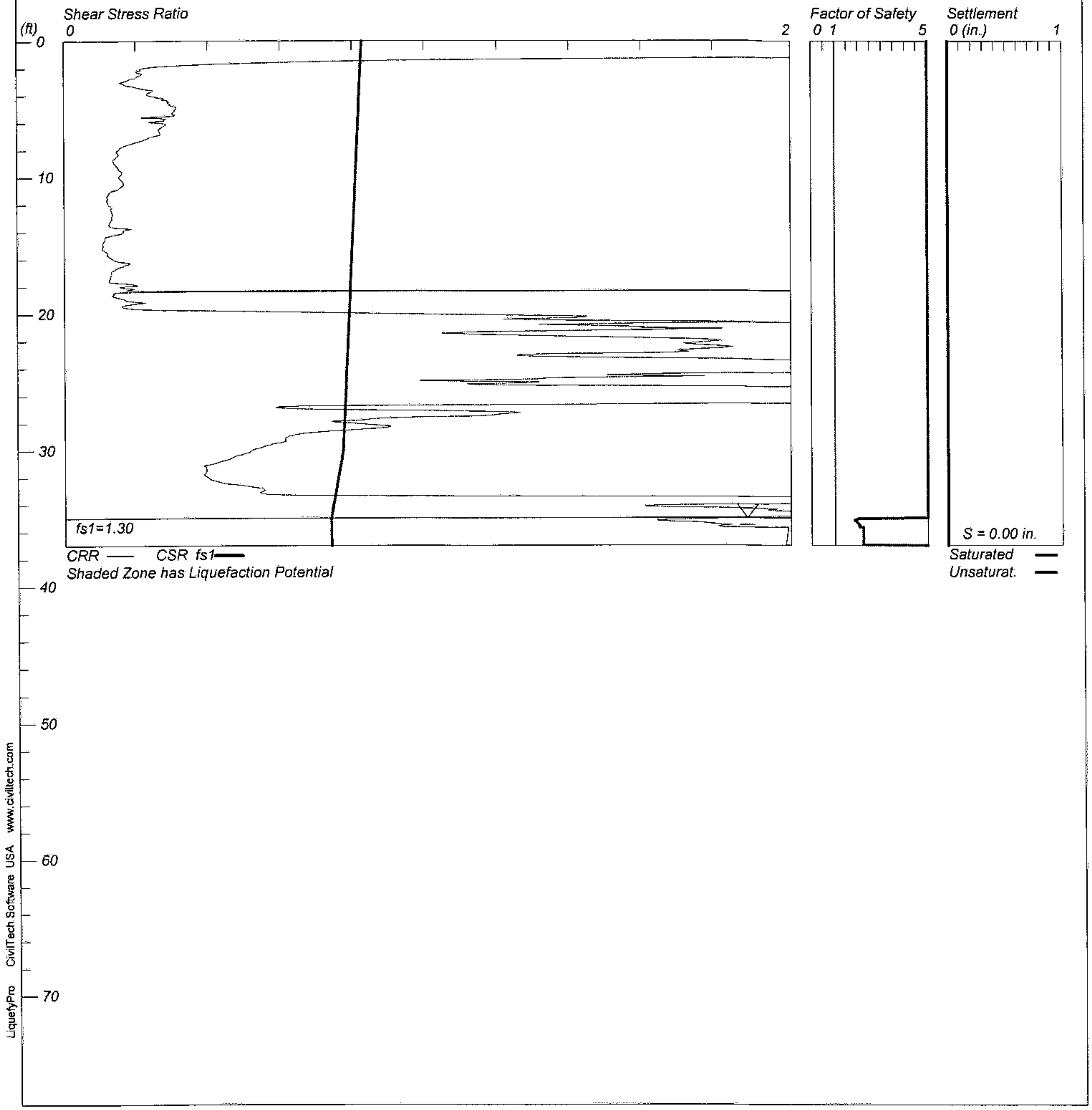
Ground Improvement of Fill=20 ft ***Acceleration=0.98g***



LIQUEFACTION ANALYSIS

Fairway Canyon PA-22

Hole No.=CPT-12 Water Depth=35 ft Surface Elev.=2237 **Magnitude=8.1**
Ground Improvement of Fill=17 ft **Acceleration=0.98g**



LIQUEFACTION ANALYSIS

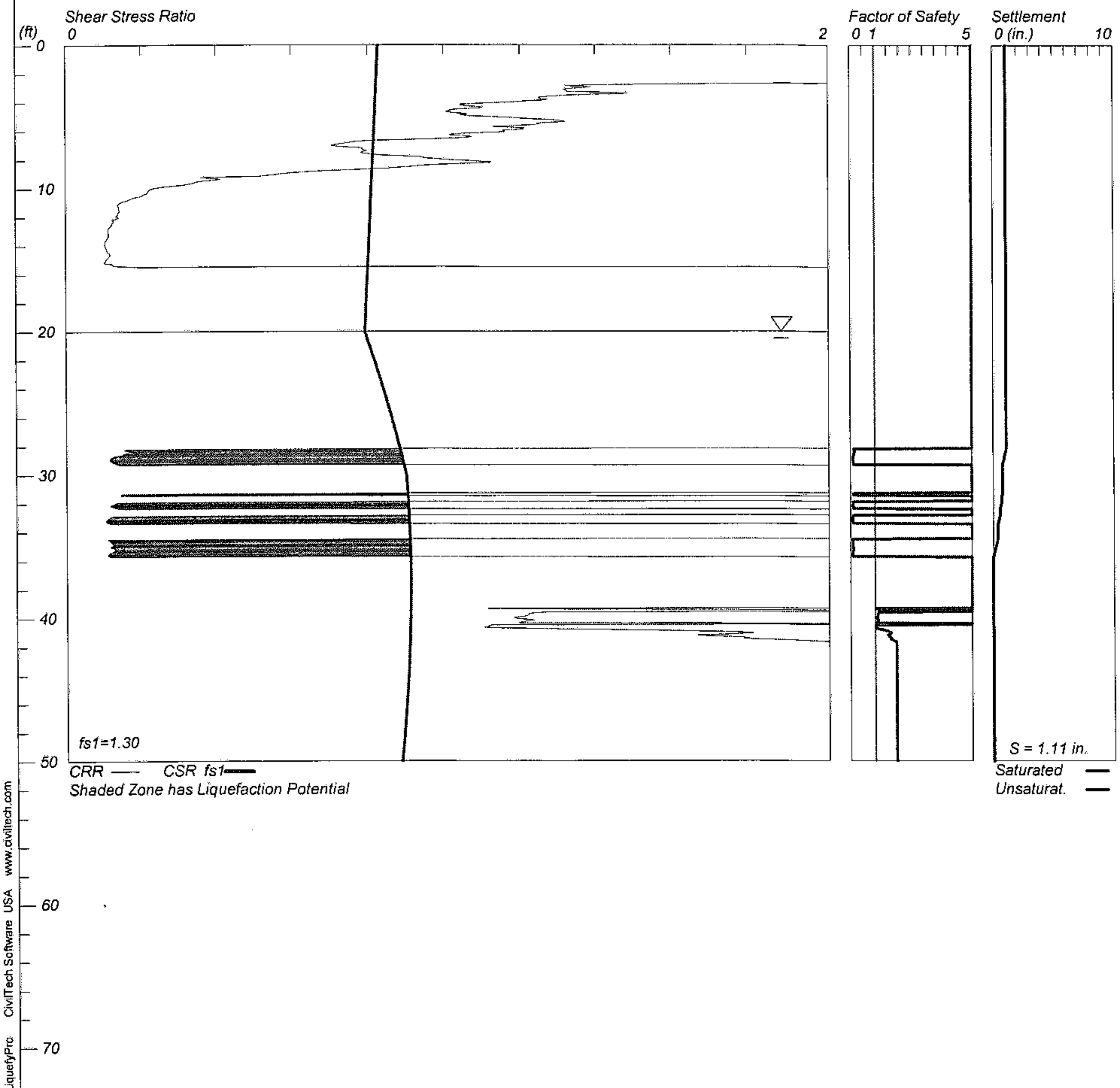
Fairway Canyon PA-22

Hole No.=CPT-13 Water Depth=20 ft Surface Elev.=2236

Ground Improvement of Fill=8 ft

Magnitude=8.1

Acceleration=0.98g

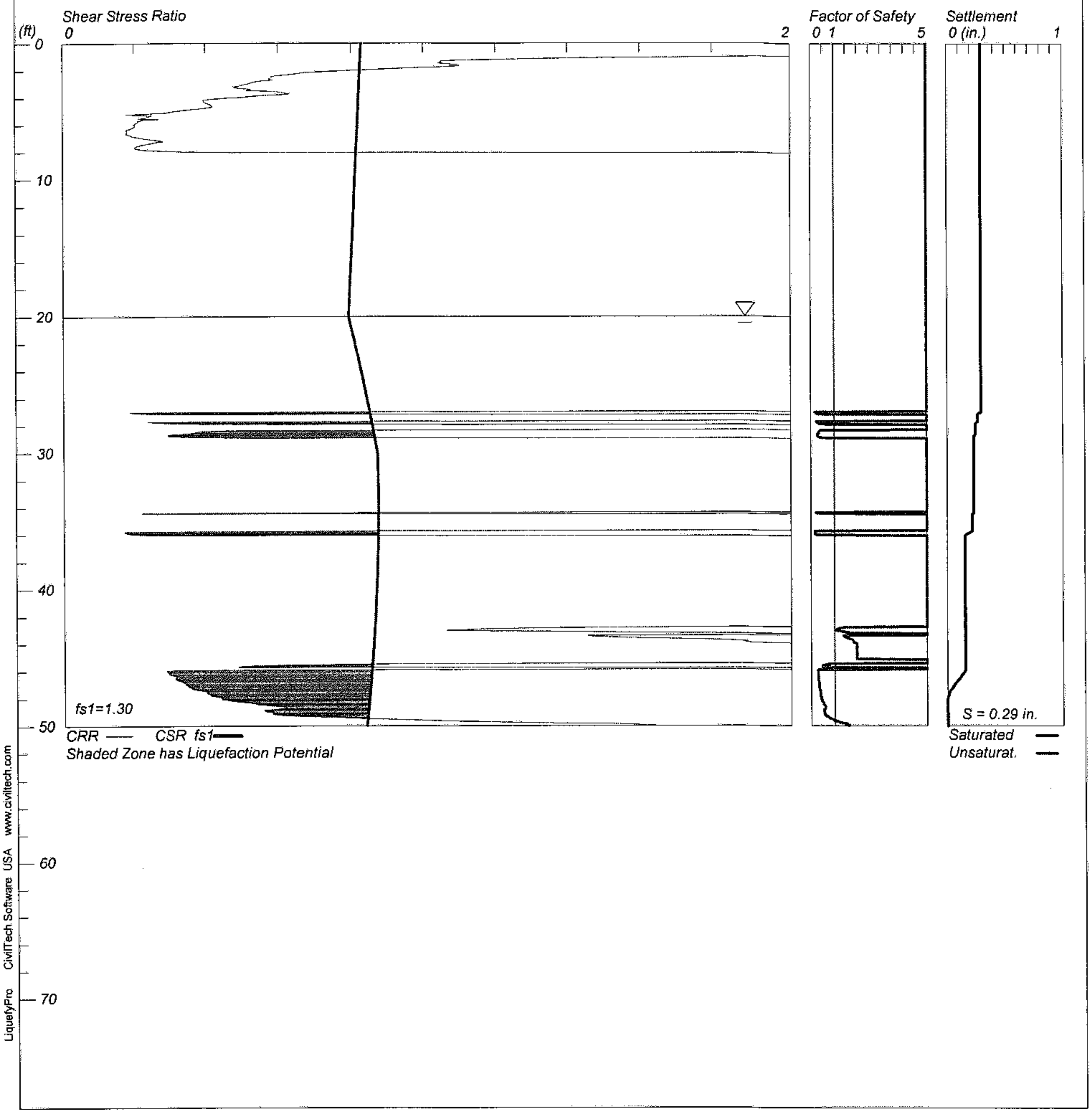


LIQUEFACTION ANALYSIS

Fairway Canyon PA-22

Hole No.=CPT-14 Water Depth=20 ft Surface Elev.=2221 *Magnitude=8.1*

Ground Improvement of Fill=17 ft *Acceleration=0.98g*

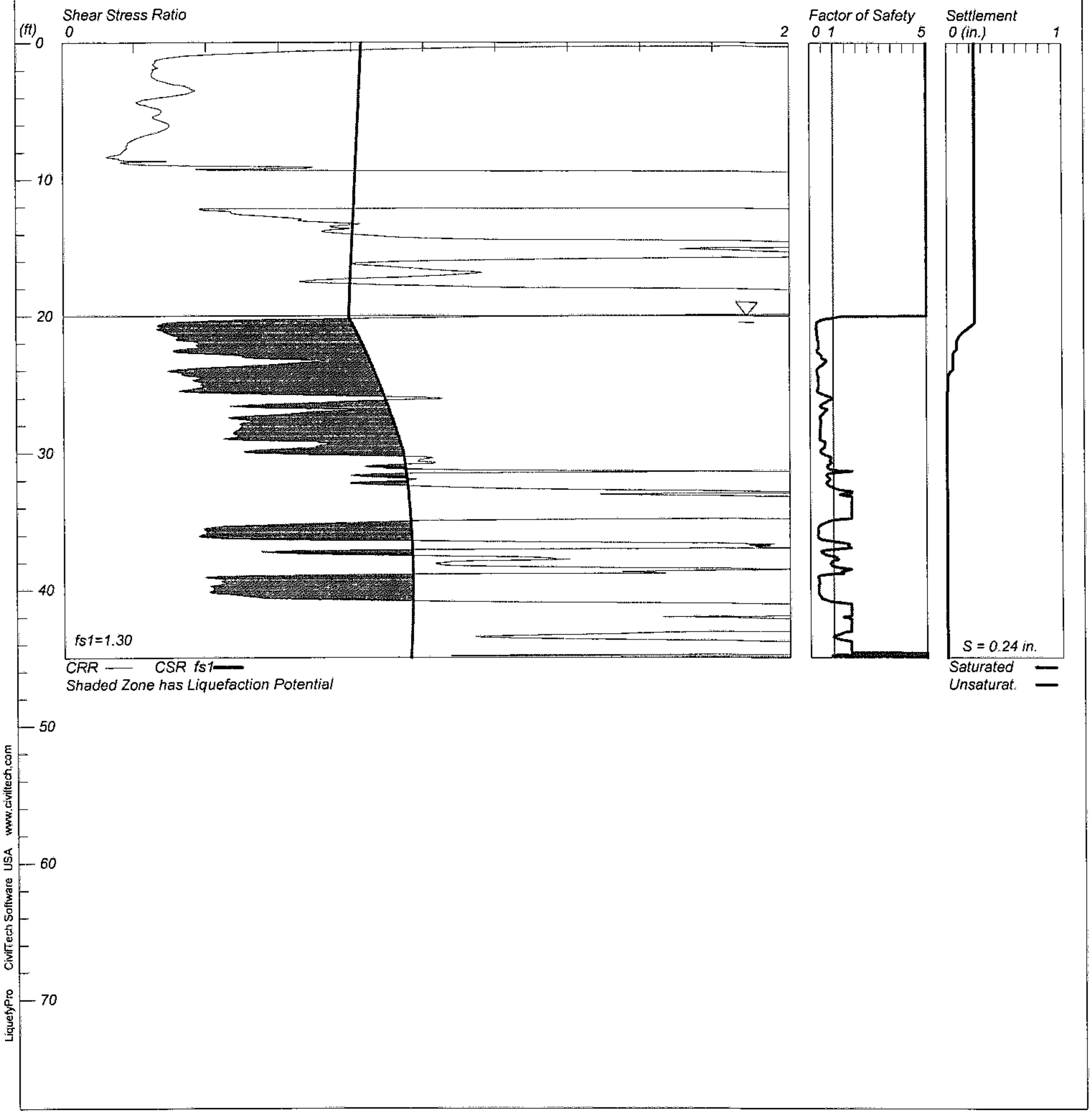


LIQUEFACTION ANALYSIS

Fairway Canyon PA-22

Hole No.=CPT-16 Water Depth=20 ft Surface Elev.=2221

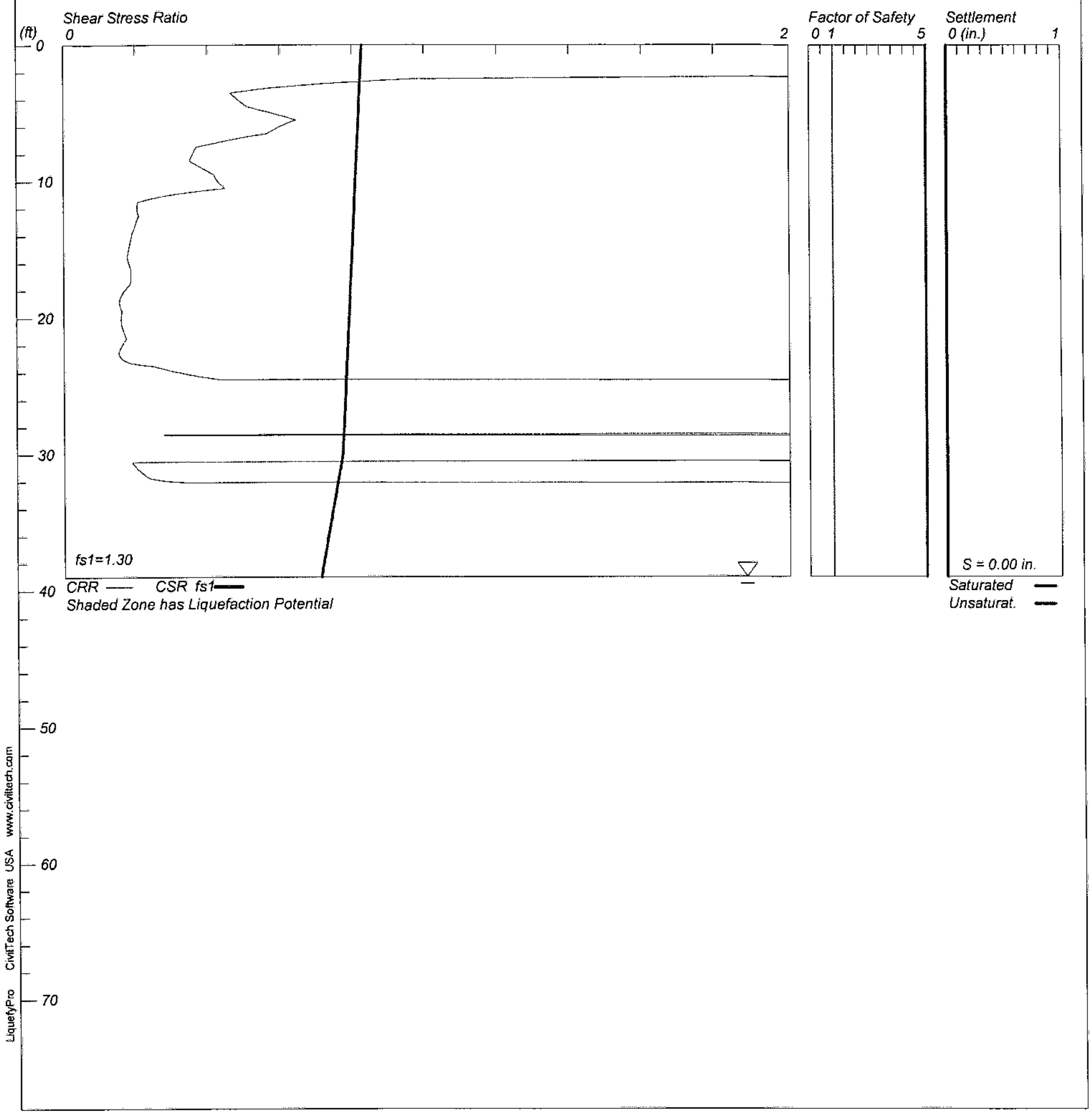
Magnitude=8.1
Acceleration=0.98g



LIQUEFACTION ANALYSIS

Fairway Canyon PA-22

Hole No.=CPT-18 Water Depth=39 ft Surface Elev.=2231 *Magnitude=8.1*
Ground Improvement of Fill=4 ft *Acceleration=0.98g*



LIQUEFACTION ANALYSIS

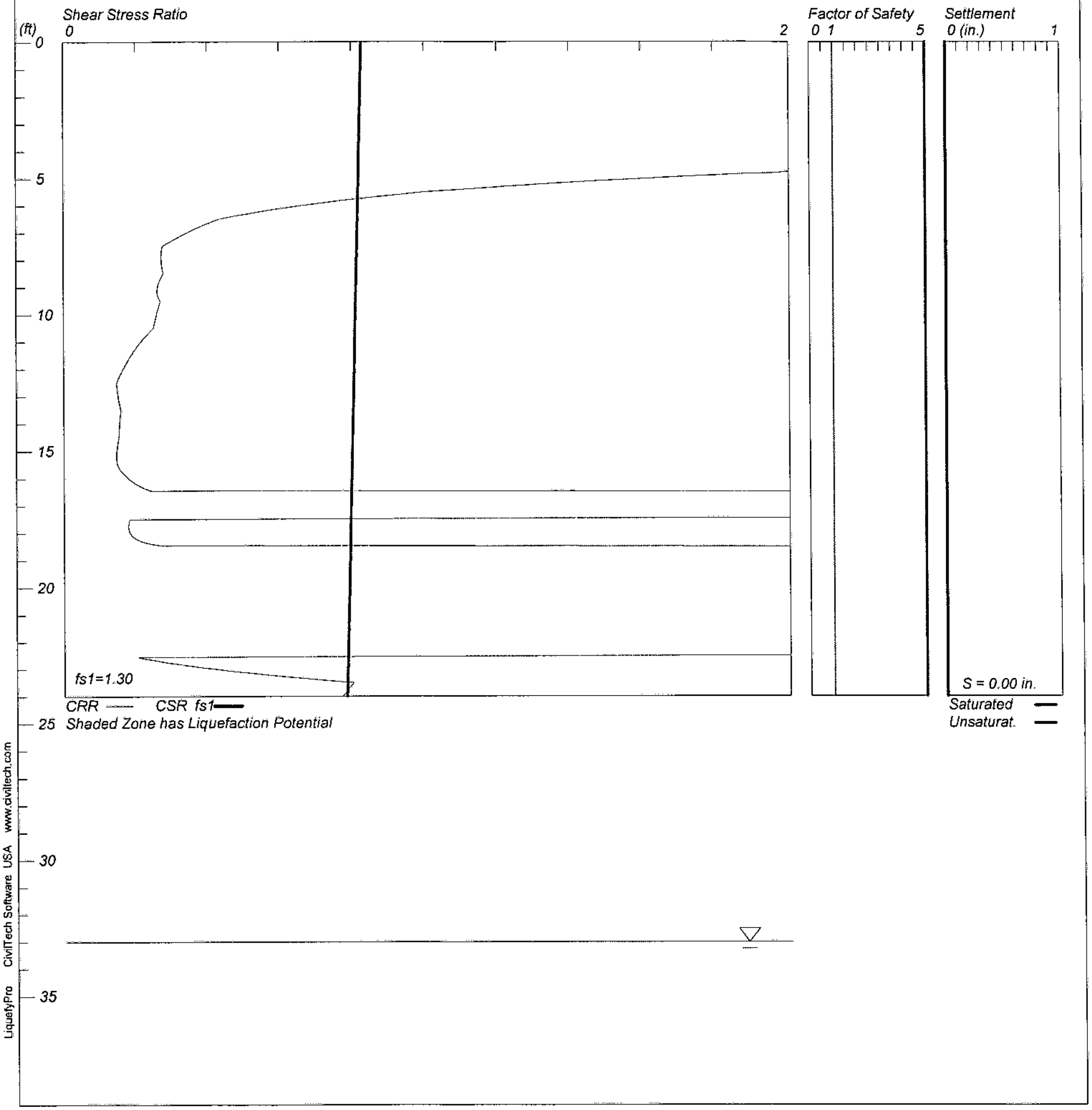
Fairway Canyon PA-22

Hole No.=CPT-19   Water Depth=33 ft   Surface Elev.=2225

Ground Improvement of Fill=22 ft

Magnitude=8.1

Acceleration=0.98g

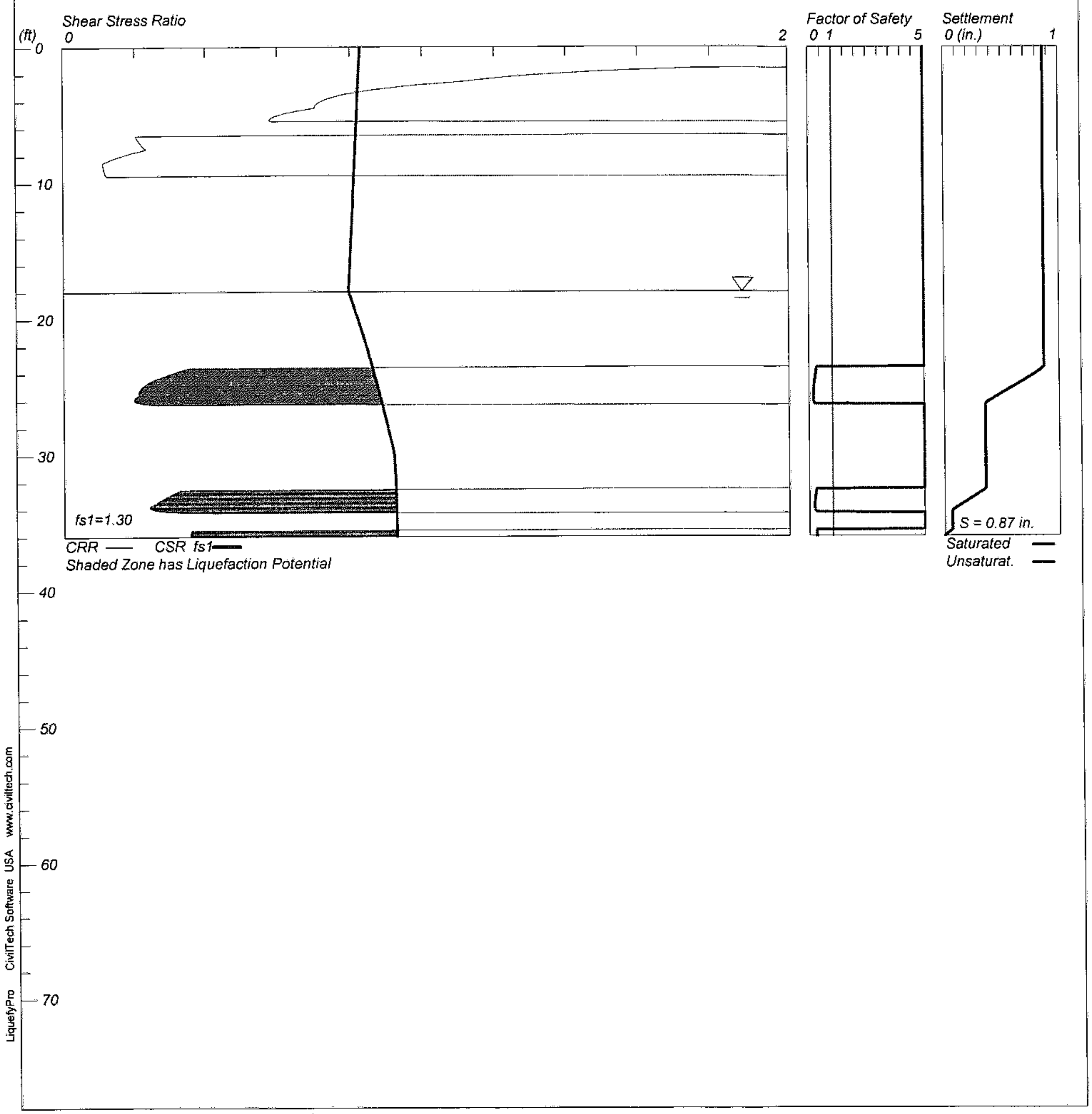


LIQUEFACTION ANALYSIS

Fairway Canyon PA-22

Hole No.=CPT-20 Water Depth=18 ft Surface Elev.=2208 **Magnitude=8.1**

Ground Improvement of Fill=10 ft **Acceleration=0.98g**



APPENDIX F

Earthwork Specifications

ALTA CALIFORNIA GEOTECHNICAL, INC.
EARTHWORK SPECIFICATIONS

These specifications present the generally accepted standards and minimum earthwork requirements for the development of the project. These specifications shall be the project guidelines for earthwork except where specifically superseded in preliminary geology and soils reports, grading plan review reports or by the prevailing grading codes or ordinances of the controlling agency.

A. GENERAL

1. The Contractor shall be responsible for the satisfactory completion of all earthwork in accordance with the project plans and specifications.
2. The project Geotechnical Engineer and Engineering Geologist, or their representatives, shall provide observation and testing services, and Geotechnical consultation for the duration of the project.
3. All clearing, grubbing, stripping and site preparation for the project shall be accomplished by the Contractor to the satisfaction of the Geotechnical Engineer/Engineering Geologist.
4. It is the Contractor's responsibility to prepare the ground surface to receive fill to the satisfaction of the Geotechnical Engineer and to place, spread, mix, moisture condition, and compact the fill in accordance with the job specifications and as required by the Geotechnical Engineer. The Contractor shall also remove all material considered by the Geotechnical Engineer to be unsuitable for use in the construction of engineered fills.
5. The Contractor shall have suitable and sufficient equipment in operation to handle the amount of fill being placed. When necessary, equipment will be shut down temporarily in order to permit the proper preparation of fills.

B. PREPARATION OF FILL AREAS

1. Excessive vegetation and all deleterious material should be disposed of offsite as required by the Geotechnical Engineer.

   Existing fill, soil, alluvium or rock materials determined by the Geotechnical Engineer as being unsuitable for placement in compacted fills shall be removed and hauled from the site. Where applicable, the Contractor may obtain the approval of the Soils Engineer and the controlling authorities for the project to dispose of the above described materials, or a portion thereof, in designated areas onsite.

After removal of the deleterious materials have been accomplished, earth materials deemed unsuitable in their natural, in-place condition, shall be removed as recommended by the Geotechnical Engineer/Engineering Geologist.

2. Upon achieving a suitable bottom for fill placement, the exposed removal bottom shall be disced or bladed by the Contractor to the satisfaction of the Geotechnical Engineer. The prepared ground surfaces shall then be brought to the specified moisture content mixed as required, and compacted and tested as specified. In localities where it is necessary to obtain the approval of the controlling agency prior to placing fill, it will be the Contractor's responsibility to contact the proper authorities to visit the site.

3. Any underground structure such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipelines or other structures not located prior to grading are to be removed or treated in a manner prescribed by the Geotechnical Engineer and/or the controlling agency for the project.

C. <u>ENGINEERED FILLS</u>

1. Any material imported or excavated on the property may be utilized as fill, provided the material has been determined to be suitable by the Geotechnical Engineer. Deleterious materials shall be removed from the fill as directed by the Geotechnical Engineer.

2. Rock or rock fragments less than twelve inches in the largest dimension may be utilized in the fill, provided they are not placed in concentrated pockets and the distribution of the rocks is approved by the Geotechnical Engineer.

3. Rocks greater than twelve inches in the largest dimension shall be taken offsite, or placed in accordance with the recommendations of the Geotechnical Engineer in areas designated as suitable for rock disposal.

4. All materials to be used as fill, shall be tested in the laboratory by the Geotechnical Engineer. Proposed import materials shall be approved by the Geotechnical Engineer 48 hours prior to importation.

5. The fill materials shall be placed by the Contractor in lifts, that when compacted, shall not exceed six inches. Each lift shall be spread evenly and shall be

thoroughly mixed to achieve a near uniform moisture condition and a uniform blend of materials.

All compaction shall be achieved at or above the optimum moisture content, as determined by the applicable laboratory standard. The Contractor will be notified if the fill materials are too wet or too dry to achieve the required compaction standard.

6. When the moisture content of the fill material is below the limit specified by the Geotechnical Engineer, water shall be added and the materials shall be blended until a uniform moisture content, within specified limits, is achieved. When the moisture content of the fill material is above the limits specified by the Geotechnical Engineer, the fill materials shall be aerated by discing, blading, mixed with dryer fill materials, or other satisfactory methods until the moisture content is within the specified limits.

7. Each fill lift shall be compacted to the minimum project standards, in compliance with the testing methods specified by the controlling governmental agency, and in accordance with recommendations of the Geotechnical Engineer.

   In the absence of specific recommendations by the Geotechnical Engineer to the contrary, the compaction standard shall be the most recent version of ASTM:D 1557.

8. Where a slope receiving fill exceeds a ratio of five-horizontal to one-vertical, the fill shall be keyed and benched through all unsuitable materials into sound bedrock or firm material, in accordance with the recommendations and approval of the Geotechnical Engineer.

9. Side hill fills shall have a minimum key width of 15 feet into bedrock or firm materials, unless otherwise specified in the soil report and approved by the Geotechnical Engineer in the field.

10. Drainage terraces and subdrainage devices shall be constructed in compliance with the ordinances of the controlling governmental agency and/or with the recommendations of the Geotechnical Engineer and Engineering Geologist.

11. The Contractor shall be required to maintain the specified minimum relative compaction out to the finish slope face of fill slopes, buttresses, and stabilization fills as directed by the Geotechnical Engineer and/or the governing agency for the project. This may be achieved by either overbuilding the slope and cutting

back to the compacted core; by direct compaction of the slope face with suitable equipment; or by any other procedure which produces the required result.

12. The fill portion of fill-over-cut slopes shall be properly keyed into rock or firm material; and the fill area shall be stripped of all soil or unsuitable materials prior to placing fill.

    The design cut portion of the slope should be made first and evaluated for suitability by the Engineering Geologist prior to placement of fill in the keyway above the cut slope.

13. Pad areas in cut or natural ground shall be approved by the Geotechnical Engineer. Finished surfaces of these pads may require scarification and recompaction, or over excavation as determined by the Geotechnical Engineer.

D. <u>CUT SLOPES</u>

1. The Engineering Geologist shall observe all cut slopes and shall be notified by the Contractor when cut slopes are to be started.

2. If, during the course of grading, unforeseen adverse or potentially adverse geologic conditions are encountered, the Engineering Geologist and Soil Engineer shall investigate, analyze and make recommendations to remediate these problems.

3. Non-erodible interceptor swales shall be placed at the top of cut slopes that face the same direction as the superjacent, prevailing drainage.

4. Unless otherwise specified in specific geotechnical reports, no cut slopes shall be excavated higher or steeper than that allowed by the ordinances of controlling governmental agencies.

5. Drainage terraces shall be constructed in compliance with the ordinances of the controlling governmental agencies, and/or in accordance with the recommendations of the Geotechnical Engineer or Engineering Geologist.

E. <u>GRADING CONTROL</u>

1. Fill placement shall be observed and tested by the Geotechnical Engineer and/or his representative during grading.

   Field density tests shall be made by the Geotechnical Engineer and/or his representative to evaluate the compaction and moisture compliance of each fill lift. Density tests shall be conducted at intervals not to exceed two feet of fill height. Where sheepsfoot rollers are used, the fill may be disturbed to a depth of several inches. Density determinations shall be taken in the compacted material below the disturbed surface at a depth determined by the Geotechnical Engineer or his representative.

2. Where tests indicate that the density of any layer of fill, or portion thereof, is below the required relative compaction, or improper moisture content is in evidence, that particular layer or portion thereof shall be reworked until the required density and/or moisture content has been attained. Additional fills shall not be placed over an area until the previous lift of fill has been tested and found to meet the density and moisture requirements for the project and the previous lift is approved by the Geotechnical Engineer.

3. When grading activities are interrupted by heavy rains, fill operations shall not be resumed until field observations and tests by the Geotechnical Engineer indicate the moisture content and density of the fill are within the specified limits.

4. During construction, the Contractor shall properly grade all surfaces to maintain good drainage and prevent the ponding of water. The Contractor shall take remedial action to control surface water and to prevent erosion of graded areas until such time as a permanent drainage and erosion devices have been installed.

5. Observation and testing by the Geotechnical Engineer and/or his representative shall be conducted during filling and compacting operations in order that he will be able to state in his opinion that all cut and filled areas are graded in accordance with the approved specifications.

6. Upon the completion of grading activities and after the Geotechnical Engineer and Engineering Geologist have finished their observations of the work, final reports shall be submitted. No further excavation or fill placement shall be undertaken without prior notification of the Geotechnical Engineer and/or Engineering Geologist.

F. **FINISHED SLOPES**

All finished cut and fill slopes shall be planted and irrigated and/or protected from erosion in accordance with the project specifications, governing agencies, and/or as recommended by a landscape architect.

APPENDIX G

Grading Details

DETAIL FOR FILL SLOPE TOEING OUT ON FLAT ALLUVIATED CANYON

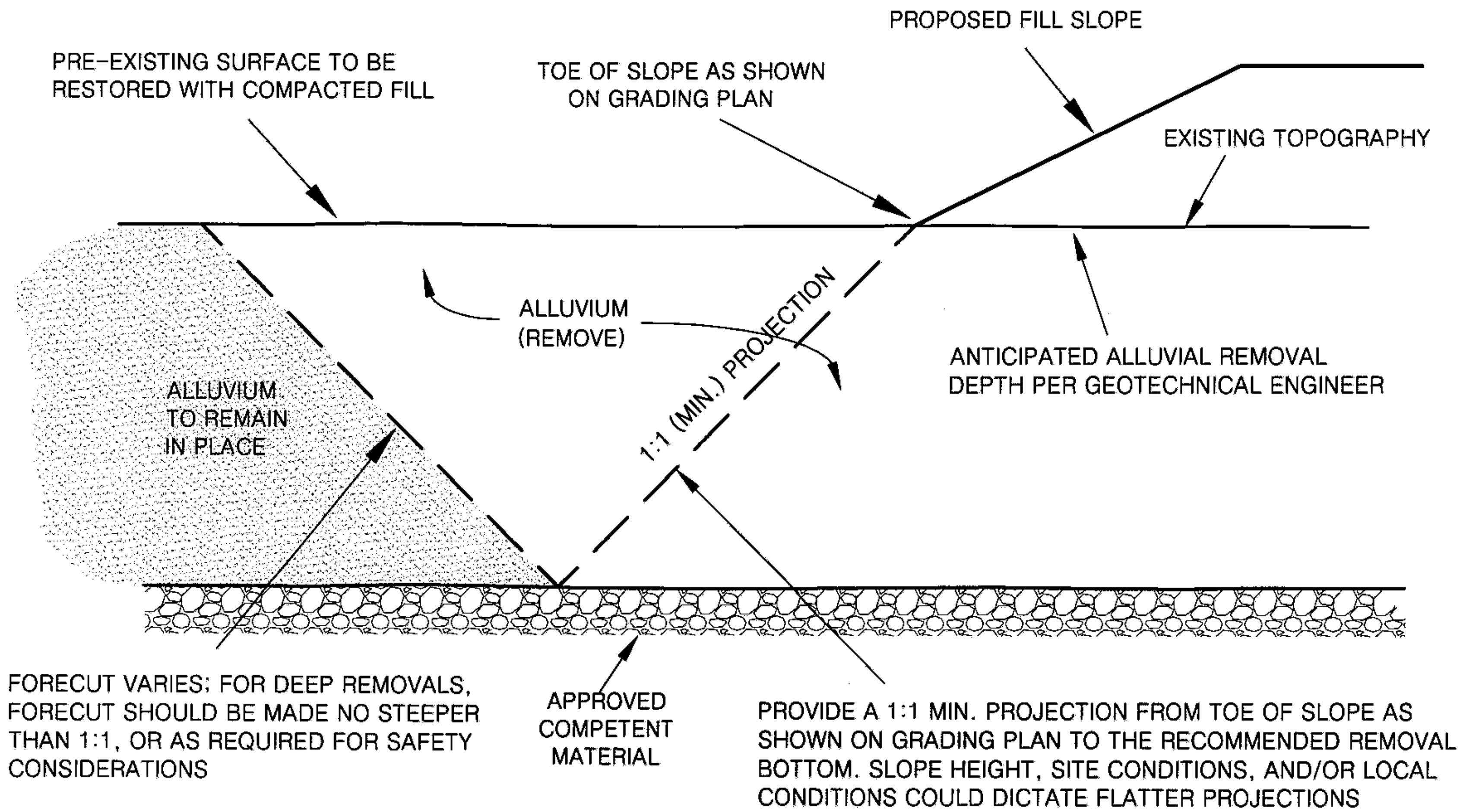


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PLATE G-1

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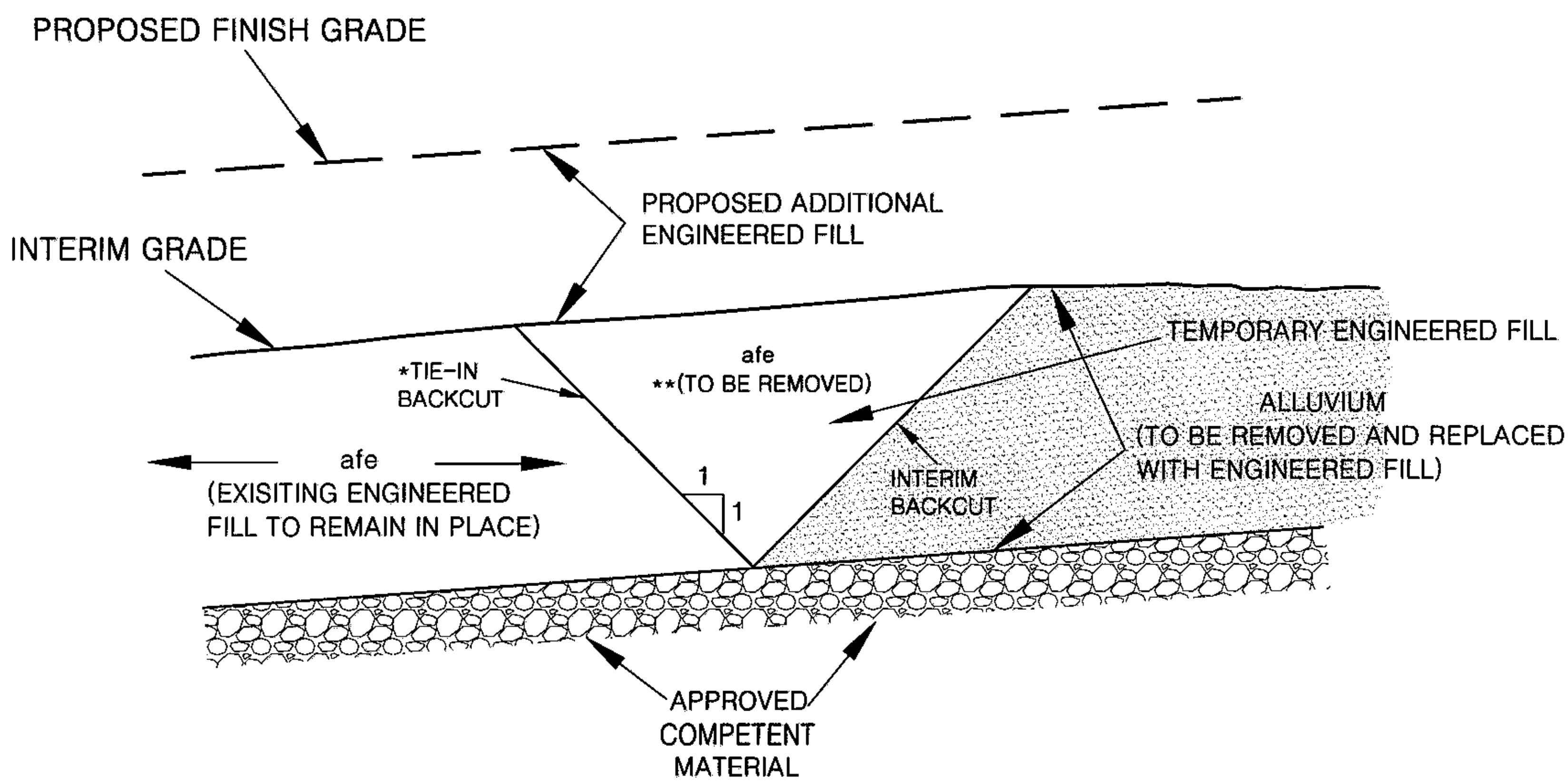
REMOVAL ADJACENT TO EXISTING FILL



*INITIATE 1:1 TIE-IN BACKCUT TO INTERCEPT TOE OF INTERIM BACKCUT

**AS PART OF TIE-IN FOR ADDITIONAL ENGINEERED FILL

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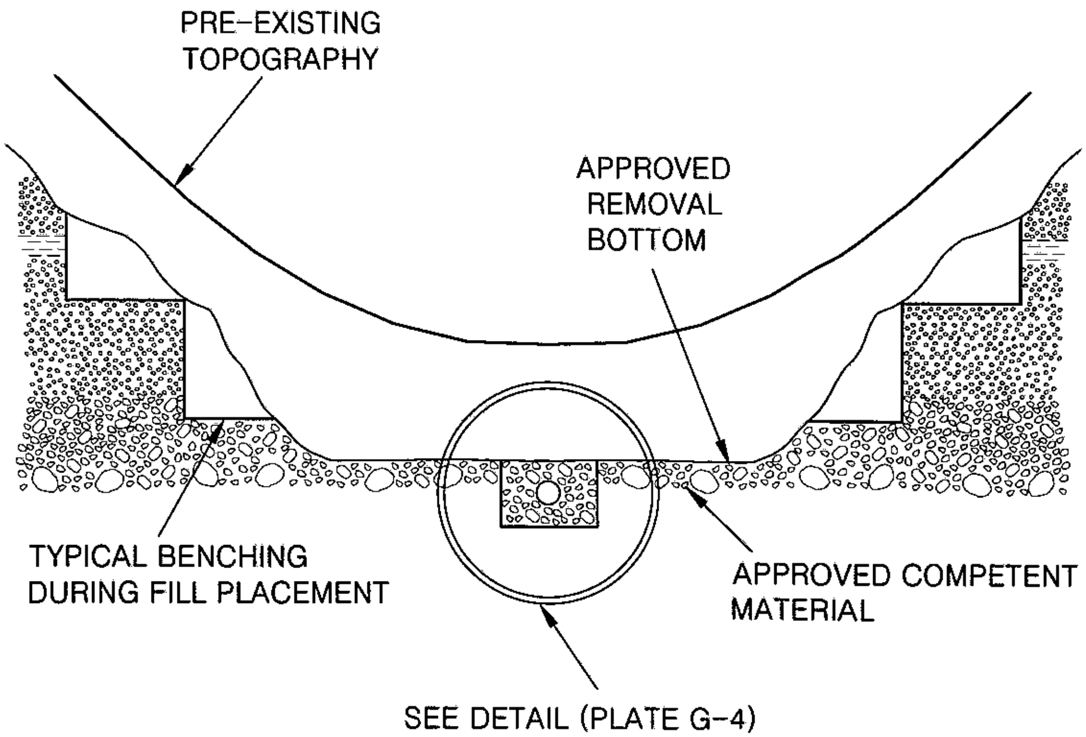
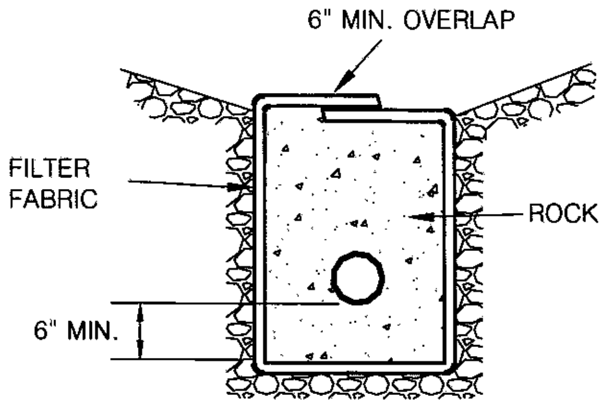
PLATE G-2

PATH: C:\Users\Jinks\Desktop\Drafting\GRADING DETAILS\G-2.dwg

CANYON SUBDRAIN



CANYON SUBDRAIN DETAIL



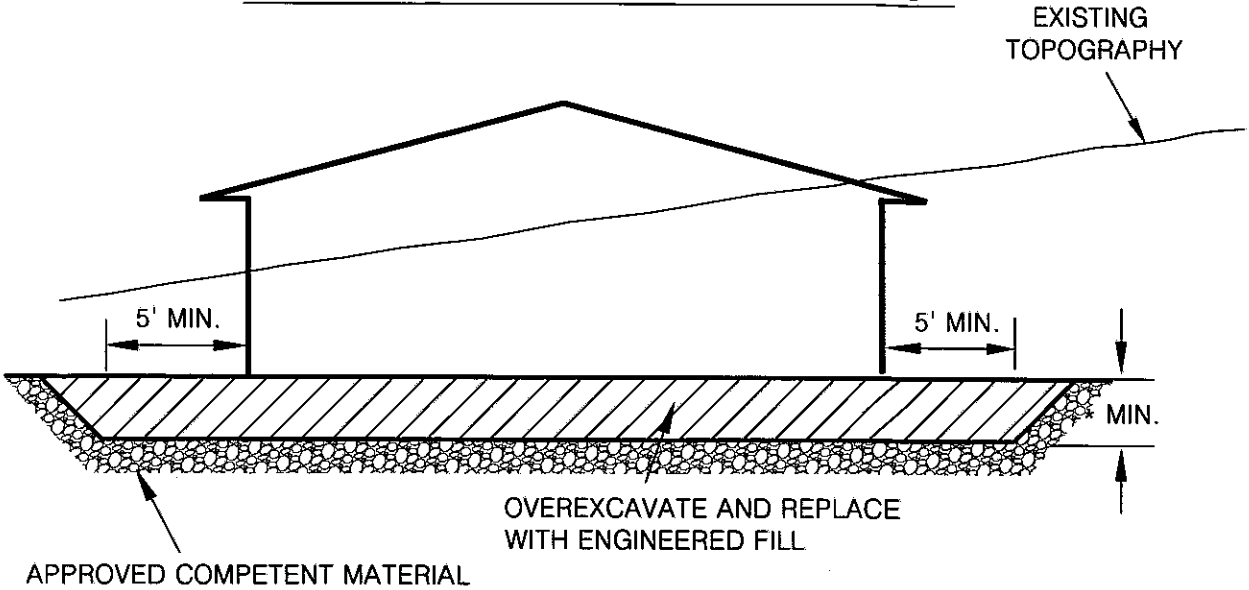
PERFORATED PIPE SURROUNDED WITH ROCK AND FILTER FABRIC

ROCK: MIN. VOLUME OF 9 CU.FT. PER LINEAR FT. OF 3/4 IN. MAX. ROCK
PIPE: 6 IN. ABS OR PVC PIPE WITH A MINIMUM OF 8 PERFORATIONS (1/4-IN. DIA.) PER LINEAL FT. IN BOTTOM HALF OF PIPE ASTM D2751, SDR 35, OR ASTM D3034 OR ASTM D1527, SCHD. 40 ASTM D1785, SCHD. 40
FILTER FABRIC: MIRAFI 140 FILTER FABRIC OR APPROVED EQUIVALENT

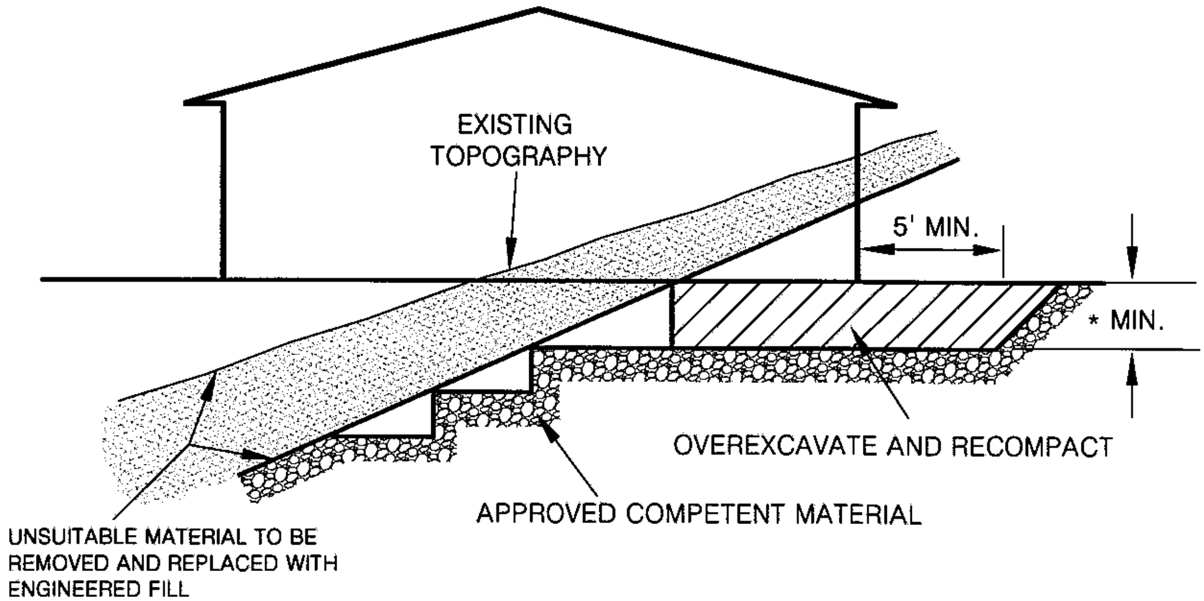
NOTES:

1. FOR CONTINUOUS RUN IN EXCESS OF 500. FT USE 8 IN. DIA. PIPE
2. ENGINEERED FILL PLACED BELOW DRAINS SHALL BE COMPACTED TO 93% OF THE LABORATORY MAXIMUM DRY DENSITY (ASTM:D1557)

OVEREXCAVATION CUT LOT



CUT-FILL LOT (TRANSITION)



*<u>NOTE</u> ALL BUILDING PADS SHALL BE OVER EXCAVATED TO A MINIMUM OF ⅓ OF THE MAXIMUM DEPTH OF FILL BELOW THE BUILDING PAD TO A MAXIMUM OF 17 FEET (SEE PLATE G-16)

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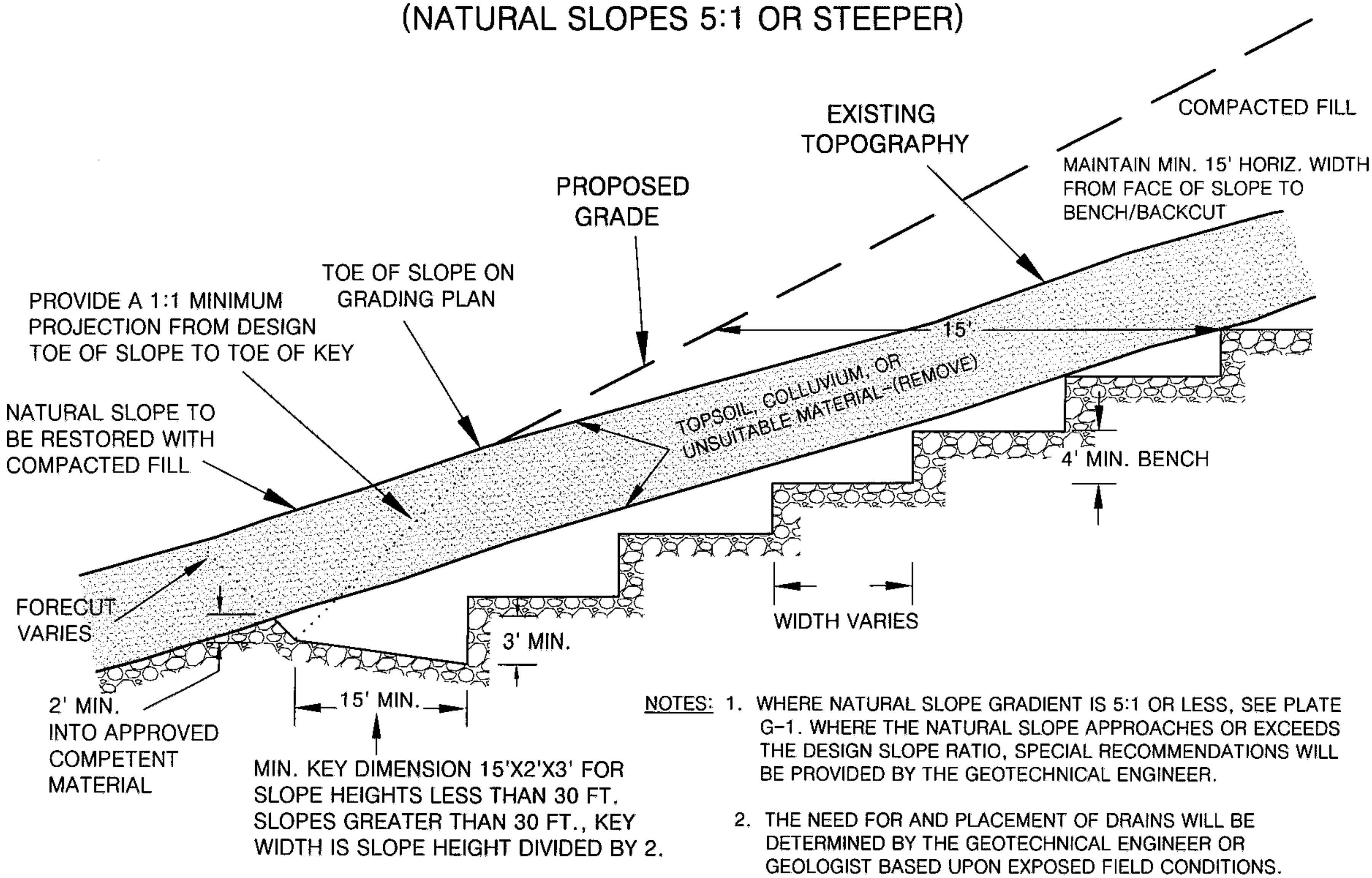
PLATE G-5

PATH: C:\Users\Jinks\Desktop\Drafting\GRADING DETAILS\G-5.dwg

SIDE HILL SLOPE FILL DETAIL

(NATURAL SLOPES 5:1 OR STEEPER)



NOTES:

1. WHERE NATURAL SLOPE GRADIENT IS 5:1 OR LESS, SEE PLATE G-1. WHERE THE NATURAL SLOPE APPROACHES OR EXCEEDS THE DESIGN SLOPE RATIO, SPECIAL RECOMMENDATIONS WILL BE PROVIDED BY THE GEOTECHNICAL ENGINEER.
2. THE NEED FOR AND PLACEMENT OF DRAINS WILL BE DETERMINED BY THE GEOTECHNICAL ENGINEER OR GEOLOGIST BASED UPON EXPOSED FIELD CONDITIONS.

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VER. 1/18

PLATE G-6

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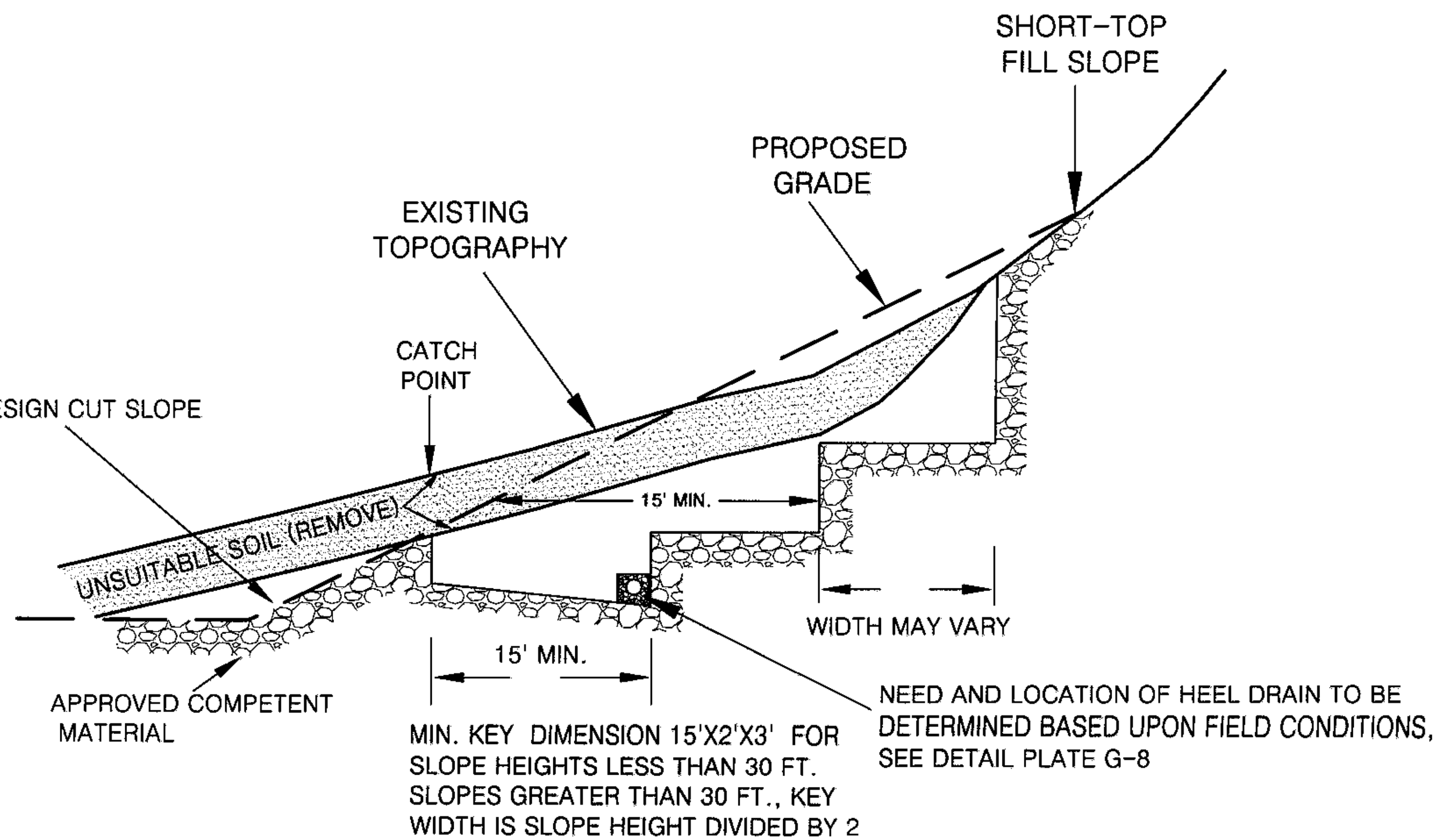
FILL OVER CUT SLOPE DETAIL



*THE CUT PORTION OF THE SLOPE SHOULD BE EXCAVATED AND EVALUATED BY THE ENGINEERING GEOLOGIST/GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTING THE FILL SLOPE

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PLATE G-7

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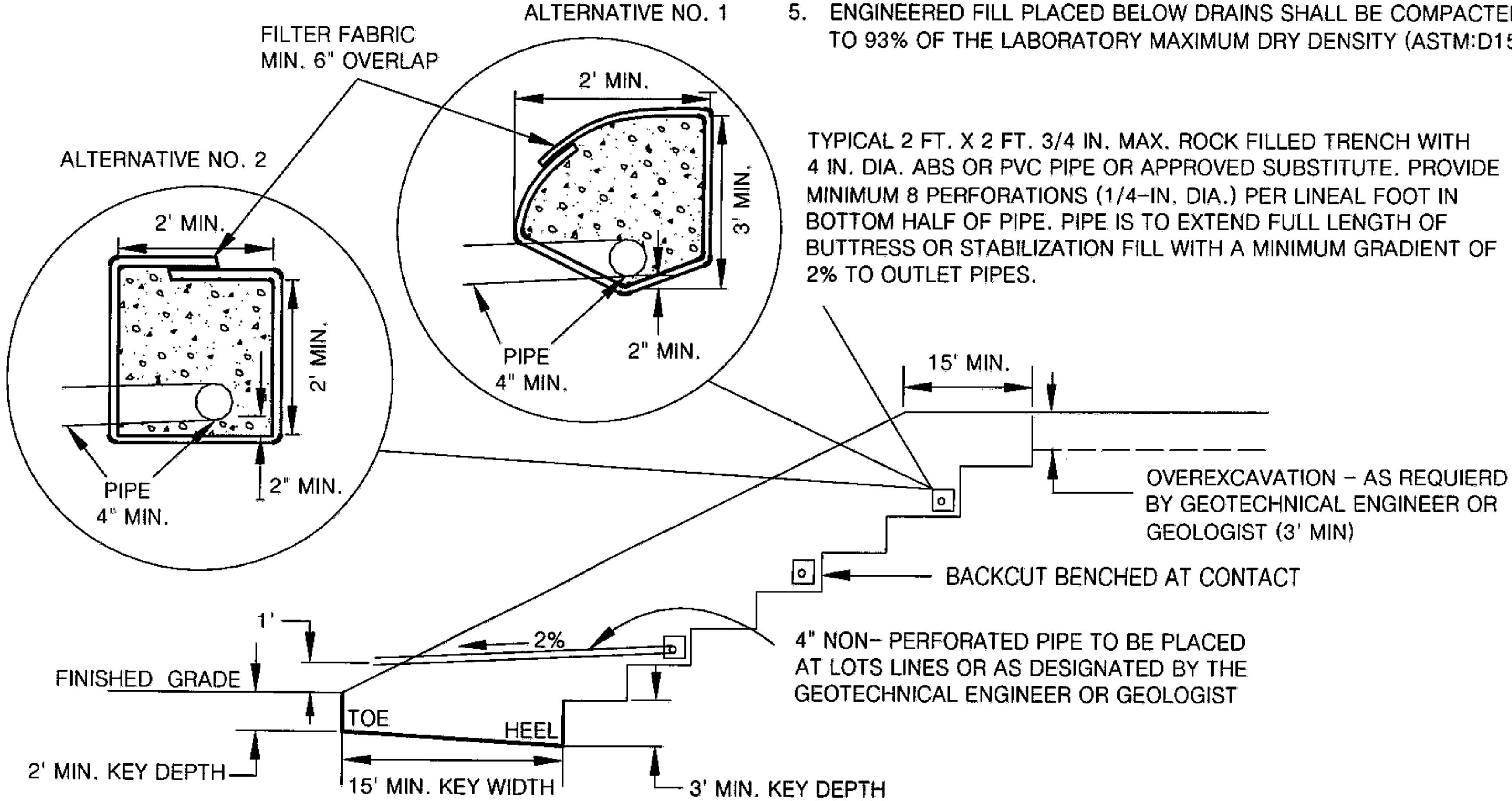
STABILIZATION/BUTTRESS FILL BACKDRAIN

NOTE:

1. ASTM D2751, SDR 35, OR ASTM D3034 OR ASTM D1527, SCHD. 40 ASTM D1785, SCHD. 40
2. SOLID PIPE OUTLETS TO BE PROVIDED EVERY 100 FT. AND JOINED TO PERFORATED BACKDRAIN PIPE WITH "L" OR "T"s. MIN. 2% GRADIENT.
3. GRAVEL TRENCH TO BE FILLED WITH 3/4 IN. MAXIMUM ROCK
4. THE NECESSITY FOR UPPER TIER BACKDRAINS SHALL BE DETERMINED IN THE FIELD BY THE GEOTECHNICAL ENGINEER OR GEOLOGIST. UPPER TIER OUTLETS SHOULD DRAIN INTO PAVED TERRACE DRAINS.
5. ENGINEERED FILL PLACED BELOW DRAINS SHALL BE COMPACTED TO 93% OF THE LABORATORY MAXIMUM DRY DENSITY (ASTM:D1557)



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VER. 3/12

PLATE G-8

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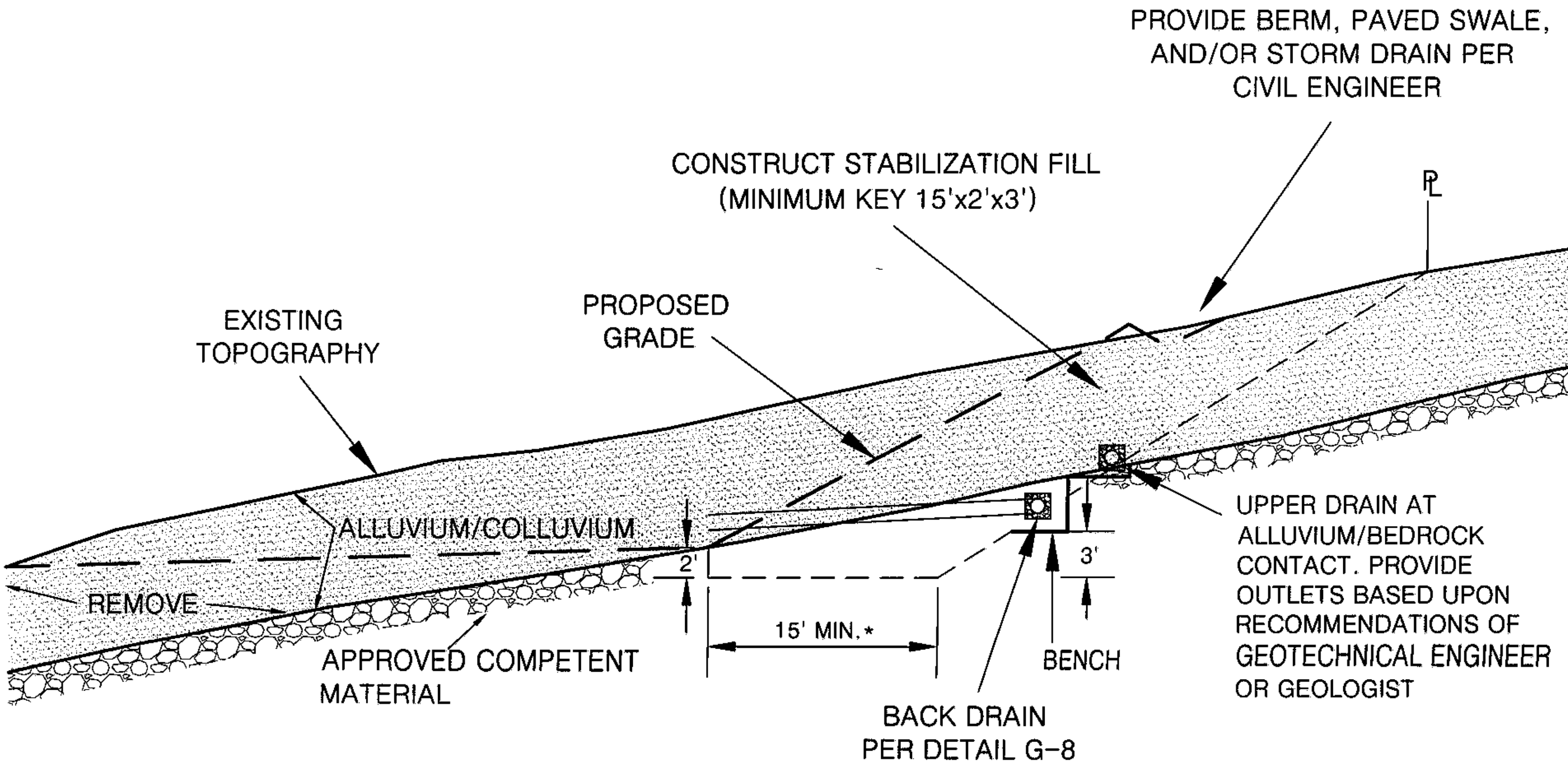
STABILIZATION FILL
(UPSLOPE ALLUVIATED AREA)



* FOR SLOPE HEIGHTS LESS THAN 30 FT.
SLOPES GREATER THAN 30 FT., KEY
WIDTH IS SLOPE HEIGHT DIVIDED BY 2

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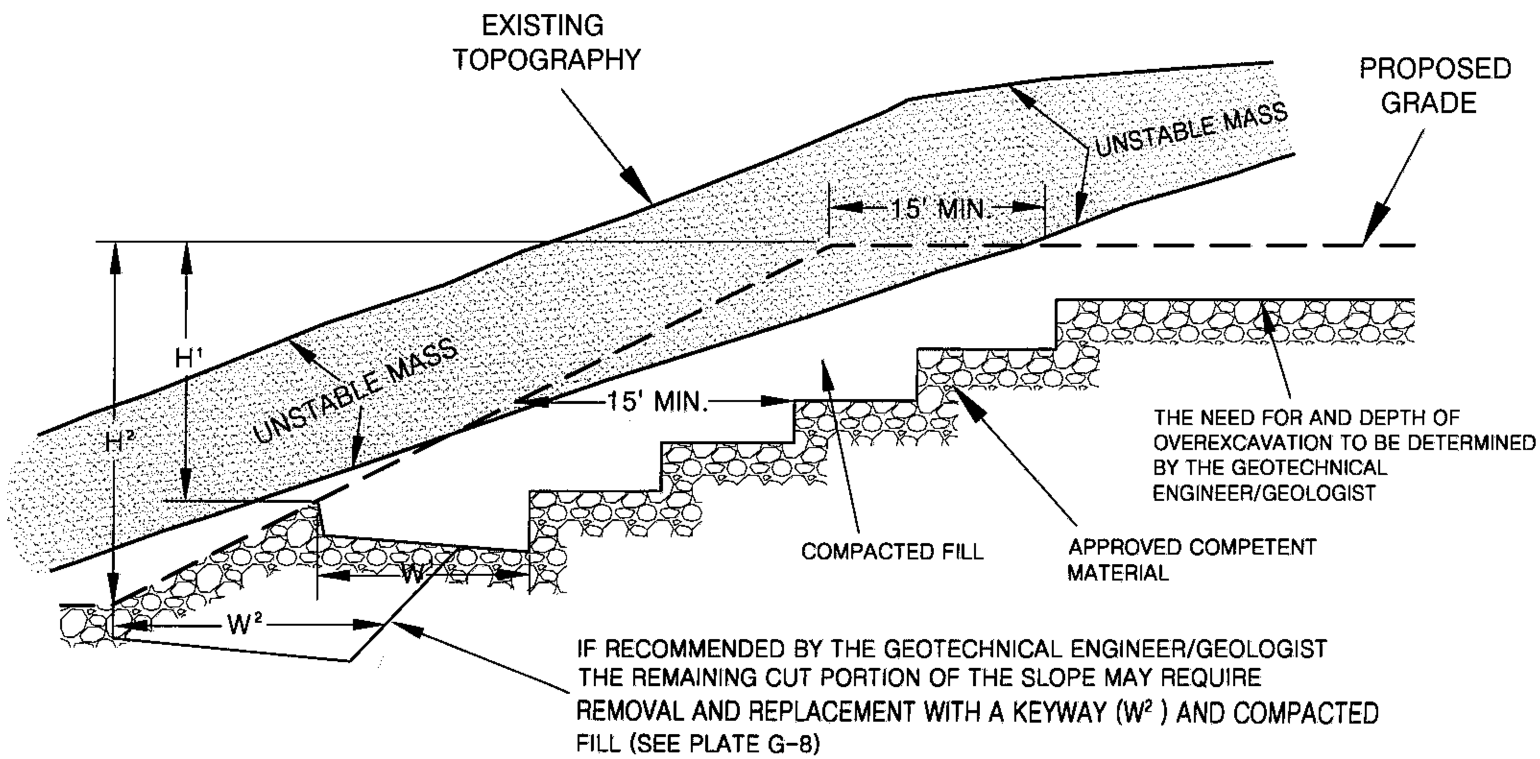
VER. 1/18

PLATE G-9

SELECTIVE GRADING DETAIL FOR STABILIZATION FILL
UNSTABLE MATERIAL EXPOSED IN PORTION OF CUT SLOPE



NOTES:

1. BACKDRAINS ARE NOT REQUIRED UNLESS SPECIFIED.

2. "W" SHALL BE EQUIPMENT WIDTH (15') FOR SLOPE HEIGHT LESS THAN 25 FEET. FOR SLOPES GREATER THAN 25 FEET, "W" SHALL BE DETERMINED BY THE PROJECT GEOTECHNICAL ENGINEER/GEOLOGIST. AT NO TIME SHALL "W" BE LESS THAN H/2.

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VER. 3/12

PLATE G-10

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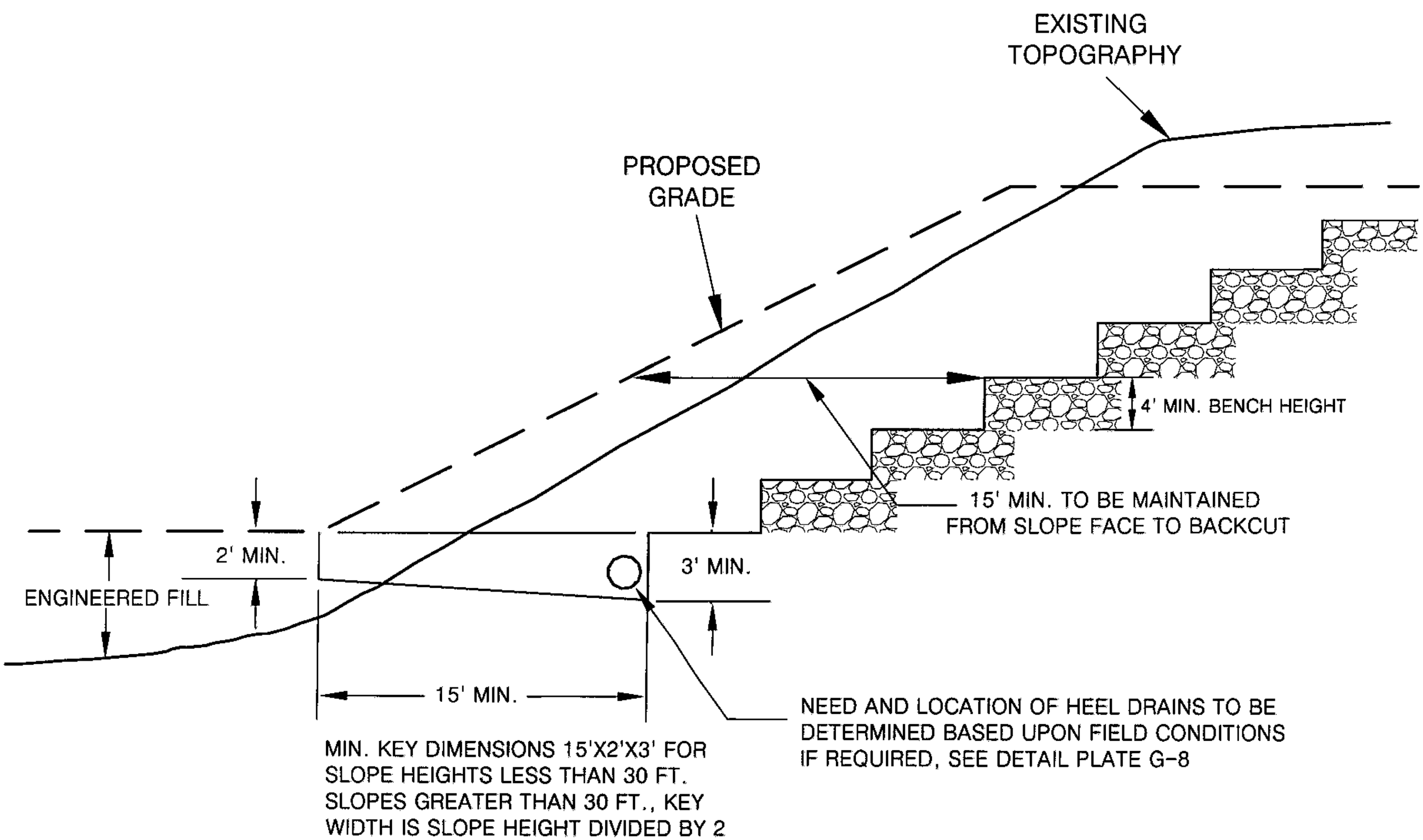
SKIN FILL SLOPE OVER NATURAL GROUND



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VER. 1/18

PLATE G-11

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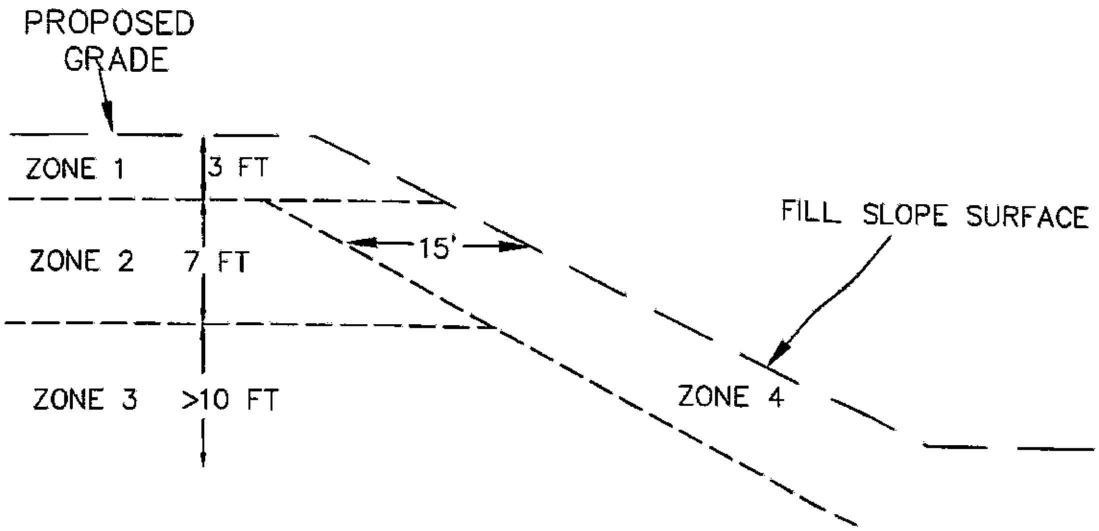
DETAIL FOR MAXIMUM PARTICLE DIMENSION



ZONE	DEPTH	PARTICLE MAX. DIMENSION	PLACEMENT METHOD
1	0-3 ft.	≤1.0 ft.	STANDARD OR CONVENTIONAL COMPACTION METHODS (SEE EARTHWORK SPECIFICATIONS)
2	3-10 ft.	≤2.0 ft.	ROCK BLANKETS (SEE PLATE G-13)
3	>10 ft.	≤8.0 ft.	ROCK BLANKETS (PLATE G-13) ROCK WINDROW (PLATE G-14) INDIVIDUAL ROCK BURIED (PLATE G-15)
4	15 HORIZONTAL FEET FROM FILL SLOPE FACE	≤1.0 ft.	STANDARD OR CONVENTIONAL COMPACTION METHODS (SEE EARTHWORK SPECIFICATIONS)

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VER. 2/15

PLATE G-12

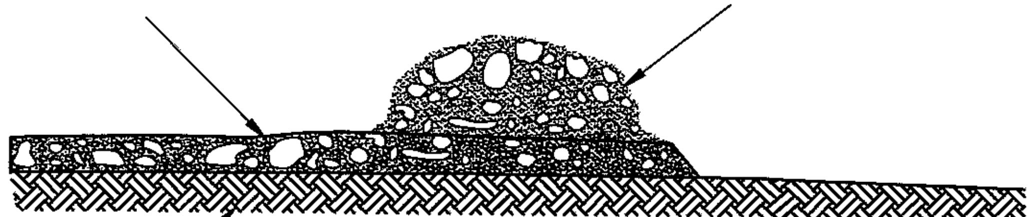
ROCK BLANKET DETAILS

LOOSE PILE 1
LOOSE, DUMPED ROCK, GRAVEL AND SAND MIXTURE REMOVE FRAGMENTS LARGER THAT 2 FEET FOR ISOLATED BURIAL (PLATE G-15) OR WINDROW (PLATE G-10)

APPROVED BOTTOM, OR TOP OF PREVIOUSLY APPROVED BLANKET FILL

COMPACT PILE 1
SPREAD LOOSE PILE FORWARD WITH HEAVY TRACKED DOZER (D-8 OR LARGER). HEAVILY WATER, TRACK, AND APPLY ADDITIONAL SAND AND GRAVEL AS NECESSARY TO FILL VOIDS AND CREATE A DENSE MATRIX OF ROCK, COBBLES, GRAVEL AND SAND (2 FOOT MAXIMUM THICKNESS)

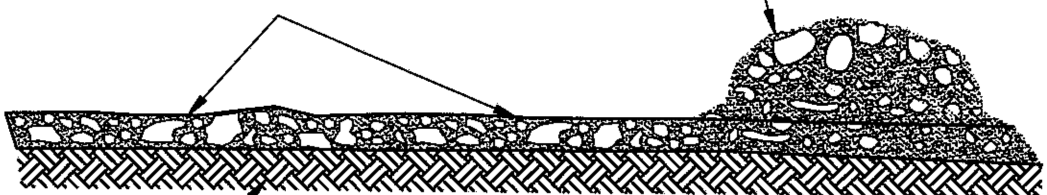
LOOSE PILE 2
DUMP SUCCESSIVE PILES OF LOOSE ROCK, GRAVEL AND SAND MIXTURE ON FORWARD EDGE OF PREVIOUSLY COMPACTED LIFT WITH TRUCKS AND/OR SCRAPERS. USE PREVIOUS LIFT TO ACCESS AND FURTHER COMPACT PILE 1.



APPROVED BOTTOM, OR TOP OF PREVIOUSLY APPROVED BLANKET FILL

LOOSE PILE 3
DUMP SUCCESSIVE PILES OF LOOSE ROCK, GRAVEL AND SAND MIXTURE ON FORWARD EDGE OF PREVIOUSLY COMPACTED LIFT WITH TRUCKS AND/OR SCRAPERS. USE PREVIOUS LIFT TO ACCESS AND FURTHER COMPACT EXISTING BLANKET.

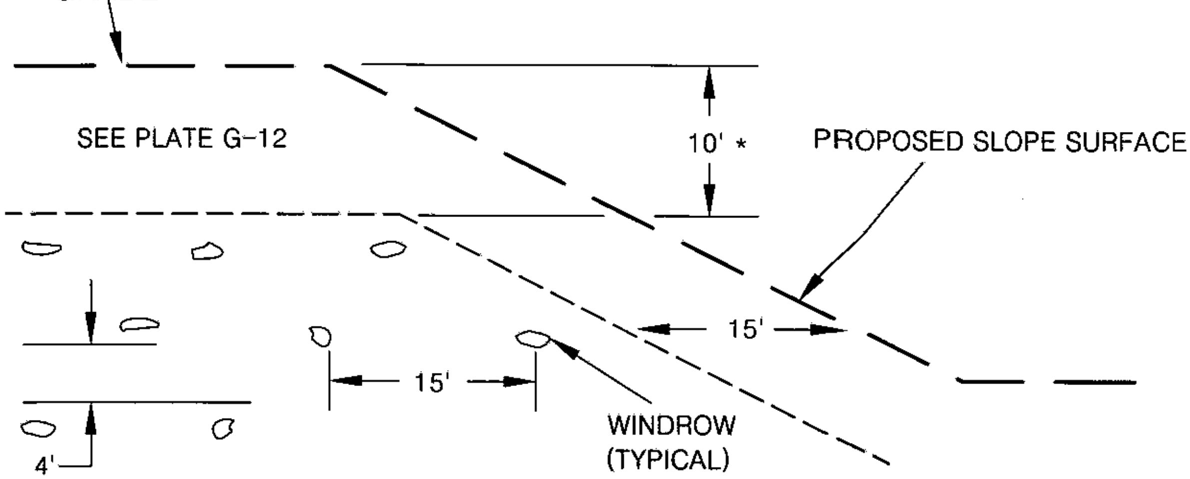
COMPACTED PILES 1 AND 2



APPROVED BOTTOM, OR TOP OF PREVIOUSLY APPROVED BLANKET FILL

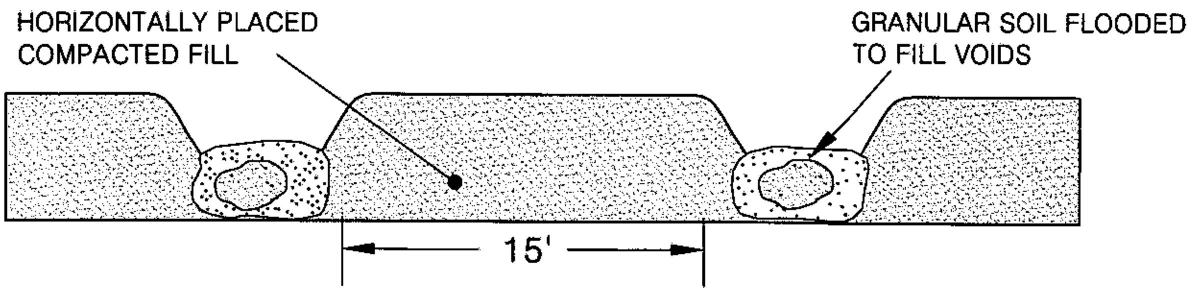
OBSERVATION TESTING AND APPROVAL PROCEDURES
OBSERVE EQUIPMENT. SCRAPERS AND TRUCKS SHOULD BE FULLY SUPPORTED ON BLANKET WITHOUT SIGNIFICANT YIELDING. EXCAVATE TEST/OBSERVATION PITS TO CONFIRM EXISTENCE OF MIXTURE OF VARIOUS PARTICLE SIZES, WITHOUT SIGNIFICANT VOIDS, AND FORMING A DENSE, COMPACTED FILL MATRIX. TEST BY ASTM D1556, D2922 AND/OR D3017 WHEN APPROPRIATE. RECORD LIMITS AND ELEVATION OF BLANKET. ALL FILL AND COMPACTION OPERATIONS TO BE CONDUCTED UNDER THE OBSERVATION OF THE GEOTECHNICAL ENGINEER. SUBSEQUENT LIFTS TO BE APPLIED ONLY AFTER OBSERVATION AND CONFIRMATION OF SUITABILITY OF FILL AND RELEASE BY THE GEOTECHNICAL ENGINEER. BLANKETS TO BE CONSTRUCTED IN ACCORDANCE WITH PLATE G-12.

ROCK WINDROW DETAIL



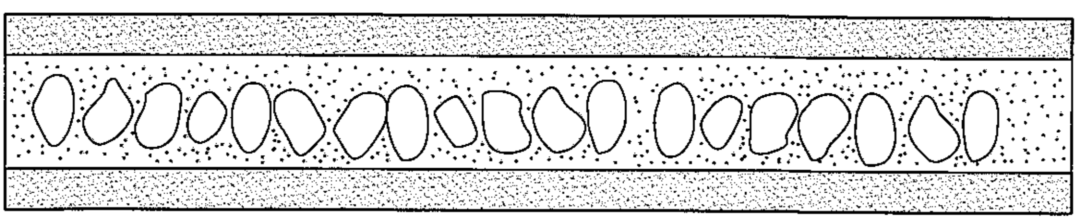
NOTE: OVERSIZED MATERIAL SHOULD BE REMOVED FROM THE 15' CLEAR ZONES WITH SPECIAL EQUIPMENT, SUCH AS A ROCK RAKE, PRIOR TO PLACING THE NEXT FILL LIFT.
*VARIANCES TO THE ABOVE ROCK HOLD DOWN MAY BE GRANTED SUBJECT TO APPROVAL BY THE OWNER, GEOTECHNICAL ENGINEER, AND GOVERNING AGENCY

TYPICAL WINDROW DETAIL (END VIEW)

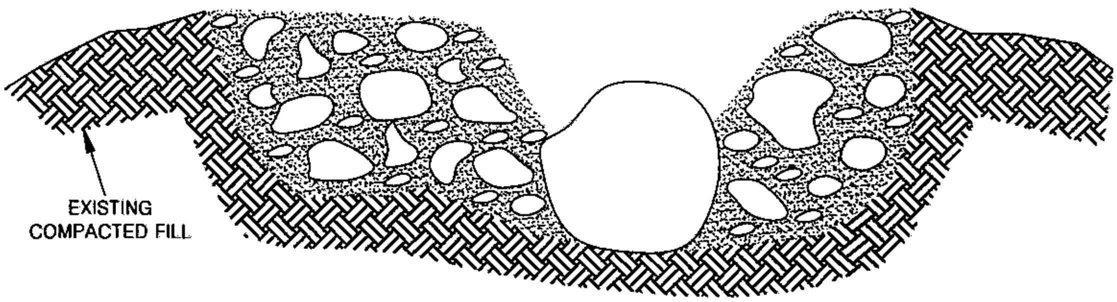


NOTE: COMPACTED FILL SHALL BE BROUGHT UP TO A HIGHER ELEVATION ALONG EACH WINDROW SO GRANULAR SOIL CAN BE FLOODED IN A "TRENCH CONDITION".

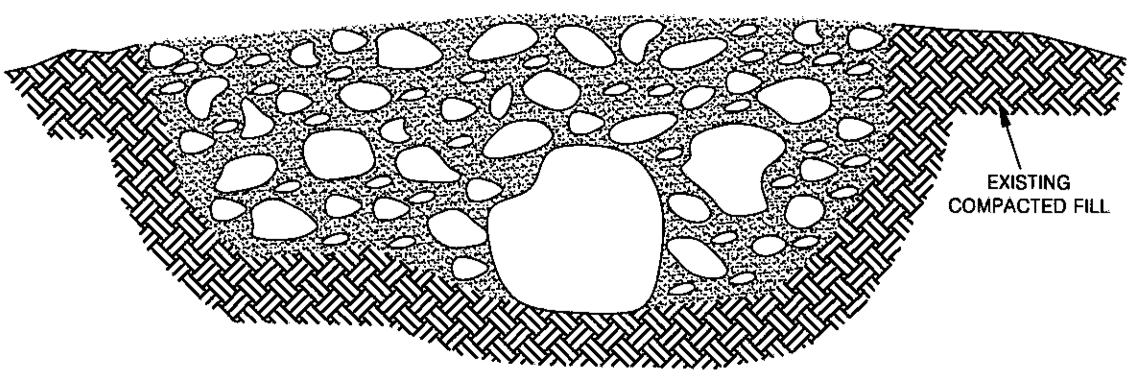
PROFILE VIEW



ISOLATED ROCK BURIAL DETAILS



EXCAVATE HOLE INTO EXISTING FILL PRISM, PLACE BOULDER (< 8 feet in maximum dimension) INTO EXISTING COMPACTED FILL. SURROUND WITH SAND, GRAVEL, COBBLES AND WATER HEAVILY. TRACK WITH D8 OR LARGER EQUIPMENT UNTIL RESULTING FILL FULLY SUPPORTS EQUIPMENT. OBSERVE AND/OR TEST IN ACCORDANCE WITH ASTM D1556, D2922 OR D3017. ROCKS LARGER THAN 8 FEET SHALL BE FURTHER REDUCED IN SIZE BY SECONDARY BREAKING.



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VER. 3/12

PLATE G-15

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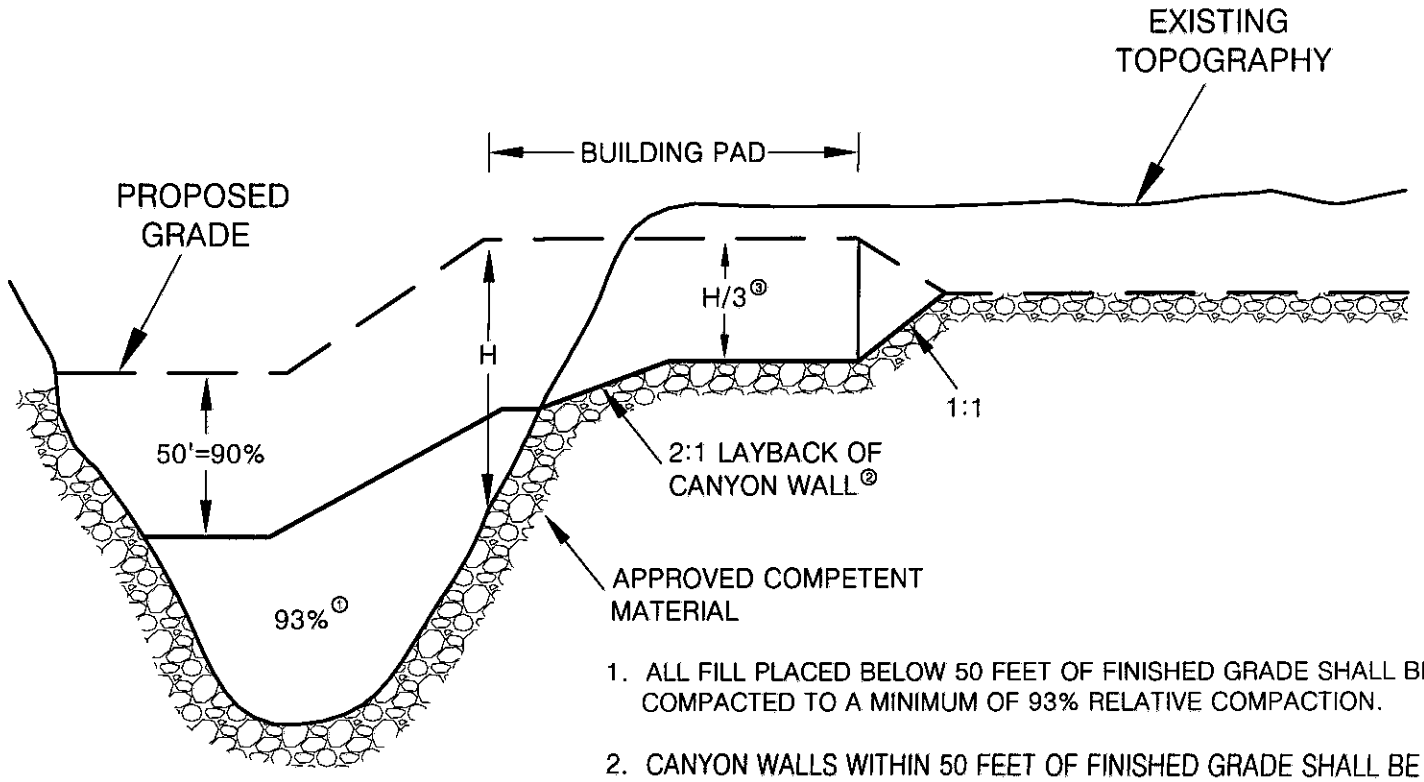
RELATIVE COMPACTION VS. DEPTH

CANYON WALL LAY BACK
DIFFERENTIAL FILL OVEREXCAVATION DETAILS



1. ALL FILL PLACED BELOW 50 FEET OF FINISHED GRADE SHALL BE COMPACTED TO A MINIMUM OF 93% RELATIVE COMPACTION.

2. CANYON WALLS WITHIN 50 FEET OF FINISHED GRADE SHALL BE LAID BACK TO A SLOPE RATIO OF 2:1 OR FLATTER.

3. ALL BUILDING PADS SHALL BE OVER EXCAVATED TO A MINIMUM OF 1/3 OF THE MAXIMUM DEPTH OF FILL BELOW THE BUILDING PAD TO A MAXIMUM OF 17 FEET.

4. IF THE 2:1 LAY BACK OF THE CANYON WALL IS IMPRACTICAL, THEN AS AN ALTERNATIVE THE INCREASED COMPACTION STANDARDS IN NOTE 1 SHOULD BE EXTENDED UP TO H/3 AND THE LAY BACK WILL NOT BE REQUIRED.

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VER. 3/12

PLATE G–16

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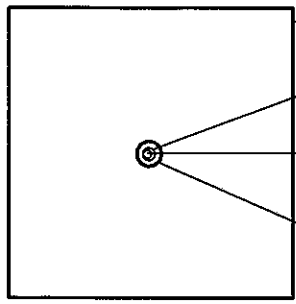
SETTLEMENT PLATE DETAIL



2'X2' X 1/4" STEEL PLATE

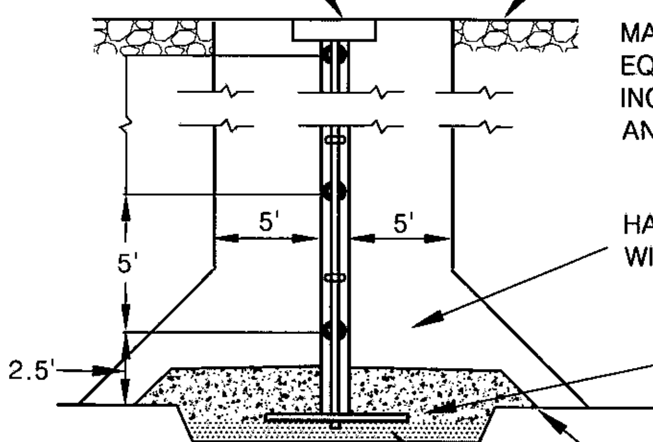
STANDARD 3/4" PIPE NIPPLE, WELDED TOP AND UNDERSIDE OF PLATE.

3/4" DIA. X 5' LONG GALVANIZED PIPE, STANDARD PIPE THREADS TOP AND BOTTOM. EXTENSIONS THREADED BOTH ENDS AND ADDED IN 5' INCREMENTS.

3" DIA. SCHEDULE 40 PVC, ADD IN 5' INCREMENTS, GLUE JOINTS.

CAP AND COVER PER PLATE G-12A

FINAL GRADE



MAINTAIN 5' HORIZONTAL CLEARANCE FOR HEAVY EQUIPMENT. HAND COMPACT IN 2' VERTICAL INCREMENTS OR ALTERNATIVE SUITABLE TO AND ACCEPTED BY THE GEOTECHNICAL ENGINEER.

HAND COMPACT INITIAL 5' (VERTICAL) WITHIN 10' HORIZONTAL

PLACE AND HAND COMPACT INITIAL 2' OF FILL PRIOR TO ESTABLISHING INITIAL READING

REMOVAL BOTTOM

PROVIDE 1-INCH OF SAND/GRAVEL BEDDING MINIMUM

NOTES:

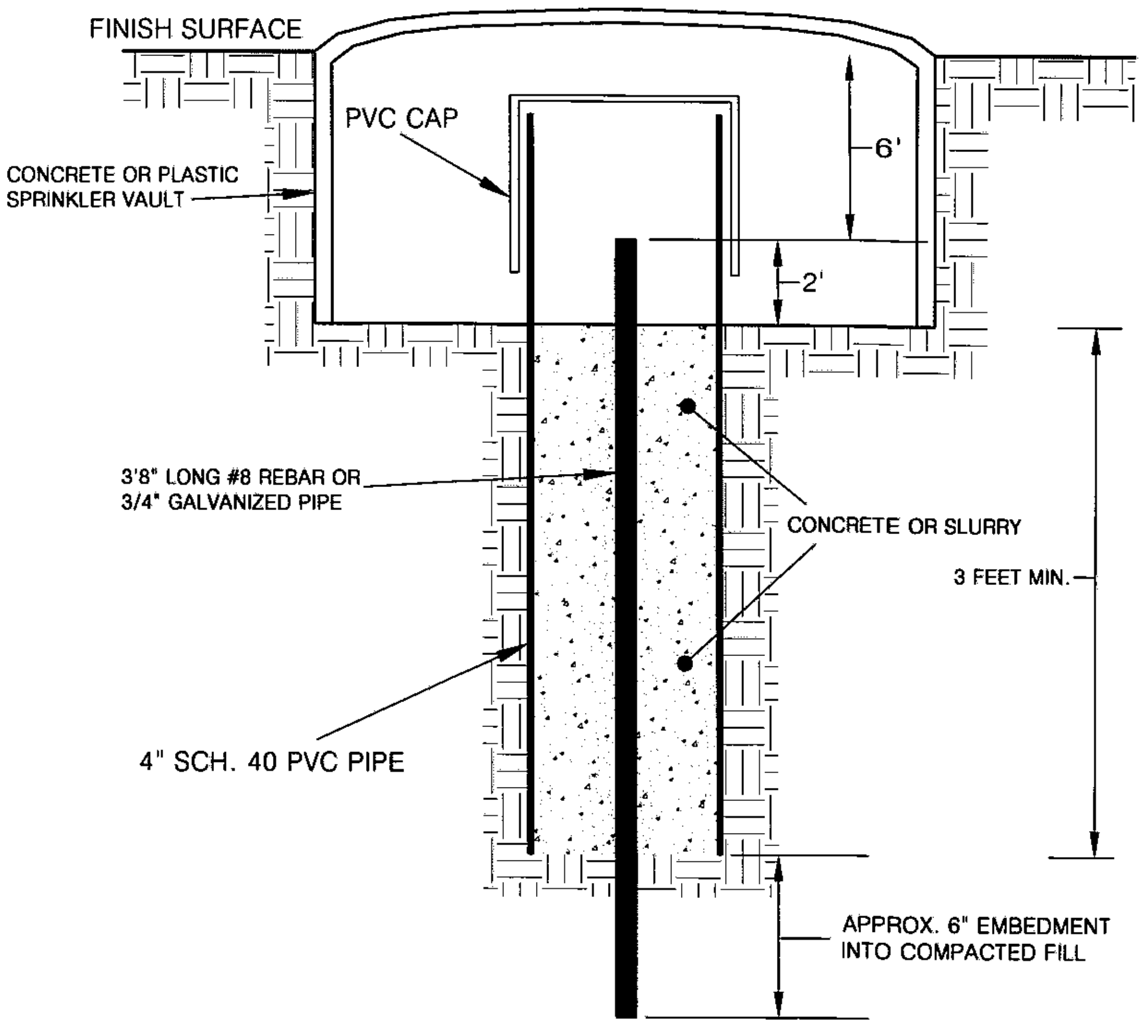
1) LOCATIONS OF SETTLEMENT PLATES SHALL BE CLEARLY MARKED AND READILY VISIBLE (RED FLAGGED) TO EQUIPMENT OPERATORS.

2) CONTRACTOR SHALL MAINTAIN 10' HORIZONTAL CLEARANCE FOR HEAVY EQUIPMENT WITHIN 5' (VERTICAL) OF PLATE BASE. FILL WITHIN CLEARANCE AREA SHALL BE HAND COMPACTED TO PROJECT SPECIFICATIONS OR COMPACTED BY ALTERNATIVE APPROVED BY THE GEOTECHNICAL ENGINEER.

3) AFTER 5' (VERTICAL) OF FILL IS IN PLACE, CONTRACTOR SHALL MAINTAIN 5' HORIZONTAL EQUIPMENT CLEARANCE. FILL IN CLEARANCE AREA SHALL BE HAND COMPACTED (OR APPROVED ALTERNATIVE) IN VERTICAL INCREMENTS NOT TO EXCEED 2 FEET.

4) IN THE EVENT OF DAMAGE TO SETTLEMENT PLATE OR EXTENSION RESULTING FROM EQUIPMENT OPERATING WITHIN PRESCRIBED CLEARANCE AREA, CONTRACTOR SHALL IMMEDIATELY NOTIFY GEOTECHNICAL ENGINEER AND SHALL BE RESPONSIBLE FOR RESTORING THE SETTLEMENT PLATE AND EXTENSION RODS TO WORKING ORDER.

SURFACE SETTLEMENT MONUMENT DETAIL



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VER. 3/12

PLATE G-18

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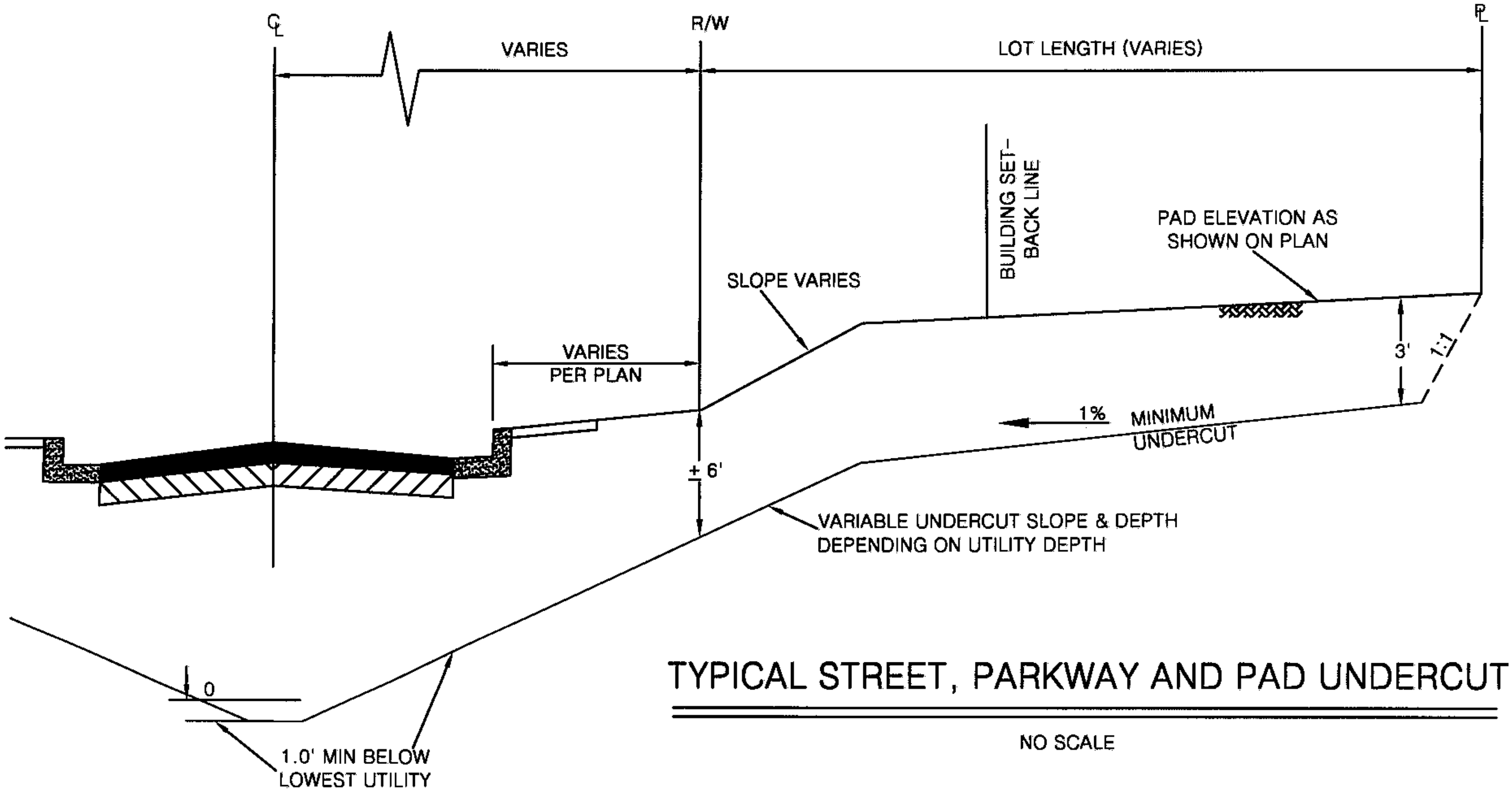

TYPICAL STREET, PARKWAY AND PAD UNDERCUT

NO SCALE

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VER. 3/13

PLATE G-19

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CONSTRUCTION NOTES:

(4) CONSTRUCT 4" SUBDRAIN PER DETAIL ON SHEET 1

(5) CONSTRUCT 6" SUBDRAIN PER DETAIL ON SHEET 1

(6) CONSTRUCT 8" SUBDRAIN PER DETAIL ON SHEET 1

(7) CONSTRUCT RETAINING WALL PER SEPARATE DETAILS ON SHEET 11

(8) CONSTRUCT INLET TYPE X PER R.C.F.C. & W.C.D. STD. DWG. NO. CB108

(20) CONSTRUCT 24" CMP

[1] EASEMENT FOR ACCESS, GRADING & INSTALLATION OF DRAINAGE, SLOPE STABILIZATION, AND LANDSCAPE & IRRIGATION AS PER GIFT DEED REC. 12/28/2000 PER INSTR. #2000-516795, O.R.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER CITY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE CITY.

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

See Plate 7 for Legend

PLATE 1

ALTA CALIFORNIA GEOTECHNICAL, INC.
170 N. MAPLE STREET, STE 108, CORONA, CA 92880
TELEPHONE: (951) 509-7090
PROJECT NUMBER: 1-0160-H DATE: AUG. 27, 2020

SCALE: 1" = 40'

DIGALERT
DIAL TOLL FREE
8-1-1
AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

BASIS OF BEARINGS:
DESCRIPTION:
THE BASIS OF COORDINATES FOR THIS MAP IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, 1983, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "REST" AND "RABBIT".
BEARING: N 27°39'52" E

BENCHMARK:
DESCRIPTION: USGS MONUMENT "REST" BENCHMARK DISK SET IN TOP OF CONCRETE MONUMENT STAMPED "REST 1972" ON DESERT LAWN DRIVE ACROSS THE DRIVE FROM DESERT LAWN CEMETERY 25.3 FT. N.E. OF THE DRIVE CENTERLINE 24.9 FT. S.W. OF THE S.W. EDGE OF THE SOUTH EASTBOUND LANES OF INTERSTATE HIGHWAY 10
ELEV. 2491.44, NGVD 29

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS	CITY	

PREPARED BY:
PROACTIVE ENGINEERING CONSULTANTS WEST, INC.
25109 JEFFERSON AVE. SUITE 200
MURRIETA, CA 92562
951-200-6840
GEORGE ALAN LENFESTEY
R.C.E. 45920 EXP. 12-31-2020
DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
GEORGE ALAN LENFESTEY
No. 45920
Exp. 12/31/20
CIVIL
STATE OF CALIFORNIA

DESIGN BY: PEC
DRAWN BY: PEC
CHECKED BY: PEC
SCALE: AS NOTED
DATE:
JOB NUMBER: 06.002.000

Reviewed By: ______________ Date: ______
Staff Engineer

Recommended for Approval By: ______________ Date: ______

Approved By: ______________ Date: ______
City Engineer

City of Beaumont, Public Works Department
Engineering Division

CITY OF BEAUMONT, CALIFORNIA
ROUGH GRADING PLAN
TRACT NO. 31462 PHASE 4A

GRADING PLAN

FOR: ARGENT MANAGEMENT

SHEET 6 OF 18 SHEETS
FILE NO.:

PRELIMINARY NOT FOR CONSTRUCTION

Plotted: By: DWG:

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER CITY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE CITY.

NOTE:
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CONSTRUCTION NOTES:

(4) CONSTRUCT 4" SUBDRAIN PER DETAIL ON SHEET 1

(5) CONSTRUCT 6" SUBDRAIN PER DETAIL ON SHEET 1

(6) CONSTRUCT 8" SUBDRAIN PER DETAIL ON SHEET 1

(7) CONSTRUCT RETAINING WALL PER SEPARATE DETAILS ON SHEET 11

[1] EASEMENT FOR ACCESS, GRADING & INSTALLATION OF DRAINAGE, SLOPE STABILIZATION, AND LANDSCAPE & IRRIGATION AS PER GIFT DEED REC. 12/28/2000 PER INSTR. #2000-516795, O.R.

DIGALERT
DIAL TOLL FREE
8-1-1
AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

BASIS OF BEARINGS:
DESCRIPTION:
THE BASIS OF COORDINATES FOR THIS MAP IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, 1983, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "REST" AND "RABBIT".
BEARING: N 27°39'52" E

BENCHMARK:
DESCRIPTION: USGS MONUMENT "REST" BENCHMARK DISK SET IN TOP OF CONCRETE MONUMENT STAMPED "REST 1972" ON DESERT LAWN DRIVE ACROSS THE DRIVE FROM DESERT LAWN CEMETERY 25.3 FT. N.E. OF THE DRIVE CENTERLINE 24.9 FT. S.W. OF THE S.W. EDGE OF THE SOUTH EASTBOUND LANES OF INTERSTATE HIGHWAY 10
ELEV. 2491.44, NGVD 29

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS		CITY

PREPARED BY:
PROACTIVE ENGINEERING CONSULTANTS WEST,INC.
25109 JEFFERSON AVE. SUITE 200
MURRIETA, CA 92562
951-200-6840
GEORGE ALAN LENFESTEY
R.C.E. 45920 EXP. 12-31-2020
DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
GEORGE ALAN LENFESTEY
No. 45920
Exp. 12/31/20
CIVIL
STATE OF CALIFORNIA

DESIGN BY: PEC
DRAWN BY: PEC
CHECKED BY: PEC
SCALE: AS NOTED
DATE:
JOB NUMBER: 06.002.000

Reviewed By: ______ Date: ______
Staff Engineer
Recommended for Approval By: ______ Date: ______
Approved By: ______ Date: ______
City Engineer
City of Beaumont, Public Works Department
Engineering Division

CITY OF BEAUMONT, CALIFORNIA
ROUGH GRADING PLAN
TRACT NO. 31462 PHASE 4A
GRADING PLAN
FOR: ARGENT MANAGEMENT

SHEET 7 OF 18 SHEETS
FILE NO.:

PRELIMINARY NOT FOR CONSTRUCTION

Plotted: By: DWG:

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4 CONSTRUCT 4" SUBDRAIN PER DETAIL ON SHEET 1
5 CONSTRUCT 6" SUBDRAIN PER DETAIL ON SHEET 1
6 CONSTRUCT 8" SUBDRAIN PER DETAIL ON SHEET 1
9 CONSTRUCT INTERCEPTOR DRAIN PER DETAIL ON SHEET 16
1 EASEMENT FOR ACCESS, GRADING & INSTALLATION OF DRAINAGE, SLOPE STABILIZATION, AND LANDSCAPE & IRRIGATION AS PER GIFT DEED REC. 12/28/2000 PER INSTR. #2000-516795, O.R.

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ELEV. 2491.44, NGVD 29

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS	CITY	

PREPARED BY:
PROACTIVE ENGINEERING CONSULTANTS WEST, INC.
25109 JEFFERSON AVE. SUITE 200
MURRIETA, CA 92562
951-200-6840
GEORGE ALAN LENFESTEY
R.C.E. 45920 EXP. 12-31-2020
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SEAL
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GEORGE ALAN LENFESTEY
No. 45920
Exp. 12/31/20
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STATE OF CALIFORNIA

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DRAWN BY: PEC
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DATE:
JOB NUMBER: 06.002.000

Reviewed By: ______ Staff Engineer Date: ______
Recommended for Approval By: ______ Date: ______
Approved By: ______ City Engineer Date: ______

City of Beaumont, Public Works Department
Engineering Division

CITY OF BEAUMONT, CALIFORNIA
ROUGH GRADING PLAN
TRACT NO. 31462 PHASE 4A
GRADING PLAN
FOR: ARGENT MANAGEMENT

SHEET 8 OF 18 SHEETS
FILE NO.:

PRELIMINARY NOT FOR CONSTRUCTION
Plotted: By: DWG:

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BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS	CITY	

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PROACTIVE ENGINEERING CONSULTANTS WEST, INC.
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951-200-6840
GEORGE ALAN LENFESTEY
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DATE

SEAL
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No. 45920
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CIVIL
STATE OF CALIFORNIA

DESIGN BY: PEC
DRAWN BY: PEC
CHECKED BY: PEC
SCALE: AS NOTED
DATE:
JOB NUMBER: 06.002.000

Reviewed By: ____ Date: ____
Staff Engineer
Recommended for Approval By: ____ Date: ____
Approved By: ____ Date: ____
City Engineer
City of Beaumont, Public Works Department
Engineering Division

CITY OF BEAUMONT, CALIFORNIA
ROUGH GRADING PLAN
TRACT NO. 31462 PHASE 4A
GRADING PLAN
FOR: ARGENT MANAGEMENT

SHEET 9 OF 18 SHEETS
FILE NO.:

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CONSTRUCTION NOTES:

5 CONSTRUCT 6" SUBDRAIN PER DETAIL ON SHEET 1
6 CONSTRUCT 8" SUBDRAIN PER DETAIL ON SHEET 1
7 CONSTRUCT RETAINING WALL PER SEPARATE DETAILS ON SHEET 11
9 CONSTRUCT INTERCEPTOR DRAIN PER DETAIL ON SHEET 16
13 CONSTRUCT 50-150 LB. (D50) RIP-RAP SLOPE PROTECTION PER DETAIL ON SHEET 16
16 CONSTRUCT DOWNDRAIN TO PIPE TRANSITION PER DETAIL ON SHEET 16

1 EASEMENT FOR ACCESS, GRADING & INSTALLATION OF DRAINAGE, SLOPE STABILIZATION, AND LANDSCAPE & IRRIGATION AS PER GIFT DEED REC. 12/28/2000 PER INSTR. #2000-516795, O.R.

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

See Plate 7 for Legend

PLATE 5

ALTA CALIFORNIA GEOTECHNICAL, INC.
170 N. MAPLE STREET, STE 108, CORONA, CA 92880
TELEPHONE: (951) 509-7090
PROJECT NUMBER: 1-0160-H DATE: AUG. 27, 2020

DIGALERT
DIAL TOLL FREE
8-1-1
AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

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ELEV. 2491.44, NGVD 29

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS	CITY	

PREPARED BY:
PROACTIVE ENGINEERING CONSULTANTS WEST, INC.
25109 JEFFERSON AVE. SUITE 200
MURRIETA, CA 92562
951-200-6840
GEORGE ALAN LENFESTEY DATE
R.C.E. 45920 EXP. 12-31-2020

SEAL
REGISTERED PROFESSIONAL ENGINEER
GEORGE ALAN LENFESTEY
No. 45920
Exp. 12/31/20
CIVIL
STATE OF CALIFORNIA

DESIGN BY: PEC
DRAWN BY: PEC
CHECKED BY: PEC
SCALE: AS NOTED
DATE:
JOB NUMBER: 06.002.000

Reviewed By: ______ Staff Engineer Date: ______
Recommended for Approval By: ______ Date: ______
Approved By: ______ City Engineer Date: ______
City of Beaumont, Public Works Department
Engineering Division

CITY OF BEAUMONT, CALIFORNIA
ROUGH GRADING PLAN
TRACT NO. 31462 PHASE 4A
GRADING PLAN
FOR: ARGENT MANAGEMENT

SHEET 10 OF 18 SHEETS
FILE NO.:

PRELIMINARY NOT FOR CONSTRUCTION

Plotted: By: DWG:

GENERAL NOTES:

1) ALL WORK SHALL CONFORM TO THE ADOPTED CODES AND ZONING REGULATIONS.

2) CONCRETE BLOCK MASONRY SHALL COMPLY WITH THE FOLLOWING:
A. CONCRETE MASONRY SHALL CONFORM TO ASTM C-90, GRADE - N.
B. MORTAR: TYPE M OR S.
C. GROUT ALL CELLS W/2000 PSI PORTLAND CEMENT GROUT.

3) THE ULTIMATE COMPRESSIVE STRENGTH REQUIRED FOR FOUNDATION CONCRETE SHALL BE 2500 PSI.

4) ALL REINFORCING STEEL SHALL BE INTERMEDIATE GRADE ASTM A615-40 AND OVERLAP SPLICES SHALL BE 40 BAR DIAMETERS MINIMUM. ALL REBAR HOOKS SHALL BE A MINIMUM OF 12 TIMES THE REBAR DIAMETER (12bd) IN LENGTH.

5) PROVIDE RETAINING WALL DRAINAGE SYSTEM AS FOLLOWS:
PROVIDE 1CF/FT OF CLEAN COARSE GRAVEL WITH 4" DIAMETER PERFORATED PVC DRAINAGE PIPE WITH 1% GRADIENT TO DRAIN - OR OMIT HEAD JOINTS IN FIRST COURSE.

6) OPTIONAL: INSTALLATION OF A MOISTURE BARRIER ON THE FILL SIDE OF THE WALL WILL HELP TO PREVENT MOISTURE FROM PENETRATING THE VISIBLE SIDE OF THE WALL, RESULTING IN DISCOLORATION.

7) THIS RETAINING WALL STANDARD IS NOT DESIGNED TO SUPPORT SURCHARGE LOADS FROM MOTOR VEHICLES OR OTHER STRUCTURES.

8) CLEANOUTS SHALL BE PROVIDED FOR ALL GROUT POURS OVER 5 FEET IN HEIGHT. WHERE REQUIRED, CLEANOUTS SHALL BE PROVIDED IN THE BOTTOM COURSE AT EVERY VERTICAL BAR AND SHALL BE SEALED AFTER INSPECTION AND BEFORE GROUTING.

REQUIRED INSPECTIONS:

1) FOOTING:
EXCAVATION TRENCH CLEAN WITH STEEL IN PLACE AND SUPPORTED 3" ABOVE AND AWAY FROM THE SURROUNDING EARTH/DIRT.

2) REBAR/PRE-GROUT AND DRAINAGE SYSTEM:
BOND BEAM REBAR AND VERTICAL REBAR IN PLACE - INSPECTION PRIOR TO PLACING GROUT. DRAINAGE SYSTEM COMPLETE.

3) FINAL;
AFTER GROUT IS PLACED AND BACKFILL COMPLETED - PRIOR TO ANY DECORATIVE CAP PLACEMENT.

SETBACK FROM TOP OF SLOPE:
ALL FOOTINGS ADJACENT TO SLOPES TO BE AT LEAST 5' TO DAYLIGHT AS SHOWN BELOW.

2:1 MAX. SLOPE
5' MIN.
DAYLIGHT
BOTTOM OF FOOTING

DESIGN PARAMETERS:

ACTIVE SOIL PRESSURE (PSF)	
LEVEL BACKFILL	= 30
SLOPING (2:1 MAX)	= 43
PASSIVE SOIL BEARING (PSF)	=150
COEFFICIENT OF FRICTION	= 0.25
ALLOWABLE SOIL BEARING PRESSURE (PSF)	=1500

(NO INCREASES TAKEN FOR DEPTH OR WIDTH OF FOOTING)

DISCLAIMER:
ALTERNATE RETAINING WALL DESIGNS MAY BE POSSIBLE WHEN PROVIDED WITH AN ENGINEERED ANALYSIS. USE OF THIS STANDARD DESIGN IS AT THE USER'S RISK AND CARRIES NO IMPLIED OR INFERRED GUARANTEE AGAINST FAILURE OR DEFECTS.

WESTERN RIVERSIDE COUNTY CODE UNIFORMITY PROGRAM
CITY OF RIVERSIDE
BUILDING DEPARTMENT
RETAINING WALLS
(951) 826-5697
FAX (951) 826-5622
3900 MAIN ST
RIVERSIDE CA. 92522
01/22/2007 | RETWALLFINAL.VSD | PAGE 2 OF 2

SCALE: 1" = 40'

1 EASEMENT FOR ACCESS, GRADING & INSTALLATION OF DRAINAGE, SLOPE STABILIZATION, AND LANDSCAPE & IRRIGATION AS PER GIFT DEED REC. 12/28/2000 PER INSTR. #2000-516795, O.R.

CONSTRUCTION NOTES:

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13 CONSTRUCT 50-150 LB. (D50) RIP-RAP SLOPE PROTECTION PER DETAIL ON SHEET 16
17 CONSTRUCT 3" GUNITE OVER COMPACTED NATIVE CHANNEL PER PLAN, WIDTH AS SHOWN

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DIGALERT
DIAL TOLL FREE
8-1-1
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UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

BASIS OF BEARINGS:
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BEARING: N 27°39'52" E

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ELEV. 2491.44, NGVD 29

BY	MARK	DESCRIPTION	APPR.	DATE
ENGINEER		REVISIONS	CITY	

PREPARED BY:
PROACTIVE ENGINEERING CONSULTANTS WEST, INC.
25109 JEFFERSON AVE. SUITE 200
MURRIETA, CA 92562
951-200-6840
GEORGE ALAN LENFESTEY
R.C.E. 45920 EXP. 12-31-2020
DATE

SEAL
REGISTERED PROFESSIONAL ENGINEER
GEORGE ALAN LENFESTEY
No. 45920
Exp. 12/31/20
CIVIL
STATE OF CALIFORNIA

DESIGN BY: PEC
DRAWN BY: PEC
CHECKED BY: PEC
SCALE: AS NOTED
DATE:
JOB NUMBER: 06.002.000

Reviewed By: ______ Staff Engineer Date: ______
Recommended for Approval By: ______ Date: ______
Approved By: ______ City Engineer Date: ______
City of Beaumont, Public Works Department
Engineering Division

CITY OF BEAUMONT, CALIFORNIA
ROUGH GRADING PLAN
TRACT NO. 31462 PHASE 4A
GRADING PLAN
FOR: ARGENT MANAGEMENT

SHEET 11 OF 18 SHEETS
FILE NO.:

PRELIMINARY NOT FOR CONSTRUCTION

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SHEET 12 OF 18 SHEETS
FILE NO.:

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Plotted: By: DWG:

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(6) CONSTRUCT 8" SUBDRAIN PER DETAIL ON SHEET 1
(8) CONSTRUCT INLET TYPE X PER R.C.F.C. & W.C.D. STD. DWG. NO. CB108
(13) CONSTRUCT 50–150 LB. (D50) RIP-RAP SLOPE PROTECTION PER DETAIL ON SHEET 16
(15) CONSTRUCT 3" AC OVER COMPACTED NATIVE
(17) CONSTRUCT 3" GUNITE OVER COMPACTED NATIVE CHANNEL PER PLAN, WIDTH AS SHOWN
(21) CONSTRUCT 36" CMP

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See Plate 7 for Legend

PLATE 8

ALTA CALIFORNIA GEOTECHNICAL, INC.
170 N. MAPLE STREET, STE 108, CORONA, CA 92880
TELEPHONE: (951) 509-7090
PROJECT NUMBER: 1-0160-H
DATE: AUG. 27, 2020

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951-200-6840
GEORGE ALAN LENFESTEY
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DATE:
JOB NUMBER: 06.002.000

Reviewed By: ______ Date: ______
Staff Engineer
Recommended for Approval By: ______ Date: ______
Approved By: ______ Date: ______
City Engineer

City of Beaumont, Public Works Department
Engineering Division

CITY OF BEAUMONT, CALIFORNIA
ROUGH GRADING PLAN
TRACT NO. 31462 PHASE 4A

GRADING PLAN

FOR: ARGENT MANAGEMENT

SHEET 13 OF 18 SHEETS
FILE NO.:

Plotted: By: DWG:

PRELIMINARY NOT FOR CONSTRUCTION

United States Department of Agriculture

Natural Resources Conservation Service

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

Custom Soil Resource Report for
Western Riverside Area, California

May 11, 2023

Preface

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

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

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

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

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

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

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Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Soil Map

Map Scale: 1:7,320 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 100, 200, 400, 600

Feet: 0, 350, 700, 1400, 2100

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

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

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

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

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ce	Chino silt loam, drained	7.0	5.0%
Cg	Chino silt loam, drained, strongly saline-alkali	2.8	2.0%
GtA	Grangeville fine sandy loam, drained, 0 to 2 percent sl opes	2.9	2.0%
GtD	Grangeville fine sandy loam, drained, 5 to 15 percent s lopes	1.5	1.1%
HcD2	Hanford coarse sandy loam, 8 to 15 percent slopes, eroded	1.0	0.7%
MfA	Metz loamy fine sand, 0 to 2 percent slopes, shorter FFS, MLRA 19	2.5	1.8%
SeC2	San Emigdio fine sandy loam, 2 to 8 percent slopes, eroded	19.4	13.8%
SgA	San Emigdio loam, 0 to 2 percent slopes	6.8	4.8%
SgC	San Emigdio loam, 2 to 8 percent slopes	1.8	1.3%
SmE2	San Timoteo loam, 8 to 25 percent slopes, eroded	2.8	2.0%
SmF2	San Timoteo loam, 25 to 50 percent slopes, eroded	74.1	52.8%
TeG	Terrace escarpments	17.8	12.6%
Totals for Area of Interest		**140.4**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Western Riverside Area, California

Ce—Chino silt loam, drained

Map Unit Setting

National map unit symbol: hcs6
Elevation: 20 to 3,100 feet
Mean annual precipitation: 8 to 20 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 230 to 340 days
Farmland classification: Prime farmland if irrigated and drained

Map Unit Composition

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

Description of Chino

Setting

Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 14 inches: silt loam
H2 - 14 to 27 inches: silty clay loam
H3 - 27 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R019XD068CA - SILTY BASIN
Hydric soil rating: No

Minor Components

Domino

Percent of map unit: 3 percent

Hydric soil rating: No

Unnamed

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

Willows

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

Unnamed

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

Grangeville

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

Cg—Chino silt loam, drained, strongly saline-alkali

Map Unit Setting

National map unit symbol: hcs8
Elevation: 3,100 feet
Mean annual precipitation: 8 to 20 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 230 to 340 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Chino

Setting

Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 14 inches: silt loam
H2 - 14 to 27 inches: silty clay loam
H3 - 27 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Strongly saline (16.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups
Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C/D
Ecological site: R019XD068CA - SILTY BASIN
Hydric soil rating: No

Minor Components

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

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

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

GtA—Grangeville fine sandy loam, drained, 0 to 2 percent sl opes

Map Unit Setting
National map unit symbol: hcvn
Elevation: 10 to 1,800 feet
Mean annual precipitation: 12 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 200 to 270 days
Farmland classification: Prime farmland if irrigated and drained

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

Description of Grangeville

Setting
Landform: 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 36 inches: fine sandy loam
H2 - 36 to 64 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: A/D
Ecological site: R019XD070CA - SANDY BASIN
Hydric soil rating: No

Minor Components

Dello

Percent of map unit: 10 percent
Hydric soil rating: No

Traver

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

Unnamed

Percent of map unit: 1 percent
Hydric soil rating: No

GtD—Grangeville fine sandy loam, drained, 5 to 15 percent s lopes

Map Unit Setting

National map unit symbol: hcvp
Elevation: 600 to 1,800 feet
Mean annual precipitation: 12 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 200 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Grangeville

Setting

Landform: 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 36 inches: fine sandy loam
H2 - 36 to 64 inches: sandy loam

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A/D
Ecological site: R019XD070CA - SANDY BASIN
Hydric soil rating: No

Minor Components

Dello

Percent of map unit: 10 percent
Hydric soil rating: No

Traver

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

Unnamed

Percent of map unit: 1 percent
Hydric soil rating: No

HcD2—Hanford coarse sandy loam, 8 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2y8tm
Elevation: 790 to 3,440 feet
Mean annual precipitation: 9 to 18 inches
Mean annual air temperature: 62 to 65 degrees F
Frost-free period: 250 to 365 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Hanford

Setting

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

Typical profile

A - 0 to 8 inches: coarse sandy loam
C1 - 8 to 40 inches: fine sandy loam
C2 - 40 to 60 inches: stratified loamy sand to coarse sandy loam

Properties and qualities

Slope: 8 to 15 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): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: R019XD012CA - SANDY
Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ramona

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Greenfield

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

MfA—Metz loamy fine sand, 0 to 2 percent slopes, shorter FFS, MLRA 19

Map Unit Setting

National map unit symbol: 2tz05
Elevation: 440 to 2,360 feet
Mean annual precipitation: 11 to 15 inches
Mean annual air temperature: 64 to 65 degrees F
Frost-free period: 181 to 300 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Metz

Setting

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

Typical profile

C1 - 0 to 28 inches: loamy fine sand
C2 - 28 to 48 inches: loamy coarse sand
C3 - 48 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: R019XD035CA - SANDY
Hydric soil rating: No

Minor Components

Metz, sandy loam substratum

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

San emigidio

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Metz, gravelly fine sandy loam

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

SeC2—San Emigdio fine sandy loam, 2 to 8 percent slopes, eroded

Map Unit Setting

National map unit symbol: hcys
Elevation: 600 to 1,800 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 220 to 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of San Emigdio

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from sedimentary rock

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 40 inches: fine sandy loam
H3 - 40 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 2 to 8 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): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

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

Minor Components

Metz

Percent of map unit: 10 percent
Hydric soil rating: No

San timoteo

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

SgA—San Emigdio loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2y8t4
Elevation: 430 to 2,340 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 64 to 65 degrees F
Frost-free period: 305 to 345 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of San Emigdio

Setting

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

Typical profile

A - 0 to 8 inches: loam
C1 - 8 to 40 inches: fine sandy loam
C2 - 40 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: A
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Minor Components

Metz

Percent of map unit: 10 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

San timoteo

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

SgC—San Emigdio loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: hcyx
Elevation: 600 to 1,800 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 220 to 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of San Emigdio

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Residuum weathered from sedimentary rock

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 40 inches: fine sandy loam
H3 - 40 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 2 to 8 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): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

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

Minor Components

Metz

Percent of map unit: 10 percent
Hydric soil rating: No

San timoteo

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

SmE2—San Timoteo loam, 8 to 25 percent slopes, eroded

Map Unit Setting

National map unit symbol: hcyz
Elevation: 300 to 3,500 feet
Mean annual precipitation: 10 to 20 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 260 to 310 days
Farmland classification: Not prime farmland

Map Unit Composition

San timoteo and similar soils: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Timoteo

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Marine deposits derived from mixed and/or residuum weathered from sandstone

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 22 inches: loam
H3 - 22 to 28 inches: weathered bedrock

Properties and qualities

Slope: 8 to 25 percent
Depth to restrictive feature: 22 to 28 inches to paralithic bedrock
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: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Minor Components

Rough broken land

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

San emigdio

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

Metz

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

SmF2—San Timoteo loam, 25 to 50 percent slopes, eroded

Map Unit Setting

National map unit symbol: hcz0
Elevation: 300 to 3,500 feet
Mean annual precipitation: 10 to 20 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 260 to 310 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of San Timoteo

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Marine deposits derived from mixed sources and/or residuum weathered from sandstone

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 22 inches: loam
H3 - 22 to 28 inches: weathered bedrock

Properties and qualities

Slope: 25 to 50 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
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: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R019XD029CA - LOAMY

Hydric soil rating: No

Minor Components

Metz

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

San emigdio

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

Rough broken land

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

TeG—Terrace escarpments

Map Unit Composition

Terrace escarpments: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Terrace Escarpments

Setting

Landform: Terraces
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Alluvium derived from mixed sources

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Ecological site: R019XD060CA - SHALLOW LOAMY
Hydric soil rating: No

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Appendix 4: Historical Site Conditions

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

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

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: Kimley-Horn and Associates — Date: 8/26/2024

Designed by: BY — Case No:

Company Project Number/Name: Fairway MC Phase 4C

BMP Identification

BMP NAME / ID: Basin 2 - Bioretention

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}= 0.75 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 Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA A	*1218068*	*Concrete or Asphalt*	*1*	*0.89*	*1086516.9*			
DMA A	*655883*	*Ornamental Landscaping*	*0.1*	*0.11*	*72447.5*			
DMA A	*277477.2*	*Natural (B Soil)*	*0.15*	*0.14*	*39248*			
	2151428.4	*Total*			1198212.4	0.75	*74888.3*	*890918*

Notes:

DMA C, DMA D, AND DMA E NOT TO BE TREATED IN THIS WQMP REPORT. REFER TO NARRATIVE FOR MORE INFORMATION.

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: Kimley-Horn and Associates — Date: 8/26/2024

Designed by: BY — Case No:

Company Project Number/Name: Fairway MC Phase 4C

BMP Identification

BMP NAME / ID: Basin 1 - Bioretention

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}= 0.75 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)*
DMA B	*1338050*	*Concrete or Asphalt*	*1*	*0.89*	*1193540.6*			
DMA B	*470126*	*Ornamental Landscaping*	*0.1*	*0.11*	*51929.1*			
	1808175.6	*Total*			1245469.7	0.75	*77841.9*	*495927*

Notes:

DMA C, DMA D, AND DMA E NOT TO BE TREATED IN THIS WQMP REPORT. REFER TO NARRATIVE FOR MORE INFORMATION.

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

Company Name:	Kimley-Horn	Date:	7/15/2024
Designed by:	BY	County/City Case No.:	

Design Volume

Enter the area tributary to this feature	A_T=	41.51	acres
Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	77,842	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 =	2.0	ft
Top Width of Bioretention Facility, excluding curb	w_T =	100.0	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 =	1.49	ft
Minimum Surface Area, A_m $A_M (ft^2) = \dfrac{V_{BMP} (ft^3)}{d_E (ft)}$	A_M =	52,138	ft^2
Proposed Surface Area	A=	52,522	ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility	z =	4	:1
Diameter of Underdrain		6	inches
Longitudinal Slope of Site (3% maximum)		1	%
6" Check Dam Spacing		25	feet

Describe Vegetation: Shrubs

Notes: 26,813

Bioretention Facility - Design Procedure	BMP ID	Legend:	Required Entries
	Basin 2		Calculated Cells

Company Name: Kimley-Horn — Date: 5/30/2024

Designed by: BY — County/City Case No.:

Design Volume

Enter the area tributary to this feature — A_T= 41.51 acres

Enter V_{BMP} determined from Section 2.1 of this Handbook — V_{BMP}= 74,888 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 = 2.0 ft

Top Width of Bioretention Facility, excluding curb — w_T = 100.0 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 = 1.49 ft

Minimum Surface Area, A_m

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

A_M = 50,160 ft^2

Proposed Surface Area — A= 134,383 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility — z = 1 :1

ERROR, side slopes too steep for Bioretention Facility design

Diameter of Underdrain — 6 inches

Longitudinal Slope of Site (3% maximum) — 1 %

6" Check Dam Spacing — 25 feet

Describe Vegetation: Shrubs

Notes: 27,749

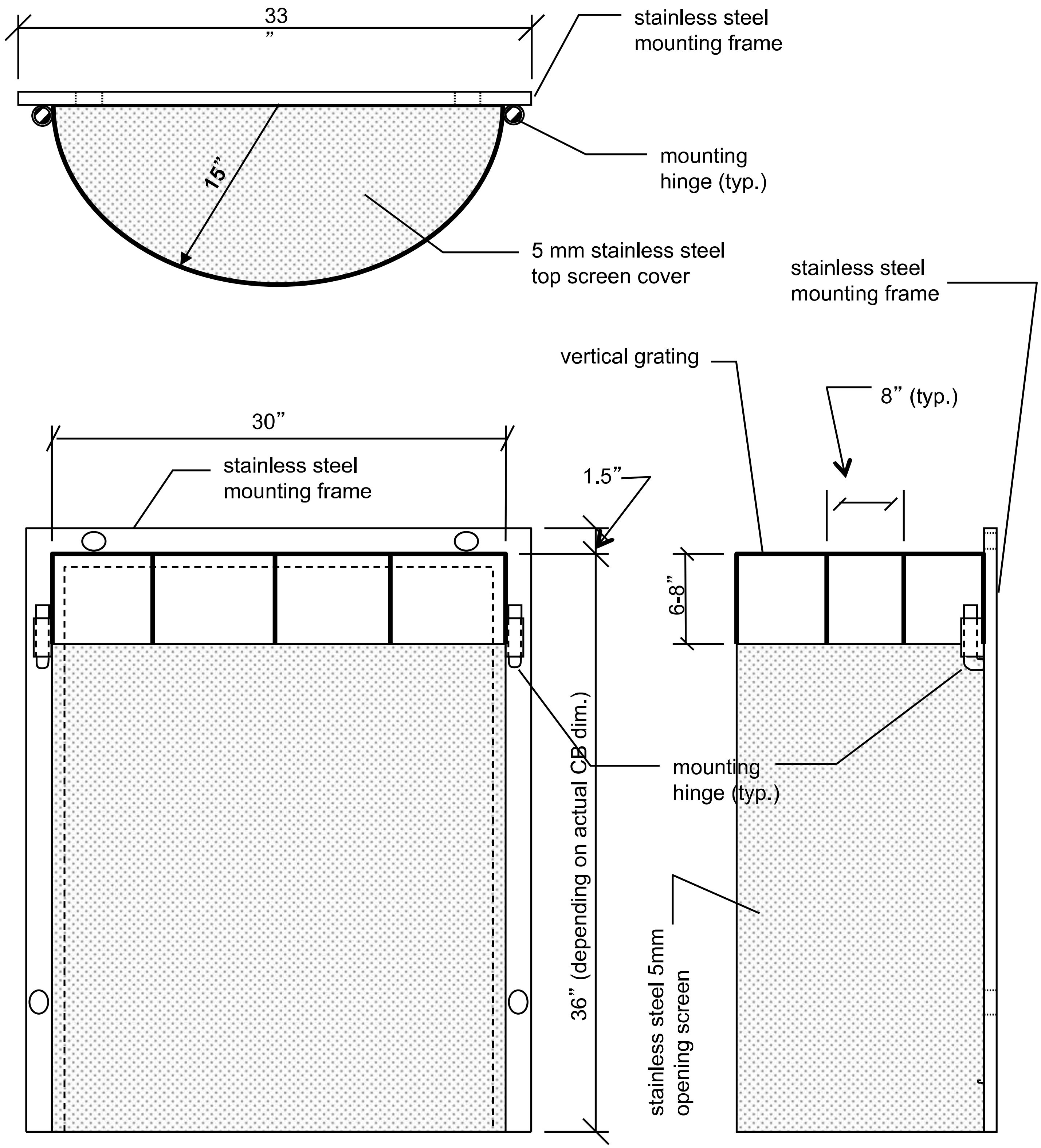
Basin 1 Stage Storage Table
Project: Fairway Canyon
Basin Description: Bioretention Basin 1

Contour Elevation	Contour Area (sq. ft)	Depth (ft)	Incremental Volume Avg. End (cu. ft)	Cumulative Volume Avg. End (cu. ft)
2,214.000	22,999.65	N/A	N/A	0.00
2,215.000	39,851.21	1.000	31425.43	31425.43
2,216.000	44,644.07	1.000	42247.64	73673.07
2,217.000	49,571.45	1.000	47107.76	120780.82
2,218.000	54,646.78	1.000	52109.11	172889.94
2,219.000	59,883.44	1.000	57265.11	230155.04
2,220.000	65,254.71	1.000	62569.08	292724.12
2,221.000	70,771.26	1.000	68012.99	360737.11
2,222.000	76,419.83	1.000	73595.55	434332.66
2,223.000	82,183.28	1.000	79301.56	513634.21
2,224.000	88,061.63	1.000	85122.46	598756.67
2,225.000	94,054.88	1.000	91058.26	689814.93
2,226.000	100,163.65	1.000	97109.27	786924.20
2,227.000	107,824.92	1.000	103994.29	890918.49

Basin 2 Stage Storage Table
Project: Fairway Canyon
Basin Description: Bioretention Basin 2

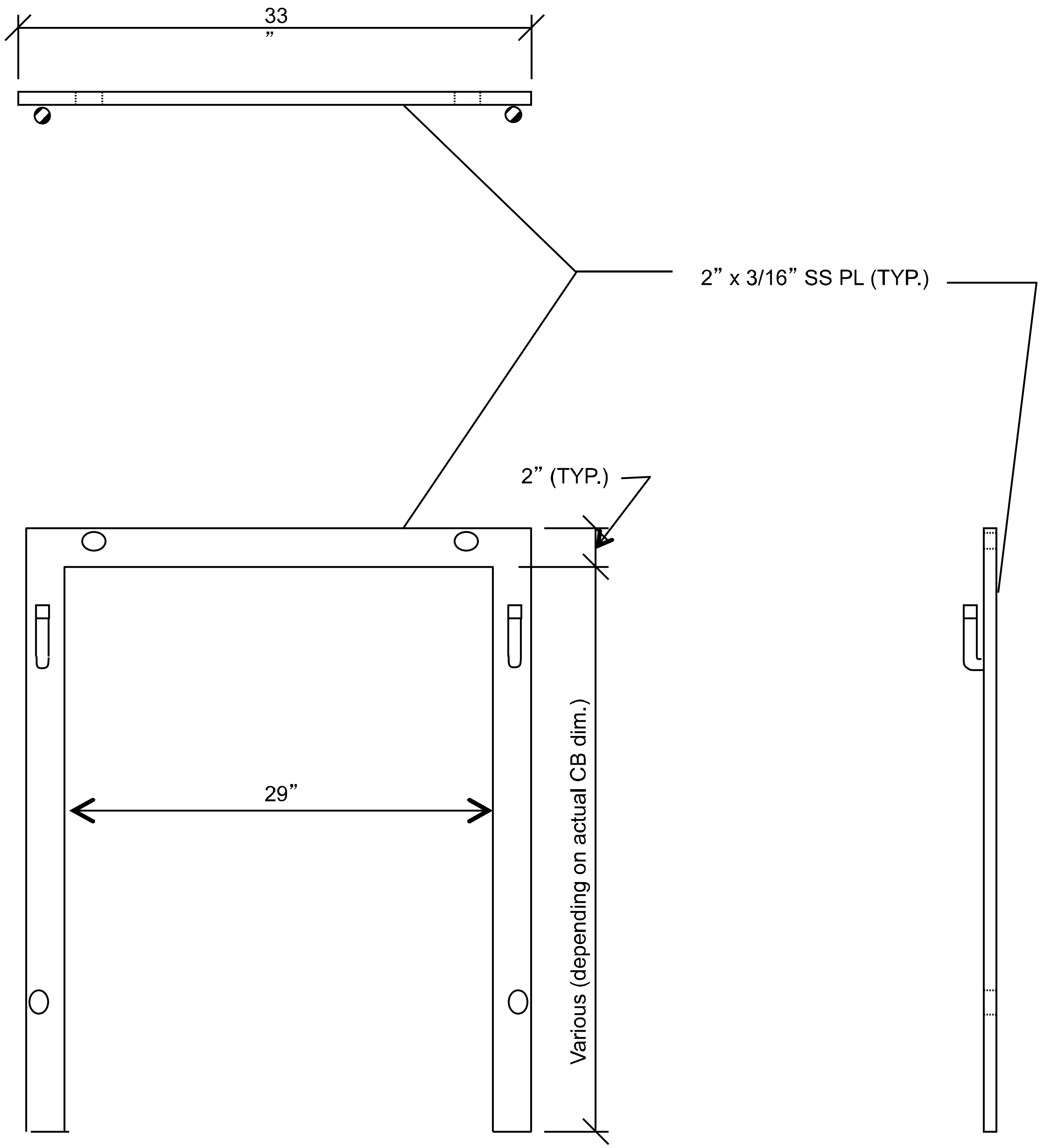
Contour Elevation	Contour Area (sq. ft)	Depth (ft)	Incremental Volume Avg. End (cu. ft)	Cumulative Volume Avg. End (cu. ft)
2,284.000	27,429.00	N/A	N/A	0.00
2,285.000	54,559.00	1.000	40244.20	40244.20
2,286.000	57,584.00	1.000	57584.00	97808.20
2,287.000	60,114.00	1.000	60114.00	157922.20
2,288.000	62,627.00	1.000	62627.00	220549.20
2,289.000	65,125.00	1.000	65125.00	285674.20
2,290.000	67,606.00	1.000	67606.00	353280.20
2,291.000	70,070.00	1.000	70070.00	423350.20
2,292.000	72,577.00	1.000	72577.00	495927.20

MODEL ST3G: REMOVABLE INSTALLATION WITH VERTICAL GRATING



STORMTEK

MOUNTING FRAME



STORMTEK

DESCRIPTION OF DESIGN ELEMENTS

•The mounting frame can be made of coated or stainless steel. Frame members are made from 2" flat bars with a minimum thickness of 3/16 inch.

•The insert screen is made of heavy-gage sheet metal with 5 millimeter (mm) openings. Total openings constitute 50% of the screen surface. Top 4 inches of the screen is grated with bars spaced at 2 inches on center.

•Insert top cover is made of heavy-gage sheet metal screen with 5 mm openings and 1" support frames.

•Structural support members for the screen and top cover are made of coated or stainless steel. Members are made from 1" flat bars with a minimum thickness of 1/8 inch.

•Mounting frame members are welded

•Structural support frame members are welded

•Insert screens are welded onto structural support frames.

•Mounting frames are bolted onto the catch basin wall at the outlet opening. Mounting frames are to be anchored at all four corners with HILTI expansion anchors or equal.

•Inserts are installed vertically onto the mounting frame directly in front of the outlet opening.

•The insert is completely removable by lifting it off the mounting frame

PREVIOUSLY APPROVED WQMP REPORT (TRACT 31462-8)

Design Procedure Form for Design Flow

Uniform Intensity Design Flow

Designer: PRESTON AYER
Company: PROACTIVE
Date: 2/8/16
Project: FAIRWAY/ PH 2
Location: -8 SWALE

1. Determine Impervious Percentage			
a. Determine total tributary area	A_{total} = 39	acres	*(1)*
b. Determine Impervious %	i = 57%	%	*(2)*
2. Determine Runoff Coefficient Values Use **Table 4** and impervious % found in step 1			
a. A Soil Runoff Coefficient	C_a = 0		*(3)*
b. B Soil Runoff Coefficient	C_b = 0.58		*(4)*
c. C Soil Runoff Coefficient	C_c = 0		*(5)*
d. D Soil Runoff Coefficient	C_d = 0.63		*(6)*
3. Determine the Area decimal fraction of each soil type in tributary area			
a. Area of A Soil / *(1)* =	A_a = 0%		*(7)*
b. Area of B Soil / *(1)* =	A_b = 50%		*(8)*
c. Area of C Soil / *(1)* =	A_c = 0%		*(9)*
d. Area of D Soil / *(1)* =	A_d = 50%		*(10)*
4. Determine Runoff Coefficient			
a. C = ***(3)***x***(7)*** + ***(4)***x***(8)*** + ***(5)***x***(9)*** + ***(6)***x***(10)*** =	C = 0+.29+0+.315 = 0.61		*(11)*
5. Determine BMP Design flow			
a. Q_{BMP} = C x I x A = ***(11)*** x 0.2 x ***(1)***	Q_{BMP} = 4.8	$\frac{ft^3}{s}$	*(12)*

PREVIOUSLY APPROVED WQMP REPORT (TRACT 31462-8)

heet 9

Design

Designer: PRESTON AYER
Company: PROACTIVE
Date: 2/8/16
Project: FAIRWAY PH2
Location: -8 SWALE

1. Determine Design Flow (Use Worksheet 2)	Q_{BMP} = 4.8 cfs
2. Swale Geometry a. Swale bottom width (b) b. Side slope (z) c. Flow direction slope (s)	 b = 32 ft z = 2 s = 0.5 %
3. Design flow velocity (Manning n = 0.2)	v = 0.31 ft/s
4. Depth of flow (D)	D = 0.47 ft
5. Design Length (L) L = (7 min) x (flow velocity, ft/sec) x 60	L = 130' ft
6. Vegetation (describe)	NATURAL GRASSES
8. Outflow Collection (check type used or describe "other")	X Grated Inlet' ___ Infiltration Trench ___ Underdrain ___ Other________

Notes:
-8 SWALE PROVIDES 130'

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

Hydromodification Summary Table

	2 year – 24 hour					
	Pre-condition	Post-condition (Unmitigated)	Post-condition (Mitigated)	% Difference	Increased by 5% or Less?	HCOC Compliant?
Time of Concentration (min)	17.01	16.62	16.62	-0.39 min	-2.3%	YES
Flow (CFS)	17.24	35.41	14.68	-2.56 CFS (mitigated)	-2.56 CFS (decreased)	YES
Volume (Cubic Feet)	469,368	992,565	461683*	-7685 CF (mitigated)	-7685 CF (decreased)	YES

*Calculated from maximum pond storage for basins subtracted from hydrograph volumes. See Pondpack results for more.

```
****************************************************************************
             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 1499

                          Analysis prepared by:





 ************************** DESCRIPTION OF STUDY **************************
* MLC Fairway Canyon Phase 4C                                              *
* 2 yr existing                                                            *
* Kimley-Horn                                                              *
 **************************************************************************

  FILE NAME: FC2E.DAT
  TIME/DATE OF STUDY: 16:19 08/23/2024
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   8.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.030
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.890
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.530
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.550
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4602009
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4593489
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =    2.00   1-HOUR INTENSITY(INCH/HOUR) =   0.429
  SLOPE OF INTENSITY DURATION CURVE = 0.4602
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR 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 0.0313 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    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
```

```
        DEVELOPMENT IS: UNDEVELOPED WITH FAIR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =   2397.00
  DOWNSTREAM ELEVATION(FEET) =   2333.20
  ELEVATION DIFFERENCE(FEET) =     63.80
  TC = 0.709*[(  300.00**3)/(    63.80)]**.2 =    9.467
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.003
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .4402
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      0.25
  TOTAL AREA(ACRES) =      0.56   TOTAL RUNOFF(CFS) =      0.25

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2333.20  DOWNSTREAM(FEET) =   2217.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1895.00   CHANNEL SLOPE =  0.0613
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   8.00
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.766
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .3801
  SOIL CLASSIFICATION IS "B"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.19
  AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   7.54
  Tc(MIN.) =   17.01
  SUBAREA AREA(ACRES) =    48.74       SUBAREA RUNOFF(CFS) =   14.18
  TOTAL AREA(ACRES) =       49.3         PEAK FLOW RATE(CFS) =      14.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.17   FLOW VELOCITY(FEET/SEC.) =   4.89
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =    2195.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.766
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .3801
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =   48.73   SUBAREA RUNOFF(CFS) =   14.18
  TOTAL AREA(ACRES) =       98.0   TOTAL RUNOFF(CFS) =      28.61
  TC(MIN.) =   17.01

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH FAIR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =   2366.00
  DOWNSTREAM ELEVATION(FEET) =   2331.50
  ELEVATION DIFFERENCE(FEET) =     34.50
  TC = 0.709*[(  300.00**3)/(    34.50)]**.2 =   10.705
```

```
    2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.948
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .4274
 SOIL CLASSIFICATION IS "B"
 SUBAREA RUNOFF(CFS) =      0.21
 TOTAL AREA(ACRES) =      0.51   TOTAL RUNOFF(CFS) =      0.21

****************************************************************************
 FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2331.50  DOWNSTREAM(FEET) =   2325.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   466.33   CHANNEL SLOPE =  0.0139
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  99.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
    2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.779
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .3838
 SOIL CLASSIFICATION IS "B"
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.89
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.37
 AVERAGE FLOW DEPTH(FEET) =   0.08   TRAVEL TIME(MIN.) =   5.69
 Tc(MIN.) =   16.39
 SUBAREA AREA(ACRES) =     4.51       SUBAREA RUNOFF(CFS) =    1.35
 TOTAL AREA(ACRES) =        5.0         PEAK FLOW RATE(CFS) =      1.55

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   1.51
 LONGEST FLOWPATH FROM NODE    103.00 TO NODE    105.00 =     766.33 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.779
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .3838
 SOIL CLASSIFICATION IS "B"
 SUBAREA AREA(ACRES) =    4.50   SUBAREA RUNOFF(CFS) =    1.35
 TOTAL AREA(ACRES) =        9.5   TOTAL RUNOFF(CFS) =       2.90
 TC(MIN.) =   16.39

****************************************************************************
 FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS CONDOMINIUM
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
 UPSTREAM ELEVATION(FEET) =   2320.80
 DOWNSTREAM ELEVATION(FEET) =   2309.70
 ELEVATION DIFFERENCE(FEET) =     11.10
 TC = 0.359*[(  300.00**3)/(    11.10)]**.2 =    6.801
    2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.168
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7510
 SOIL CLASSIFICATION IS "B"
 SUBAREA RUNOFF(CFS) =      0.38
 TOTAL AREA(ACRES) =      0.43   TOTAL RUNOFF(CFS) =      0.38

****************************************************************************
```

```
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2309.70  DOWNSTREAM(FEET) =   2289.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1055.00   CHANNEL SLOPE =  0.0193
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   4.00
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.868
  CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7277
  SOIL CLASSIFICATION IS "B"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.86
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   6.16
  Tc(MIN.) =   12.96
  SUBAREA AREA(ACRES) =    29.28       SUBAREA RUNOFF(CFS) =   18.49
  TOTAL AREA(ACRES) =       29.7         PEAK FLOW RATE(CFS) =     18.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.24   FLOW VELOCITY(FEET/SEC.) =   3.33
  LONGEST FLOWPATH FROM NODE    106.00 TO NODE    108.00 =    1355.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.868
  CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7277
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =   29.28   SUBAREA RUNOFF(CFS) =   18.49
  TOTAL AREA(ACRES) =       59.0   TOTAL RUNOFF(CFS) =      37.36
  TC(MIN.) =   12.96
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       59.0  TC(MIN.) =     12.96
  PEAK FLOW RATE(CFS)   =      37.36
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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

Study date 08/26/24 File: da5fex242.out

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

Program License Serial Number 6443

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

English Units used in output format

Fairway Canyon Exiting Conditions
DA-5 2 yr
Kimley-Horn

Drainage Area = 58.99(Ac.) = 0.092 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 58.99(Ac.) = 0.092 Sq. Mi.
USER Entry of lag time in hours
Lag time = 0.148 Hr.
Lag time = 8.88 Min.
25% of lag time = 2.22 Min.
40% of lag time = 3.55 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]
58.99	2.56	151.01

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
58.99	6.25	368.69

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.560(In)
Area Averaged 100-Year Rainfall = 6.250(In)

Point rain (area averaged) = 2.560(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 2.560(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
58.990	56.00	0.700

Total Area Entered = 58.99(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	36.0	0.706	0.700	0.261	1.000	0.261
					Sum (F) =	0.261

Area averaged mean soil loss (F) (In/Hr) = 0.261
Minimum soil loss rate ((In/Hr)) = 0.131
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.340

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

Combination of 'S' Curves:
VALLEY 'S' Curve Percentage = 0.00
FOOTHILL 'S' Curve Percentage = 50.00
MOUNTAIN 'S' Curve Percentage = 50.00
DESERT 'S' Curve Percentage = 0.00

Unit Hydrograph Data

Unit time period	(hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	56.306	7.352	4.371
2	0.167	112.613	30.253	17.985
3	0.250	168.919	26.515	15.764
4	0.333	225.225	11.041	6.564
5	0.417	281.532	6.936	4.124
6	0.500	337.838	4.682	2.783
7	0.583	394.144	3.126	1.859
8	0.667	450.450	2.043	1.214
9	0.750	506.757	1.465	0.871
10	0.833	563.063	1.201	0.714
11	0.917	619.369	1.056	0.628
12	1.000	675.676	0.881	0.524
13	1.083	731.982	0.727	0.432
14	1.167	788.288	0.561	0.333
15	1.250	844.595	0.510	0.303
16	1.333	900.901	0.507	0.301
17	1.417	957.207	0.507	0.301
18	1.500	1013.514	0.639	0.380
			Sum = 100.000	Sum= 59.451

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(0.463)	0.007	0.014
2	0.17	0.07	0.020	(0.461)	0.007	0.014
3	0.25	0.07	0.020	(0.459)	0.007	0.014
4	0.33	0.10	0.031	(0.458)	0.010	0.020
5	0.42	0.10	0.031	(0.456)	0.010	0.020
6	0.50	0.10	0.031	(0.454)	0.010	0.020
7	0.58	0.10	0.031	(0.452)	0.010	0.020
8	0.67	0.10	0.031	(0.451)	0.010	0.020

9	0.75	0.10	0.031	(0.449)	0.010	0.020
10	0.83	0.13	0.041	(0.447)	0.014	0.027
11	0.92	0.13	0.041	(0.445)	0.014	0.027
12	1.00	0.13	0.041	(0.444)	0.014	0.027
13	1.08	0.10	0.031	(0.442)	0.010	0.020
14	1.17	0.10	0.031	(0.440)	0.010	0.020
15	1.25	0.10	0.031	(0.438)	0.010	0.020
16	1.33	0.10	0.031	(0.437)	0.010	0.020
17	1.42	0.10	0.031	(0.435)	0.010	0.020
18	1.50	0.10	0.031	(0.433)	0.010	0.020
19	1.58	0.10	0.031	(0.431)	0.010	0.020
20	1.67	0.10	0.031	(0.430)	0.010	0.020
21	1.75	0.10	0.031	(0.428)	0.010	0.020
22	1.83	0.13	0.041	(0.426)	0.014	0.027
23	1.92	0.13	0.041	(0.424)	0.014	0.027
24	2.00	0.13	0.041	(0.423)	0.014	0.027
25	2.08	0.13	0.041	(0.421)	0.014	0.027
26	2.17	0.13	0.041	(0.419)	0.014	0.027
27	2.25	0.13	0.041	(0.418)	0.014	0.027
28	2.33	0.13	0.041	(0.416)	0.014	0.027
29	2.42	0.13	0.041	(0.414)	0.014	0.027
30	2.50	0.13	0.041	(0.413)	0.014	0.027
31	2.58	0.17	0.051	(0.411)	0.017	0.034
32	2.67	0.17	0.051	(0.409)	0.017	0.034
33	2.75	0.17	0.051	(0.408)	0.017	0.034
34	2.83	0.17	0.051	(0.406)	0.017	0.034
35	2.92	0.17	0.051	(0.404)	0.017	0.034
36	3.00	0.17	0.051	(0.402)	0.017	0.034
37	3.08	0.17	0.051	(0.401)	0.017	0.034
38	3.17	0.17	0.051	(0.399)	0.017	0.034
39	3.25	0.17	0.051	(0.397)	0.017	0.034
40	3.33	0.17	0.051	(0.396)	0.017	0.034
41	3.42	0.17	0.051	(0.394)	0.017	0.034
42	3.50	0.17	0.051	(0.393)	0.017	0.034
43	3.58	0.17	0.051	(0.391)	0.017	0.034
44	3.67	0.17	0.051	(0.389)	0.017	0.034
45	3.75	0.17	0.051	(0.388)	0.017	0.034
46	3.83	0.20	0.061	(0.386)	0.021	0.041
47	3.92	0.20	0.061	(0.384)	0.021	0.041
48	4.00	0.20	0.061	(0.383)	0.021	0.041
49	4.08	0.20	0.061	(0.381)	0.021	0.041
50	4.17	0.20	0.061	(0.379)	0.021	0.041
51	4.25	0.20	0.061	(0.378)	0.021	0.041
52	4.33	0.23	0.072	(0.376)	0.024	0.047
53	4.42	0.23	0.072	(0.375)	0.024	0.047
54	4.50	0.23	0.072	(0.373)	0.024	0.047
55	4.58	0.23	0.072	(0.371)	0.024	0.047
56	4.67	0.23	0.072	(0.370)	0.024	0.047
57	4.75	0.23	0.072	(0.368)	0.024	0.047
58	4.83	0.27	0.082	(0.367)	0.028	0.054
59	4.92	0.27	0.082	(0.365)	0.028	0.054
60	5.00	0.27	0.082	(0.363)	0.028	0.054
61	5.08	0.20	0.061	(0.362)	0.021	0.041
62	5.17	0.20	0.061	(0.360)	0.021	0.041
63	5.25	0.20	0.061	(0.359)	0.021	0.041
64	5.33	0.23	0.072	(0.357)	0.024	0.047
65	5.42	0.23	0.072	(0.356)	0.024	0.047
66	5.50	0.23	0.072	(0.354)	0.024	0.047
67	5.58	0.27	0.082	(0.353)	0.028	0.054
68	5.67	0.27	0.082	(0.351)	0.028	0.054
69	5.75	0.27	0.082	(0.349)	0.028	0.054
70	5.83	0.27	0.082	(0.348)	0.028	0.054

71	5.92	0.27	0.082	(0.346)	0.028	0.054
72	6.00	0.27	0.082	(0.345)	0.028	0.054
73	6.08	0.30	0.092	(0.343)	0.031	0.061
74	6.17	0.30	0.092	(0.342)	0.031	0.061
75	6.25	0.30	0.092	(0.340)	0.031	0.061
76	6.33	0.30	0.092	(0.339)	0.031	0.061
77	6.42	0.30	0.092	(0.337)	0.031	0.061
78	6.50	0.30	0.092	(0.336)	0.031	0.061
79	6.58	0.33	0.102	(0.334)	0.035	0.068
80	6.67	0.33	0.102	(0.333)	0.035	0.068
81	6.75	0.33	0.102	(0.331)	0.035	0.068
82	6.83	0.33	0.102	(0.330)	0.035	0.068
83	6.92	0.33	0.102	(0.328)	0.035	0.068
84	7.00	0.33	0.102	(0.327)	0.035	0.068
85	7.08	0.33	0.102	(0.325)	0.035	0.068
86	7.17	0.33	0.102	(0.324)	0.035	0.068
87	7.25	0.33	0.102	(0.322)	0.035	0.068
88	7.33	0.37	0.113	(0.321)	0.038	0.074
89	7.42	0.37	0.113	(0.319)	0.038	0.074
90	7.50	0.37	0.113	(0.318)	0.038	0.074
91	7.58	0.40	0.123	(0.316)	0.042	0.081
92	7.67	0.40	0.123	(0.315)	0.042	0.081
93	7.75	0.40	0.123	(0.313)	0.042	0.081
94	7.83	0.43	0.133	(0.312)	0.045	0.088
95	7.92	0.43	0.133	(0.311)	0.045	0.088
96	8.00	0.43	0.133	(0.309)	0.045	0.088
97	8.08	0.50	0.154	(0.308)	0.052	0.101
98	8.17	0.50	0.154	(0.306)	0.052	0.101
99	8.25	0.50	0.154	(0.305)	0.052	0.101
100	8.33	0.50	0.154	(0.303)	0.052	0.101
101	8.42	0.50	0.154	(0.302)	0.052	0.101
102	8.50	0.50	0.154	(0.301)	0.052	0.101
103	8.58	0.53	0.164	(0.299)	0.056	0.108
104	8.67	0.53	0.164	(0.298)	0.056	0.108
105	8.75	0.53	0.164	(0.296)	0.056	0.108
106	8.83	0.57	0.174	(0.295)	0.059	0.115
107	8.92	0.57	0.174	(0.294)	0.059	0.115
108	9.00	0.57	0.174	(0.292)	0.059	0.115
109	9.08	0.63	0.195	(0.291)	0.066	0.128
110	9.17	0.63	0.195	(0.289)	0.066	0.128
111	9.25	0.63	0.195	(0.288)	0.066	0.128
112	9.33	0.67	0.205	(0.287)	0.070	0.135
113	9.42	0.67	0.205	(0.285)	0.070	0.135
114	9.50	0.67	0.205	(0.284)	0.070	0.135
115	9.58	0.70	0.215	(0.283)	0.073	0.142
116	9.67	0.70	0.215	(0.281)	0.073	0.142
117	9.75	0.70	0.215	(0.280)	0.073	0.142
118	9.83	0.73	0.225	(0.279)	0.077	0.149
119	9.92	0.73	0.225	(0.277)	0.077	0.149
120	10.00	0.73	0.225	(0.276)	0.077	0.149
121	10.08	0.50	0.154	(0.275)	0.052	0.101
122	10.17	0.50	0.154	(0.273)	0.052	0.101
123	10.25	0.50	0.154	(0.272)	0.052	0.101
124	10.33	0.50	0.154	(0.271)	0.052	0.101
125	10.42	0.50	0.154	(0.269)	0.052	0.101
126	10.50	0.50	0.154	(0.268)	0.052	0.101
127	10.58	0.67	0.205	(0.267)	0.070	0.135
128	10.67	0.67	0.205	(0.265)	0.070	0.135
129	10.75	0.67	0.205	(0.264)	0.070	0.135
130	10.83	0.67	0.205	(0.263)	0.070	0.135
131	10.92	0.67	0.205	(0.261)	0.070	0.135
132	11.00	0.67	0.205	(0.260)	0.070	0.135

133	11.08	0.63	0.195	(0.259)	0.066	0.128
134	11.17	0.63	0.195	(0.258)	0.066	0.128
135	11.25	0.63	0.195	(0.256)	0.066	0.128
136	11.33	0.63	0.195	(0.255)	0.066	0.128
137	11.42	0.63	0.195	(0.254)	0.066	0.128
138	11.50	0.63	0.195	(0.253)	0.066	0.128
139	11.58	0.57	0.174	(0.251)	0.059	0.115
140	11.67	0.57	0.174	(0.250)	0.059	0.115
141	11.75	0.57	0.174	(0.249)	0.059	0.115
142	11.83	0.60	0.184	(0.248)	0.063	0.122
143	11.92	0.60	0.184	(0.246)	0.063	0.122
144	12.00	0.60	0.184	(0.245)	0.063	0.122
145	12.08	0.83	0.256	(0.244)	0.087	0.169
146	12.17	0.83	0.256	(0.243)	0.087	0.169
147	12.25	0.83	0.256	(0.241)	0.087	0.169
148	12.33	0.87	0.266	(0.240)	0.091	0.176
149	12.42	0.87	0.266	(0.239)	0.091	0.176
150	12.50	0.87	0.266	(0.238)	0.091	0.176
151	12.58	0.93	0.287	(0.237)	0.097	0.189
152	12.67	0.93	0.287	(0.235)	0.097	0.189
153	12.75	0.93	0.287	(0.234)	0.097	0.189
154	12.83	0.97	0.297	(0.233)	0.101	0.196
155	12.92	0.97	0.297	(0.232)	0.101	0.196
156	13.00	0.97	0.297	(0.231)	0.101	0.196
157	13.08	1.13	0.348	(0.230)	0.118	0.230
158	13.17	1.13	0.348	(0.228)	0.118	0.230
159	13.25	1.13	0.348	(0.227)	0.118	0.230
160	13.33	1.13	0.348	(0.226)	0.118	0.230
161	13.42	1.13	0.348	(0.225)	0.118	0.230
162	13.50	1.13	0.348	(0.224)	0.118	0.230
163	13.58	0.77	0.235	(0.223)	0.080	0.155
164	13.67	0.77	0.235	(0.221)	0.080	0.155
165	13.75	0.77	0.235	(0.220)	0.080	0.155
166	13.83	0.77	0.235	(0.219)	0.080	0.155
167	13.92	0.77	0.235	(0.218)	0.080	0.155
168	14.00	0.77	0.235	(0.217)	0.080	0.155
169	14.08	0.90	0.276	(0.216)	0.094	0.182
170	14.17	0.90	0.276	(0.215)	0.094	0.182
171	14.25	0.90	0.276	(0.214)	0.094	0.182
172	14.33	0.87	0.266	(0.213)	0.091	0.176
173	14.42	0.87	0.266	(0.211)	0.091	0.176
174	14.50	0.87	0.266	(0.210)	0.091	0.176
175	14.58	0.87	0.266	(0.209)	0.091	0.176
176	14.67	0.87	0.266	(0.208)	0.091	0.176
177	14.75	0.87	0.266	(0.207)	0.091	0.176
178	14.83	0.83	0.256	(0.206)	0.087	0.169
179	14.92	0.83	0.256	(0.205)	0.087	0.169
180	15.00	0.83	0.256	(0.204)	0.087	0.169
181	15.08	0.80	0.246	(0.203)	0.084	0.162
182	15.17	0.80	0.246	(0.202)	0.084	0.162
183	15.25	0.80	0.246	(0.201)	0.084	0.162
184	15.33	0.77	0.235	(0.200)	0.080	0.155
185	15.42	0.77	0.235	(0.199)	0.080	0.155
186	15.50	0.77	0.235	(0.198)	0.080	0.155
187	15.58	0.63	0.195	(0.197)	0.066	0.128
188	15.67	0.63	0.195	(0.196)	0.066	0.128
189	15.75	0.63	0.195	(0.195)	0.066	0.128
190	15.83	0.63	0.195	(0.194)	0.066	0.128
191	15.92	0.63	0.195	(0.193)	0.066	0.128
192	16.00	0.63	0.195	(0.192)	0.066	0.128
193	16.08	0.13	0.041	(0.191)	0.014	0.027
194	16.17	0.13	0.041	(0.190)	0.014	0.027

195	16.25	0.13	0.041	(0.189)	0.014	0.027
196	16.33	0.13	0.041	(0.188)	0.014	0.027
197	16.42	0.13	0.041	(0.187)	0.014	0.027
198	16.50	0.13	0.041	(0.186)	0.014	0.027
199	16.58	0.10	0.031	(0.185)	0.010	0.020
200	16.67	0.10	0.031	(0.184)	0.010	0.020
201	16.75	0.10	0.031	(0.183)	0.010	0.020
202	16.83	0.10	0.031	(0.182)	0.010	0.020
203	16.92	0.10	0.031	(0.181)	0.010	0.020
204	17.00	0.10	0.031	(0.180)	0.010	0.020
205	17.08	0.17	0.051	(0.180)	0.017	0.034
206	17.17	0.17	0.051	(0.179)	0.017	0.034
207	17.25	0.17	0.051	(0.178)	0.017	0.034
208	17.33	0.17	0.051	(0.177)	0.017	0.034
209	17.42	0.17	0.051	(0.176)	0.017	0.034
210	17.50	0.17	0.051	(0.175)	0.017	0.034
211	17.58	0.17	0.051	(0.174)	0.017	0.034
212	17.67	0.17	0.051	(0.173)	0.017	0.034
213	17.75	0.17	0.051	(0.172)	0.017	0.034
214	17.83	0.13	0.041	(0.172)	0.014	0.027
215	17.92	0.13	0.041	(0.171)	0.014	0.027
216	18.00	0.13	0.041	(0.170)	0.014	0.027
217	18.08	0.13	0.041	(0.169)	0.014	0.027
218	18.17	0.13	0.041	(0.168)	0.014	0.027
219	18.25	0.13	0.041	(0.167)	0.014	0.027
220	18.33	0.13	0.041	(0.167)	0.014	0.027
221	18.42	0.13	0.041	(0.166)	0.014	0.027
222	18.50	0.13	0.041	(0.165)	0.014	0.027
223	18.58	0.10	0.031	(0.164)	0.010	0.020
224	18.67	0.10	0.031	(0.163)	0.010	0.020
225	18.75	0.10	0.031	(0.163)	0.010	0.020
226	18.83	0.07	0.020	(0.162)	0.007	0.014
227	18.92	0.07	0.020	(0.161)	0.007	0.014
228	19.00	0.07	0.020	(0.160)	0.007	0.014
229	19.08	0.10	0.031	(0.160)	0.010	0.020
230	19.17	0.10	0.031	(0.159)	0.010	0.020
231	19.25	0.10	0.031	(0.158)	0.010	0.020
232	19.33	0.13	0.041	(0.157)	0.014	0.027
233	19.42	0.13	0.041	(0.157)	0.014	0.027
234	19.50	0.13	0.041	(0.156)	0.014	0.027
235	19.58	0.10	0.031	(0.155)	0.010	0.020
236	19.67	0.10	0.031	(0.154)	0.010	0.020
237	19.75	0.10	0.031	(0.154)	0.010	0.020
238	19.83	0.07	0.020	(0.153)	0.007	0.014
239	19.92	0.07	0.020	(0.152)	0.007	0.014
240	20.00	0.07	0.020	(0.152)	0.007	0.014
241	20.08	0.10	0.031	(0.151)	0.010	0.020
242	20.17	0.10	0.031	(0.150)	0.010	0.020
243	20.25	0.10	0.031	(0.150)	0.010	0.020
244	20.33	0.10	0.031	(0.149)	0.010	0.020
245	20.42	0.10	0.031	(0.148)	0.010	0.020
246	20.50	0.10	0.031	(0.148)	0.010	0.020
247	20.58	0.10	0.031	(0.147)	0.010	0.020
248	20.67	0.10	0.031	(0.147)	0.010	0.020
249	20.75	0.10	0.031	(0.146)	0.010	0.020
250	20.83	0.07	0.020	(0.145)	0.007	0.014
251	20.92	0.07	0.020	(0.145)	0.007	0.014
252	21.00	0.07	0.020	(0.144)	0.007	0.014
253	21.08	0.10	0.031	(0.144)	0.010	0.020
254	21.17	0.10	0.031	(0.143)	0.010	0.020
255	21.25	0.10	0.031	(0.142)	0.010	0.020
256	21.33	0.07	0.020	(0.142)	0.007	0.014

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257  21.42     0.07      0.020       (  0.141)       0.007        0.014
258  21.50     0.07      0.020       (  0.141)       0.007        0.014
259  21.58     0.10      0.031       (  0.140)       0.010        0.020
260  21.67     0.10      0.031       (  0.140)       0.010        0.020
261  21.75     0.10      0.031       (  0.139)       0.010        0.020
262  21.83     0.07      0.020       (  0.139)       0.007        0.014
263  21.92     0.07      0.020       (  0.138)       0.007        0.014
264  22.00     0.07      0.020       (  0.138)       0.007        0.014
265  22.08     0.10      0.031       (  0.137)       0.010        0.020
266  22.17     0.10      0.031       (  0.137)       0.010        0.020
267  22.25     0.10      0.031       (  0.137)       0.010        0.020
268  22.33     0.07      0.020       (  0.136)       0.007        0.014
269  22.42     0.07      0.020       (  0.136)       0.007        0.014
270  22.50     0.07      0.020       (  0.135)       0.007        0.014
271  22.58     0.07      0.020       (  0.135)       0.007        0.014
272  22.67     0.07      0.020       (  0.135)       0.007        0.014
273  22.75     0.07      0.020       (  0.134)       0.007        0.014
274  22.83     0.07      0.020       (  0.134)       0.007        0.014
275  22.92     0.07      0.020       (  0.134)       0.007        0.014
276  23.00     0.07      0.020       (  0.133)       0.007        0.014
277  23.08     0.07      0.020       (  0.133)       0.007        0.014
278  23.17     0.07      0.020       (  0.133)       0.007        0.014
279  23.25     0.07      0.020       (  0.132)       0.007        0.014
280  23.33     0.07      0.020       (  0.132)       0.007        0.014
281  23.42     0.07      0.020       (  0.132)       0.007        0.014
282  23.50     0.07      0.020       (  0.132)       0.007        0.014
283  23.58     0.07      0.020       (  0.131)       0.007        0.014
284  23.67     0.07      0.020       (  0.131)       0.007        0.014
285  23.75     0.07      0.020       (  0.131)       0.007        0.014
286  23.83     0.07      0.020       (  0.131)       0.007        0.014
287  23.92     0.07      0.020       (  0.131)       0.007        0.014
288  24.00     0.07      0.020       (  0.131)       0.007        0.014
                (Loss Rate Not Used)
    Sum =     100.0                                   Sum =    20.3
       Flood volume = Effective rainfall      1.69(In)
        times area      59.0(Ac.)/[(In)/(Ft.)] =      8.3(Ac.Ft)
       Total soil loss =      0.87(In)
       Total soil loss =     4.278(Ac.Ft)
       Total rainfall =      2.56(In)
       Flood volume =      361758.6 Cubic Feet
       Total soil loss =      186360.5 Cubic Feet
       --------------------------------------------------------------------
        Peak flow rate of this hydrograph =     13.340(CFS)
       --------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          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        5.0      10.0      15.0      20.0
 -----------------------------------------------------------------------
   0+ 5       0.0004      0.06  Q         |         |         |         |
   0+10       0.0025      0.30  Q         |         |         |         |
   0+15       0.0060      0.52  VQ        |         |         |         |
   0+20       0.0104      0.63  VQ        |         |         |         |
   0+25       0.0160      0.81  VQ        |         |         |         |
   0+30       0.0226      0.96  VQ        |         |         |         |
   0+35       0.0296      1.02  V Q       |         |         |         |
   0+40       0.0370      1.07  V Q       |         |         |         |
   0+45       0.0446      1.10  V Q       |         |         |         |
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 0+50       0.0525      1.15  V Q        |          |          |          |
 0+55       0.0614      1.29  V Q        |          |          |          |
 1+ 0       0.0711      1.41  V Q        |          |          |          |
 1+ 5       0.0810      1.43  V Q        |          |          |          |
 1+10       0.0903      1.35  V Q        |          |          |          |
 1+15       0.0990      1.27  V Q        |          |          |          |
 1+20       0.1076      1.24  V Q        |          |          |          |
 1+25       0.1161      1.23  V Q        |          |          |          |
 1+30       0.1245      1.23  V Q        |          |          |          |
 1+35       0.1329      1.22  V Q        |          |          |          |
 1+40       0.1413      1.22  V Q        |          |          |          |
 1+45       0.1497      1.22  V Q        |          |          |          |
 1+50       0.1583      1.25  V Q        |          |          |          |
 1+55       0.1677      1.37  V Q        |          |          |          |
 2+ 0       0.1778      1.47  V Q        |          |          |          |
 2+ 5       0.1882      1.51  V  Q       |          |          |          |
 2+10       0.1989      1.54  V  Q       |          |          |          |
 2+15       0.2096      1.56  |V Q       |          |          |          |
 2+20       0.2204      1.57  |V Q       |          |          |          |
 2+25       0.2313      1.58  |V Q       |          |          |          |
 2+30       0.2422      1.58  |V Q       |          |          |          |
 2+35       0.2533      1.62  |V Q       |          |          |          |
 2+40       0.2653      1.74  |V Q       |          |          |          |
 2+45       0.2781      1.85  |V Q       |          |          |          |
 2+50       0.2912      1.90  |V Q       |          |          |          |
 2+55       0.3044      1.93  |V Q       |          |          |          |
 3+ 0       0.3179      1.95  |V Q       |          |          |          |
 3+ 5       0.3314      1.96  |V Q       |          |          |          |
 3+10       0.3450      1.97  |V Q       |          |          |          |
 3+15       0.3587      1.98  |V Q       |          |          |          |
 3+20       0.3723      1.99  |V Q       |          |          |          |
 3+25       0.3861      1.99  |V Q       |          |          |          |
 3+30       0.3998      2.00  |V Q       |          |          |          |
 3+35       0.4136      2.00  |V Q       |          |          |          |
 3+40       0.4274      2.00  | V Q      |          |          |          |
 3+45       0.4412      2.00  | V Q      |          |          |          |
 3+50       0.4552      2.03  | V Q      |          |          |          |
 3+55       0.4700      2.16  | V Q      |          |          |          |
 4+ 0       0.4857      2.27  | V Q      |          |          |          |
 4+ 5       0.5016      2.31  | V Q      |          |          |          |
 4+10       0.5177      2.34  | V Q      |          |          |          |
 4+15       0.5339      2.36  | V Q      |          |          |          |
 4+20       0.5505      2.40  | V Q      |          |          |          |
 4+25       0.5679      2.53  | V  Q     |          |          |          |
 4+30       0.5861      2.64  | V  Q     |          |          |          |
 4+35       0.6046      2.69  | V  Q     |          |          |          |
 4+40       0.6234      2.72  |  V Q     |          |          |          |
 4+45       0.6423      2.75  |  V Q     |          |          |          |
 4+50       0.6615      2.79  |  V Q     |          |          |          |
 4+55       0.6817      2.92  |  V Q     |          |          |          |
 5+ 0       0.7026      3.04  |  V  Q    |          |          |          |
 5+ 5       0.7235      3.03  |  V  Q    |          |          |          |
 5+10       0.7429      2.82  |  V Q     |          |          |          |
 5+15       0.7610      2.63  |  V Q     |          |          |          |
 5+20       0.7789      2.59  |  V Q     |          |          |          |
 5+25       0.7972      2.67  |  V Q     |          |          |          |
 5+30       0.8161      2.74  |  V Q     |          |          |          |
 5+35       0.8354      2.80  |   VQ     |          |          |          |
 5+40       0.8556      2.94  |   VQ     |          |          |          |
 5+45       0.8767      3.06  |   V Q    |          |          |          |
 5+50       0.8981      3.11  |   V Q    |          |          |          |
 5+55       0.9197      3.14  |   V Q    |          |          |          |
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 6+ 0       0.9414      3.16  |   V Q   |         |         |         |
 6+ 5       0.9635      3.20  |   V Q   |         |         |         |
 6+10       0.9864      3.33  |   V Q   |         |         |         |
 6+15       1.0102      3.45  |   V Q   |         |         |         |
 6+20       1.0342      3.49  |   V Q   |         |         |         |
 6+25       1.0585      3.52  |    V Q  |         |         |         |
 6+30       1.0829      3.54  |    V Q  |         |         |         |
 6+35       1.1076      3.59  |    V Q  |         |         |         |
 6+40       1.1333      3.73  |    V Q  |         |         |         |
 6+45       1.1598      3.84  |    V Q  |         |         |         |
 6+50       1.1866      3.89  |    V Q  |         |         |         |
 6+55       1.2136      3.93  |    V Q  |         |         |         |
 7+ 0       1.2408      3.95  |    V Q  |         |         |         |
 7+ 5       1.2682      3.97  |     VQ  |         |         |         |
 7+10       1.2956      3.98  |     VQ  |         |         |         |
 7+15       1.3230      3.99  |     VQ  |         |         |         |
 7+20       1.3507      4.02  |     V Q |         |         |         |
 7+25       1.3793      4.15  |     V Q |         |         |         |
 7+30       1.4087      4.26  |     V Q |         |         |         |
 7+35       1.4386      4.34  |     V Q |         |         |         |
 7+40       1.4695      4.49  |      VQ |         |         |         |
 7+45       1.5013      4.62  |      V Q|         |         |         |
 7+50       1.5337      4.71  |      V Q|         |         |         |
 7+55       1.5673      4.87  |      V Q|         |         |         |
 8+ 0       1.6017      5.00  |      V  Q         |         |         |
 8+ 5       1.6370      5.12  |      V  Q         |         |         |
 8+10       1.6742      5.41  |       V Q         |         |         |
 8+15       1.7131      5.65  |       V |Q        |         |         |
 8+20       1.7528      5.76  |       V |Q        |         |         |
 8+25       1.7929      5.83  |       V |Q        |         |         |
 8+30       1.8334      5.88  |       V |Q        |         |         |
 8+35       1.8743      5.94  |        V|Q        |         |         |
 8+40       1.9162      6.09  |        V| Q       |         |         |
 8+45       1.9590      6.21  |        V| Q       |         |         |
 8+50       2.0024      6.30  |        V| Q       |         |         |
 8+55       2.0469      6.46  |        V| Q       |         |         |
 9+ 0       2.0924      6.60  |         V  Q      |         |         |
 9+ 5       2.1387      6.73  |         V  Q      |         |         |
 9+10       2.1870      7.01  |         V   Q     |         |         |
 9+15       2.2370      7.26  |         V   Q     |         |         |
 9+20       2.2879      7.40  |         |V  Q     |         |         |
 9+25       2.3402      7.59  |         |V   Q    |         |         |
 9+30       2.3935      7.75  |         |V   Q    |         |         |
 9+35       2.4476      7.86  |         |V   Q    |         |         |
 9+40       2.5029      8.03  |         | V   Q   |         |         |
 9+45       2.5592      8.17  |         | V   Q   |         |         |
 9+50       2.6161      8.27  |         | V   Q   |         |         |
 9+55       2.6743      8.44  |         | V   Q   |         |         |
10+ 0       2.7334      8.58  |         |  V   Q  |         |         |
10+ 5       2.7916      8.45  |         |  V  Q   |         |         |
10+10       2.8442      7.64  |         |  V Q    |         |         |
10+15       2.8920      6.93  |         |  Q      |         |         |
10+20       2.9377      6.65  |         |  QV     |         |         |
10+25       2.9823      6.47  |         | Q V     |         |         |
10+30       3.0260      6.35  |         | Q V     |         |         |
10+35       3.0703      6.42  |         | Q V     |         |         |
10+40       3.1184      6.98  |         |  Q V    |         |         |
10+45       3.1699      7.48  |         |   QV    |         |         |
10+50       3.2228      7.68  |         |    Q    |         |         |
10+55       3.2764      7.79  |         |    Q    |         |         |
11+ 0       3.3306      7.86  |         |    QV   |         |         |
11+ 5       3.3848      7.88  |         |    QV   |         |         |
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11+10       3.4385       7.78  |         |    QV   |         |         |
11+15       3.4915       7.70  |         |    QV   |         |         |
11+20       3.5442       7.66  |         |    Q V  |         |         |
11+25       3.5968       7.64  |         |    Q V  |         |         |
11+30       3.6493       7.62  |         |    Q V  |         |         |
11+35       3.7014       7.56  |         |    Q V  |         |         |
11+40       3.7519       7.32  |         |   Q   V |         |         |
11+45       3.8009       7.11  |         |   Q   V |         |         |
11+50       3.8495       7.06  |         |   Q   V |         |         |
11+55       3.8986       7.13  |         |   Q   V |         |         |
12+ 0       3.9483       7.21  |         |   Q    V|         |         |
12+ 5       3.9995       7.43  |         |   Q    V|         |         |
12+10       4.0566       8.29  |         |     Q  V|         |         |
12+15       4.1189       9.05  |         |       QV|         |         |
12+20       4.1835       9.39  |         |       Q V         |         |
12+25       4.2504       9.70  |         |        QV         |         |
12+30       4.3188       9.94  |         |        QV         |         |
12+35       4.3885      10.13  |         |         QV        |         |
12+40       4.4605      10.45  |         |         QV        |         |
12+45       4.5344      10.73  |         |         |Q        |         |
12+50       4.6094      10.89  |         |         |QV       |         |
12+55       4.6859      11.10  |         |         | Q       |         |
13+ 0       4.7635      11.28  |         |         | Q       |         |
13+ 5       4.8429      11.52  |         |         |  Q      |         |
13+10       4.9269      12.19  |         |         |  VQ     |         |
13+15       5.0149      12.78  |         |         |   VQ    |         |
13+20       5.1047      13.04  |         |         |   V Q   |         |
13+25       5.1957      13.21  |         |         |    VQ   |         |
13+30       5.2876      13.34  |         |         |    VQ   |         |
13+35       5.3777      13.09  |         |         |    VQ   |         |
13+40       5.4590      11.80  |         |         |  Q  V   |         |
13+45       5.5325      10.67  |         |         |Q    V   |         |
13+50       5.6029      10.21  |         |         Q     V   |         |
13+55       5.6713       9.94  |         |        Q|      V  |         |
14+ 0       5.7385       9.75  |         |        Q|      V  |         |
14+ 5       5.8056       9.75  |         |        Q|      V  |         |
14+10       5.8756      10.16  |         |         Q       V |         |
14+15       5.9481      10.53  |         |         |Q      V |         |
14+20       6.0214      10.64  |         |         |Q       V|         |
14+25       6.0944      10.59  |         |         |Q       V|         |
14+30       6.1669      10.53  |         |         |Q       V|         |
14+35       6.2393      10.51  |         |         |Q        V         |
14+40       6.3115      10.49  |         |         Q         V         |
14+45       6.3836      10.47  |         |         Q         V         |
14+50       6.4554      10.43  |         |         Q         |V        |
14+55       6.5263      10.29  |         |         Q         |V        |
15+ 0       6.5963      10.16  |         |         Q         |V        |
15+ 5       6.6658      10.10  |         |         Q         | V       |
15+10       6.7344       9.95  |         |        Q|         | V       |
15+15       6.8021       9.83  |         |        Q|         | V       |
15+20       6.8693       9.75  |         |        Q|         |  V      |
15+25       6.9354       9.60  |         |        Q|         |  V      |
15+30       7.0006       9.48  |         |       Q |         |  V      |
15+35       7.0646       9.29  |         |       Q |         |   V     |
15+40       7.1250       8.76  |         |      Q  |         |   V     |
15+45       7.1822       8.31  |         |     Q   |         |   V     |
15+50       7.2380       8.11  |         |     Q   |         |   V     |
15+55       7.2930       7.98  |         |    Q    |         |    V    |
16+ 0       7.3474       7.90  |         |    Q    |         |    V    |
16+ 5       7.3983       7.39  |         |   Q     |         |    V    |
16+10       7.4364       5.53  |         |Q        |         |    V    |
16+15       7.4632       3.90  |      Q  |         |         |    V    |
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16+20	7.4853	3.21	Q				V
16+25	7.5044	2.77	Q				V
16+30	7.5214	2.47	Q				V
16+35	7.5368	2.24	Q				V
16+40	7.5504	1.98	Q				V
16+45	7.5626	1.77	Q				V
16+50	7.5740	1.65	Q				V
16+55	7.5847	1.55	Q				V
17+ 0	7.5948	1.47	Q				V
17+ 5	7.6049	1.47	Q				V
17+10	7.6164	1.67	Q				V
17+15	7.6291	1.85	Q				V
17+20	7.6422	1.90	Q				V
17+25	7.6554	1.92	Q				V
17+30	7.6686	1.92	Q				V
17+35	7.6820	1.94	Q				V
17+40	7.6955	1.95	Q				V
17+45	7.7090	1.96	Q				V
17+50	7.7224	1.94	Q				V
17+55	7.7349	1.83	Q				V
18+ 0	7.7468	1.72	Q				V
18+ 5	7.7584	1.69	Q				V
18+10	7.7699	1.66	Q				V
18+15	7.7812	1.65	Q				V
18+20	7.7925	1.64	Q				V
18+25	7.8038	1.64	Q				V
18+30	7.8150	1.63	Q				V
18+35	7.8260	1.60	Q				V
18+40	7.8362	1.47	Q				V
18+45	7.8456	1.36	Q				V
18+50	7.8544	1.29	Q				V
18+55	7.8623	1.14	Q				V
19+ 0	7.8692	1.01	Q				V
19+ 5	7.8759	0.98	Q				V
19+10	7.8833	1.06	Q				V
19+15	7.8911	1.14	Q				V
19+20	7.8994	1.20	Q				V
19+25	7.9086	1.33	Q				V
19+30	7.9186	1.45	Q				V
19+35	7.9287	1.47	Q				V
19+40	7.9382	1.38	Q				V
19+45	7.9471	1.29	Q				V
19+50	7.9555	1.23	Q				V
19+55	7.9630	1.09	Q				V
20+ 0	7.9697	0.97	Q				V
20+ 5	7.9762	0.95	Q				V
20+10	7.9833	1.04	Q				V
20+15	7.9911	1.12	Q				V
20+20	7.9990	1.15	Q				V
20+25	8.0071	1.17	Q				V
20+30	8.0152	1.19	Q				V
20+35	8.0235	1.19	Q				V
20+40	8.0317	1.20	Q				V
20+45	8.0400	1.20	Q				V
20+50	8.0480	1.17	Q				V
20+55	8.0552	1.05	Q				V
21+ 0	8.0617	0.94	Q				V
21+ 5	8.0681	0.93	Q				V
21+10	8.0751	1.02	Q				V
21+15	8.0828	1.11	Q				V
21+20	8.0904	1.11	Q				V
21+25	8.0974	1.01	Q				V

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   21+30       8.1038      0.92  |Q        |         |         |        V|
   21+35       8.1101      0.91  |Q        |         |         |        V|
   21+40       8.1170      1.01  | Q       |         |         |        V|
   21+45       8.1246      1.10  | Q       |         |         |        V|
   21+50       8.1322      1.11  | Q       |         |         |        V|
   21+55       8.1392      1.01  | Q       |         |         |        V|
   22+ 0       8.1455      0.91  |Q        |         |         |        V|
   22+ 5       8.1517      0.91  |Q        |         |         |        V|
   22+10       8.1586      1.01  | Q       |         |         |        V|
   22+15       8.1662      1.10  | Q       |         |         |        V|
   22+20       8.1738      1.10  | Q       |         |         |        V|
   22+25       8.1807      1.00  | Q       |         |         |        V|
   22+30       8.1870      0.91  |Q        |         |         |        V|
   22+35       8.1930      0.88  |Q        |         |         |        V|
   22+40       8.1989      0.85  |Q        |         |         |        V|
   22+45       8.2047      0.84  |Q        |         |         |        V|
   22+50       8.2104      0.83  |Q        |         |         |        V|
   22+55       8.2161      0.82  |Q        |         |         |        V|
   23+ 0       8.2218      0.82  |Q        |         |         |        V|
   23+ 5       8.2274      0.82  |Q        |         |         |        V|
   23+10       8.2330      0.82  |Q        |         |         |        V|
   23+15       8.2386      0.81  |Q        |         |         |        V|
   23+20       8.2442      0.81  |Q        |         |         |        V|
   23+25       8.2498      0.81  |Q        |         |         |        V|
   23+30       8.2553      0.81  |Q        |         |         |        V|
   23+35       8.2609      0.81  |Q        |         |         |        V|
   23+40       8.2665      0.81  |Q        |         |         |        V|
   23+45       8.2720      0.80  |Q        |         |         |        V|
   23+50       8.2775      0.80  |Q        |         |         |        V|
   23+55       8.2831      0.80  |Q        |         |         |        V|
   24+ 0       8.2886      0.80  |Q        |         |         |        V|
   24+ 5       8.2937      0.74  |Q        |         |         |        V|
   24+10       8.2972      0.50  |Q        |         |         |        V|
   24+15       8.2992      0.29  Q         |         |         |        V|
   24+20       8.3006      0.20  Q         |         |         |        V|
   24+25       8.3015      0.14  Q         |         |         |        V|
   24+30       8.3023      0.11  Q         |         |         |        V|
   24+35       8.3028      0.08  Q         |         |         |        V|
   24+40       8.3033      0.06  Q         |         |         |        V|
   24+45       8.3036      0.05  Q         |         |         |        V|
   24+50       8.3039      0.04  Q         |         |         |        V|
   24+55       8.3042      0.03  Q         |         |         |        V|
   25+ 0       8.3044      0.03  Q         |         |         |        V|
   25+ 5       8.3045      0.02  Q         |         |         |        V|
   25+10       8.3046      0.02  Q         |         |         |        V|
   25+15       8.3047      0.01  Q         |         |         |        V|
   25+20       8.3048      0.01  Q         |         |         |        V|
   25+25       8.3048      0.01  Q         |         |         |        V|
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        U n i t   H y d r o g r a p h   A n a l y s i s

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                Study date  08/26/24 File: da100fex242.out

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


Program License Serial Number 6443

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

 English Units used in output format



---------------------------------------------------------------------
Fairway Canyon Existing Conditions
DA100 2yr
Kimley-Horn

--------------------------------------------------------------------
Drainage Area =     106.30(Ac.)  =      0.166 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     106.30(Ac.)  =      0.166 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.190 Hr.
Lag time =    11.40 Min.
25% of lag time =     2.85 Min.
40% of lag time =     4.56 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]
      106.30            2.56                 272.13

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      106.30            6.25                 664.38

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    2.560(In)
Area Averaged 100-Year Rainfall =    6.250(In)

Point rain (area averaged) =    2.560(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    2.559(In)

Sub-Area Data:
```

Area(Ac.)	Runoff Index	Impervious %
106.300	69.00	0.000

Total Area Entered = 106.30(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
69.0	49.8	0.574	0.000	0.574	1.000	0.574
					Sum (F) =	0.574

Area averaged mean soil loss (F) (In/Hr) = 0.574
Minimum soil loss rate ((In/Hr)) = 0.287
(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
Combination of 'S' Curves:
VALLEY 'S' Curve Percentage = 0.00
FOOTHILL 'S' Curve Percentage = 50.00
MOUNTAIN 'S' Curve Percentage = 50.00
DESERT 'S' Curve Percentage = 0.00

Unit Hydrograph Data

Unit time period	(hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	43.860	4.957	5.310
2	0.167	87.719	20.147	21.583
3	0.250	131.579	28.120	30.125
4	0.333	175.439	14.114	15.121
5	0.417	219.298	7.923	8.488
6	0.500	263.158	5.611	6.011
7	0.583	307.018	4.109	4.402
8	0.667	350.877	3.039	3.256
9	0.750	394.737	2.204	2.361
10	0.833	438.596	1.573	1.686
11	0.917	482.456	1.164	1.247
12	1.000	526.316	1.052	1.127
13	1.083	570.175	0.854	0.915
14	1.167	614.035	0.824	0.883
15	1.250	657.895	0.697	0.747
16	1.333	701.754	0.620	0.664
17	1.417	745.614	0.479	0.513
18	1.500	789.474	0.421	0.451
19	1.583	833.333	0.395	0.423
20	1.667	877.193	0.395	0.423
21	1.750	921.053	0.395	0.423
22	1.833	964.912	0.395	0.423
23	1.917	1008.772	0.513	0.550
			Sum = 100.000	Sum= 107.130

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(1.017)	0.018	0.002
2	0.17	0.07	0.020	(1.014)	0.018	0.002
3	0.25	0.07	0.020	(1.010)	0.018	0.002

4	0.33	0.10	0.031	(1.006)	0.028	0.003
5	0.42	0.10	0.031	(1.002)	0.028	0.003
6	0.50	0.10	0.031	(0.998)	0.028	0.003
7	0.58	0.10	0.031	(0.994)	0.028	0.003
8	0.67	0.10	0.031	(0.990)	0.028	0.003
9	0.75	0.10	0.031	(0.986)	0.028	0.003
10	0.83	0.13	0.041	(0.982)	0.037	0.004
11	0.92	0.13	0.041	(0.978)	0.037	0.004
12	1.00	0.13	0.041	(0.975)	0.037	0.004
13	1.08	0.10	0.031	(0.971)	0.028	0.003
14	1.17	0.10	0.031	(0.967)	0.028	0.003
15	1.25	0.10	0.031	(0.963)	0.028	0.003
16	1.33	0.10	0.031	(0.959)	0.028	0.003
17	1.42	0.10	0.031	(0.955)	0.028	0.003
18	1.50	0.10	0.031	(0.952)	0.028	0.003
19	1.58	0.10	0.031	(0.948)	0.028	0.003
20	1.67	0.10	0.031	(0.944)	0.028	0.003
21	1.75	0.10	0.031	(0.940)	0.028	0.003
22	1.83	0.13	0.041	(0.936)	0.037	0.004
23	1.92	0.13	0.041	(0.933)	0.037	0.004
24	2.00	0.13	0.041	(0.929)	0.037	0.004
25	2.08	0.13	0.041	(0.925)	0.037	0.004
26	2.17	0.13	0.041	(0.921)	0.037	0.004
27	2.25	0.13	0.041	(0.918)	0.037	0.004
28	2.33	0.13	0.041	(0.914)	0.037	0.004
29	2.42	0.13	0.041	(0.910)	0.037	0.004
30	2.50	0.13	0.041	(0.906)	0.037	0.004
31	2.58	0.17	0.051	(0.903)	0.046	0.005
32	2.67	0.17	0.051	(0.899)	0.046	0.005
33	2.75	0.17	0.051	(0.895)	0.046	0.005
34	2.83	0.17	0.051	(0.892)	0.046	0.005
35	2.92	0.17	0.051	(0.888)	0.046	0.005
36	3.00	0.17	0.051	(0.884)	0.046	0.005
37	3.08	0.17	0.051	(0.881)	0.046	0.005
38	3.17	0.17	0.051	(0.877)	0.046	0.005
39	3.25	0.17	0.051	(0.873)	0.046	0.005
40	3.33	0.17	0.051	(0.870)	0.046	0.005
41	3.42	0.17	0.051	(0.866)	0.046	0.005
42	3.50	0.17	0.051	(0.862)	0.046	0.005
43	3.58	0.17	0.051	(0.859)	0.046	0.005
44	3.67	0.17	0.051	(0.855)	0.046	0.005
45	3.75	0.17	0.051	(0.852)	0.046	0.005
46	3.83	0.20	0.061	(0.848)	0.055	0.006
47	3.92	0.20	0.061	(0.844)	0.055	0.006
48	4.00	0.20	0.061	(0.841)	0.055	0.006
49	4.08	0.20	0.061	(0.837)	0.055	0.006
50	4.17	0.20	0.061	(0.834)	0.055	0.006
51	4.25	0.20	0.061	(0.830)	0.055	0.006
52	4.33	0.23	0.072	(0.827)	0.064	0.007
53	4.42	0.23	0.072	(0.823)	0.064	0.007
54	4.50	0.23	0.072	(0.820)	0.064	0.007
55	4.58	0.23	0.072	(0.816)	0.064	0.007
56	4.67	0.23	0.072	(0.813)	0.064	0.007
57	4.75	0.23	0.072	(0.809)	0.064	0.007
58	4.83	0.27	0.082	(0.806)	0.074	0.008
59	4.92	0.27	0.082	(0.802)	0.074	0.008
60	5.00	0.27	0.082	(0.799)	0.074	0.008
61	5.08	0.20	0.061	(0.795)	0.055	0.006
62	5.17	0.20	0.061	(0.792)	0.055	0.006
63	5.25	0.20	0.061	(0.788)	0.055	0.006
64	5.33	0.23	0.072	(0.785)	0.064	0.007
65	5.42	0.23	0.072	(0.781)	0.064	0.007

66	5.50	0.23	0.072	(0.778)	0.064	0.007
67	5.58	0.27	0.082	(0.775)	0.074	0.008
68	5.67	0.27	0.082	(0.771)	0.074	0.008
69	5.75	0.27	0.082	(0.768)	0.074	0.008
70	5.83	0.27	0.082	(0.764)	0.074	0.008
71	5.92	0.27	0.082	(0.761)	0.074	0.008
72	6.00	0.27	0.082	(0.758)	0.074	0.008
73	6.08	0.30	0.092	(0.754)	0.083	0.009
74	6.17	0.30	0.092	(0.751)	0.083	0.009
75	6.25	0.30	0.092	(0.748)	0.083	0.009
76	6.33	0.30	0.092	(0.744)	0.083	0.009
77	6.42	0.30	0.092	(0.741)	0.083	0.009
78	6.50	0.30	0.092	(0.738)	0.083	0.009
79	6.58	0.33	0.102	(0.734)	0.092	0.010
80	6.67	0.33	0.102	(0.731)	0.092	0.010
81	6.75	0.33	0.102	(0.728)	0.092	0.010
82	6.83	0.33	0.102	(0.724)	0.092	0.010
83	6.92	0.33	0.102	(0.721)	0.092	0.010
84	7.00	0.33	0.102	(0.718)	0.092	0.010
85	7.08	0.33	0.102	(0.715)	0.092	0.010
86	7.17	0.33	0.102	(0.711)	0.092	0.010
87	7.25	0.33	0.102	(0.708)	0.092	0.010
88	7.33	0.37	0.113	(0.705)	0.101	0.011
89	7.42	0.37	0.113	(0.702)	0.101	0.011
90	7.50	0.37	0.113	(0.698)	0.101	0.011
91	7.58	0.40	0.123	(0.695)	0.111	0.012
92	7.67	0.40	0.123	(0.692)	0.111	0.012
93	7.75	0.40	0.123	(0.689)	0.111	0.012
94	7.83	0.43	0.133	(0.686)	0.120	0.013
95	7.92	0.43	0.133	(0.682)	0.120	0.013
96	8.00	0.43	0.133	(0.679)	0.120	0.013
97	8.08	0.50	0.154	(0.676)	0.138	0.015
98	8.17	0.50	0.154	(0.673)	0.138	0.015
99	8.25	0.50	0.154	(0.670)	0.138	0.015
100	8.33	0.50	0.154	(0.667)	0.138	0.015
101	8.42	0.50	0.154	(0.664)	0.138	0.015
102	8.50	0.50	0.154	(0.660)	0.138	0.015
103	8.58	0.53	0.164	(0.657)	0.147	0.016
104	8.67	0.53	0.164	(0.654)	0.147	0.016
105	8.75	0.53	0.164	(0.651)	0.147	0.016
106	8.83	0.57	0.174	(0.648)	0.157	0.017
107	8.92	0.57	0.174	(0.645)	0.157	0.017
108	9.00	0.57	0.174	(0.642)	0.157	0.017
109	9.08	0.63	0.195	(0.639)	0.175	0.019
110	9.17	0.63	0.195	(0.636)	0.175	0.019
111	9.25	0.63	0.195	(0.633)	0.175	0.019
112	9.33	0.67	0.205	(0.630)	0.184	0.020
113	9.42	0.67	0.205	(0.627)	0.184	0.020
114	9.50	0.67	0.205	(0.624)	0.184	0.020
115	9.58	0.70	0.215	(0.621)	0.193	0.021
116	9.67	0.70	0.215	(0.618)	0.193	0.021
117	9.75	0.70	0.215	(0.615)	0.193	0.021
118	9.83	0.73	0.225	(0.612)	0.203	0.023
119	9.92	0.73	0.225	(0.609)	0.203	0.023
120	10.00	0.73	0.225	(0.606)	0.203	0.023
121	10.08	0.50	0.154	(0.603)	0.138	0.015
122	10.17	0.50	0.154	(0.600)	0.138	0.015
123	10.25	0.50	0.154	(0.597)	0.138	0.015
124	10.33	0.50	0.154	(0.594)	0.138	0.015
125	10.42	0.50	0.154	(0.592)	0.138	0.015
126	10.50	0.50	0.154	(0.589)	0.138	0.015
127	10.58	0.67	0.205	(0.586)	0.184	0.020

128	10.67	0.67	0.205	(0.583)	0.184	0.020
129	10.75	0.67	0.205	(0.580)	0.184	0.020
130	10.83	0.67	0.205	(0.577)	0.184	0.020
131	10.92	0.67	0.205	(0.574)	0.184	0.020
132	11.00	0.67	0.205	(0.572)	0.184	0.020
133	11.08	0.63	0.195	(0.569)	0.175	0.019
134	11.17	0.63	0.195	(0.566)	0.175	0.019
135	11.25	0.63	0.195	(0.563)	0.175	0.019
136	11.33	0.63	0.195	(0.560)	0.175	0.019
137	11.42	0.63	0.195	(0.558)	0.175	0.019
138	11.50	0.63	0.195	(0.555)	0.175	0.019
139	11.58	0.57	0.174	(0.552)	0.157	0.017
140	11.67	0.57	0.174	(0.549)	0.157	0.017
141	11.75	0.57	0.174	(0.547)	0.157	0.017
142	11.83	0.60	0.184	(0.544)	0.166	0.018
143	11.92	0.60	0.184	(0.541)	0.166	0.018
144	12.00	0.60	0.184	(0.538)	0.166	0.018
145	12.08	0.83	0.256	(0.536)	0.230	0.026
146	12.17	0.83	0.256	(0.533)	0.230	0.026
147	12.25	0.83	0.256	(0.530)	0.230	0.026
148	12.33	0.87	0.266	(0.528)	0.240	0.027
149	12.42	0.87	0.266	(0.525)	0.240	0.027
150	12.50	0.87	0.266	(0.522)	0.240	0.027
151	12.58	0.93	0.287	(0.520)	0.258	0.029
152	12.67	0.93	0.287	(0.517)	0.258	0.029
153	12.75	0.93	0.287	(0.515)	0.258	0.029
154	12.83	0.97	0.297	(0.512)	0.267	0.030
155	12.92	0.97	0.297	(0.509)	0.267	0.030
156	13.00	0.97	0.297	(0.507)	0.267	0.030
157	13.08	1.13	0.348	(0.504)	0.313	0.035
158	13.17	1.13	0.348	(0.502)	0.313	0.035
159	13.25	1.13	0.348	(0.499)	0.313	0.035
160	13.33	1.13	0.348	(0.497)	0.313	0.035
161	13.42	1.13	0.348	(0.494)	0.313	0.035
162	13.50	1.13	0.348	(0.492)	0.313	0.035
163	13.58	0.77	0.235	(0.489)	0.212	0.024
164	13.67	0.77	0.235	(0.487)	0.212	0.024
165	13.75	0.77	0.235	(0.484)	0.212	0.024
166	13.83	0.77	0.235	(0.482)	0.212	0.024
167	13.92	0.77	0.235	(0.479)	0.212	0.024
168	14.00	0.77	0.235	(0.477)	0.212	0.024
169	14.08	0.90	0.276	(0.474)	0.249	0.028
170	14.17	0.90	0.276	(0.472)	0.249	0.028
171	14.25	0.90	0.276	(0.469)	0.249	0.028
172	14.33	0.87	0.266	(0.467)	0.240	0.027
173	14.42	0.87	0.266	(0.465)	0.240	0.027
174	14.50	0.87	0.266	(0.462)	0.240	0.027
175	14.58	0.87	0.266	(0.460)	0.240	0.027
176	14.67	0.87	0.266	(0.458)	0.240	0.027
177	14.75	0.87	0.266	(0.455)	0.240	0.027
178	14.83	0.83	0.256	(0.453)	0.230	0.026
179	14.92	0.83	0.256	(0.451)	0.230	0.026
180	15.00	0.83	0.256	(0.448)	0.230	0.026
181	15.08	0.80	0.246	(0.446)	0.221	0.025
182	15.17	0.80	0.246	(0.444)	0.221	0.025
183	15.25	0.80	0.246	(0.441)	0.221	0.025
184	15.33	0.77	0.235	(0.439)	0.212	0.024
185	15.42	0.77	0.235	(0.437)	0.212	0.024
186	15.50	0.77	0.235	(0.435)	0.212	0.024
187	15.58	0.63	0.195	(0.432)	0.175	0.019
188	15.67	0.63	0.195	(0.430)	0.175	0.019
189	15.75	0.63	0.195	(0.428)	0.175	0.019

190	15.83	0.63	0.195	(0.426)	0.175	0.019
191	15.92	0.63	0.195	(0.424)	0.175	0.019
192	16.00	0.63	0.195	(0.421)	0.175	0.019
193	16.08	0.13	0.041	(0.419)	0.037	0.004
194	16.17	0.13	0.041	(0.417)	0.037	0.004
195	16.25	0.13	0.041	(0.415)	0.037	0.004
196	16.33	0.13	0.041	(0.413)	0.037	0.004
197	16.42	0.13	0.041	(0.411)	0.037	0.004
198	16.50	0.13	0.041	(0.409)	0.037	0.004
199	16.58	0.10	0.031	(0.407)	0.028	0.003
200	16.67	0.10	0.031	(0.405)	0.028	0.003
201	16.75	0.10	0.031	(0.403)	0.028	0.003
202	16.83	0.10	0.031	(0.401)	0.028	0.003
203	16.92	0.10	0.031	(0.398)	0.028	0.003
204	17.00	0.10	0.031	(0.396)	0.028	0.003
205	17.08	0.17	0.051	(0.394)	0.046	0.005
206	17.17	0.17	0.051	(0.392)	0.046	0.005
207	17.25	0.17	0.051	(0.390)	0.046	0.005
208	17.33	0.17	0.051	(0.389)	0.046	0.005
209	17.42	0.17	0.051	(0.387)	0.046	0.005
210	17.50	0.17	0.051	(0.385)	0.046	0.005
211	17.58	0.17	0.051	(0.383)	0.046	0.005
212	17.67	0.17	0.051	(0.381)	0.046	0.005
213	17.75	0.17	0.051	(0.379)	0.046	0.005
214	17.83	0.13	0.041	(0.377)	0.037	0.004
215	17.92	0.13	0.041	(0.375)	0.037	0.004
216	18.00	0.13	0.041	(0.373)	0.037	0.004
217	18.08	0.13	0.041	(0.371)	0.037	0.004
218	18.17	0.13	0.041	(0.370)	0.037	0.004
219	18.25	0.13	0.041	(0.368)	0.037	0.004
220	18.33	0.13	0.041	(0.366)	0.037	0.004
221	18.42	0.13	0.041	(0.364)	0.037	0.004
222	18.50	0.13	0.041	(0.363)	0.037	0.004
223	18.58	0.10	0.031	(0.361)	0.028	0.003
224	18.67	0.10	0.031	(0.359)	0.028	0.003
225	18.75	0.10	0.031	(0.357)	0.028	0.003
226	18.83	0.07	0.020	(0.356)	0.018	0.002
227	18.92	0.07	0.020	(0.354)	0.018	0.002
228	19.00	0.07	0.020	(0.352)	0.018	0.002
229	19.08	0.10	0.031	(0.351)	0.028	0.003
230	19.17	0.10	0.031	(0.349)	0.028	0.003
231	19.25	0.10	0.031	(0.347)	0.028	0.003
232	19.33	0.13	0.041	(0.346)	0.037	0.004
233	19.42	0.13	0.041	(0.344)	0.037	0.004
234	19.50	0.13	0.041	(0.342)	0.037	0.004
235	19.58	0.10	0.031	(0.341)	0.028	0.003
236	19.67	0.10	0.031	(0.339)	0.028	0.003
237	19.75	0.10	0.031	(0.338)	0.028	0.003
238	19.83	0.07	0.020	(0.336)	0.018	0.002
239	19.92	0.07	0.020	(0.335)	0.018	0.002
240	20.00	0.07	0.020	(0.333)	0.018	0.002
241	20.08	0.10	0.031	(0.332)	0.028	0.003
242	20.17	0.10	0.031	(0.330)	0.028	0.003
243	20.25	0.10	0.031	(0.329)	0.028	0.003
244	20.33	0.10	0.031	(0.328)	0.028	0.003
245	20.42	0.10	0.031	(0.326)	0.028	0.003
246	20.50	0.10	0.031	(0.325)	0.028	0.003
247	20.58	0.10	0.031	(0.323)	0.028	0.003
248	20.67	0.10	0.031	(0.322)	0.028	0.003
249	20.75	0.10	0.031	(0.321)	0.028	0.003
250	20.83	0.07	0.020	(0.319)	0.018	0.002
251	20.92	0.07	0.020	(0.318)	0.018	0.002

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252  21.00     0.07      0.020       (  0.317)       0.018        0.002
253  21.08     0.10      0.031       (  0.316)       0.028        0.003
254  21.17     0.10      0.031       (  0.314)       0.028        0.003
255  21.25     0.10      0.031       (  0.313)       0.028        0.003
256  21.33     0.07      0.020       (  0.312)       0.018        0.002
257  21.42     0.07      0.020       (  0.311)       0.018        0.002
258  21.50     0.07      0.020       (  0.310)       0.018        0.002
259  21.58     0.10      0.031       (  0.308)       0.028        0.003
260  21.67     0.10      0.031       (  0.307)       0.028        0.003
261  21.75     0.10      0.031       (  0.306)       0.028        0.003
262  21.83     0.07      0.020       (  0.305)       0.018        0.002
263  21.92     0.07      0.020       (  0.304)       0.018        0.002
264  22.00     0.07      0.020       (  0.303)       0.018        0.002
265  22.08     0.10      0.031       (  0.302)       0.028        0.003
266  22.17     0.10      0.031       (  0.301)       0.028        0.003
267  22.25     0.10      0.031       (  0.300)       0.028        0.003
268  22.33     0.07      0.020       (  0.299)       0.018        0.002
269  22.42     0.07      0.020       (  0.298)       0.018        0.002
270  22.50     0.07      0.020       (  0.297)       0.018        0.002
271  22.58     0.07      0.020       (  0.297)       0.018        0.002
272  22.67     0.07      0.020       (  0.296)       0.018        0.002
273  22.75     0.07      0.020       (  0.295)       0.018        0.002
274  22.83     0.07      0.020       (  0.294)       0.018        0.002
275  22.92     0.07      0.020       (  0.293)       0.018        0.002
276  23.00     0.07      0.020       (  0.293)       0.018        0.002
277  23.08     0.07      0.020       (  0.292)       0.018        0.002
278  23.17     0.07      0.020       (  0.291)       0.018        0.002
279  23.25     0.07      0.020       (  0.291)       0.018        0.002
280  23.33     0.07      0.020       (  0.290)       0.018        0.002
281  23.42     0.07      0.020       (  0.290)       0.018        0.002
282  23.50     0.07      0.020       (  0.289)       0.018        0.002
283  23.58     0.07      0.020       (  0.289)       0.018        0.002
284  23.67     0.07      0.020       (  0.288)       0.018        0.002
285  23.75     0.07      0.020       (  0.288)       0.018        0.002
286  23.83     0.07      0.020       (  0.287)       0.018        0.002
287  23.92     0.07      0.020       (  0.287)       0.018        0.002
288  24.00     0.07      0.020       (  0.287)       0.018        0.002
                (Loss Rate Not Used)
    Sum =     100.0                                  Sum =     3.1
       Flood volume = Effective rainfall      0.26(In)
        times area     106.3(Ac.)/[(In)/(Ft.)] =       2.3(Ac.Ft)
       Total soil loss =      2.30(In)
       Total soil loss =    20.405(Ac.Ft)
       Total rainfall =      2.56(In)
       Flood volume =       98762.0 Cubic Feet
       Total soil loss =      888857.6 Cubic Feet
       --------------------------------------------------------------------
        Peak flow rate of this hydrograph =      3.581(CFS)
       --------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           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      0.01  Q         |         |         |         |
   0+10       0.0005      0.06  Q         |         |         |         |
   0+15       0.0013      0.12  Q         |         |         |         |
   0+20       0.0023      0.15  Q         |         |         |         |
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 0+25       0.0036      0.19  Q         |         |         |         |
 0+30       0.0053      0.24  Q         |         |         |         |
 0+35       0.0071      0.26  VQ        |         |         |         |
 0+40       0.0090      0.28  VQ        |         |         |         |
 0+45       0.0109      0.29  VQ        |         |         |         |
 0+50       0.0130      0.30  VQ        |         |         |         |
 0+55       0.0153      0.33  VQ        |         |         |         |
 1+ 0       0.0178      0.36  VQ        |         |         |         |
 1+ 5       0.0204      0.38  VQ        |         |         |         |
 1+10       0.0229      0.37  VQ        |         |         |         |
 1+15       0.0253      0.35  VQ        |         |         |         |
 1+20       0.0276      0.34  VQ        |         |         |         |
 1+25       0.0299      0.33  VQ        |         |         |         |
 1+30       0.0322      0.33  VQ        |         |         |         |
 1+35       0.0344      0.33  VQ        |         |         |         |
 1+40       0.0367      0.33  VQ        |         |         |         |
 1+45       0.0390      0.33  VQ        |         |         |         |
 1+50       0.0413      0.34  VQ        |         |         |         |
 1+55       0.0437      0.36  VQ        |         |         |         |
 2+ 0       0.0464      0.39  VQ        |         |         |         |
 2+ 5       0.0492      0.40  VQ        |         |         |         |
 2+10       0.0521      0.41  VQ        |         |         |         |
 2+15       0.0549      0.42  VQ        |         |         |         |
 2+20       0.0579      0.42  |Q        |         |         |         |
 2+25       0.0608      0.43  |Q        |         |         |         |
 2+30       0.0638      0.43  |Q        |         |         |         |
 2+35       0.0668      0.44  |Q        |         |         |         |
 2+40       0.0699      0.46  |Q        |         |         |         |
 2+45       0.0733      0.49  |Q        |         |         |         |
 2+50       0.0768      0.51  |VQ       |         |         |         |
 2+55       0.0804      0.52  |VQ       |         |         |         |
 3+ 0       0.0840      0.52  |VQ       |         |         |         |
 3+ 5       0.0876      0.53  |VQ       |         |         |         |
 3+10       0.0913      0.53  |VQ       |         |         |         |
 3+15       0.0950      0.54  |VQ       |         |         |         |
 3+20       0.0987      0.54  |VQ       |         |         |         |
 3+25       0.1024      0.54  |VQ       |         |         |         |
 3+30       0.1061      0.54  |VQ       |         |         |         |
 3+35       0.1099      0.54  |VQ       |         |         |         |
 3+40       0.1136      0.54  | Q       |         |         |         |
 3+45       0.1174      0.54  | Q       |         |         |         |
 3+50       0.1212      0.55  | Q       |         |         |         |
 3+55       0.1251      0.57  | Q       |         |         |         |
 4+ 0       0.1293      0.60  | Q       |         |         |         |
 4+ 5       0.1336      0.62  | Q       |         |         |         |
 4+10       0.1379      0.63  | Q       |         |         |         |
 4+15       0.1423      0.64  | Q       |         |         |         |
 4+20       0.1467      0.65  | Q       |         |         |         |
 4+25       0.1514      0.67  | Q       |         |         |         |
 4+30       0.1562      0.71  | Q       |         |         |         |
 4+35       0.1612      0.72  | Q       |         |         |         |
 4+40       0.1663      0.73  | Q       |         |         |         |
 4+45       0.1714      0.74  | QV      |         |         |         |
 4+50       0.1765      0.75  |  Q      |         |         |         |
 4+55       0.1819      0.78  |  Q      |         |         |         |
 5+ 0       0.1875      0.81  |  Q      |         |         |         |
 5+ 5       0.1931      0.82  |  Q      |         |         |         |
 5+10       0.1985      0.79  |  Q      |         |         |         |
 5+15       0.2036      0.73  | QV      |         |         |         |
 5+20       0.2085      0.71  | QV      |         |         |         |
 5+25       0.2134      0.72  | QV      |         |         |         |
 5+30       0.2185      0.74  | QV      |         |         |         |
```

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 5+35       0.2238      0.76  |  Q      |         |         |         |
 5+40       0.2292      0.78  |  QV     |         |         |         |
 5+45       0.2348      0.82  |  QV     |         |         |         |
 5+50       0.2406      0.84  |  QV     |         |         |         |
 5+55       0.2464      0.85  |  QV     |         |         |         |
 6+ 0       0.2523      0.85  |  QV     |         |         |         |
 6+ 5       0.2582      0.87  |  QV     |         |         |         |
 6+10       0.2644      0.89  |  QV     |         |         |         |
 6+15       0.2707      0.92  |  QV     |         |         |         |
 6+20       0.2772      0.94  |  QV     |         |         |         |
 6+25       0.2838      0.95  |  Q V    |         |         |         |
 6+30       0.2904      0.96  |  Q V    |         |         |         |
 6+35       0.2971      0.97  |  Q V    |         |         |         |
 6+40       0.3040      1.00  |  Q V    |         |         |         |
 6+45       0.3111      1.03  |   QV    |         |         |         |
 6+50       0.3183      1.05  |   QV    |         |         |         |
 6+55       0.3256      1.06  |   QV    |         |         |         |
 7+ 0       0.3329      1.07  |   QV    |         |         |         |
 7+ 5       0.3403      1.07  |   Q V   |         |         |         |
 7+10       0.3477      1.08  |   Q V   |         |         |         |
 7+15       0.3552      1.08  |   Q V   |         |         |         |
 7+20       0.3627      1.09  |   Q V   |         |         |         |
 7+25       0.3704      1.11  |   Q V   |         |         |         |
 7+30       0.3783      1.15  |   Q V   |         |         |         |
 7+35       0.3863      1.17  |   Q V   |         |         |         |
 7+40       0.3946      1.20  |   Q V   |         |         |         |
 7+45       0.4031      1.24  |   Q  V  |         |         |         |
 7+50       0.4118      1.27  |    Q V  |         |         |         |
 7+55       0.4208      1.30  |    Q V  |         |         |         |
 8+ 0       0.4300      1.34  |    Q V  |         |         |         |
 8+ 5       0.4395      1.37  |    Q V  |         |         |         |
 8+10       0.4494      1.43  |    Q V  |         |         |         |
 8+15       0.4597      1.50  |     Q V |         |         |         |
 8+20       0.4703      1.54  |     Q V |         |         |         |
 8+25       0.4811      1.57  |     Q V |         |         |         |
 8+30       0.4920      1.58  |     Q V |         |         |         |
 8+35       0.5031      1.60  |     Q V |         |         |         |
 8+40       0.5143      1.63  |     Q  V|         |         |         |
 8+45       0.5258      1.67  |     Q  V|         |         |         |
 8+50       0.5375      1.70  |     Q  V|         |         |         |
 8+55       0.5494      1.73  |     Q  V|         |         |         |
 9+ 0       0.5616      1.77  |      Q V|         |         |         |
 9+ 5       0.5741      1.81  |      Q  V         |         |         |
 9+10       0.5869      1.87  |      Q  V         |         |         |
 9+15       0.6003      1.94  |      Q  V         |         |         |
 9+20       0.6139      1.98  |      Q  V         |         |         |
 9+25       0.6279      2.03  |       Q |V        |         |         |
 9+30       0.6422      2.08  |       Q |V        |         |         |
 9+35       0.6568      2.11  |       Q |V        |         |         |
 9+40       0.6716      2.15  |       Q |V        |         |         |
 9+45       0.6868      2.20  |       Q | V       |         |         |
 9+50       0.7021      2.23  |       Q | V       |         |         |
 9+55       0.7177      2.27  |        Q| V       |         |         |
10+ 0       0.7337      2.31  |        Q| V       |         |         |
10+ 5       0.7495      2.30  |        Q|  V      |         |         |
10+10       0.7644      2.16  |       Q |  V      |         |         |
10+15       0.7778      1.96  |      Q  |  V      |         |         |
10+20       0.7906      1.86  |      Q  |  V      |         |         |
10+25       0.8030      1.80  |      Q  |   V     |         |         |
10+30       0.8152      1.77  |      Q  |   V     |         |         |
10+35       0.8274      1.77  |      Q  |   V     |         |         |
10+40       0.8402      1.86  |      Q  |   V     |         |         |
```

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10+45       0.8539      2.00  |      Q  |    V    |         |         |
10+50       0.8682      2.07  |       Q |    V    |         |         |
10+55       0.8826      2.10  |       Q |    V    |         |         |
11+ 0       0.8973      2.13  |       Q |    V    |         |         |
11+ 5       0.9121      2.14  |       Q |     V   |         |         |
11+10       0.9267      2.13  |       Q |     V   |         |         |
11+15       0.9412      2.11  |       Q |     V   |         |         |
11+20       0.9557      2.10  |       Q |     V   |         |         |
11+25       0.9701      2.09  |       Q |      V  |         |         |
11+30       0.9845      2.09  |       Q |      V  |         |         |
11+35       0.9987      2.07  |       Q |      V  |         |         |
11+40       1.0127      2.03  |       Q |      V  |         |         |
11+45       1.0263      1.97  |      Q  |       V |         |         |
11+50       1.0396      1.94  |      Q  |       V |         |         |
11+55       1.0530      1.94  |      Q  |       V |         |         |
12+ 0       1.0665      1.96  |      Q  |       V |         |         |
12+ 5       1.0803      2.01  |       Q |        V|         |         |
12+10       1.0952      2.16  |       Q |        V|         |         |
12+15       1.1116      2.38  |        Q|        V|         |         |
12+20       1.1289      2.50  |        Q|        V|         |         |
12+25       1.1467      2.59  |         Q         V         |         |
12+30       1.1650      2.66  |         Q         V         |         |
12+35       1.1837      2.72  |         Q         V         |         |
12+40       1.2029      2.79  |         |Q        |V        |         |
12+45       1.2227      2.88  |         |Q        |V        |         |
12+50       1.2429      2.93  |         |Q        |V        |         |
12+55       1.2634      2.98  |         |Q        | V       |         |
13+ 0       1.2843      3.03  |         | Q       | V       |         |
13+ 5       1.3056      3.09  |         | Q       |  V      |         |
13+10       1.3278      3.23  |         | Q       |  V      |         |
13+15       1.3512      3.40  |         |  Q      |  V      |         |
13+20       1.3752      3.49  |         |  Q      |   V     |         |
13+25       1.3996      3.54  |         |   Q     |   V     |         |
13+30       1.4243      3.58  |         |   Q     |    V    |         |
13+35       1.4488      3.55  |         |   Q     |    V    |         |
13+40       1.4717      3.33  |         |  Q      |    V    |         |
13+45       1.4924      3.01  |         | Q       |     V   |         |
13+50       1.5121      2.86  |         |Q        |     V   |         |
13+55       1.5312      2.77  |         |Q        |      V  |         |
14+ 0       1.5499      2.71  |         Q         |      V  |         |
14+ 5       1.5684      2.69  |         Q         |      V  |         |
14+10       1.5873      2.75  |         Q         |       V |         |
14+15       1.6070      2.85  |         |Q        |       V |         |
14+20       1.6269      2.89  |         |Q        |       V |         |
14+25       1.6469      2.90  |         |Q        |        V|         |
14+30       1.6667      2.88  |         |Q        |        V|         |
14+35       1.6865      2.88  |         |Q        |        V|         |
14+40       1.7063      2.87  |         |Q        |         V         |
14+45       1.7261      2.87  |         |Q        |         V         |
14+50       1.7458      2.86  |         |Q        |         V         |
14+55       1.7653      2.84  |         |Q        |         |V        |
15+ 0       1.7846      2.80  |         |Q        |         |V        |
15+ 5       1.8038      2.78  |         |Q        |         |V        |
15+10       1.8227      2.75  |         Q         |         | V       |
15+15       1.8413      2.71  |         Q         |         | V       |
15+20       1.8598      2.68  |         Q         |         | V       |
15+25       1.8780      2.64  |         Q         |         |  V      |
15+30       1.8959      2.60  |         Q         |         |  V      |
15+35       1.9135      2.56  |         Q         |         |  V      |
15+40       1.9305      2.46  |        Q|         |         |   V     |
15+45       1.9465      2.33  |        Q|         |         |   V     |
15+50       1.9620      2.26  |        Q|         |         |   V     |
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15+55       1.9773      2.22  |       Q |         |         |   V     |
16+ 0       1.9924      2.19  |       Q |         |         |    V    |
16+ 5       2.0068      2.09  |       Q |         |         |    V    |
16+10       2.0188      1.74  |     Q   |         |         |    V    |
16+15       2.0275      1.26  |    Q    |         |         |    V    |
16+20       2.0345      1.02  |   Q     |         |         |    V    |
16+25       2.0406      0.89  |  Q      |         |         |     V   |
16+30       2.0461      0.79  |  Q      |         |         |     V   |
16+35       2.0509      0.71  | Q       |         |         |     V   |
16+40       2.0553      0.63  | Q       |         |         |     V   |
16+45       2.0592      0.56  | Q       |         |         |     V   |
16+50       2.0627      0.52  | Q       |         |         |     V   |
16+55       2.0660      0.48  |Q        |         |         |     V   |
17+ 0       2.0692      0.46  |Q        |         |         |     V   |
17+ 5       2.0723      0.45  |Q        |         |         |     V   |
17+10       2.0756      0.47  |Q        |         |         |     V   |
17+15       2.0791      0.52  | Q       |         |         |     V   |
17+20       2.0828      0.54  | Q       |         |         |     V   |
17+25       2.0866      0.54  | Q       |         |         |     V   |
17+30       2.0904      0.55  | Q       |         |         |     V   |
17+35       2.0941      0.55  | Q       |         |         |     V   |
17+40       2.0979      0.55  | Q       |         |         |      V  |
17+45       2.1017      0.55  | Q       |         |         |      V  |
17+50       2.1054      0.54  | Q       |         |         |      V  |
17+55       2.1089      0.51  | Q       |         |         |      V  |
18+ 0       2.1122      0.48  |Q        |         |         |      V  |
18+ 5       2.1154      0.47  |Q        |         |         |      V  |
18+10       2.1185      0.46  |Q        |         |         |      V  |
18+15       2.1217      0.45  |Q        |         |         |      V  |
18+20       2.1248      0.45  |Q        |         |         |      V  |
18+25       2.1278      0.45  |Q        |         |         |      V  |
18+30       2.1309      0.45  |Q        |         |         |      V  |
18+35       2.1339      0.44  |Q        |         |         |      V  |
18+40       2.1368      0.42  |Q        |         |         |      V  |
18+45       2.1394      0.39  |Q        |         |         |      V  |
18+50       2.1420      0.36  |Q        |         |         |      V  |
18+55       2.1442      0.33  |Q        |         |         |      V  |
19+ 0       2.1463      0.30  |Q        |         |         |      V  |
19+ 5       2.1482      0.28  |Q        |         |         |      V  |
19+10       2.1502      0.29  |Q        |         |         |      V  |
19+15       2.1524      0.31  |Q        |         |         |      V  |
19+20       2.1546      0.33  |Q        |         |         |       V |
19+25       2.1570      0.35  |Q        |         |         |       V |
19+30       2.1597      0.38  |Q        |         |         |       V |
19+35       2.1624      0.40  |Q        |         |         |       V |
19+40       2.1651      0.38  |Q        |         |         |       V |
19+45       2.1675      0.36  |Q        |         |         |       V |
19+50       2.1699      0.34  |Q        |         |         |       V |
19+55       2.1721      0.32  |Q        |         |         |       V |
20+ 0       2.1740      0.28  |Q        |         |         |       V |
20+ 5       2.1758      0.27  |Q        |         |         |       V |
20+10       2.1778      0.28  |Q        |         |         |       V |
20+15       2.1798      0.30  |Q        |         |         |       V |
20+20       2.1820      0.31  |Q        |         |         |       V |
20+25       2.1842      0.32  |Q        |         |         |       V |
20+30       2.1864      0.32  |Q        |         |         |       V |
20+35       2.1886      0.32  |Q        |         |         |       V |
20+40       2.1908      0.32  |Q        |         |         |       V |
20+45       2.1931      0.33  |Q        |         |         |       V |
20+50       2.1953      0.32  |Q        |         |         |       V |
20+55       2.1974      0.30  |Q        |         |         |       V |
21+ 0       2.1992      0.27  |Q        |         |         |       V |
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  21+ 5      2.2010     0.26  |Q        |         |         |       V |
  21+10      2.2029     0.27  |Q        |         |         |       V |
  21+15      2.2049     0.30  |Q        |         |         |       V |
  21+20      2.2070     0.30  |Q        |         |         |       V |
  21+25      2.2090     0.29  |Q        |         |         |       V |
  21+30      2.2108     0.26  |Q        |         |         |        V|
  21+35      2.2125     0.25  |Q        |         |         |        V|
  21+40      2.2144     0.27  |Q        |         |         |        V|
  21+45      2.2164     0.29  |Q        |         |         |        V|
  21+50      2.2185     0.30  |Q        |         |         |        V|
  21+55      2.2204     0.28  |Q        |         |         |        V|
  22+ 0      2.2222     0.26  |Q        |         |         |        V|
  22+ 5      2.2239     0.25  |Q        |         |         |        V|
  22+10      2.2258     0.27  |Q        |         |         |        V|
  22+15      2.2278     0.29  |Q        |         |         |        V|
  22+20      2.2298     0.30  |Q        |         |         |        V|
  22+25      2.2318     0.28  |Q        |         |         |        V|
  22+30      2.2336     0.26  |Q        |         |         |        V|
  22+35      2.2352     0.24  Q         |         |         |        V|
  22+40      2.2369     0.24  Q         |         |         |        V|
  22+45      2.2385     0.23  Q         |         |         |        V|
  22+50      2.2401     0.23  Q         |         |         |        V|
  22+55      2.2417     0.23  Q         |         |         |        V|
  23+ 0      2.2432     0.23  Q         |         |         |        V|
  23+ 5      2.2448     0.22  Q         |         |         |        V|
  23+10      2.2463     0.22  Q         |         |         |        V|
  23+15      2.2478     0.22  Q         |         |         |        V|
  23+20      2.2494     0.22  Q         |         |         |        V|
  23+25      2.2509     0.22  Q         |         |         |        V|
  23+30      2.2524     0.22  Q         |         |         |        V|
  23+35      2.2540     0.22  Q         |         |         |        V|
  23+40      2.2555     0.22  Q         |         |         |        V|
  23+45      2.2570     0.22  Q         |         |         |        V|
  23+50      2.2585     0.22  Q         |         |         |        V|
  23+55      2.2601     0.22  Q         |         |         |        V|
  24+ 0      2.2616     0.22  Q         |         |         |        V|
  24+ 5      2.2630     0.21  Q         |         |         |        V|
  24+10      2.2641     0.16  Q         |         |         |        V|
  24+15      2.2648     0.10  Q         |         |         |        V|
  24+20      2.2653     0.07  Q         |         |         |        V|
  24+25      2.2657     0.05  Q         |         |         |        V|
  24+30      2.2660     0.04  Q         |         |         |        V|
  24+35      2.2662     0.03  Q         |         |         |        V|
  24+40      2.2664     0.03  Q         |         |         |        V|
  24+45      2.2666     0.02  Q         |         |         |        V|
  24+50      2.2667     0.02  Q         |         |         |        V|
  24+55      2.2668     0.02  Q         |         |         |        V|
  25+ 0      2.2669     0.01  Q         |         |         |        V|
  25+ 5      2.2670     0.01  Q         |         |         |        V|
  25+10      2.2670     0.01  Q         |         |         |        V|
  25+15      2.2671     0.01  Q         |         |         |        V|
  25+20      2.2671     0.01  Q         |         |         |        V|
  25+25      2.2672     0.01  Q         |         |         |        V|
  25+30      2.2672     0.00  Q         |         |         |        V|
  25+35      2.2672     0.00  Q         |         |         |        V|
  25+40      2.2672     0.00  Q         |         |         |        V|
  25+45      2.2673     0.00  Q         |         |         |        V|
  25+50      2.2673     0.00  Q         |         |         |         V
-----------------------------------------------------------------------
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        U n i t   H y d r o g r a p h   A n a l y s i s

        Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018, Version 9.0
                Study date  08/26/24 File: da200fex242.out

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------------------------------------------------------------------------

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


Program License Serial Number 6443

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

 English Units used in output format



---------------------------------------------------------------------
Fairway Canyon Existing Conditions
DA-200 2yr
Kimley-Horn

--------------------------------------------------------------------
Drainage Area =       9.52(Ac.)  =      0.015 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       9.52(Ac.)  =      0.015 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.190 Hr.
Lag time =    11.40 Min.
25% of lag time =     2.85 Min.
40% of lag time =     4.56 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]
        9.52            2.56                   24.37

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        9.52            6.25                   59.50

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    2.560(In)
Area Averaged 100-Year Rainfall =    6.250(In)

Point rain (area averaged) =    2.560(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    2.560(In)

Sub-Area Data:
```

Area(Ac.) Runoff Index Impervious %

Area(Ac.)	Runoff Index	Impervious %
9.520	69.00	0.000

Total Area Entered = 9.52(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
69.0	49.8	0.574	0.000	0.574	1.000	0.574
					Sum (F) =	0.574

Area averaged mean soil loss (F) (In/Hr) = 0.574
Minimum soil loss rate ((In/Hr)) = 0.287
(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

Combination of 'S' Curves:
VALLEY 'S' Curve Percentage = 0.00
FOOTHILL 'S' Curve Percentage = 50.00
MOUNTAIN 'S' Curve Percentage = 50.00
DESERT 'S' Curve Percentage = 0.00

Unit Hydrograph Data

Unit time period	(hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	43.860	4.957	0.476
2	0.167	87.719	20.147	1.933
3	0.250	131.579	28.120	2.698
4	0.333	175.439	14.114	1.354
5	0.417	219.298	7.923	0.760
6	0.500	263.158	5.611	0.538
7	0.583	307.018	4.109	0.394
8	0.667	350.877	3.039	0.292
9	0.750	394.737	2.204	0.211
10	0.833	438.596	1.573	0.151
11	0.917	482.456	1.164	0.112
12	1.000	526.316	1.052	0.101
13	1.083	570.175	0.854	0.082
14	1.167	614.035	0.824	0.079
15	1.250	657.895	0.697	0.067
16	1.333	701.754	0.620	0.059
17	1.417	745.614	0.479	0.046
18	1.500	789.474	0.421	0.040
19	1.583	833.333	0.395	0.038
20	1.667	877.193	0.395	0.038
21	1.750	921.053	0.395	0.038
22	1.833	964.912	0.395	0.038
23	1.917	1008.772	0.513	0.049
			Sum = 100.000	Sum= 9.594

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(1.017)	0.018	0.002
2	0.17	0.07	0.020	(1.014)	0.018	0.002
3	0.25	0.07	0.020	(1.010)	0.018	0.002

4	0.33	0.10	0.031	(1.006)	0.028	0.003
5	0.42	0.10	0.031	(1.002)	0.028	0.003
6	0.50	0.10	0.031	(0.998)	0.028	0.003
7	0.58	0.10	0.031	(0.994)	0.028	0.003
8	0.67	0.10	0.031	(0.990)	0.028	0.003
9	0.75	0.10	0.031	(0.986)	0.028	0.003
10	0.83	0.13	0.041	(0.982)	0.037	0.004
11	0.92	0.13	0.041	(0.978)	0.037	0.004
12	1.00	0.13	0.041	(0.975)	0.037	0.004
13	1.08	0.10	0.031	(0.971)	0.028	0.003
14	1.17	0.10	0.031	(0.967)	0.028	0.003
15	1.25	0.10	0.031	(0.963)	0.028	0.003
16	1.33	0.10	0.031	(0.959)	0.028	0.003
17	1.42	0.10	0.031	(0.955)	0.028	0.003
18	1.50	0.10	0.031	(0.952)	0.028	0.003
19	1.58	0.10	0.031	(0.948)	0.028	0.003
20	1.67	0.10	0.031	(0.944)	0.028	0.003
21	1.75	0.10	0.031	(0.940)	0.028	0.003
22	1.83	0.13	0.041	(0.936)	0.037	0.004
23	1.92	0.13	0.041	(0.933)	0.037	0.004
24	2.00	0.13	0.041	(0.929)	0.037	0.004
25	2.08	0.13	0.041	(0.925)	0.037	0.004
26	2.17	0.13	0.041	(0.921)	0.037	0.004
27	2.25	0.13	0.041	(0.918)	0.037	0.004
28	2.33	0.13	0.041	(0.914)	0.037	0.004
29	2.42	0.13	0.041	(0.910)	0.037	0.004
30	2.50	0.13	0.041	(0.906)	0.037	0.004
31	2.58	0.17	0.051	(0.903)	0.046	0.005
32	2.67	0.17	0.051	(0.899)	0.046	0.005
33	2.75	0.17	0.051	(0.895)	0.046	0.005
34	2.83	0.17	0.051	(0.892)	0.046	0.005
35	2.92	0.17	0.051	(0.888)	0.046	0.005
36	3.00	0.17	0.051	(0.884)	0.046	0.005
37	3.08	0.17	0.051	(0.881)	0.046	0.005
38	3.17	0.17	0.051	(0.877)	0.046	0.005
39	3.25	0.17	0.051	(0.873)	0.046	0.005
40	3.33	0.17	0.051	(0.870)	0.046	0.005
41	3.42	0.17	0.051	(0.866)	0.046	0.005
42	3.50	0.17	0.051	(0.862)	0.046	0.005
43	3.58	0.17	0.051	(0.859)	0.046	0.005
44	3.67	0.17	0.051	(0.855)	0.046	0.005
45	3.75	0.17	0.051	(0.852)	0.046	0.005
46	3.83	0.20	0.061	(0.848)	0.055	0.006
47	3.92	0.20	0.061	(0.844)	0.055	0.006
48	4.00	0.20	0.061	(0.841)	0.055	0.006
49	4.08	0.20	0.061	(0.837)	0.055	0.006
50	4.17	0.20	0.061	(0.834)	0.055	0.006
51	4.25	0.20	0.061	(0.830)	0.055	0.006
52	4.33	0.23	0.072	(0.827)	0.065	0.007
53	4.42	0.23	0.072	(0.823)	0.065	0.007
54	4.50	0.23	0.072	(0.820)	0.065	0.007
55	4.58	0.23	0.072	(0.816)	0.065	0.007
56	4.67	0.23	0.072	(0.813)	0.065	0.007
57	4.75	0.23	0.072	(0.809)	0.065	0.007
58	4.83	0.27	0.082	(0.806)	0.074	0.008
59	4.92	0.27	0.082	(0.802)	0.074	0.008
60	5.00	0.27	0.082	(0.799)	0.074	0.008
61	5.08	0.20	0.061	(0.795)	0.055	0.006
62	5.17	0.20	0.061	(0.792)	0.055	0.006
63	5.25	0.20	0.061	(0.788)	0.055	0.006
64	5.33	0.23	0.072	(0.785)	0.065	0.007
65	5.42	0.23	0.072	(0.781)	0.065	0.007

66	5.50	0.23	0.072	(0.778)	0.065	0.007
67	5.58	0.27	0.082	(0.775)	0.074	0.008
68	5.67	0.27	0.082	(0.771)	0.074	0.008
69	5.75	0.27	0.082	(0.768)	0.074	0.008
70	5.83	0.27	0.082	(0.764)	0.074	0.008
71	5.92	0.27	0.082	(0.761)	0.074	0.008
72	6.00	0.27	0.082	(0.758)	0.074	0.008
73	6.08	0.30	0.092	(0.754)	0.083	0.009
74	6.17	0.30	0.092	(0.751)	0.083	0.009
75	6.25	0.30	0.092	(0.748)	0.083	0.009
76	6.33	0.30	0.092	(0.744)	0.083	0.009
77	6.42	0.30	0.092	(0.741)	0.083	0.009
78	6.50	0.30	0.092	(0.738)	0.083	0.009
79	6.58	0.33	0.102	(0.734)	0.092	0.010
80	6.67	0.33	0.102	(0.731)	0.092	0.010
81	6.75	0.33	0.102	(0.728)	0.092	0.010
82	6.83	0.33	0.102	(0.724)	0.092	0.010
83	6.92	0.33	0.102	(0.721)	0.092	0.010
84	7.00	0.33	0.102	(0.718)	0.092	0.010
85	7.08	0.33	0.102	(0.715)	0.092	0.010
86	7.17	0.33	0.102	(0.711)	0.092	0.010
87	7.25	0.33	0.102	(0.708)	0.092	0.010
88	7.33	0.37	0.113	(0.705)	0.101	0.011
89	7.42	0.37	0.113	(0.702)	0.101	0.011
90	7.50	0.37	0.113	(0.698)	0.101	0.011
91	7.58	0.40	0.123	(0.695)	0.111	0.012
92	7.67	0.40	0.123	(0.692)	0.111	0.012
93	7.75	0.40	0.123	(0.689)	0.111	0.012
94	7.83	0.43	0.133	(0.686)	0.120	0.013
95	7.92	0.43	0.133	(0.682)	0.120	0.013
96	8.00	0.43	0.133	(0.679)	0.120	0.013
97	8.08	0.50	0.154	(0.676)	0.138	0.015
98	8.17	0.50	0.154	(0.673)	0.138	0.015
99	8.25	0.50	0.154	(0.670)	0.138	0.015
100	8.33	0.50	0.154	(0.667)	0.138	0.015
101	8.42	0.50	0.154	(0.664)	0.138	0.015
102	8.50	0.50	0.154	(0.660)	0.138	0.015
103	8.58	0.53	0.164	(0.657)	0.147	0.016
104	8.67	0.53	0.164	(0.654)	0.147	0.016
105	8.75	0.53	0.164	(0.651)	0.147	0.016
106	8.83	0.57	0.174	(0.648)	0.157	0.017
107	8.92	0.57	0.174	(0.645)	0.157	0.017
108	9.00	0.57	0.174	(0.642)	0.157	0.017
109	9.08	0.63	0.195	(0.639)	0.175	0.019
110	9.17	0.63	0.195	(0.636)	0.175	0.019
111	9.25	0.63	0.195	(0.633)	0.175	0.019
112	9.33	0.67	0.205	(0.630)	0.184	0.020
113	9.42	0.67	0.205	(0.627)	0.184	0.020
114	9.50	0.67	0.205	(0.624)	0.184	0.020
115	9.58	0.70	0.215	(0.621)	0.194	0.022
116	9.67	0.70	0.215	(0.618)	0.194	0.022
117	9.75	0.70	0.215	(0.615)	0.194	0.022
118	9.83	0.73	0.225	(0.612)	0.203	0.023
119	9.92	0.73	0.225	(0.609)	0.203	0.023
120	10.00	0.73	0.225	(0.606)	0.203	0.023
121	10.08	0.50	0.154	(0.603)	0.138	0.015
122	10.17	0.50	0.154	(0.600)	0.138	0.015
123	10.25	0.50	0.154	(0.597)	0.138	0.015
124	10.33	0.50	0.154	(0.594)	0.138	0.015
125	10.42	0.50	0.154	(0.592)	0.138	0.015
126	10.50	0.50	0.154	(0.589)	0.138	0.015
127	10.58	0.67	0.205	(0.586)	0.184	0.020

128	10.67	0.67	0.205	(0.583)	0.184	0.020
129	10.75	0.67	0.205	(0.580)	0.184	0.020
130	10.83	0.67	0.205	(0.577)	0.184	0.020
131	10.92	0.67	0.205	(0.574)	0.184	0.020
132	11.00	0.67	0.205	(0.572)	0.184	0.020
133	11.08	0.63	0.195	(0.569)	0.175	0.019
134	11.17	0.63	0.195	(0.566)	0.175	0.019
135	11.25	0.63	0.195	(0.563)	0.175	0.019
136	11.33	0.63	0.195	(0.560)	0.175	0.019
137	11.42	0.63	0.195	(0.558)	0.175	0.019
138	11.50	0.63	0.195	(0.555)	0.175	0.019
139	11.58	0.57	0.174	(0.552)	0.157	0.017
140	11.67	0.57	0.174	(0.549)	0.157	0.017
141	11.75	0.57	0.174	(0.547)	0.157	0.017
142	11.83	0.60	0.184	(0.544)	0.166	0.018
143	11.92	0.60	0.184	(0.541)	0.166	0.018
144	12.00	0.60	0.184	(0.538)	0.166	0.018
145	12.08	0.83	0.256	(0.536)	0.230	0.026
146	12.17	0.83	0.256	(0.533)	0.230	0.026
147	12.25	0.83	0.256	(0.530)	0.230	0.026
148	12.33	0.87	0.266	(0.528)	0.240	0.027
149	12.42	0.87	0.266	(0.525)	0.240	0.027
150	12.50	0.87	0.266	(0.522)	0.240	0.027
151	12.58	0.93	0.287	(0.520)	0.258	0.029
152	12.67	0.93	0.287	(0.517)	0.258	0.029
153	12.75	0.93	0.287	(0.515)	0.258	0.029
154	12.83	0.97	0.297	(0.512)	0.267	0.030
155	12.92	0.97	0.297	(0.509)	0.267	0.030
156	13.00	0.97	0.297	(0.507)	0.267	0.030
157	13.08	1.13	0.348	(0.504)	0.313	0.035
158	13.17	1.13	0.348	(0.502)	0.313	0.035
159	13.25	1.13	0.348	(0.499)	0.313	0.035
160	13.33	1.13	0.348	(0.497)	0.313	0.035
161	13.42	1.13	0.348	(0.494)	0.313	0.035
162	13.50	1.13	0.348	(0.492)	0.313	0.035
163	13.58	0.77	0.236	(0.489)	0.212	0.024
164	13.67	0.77	0.236	(0.487)	0.212	0.024
165	13.75	0.77	0.236	(0.484)	0.212	0.024
166	13.83	0.77	0.236	(0.482)	0.212	0.024
167	13.92	0.77	0.236	(0.479)	0.212	0.024
168	14.00	0.77	0.236	(0.477)	0.212	0.024
169	14.08	0.90	0.276	(0.474)	0.249	0.028
170	14.17	0.90	0.276	(0.472)	0.249	0.028
171	14.25	0.90	0.276	(0.469)	0.249	0.028
172	14.33	0.87	0.266	(0.467)	0.240	0.027
173	14.42	0.87	0.266	(0.465)	0.240	0.027
174	14.50	0.87	0.266	(0.462)	0.240	0.027
175	14.58	0.87	0.266	(0.460)	0.240	0.027
176	14.67	0.87	0.266	(0.458)	0.240	0.027
177	14.75	0.87	0.266	(0.455)	0.240	0.027
178	14.83	0.83	0.256	(0.453)	0.230	0.026
179	14.92	0.83	0.256	(0.451)	0.230	0.026
180	15.00	0.83	0.256	(0.448)	0.230	0.026
181	15.08	0.80	0.246	(0.446)	0.221	0.025
182	15.17	0.80	0.246	(0.444)	0.221	0.025
183	15.25	0.80	0.246	(0.441)	0.221	0.025
184	15.33	0.77	0.236	(0.439)	0.212	0.024
185	15.42	0.77	0.236	(0.437)	0.212	0.024
186	15.50	0.77	0.236	(0.435)	0.212	0.024
187	15.58	0.63	0.195	(0.432)	0.175	0.019
188	15.67	0.63	0.195	(0.430)	0.175	0.019
189	15.75	0.63	0.195	(0.428)	0.175	0.019

190	15.83	0.63	0.195	(0.426)	0.175	0.019
191	15.92	0.63	0.195	(0.424)	0.175	0.019
192	16.00	0.63	0.195	(0.421)	0.175	0.019
193	16.08	0.13	0.041	(0.419)	0.037	0.004
194	16.17	0.13	0.041	(0.417)	0.037	0.004
195	16.25	0.13	0.041	(0.415)	0.037	0.004
196	16.33	0.13	0.041	(0.413)	0.037	0.004
197	16.42	0.13	0.041	(0.411)	0.037	0.004
198	16.50	0.13	0.041	(0.409)	0.037	0.004
199	16.58	0.10	0.031	(0.407)	0.028	0.003
200	16.67	0.10	0.031	(0.405)	0.028	0.003
201	16.75	0.10	0.031	(0.403)	0.028	0.003
202	16.83	0.10	0.031	(0.401)	0.028	0.003
203	16.92	0.10	0.031	(0.398)	0.028	0.003
204	17.00	0.10	0.031	(0.396)	0.028	0.003
205	17.08	0.17	0.051	(0.394)	0.046	0.005
206	17.17	0.17	0.051	(0.392)	0.046	0.005
207	17.25	0.17	0.051	(0.390)	0.046	0.005
208	17.33	0.17	0.051	(0.389)	0.046	0.005
209	17.42	0.17	0.051	(0.387)	0.046	0.005
210	17.50	0.17	0.051	(0.385)	0.046	0.005
211	17.58	0.17	0.051	(0.383)	0.046	0.005
212	17.67	0.17	0.051	(0.381)	0.046	0.005
213	17.75	0.17	0.051	(0.379)	0.046	0.005
214	17.83	0.13	0.041	(0.377)	0.037	0.004
215	17.92	0.13	0.041	(0.375)	0.037	0.004
216	18.00	0.13	0.041	(0.373)	0.037	0.004
217	18.08	0.13	0.041	(0.371)	0.037	0.004
218	18.17	0.13	0.041	(0.370)	0.037	0.004
219	18.25	0.13	0.041	(0.368)	0.037	0.004
220	18.33	0.13	0.041	(0.366)	0.037	0.004
221	18.42	0.13	0.041	(0.364)	0.037	0.004
222	18.50	0.13	0.041	(0.363)	0.037	0.004
223	18.58	0.10	0.031	(0.361)	0.028	0.003
224	18.67	0.10	0.031	(0.359)	0.028	0.003
225	18.75	0.10	0.031	(0.357)	0.028	0.003
226	18.83	0.07	0.020	(0.356)	0.018	0.002
227	18.92	0.07	0.020	(0.354)	0.018	0.002
228	19.00	0.07	0.020	(0.352)	0.018	0.002
229	19.08	0.10	0.031	(0.351)	0.028	0.003
230	19.17	0.10	0.031	(0.349)	0.028	0.003
231	19.25	0.10	0.031	(0.347)	0.028	0.003
232	19.33	0.13	0.041	(0.346)	0.037	0.004
233	19.42	0.13	0.041	(0.344)	0.037	0.004
234	19.50	0.13	0.041	(0.342)	0.037	0.004
235	19.58	0.10	0.031	(0.341)	0.028	0.003
236	19.67	0.10	0.031	(0.339)	0.028	0.003
237	19.75	0.10	0.031	(0.338)	0.028	0.003
238	19.83	0.07	0.020	(0.336)	0.018	0.002
239	19.92	0.07	0.020	(0.335)	0.018	0.002
240	20.00	0.07	0.020	(0.333)	0.018	0.002
241	20.08	0.10	0.031	(0.332)	0.028	0.003
242	20.17	0.10	0.031	(0.330)	0.028	0.003
243	20.25	0.10	0.031	(0.329)	0.028	0.003
244	20.33	0.10	0.031	(0.328)	0.028	0.003
245	20.42	0.10	0.031	(0.326)	0.028	0.003
246	20.50	0.10	0.031	(0.325)	0.028	0.003
247	20.58	0.10	0.031	(0.323)	0.028	0.003
248	20.67	0.10	0.031	(0.322)	0.028	0.003
249	20.75	0.10	0.031	(0.321)	0.028	0.003
250	20.83	0.07	0.020	(0.319)	0.018	0.002
251	20.92	0.07	0.020	(0.318)	0.018	0.002

252	21.00	0.07	0.020	(0.317)	0.018	0.002
253	21.08	0.10	0.031	(0.316)	0.028	0.003
254	21.17	0.10	0.031	(0.314)	0.028	0.003
255	21.25	0.10	0.031	(0.313)	0.028	0.003
256	21.33	0.07	0.020	(0.312)	0.018	0.002
257	21.42	0.07	0.020	(0.311)	0.018	0.002
258	21.50	0.07	0.020	(0.310)	0.018	0.002
259	21.58	0.10	0.031	(0.308)	0.028	0.003
260	21.67	0.10	0.031	(0.307)	0.028	0.003
261	21.75	0.10	0.031	(0.306)	0.028	0.003
262	21.83	0.07	0.020	(0.305)	0.018	0.002
263	21.92	0.07	0.020	(0.304)	0.018	0.002
264	22.00	0.07	0.020	(0.303)	0.018	0.002
265	22.08	0.10	0.031	(0.302)	0.028	0.003
266	22.17	0.10	0.031	(0.301)	0.028	0.003
267	22.25	0.10	0.031	(0.300)	0.028	0.003
268	22.33	0.07	0.020	(0.299)	0.018	0.002
269	22.42	0.07	0.020	(0.298)	0.018	0.002
270	22.50	0.07	0.020	(0.297)	0.018	0.002
271	22.58	0.07	0.020	(0.297)	0.018	0.002
272	22.67	0.07	0.020	(0.296)	0.018	0.002
273	22.75	0.07	0.020	(0.295)	0.018	0.002
274	22.83	0.07	0.020	(0.294)	0.018	0.002
275	22.92	0.07	0.020	(0.293)	0.018	0.002
276	23.00	0.07	0.020	(0.293)	0.018	0.002
277	23.08	0.07	0.020	(0.292)	0.018	0.002
278	23.17	0.07	0.020	(0.291)	0.018	0.002
279	23.25	0.07	0.020	(0.291)	0.018	0.002
280	23.33	0.07	0.020	(0.290)	0.018	0.002
281	23.42	0.07	0.020	(0.290)	0.018	0.002
282	23.50	0.07	0.020	(0.289)	0.018	0.002
283	23.58	0.07	0.020	(0.289)	0.018	0.002
284	23.67	0.07	0.020	(0.288)	0.018	0.002
285	23.75	0.07	0.020	(0.288)	0.018	0.002
286	23.83	0.07	0.020	(0.287)	0.018	0.002
287	23.92	0.07	0.020	(0.287)	0.018	0.002
288	24.00	0.07	0.020	(0.287)	0.018	0.002

(Loss Rate Not Used)

Sum = 100.0 Sum = 3.1

Flood volume = Effective rainfall 0.26(In)
times area 9.5(Ac.)/[(In)/(Ft.)] = 0.2(Ac.Ft)
Total soil loss = 2.30(In)
Total soil loss = 1.828(Ac.Ft)
Total rainfall = 2.56(In)
Flood volume = 8846.6 Cubic Feet
Total soil loss = 79619.2 Cubic Feet

Peak flow rate of this hydrograph = 0.321(CFS)

+++

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	0.0000	0.00	Q	|	|	|	|
0+15	0.0001	0.01	Q	|	|	|	|
0+20	0.0002	0.01	Q	|	|	|	|

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0+25       0.0003      0.02  Q          |         |         |         |
0+30       0.0005      0.02  Q          |         |         |         |
0+35       0.0006      0.02  Q          |         |         |         |
0+40       0.0008      0.02  Q          |         |         |         |
0+45       0.0010      0.03  Q          |         |         |         |
0+50       0.0012      0.03  Q          |         |         |         |
0+55       0.0014      0.03  Q          |         |         |         |
1+ 0       0.0016      0.03  Q          |         |         |         |
1+ 5       0.0018      0.03  Q          |         |         |         |
1+10       0.0021      0.03  Q          |         |         |         |
1+15       0.0023      0.03  Q          |         |         |         |
1+20       0.0025      0.03  Q          |         |         |         |
1+25       0.0027      0.03  Q          |         |         |         |
1+30       0.0029      0.03  Q          |         |         |         |
1+35       0.0031      0.03  Q          |         |         |         |
1+40       0.0033      0.03  Q          |         |         |         |
1+45       0.0035      0.03  Q          |         |         |         |
1+50       0.0037      0.03  Q          |         |         |         |
1+55       0.0039      0.03  Q          |         |         |         |
2+ 0       0.0042      0.03  Q          |         |         |         |
2+ 5       0.0044      0.04  Q          |         |         |         |
2+10       0.0047      0.04  Q          |         |         |         |
2+15       0.0049      0.04  Q          |         |         |         |
2+20       0.0052      0.04  QV         |         |         |         |
2+25       0.0054      0.04  QV         |         |         |         |
2+30       0.0057      0.04  QV         |         |         |         |
2+35       0.0060      0.04  QV         |         |         |         |
2+40       0.0063      0.04  QV         |         |         |         |
2+45       0.0066      0.04  QV         |         |         |         |
2+50       0.0069      0.05  QV         |         |         |         |
2+55       0.0072      0.05  QV         |         |         |         |
3+ 0       0.0075      0.05  QV         |         |         |         |
3+ 5       0.0078      0.05  QV         |         |         |         |
3+10       0.0082      0.05  QV         |         |         |         |
3+15       0.0085      0.05  QV         |         |         |         |
3+20       0.0088      0.05  QV         |         |         |         |
3+25       0.0092      0.05  QV         |         |         |         |
3+30       0.0095      0.05  QV         |         |         |         |
3+35       0.0098      0.05  QV         |         |         |         |
3+40       0.0102      0.05  Q V        |         |         |         |
3+45       0.0105      0.05  Q V        |         |         |         |
3+50       0.0109      0.05  Q V        |         |         |         |
3+55       0.0112      0.05  Q V        |         |         |         |
4+ 0       0.0116      0.05  Q V        |         |         |         |
4+ 5       0.0120      0.06  Q V        |         |         |         |
4+10       0.0124      0.06  Q V        |         |         |         |
4+15       0.0127      0.06  Q V        |         |         |         |
4+20       0.0131      0.06  Q V        |         |         |         |
4+25       0.0136      0.06  Q V        |         |         |         |
4+30       0.0140      0.06  Q V        |         |         |         |
4+35       0.0144      0.06  Q V        |         |         |         |
4+40       0.0149      0.07  Q V        |         |         |         |
4+45       0.0153      0.07  Q  V       |         |         |         |
4+50       0.0158      0.07  Q  V       |         |         |         |
4+55       0.0163      0.07  Q  V       |         |         |         |
5+ 0       0.0168      0.07  Q  V       |         |         |         |
5+ 5       0.0173      0.07  Q  V       |         |         |         |
5+10       0.0178      0.07  Q  V       |         |         |         |
5+15       0.0182      0.07  Q  V       |         |         |         |
5+20       0.0187      0.06  Q  V       |         |         |         |
5+25       0.0191      0.06  Q  V       |         |         |         |
5+30       0.0196      0.07  Q  V       |         |         |         |
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 5+35       0.0200      0.07  Q  V      |         |         |         |
 5+40       0.0205      0.07  Q   V     |         |         |         |
 5+45       0.0210      0.07  Q   V     |         |         |         |
 5+50       0.0215      0.07  Q   V     |         |         |         |
 5+55       0.0221      0.08  Q   V     |         |         |         |
 6+ 0       0.0226      0.08  Q   V     |         |         |         |
 6+ 5       0.0231      0.08  Q   V     |         |         |         |
 6+10       0.0237      0.08  Q   V     |         |         |         |
 6+15       0.0243      0.08  Q   V     |         |         |         |
 6+20       0.0248      0.08  Q   V     |         |         |         |
 6+25       0.0254      0.09  Q    V    |         |         |         |
 6+30       0.0260      0.09  Q    V    |         |         |         |
 6+35       0.0266      0.09  Q    V    |         |         |         |
 6+40       0.0272      0.09  Q    V    |         |         |         |
 6+45       0.0279      0.09  Q    V    |         |         |         |
 6+50       0.0285      0.09  Q    V    |         |         |         |
 6+55       0.0292      0.09  Q    V    |         |         |         |
 7+ 0       0.0298      0.10  Q    V    |         |         |         |
 7+ 5       0.0305      0.10  Q     V   |         |         |         |
 7+10       0.0311      0.10  Q     V   |         |         |         |
 7+15       0.0318      0.10  Q     V   |         |         |         |
 7+20       0.0325      0.10  Q     V   |         |         |         |
 7+25       0.0332      0.10  Q     V   |         |         |         |
 7+30       0.0339      0.10  Q     V   |         |         |         |
 7+35       0.0346      0.10  Q     V   |         |         |         |
 7+40       0.0353      0.11  Q     V   |         |         |         |
 7+45       0.0361      0.11  Q      V  |         |         |         |
 7+50       0.0369      0.11  Q      V  |         |         |         |
 7+55       0.0377      0.12  Q      V  |         |         |         |
 8+ 0       0.0385      0.12  Q      V  |         |         |         |
 8+ 5       0.0394      0.12  Q      V  |         |         |         |
 8+10       0.0403      0.13  Q      V  |         |         |         |
 8+15       0.0412      0.13  Q       V |         |         |         |
 8+20       0.0421      0.14  Q       V |         |         |         |
 8+25       0.0431      0.14  Q       V |         |         |         |
 8+30       0.0441      0.14  Q       V |         |         |         |
 8+35       0.0451      0.14  Q       V |         |         |         |
 8+40       0.0461      0.15  Q        V|         |         |         |
 8+45       0.0471      0.15  Q        V|         |         |         |
 8+50       0.0481      0.15  Q        V|         |         |         |
 8+55       0.0492      0.16  Q        V|         |         |         |
 9+ 0       0.0503      0.16  Q        V|         |         |         |
 9+ 5       0.0514      0.16  Q         V         |         |         |
 9+10       0.0526      0.17  Q         V         |         |         |
 9+15       0.0538      0.17  Q         V         |         |         |
 9+20       0.0550      0.18  Q         V         |         |         |
 9+25       0.0562      0.18  Q         |V        |         |         |
 9+30       0.0575      0.19  Q         |V        |         |         |
 9+35       0.0588      0.19  Q         |V        |         |         |
 9+40       0.0602      0.19  Q         |V        |         |         |
 9+45       0.0615      0.20  Q         | V       |         |         |
 9+50       0.0629      0.20  Q         | V       |         |         |
 9+55       0.0643      0.20  Q         | V       |         |         |
10+ 0       0.0657      0.21  Q         | V       |         |         |
10+ 5       0.0671      0.21  Q         |  V      |         |         |
10+10       0.0685      0.19  Q         |  V      |         |         |
10+15       0.0697      0.18  Q         |  V      |         |         |
10+20       0.0708      0.17  Q         |  V      |         |         |
10+25       0.0719      0.16  Q         |   V     |         |         |
10+30       0.0730      0.16  Q         |   V     |         |         |
10+35       0.0741      0.16  Q         |   V     |         |         |
10+40       0.0753      0.17  Q         |   V     |         |         |
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10+45       0.0765      0.18  Q         |    V    |         |         |
10+50       0.0778      0.19  Q         |    V    |         |         |
10+55       0.0791      0.19  Q         |    V    |         |         |
11+ 0       0.0804      0.19  Q         |    V    |         |         |
11+ 5       0.0817      0.19  Q         |     V   |         |         |
11+10       0.0830      0.19  Q         |     V   |         |         |
11+15       0.0843      0.19  Q         |     V   |         |         |
11+20       0.0856      0.19  Q         |     V   |         |         |
11+25       0.0869      0.19  Q         |      V  |         |         |
11+30       0.0882      0.19  Q         |      V  |         |         |
11+35       0.0895      0.19  Q         |      V  |         |         |
11+40       0.0907      0.18  Q         |      V  |         |         |
11+45       0.0919      0.18  Q         |       V |         |         |
11+50       0.0931      0.17  Q         |       V |         |         |
11+55       0.0943      0.17  Q         |       V |         |         |
12+ 0       0.0955      0.18  Q         |       V |         |         |
12+ 5       0.0968      0.18  Q         |        V|         |         |
12+10       0.0981      0.19  Q         |        V|         |         |
12+15       0.0996      0.21  Q         |        V|         |         |
12+20       0.1011      0.22  Q         |        V|         |         |
12+25       0.1027      0.23  Q         |         V         |         |
12+30       0.1044      0.24  Q         |         V         |         |
12+35       0.1060      0.24  Q         |         V         |         |
12+40       0.1078      0.25  |Q        |         |V        |         |
12+45       0.1095      0.26  |Q        |         |V        |         |
12+50       0.1113      0.26  |Q        |         |V        |         |
12+55       0.1132      0.27  |Q        |         | V       |         |
13+ 0       0.1150      0.27  |Q        |         | V       |         |
13+ 5       0.1169      0.28  |Q        |         |  V      |         |
13+10       0.1189      0.29  |Q        |         |  V      |         |
13+15       0.1210      0.30  |Q        |         |  V      |         |
13+20       0.1232      0.31  |Q        |         |   V     |         |
13+25       0.1254      0.32  |Q        |         |   V     |         |
13+30       0.1276      0.32  |Q        |         |    V    |         |
13+35       0.1298      0.32  |Q        |         |    V    |         |
13+40       0.1318      0.30  |Q        |         |    V    |         |
13+45       0.1337      0.27  |Q        |         |     V   |         |
13+50       0.1354      0.26  |Q        |         |     V   |         |
13+55       0.1372      0.25  Q         |         |      V  |         |
14+ 0       0.1388      0.24  Q         |         |      V  |         |
14+ 5       0.1405      0.24  Q         |         |      V  |         |
14+10       0.1422      0.25  Q         |         |       V |         |
14+15       0.1439      0.26  |Q        |         |       V |         |
14+20       0.1457      0.26  |Q        |         |       V |         |
14+25       0.1475      0.26  |Q        |         |        V|         |
14+30       0.1493      0.26  |Q        |         |        V|         |
14+35       0.1511      0.26  |Q        |         |        V|         |
14+40       0.1528      0.26  |Q        |         |         V         |
14+45       0.1546      0.26  |Q        |         |         V         |
14+50       0.1564      0.26  |Q        |         |         V         |
14+55       0.1581      0.25  |Q        |         |         |V        |
15+ 0       0.1599      0.25  |Q        |         |         |V        |
15+ 5       0.1616      0.25  Q         |         |         |V        |
15+10       0.1633      0.25  Q         |         |         | V       |
15+15       0.1649      0.24  Q         |         |         | V       |
15+20       0.1666      0.24  Q         |         |         | V       |
15+25       0.1682      0.24  Q         |         |         |  V      |
15+30       0.1698      0.23  Q         |         |         |  V      |
15+35       0.1714      0.23  Q         |         |         |  V      |
15+40       0.1729      0.22  Q         |         |         |   V     |
15+45       0.1744      0.21  Q         |         |         |   V     |
15+50       0.1757      0.20  Q         |         |         |   V     |
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15+55	0.1771	0.20	Q	|	|	|	V	|
16+ 0	0.1785	0.20	Q	|	|	|	V	|
16+ 5	0.1798	0.19	Q	|	|	|	V	|
16+10	0.1808	0.16	Q	|	|	|	V	|
16+15	0.1816	0.11	Q	|	|	|	V	|
16+20	0.1822	0.09	Q	|	|	|	V	|
16+25	0.1828	0.08	Q	|	|	|	V	|
16+30	0.1833	0.07	Q	|	|	|	V	|
16+35	0.1837	0.06	Q	|	|	|	V	|
16+40	0.1841	0.06	Q	|	|	|	V	|
16+45	0.1844	0.05	Q	|	|	|	V	|
16+50	0.1848	0.05	Q	|	|	|	V	|
16+55	0.1851	0.04	Q	|	|	|	V	|
17+ 0	0.1853	0.04	Q	|	|	|	V	|
17+ 5	0.1856	0.04	Q	|	|	|	V	|
17+10	0.1859	0.04	Q	|	|	|	V	|
17+15	0.1862	0.05	Q	|	|	|	V	|
17+20	0.1866	0.05	Q	|	|	|	V	|
17+25	0.1869	0.05	Q	|	|	|	V	|
17+30	0.1872	0.05	Q	|	|	|	V	|
17+35	0.1876	0.05	Q	|	|	|	V	|
17+40	0.1879	0.05	Q	|	|	|	V	|
17+45	0.1883	0.05	Q	|	|	|	V	|
17+50	0.1886	0.05	Q	|	|	|	V	|
17+55	0.1889	0.05	Q	|	|	|	V	|
18+ 0	0.1892	0.04	Q	|	|	|	V	|
18+ 5	0.1895	0.04	Q	|	|	|	V	|
18+10	0.1898	0.04	Q	|	|	|	V	|
18+15	0.1900	0.04	Q	|	|	|	V	|
18+20	0.1903	0.04	Q	|	|	|	V	|
18+25	0.1906	0.04	Q	|	|	|	V	|
18+30	0.1909	0.04	Q	|	|	|	V	|
18+35	0.1911	0.04	Q	|	|	|	V	|
18+40	0.1914	0.04	Q	|	|	|	V	|
18+45	0.1916	0.03	Q	|	|	|	V	|
18+50	0.1919	0.03	Q	|	|	|	V	|
18+55	0.1921	0.03	Q	|	|	|	V	|
19+ 0	0.1923	0.03	Q	|	|	|	V	|
19+ 5	0.1924	0.03	Q	|	|	|	V	|
19+10	0.1926	0.03	Q	|	|	|	V	|
19+15	0.1928	0.03	Q	|	|	|	V	|
19+20	0.1930	0.03	Q	|	|	|	V	|
19+25	0.1932	0.03	Q	|	|	|	V	|
19+30	0.1935	0.03	Q	|	|	|	V	|
19+35	0.1937	0.04	Q	|	|	|	V	|
19+40	0.1939	0.03	Q	|	|	|	V	|
19+45	0.1942	0.03	Q	|	|	|	V	|
19+50	0.1944	0.03	Q	|	|	|	V	|
19+55	0.1946	0.03	Q	|	|	|	V	|
20+ 0	0.1947	0.03	Q	|	|	|	V	|
20+ 5	0.1949	0.02	Q	|	|	|	V	|
20+10	0.1951	0.02	Q	|	|	|	V	|
20+15	0.1953	0.03	Q	|	|	|	V	|
20+20	0.1955	0.03	Q	|	|	|	V	|
20+25	0.1956	0.03	Q	|	|	|	V	|
20+30	0.1958	0.03	Q	|	|	|	V	|
20+35	0.1960	0.03	Q	|	|	|	V	|
20+40	0.1962	0.03	Q	|	|	|	V	|
20+45	0.1964	0.03	Q	|	|	|	V	|
20+50	0.1966	0.03	Q	|	|	|	V	|
20+55	0.1968	0.03	Q	|	|	|	V	|
21+ 0	0.1970	0.02	Q	|	|	|	V	|

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   21+ 5       0.1972      0.02  Q         |         |         |       V |
   21+10       0.1973      0.02  Q         |         |         |       V |
   21+15       0.1975      0.03  Q         |         |         |       V |
   21+20       0.1977      0.03  Q         |         |         |       V |
   21+25       0.1979      0.03  Q         |         |         |       V |
   21+30       0.1980      0.02  Q         |         |         |        V|
   21+35       0.1982      0.02  Q         |         |         |        V|
   21+40       0.1984      0.02  Q         |         |         |        V|
   21+45       0.1985      0.03  Q         |         |         |        V|
   21+50       0.1987      0.03  Q         |         |         |        V|
   21+55       0.1989      0.03  Q         |         |         |        V|
   22+ 0       0.1991      0.02  Q         |         |         |        V|
   22+ 5       0.1992      0.02  Q         |         |         |        V|
   22+10       0.1994      0.02  Q         |         |         |        V|
   22+15       0.1996      0.03  Q         |         |         |        V|
   22+20       0.1997      0.03  Q         |         |         |        V|
   22+25       0.1999      0.03  Q         |         |         |        V|
   22+30       0.2001      0.02  Q         |         |         |        V|
   22+35       0.2002      0.02  Q         |         |         |        V|
   22+40       0.2004      0.02  Q         |         |         |        V|
   22+45       0.2005      0.02  Q         |         |         |        V|
   22+50       0.2007      0.02  Q         |         |         |        V|
   22+55       0.2008      0.02  Q         |         |         |        V|
   23+ 0       0.2009      0.02  Q         |         |         |        V|
   23+ 5       0.2011      0.02  Q         |         |         |        V|
   23+10       0.2012      0.02  Q         |         |         |        V|
   23+15       0.2014      0.02  Q         |         |         |        V|
   23+20       0.2015      0.02  Q         |         |         |        V|
   23+25       0.2016      0.02  Q         |         |         |        V|
   23+30       0.2018      0.02  Q         |         |         |        V|
   23+35       0.2019      0.02  Q         |         |         |        V|
   23+40       0.2020      0.02  Q         |         |         |        V|
   23+45       0.2022      0.02  Q         |         |         |        V|
   23+50       0.2023      0.02  Q         |         |         |        V|
   23+55       0.2024      0.02  Q         |         |         |        V|
   24+ 0       0.2026      0.02  Q         |         |         |        V|
   24+ 5       0.2027      0.02  Q         |         |         |        V|
   24+10       0.2028      0.01  Q         |         |         |        V|
   24+15       0.2029      0.01  Q         |         |         |        V|
   24+20       0.2029      0.01  Q         |         |         |        V|
   24+25       0.2030      0.00  Q         |         |         |        V|
   24+30       0.2030      0.00  Q         |         |         |        V|
   24+35       0.2030      0.00  Q         |         |         |        V|
   24+40       0.2030      0.00  Q         |         |         |        V|
   24+45       0.2030      0.00  Q         |         |         |        V|
   24+50       0.2030      0.00  Q         |         |         |        V|
   24+55       0.2030      0.00  Q         |         |         |        V|
   25+ 0       0.2031      0.00  Q         |         |         |        V|
   25+ 5       0.2031      0.00  Q         |         |         |        V|
   25+10       0.2031      0.00  Q         |         |         |        V|
   25+15       0.2031      0.00  Q         |         |         |        V|
   25+20       0.2031      0.00  Q         |         |         |        V|
   25+25       0.2031      0.00  Q         |         |         |        V|
   25+30       0.2031      0.00  Q         |         |         |        V|
   25+35       0.2031      0.00  Q         |         |         |        V|
   25+40       0.2031      0.00  Q         |         |         |        V|
   25+45       0.2031      0.00  Q         |         |         |        V|
   25+50       0.2031      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  07/12/24 File: FCDP242.out

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


Program License Serial Number 6443

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

 English Units used in output format



---------------------------------------------------------------------
FAIRWAY CANYON
PROPOSED 2 YR
DMA D (OFFSITE)
KIMLEY-HORN
--------------------------------------------------------------------
Drainage Area =      58.76(Ac.)  =      0.092 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      58.76(Ac.)  =      0.092 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.154 Hr.
Lag time =     9.24 Min.
25% of lag time =     2.31 Min.
40% of lag time =     3.70 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]
       58.76            2.56                 150.43

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       58.76            6.25                 367.25

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    2.560(In)
Area Averaged 100-Year Rainfall =    6.250(In)

Point rain (area averaged) =    2.560(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    2.560(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    58.760           56.00         0.700
 Total Area Entered =     58.76(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
```

56.0 36.0   0.706   0.700   0.261   1.000   0.261
Sum (F) =   0.261

Area averaged mean soil loss (F) (In/Hr) = 0.261
Minimum soil loss rate ((In/Hr)) = 0.131
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.340

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

Combination of 'S' Curves:
VALLEY 'S' Curve Percentage =   0.00
FOOTHILL 'S' Curve Percentage =   50.00
MOUNTAIN 'S' Curve Percentage =   50.00
DESERT 'S' Curve Percentage =   0.00

Unit Hydrograph Data

Unit time period	(hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	54.113	6.892	4.081
2	0.167	108.225	28.539	16.900
3	0.250	162.338	27.239	16.130
4	0.333	216.450	11.308	6.696
5	0.417	270.563	7.104	4.207
6	0.500	324.675	4.847	2.871
7	0.583	378.788	3.303	1.956
8	0.667	432.900	2.222	1.316
9	0.750	487.013	1.490	0.882
10	0.833	541.126	1.264	0.749
11	0.917	595.238	1.037	0.614
12	1.000	649.351	0.938	0.556
13	1.083	703.463	0.783	0.464
14	1.167	757.576	0.588	0.348
15	1.250	811.688	0.507	0.300
16	1.333	865.801	0.487	0.288
17	1.417	919.913	0.487	0.288
18	1.500	974.026	0.487	0.288
19	1.583	1028.139	0.477	0.283
			Sum = 100.000	Sum= 59.219

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(0.463)	0.007	0.014
2	0.17	0.07	0.020	(0.461)	0.007	0.014
3	0.25	0.07	0.020	(0.459)	0.007	0.014
4	0.33	0.10	0.031	(0.458)	0.010	0.020
5	0.42	0.10	0.031	(0.456)	0.010	0.020
6	0.50	0.10	0.031	(0.454)	0.010	0.020
7	0.58	0.10	0.031	(0.452)	0.010	0.020
8	0.67	0.10	0.031	(0.451)	0.010	0.020
9	0.75	0.10	0.031	(0.449)	0.010	0.020
10	0.83	0.13	0.041	(0.447)	0.014	0.027
11	0.92	0.13	0.041	(0.445)	0.014	0.027
12	1.00	0.13	0.041	(0.444)	0.014	0.027
13	1.08	0.10	0.031	(0.442)	0.010	0.020
14	1.17	0.10	0.031	(0.440)	0.010	0.020
15	1.25	0.10	0.031	(0.438)	0.010	0.020
16	1.33	0.10	0.031	(0.437)	0.010	0.020
17	1.42	0.10	0.031	(0.435)	0.010	0.020
18	1.50	0.10	0.031	(0.433)	0.010	0.020
19	1.58	0.10	0.031	(0.431)	0.010	0.020
20	1.67	0.10	0.031	(0.430)	0.010	0.020
21	1.75	0.10	0.031	(0.428)	0.010	0.020

22	1.83	0.13	0.041	(0.426)	0.014	0.027
23	1.92	0.13	0.041	(0.424)	0.014	0.027
24	2.00	0.13	0.041	(0.423)	0.014	0.027
25	2.08	0.13	0.041	(0.421)	0.014	0.027
26	2.17	0.13	0.041	(0.419)	0.014	0.027
27	2.25	0.13	0.041	(0.418)	0.014	0.027
28	2.33	0.13	0.041	(0.416)	0.014	0.027
29	2.42	0.13	0.041	(0.414)	0.014	0.027
30	2.50	0.13	0.041	(0.413)	0.014	0.027
31	2.58	0.17	0.051	(0.411)	0.017	0.034
32	2.67	0.17	0.051	(0.409)	0.017	0.034
33	2.75	0.17	0.051	(0.408)	0.017	0.034
34	2.83	0.17	0.051	(0.406)	0.017	0.034
35	2.92	0.17	0.051	(0.404)	0.017	0.034
36	3.00	0.17	0.051	(0.402)	0.017	0.034
37	3.08	0.17	0.051	(0.401)	0.017	0.034
38	3.17	0.17	0.051	(0.399)	0.017	0.034
39	3.25	0.17	0.051	(0.397)	0.017	0.034
40	3.33	0.17	0.051	(0.396)	0.017	0.034
41	3.42	0.17	0.051	(0.394)	0.017	0.034
42	3.50	0.17	0.051	(0.393)	0.017	0.034
43	3.58	0.17	0.051	(0.391)	0.017	0.034
44	3.67	0.17	0.051	(0.389)	0.017	0.034
45	3.75	0.17	0.051	(0.388)	0.017	0.034
46	3.83	0.20	0.061	(0.386)	0.021	0.041
47	3.92	0.20	0.061	(0.384)	0.021	0.041
48	4.00	0.20	0.061	(0.383)	0.021	0.041
49	4.08	0.20	0.061	(0.381)	0.021	0.041
50	4.17	0.20	0.061	(0.379)	0.021	0.041
51	4.25	0.20	0.061	(0.378)	0.021	0.041
52	4.33	0.23	0.072	(0.376)	0.024	0.047
53	4.42	0.23	0.072	(0.375)	0.024	0.047
54	4.50	0.23	0.072	(0.373)	0.024	0.047
55	4.58	0.23	0.072	(0.371)	0.024	0.047
56	4.67	0.23	0.072	(0.370)	0.024	0.047
57	4.75	0.23	0.072	(0.368)	0.024	0.047
58	4.83	0.27	0.082	(0.367)	0.028	0.054
59	4.92	0.27	0.082	(0.365)	0.028	0.054
60	5.00	0.27	0.082	(0.363)	0.028	0.054
61	5.08	0.20	0.061	(0.362)	0.021	0.041
62	5.17	0.20	0.061	(0.360)	0.021	0.041
63	5.25	0.20	0.061	(0.359)	0.021	0.041
64	5.33	0.23	0.072	(0.357)	0.024	0.047
65	5.42	0.23	0.072	(0.356)	0.024	0.047
66	5.50	0.23	0.072	(0.354)	0.024	0.047
67	5.58	0.27	0.082	(0.353)	0.028	0.054
68	5.67	0.27	0.082	(0.351)	0.028	0.054
69	5.75	0.27	0.082	(0.349)	0.028	0.054
70	5.83	0.27	0.082	(0.348)	0.028	0.054
71	5.92	0.27	0.082	(0.346)	0.028	0.054
72	6.00	0.27	0.082	(0.345)	0.028	0.054
73	6.08	0.30	0.092	(0.343)	0.031	0.061
74	6.17	0.30	0.092	(0.342)	0.031	0.061
75	6.25	0.30	0.092	(0.340)	0.031	0.061
76	6.33	0.30	0.092	(0.339)	0.031	0.061
77	6.42	0.30	0.092	(0.337)	0.031	0.061
78	6.50	0.30	0.092	(0.336)	0.031	0.061
79	6.58	0.33	0.102	(0.334)	0.035	0.068
80	6.67	0.33	0.102	(0.333)	0.035	0.068
81	6.75	0.33	0.102	(0.331)	0.035	0.068
82	6.83	0.33	0.102	(0.330)	0.035	0.068
83	6.92	0.33	0.102	(0.328)	0.035	0.068
84	7.00	0.33	0.102	(0.327)	0.035	0.068
85	7.08	0.33	0.102	(0.325)	0.035	0.068
86	7.17	0.33	0.102	(0.324)	0.035	0.068
87	7.25	0.33	0.102	(0.322)	0.035	0.068
88	7.33	0.37	0.113	(0.321)	0.038	0.074
89	7.42	0.37	0.113	(0.319)	0.038	0.074
90	7.50	0.37	0.113	(0.318)	0.038	0.074

91	7.58	0.40	0.123	(0.316)	0.042	0.081
92	7.67	0.40	0.123	(0.315)	0.042	0.081
93	7.75	0.40	0.123	(0.313)	0.042	0.081
94	7.83	0.43	0.133	(0.312)	0.045	0.088
95	7.92	0.43	0.133	(0.311)	0.045	0.088
96	8.00	0.43	0.133	(0.309)	0.045	0.088
97	8.08	0.50	0.154	(0.308)	0.052	0.101
98	8.17	0.50	0.154	(0.306)	0.052	0.101
99	8.25	0.50	0.154	(0.305)	0.052	0.101
100	8.33	0.50	0.154	(0.303)	0.052	0.101
101	8.42	0.50	0.154	(0.302)	0.052	0.101
102	8.50	0.50	0.154	(0.301)	0.052	0.101
103	8.58	0.53	0.164	(0.299)	0.056	0.108
104	8.67	0.53	0.164	(0.298)	0.056	0.108
105	8.75	0.53	0.164	(0.296)	0.056	0.108
106	8.83	0.57	0.174	(0.295)	0.059	0.115
107	8.92	0.57	0.174	(0.294)	0.059	0.115
108	9.00	0.57	0.174	(0.292)	0.059	0.115
109	9.08	0.63	0.195	(0.291)	0.066	0.128
110	9.17	0.63	0.195	(0.289)	0.066	0.128
111	9.25	0.63	0.195	(0.288)	0.066	0.128
112	9.33	0.67	0.205	(0.287)	0.070	0.135
113	9.42	0.67	0.205	(0.285)	0.070	0.135
114	9.50	0.67	0.205	(0.284)	0.070	0.135
115	9.58	0.70	0.215	(0.283)	0.073	0.142
116	9.67	0.70	0.215	(0.281)	0.073	0.142
117	9.75	0.70	0.215	(0.280)	0.073	0.142
118	9.83	0.73	0.225	(0.279)	0.077	0.149
119	9.92	0.73	0.225	(0.277)	0.077	0.149
120	10.00	0.73	0.225	(0.276)	0.077	0.149
121	10.08	0.50	0.154	(0.275)	0.052	0.101
122	10.17	0.50	0.154	(0.273)	0.052	0.101
123	10.25	0.50	0.154	(0.272)	0.052	0.101
124	10.33	0.50	0.154	(0.271)	0.052	0.101
125	10.42	0.50	0.154	(0.269)	0.052	0.101
126	10.50	0.50	0.154	(0.268)	0.052	0.101
127	10.58	0.67	0.205	(0.267)	0.070	0.135
128	10.67	0.67	0.205	(0.265)	0.070	0.135
129	10.75	0.67	0.205	(0.264)	0.070	0.135
130	10.83	0.67	0.205	(0.263)	0.070	0.135
131	10.92	0.67	0.205	(0.261)	0.070	0.135
132	11.00	0.67	0.205	(0.260)	0.070	0.135
133	11.08	0.63	0.195	(0.259)	0.066	0.128
134	11.17	0.63	0.195	(0.258)	0.066	0.128
135	11.25	0.63	0.195	(0.256)	0.066	0.128
136	11.33	0.63	0.195	(0.255)	0.066	0.128
137	11.42	0.63	0.195	(0.254)	0.066	0.128
138	11.50	0.63	0.195	(0.253)	0.066	0.128
139	11.58	0.57	0.174	(0.251)	0.059	0.115
140	11.67	0.57	0.174	(0.250)	0.059	0.115
141	11.75	0.57	0.174	(0.249)	0.059	0.115
142	11.83	0.60	0.184	(0.248)	0.063	0.122
143	11.92	0.60	0.184	(0.246)	0.063	0.122
144	12.00	0.60	0.184	(0.245)	0.063	0.122
145	12.08	0.83	0.256	(0.244)	0.087	0.169
146	12.17	0.83	0.256	(0.243)	0.087	0.169
147	12.25	0.83	0.256	(0.241)	0.087	0.169
148	12.33	0.87	0.266	(0.240)	0.091	0.176
149	12.42	0.87	0.266	(0.239)	0.091	0.176
150	12.50	0.87	0.266	(0.238)	0.091	0.176
151	12.58	0.93	0.287	(0.237)	0.097	0.189
152	12.67	0.93	0.287	(0.235)	0.097	0.189
153	12.75	0.93	0.287	(0.234)	0.097	0.189
154	12.83	0.97	0.297	(0.233)	0.101	0.196
155	12.92	0.97	0.297	(0.232)	0.101	0.196
156	13.00	0.97	0.297	(0.231)	0.101	0.196
157	13.08	1.13	0.348	(0.230)	0.118	0.230
158	13.17	1.13	0.348	(0.228)	0.118	0.230
159	13.25	1.13	0.348	(0.227)	0.118	0.230

160	13.33	1.13	0.348	(0.226)	0.118	0.230
161	13.42	1.13	0.348	(0.225)	0.118	0.230
162	13.50	1.13	0.348	(0.224)	0.118	0.230
163	13.58	0.77	0.235	(0.223)	0.080	0.155
164	13.67	0.77	0.235	(0.221)	0.080	0.155
165	13.75	0.77	0.235	(0.220)	0.080	0.155
166	13.83	0.77	0.235	(0.219)	0.080	0.155
167	13.92	0.77	0.235	(0.218)	0.080	0.155
168	14.00	0.77	0.235	(0.217)	0.080	0.155
169	14.08	0.90	0.276	(0.216)	0.094	0.182
170	14.17	0.90	0.276	(0.215)	0.094	0.182
171	14.25	0.90	0.276	(0.214)	0.094	0.182
172	14.33	0.87	0.266	(0.213)	0.091	0.176
173	14.42	0.87	0.266	(0.211)	0.091	0.176
174	14.50	0.87	0.266	(0.210)	0.091	0.176
175	14.58	0.87	0.266	(0.209)	0.091	0.176
176	14.67	0.87	0.266	(0.208)	0.091	0.176
177	14.75	0.87	0.266	(0.207)	0.091	0.176
178	14.83	0.83	0.256	(0.206)	0.087	0.169
179	14.92	0.83	0.256	(0.205)	0.087	0.169
180	15.00	0.83	0.256	(0.204)	0.087	0.169
181	15.08	0.80	0.246	(0.203)	0.084	0.162
182	15.17	0.80	0.246	(0.202)	0.084	0.162
183	15.25	0.80	0.246	(0.201)	0.084	0.162
184	15.33	0.77	0.235	(0.200)	0.080	0.155
185	15.42	0.77	0.235	(0.199)	0.080	0.155
186	15.50	0.77	0.235	(0.198)	0.080	0.155
187	15.58	0.63	0.195	(0.197)	0.066	0.128
188	15.67	0.63	0.195	(0.196)	0.066	0.128
189	15.75	0.63	0.195	(0.195)	0.066	0.128
190	15.83	0.63	0.195	(0.194)	0.066	0.128
191	15.92	0.63	0.195	(0.193)	0.066	0.128
192	16.00	0.63	0.195	(0.192)	0.066	0.128
193	16.08	0.13	0.041	(0.191)	0.014	0.027
194	16.17	0.13	0.041	(0.190)	0.014	0.027
195	16.25	0.13	0.041	(0.189)	0.014	0.027
196	16.33	0.13	0.041	(0.188)	0.014	0.027
197	16.42	0.13	0.041	(0.187)	0.014	0.027
198	16.50	0.13	0.041	(0.186)	0.014	0.027
199	16.58	0.10	0.031	(0.185)	0.010	0.020
200	16.67	0.10	0.031	(0.184)	0.010	0.020
201	16.75	0.10	0.031	(0.183)	0.010	0.020
202	16.83	0.10	0.031	(0.182)	0.010	0.020
203	16.92	0.10	0.031	(0.181)	0.010	0.020
204	17.00	0.10	0.031	(0.180)	0.010	0.020
205	17.08	0.17	0.051	(0.180)	0.017	0.034
206	17.17	0.17	0.051	(0.179)	0.017	0.034
207	17.25	0.17	0.051	(0.178)	0.017	0.034
208	17.33	0.17	0.051	(0.177)	0.017	0.034
209	17.42	0.17	0.051	(0.176)	0.017	0.034
210	17.50	0.17	0.051	(0.175)	0.017	0.034
211	17.58	0.17	0.051	(0.174)	0.017	0.034
212	17.67	0.17	0.051	(0.173)	0.017	0.034
213	17.75	0.17	0.051	(0.172)	0.017	0.034
214	17.83	0.13	0.041	(0.172)	0.014	0.027
215	17.92	0.13	0.041	(0.171)	0.014	0.027
216	18.00	0.13	0.041	(0.170)	0.014	0.027
217	18.08	0.13	0.041	(0.169)	0.014	0.027
218	18.17	0.13	0.041	(0.168)	0.014	0.027
219	18.25	0.13	0.041	(0.167)	0.014	0.027
220	18.33	0.13	0.041	(0.167)	0.014	0.027
221	18.42	0.13	0.041	(0.166)	0.014	0.027
222	18.50	0.13	0.041	(0.165)	0.014	0.027
223	18.58	0.10	0.031	(0.164)	0.010	0.020
224	18.67	0.10	0.031	(0.163)	0.010	0.020
225	18.75	0.10	0.031	(0.163)	0.010	0.020
226	18.83	0.07	0.020	(0.162)	0.007	0.014
227	18.92	0.07	0.020	(0.161)	0.007	0.014
228	19.00	0.07	0.020	(0.160)	0.007	0.014

229	19.08	0.10	0.031	(0.160)	0.010	0.020
230	19.17	0.10	0.031	(0.159)	0.010	0.020
231	19.25	0.10	0.031	(0.158)	0.010	0.020
232	19.33	0.13	0.041	(0.157)	0.014	0.027
233	19.42	0.13	0.041	(0.157)	0.014	0.027
234	19.50	0.13	0.041	(0.156)	0.014	0.027
235	19.58	0.10	0.031	(0.155)	0.010	0.020
236	19.67	0.10	0.031	(0.154)	0.010	0.020
237	19.75	0.10	0.031	(0.154)	0.010	0.020
238	19.83	0.07	0.020	(0.153)	0.007	0.014
239	19.92	0.07	0.020	(0.152)	0.007	0.014
240	20.00	0.07	0.020	(0.152)	0.007	0.014
241	20.08	0.10	0.031	(0.151)	0.010	0.020
242	20.17	0.10	0.031	(0.150)	0.010	0.020
243	20.25	0.10	0.031	(0.150)	0.010	0.020
244	20.33	0.10	0.031	(0.149)	0.010	0.020
245	20.42	0.10	0.031	(0.148)	0.010	0.020
246	20.50	0.10	0.031	(0.148)	0.010	0.020
247	20.58	0.10	0.031	(0.147)	0.010	0.020
248	20.67	0.10	0.031	(0.147)	0.010	0.020
249	20.75	0.10	0.031	(0.146)	0.010	0.020
250	20.83	0.07	0.020	(0.145)	0.007	0.014
251	20.92	0.07	0.020	(0.145)	0.007	0.014
252	21.00	0.07	0.020	(0.144)	0.007	0.014
253	21.08	0.10	0.031	(0.144)	0.010	0.020
254	21.17	0.10	0.031	(0.143)	0.010	0.020
255	21.25	0.10	0.031	(0.142)	0.010	0.020
256	21.33	0.07	0.020	(0.142)	0.007	0.014
257	21.42	0.07	0.020	(0.141)	0.007	0.014
258	21.50	0.07	0.020	(0.141)	0.007	0.014
259	21.58	0.10	0.031	(0.140)	0.010	0.020
260	21.67	0.10	0.031	(0.140)	0.010	0.020
261	21.75	0.10	0.031	(0.139)	0.010	0.020
262	21.83	0.07	0.020	(0.139)	0.007	0.014
263	21.92	0.07	0.020	(0.138)	0.007	0.014
264	22.00	0.07	0.020	(0.138)	0.007	0.014
265	22.08	0.10	0.031	(0.137)	0.010	0.020
266	22.17	0.10	0.031	(0.137)	0.010	0.020
267	22.25	0.10	0.031	(0.137)	0.010	0.020
268	22.33	0.07	0.020	(0.136)	0.007	0.014
269	22.42	0.07	0.020	(0.136)	0.007	0.014
270	22.50	0.07	0.020	(0.135)	0.007	0.014
271	22.58	0.07	0.020	(0.135)	0.007	0.014
272	22.67	0.07	0.020	(0.135)	0.007	0.014
273	22.75	0.07	0.020	(0.134)	0.007	0.014
274	22.83	0.07	0.020	(0.134)	0.007	0.014
275	22.92	0.07	0.020	(0.134)	0.007	0.014
276	23.00	0.07	0.020	(0.133)	0.007	0.014
277	23.08	0.07	0.020	(0.133)	0.007	0.014
278	23.17	0.07	0.020	(0.133)	0.007	0.014
279	23.25	0.07	0.020	(0.132)	0.007	0.014
280	23.33	0.07	0.020	(0.132)	0.007	0.014
281	23.42	0.07	0.020	(0.132)	0.007	0.014
282	23.50	0.07	0.020	(0.132)	0.007	0.014
283	23.58	0.07	0.020	(0.131)	0.007	0.014
284	23.67	0.07	0.020	(0.131)	0.007	0.014
285	23.75	0.07	0.020	(0.131)	0.007	0.014
286	23.83	0.07	0.020	(0.131)	0.007	0.014
287	23.92	0.07	0.020	(0.131)	0.007	0.014
288	24.00	0.07	0.020	(0.131)	0.007	0.014

(Loss Rate Not Used)

Sum = 100.0 Sum = 20.3

Flood volume = Effective rainfall 1.69(In)
times area 58.8(Ac.)/[(In)/(Ft.)] = 8.3(Ac.Ft)
Total soil loss = 0.87(In)
Total soil loss = 4.262(Ac.Ft)
Total rainfall = 2.56(In)
Flood volume = 360348.3 Cubic Feet
Total soil loss = 185634.0 Cubic Feet

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    ----------------------------------------------------------------------
     Peak flow rate of this hydrograph =     13.252(CFS)
    ----------------------------------------------------------------------
    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        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        5.0      10.0      15.0      20.0
----------------------------------------------------------------------
  0+ 5       0.0004      0.06  Q         |         |         |         |
  0+10       0.0023      0.28  Q         |         |         |         |
  0+15       0.0058      0.50  VQ        |         |         |         |
  0+20       0.0101      0.62  VQ        |         |         |         |
  0+25       0.0155      0.79  VQ        |         |         |         |
  0+30       0.0220      0.94  VQ        |         |         |         |
  0+35       0.0289      1.01  V Q       |         |         |         |
  0+40       0.0362      1.06  V Q       |         |         |         |
  0+45       0.0437      1.09  V Q       |         |         |         |
  0+50       0.0516      1.14  V Q       |         |         |         |
  0+55       0.0603      1.27  V Q       |         |         |         |
  1+ 0       0.0699      1.39  V Q       |         |         |         |
  1+ 5       0.0797      1.42  V Q       |         |         |         |
  1+10       0.0890      1.35  V Q       |         |         |         |
  1+15       0.0977      1.26  V Q       |         |         |         |
  1+20       0.1062      1.24  V Q       |         |         |         |
  1+25       0.1146      1.23  V Q       |         |         |         |
  1+30       0.1230      1.22  V Q       |         |         |         |
  1+35       0.1314      1.22  V Q       |         |         |         |
  1+40       0.1397      1.21  V Q       |         |         |         |
  1+45       0.1481      1.21  V Q       |         |         |         |
  1+50       0.1566      1.24  V Q       |         |         |         |
  1+55       0.1659      1.35  V Q       |         |         |         |
  2+ 0       0.1760      1.46  V Q       |         |         |         |
  2+ 5       0.1863      1.50  V  Q      |         |         |         |
  2+10       0.1969      1.53  V  Q      |         |         |         |
  2+15       0.2076      1.55  |V Q      |         |         |         |
  2+20       0.2184      1.56  |V Q      |         |         |         |
  2+25       0.2292      1.57  |V Q      |         |         |         |
  2+30       0.2400      1.58  |V Q      |         |         |         |
  2+35       0.2511      1.61  |V Q      |         |         |         |
  2+40       0.2630      1.72  |V Q      |         |         |         |
  2+45       0.2756      1.84  |V Q      |         |         |         |
  2+50       0.2886      1.89  |V Q      |         |         |         |
  2+55       0.3018      1.92  |V Q      |         |         |         |
  3+ 0       0.3151      1.94  |V Q      |         |         |         |
  3+ 5       0.3286      1.95  |V Q      |         |         |         |
  3+10       0.3421      1.96  |V Q      |         |         |         |
  3+15       0.3557      1.97  |V Q      |         |         |         |
  3+20       0.3693      1.98  |V Q      |         |         |         |
  3+25       0.3830      1.98  |V Q      |         |         |         |
  3+30       0.3967      1.99  |V Q      |         |         |         |
  3+35       0.4104      1.99  |V Q      |         |         |         |
  3+40       0.4241      1.99  | VQ      |         |         |         |
  3+45       0.4378      1.99  | VQ      |         |         |         |
  3+50       0.4518      2.02  | V Q     |         |         |         |
  3+55       0.4665      2.14  | V Q     |         |         |         |
  4+ 0       0.4820      2.25  | V Q     |         |         |         |
  4+ 5       0.4978      2.30  | V Q     |         |         |         |
  4+10       0.5138      2.33  | V Q     |         |         |         |
  4+15       0.5300      2.35  | V Q     |         |         |         |
  4+20       0.5464      2.39  | V Q     |         |         |         |
  4+25       0.5637      2.51  | V  Q    |         |         |         |
  4+30       0.5818      2.62  | V  Q    |         |         |         |
  4+35       0.6002      2.68  | V  Q    |         |         |         |
  4+40       0.6189      2.71  | V  Q    |         |         |         |
  4+45       0.6377      2.73  |  V Q    |         |         |         |
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 4+50       0.6568      2.78  |  V Q    |         |         |         |
 4+55       0.6768      2.90  |  V Q    |         |         |         |
 5+ 0       0.6976      3.02  |  V  Q   |         |         |         |
 5+ 5       0.7183      3.01  |  V  Q   |         |         |         |
 5+10       0.7378      2.82  |  V Q    |         |         |         |
 5+15       0.7559      2.63  |  V Q    |         |         |         |
 5+20       0.7736      2.58  |  V Q    |         |         |         |
 5+25       0.7919      2.65  |  V Q    |         |         |         |
 5+30       0.8107      2.73  |  V Q    |         |         |         |
 5+35       0.8299      2.78  |   VQ    |         |         |         |
 5+40       0.8499      2.91  |   VQ    |         |         |         |
 5+45       0.8709      3.04  |   V Q   |         |         |         |
 5+50       0.8921      3.09  |   V Q   |         |         |         |
 5+55       0.9136      3.12  |   V Q   |         |         |         |
 6+ 0       0.9353      3.14  |   V Q   |         |         |         |
 6+ 5       0.9572      3.18  |   V Q   |         |         |         |
 6+10       0.9800      3.31  |   V Q   |         |         |         |
 6+15       1.0036      3.42  |   V Q   |         |         |         |
 6+20       1.0275      3.48  |   V Q   |         |         |         |
 6+25       1.0516      3.51  |    V Q  |         |         |         |
 6+30       1.0759      3.53  |    V Q  |         |         |         |
 6+35       1.1005      3.57  |    V Q  |         |         |         |
 6+40       1.1260      3.70  |    V Q  |         |         |         |
 6+45       1.1523      3.82  |    V Q  |         |         |         |
 6+50       1.1789      3.87  |    V Q  |         |         |         |
 6+55       1.2058      3.91  |    V Q  |         |         |         |
 7+ 0       1.2329      3.93  |    V Q  |         |         |         |
 7+ 5       1.2601      3.95  |     VQ  |         |         |         |
 7+10       1.2874      3.96  |     VQ  |         |         |         |
 7+15       1.3147      3.97  |     VQ  |         |         |         |
 7+20       1.3422      4.00  |     V Q |         |         |         |
 7+25       1.3706      4.12  |     V Q |         |         |         |
 7+30       1.3998      4.24  |     V Q |         |         |         |
 7+35       1.4295      4.32  |     V Q |         |         |         |
 7+40       1.4603      4.46  |      VQ |         |         |         |
 7+45       1.4919      4.59  |      V Q|         |         |         |
 7+50       1.5241      4.68  |      V Q|         |         |         |
 7+55       1.5574      4.83  |      V Q|         |         |         |
 8+ 0       1.5916      4.97  |      V Q|         |         |         |
 8+ 5       1.6267      5.09  |      V  Q         |         |         |
 8+10       1.6636      5.36  |       V Q         |         |         |
 8+15       1.7022      5.61  |       V |Q        |         |         |
 8+20       1.7416      5.72  |       V |Q        |         |         |
 8+25       1.7815      5.79  |       V |Q        |         |         |
 8+30       1.8217      5.84  |       V |Q        |         |         |
 8+35       1.8624      5.91  |        V|Q        |         |         |
 8+40       1.9040      6.05  |        V| Q       |         |         |
 8+45       1.9466      6.18  |        V| Q       |         |         |
 8+50       1.9897      6.27  |        V| Q       |         |         |
 8+55       2.0339      6.42  |        V| Q       |         |         |
 9+ 0       2.0791      6.56  |         V  Q      |         |         |
 9+ 5       2.1251      6.68  |         V  Q      |         |         |
 9+10       2.1731      6.96  |         V  Q      |         |         |
 9+15       2.2227      7.21  |         V   Q     |         |         |
 9+20       2.2733      7.35  |         V   Q     |         |         |
 9+25       2.3252      7.54  |         |V   Q    |         |         |
 9+30       2.3782      7.70  |         |V   Q    |         |         |
 9+35       2.4320      7.81  |         |V   Q    |         |         |
 9+40       2.4869      7.98  |         | V  Q    |         |         |
 9+45       2.5429      8.12  |         | V   Q   |         |         |
 9+50       2.5995      8.22  |         | V   Q   |         |         |
 9+55       2.6573      8.39  |         | V   Q   |         |         |
10+ 0       2.7161      8.53  |         |  V   Q  |         |         |
10+ 5       2.7740      8.41  |         |  V  Q   |         |         |
10+10       2.8268      7.66  |         |  V Q    |         |         |
10+15       2.8746      6.93  |         |  Q      |         |         |
10+20       2.9203      6.65  |         |  QV     |         |         |
10+25       2.9648      6.47  |         | Q V     |         |         |
10+30       3.0085      6.35  |         | Q V     |         |         |
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10+35       3.0527      6.40  |         | Q V     |         |         |
10+40       3.1003      6.92  |         |  QV     |         |         |
10+45       3.1515      7.43  |         |   QV    |         |         |
10+50       3.2041      7.63  |         |    Q    |         |         |
10+55       3.2574      7.75  |         |    Q    |         |         |
11+ 0       3.3113      7.82  |         |    QV   |         |         |
11+ 5       3.3653      7.84  |         |    QV   |         |         |
11+10       3.4188      7.76  |         |    QV   |         |         |
11+15       3.4716      7.67  |         |    QV   |         |         |
11+20       3.5242      7.64  |         |    Q V  |         |         |
11+25       3.5766      7.61  |         |    Q V  |         |         |
11+30       3.6290      7.60  |         |    Q V  |         |         |
11+35       3.6809      7.53  |         |    Q V  |         |         |
11+40       3.7312      7.31  |         |   Q   V |         |         |
11+45       3.7801      7.09  |         |   Q   V |         |         |
11+50       3.8285      7.04  |         |   Q   V |         |         |
11+55       3.8774      7.10  |         |   Q   V |         |         |
12+ 0       3.9268      7.18  |         |   Q   V |         |         |
12+ 5       3.9778      7.39  |         |   Q    V|         |         |
12+10       4.0343      8.20  |         |     Q  V|         |         |
12+15       4.0960      8.97  |         |      Q V|         |         |
12+20       4.1602      9.32  |         |       Q V         |         |
12+25       4.2265      9.63  |         |        QV         |         |
12+30       4.2945      9.87  |         |        QV         |         |
12+35       4.3638     10.06  |         |         QV        |         |
12+40       4.4353     10.38  |         |         QV        |         |
12+45       4.5087     10.66  |         |         |Q        |         |
12+50       4.5832     10.82  |         |         |QV       |         |
12+55       4.6592     11.03  |         |         | Q       |         |
13+ 0       4.7364     11.21  |         |         | Q       |         |
13+ 5       4.8152     11.44  |         |         | QV      |         |
13+10       4.8984     12.08  |         |         |  VQ     |         |
13+15       4.9858     12.68  |         |         |   VQ    |         |
13+20       5.0750     12.95  |         |         |   VQ    |         |
13+25       5.1654     13.13  |         |         |   V Q   |         |
13+30       5.2566     13.25  |         |         |    VQ   |         |
13+35       5.3464     13.04  |         |         |    VQ   |         |
13+40       5.4280     11.84  |         |         |  Q  V   |         |
13+45       5.5015     10.68  |         |         |Q    V   |         |
13+50       5.5719     10.22  |         |         Q     V   |         |
13+55       5.6403      9.93  |         |        Q|      V  |         |
14+ 0       5.7073      9.74  |         |        Q|      V  |         |
14+ 5       5.7743      9.73  |         |        Q|      V  |         |
14+10       5.8439     10.10  |         |         Q       V |         |
14+15       5.9161     10.48  |         |         Q       V |         |
14+20       5.9890     10.59  |         |         |Q      V |         |
14+25       6.0617     10.56  |         |         |Q       V|         |
14+30       6.1340     10.49  |         |         Q        V|         |
14+35       6.2061     10.48  |         |         Q         V         |
14+40       6.2782     10.46  |         |         Q         V         |
14+45       6.3501     10.44  |         |         Q         V         |
14+50       6.4217     10.40  |         |         Q         |V        |
14+55       6.4924     10.27  |         |         Q         |V        |
15+ 0       6.5623     10.15  |         |         Q         |V        |
15+ 5       6.6316     10.06  |         |         Q         | V       |
15+10       6.6999      9.92  |         |        Q|         | V       |
15+15       6.7674      9.80  |         |        Q|         | V       |
15+20       6.8343      9.72  |         |        Q|         |  V      |
15+25       6.9002      9.57  |         |        Q|         |  V      |
15+30       6.9653      9.44  |         |       Q |         |  V      |
15+35       7.0291      9.27  |         |       Q |         |  V      |
15+40       7.0896      8.77  |         |      Q  |         |   V     |
15+45       7.1468      8.31  |         |     Q   |         |   V     |
15+50       7.2026      8.10  |         |     Q   |         |   V     |
15+55       7.2575      7.97  |         |    Q    |         |    V    |
16+ 0       7.3118      7.88  |         |    Q    |         |    V    |
16+ 5       7.3628      7.41  |         |   Q     |         |    V    |
16+10       7.4017      5.65  |         |Q        |         |    V    |
16+15       7.4291      3.98  |      Q  |         |         |    V    |
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16+20       7.4517      3.28  |     Q   |         |         |     V   |
16+25       7.4712      2.83  |    Q    |         |         |     V   |
16+30       7.4885      2.52  |    Q    |         |         |     V   |
16+35       7.5042      2.28  |   Q     |         |         |     V   |
16+40       7.5181      2.02  |   Q     |         |         |     V   |
16+45       7.5305      1.81  |  Q      |         |         |     V   |
16+50       7.5420      1.68  |  Q      |         |         |     V   |
16+55       7.5529      1.58  |  Q      |         |         |     V   |
17+ 0       7.5632      1.49  | Q       |         |         |     V   |
17+ 5       7.5734      1.48  | Q       |         |         |     V   |
17+10       7.5849      1.67  |  Q      |         |         |     V   |
17+15       7.5976      1.85  |  Q      |         |         |     V   |
17+20       7.6107      1.90  |  Q      |         |         |     V   |
17+25       7.6240      1.93  |  Q      |         |         |     V   |
17+30       7.6373      1.93  |  Q      |         |         |     V   |
17+35       7.6506      1.93  |  Q      |         |         |     V   |
17+40       7.6640      1.94  |  Q      |         |         |      V  |
17+45       7.6774      1.95  |  Q      |         |         |      V  |
17+50       7.6907      1.93  |  Q      |         |         |      V  |
17+55       7.7033      1.83  |  Q      |         |         |      V  |
18+ 0       7.7152      1.72  |  Q      |         |         |      V  |
18+ 5       7.7268      1.68  |  Q      |         |         |      V  |
18+10       7.7382      1.66  |  Q      |         |         |      V  |
18+15       7.7495      1.64  |  Q      |         |         |      V  |
18+20       7.7607      1.63  |  Q      |         |         |      V  |
18+25       7.7719      1.63  |  Q      |         |         |      V  |
18+30       7.7831      1.63  |  Q      |         |         |      V  |
18+35       7.7941      1.60  |  Q      |         |         |      V  |
18+40       7.8043      1.48  | Q       |         |         |      V  |
18+45       7.8137      1.37  | Q       |         |         |      V  |
18+50       7.8226      1.29  | Q       |         |         |      V  |
18+55       7.8305      1.14  | Q       |         |         |      V  |
19+ 0       7.8375      1.01  | Q       |         |         |      V  |
19+ 5       7.8442      0.98  |Q        |         |         |      V  |
19+10       7.8515      1.06  | Q       |         |         |      V  |
19+15       7.8594      1.14  | Q       |         |         |       V |
19+20       7.8676      1.19  | Q       |         |         |       V |
19+25       7.8767      1.32  | Q       |         |         |       V |
19+30       7.8866      1.44  | Q       |         |         |       V |
19+35       7.8966      1.46  | Q       |         |         |       V |
19+40       7.9061      1.38  | Q       |         |         |       V |
19+45       7.9150      1.29  | Q       |         |         |       V |
19+50       7.9235      1.23  | Q       |         |         |       V |
19+55       7.9310      1.10  | Q       |         |         |       V |
20+ 0       7.9377      0.97  |Q        |         |         |       V |
20+ 5       7.9442      0.95  |Q        |         |         |       V |
20+10       7.9513      1.03  | Q       |         |         |       V |
20+15       7.9590      1.12  | Q       |         |         |       V |
20+20       7.9669      1.15  | Q       |         |         |       V |
20+25       7.9749      1.17  | Q       |         |         |       V |
20+30       7.9830      1.18  | Q       |         |         |       V |
20+35       7.9912      1.19  | Q       |         |         |       V |
20+40       7.9994      1.19  | Q       |         |         |       V |
20+45       8.0076      1.19  | Q       |         |         |       V |
20+50       8.0157      1.17  | Q       |         |         |       V |
20+55       8.0229      1.05  | Q       |         |         |       V |
21+ 0       8.0294      0.94  |Q        |         |         |       V |
21+ 5       8.0358      0.93  |Q        |         |         |       V |
21+10       8.0428      1.01  | Q       |         |         |       V |
21+15       8.0504      1.10  | Q       |         |         |       V |
21+20       8.0580      1.11  | Q       |         |         |       V |
21+25       8.0650      1.01  | Q       |         |         |       V |
21+30       8.0713      0.92  |Q        |         |         |        V|
21+35       8.0776      0.91  |Q        |         |         |        V|
21+40       8.0845      1.00  | Q       |         |         |        V|
21+45       8.0921      1.10  | Q       |         |         |        V|
21+50       8.0997      1.10  | Q       |         |         |        V|
21+55       8.1066      1.01  | Q       |         |         |        V|
22+ 0       8.1129      0.91  |Q        |         |         |        V|
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    22+ 5       8.1191      0.91  |Q         |         |         |        V|
    22+10       8.1260      1.00  |Q         |         |         |        V|
    22+15       8.1335      1.09  | Q        |         |         |        V|
    22+20       8.1411      1.10  | Q        |         |         |        V|
    22+25       8.1480      1.00  | Q        |         |         |        V|
    22+30       8.1543      0.91  |Q         |         |         |        V|
    22+35       8.1603      0.88  |Q         |         |         |        V|
    22+40       8.1662      0.86  |Q         |         |         |        V|
    22+45       8.1720      0.84  |Q         |         |         |        V|
    22+50       8.1777      0.83  |Q         |         |         |        V|
    22+55       8.1833      0.82  |Q         |         |         |        V|
    23+ 0       8.1890      0.82  |Q         |         |         |        V|
    23+ 5       8.1946      0.82  |Q         |         |         |        V|
    23+10       8.2002      0.81  |Q         |         |         |        V|
    23+15       8.2058      0.81  |Q         |         |         |        V|
    23+20       8.2114      0.81  |Q         |         |         |        V|
    23+25       8.2169      0.81  |Q         |         |         |        V|
    23+30       8.2225      0.81  |Q         |         |         |        V|
    23+35       8.2280      0.81  |Q         |         |         |        V|
    23+40       8.2336      0.80  |Q         |         |         |        V|
    23+45       8.2391      0.80  |Q         |         |         |        V|
    23+50       8.2446      0.80  |Q         |         |         |        V|
    23+55       8.2501      0.80  |Q         |         |         |        V|
    24+ 0       8.2556      0.80  |Q         |         |         |        V|
    24+ 5       8.2608      0.75  |Q         |         |         |        V|
    24+10       8.2643      0.52  |Q         |         |         |        V|
    24+15       8.2664      0.30  Q          |         |         |        V|
    24+20       8.2678      0.21  Q          |         |         |        V|
    24+25       8.2689      0.15  Q          |         |         |        V|
    24+30       8.2696      0.11  Q          |         |         |        V|
    24+35       8.2702      0.09  Q          |         |         |        V|
    24+40       8.2707      0.07  Q          |         |         |        V|
    24+45       8.2711      0.06  Q          |         |         |        V|
    24+50       8.2714      0.05  Q          |         |         |        V|
    24+55       8.2717      0.04  Q          |         |         |        V|
    25+ 0       8.2719      0.03  Q          |         |         |        V|
    25+ 5       8.2721      0.02  Q          |         |         |        V|
    25+10       8.2722      0.02  Q          |         |         |        V|
    25+15       8.2723      0.02  Q          |         |         |        V|
    25+20       8.2724      0.01  Q          |         |         |        V|
    25+25       8.2724      0.01  Q          |         |         |        V|
    25+30       8.2725      0.00  Q          |         |         |        V|
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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  07/11/24 File: FCAP242.out


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


Program License Serial Number 6443

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

 English Units used in output format



---------------------------------------------------------------------
FAIRWAY CANYON
DA A AND A-OFFSITE 2 YR
KIMLEY-HORN

--------------------------------------------------------------------
Drainage Area =      49.40(Ac.)  =      0.077 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      49.40(Ac.)  =      0.077 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.394 Hr.
Lag time =    23.64 Min.
25% of lag time =     5.91 Min.
40% of lag time =     9.46 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]
       49.40            2.56                 126.46

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       49.40            6.25                 308.75

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    2.560(In)
Area Averaged 100-Year Rainfall =    6.250(In)

Point rain (area averaged) =    2.560(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    2.560(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    49.400           56.00         0.650
 Total Area Entered =     49.40(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
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```
56.0  36.0      0.706     0.650        0.293       1.000      0.293
                                                    Sum (F) =   0.293
Area averaged mean soil loss (F) (In/Hr) =  0.293
Minimum soil loss rate ((In/Hr)) =  0.146
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.380
---------------------------------------------------------------------

                U n i t  H y d r o g r a p h
        Combination of 'S' Curves:
        VALLEY 'S' Curve Percentage =    0.00
        FOOTHILL 'S' Curve Percentage =   50.00
        MOUNTAIN 'S' Curve Percentage =   50.00
        DESERT 'S' Curve Percentage =    0.00
--------------------------------------------------------------------
                Unit Hydrograph Data
---------------------------------------------------------------------
```

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	21.151	1.915	0.953
2	0.167	42.301	5.562	2.769
3	0.250	63.452	9.962	4.960
4	0.333	84.602	12.558	6.252
5	0.417	105.753	15.213	7.574
6	0.500	126.904	11.876	5.912
7	0.583	148.054	6.568	3.270
8	0.667	169.205	4.901	2.440
9	0.750	190.355	3.980	1.982
10	0.833	211.506	3.327	1.656
11	0.917	232.657	2.826	1.407
12	1.000	253.807	2.448	1.219
13	1.083	274.958	2.088	1.040
14	1.167	296.108	1.819	0.906
15	1.250	317.259	1.593	0.793
16	1.333	338.409	1.350	0.672
17	1.417	359.560	1.142	0.568
18	1.500	380.711	0.994	0.495
19	1.583	401.861	0.879	0.438
20	1.667	423.012	0.685	0.341
21	1.750	444.162	0.571	0.284
22	1.833	465.313	0.560	0.279
23	1.917	486.464	0.530	0.264
24	2.000	507.614	0.521	0.259
25	2.083	528.765	0.428	0.213
26	2.167	549.915	0.402	0.200
27	2.250	571.066	0.402	0.200
28	2.333	592.217	0.402	0.200
29	2.417	613.367	0.385	0.192
30	2.500	634.518	0.323	0.161
31	2.583	655.668	0.316	0.157
32	2.667	676.819	0.286	0.143
33	2.750	697.970	0.275	0.137
34	2.833	719.120	0.249	0.124
35	2.917	740.271	0.212	0.105
36	3.000	761.421	0.208	0.104
37	3.083	782.572	0.193	0.096
38	3.167	803.723	0.190	0.095
39	3.250	824.873	0.190	0.095
40	3.333	846.024	0.190	0.095
41	3.417	867.174	0.190	0.095
42	3.500	888.325	0.190	0.095
43	3.583	909.475	0.190	0.095
44	3.667	930.626	0.190	0.095
45	3.750	951.777	0.190	0.095
46	3.833	972.927	0.190	0.095
47	3.917	994.078	0.190	0.095
48	4.000	1015.228	0.148	0.074
			Sum = 100.000	Sum= 49.786

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(0.519)	0.008	0.013
2	0.17	0.07	0.020	(0.517)	0.008	0.013
3	0.25	0.07	0.020	(0.515)	0.008	0.013
4	0.33	0.10	0.031	(0.513)	0.012	0.019
5	0.42	0.10	0.031	(0.511)	0.012	0.019
6	0.50	0.10	0.031	(0.509)	0.012	0.019
7	0.58	0.10	0.031	(0.507)	0.012	0.019
8	0.67	0.10	0.031	(0.505)	0.012	0.019
9	0.75	0.10	0.031	(0.503)	0.012	0.019
10	0.83	0.13	0.041	(0.501)	0.016	0.025
11	0.92	0.13	0.041	(0.499)	0.016	0.025
12	1.00	0.13	0.041	(0.498)	0.016	0.025
13	1.08	0.10	0.031	(0.496)	0.012	0.019
14	1.17	0.10	0.031	(0.494)	0.012	0.019
15	1.25	0.10	0.031	(0.492)	0.012	0.019
16	1.33	0.10	0.031	(0.490)	0.012	0.019
17	1.42	0.10	0.031	(0.488)	0.012	0.019
18	1.50	0.10	0.031	(0.486)	0.012	0.019
19	1.58	0.10	0.031	(0.484)	0.012	0.019
20	1.67	0.10	0.031	(0.482)	0.012	0.019
21	1.75	0.10	0.031	(0.480)	0.012	0.019
22	1.83	0.13	0.041	(0.478)	0.016	0.025
23	1.92	0.13	0.041	(0.476)	0.016	0.025
24	2.00	0.13	0.041	(0.474)	0.016	0.025
25	2.08	0.13	0.041	(0.472)	0.016	0.025
26	2.17	0.13	0.041	(0.470)	0.016	0.025
27	2.25	0.13	0.041	(0.468)	0.016	0.025
28	2.33	0.13	0.041	(0.467)	0.016	0.025
29	2.42	0.13	0.041	(0.465)	0.016	0.025
30	2.50	0.13	0.041	(0.463)	0.016	0.025
31	2.58	0.17	0.051	(0.461)	0.019	0.032
32	2.67	0.17	0.051	(0.459)	0.019	0.032
33	2.75	0.17	0.051	(0.457)	0.019	0.032
34	2.83	0.17	0.051	(0.455)	0.019	0.032
35	2.92	0.17	0.051	(0.453)	0.019	0.032
36	3.00	0.17	0.051	(0.451)	0.019	0.032
37	3.08	0.17	0.051	(0.450)	0.019	0.032
38	3.17	0.17	0.051	(0.448)	0.019	0.032
39	3.25	0.17	0.051	(0.446)	0.019	0.032
40	3.33	0.17	0.051	(0.444)	0.019	0.032
41	3.42	0.17	0.051	(0.442)	0.019	0.032
42	3.50	0.17	0.051	(0.440)	0.019	0.032
43	3.58	0.17	0.051	(0.438)	0.019	0.032
44	3.67	0.17	0.051	(0.437)	0.019	0.032
45	3.75	0.17	0.051	(0.435)	0.019	0.032
46	3.83	0.20	0.061	(0.433)	0.023	0.038
47	3.92	0.20	0.061	(0.431)	0.023	0.038
48	4.00	0.20	0.061	(0.429)	0.023	0.038
49	4.08	0.20	0.061	(0.427)	0.023	0.038
50	4.17	0.20	0.061	(0.426)	0.023	0.038
51	4.25	0.20	0.061	(0.424)	0.023	0.038
52	4.33	0.23	0.072	(0.422)	0.027	0.044
53	4.42	0.23	0.072	(0.420)	0.027	0.044
54	4.50	0.23	0.072	(0.418)	0.027	0.044
55	4.58	0.23	0.072	(0.417)	0.027	0.044
56	4.67	0.23	0.072	(0.415)	0.027	0.044
57	4.75	0.23	0.072	(0.413)	0.027	0.044
58	4.83	0.27	0.082	(0.411)	0.031	0.051
59	4.92	0.27	0.082	(0.409)	0.031	0.051
60	5.00	0.27	0.082	(0.408)	0.031	0.051
61	5.08	0.20	0.061	(0.406)	0.023	0.038

62	5.17	0.20	0.061	(0.404)	0.023	0.038
63	5.25	0.20	0.061	(0.402)	0.023	0.038
64	5.33	0.23	0.072	(0.401)	0.027	0.044
65	5.42	0.23	0.072	(0.399)	0.027	0.044
66	5.50	0.23	0.072	(0.397)	0.027	0.044
67	5.58	0.27	0.082	(0.395)	0.031	0.051
68	5.67	0.27	0.082	(0.394)	0.031	0.051
69	5.75	0.27	0.082	(0.392)	0.031	0.051
70	5.83	0.27	0.082	(0.390)	0.031	0.051
71	5.92	0.27	0.082	(0.388)	0.031	0.051
72	6.00	0.27	0.082	(0.387)	0.031	0.051
73	6.08	0.30	0.092	(0.385)	0.035	0.057
74	6.17	0.30	0.092	(0.383)	0.035	0.057
75	6.25	0.30	0.092	(0.382)	0.035	0.057
76	6.33	0.30	0.092	(0.380)	0.035	0.057
77	6.42	0.30	0.092	(0.378)	0.035	0.057
78	6.50	0.30	0.092	(0.377)	0.035	0.057
79	6.58	0.33	0.102	(0.375)	0.039	0.063
80	6.67	0.33	0.102	(0.373)	0.039	0.063
81	6.75	0.33	0.102	(0.371)	0.039	0.063
82	6.83	0.33	0.102	(0.370)	0.039	0.063
83	6.92	0.33	0.102	(0.368)	0.039	0.063
84	7.00	0.33	0.102	(0.366)	0.039	0.063
85	7.08	0.33	0.102	(0.365)	0.039	0.063
86	7.17	0.33	0.102	(0.363)	0.039	0.063
87	7.25	0.33	0.102	(0.361)	0.039	0.063
88	7.33	0.37	0.113	(0.360)	0.043	0.070
89	7.42	0.37	0.113	(0.358)	0.043	0.070
90	7.50	0.37	0.113	(0.356)	0.043	0.070
91	7.58	0.40	0.123	(0.355)	0.047	0.076
92	7.67	0.40	0.123	(0.353)	0.047	0.076
93	7.75	0.40	0.123	(0.352)	0.047	0.076
94	7.83	0.43	0.133	(0.350)	0.051	0.083
95	7.92	0.43	0.133	(0.348)	0.051	0.083
96	8.00	0.43	0.133	(0.347)	0.051	0.083
97	8.08	0.50	0.154	(0.345)	0.058	0.095
98	8.17	0.50	0.154	(0.344)	0.058	0.095
99	8.25	0.50	0.154	(0.342)	0.058	0.095
100	8.33	0.50	0.154	(0.340)	0.058	0.095
101	8.42	0.50	0.154	(0.339)	0.058	0.095
102	8.50	0.50	0.154	(0.337)	0.058	0.095
103	8.58	0.53	0.164	(0.336)	0.062	0.102
104	8.67	0.53	0.164	(0.334)	0.062	0.102
105	8.75	0.53	0.164	(0.332)	0.062	0.102
106	8.83	0.57	0.174	(0.331)	0.066	0.108
107	8.92	0.57	0.174	(0.329)	0.066	0.108
108	9.00	0.57	0.174	(0.328)	0.066	0.108
109	9.08	0.63	0.195	(0.326)	0.074	0.121
110	9.17	0.63	0.195	(0.325)	0.074	0.121
111	9.25	0.63	0.195	(0.323)	0.074	0.121
112	9.33	0.67	0.205	(0.322)	0.078	0.127
113	9.42	0.67	0.205	(0.320)	0.078	0.127
114	9.50	0.67	0.205	(0.318)	0.078	0.127
115	9.58	0.70	0.215	(0.317)	0.082	0.133
116	9.67	0.70	0.215	(0.315)	0.082	0.133
117	9.75	0.70	0.215	(0.314)	0.082	0.133
118	9.83	0.73	0.225	(0.312)	0.086	0.140
119	9.92	0.73	0.225	(0.311)	0.086	0.140
120	10.00	0.73	0.225	(0.309)	0.086	0.140
121	10.08	0.50	0.154	(0.308)	0.058	0.095
122	10.17	0.50	0.154	(0.306)	0.058	0.095
123	10.25	0.50	0.154	(0.305)	0.058	0.095
124	10.33	0.50	0.154	(0.303)	0.058	0.095
125	10.42	0.50	0.154	(0.302)	0.058	0.095
126	10.50	0.50	0.154	(0.300)	0.058	0.095
127	10.58	0.67	0.205	(0.299)	0.078	0.127
128	10.67	0.67	0.205	(0.298)	0.078	0.127
129	10.75	0.67	0.205	(0.296)	0.078	0.127
130	10.83	0.67	0.205	(0.295)	0.078	0.127

131	10.92	0.67	0.205	(0.293)	0.078	0.127
132	11.00	0.67	0.205	(0.292)	0.078	0.127
133	11.08	0.63	0.195	(0.290)	0.074	0.121
134	11.17	0.63	0.195	(0.289)	0.074	0.121
135	11.25	0.63	0.195	(0.287)	0.074	0.121
136	11.33	0.63	0.195	(0.286)	0.074	0.121
137	11.42	0.63	0.195	(0.285)	0.074	0.121
138	11.50	0.63	0.195	(0.283)	0.074	0.121
139	11.58	0.57	0.174	(0.282)	0.066	0.108
140	11.67	0.57	0.174	(0.280)	0.066	0.108
141	11.75	0.57	0.174	(0.279)	0.066	0.108
142	11.83	0.60	0.184	(0.278)	0.070	0.114
143	11.92	0.60	0.184	(0.276)	0.070	0.114
144	12.00	0.60	0.184	(0.275)	0.070	0.114
145	12.08	0.83	0.256	(0.273)	0.097	0.159
146	12.17	0.83	0.256	(0.272)	0.097	0.159
147	12.25	0.83	0.256	(0.271)	0.097	0.159
148	12.33	0.87	0.266	(0.269)	0.101	0.165
149	12.42	0.87	0.266	(0.268)	0.101	0.165
150	12.50	0.87	0.266	(0.267)	0.101	0.165
151	12.58	0.93	0.287	(0.265)	0.109	0.178
152	12.67	0.93	0.287	(0.264)	0.109	0.178
153	12.75	0.93	0.287	(0.263)	0.109	0.178
154	12.83	0.97	0.297	(0.261)	0.113	0.184
155	12.92	0.97	0.297	(0.260)	0.113	0.184
156	13.00	0.97	0.297	(0.259)	0.113	0.184
157	13.08	1.13	0.348	(0.257)	0.132	0.216
158	13.17	1.13	0.348	(0.256)	0.132	0.216
159	13.25	1.13	0.348	(0.255)	0.132	0.216
160	13.33	1.13	0.348	(0.254)	0.132	0.216
161	13.42	1.13	0.348	(0.252)	0.132	0.216
162	13.50	1.13	0.348	(0.251)	0.132	0.216
163	13.58	0.77	0.235	(0.250)	0.089	0.146
164	13.67	0.77	0.235	(0.248)	0.089	0.146
165	13.75	0.77	0.235	(0.247)	0.089	0.146
166	13.83	0.77	0.235	(0.246)	0.089	0.146
167	13.92	0.77	0.235	(0.245)	0.089	0.146
168	14.00	0.77	0.235	(0.243)	0.089	0.146
169	14.08	0.90	0.276	(0.242)	0.105	0.171
170	14.17	0.90	0.276	(0.241)	0.105	0.171
171	14.25	0.90	0.276	(0.240)	0.105	0.171
172	14.33	0.87	0.266	(0.238)	0.101	0.165
173	14.42	0.87	0.266	(0.237)	0.101	0.165
174	14.50	0.87	0.266	(0.236)	0.101	0.165
175	14.58	0.87	0.266	(0.235)	0.101	0.165
176	14.67	0.87	0.266	(0.234)	0.101	0.165
177	14.75	0.87	0.266	(0.232)	0.101	0.165
178	14.83	0.83	0.256	(0.231)	0.097	0.159
179	14.92	0.83	0.256	(0.230)	0.097	0.159
180	15.00	0.83	0.256	(0.229)	0.097	0.159
181	15.08	0.80	0.246	(0.228)	0.093	0.152
182	15.17	0.80	0.246	(0.226)	0.093	0.152
183	15.25	0.80	0.246	(0.225)	0.093	0.152
184	15.33	0.77	0.235	(0.224)	0.089	0.146
185	15.42	0.77	0.235	(0.223)	0.089	0.146
186	15.50	0.77	0.235	(0.222)	0.089	0.146
187	15.58	0.63	0.195	(0.221)	0.074	0.121
188	15.67	0.63	0.195	(0.220)	0.074	0.121
189	15.75	0.63	0.195	(0.218)	0.074	0.121
190	15.83	0.63	0.195	(0.217)	0.074	0.121
191	15.92	0.63	0.195	(0.216)	0.074	0.121
192	16.00	0.63	0.195	(0.215)	0.074	0.121
193	16.08	0.13	0.041	(0.214)	0.016	0.025
194	16.17	0.13	0.041	(0.213)	0.016	0.025
195	16.25	0.13	0.041	(0.212)	0.016	0.025
196	16.33	0.13	0.041	(0.211)	0.016	0.025
197	16.42	0.13	0.041	(0.210)	0.016	0.025
198	16.50	0.13	0.041	(0.209)	0.016	0.025
199	16.58	0.10	0.031	(0.208)	0.012	0.019

200	16.67	0.10	0.031	(0.207)	0.012	0.019
201	16.75	0.10	0.031	(0.205)	0.012	0.019
202	16.83	0.10	0.031	(0.204)	0.012	0.019
203	16.92	0.10	0.031	(0.203)	0.012	0.019
204	17.00	0.10	0.031	(0.202)	0.012	0.019
205	17.08	0.17	0.051	(0.201)	0.019	0.032
206	17.17	0.17	0.051	(0.200)	0.019	0.032
207	17.25	0.17	0.051	(0.199)	0.019	0.032
208	17.33	0.17	0.051	(0.198)	0.019	0.032
209	17.42	0.17	0.051	(0.197)	0.019	0.032
210	17.50	0.17	0.051	(0.196)	0.019	0.032
211	17.58	0.17	0.051	(0.195)	0.019	0.032
212	17.67	0.17	0.051	(0.194)	0.019	0.032
213	17.75	0.17	0.051	(0.193)	0.019	0.032
214	17.83	0.13	0.041	(0.192)	0.016	0.025
215	17.92	0.13	0.041	(0.192)	0.016	0.025
216	18.00	0.13	0.041	(0.191)	0.016	0.025
217	18.08	0.13	0.041	(0.190)	0.016	0.025
218	18.17	0.13	0.041	(0.189)	0.016	0.025
219	18.25	0.13	0.041	(0.188)	0.016	0.025
220	18.33	0.13	0.041	(0.187)	0.016	0.025
221	18.42	0.13	0.041	(0.186)	0.016	0.025
222	18.50	0.13	0.041	(0.185)	0.016	0.025
223	18.58	0.10	0.031	(0.184)	0.012	0.019
224	18.67	0.10	0.031	(0.183)	0.012	0.019
225	18.75	0.10	0.031	(0.182)	0.012	0.019
226	18.83	0.07	0.020	(0.182)	0.008	0.013
227	18.92	0.07	0.020	(0.181)	0.008	0.013
228	19.00	0.07	0.020	(0.180)	0.008	0.013
229	19.08	0.10	0.031	(0.179)	0.012	0.019
230	19.17	0.10	0.031	(0.178)	0.012	0.019
231	19.25	0.10	0.031	(0.177)	0.012	0.019
232	19.33	0.13	0.041	(0.176)	0.016	0.025
233	19.42	0.13	0.041	(0.176)	0.016	0.025
234	19.50	0.13	0.041	(0.175)	0.016	0.025
235	19.58	0.10	0.031	(0.174)	0.012	0.019
236	19.67	0.10	0.031	(0.173)	0.012	0.019
237	19.75	0.10	0.031	(0.172)	0.012	0.019
238	19.83	0.07	0.020	(0.172)	0.008	0.013
239	19.92	0.07	0.020	(0.171)	0.008	0.013
240	20.00	0.07	0.020	(0.170)	0.008	0.013
241	20.08	0.10	0.031	(0.169)	0.012	0.019
242	20.17	0.10	0.031	(0.169)	0.012	0.019
243	20.25	0.10	0.031	(0.168)	0.012	0.019
244	20.33	0.10	0.031	(0.167)	0.012	0.019
245	20.42	0.10	0.031	(0.166)	0.012	0.019
246	20.50	0.10	0.031	(0.166)	0.012	0.019
247	20.58	0.10	0.031	(0.165)	0.012	0.019
248	20.67	0.10	0.031	(0.164)	0.012	0.019
249	20.75	0.10	0.031	(0.164)	0.012	0.019
250	20.83	0.07	0.020	(0.163)	0.008	0.013
251	20.92	0.07	0.020	(0.162)	0.008	0.013
252	21.00	0.07	0.020	(0.162)	0.008	0.013
253	21.08	0.10	0.031	(0.161)	0.012	0.019
254	21.17	0.10	0.031	(0.160)	0.012	0.019
255	21.25	0.10	0.031	(0.160)	0.012	0.019
256	21.33	0.07	0.020	(0.159)	0.008	0.013
257	21.42	0.07	0.020	(0.159)	0.008	0.013
258	21.50	0.07	0.020	(0.158)	0.008	0.013
259	21.58	0.10	0.031	(0.157)	0.012	0.019
260	21.67	0.10	0.031	(0.157)	0.012	0.019
261	21.75	0.10	0.031	(0.156)	0.012	0.019
262	21.83	0.07	0.020	(0.156)	0.008	0.013
263	21.92	0.07	0.020	(0.155)	0.008	0.013
264	22.00	0.07	0.020	(0.155)	0.008	0.013
265	22.08	0.10	0.031	(0.154)	0.012	0.019
266	22.17	0.10	0.031	(0.154)	0.012	0.019
267	22.25	0.10	0.031	(0.153)	0.012	0.019
268	22.33	0.07	0.020	(0.153)	0.008	0.013

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269  22.42     0.07      0.020       (  0.152)      0.008        0.013
270  22.50     0.07      0.020       (  0.152)      0.008        0.013
271  22.58     0.07      0.020       (  0.151)      0.008        0.013
272  22.67     0.07      0.020       (  0.151)      0.008        0.013
273  22.75     0.07      0.020       (  0.151)      0.008        0.013
274  22.83     0.07      0.020       (  0.150)      0.008        0.013
275  22.92     0.07      0.020       (  0.150)      0.008        0.013
276  23.00     0.07      0.020       (  0.149)      0.008        0.013
277  23.08     0.07      0.020       (  0.149)      0.008        0.013
278  23.17     0.07      0.020       (  0.149)      0.008        0.013
279  23.25     0.07      0.020       (  0.148)      0.008        0.013
280  23.33     0.07      0.020       (  0.148)      0.008        0.013
281  23.42     0.07      0.020       (  0.148)      0.008        0.013
282  23.50     0.07      0.020       (  0.148)      0.008        0.013
283  23.58     0.07      0.020       (  0.147)      0.008        0.013
284  23.67     0.07      0.020       (  0.147)      0.008        0.013
285  23.75     0.07      0.020       (  0.147)      0.008        0.013
286  23.83     0.07      0.020       (  0.147)      0.008        0.013
287  23.92     0.07      0.020       (  0.147)      0.008        0.013
288  24.00     0.07      0.020       (  0.147)      0.008        0.013
                (Loss Rate Not Used)
    Sum =     100.0                                  Sum =    19.0
       Flood volume = Effective rainfall      1.59(In)
        times area      49.4(Ac.)/[(In)/(Ft.)] =       6.5(Ac.Ft)
       Total soil loss =      0.97(In)
       Total soil loss =     4.004(Ac.Ft)
       Total rainfall =      2.56(In)
       Flood volume =      284592.4 Cubic Feet
       Total soil loss =      174427.6 Cubic Feet
       --------------------------------------------------------------------
        Peak flow rate of this hydrograph =      9.701(CFS)
       --------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           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      0.01  Q         |         |         |         |
   0+10       0.0004      0.05  Q         |         |         |         |
   0+15       0.0012      0.11  Q         |         |         |         |
   0+20       0.0025      0.20  Q         |         |         |         |
   0+25       0.0046      0.31  VQ        |         |         |         |
   0+30       0.0075      0.42  VQ        |         |         |         |
   0+35       0.0109      0.50  VQ        |         |         |         |
   0+40       0.0149      0.58  V Q       |         |         |         |
   0+45       0.0193      0.64  V Q       |         |         |         |
   0+50       0.0240      0.69  V Q       |         |         |         |
   0+55       0.0291      0.74  V Q       |         |         |         |
   1+ 0       0.0346      0.80  V  Q      |         |         |         |
   1+ 5       0.0405      0.86  V  Q      |         |         |         |
   1+10       0.0468      0.91  V  Q      |         |         |         |
   1+15       0.0532      0.93  V  Q      |         |         |         |
   1+20       0.0595      0.93  V  Q      |         |         |         |
   1+25       0.0658      0.91  V  Q      |         |         |         |
   1+30       0.0719      0.89  V  Q      |         |         |         |
   1+35       0.0781      0.89  V  Q      |         |         |         |
   1+40       0.0842      0.89  V  Q      |         |         |         |
   1+45       0.0904      0.90  V  Q      |         |         |         |
   1+50       0.0966      0.90  V  Q      |         |         |         |
   1+55       0.1030      0.92  V  Q      |         |         |         |
   2+ 0       0.1096      0.96  V  Q      |         |         |         |
   2+ 5       0.1165      1.00  V  Q      |         |         |         |
   2+10       0.1237      1.05  V   Q     |         |         |         |
   2+15       0.1312      1.09  V   Q     |         |         |         |
   2+20       0.1389      1.11  V   Q     |         |         |         |
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2+25       0.1467      1.13  V   Q     |         |         |         |
2+30       0.1545      1.15  V   Q     |         |         |         |
2+35       0.1626      1.16  V   Q     |         |         |         |
2+40       0.1708      1.19  |V  Q     |         |         |         |
2+45       0.1793      1.24  |V  Q     |         |         |         |
2+50       0.1881      1.28  |V   Q    |         |         |         |
2+55       0.1973      1.34  |V   Q    |         |         |         |
3+ 0       0.2069      1.38  |V   Q    |         |         |         |
3+ 5       0.2166      1.41  |V   Q    |         |         |         |
3+10       0.2264      1.43  |V   Q    |         |         |         |
3+15       0.2364      1.45  |V   Q    |         |         |         |
3+20       0.2465      1.46  |V   Q    |         |         |         |
3+25       0.2567      1.48  |V   Q    |         |         |         |
3+30       0.2669      1.49  |V   Q    |         |         |         |
3+35       0.2772      1.50  |V   Q    |         |         |         |
3+40       0.2876      1.51  |V    Q   |         |         |         |
3+45       0.2980      1.51  |V    Q   |         |         |         |
3+50       0.3086      1.53  |V    Q   |         |         |         |
3+55       0.3192      1.55  |V    Q   |         |         |         |
4+ 0       0.3302      1.59  | V   Q   |         |         |         |
4+ 5       0.3415      1.63  | V   Q   |         |         |         |
4+10       0.3531      1.69  | V   Q   |         |         |         |
4+15       0.3650      1.73  | V   Q   |         |         |         |
4+20       0.3771      1.76  | V    Q  |         |         |         |
4+25       0.3894      1.79  | V    Q  |         |         |         |
4+30       0.4021      1.84  | V    Q  |         |         |         |
4+35       0.4151      1.89  | V    Q  |         |         |         |
4+40       0.4285      1.95  | V    Q  |         |         |         |
4+45       0.4423      2.00  | V    Q  |         |         |         |
4+50       0.4563      2.03  | V     Q |         |         |         |
4+55       0.4705      2.07  | V     Q |         |         |         |
5+ 0       0.4851      2.12  | V     Q |         |         |         |
5+ 5       0.5001      2.17  |  V    Q |         |         |         |
5+10       0.5152      2.19  |  V    Q |         |         |         |
5+15       0.5302      2.18  |  V    Q |         |         |         |
5+20       0.5449      2.14  |  V    Q |         |         |         |
5+25       0.5593      2.08  |  V    Q |         |         |         |
5+30       0.5735      2.06  |  V    Q |         |         |         |
5+35       0.5878      2.08  |  V    Q |         |         |         |
5+40       0.6025      2.13  |  V    Q |         |         |         |
5+45       0.6176      2.19  |  V    Q |         |         |         |
5+50       0.6330      2.24  |  V    Q |         |         |         |
5+55       0.6489      2.30  |  V     Q|         |         |         |
6+ 0       0.6650      2.34  |   V    Q|         |         |         |
6+ 5       0.6813      2.37  |   V    Q|         |         |         |
6+10       0.6979      2.41  |   V    Q|         |         |         |
6+15       0.7149      2.46  |   V    Q|         |         |         |
6+20       0.7322      2.51  |   V     Q         |         |         |
6+25       0.7499      2.57  |   V     Q         |         |         |
6+30       0.7679      2.62  |   V     Q         |         |         |
6+35       0.7862      2.66  |   V     Q         |         |         |
6+40       0.8048      2.70  |   V     Q         |         |         |
6+45       0.8238      2.75  |    V    |Q        |         |         |
6+50       0.8431      2.81  |    V    |Q        |         |         |
6+55       0.8629      2.87  |    V    |Q        |         |         |
7+ 0       0.8830      2.92  |    V    |Q        |         |         |
7+ 5       0.9033      2.95  |    V    |Q        |         |         |
7+10       0.9238      2.98  |    V    |Q        |         |         |
7+15       0.9445      3.00  |    V    |Q        |         |         |
7+20       0.9653      3.02  |    V    | Q       |         |         |
7+25       0.9863      3.05  |     V   | Q       |         |         |
7+30       1.0077      3.10  |     V   | Q       |         |         |
7+35       1.0294      3.16  |     V   | Q       |         |         |
7+40       1.0517      3.23  |     V   | Q       |         |         |
7+45       1.0745      3.31  |     V   |  Q      |         |         |
7+50       1.0978      3.39  |     V   |  Q      |         |         |
7+55       1.1217      3.47  |     V   |  Q      |         |         |
8+ 0       1.1463      3.56  |      V  |   Q     |         |         |
8+ 5       1.1714      3.65  |      V  |   Q     |         |         |
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 8+10       1.1973      3.76  |      V  |    Q    |         |         |
 8+15       1.2241      3.89  |      V  |    Q    |         |         |
 8+20       1.2517      4.01  |      V  |     Q   |         |         |
 8+25       1.2803      4.14  |      V  |     Q   |         |         |
 8+30       1.3095      4.24  |       V |     Q   |         |         |
 8+35       1.3392      4.32  |       V |      Q  |         |         |
 8+40       1.3694      4.39  |       V |      Q  |         |         |
 8+45       1.4001      4.46  |       V |      Q  |         |         |
 8+50       1.4314      4.54  |       V |       Q |         |         |
 8+55       1.4634      4.64  |       V |       Q |         |         |
 9+ 0       1.4960      4.74  |        V|       Q |         |         |
 9+ 5       1.5293      4.83  |        V|        Q|         |         |
 9+10       1.5635      4.96  |        V|        Q|         |         |
 9+15       1.5985      5.09  |        V|         Q         |         |
 9+20       1.6344      5.22  |         V         Q         |         |
 9+25       1.6715      5.37  |         V         |Q        |         |
 9+30       1.7094      5.51  |         V         | Q       |         |
 9+35       1.7482      5.63  |         V         | Q       |         |
 9+40       1.7878      5.75  |         V         | Q       |         |
 9+45       1.8282      5.87  |         |V        |  Q      |         |
 9+50       1.8693      5.97  |         |V        |  Q      |         |
 9+55       1.9112      6.09  |         |V        |   Q     |         |
10+ 0       1.9539      6.20  |         |V        |   Q     |         |
10+ 5       1.9970      6.26  |         | V       |    Q    |         |
10+10       2.0399      6.23  |         | V       |   Q     |         |
10+15       2.0819      6.09  |         | V       |   Q     |         |
10+20       2.1223      5.87  |         | V       |  Q      |         |
10+25       2.1607      5.58  |         |  V      | Q       |         |
10+30       2.1975      5.35  |         |  V      |Q        |         |
10+35       2.2338      5.27  |         |  V      |Q        |         |
10+40       2.2702      5.28  |         |  V      |Q        |         |
10+45       2.3072      5.38  |         |   V     |Q        |         |
10+50       2.3453      5.52  |         |   V     | Q       |         |
10+55       2.3847      5.72  |         |   V     | Q       |         |
11+ 0       2.4251      5.87  |         |   V     |  Q      |         |
11+ 5       2.4661      5.94  |         |    V    |  Q      |         |
11+10       2.5072      5.98  |         |    V    |  Q      |         |
11+15       2.5485      5.99  |         |    V    |  Q      |         |
11+20       2.5897      5.98  |         |    V    |  Q      |         |
11+25       2.6308      5.97  |         |     V   |  Q      |         |
11+30       2.6718      5.96  |         |     V   |  Q      |         |
11+35       2.7127      5.95  |         |     V   |  Q      |         |
11+40       2.7535      5.92  |         |     V   |  Q      |         |
11+45       2.7939      5.86  |         |      V  |  Q      |         |
11+50       2.8338      5.80  |         |      V  |  Q      |         |
11+55       2.8732      5.72  |         |      V  | Q       |         |
12+ 0       2.9123      5.68  |         |      V  | Q       |         |
12+ 5       2.9518      5.73  |         |       V | Q       |         |
12+10       2.9922      5.87  |         |       V |  Q      |         |
12+15       3.0342      6.10  |         |       V |   Q     |         |
12+20       3.0781      6.38  |         |       V |    Q    |         |
12+25       3.1245      6.74  |         |        V|     Q   |         |
12+30       3.1730      7.03  |         |        V|       Q |         |
12+35       3.2227      7.23  |         |        V|       Q |         |
12+40       3.2738      7.42  |         |         V        Q|         |
12+45       3.3262      7.61  |         |         V         Q         |
12+50       3.3798      7.79  |         |         V         |Q        |
12+55       3.4348      7.98  |         |         |V        |Q        |
13+ 0       3.4909      8.15  |         |         |V        | Q       |
13+ 5       3.5482      8.32  |         |         |V        |  Q      |
13+10       3.6070      8.54  |         |         | V       |   Q     |
13+15       3.6676      8.80  |         |         | V       |    Q    |
13+20       3.7301      9.08  |         |         | V       |     Q   |
13+25       3.7947      9.38  |         |         |  V      |      Q  |
13+30       3.8610      9.62  |         |         |  V      |       Q |
13+35       3.9278      9.70  |         |         |   V     |       Q |
13+40       3.9940      9.62  |         |         |   V     |       Q |
13+45       4.0586      9.37  |         |         |   V     |      Q  |
13+50       4.1206      9.01  |         |         |    V    |     Q   |
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13+55       4.1795      8.55  |         |         |    V    |   Q     |
14+ 0       4.2360      8.20  |         |         |    V    | Q       |
14+ 5       4.2915      8.05  |         |         |     V   | Q       |
14+10       4.3466      8.00  |         |         |     V   | Q       |
14+15       4.4019      8.03  |         |         |     V   | Q       |
14+20       4.4577      8.11  |         |         |      V  | Q       |
14+25       4.5144      8.22  |         |         |      V  | Q       |
14+30       4.5714      8.29  |         |         |      V  |  Q      |
14+35       4.6285      8.28  |         |         |       V |  Q      |
14+40       4.6853      8.25  |         |         |       V |  Q      |
14+45       4.7420      8.23  |         |         |        V| Q       |
14+50       4.7986      8.22  |         |         |        V| Q       |
14+55       4.8550      8.20  |         |         |        V| Q       |
15+ 0       4.9113      8.16  |         |         |         V Q       |
15+ 5       4.9672      8.12  |         |         |         V Q       |
15+10       5.0227      8.06  |         |         |         V Q       |
15+15       5.0777      7.99  |         |         |         |Q        |
15+20       5.1323      7.93  |         |         |         |Q        |
15+25       5.1864      7.85  |         |         |         |Q        |
15+30       5.2400      7.77  |         |         |         |QV       |
15+35       5.2929      7.68  |         |         |         Q V       |
15+40       5.3448      7.54  |         |         |         Q V       |
15+45       5.3955      7.36  |         |         |        Q|  V      |
15+50       5.4448      7.16  |         |         |       Q |  V      |
15+55       5.4926      6.94  |         |         |      Q  |  V      |
16+ 0       5.5393      6.77  |         |         |      Q  |  V      |
16+ 5       5.5845      6.57  |         |         |     Q   |   V     |
16+10       5.6274      6.23  |         |         |   Q     |   V     |
16+15       5.6666      5.69  |         |         | Q       |   V     |
16+20       5.7012      5.04  |         |         Q         |   V     |
16+25       5.7306      4.27  |         |      Q  |         |    V    |
16+30       5.7559      3.66  |         |   Q     |         |    V    |
16+35       5.7787      3.31  |         |  Q      |         |    V    |
16+40       5.7995      3.03  |         | Q       |         |    V    |
16+45       5.8187      2.78  |         |Q        |         |    V    |
16+50       5.8363      2.56  |         Q         |         |    V    |
16+55       5.8525      2.36  |        Q|         |         |    V    |
17+ 0       5.8676      2.18  |       Q |         |         |    V    |
17+ 5       5.8817      2.05  |       Q |         |         |     V   |
17+10       5.8953      1.97  |      Q  |         |         |     V   |
17+15       5.9086      1.93  |      Q  |         |         |     V   |
17+20       5.9218      1.92  |      Q  |         |         |     V   |
17+25       5.9351      1.94  |      Q  |         |         |     V   |
17+30       5.9485      1.94  |      Q  |         |         |     V   |
17+35       5.9618      1.93  |      Q  |         |         |     V   |
17+40       5.9750      1.92  |      Q  |         |         |     V   |
17+45       5.9881      1.90  |      Q  |         |         |     V   |
17+50       6.0011      1.88  |      Q  |         |         |     V   |
17+55       6.0138      1.85  |      Q  |         |         |     V   |
18+ 0       6.0262      1.80  |      Q  |         |         |     V   |
18+ 5       6.0382      1.74  |     Q   |         |         |     V   |
18+10       6.0498      1.68  |     Q   |         |         |      V  |
18+15       6.0610      1.63  |     Q   |         |         |      V  |
18+20       6.0719      1.59  |     Q   |         |         |      V  |
18+25       6.0826      1.55  |     Q   |         |         |      V  |
18+30       6.0931      1.53  |     Q   |         |         |      V  |
18+35       6.1034      1.50  |    Q    |         |         |      V  |
18+40       6.1135      1.45  |    Q    |         |         |      V  |
18+45       6.1231      1.40  |    Q    |         |         |      V  |
18+50       6.1323      1.33  |    Q    |         |         |      V  |
18+55       6.1409      1.25  |    Q    |         |         |      V  |
19+ 0       6.1489      1.17  |   Q     |         |         |      V  |
19+ 5       6.1565      1.10  |   Q     |         |         |      V  |
19+10       6.1637      1.04  |   Q     |         |         |      V  |
19+15       6.1706      1.01  |   Q     |         |         |      V  |
19+20       6.1775      1.01  |   Q     |         |         |      V  |
19+25       6.1847      1.04  |   Q     |         |         |      V  |
19+30       6.1921      1.07  |   Q     |         |         |      V  |
19+35       6.1996      1.10  |   Q     |         |         |      V  |
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19+40       6.2074     1.12  |    Q      |         |         |       V |
19+45       6.2151     1.12  |    Q      |         |         |       V |
19+50       6.2226     1.09  |    Q      |         |         |       V |
19+55       6.2296     1.03  |    Q      |         |         |       V |
20+ 0       6.2363     0.96  |   Q       |         |         |       V |
20+ 5       6.2426     0.92  |   Q       |         |         |       V |
20+10       6.2486     0.88  |   Q       |         |         |       V |
20+15       6.2546     0.87  |   Q       |         |         |       V |
20+20       6.2607     0.88  |   Q       |         |         |       V |
20+25       6.2669     0.91  |   Q       |         |         |       V |
20+30       6.2734     0.93  |   Q       |         |         |       V |
20+35       6.2798     0.94  |   Q       |         |         |       V |
20+40       6.2863     0.94  |   Q       |         |         |       V |
20+45       6.2928     0.95  |   Q       |         |         |       V |
20+50       6.2993     0.94  |   Q       |         |         |       V |
20+55       6.3057     0.93  |   Q       |         |         |       V |
21+ 0       6.3119     0.90  |   Q       |         |         |       V |
21+ 5       6.3178     0.86  |   Q       |         |         |       V |
21+10       6.3236     0.83  |   Q       |         |         |       V |
21+15       6.3293     0.83  |   Q       |         |         |       V |
21+20       6.3350     0.84  |   Q       |         |         |       V |
21+25       6.3409     0.85  |   Q       |         |         |       V |
21+30       6.3468     0.85  |   Q       |         |         |       V |
21+35       6.3524     0.82  |   Q       |         |         |       V |
21+40       6.3579     0.80  |   Q       |         |         |       V |
21+45       6.3634     0.80  |   Q       |         |         |       V |
21+50       6.3690     0.81  |   Q       |         |         |       V |
21+55       6.3748     0.83  |   Q       |         |         |        V|
22+ 0       6.3805     0.83  |   Q       |         |         |        V|
22+ 5       6.3860     0.81  |   Q       |         |         |        V|
22+10       6.3914     0.78  |   Q       |         |         |        V|
22+15       6.3968     0.78  |   Q       |         |         |        V|
22+20       6.4023     0.80  |   Q       |         |         |        V|
22+25       6.4080     0.82  |   Q       |         |         |        V|
22+30       6.4136     0.82  |   Q       |         |         |        V|
22+35       6.4191     0.79  |   Q       |         |         |        V|
22+40       6.4243     0.75  |   Q       |         |         |        V|
22+45       6.4292     0.72  | Q         |         |         |        V|
22+50       6.4341     0.71  | Q         |         |         |        V|
22+55       6.4389     0.70  | Q         |         |         |        V|
23+ 0       6.4437     0.69  | Q         |         |         |        V|
23+ 5       6.4484     0.68  | Q         |         |         |        V|
23+10       6.4531     0.68  | Q         |         |         |        V|
23+15       6.4577     0.67  | Q         |         |         |        V|
23+20       6.4623     0.67  | Q         |         |         |        V|
23+25       6.4669     0.66  | Q         |         |         |        V|
23+30       6.4714     0.66  | Q         |         |         |        V|
23+35       6.4759     0.66  | Q         |         |         |        V|
23+40       6.4804     0.65  | Q         |         |         |        V|
23+45       6.4849     0.65  | Q         |         |         |        V|
23+50       6.4894     0.65  | Q         |         |         |        V|
23+55       6.4939     0.65  | Q         |         |         |        V|
24+ 0       6.4983     0.65  | Q         |         |         |        V|
24+ 5       6.5027     0.63  | Q         |         |         |        V|
24+10       6.5068     0.60  | Q         |         |         |        V|
24+15       6.5105     0.53  | Q         |         |         |        V|
24+20       6.5136     0.45  |Q          |         |         |        V|
24+25       6.5161     0.36  |Q          |         |         |        V|
24+30       6.5180     0.28  |Q          |         |         |        V|
24+35       6.5197     0.24  Q           |         |         |        V|
24+40       6.5211     0.21  Q           |         |         |        V|
24+45       6.5223     0.18  Q           |         |         |        V|
24+50       6.5234     0.16  Q           |         |         |        V|
24+55       6.5244     0.14  Q           |         |         |        V|
25+ 0       6.5252     0.12  Q           |         |         |        V|
25+ 5       6.5260     0.11  Q           |         |         |        V|
25+10       6.5267     0.10  Q           |         |         |        V|
25+15       6.5273     0.09  Q           |         |         |        V|
25+20       6.5278     0.08  Q           |         |         |        V|
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    25+25       6.5283      0.07  Q         |         |         |        V|
    25+30       6.5288      0.07  Q         |         |         |        V|
    25+35       6.5292      0.06  Q         |         |         |        V|
    25+40       6.5296      0.05  Q         |         |         |        V|
    25+45       6.5299      0.05  Q         |         |         |        V|
    25+50       6.5303      0.05  Q         |         |         |        V|
    25+55       6.5306      0.04  Q         |         |         |        V|
    26+ 0       6.5308      0.04  Q         |         |         |        V|
    26+ 5       6.5311      0.04  Q         |         |         |        V|
    26+10       6.5313      0.03  Q         |         |         |        V|
    26+15       6.5315      0.03  Q         |         |         |        V|
    26+20       6.5317      0.03  Q         |         |         |        V|
    26+25       6.5319      0.03  Q         |         |         |        V|
    26+30       6.5321      0.02  Q         |         |         |        V|
    26+35       6.5322      0.02  Q         |         |         |        V|
    26+40       6.5324      0.02  Q         |         |         |        V|
    26+45       6.5325      0.02  Q         |         |         |        V|
    26+50       6.5326      0.02  Q         |         |         |        V|
    26+55       6.5327      0.02  Q         |         |         |        V|
    27+ 0       6.5328      0.01  Q         |         |         |        V|
    27+ 5       6.5329      0.01  Q         |         |         |        V|
    27+10       6.5330      0.01  Q         |         |         |        V|
    27+15       6.5331      0.01  Q         |         |         |        V|
    27+20       6.5331      0.01  Q         |         |         |        V|
    27+25       6.5332      0.01  Q         |         |         |        V|
    27+30       6.5332      0.01  Q         |         |         |        V|
    27+35       6.5333      0.01  Q         |         |         |        V|
    27+40       6.5333      0.00  Q         |         |         |        V|
    27+45       6.5333      0.00  Q         |         |         |        V|
    27+50       6.5333      0.00  Q         |         |         |        V|
    27+55       6.5333      0.00  Q         |         |         |        V|
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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  07/12/24 File: FCBC242.out


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


Program License Serial Number 6443

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

 English Units used in output format




---------------------------------------------------------------------
Fairway Canyon
PROPOSED 2 YR
DMA B and C
Kimley-Horn
--------------------------------------------------------------------
Drainage Area =      53.97(Ac.)  =      0.084 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      53.97(Ac.)  =      0.084 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.209 Hr.
Lag time =    12.54 Min.
25% of lag time =     3.13 Min.
40% of lag time =     5.02 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]
       53.97            2.56                 138.16

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       53.97            6.25                 337.31

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    2.560(In)
Area Averaged 100-Year Rainfall =    6.250(In)

Point rain (area averaged) =    2.560(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    2.560(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    53.970           56.00         0.740
 Total Area Entered =     53.97(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
```

56.0	36.0	0.706	0.740	0.236	1.000	0.236
					Sum (F) =	0.236

Area averaged mean soil loss (F) (In/Hr) = 0.236
Minimum soil loss rate ((In/Hr)) = 0.118
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.310

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

Combination of 'S' Curves:
VALLEY 'S' Curve Percentage = 0.00
FOOTHILL 'S' Curve Percentage = 50.00
MOUNTAIN 'S' Curve Percentage = 50.00
DESERT 'S' Curve Percentage = 0.00

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	39.872	4.313	2.346
2	0.167	79.745	17.281	9.399
3	0.250	119.617	26.015	14.150
4	0.333	159.490	16.436	8.940
5	0.417	199.362	8.349	4.541
6	0.500	239.234	5.903	3.211
7	0.583	279.107	4.416	2.402
8	0.667	318.979	3.348	1.821
9	0.750	358.852	2.528	1.375
10	0.833	398.724	1.894	1.030
11	0.917	438.596	1.372	0.746
12	1.000	478.469	1.056	0.575
13	1.083	518.341	0.975	0.530
14	1.167	558.214	0.792	0.431
15	1.250	598.086	0.758	0.412
16	1.333	637.959	0.685	0.373
17	1.417	677.831	0.579	0.315
18	1.500	717.703	0.516	0.281
19	1.583	757.576	0.410	0.223
20	1.667	797.448	0.372	0.202
21	1.750	837.321	0.359	0.195
22	1.833	877.193	0.359	0.195
23	1.917	917.065	0.359	0.195
24	2.000	956.938	0.359	0.195
25	2.083	996.810	0.359	0.195
26	2.167	1036.683	0.208	0.113
			Sum = 100.000	Sum= 54.392

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(0.418)	0.006	0.014
2	0.17	0.07	0.020	(0.416)	0.006	0.014
3	0.25	0.07	0.020	(0.415)	0.006	0.014
4	0.33	0.10	0.031	(0.413)	0.010	0.021
5	0.42	0.10	0.031	(0.412)	0.010	0.021
6	0.50	0.10	0.031	(0.410)	0.010	0.021
7	0.58	0.10	0.031	(0.408)	0.010	0.021
8	0.67	0.10	0.031	(0.407)	0.010	0.021
9	0.75	0.10	0.031	(0.405)	0.010	0.021
10	0.83	0.13	0.041	(0.404)	0.013	0.028
11	0.92	0.13	0.041	(0.402)	0.013	0.028
12	1.00	0.13	0.041	(0.400)	0.013	0.028
13	1.08	0.10	0.031	(0.399)	0.010	0.021
14	1.17	0.10	0.031	(0.397)	0.010	0.021

15	1.25	0.10	0.031	(0.396)	0.010	0.021
16	1.33	0.10	0.031	(0.394)	0.010	0.021
17	1.42	0.10	0.031	(0.393)	0.010	0.021
18	1.50	0.10	0.031	(0.391)	0.010	0.021
19	1.58	0.10	0.031	(0.389)	0.010	0.021
20	1.67	0.10	0.031	(0.388)	0.010	0.021
21	1.75	0.10	0.031	(0.386)	0.010	0.021
22	1.83	0.13	0.041	(0.385)	0.013	0.028
23	1.92	0.13	0.041	(0.383)	0.013	0.028
24	2.00	0.13	0.041	(0.382)	0.013	0.028
25	2.08	0.13	0.041	(0.380)	0.013	0.028
26	2.17	0.13	0.041	(0.379)	0.013	0.028
27	2.25	0.13	0.041	(0.377)	0.013	0.028
28	2.33	0.13	0.041	(0.375)	0.013	0.028
29	2.42	0.13	0.041	(0.374)	0.013	0.028
30	2.50	0.13	0.041	(0.372)	0.013	0.028
31	2.58	0.17	0.051	(0.371)	0.016	0.035
32	2.67	0.17	0.051	(0.369)	0.016	0.035
33	2.75	0.17	0.051	(0.368)	0.016	0.035
34	2.83	0.17	0.051	(0.366)	0.016	0.035
35	2.92	0.17	0.051	(0.365)	0.016	0.035
36	3.00	0.17	0.051	(0.363)	0.016	0.035
37	3.08	0.17	0.051	(0.362)	0.016	0.035
38	3.17	0.17	0.051	(0.360)	0.016	0.035
39	3.25	0.17	0.051	(0.359)	0.016	0.035
40	3.33	0.17	0.051	(0.357)	0.016	0.035
41	3.42	0.17	0.051	(0.356)	0.016	0.035
42	3.50	0.17	0.051	(0.354)	0.016	0.035
43	3.58	0.17	0.051	(0.353)	0.016	0.035
44	3.67	0.17	0.051	(0.351)	0.016	0.035
45	3.75	0.17	0.051	(0.350)	0.016	0.035
46	3.83	0.20	0.061	(0.348)	0.019	0.042
47	3.92	0.20	0.061	(0.347)	0.019	0.042
48	4.00	0.20	0.061	(0.345)	0.019	0.042
49	4.08	0.20	0.061	(0.344)	0.019	0.042
50	4.17	0.20	0.061	(0.343)	0.019	0.042
51	4.25	0.20	0.061	(0.341)	0.019	0.042
52	4.33	0.23	0.072	(0.340)	0.022	0.049
53	4.42	0.23	0.072	(0.338)	0.022	0.049
54	4.50	0.23	0.072	(0.337)	0.022	0.049
55	4.58	0.23	0.072	(0.335)	0.022	0.049
56	4.67	0.23	0.072	(0.334)	0.022	0.049
57	4.75	0.23	0.072	(0.332)	0.022	0.049
58	4.83	0.27	0.082	(0.331)	0.025	0.057
59	4.92	0.27	0.082	(0.330)	0.025	0.057
60	5.00	0.27	0.082	(0.328)	0.025	0.057
61	5.08	0.20	0.061	(0.327)	0.019	0.042
62	5.17	0.20	0.061	(0.325)	0.019	0.042
63	5.25	0.20	0.061	(0.324)	0.019	0.042
64	5.33	0.23	0.072	(0.322)	0.022	0.049
65	5.42	0.23	0.072	(0.321)	0.022	0.049
66	5.50	0.23	0.072	(0.320)	0.022	0.049
67	5.58	0.27	0.082	(0.318)	0.025	0.057
68	5.67	0.27	0.082	(0.317)	0.025	0.057
69	5.75	0.27	0.082	(0.315)	0.025	0.057
70	5.83	0.27	0.082	(0.314)	0.025	0.057
71	5.92	0.27	0.082	(0.313)	0.025	0.057
72	6.00	0.27	0.082	(0.311)	0.025	0.057
73	6.08	0.30	0.092	(0.310)	0.029	0.064
74	6.17	0.30	0.092	(0.308)	0.029	0.064
75	6.25	0.30	0.092	(0.307)	0.029	0.064
76	6.33	0.30	0.092	(0.306)	0.029	0.064
77	6.42	0.30	0.092	(0.304)	0.029	0.064
78	6.50	0.30	0.092	(0.303)	0.029	0.064
79	6.58	0.33	0.102	(0.302)	0.032	0.071
80	6.67	0.33	0.102	(0.300)	0.032	0.071
81	6.75	0.33	0.102	(0.299)	0.032	0.071
82	6.83	0.33	0.102	(0.298)	0.032	0.071
83	6.92	0.33	0.102	(0.296)	0.032	0.071

84	7.00	0.33	0.102	(0.295)	0.032	0.071
85	7.08	0.33	0.102	(0.294)	0.032	0.071
86	7.17	0.33	0.102	(0.292)	0.032	0.071
87	7.25	0.33	0.102	(0.291)	0.032	0.071
88	7.33	0.37	0.113	(0.290)	0.035	0.078
89	7.42	0.37	0.113	(0.288)	0.035	0.078
90	7.50	0.37	0.113	(0.287)	0.035	0.078
91	7.58	0.40	0.123	(0.286)	0.038	0.085
92	7.67	0.40	0.123	(0.284)	0.038	0.085
93	7.75	0.40	0.123	(0.283)	0.038	0.085
94	7.83	0.43	0.133	(0.282)	0.041	0.092
95	7.92	0.43	0.133	(0.280)	0.041	0.092
96	8.00	0.43	0.133	(0.279)	0.041	0.092
97	8.08	0.50	0.154	(0.278)	0.048	0.106
98	8.17	0.50	0.154	(0.276)	0.048	0.106
99	8.25	0.50	0.154	(0.275)	0.048	0.106
100	8.33	0.50	0.154	(0.274)	0.048	0.106
101	8.42	0.50	0.154	(0.273)	0.048	0.106
102	8.50	0.50	0.154	(0.271)	0.048	0.106
103	8.58	0.53	0.164	(0.270)	0.051	0.113
104	8.67	0.53	0.164	(0.269)	0.051	0.113
105	8.75	0.53	0.164	(0.268)	0.051	0.113
106	8.83	0.57	0.174	(0.266)	0.054	0.120
107	8.92	0.57	0.174	(0.265)	0.054	0.120
108	9.00	0.57	0.174	(0.264)	0.054	0.120
109	9.08	0.63	0.195	(0.263)	0.060	0.134
110	9.17	0.63	0.195	(0.261)	0.060	0.134
111	9.25	0.63	0.195	(0.260)	0.060	0.134
112	9.33	0.67	0.205	(0.259)	0.063	0.141
113	9.42	0.67	0.205	(0.258)	0.063	0.141
114	9.50	0.67	0.205	(0.256)	0.063	0.141
115	9.58	0.70	0.215	(0.255)	0.067	0.148
116	9.67	0.70	0.215	(0.254)	0.067	0.148
117	9.75	0.70	0.215	(0.253)	0.067	0.148
118	9.83	0.73	0.225	(0.251)	0.070	0.155
119	9.92	0.73	0.225	(0.250)	0.070	0.155
120	10.00	0.73	0.225	(0.249)	0.070	0.155
121	10.08	0.50	0.154	(0.248)	0.048	0.106
122	10.17	0.50	0.154	(0.247)	0.048	0.106
123	10.25	0.50	0.154	(0.245)	0.048	0.106
124	10.33	0.50	0.154	(0.244)	0.048	0.106
125	10.42	0.50	0.154	(0.243)	0.048	0.106
126	10.50	0.50	0.154	(0.242)	0.048	0.106
127	10.58	0.67	0.205	(0.241)	0.063	0.141
128	10.67	0.67	0.205	(0.239)	0.063	0.141
129	10.75	0.67	0.205	(0.238)	0.063	0.141
130	10.83	0.67	0.205	(0.237)	0.063	0.141
131	10.92	0.67	0.205	(0.236)	0.063	0.141
132	11.00	0.67	0.205	(0.235)	0.063	0.141
133	11.08	0.63	0.195	(0.234)	0.060	0.134
134	11.17	0.63	0.195	(0.233)	0.060	0.134
135	11.25	0.63	0.195	(0.231)	0.060	0.134
136	11.33	0.63	0.195	(0.230)	0.060	0.134
137	11.42	0.63	0.195	(0.229)	0.060	0.134
138	11.50	0.63	0.195	(0.228)	0.060	0.134
139	11.58	0.57	0.174	(0.227)	0.054	0.120
140	11.67	0.57	0.174	(0.226)	0.054	0.120
141	11.75	0.57	0.174	(0.225)	0.054	0.120
142	11.83	0.60	0.184	(0.223)	0.057	0.127
143	11.92	0.60	0.184	(0.222)	0.057	0.127
144	12.00	0.60	0.184	(0.221)	0.057	0.127
145	12.08	0.83	0.256	(0.220)	0.079	0.177
146	12.17	0.83	0.256	(0.219)	0.079	0.177
147	12.25	0.83	0.256	(0.218)	0.079	0.177
148	12.33	0.87	0.266	(0.217)	0.083	0.184
149	12.42	0.87	0.266	(0.216)	0.083	0.184
150	12.50	0.87	0.266	(0.215)	0.083	0.184
151	12.58	0.93	0.287	(0.214)	0.089	0.198
152	12.67	0.93	0.287	(0.212)	0.089	0.198

153	12.75	0.93	0.287	(0.211)	0.089	0.198
154	12.83	0.97	0.297	(0.210)	0.092	0.205
155	12.92	0.97	0.297	(0.209)	0.092	0.205
156	13.00	0.97	0.297	(0.208)	0.092	0.205
157	13.08	1.13	0.348	(0.207)	0.108	0.240
158	13.17	1.13	0.348	(0.206)	0.108	0.240
159	13.25	1.13	0.348	(0.205)	0.108	0.240
160	13.33	1.13	0.348	(0.204)	0.108	0.240
161	13.42	1.13	0.348	(0.203)	0.108	0.240
162	13.50	1.13	0.348	(0.202)	0.108	0.240
163	13.58	0.77	0.235	(0.201)	0.073	0.162
164	13.67	0.77	0.235	(0.200)	0.073	0.162
165	13.75	0.77	0.235	(0.199)	0.073	0.162
166	13.83	0.77	0.235	(0.198)	0.073	0.162
167	13.92	0.77	0.235	(0.197)	0.073	0.162
168	14.00	0.77	0.235	(0.196)	0.073	0.162
169	14.08	0.90	0.276	(0.195)	0.086	0.191
170	14.17	0.90	0.276	(0.194)	0.086	0.191
171	14.25	0.90	0.276	(0.193)	0.086	0.191
172	14.33	0.87	0.266	(0.192)	0.083	0.184
173	14.42	0.87	0.266	(0.191)	0.083	0.184
174	14.50	0.87	0.266	(0.190)	0.083	0.184
175	14.58	0.87	0.266	(0.189)	0.083	0.184
176	14.67	0.87	0.266	(0.188)	0.083	0.184
177	14.75	0.87	0.266	(0.187)	0.083	0.184
178	14.83	0.83	0.256	(0.186)	0.079	0.177
179	14.92	0.83	0.256	(0.185)	0.079	0.177
180	15.00	0.83	0.256	(0.184)	0.079	0.177
181	15.08	0.80	0.246	(0.183)	0.076	0.170
182	15.17	0.80	0.246	(0.182)	0.076	0.170
183	15.25	0.80	0.246	(0.181)	0.076	0.170
184	15.33	0.77	0.235	(0.180)	0.073	0.162
185	15.42	0.77	0.235	(0.179)	0.073	0.162
186	15.50	0.77	0.235	(0.179)	0.073	0.162
187	15.58	0.63	0.195	(0.178)	0.060	0.134
188	15.67	0.63	0.195	(0.177)	0.060	0.134
189	15.75	0.63	0.195	(0.176)	0.060	0.134
190	15.83	0.63	0.195	(0.175)	0.060	0.134
191	15.92	0.63	0.195	(0.174)	0.060	0.134
192	16.00	0.63	0.195	(0.173)	0.060	0.134
193	16.08	0.13	0.041	(0.172)	0.013	0.028
194	16.17	0.13	0.041	(0.171)	0.013	0.028
195	16.25	0.13	0.041	(0.171)	0.013	0.028
196	16.33	0.13	0.041	(0.170)	0.013	0.028
197	16.42	0.13	0.041	(0.169)	0.013	0.028
198	16.50	0.13	0.041	(0.168)	0.013	0.028
199	16.58	0.10	0.031	(0.167)	0.010	0.021
200	16.67	0.10	0.031	(0.166)	0.010	0.021
201	16.75	0.10	0.031	(0.165)	0.010	0.021
202	16.83	0.10	0.031	(0.165)	0.010	0.021
203	16.92	0.10	0.031	(0.164)	0.010	0.021
204	17.00	0.10	0.031	(0.163)	0.010	0.021
205	17.08	0.17	0.051	(0.162)	0.016	0.035
206	17.17	0.17	0.051	(0.161)	0.016	0.035
207	17.25	0.17	0.051	(0.160)	0.016	0.035
208	17.33	0.17	0.051	(0.160)	0.016	0.035
209	17.42	0.17	0.051	(0.159)	0.016	0.035
210	17.50	0.17	0.051	(0.158)	0.016	0.035
211	17.58	0.17	0.051	(0.157)	0.016	0.035
212	17.67	0.17	0.051	(0.156)	0.016	0.035
213	17.75	0.17	0.051	(0.156)	0.016	0.035
214	17.83	0.13	0.041	(0.155)	0.013	0.028
215	17.92	0.13	0.041	(0.154)	0.013	0.028
216	18.00	0.13	0.041	(0.153)	0.013	0.028
217	18.08	0.13	0.041	(0.153)	0.013	0.028
218	18.17	0.13	0.041	(0.152)	0.013	0.028
219	18.25	0.13	0.041	(0.151)	0.013	0.028
220	18.33	0.13	0.041	(0.150)	0.013	0.028
221	18.42	0.13	0.041	(0.150)	0.013	0.028

222	18.50	0.13	0.041	(0.149)	0.013	0.028
223	18.58	0.10	0.031	(0.148)	0.010	0.021
224	18.67	0.10	0.031	(0.147)	0.010	0.021
225	18.75	0.10	0.031	(0.147)	0.010	0.021
226	18.83	0.07	0.020	(0.146)	0.006	0.014
227	18.92	0.07	0.020	(0.145)	0.006	0.014
228	19.00	0.07	0.020	(0.145)	0.006	0.014
229	19.08	0.10	0.031	(0.144)	0.010	0.021
230	19.17	0.10	0.031	(0.143)	0.010	0.021
231	19.25	0.10	0.031	(0.143)	0.010	0.021
232	19.33	0.13	0.041	(0.142)	0.013	0.028
233	19.42	0.13	0.041	(0.141)	0.013	0.028
234	19.50	0.13	0.041	(0.141)	0.013	0.028
235	19.58	0.10	0.031	(0.140)	0.010	0.021
236	19.67	0.10	0.031	(0.139)	0.010	0.021
237	19.75	0.10	0.031	(0.139)	0.010	0.021
238	19.83	0.07	0.020	(0.138)	0.006	0.014
239	19.92	0.07	0.020	(0.138)	0.006	0.014
240	20.00	0.07	0.020	(0.137)	0.006	0.014
241	20.08	0.10	0.031	(0.136)	0.010	0.021
242	20.17	0.10	0.031	(0.136)	0.010	0.021
243	20.25	0.10	0.031	(0.135)	0.010	0.021
244	20.33	0.10	0.031	(0.135)	0.010	0.021
245	20.42	0.10	0.031	(0.134)	0.010	0.021
246	20.50	0.10	0.031	(0.133)	0.010	0.021
247	20.58	0.10	0.031	(0.133)	0.010	0.021
248	20.67	0.10	0.031	(0.132)	0.010	0.021
249	20.75	0.10	0.031	(0.132)	0.010	0.021
250	20.83	0.07	0.020	(0.131)	0.006	0.014
251	20.92	0.07	0.020	(0.131)	0.006	0.014
252	21.00	0.07	0.020	(0.130)	0.006	0.014
253	21.08	0.10	0.031	(0.130)	0.010	0.021
254	21.17	0.10	0.031	(0.129)	0.010	0.021
255	21.25	0.10	0.031	(0.129)	0.010	0.021
256	21.33	0.07	0.020	(0.128)	0.006	0.014
257	21.42	0.07	0.020	(0.128)	0.006	0.014
258	21.50	0.07	0.020	(0.127)	0.006	0.014
259	21.58	0.10	0.031	(0.127)	0.010	0.021
260	21.67	0.10	0.031	(0.126)	0.010	0.021
261	21.75	0.10	0.031	(0.126)	0.010	0.021
262	21.83	0.07	0.020	(0.125)	0.006	0.014
263	21.92	0.07	0.020	(0.125)	0.006	0.014
264	22.00	0.07	0.020	(0.125)	0.006	0.014
265	22.08	0.10	0.031	(0.124)	0.010	0.021
266	22.17	0.10	0.031	(0.124)	0.010	0.021
267	22.25	0.10	0.031	(0.123)	0.010	0.021
268	22.33	0.07	0.020	(0.123)	0.006	0.014
269	22.42	0.07	0.020	(0.123)	0.006	0.014
270	22.50	0.07	0.020	(0.122)	0.006	0.014
271	22.58	0.07	0.020	(0.122)	0.006	0.014
272	22.67	0.07	0.020	(0.121)	0.006	0.014
273	22.75	0.07	0.020	(0.121)	0.006	0.014
274	22.83	0.07	0.020	(0.121)	0.006	0.014
275	22.92	0.07	0.020	(0.121)	0.006	0.014
276	23.00	0.07	0.020	(0.120)	0.006	0.014
277	23.08	0.07	0.020	(0.120)	0.006	0.014
278	23.17	0.07	0.020	(0.120)	0.006	0.014
279	23.25	0.07	0.020	(0.119)	0.006	0.014
280	23.33	0.07	0.020	(0.119)	0.006	0.014
281	23.42	0.07	0.020	(0.119)	0.006	0.014
282	23.50	0.07	0.020	(0.119)	0.006	0.014
283	23.58	0.07	0.020	(0.119)	0.006	0.014
284	23.67	0.07	0.020	(0.118)	0.006	0.014
285	23.75	0.07	0.020	(0.118)	0.006	0.014
286	23.83	0.07	0.020	(0.118)	0.006	0.014
287	23.92	0.07	0.020	(0.118)	0.006	0.014
288	24.00	0.07	0.020	(0.118)	0.006	0.014
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	21.2

```
      Flood volume = Effective rainfall      1.77(In)
       times area      54.0(Ac.)/[(In)/(Ft.)] =       7.9(Ac.Ft)
      Total soil loss =      0.79(In)
      Total soil loss =     3.569(Ac.Ft)
      Total rainfall =      2.56(In)
      Flood volume =      346020.9 Cubic Feet
      Total soil loss =      155458.7 Cubic Feet
      --------------------------------------------------------------------
       Peak flow rate of this hydrograph =     12.462(CFS)
      --------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          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        5.0      10.0      15.0      20.0
----------------------------------------------------------------------
  0+ 5      0.0002      0.03  Q         |         |         |         |
  0+10      0.0014      0.17  Q         |         |         |         |
  0+15      0.0039      0.37  Q         |         |         |         |
  0+20      0.0074      0.51  VQ        |         |         |         |
  0+25      0.0118      0.64  VQ        |         |         |         |
  0+30      0.0172      0.79  VQ        |         |         |         |
  0+35      0.0233      0.88  VQ        |         |         |         |
  0+40      0.0298      0.94  VQ        |         |         |         |
  0+45      0.0365      0.98  VQ        |         |         |         |
  0+50      0.0436      1.03  V Q       |         |         |         |
  0+55      0.0513      1.12  V Q       |         |         |         |
  1+ 0      0.0599      1.24  V Q       |         |         |         |
  1+ 5      0.0688      1.30  V Q       |         |         |         |
  1+10      0.0776      1.28  V Q       |         |         |         |
  1+15      0.0859      1.21  V Q       |         |         |         |
  1+20      0.0940      1.17  V Q       |         |         |         |
  1+25      0.1020      1.16  V Q       |         |         |         |
  1+30      0.1099      1.15  V Q       |         |         |         |
  1+35      0.1179      1.15  V Q       |         |         |         |
  1+40      0.1258      1.15  V Q       |         |         |         |
  1+45      0.1337      1.15  V Q       |         |         |         |
  1+50      0.1417      1.16  V Q       |         |         |         |
  1+55      0.1502      1.23  V Q       |         |         |         |
  2+ 0      0.1594      1.34  V Q       |         |         |         |
  2+ 5      0.1690      1.40  V Q       |         |         |         |
  2+10      0.1789      1.44  V Q       |         |         |         |
  2+15      0.1890      1.46  V Q       |         |         |         |
  2+20      0.1991      1.48   |VQ      |         |         |         |
  2+25      0.2094      1.49   |VQ      |         |         |         |
  2+30      0.2197      1.50   |VQ      |         |         |         |
  2+35      0.2302      1.52   |V Q     |         |         |         |
  2+40      0.2412      1.59   |V Q     |         |         |         |
  2+45      0.2528      1.70   |V Q     |         |         |         |
  2+50      0.2650      1.76   |V Q     |         |         |         |
  2+55      0.2774      1.80   |V Q     |         |         |         |
  3+ 0      0.2900      1.82   |V Q     |         |         |         |
  3+ 5      0.3026      1.84   |V Q     |         |         |         |
  3+10      0.3154      1.86   |V Q     |         |         |         |
  3+15      0.3283      1.87   |V Q     |         |         |         |
  3+20      0.3412      1.88   |V Q     |         |         |         |
  3+25      0.3542      1.88   |V Q     |         |         |         |
  3+30      0.3672      1.89   |V Q     |         |         |         |
  3+35      0.3802      1.89   |V Q     |         |         |         |
  3+40      0.3933      1.90   |V Q     |         |         |         |
  3+45      0.4064      1.90   | VQ     |         |         |         |
  3+50      0.4197      1.92   | VQ     |         |         |         |
  3+55      0.4334      1.99   | VQ     |         |         |         |
  4+ 0      0.4478      2.09   | V Q    |         |         |         |
  4+ 5      0.4627      2.16   | V Q    |         |         |         |
  4+10      0.4778      2.19   | V Q    |         |         |         |
```

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4+15       0.4930      2.22  | V Q     |         |         |         |
4+20       0.5086      2.25  | V Q     |         |         |         |
4+25       0.5246      2.33  | V Q     |         |         |         |
4+30       0.5415      2.44  | V Q     |         |         |         |
4+35       0.5588      2.52  | V  Q    |         |         |         |
4+40       0.5764      2.55  | V  Q    |         |         |         |
4+45       0.5941      2.58  | V  Q    |         |         |         |
4+50       0.6122      2.62  |  V Q    |         |         |         |
4+55       0.6308      2.70  |  V Q    |         |         |         |
5+ 0       0.6501      2.81  |  V Q    |         |         |         |
5+ 5       0.6698      2.85  |  V Q    |         |         |         |
5+10       0.6888      2.76  |  V Q    |         |         |         |
5+15       0.7066      2.59  |  V Q    |         |         |         |
5+20       0.7238      2.50  |  V Q    |         |         |         |
5+25       0.7412      2.52  |  V Q    |         |         |         |
5+30       0.7590      2.59  |  V Q    |         |         |         |
5+35       0.7772      2.65  |  V Q    |         |         |         |
5+40       0.7960      2.73  |   VQ    |         |         |         |
5+45       0.8156      2.84  |   VQ    |         |         |         |
5+50       0.8356      2.91  |   VQ    |         |         |         |
5+55       0.8560      2.95  |   VQ    |         |         |         |
6+ 0       0.8765      2.98  |   VQ    |         |         |         |
6+ 5       0.8972      3.02  |   V Q   |         |         |         |
6+10       0.9186      3.10  |   V Q   |         |         |         |
6+15       0.9407      3.21  |   V Q   |         |         |         |
6+20       0.9633      3.28  |   V Q   |         |         |         |
6+25       0.9862      3.32  |   V Q   |         |         |         |
6+30       1.0092      3.35  |    VQ   |         |         |         |
6+35       1.0325      3.39  |    VQ   |         |         |         |
6+40       1.0564      3.47  |    VQ   |         |         |         |
6+45       1.0811      3.58  |    V Q  |         |         |         |
6+50       1.1062      3.65  |    V Q  |         |         |         |
6+55       1.1317      3.69  |    V Q  |         |         |         |
7+ 0       1.1573      3.72  |    V Q  |         |         |         |
7+ 5       1.1831      3.74  |    V Q  |         |         |         |
7+10       1.2090      3.76  |     VQ  |         |         |         |
7+15       1.2350      3.77  |     VQ  |         |         |         |
7+20       1.2612      3.80  |     VQ  |         |         |         |
7+25       1.2879      3.88  |     VQ  |         |         |         |
7+30       1.3154      3.99  |     VQ  |         |         |         |
7+35       1.3434      4.07  |     V Q |         |         |         |
7+40       1.3722      4.18  |     V Q |         |         |         |
7+45       1.4018      4.30  |      VQ |         |         |         |
7+50       1.4322      4.41  |      VQ |         |         |         |
7+55       1.4633      4.52  |      V Q|         |         |         |
8+ 0       1.4954      4.66  |      V Q|         |         |         |
8+ 5       1.5283      4.78  |      V Q|         |         |         |
8+10       1.5625      4.97  |      V Q|         |         |         |
8+15       1.5983      5.20  |       V Q         |         |         |
8+20       1.6352      5.36  |       V Q         |         |         |
8+25       1.6727      5.45  |       V Q         |         |         |
8+30       1.7107      5.51  |       V |Q        |         |         |
8+35       1.7491      5.57  |       V |Q        |         |         |
8+40       1.7882      5.68  |        V|Q        |         |         |
8+45       1.8282      5.81  |        V|Q        |         |         |
8+50       1.8689      5.91  |        V|Q        |         |         |
8+55       1.9104      6.02  |        V| Q       |         |         |
9+ 0       1.9528      6.16  |        V| Q       |         |         |
9+ 5       1.9961      6.29  |         V Q       |         |         |
9+10       2.0407      6.48  |         V Q       |         |         |
9+15       2.0870      6.72  |         V  Q      |         |         |
9+20       2.1345      6.90  |         V  Q      |         |         |
9+25       2.1831      7.05  |         V   Q     |         |         |
9+30       2.2328      7.22  |         |V  Q     |         |         |
9+35       2.2834      7.35  |         |V  Q     |         |         |
9+40       2.3350      7.49  |         |V  Q     |         |         |
9+45       2.3876      7.64  |         | V  Q    |         |         |
9+50       2.4411      7.76  |         | V  Q    |         |         |
9+55       2.4955      7.89  |         | V  Q    |         |         |
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10+ 0       2.5509      8.04  |         | V   Q   |         |         |
10+ 5       2.6062      8.03  |         |  V  Q   |         |         |
10+10       2.6587      7.62  |         |  V Q    |         |         |
10+15       2.7067      6.97  |         |  Q      |         |         |
10+20       2.7519      6.56  |         |  Q      |         |         |
10+25       2.7957      6.37  |         | Q V     |         |         |
10+30       2.8387      6.23  |         | Q V     |         |         |
10+35       2.8815      6.22  |         | Q V     |         |         |
10+40       2.9261      6.47  |         | Q V     |         |         |
10+45       2.9737      6.92  |         |  QV     |         |         |
10+50       3.0233      7.20  |         |   QV    |         |         |
10+55       3.0738      7.33  |         |   QV    |         |         |
11+ 0       3.1249      7.42  |         |   QV    |         |         |
11+ 5       3.1764      7.47  |         |   QV    |         |         |
11+10       3.2277      7.46  |         |   Q V   |         |         |
11+15       3.2786      7.39  |         |   Q V   |         |         |
11+20       3.3292      7.35  |         |   Q V   |         |         |
11+25       3.3797      7.33  |         |   Q  V  |         |         |
11+30       3.4301      7.32  |         |   Q  V  |         |         |
11+35       3.4803      7.28  |         |   Q  V  |         |         |
11+40       3.5294      7.14  |         |   Q  V  |         |         |
11+45       3.5772      6.94  |         |  Q    V |         |         |
11+50       3.6242      6.82  |         |  Q    V |         |         |
11+55       3.6712      6.82  |         |  Q    V |         |         |
12+ 0       3.7186      6.87  |         |  Q    V |         |         |
12+ 5       3.7669      7.01  |         |   Q   V |         |         |
12+10       3.8184      7.48  |         |   Q    V|         |         |
12+15       3.8748      8.19  |         |     Q  V|         |         |
12+20       3.9345      8.66  |         |      Q V|         |         |
12+25       3.9961      8.96  |         |      Q  V         |         |
12+30       4.0597      9.22  |         |       Q V         |         |
12+35       4.1247      9.44  |         |       Q V         |         |
12+40       4.1915      9.70  |         |        Q|V        |         |
12+45       4.2602      9.99  |         |        Q|V        |         |
12+50       4.3304     10.19  |         |         QV        |         |
12+55       4.4019     10.37  |         |         Q V       |         |
13+ 0       4.4746     10.55  |         |         |QV       |         |
13+ 5       4.5487     10.76  |         |         |QV       |         |
13+10       4.6257     11.18  |         |         | QV      |         |
13+15       4.7066     11.75  |         |         |  Q      |         |
13+20       4.7900     12.11  |         |         |   Q     |         |
13+25       4.8748     12.32  |         |         |   Q     |         |
13+30       4.9606     12.46  |         |         |   Q     |         |
13+35       5.0460     12.39  |         |         |   QV    |         |
13+40       5.1269     11.75  |         |         |  Q V    |         |
13+45       5.2007     10.72  |         |         |Q    V   |         |
13+50       5.2702     10.08  |         |         Q     V   |         |
13+55       5.3375      9.78  |         |        Q|     V   |         |
14+ 0       5.4033      9.56  |         |        Q|      V  |         |
14+ 5       5.4686      9.48  |         |       Q |      V  |         |
14+10       5.5350      9.63  |         |        Q|      V  |         |
14+15       5.6034      9.94  |         |        Q|       V |         |
14+20       5.6731     10.12  |         |         Q       V |         |
14+25       5.7430     10.14  |         |         Q       V |         |
14+30       5.8125     10.10  |         |         Q        V|         |
14+35       5.8819     10.07  |         |         Q        V|         |
14+40       5.9513     10.07  |         |         Q        V|         |
14+45       6.0206     10.06  |         |         Q         V         |
14+50       6.0897     10.04  |         |         Q         V         |
14+55       6.1583      9.96  |         |        Q|         |V        |
15+ 0       6.2262      9.85  |         |        Q|         |V        |
15+ 5       6.2935      9.77  |         |        Q|         |V        |
15+10       6.3601      9.67  |         |        Q|         | V       |
15+15       6.4258      9.54  |         |        Q|         | V       |
15+20       6.4907      9.43  |         |       Q |         | V       |
15+25       6.5549      9.31  |         |       Q |         |  V      |
15+30       6.6180      9.17  |         |       Q |         |  V      |
15+35       6.6801      9.00  |         |       Q |         |  V      |
15+40       6.7399      8.68  |         |      Q  |         |  V      |
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15+45       6.7967      8.25  |         |     Q   |         |   V     |
15+50       6.8516      7.97  |         |    Q    |         |   V     |
15+55       6.9055      7.83  |         |    Q    |         |   V     |
16+ 0       6.9587      7.72  |         |    Q    |         |    V    |
16+ 5       7.0097      7.40  |         |   Q     |         |    V    |
16+10       7.0534      6.34  |         | Q       |         |    V    |
16+15       7.0864      4.79  |        Q|         |         |    V    |
16+20       7.1126      3.81  |      Q  |         |         |    V    |
16+25       7.1353      3.30  |     Q   |         |         |    V    |
16+30       7.1555      2.93  |    Q    |         |         |     V   |
16+35       7.1737      2.64  |    Q    |         |         |     V   |
16+40       7.1899      2.36  |   Q     |         |         |     V   |
16+45       7.2044      2.10  |   Q     |         |         |     V   |
16+50       7.2176      1.92  |  Q      |         |         |     V   |
16+55       7.2300      1.79  |  Q      |         |         |     V   |
17+ 0       7.2416      1.70  |  Q      |         |         |     V   |
17+ 5       7.2530      1.65  |  Q      |         |         |     V   |
17+10       7.2648      1.71  |  Q      |         |         |     V   |
17+15       7.2776      1.85  |  Q      |         |         |     V   |
17+20       7.2908      1.93  |  Q      |         |         |     V   |
17+25       7.3042      1.95  |  Q      |         |         |     V   |
17+30       7.3177      1.95  |  Q      |         |         |     V   |
17+35       7.3311      1.95  |  Q      |         |         |     V   |
17+40       7.3446      1.95  |  Q      |         |         |     V   |
17+45       7.3580      1.95  |  Q      |         |         |      V  |
17+50       7.3712      1.92  |  Q      |         |         |      V  |
17+55       7.3839      1.84  |  Q      |         |         |      V  |
18+ 0       7.3958      1.73  |  Q      |         |         |      V  |
18+ 5       7.4072      1.65  |  Q      |         |         |      V  |
18+10       7.4183      1.61  |  Q      |         |         |      V  |
18+15       7.4292      1.59  |  Q      |         |         |      V  |
18+20       7.4401      1.58  |  Q      |         |         |      V  |
18+25       7.4509      1.57  |  Q      |         |         |      V  |
18+30       7.4617      1.56  |  Q      |         |         |      V  |
18+35       7.4723      1.54  |  Q      |         |         |      V  |
18+40       7.4824      1.47  | Q       |         |         |      V  |
18+45       7.4919      1.37  | Q       |         |         |      V  |
18+50       7.5007      1.29  | Q       |         |         |      V  |
18+55       7.5089      1.19  | Q       |         |         |      V  |
19+ 0       7.5163      1.07  | Q       |         |         |      V  |
19+ 5       7.5232      1.00  | Q       |         |         |      V  |
19+10       7.5302      1.02  | Q       |         |         |      V  |
19+15       7.5377      1.09  | Q       |         |         |      V  |
19+20       7.5456      1.14  | Q       |         |         |      V  |
19+25       7.5540      1.22  | Q       |         |         |       V |
19+30       7.5632      1.33  | Q       |         |         |       V |
19+35       7.5727      1.38  | Q       |         |         |       V |
19+40       7.5820      1.35  | Q       |         |         |       V |
19+45       7.5908      1.27  | Q       |         |         |       V |
19+50       7.5991      1.21  | Q       |         |         |       V |
19+55       7.6069      1.12  | Q       |         |         |       V |
20+ 0       7.6138      1.01  | Q       |         |         |       V |
20+ 5       7.6204      0.95  |Q        |         |         |       V |
20+10       7.6272      0.98  |Q        |         |         |       V |
20+15       7.6344      1.05  | Q       |         |         |       V |
20+20       7.6419      1.09  | Q       |         |         |       V |
20+25       7.6496      1.11  | Q       |         |         |       V |
20+30       7.6573      1.12  | Q       |         |         |       V |
20+35       7.6651      1.13  | Q       |         |         |       V |
20+40       7.6729      1.13  | Q       |         |         |       V |
20+45       7.6808      1.14  | Q       |         |         |       V |
20+50       7.6885      1.13  | Q       |         |         |       V |
20+55       7.6958      1.06  | Q       |         |         |       V |
21+ 0       7.7024      0.96  |Q        |         |         |       V |
21+ 5       7.7088      0.92  |Q        |         |         |       V |
21+10       7.7153      0.95  |Q        |         |         |       V |
21+15       7.7225      1.03  | Q       |         |         |       V |
21+20       7.7298      1.06  | Q       |         |         |       V |
21+25       7.7368      1.02  | Q       |         |         |       V |
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   21+30       7.7432      0.93  |Q         |         |         |       V |
   21+35       7.7493      0.89  |Q         |         |         |        V|
   21+40       7.7557      0.93  |Q         |         |         |        V|
   21+45       7.7627      1.01  | Q        |         |         |        V|
   21+50       7.7699      1.05  | Q        |         |         |        V|
   21+55       7.7768      1.00  | Q        |         |         |        V|
   22+ 0       7.7832      0.92  |Q         |         |         |        V|
   22+ 5       7.7893      0.88  |Q         |         |         |        V|
   22+10       7.7956      0.93  |Q         |         |         |        V|
   22+15       7.8026      1.01  | Q        |         |         |        V|
   22+20       7.8098      1.05  | Q        |         |         |        V|
   22+25       7.8167      1.00  | Q        |         |         |        V|
   22+30       7.8230      0.92  |Q         |         |         |        V|
   22+35       7.8290      0.86  |Q         |         |         |        V|
   22+40       7.8348      0.84  |Q         |         |         |        V|
   22+45       7.8405      0.82  |Q         |         |         |        V|
   22+50       7.8461      0.81  |Q         |         |         |        V|
   22+55       7.8516      0.80  |Q         |         |         |        V|
   23+ 0       7.8571      0.80  |Q         |         |         |        V|
   23+ 5       7.8625      0.79  |Q         |         |         |        V|
   23+10       7.8680      0.79  |Q         |         |         |        V|
   23+15       7.8734      0.79  |Q         |         |         |        V|
   23+20       7.8788      0.78  |Q         |         |         |        V|
   23+25       7.8841      0.78  |Q         |         |         |        V|
   23+30       7.8895      0.78  |Q         |         |         |        V|
   23+35       7.8949      0.78  |Q         |         |         |        V|
   23+40       7.9002      0.78  |Q         |         |         |        V|
   23+45       7.9056      0.78  |Q         |         |         |        V|
   23+50       7.9109      0.77  |Q         |         |         |        V|
   23+55       7.9162      0.77  |Q         |         |         |        V|
   24+ 0       7.9215      0.77  |Q         |         |         |        V|
   24+ 5       7.9266      0.74  |Q         |         |         |        V|
   24+10       7.9308      0.61  |Q         |         |         |        V|
   24+15       7.9336      0.41  Q          |         |         |        V|
   24+20       7.9355      0.28  Q          |         |         |        V|
   24+25       7.9370      0.21  Q          |         |         |        V|
   24+30       7.9381      0.17  Q          |         |         |        V|
   24+35       7.9390      0.13  Q          |         |         |        V|
   24+40       7.9398      0.11  Q          |         |         |        V|
   24+45       7.9404      0.09  Q          |         |         |        V|
   24+50       7.9409      0.07  Q          |         |         |        V|
   24+55       7.9413      0.06  Q          |         |         |        V|
   25+ 0       7.9417      0.05  Q          |         |         |        V|
   25+ 5       7.9420      0.05  Q          |         |         |        V|
   25+10       7.9423      0.04  Q          |         |         |        V|
   25+15       7.9425      0.04  Q          |         |         |        V|
   25+20       7.9427      0.03  Q          |         |         |        V|
   25+25       7.9429      0.03  Q          |         |         |        V|
   25+30       7.9431      0.02  Q          |         |         |        V|
   25+35       7.9432      0.02  Q          |         |         |        V|
   25+40       7.9433      0.02  Q          |         |         |        V|
   25+45       7.9434      0.01  Q          |         |         |        V|
   25+50       7.9435      0.01  Q          |         |         |        V|
   25+55       7.9435      0.01  Q          |         |         |        V|
   26+ 0       7.9435      0.00  Q          |         |         |        V|
   26+ 5       7.9435      0.00  Q          |         |         |         V
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Fairway Canyon 4C 2yr Proposed Conditions

Project Summary	
Title	Fairway Canyon
Engineer	Mike Sutton, PE
Company	Kimley-Horn and Associates, Inc.
Date	8/26/2024

Notes	1. Inflow hydrographs calculated based on Synthetic Unit Hydrograph Method from Riverside County Flood Control and Water Conservation District Hydrology Manual (April 1978) using CivilD software. 2. Flow-through basin analysis completed using modified Pul's (storage indication routing).

Table of Contents

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: User Notifications

User Notifications

Message Id	17
Scenario	Scenario - 2yr 24hr
Element Type	Composite Outlet Structure
Element Id	21
Label	Outlet Basin1
Time	(N/A)
Message	Riser orifice equation controls at one or more headwater elevations for outlet structure.
Source	Information
Message Id	17
Scenario	Scenario - 2yr 24hr
Element Type	Composite Outlet Structure
Element Id	85
Label	Outlet Basin2
Time	(N/A)
Message	Riser orifice equation controls at one or more headwater elevations for outlet structure.
Source	Information

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
DA-D/5	Scenario - 2yr 24hr	0	360,360.000	810.000	13.25000
DMA A (North)	Scenario - 2yr 24hr	0	284,590.000	815.000	9.70000
DMA B and C	Scenario - 2yr 24hr	0	345,972.000	810.000	12.46000

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
Outfall Basin1	Scenario - 2yr 24hr	0	707,977.000	969.000	12.44280
Outfall Basin2	Scenario - 2yr 24hr	0	284,586.000	1,017.000	2.23669

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
Basin 1 (IN)	Scenario - 2yr 24hr	0	707,994.000	810.000	25.71000	(N/A)	(N/A)
Basin 1 (OUT)	Scenario - 2yr 24hr	0	707,977.000	969.000	12.44280	2,220.63	355,860.000
Basin 2 (IN)	Scenario - 2yr 24hr	0	284,591.000	816.000	9.68400	(N/A)	(N/A)
Basin 2 (OUT)	Scenario - 2yr 24hr	0	284,586.000	1,017.000	2.23669	2,286.91	175,022.000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Read Hydrograph Scenario: Scenario - 2yr 24hr
Label: DA-D/5

Peak Discharge	13.25000 ft³/s
Time to Peak	810.000 min
Hydrograph Volume	360,360.000 ft³

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 5.000 min
Time on left represents time for first value in each row.

Time (min)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
5.000	0.06000	0.28000	0.50000	0.62000	0.79000
30.000	0.94000	1.01000	1.06000	1.09000	1.14000
55.000	1.27000	1.39000	1.42000	1.35000	1.26000
80.000	1.24000	1.23000	1.22000	1.22000	1.21000
105.000	1.21000	1.24000	1.35000	1.46000	1.50000
130.000	1.53000	1.55000	1.56000	1.57000	1.58000
155.000	1.61000	1.72000	1.84000	1.89000	1.92000
180.000	1.94000	1.95000	1.96000	1.97000	1.98000
205.000	1.98000	1.99000	1.99000	1.99000	1.99000
230.000	2.02000	2.14000	2.25000	2.30000	2.33000
255.000	2.35000	2.39000	2.51000	2.62000	2.68000
280.000	2.71000	2.73000	2.78000	2.90000	3.02000
305.000	3.01000	2.82000	2.63000	2.58000	2.65000
330.000	2.73000	2.78000	2.91000	3.04000	3.09000
355.000	3.12000	3.14000	3.18000	3.31000	3.42000
380.000	3.48000	3.51000	3.53000	3.57000	3.70000
405.000	3.82000	3.87000	3.91000	3.93000	3.95000
430.000	3.96000	3.97000	4.00000	4.12000	4.24000
455.000	4.32000	4.46000	4.59000	4.68000	4.83000
480.000	4.97000	5.09000	5.36000	5.61000	5.72000
505.000	5.79000	5.84000	5.91000	6.05000	6.18000
530.000	6.27000	6.42000	6.56000	6.68000	6.96000
555.000	7.21000	7.35000	7.54000	7.70000	7.81000
580.000	7.98000	8.12000	8.22000	8.39000	8.53000
605.000	8.41000	7.66000	6.93000	6.65000	6.47000
630.000	6.35000	6.40000	6.92000	7.43000	7.63000
655.000	7.75000	7.82000	7.84000	7.76000	7.67000
680.000	7.64000	7.61000	7.60000	7.53000	7.31000
705.000	7.09000	7.04000	7.10000	7.18000	7.39000
730.000	8.20000	8.97000	9.32000	9.63000	9.87000
755.000	10.06000	10.38000	10.66000	10.82000	11.03000
780.000	11.21000	11.44000	12.08000	12.68000	12.95000
805.000	13.13000	13.25000	13.04000	11.84000	10.68000
830.000	10.22000	9.93000	9.74000	9.73000	10.10000
855.000	10.48000	10.59000	10.56000	10.49000	10.48000
880.000	10.46000	10.44000	10.40000	10.27000	10.15000
905.000	10.06000	9.92000	9.80000	9.72000	9.57000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Read Hydrograph | Scenario: Scenario - 2yr 24hr
Label: DA-D/5

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 5.000 min
Time on left represents time for first value in each row.

Time (min)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
930.000	9.44000	9.27000	8.77000	8.31000	8.10000
955.000	7.97000	7.88000	7.41000	5.65000	3.98000
980.000	3.28000	2.83000	2.52000	2.28000	2.02000
1,005.000	1.81000	1.68000	1.58000	1.49000	1.48000
1,030.000	1.67000	1.85000	1.90000	1.93000	1.93000
1,055.000	1.93000	1.94000	1.95000	1.93000	1.83000
1,080.000	1.72000	1.68000	1.66000	1.64000	1.63000
1,105.000	1.63000	1.63000	1.60000	1.48000	1.37000
1,130.000	1.29000	1.14000	1.01000	0.98000	1.06000
1,155.000	1.14000	1.19000	1.32000	1.44000	1.46000
1,180.000	1.38000	1.29000	1.23000	1.10000	0.97000
1,205.000	0.95000	1.03000	1.12000	1.15000	1.17000
1,230.000	1.18000	1.19000	1.19000	1.19000	1.17000
1,255.000	1.05000	0.94000	0.93000	1.01000	1.10000
1,280.000	1.11000	1.01000	0.92000	0.91000	1.00000
1,305.000	1.10000	1.10000	1.01000	0.91000	0.91000
1,330.000	1.00000	1.09000	1.10000	1.00000	0.91000
1,355.000	0.88000	0.86000	0.84000	0.83000	0.82000
1,380.000	0.82000	0.82000	0.81000	0.81000	0.81000
1,405.000	0.81000	0.81000	0.81000	0.80000	0.80000
1,430.000	0.80000	0.80000	0.80000	0.75000	0.52000
1,455.000	0.30000	0.21000	0.15000	0.11000	0.09000
1,480.000	0.07000	0.06000	0.05000	0.04000	0.03000
1,505.000	0.02000	0.02000	0.02000	0.01000	0.01000
1,530.000	0.00000	(N/A)	(N/A)	(N/A)	(N/A)

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Read Hydrograph Scenario: Scenario - 2yr 24hr
Label: DMA A (North)

Peak Discharge	9.70000 ft³/s
Time to Peak	815.000 min
Hydrograph Volume	284,590.500 ft³

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 5.000 min
Time on left represents time for first value in each row.

Time (min)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
5.000	0.01000	0.05000	0.11000	0.20000	0.31000
30.000	0.42000	0.50000	0.58000	0.64000	0.69000
55.000	0.74000	0.80000	0.86000	0.91000	0.93000
80.000	0.93000	0.91000	0.89000	0.89000	0.89000
105.000	0.90000	0.90000	0.92000	0.96000	1.00000
130.000	1.05000	1.09000	1.11000	1.13000	1.15000
155.000	1.16000	1.19000	1.24000	1.28000	1.34000
180.000	1.38000	1.41000	1.43000	1.45000	1.46000
205.000	1.48000	1.49000	1.50000	1.51000	1.51000
230.000	1.53000	1.55000	1.59000	1.63000	1.69000
255.000	1.73000	1.76000	1.79000	1.84000	1.89000
280.000	1.95000	2.00000	2.03000	2.07000	2.12000
305.000	2.17000	2.19000	2.18000	2.14000	2.08000
330.000	2.06000	2.08000	2.13000	2.19000	2.24000
355.000	2.30000	2.34000	2.37000	2.41000	2.46000
380.000	2.51000	2.57000	2.62000	2.66000	2.70000
405.000	2.75000	2.81000	2.87000	2.92000	2.95000
430.000	2.98000	3.00000	3.02000	3.05000	3.10000
455.000	3.16000	3.23000	3.31000	3.39000	3.47000
480.000	3.56000	3.65000	3.76000	3.89000	4.01000
505.000	4.14000	4.24000	4.32000	4.39000	4.46000
530.000	4.54000	4.64000	4.74000	4.83000	4.96000
555.000	5.09000	5.22000	5.37000	5.51000	5.63000
580.000	5.75000	5.87000	5.97000	6.09000	6.20000
605.000	6.26000	6.23000	6.09000	5.87000	5.58000
630.000	5.35000	5.27000	5.28000	5.38000	5.52000
655.000	5.72000	5.87000	5.94000	5.98000	5.99000
680.000	5.98000	5.97000	5.96000	5.95000	5.92000
705.000	5.86000	5.80000	5.72000	5.68000	5.73000
730.000	5.87000	6.10000	6.38000	6.74000	7.03000
755.000	7.23000	7.42000	7.61000	7.79000	7.98000
780.000	8.15000	8.32000	8.54000	8.80000	9.08000
805.000	9.38000	9.62000	9.70000	9.62000	9.37000
830.000	9.01000	8.55000	8.20000	8.05000	8.00000
855.000	8.03000	8.11000	8.22000	8.29000	8.28000
880.000	8.25000	8.23000	8.22000	8.20000	8.16000
905.000	8.12000	8.06000	7.99000	7.93000	7.85000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Read Hydrograph | Scenario: Scenario - 2yr 24hr
Label: DMA A (North)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 5.000 min
Time on left represents time for first value in each row.

Time (min)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
930.000	7.77000	7.68000	7.54000	7.36000	7.16000
955.000	6.94000	6.77000	6.57000	6.23000	5.69000
980.000	5.04000	4.27000	3.66000	3.31000	3.03000
1,005.000	2.78000	2.56000	2.36000	2.18000	2.05000
1,030.000	1.97000	1.93000	1.92000	1.94000	1.94000
1,055.000	1.93000	1.92000	1.90000	1.88000	1.85000
1,080.000	1.80000	1.74000	1.68000	1.63000	1.59000
1,105.000	1.55000	1.53000	1.50000	1.45000	1.40000
1,130.000	1.33000	1.25000	1.17000	1.10000	1.04000
1,155.000	1.01000	1.01000	1.04000	1.07000	1.10000
1,180.000	1.12000	1.12000	1.09000	1.03000	0.96000
1,205.000	0.92000	0.88000	0.87000	0.88000	0.91000
1,230.000	0.93000	0.94000	0.94000	0.95000	0.94000
1,255.000	0.93000	0.90000	0.86000	0.83000	0.83000
1,280.000	0.84000	0.85000	0.85000	0.82000	0.80000
1,305.000	0.80000	0.81000	0.83000	0.83000	0.81000
1,330.000	0.78000	0.78000	0.80000	0.82000	0.82000
1,355.000	0.79000	0.75000	0.72000	0.71000	0.70000
1,380.000	0.69000	0.68000	0.68000	0.67000	0.67000
1,405.000	0.66000	0.66000	0.66000	0.65000	0.65000
1,430.000	0.65000	0.65000	0.65000	0.63000	0.60000
1,455.000	0.53000	0.45000	0.36000	0.28000	0.24000
1,480.000	0.21000	0.18000	0.16000	0.14000	0.12000
1,505.000	0.11000	0.10000	0.09000	0.08000	0.07000
1,530.000	0.07000	0.06000	0.05000	0.05000	0.05000
1,555.000	0.04000	0.04000	0.04000	0.03000	0.03000
1,580.000	0.03000	0.03000	0.02000	0.02000	0.02000
1,605.000	0.02000	0.02000	0.02000	0.01000	0.01000
1,630.000	0.01000	0.01000	0.01000	0.01000	0.01000
1,655.000	0.01000	0.00000	0.00000	0.00000	0.00000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Read Hydrograph | Scenario: Scenario - 2yr 24hr
Label: DMA B and C

Peak Discharge	12.46000 ft³/s
Time to Peak	810.000 min
Hydrograph Volume	345,972.000 ft³

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 5.000 min
Time on left represents time for first value in each row.

Time (min)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
5.000	0.03000	0.17000	0.37000	0.51000	0.64000
30.000	0.79000	0.88000	0.94000	0.98000	1.03000
55.000	1.12000	1.24000	1.30000	1.28000	1.21000
80.000	1.17000	1.16000	1.15000	1.15000	1.15000
105.000	1.15000	1.16000	1.23000	1.34000	1.40000
130.000	1.44000	1.46000	1.48000	1.49000	1.50000
155.000	1.52000	1.59000	1.70000	1.76000	1.80000
180.000	1.82000	1.84000	1.86000	1.87000	1.88000
205.000	1.88000	1.89000	1.89000	1.90000	1.90000
230.000	1.92000	1.99000	2.09000	2.16000	2.19000
255.000	2.22000	2.25000	2.33000	2.44000	2.52000
280.000	2.55000	2.58000	2.62000	2.70000	2.81000
305.000	2.85000	2.76000	2.59000	2.50000	2.52000
330.000	2.59000	2.65000	2.73000	2.84000	2.91000
355.000	2.95000	2.98000	3.02000	3.10000	3.21000
380.000	3.28000	3.32000	3.35000	3.39000	3.47000
405.000	3.58000	3.65000	3.69000	3.72000	3.74000
430.000	3.76000	3.77000	3.80000	3.88000	3.99000
455.000	4.07000	4.18000	4.30000	4.41000	4.52000
480.000	4.66000	4.78000	4.97000	5.20000	5.36000
505.000	5.45000	5.51000	5.57000	5.68000	5.81000
530.000	5.91000	6.02000	6.16000	6.29000	6.48000
555.000	6.72000	6.90000	7.05000	7.22000	7.35000
580.000	7.49000	7.64000	7.76000	7.89000	8.04000
605.000	8.03000	7.62000	6.97000	6.56000	6.37000
630.000	6.23000	6.22000	6.47000	6.92000	7.20000
655.000	7.33000	7.42000	7.47000	7.46000	7.39000
680.000	7.35000	7.33000	7.32000	7.28000	7.14000
705.000	6.94000	6.82000	6.82000	6.87000	7.01000
730.000	7.48000	8.19000	8.66000	8.96000	9.22000
755.000	9.44000	9.70000	9.99000	10.19000	10.37000
780.000	10.55000	10.76000	11.18000	11.75000	12.11000
805.000	12.32000	12.46000	12.39000	11.75000	10.72000
830.000	10.08000	9.78000	9.56000	9.48000	9.63000
855.000	9.94000	10.12000	10.14000	10.10000	10.07000
880.000	10.07000	10.06000	10.04000	9.96000	9.85000
905.000	9.77000	9.67000	9.54000	9.43000	9.31000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Read Hydrograph Scenario: Scenario - 2yr 24hr
Label: DMA B and C

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 5.000 min
Time on left represents time for first value in each row.

Time (min)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
930.000	9.17000	9.00000	8.68000	8.25000	7.97000
955.000	7.83000	7.72000	7.40000	6.34000	4.79000
980.000	3.81000	3.30000	2.93000	2.64000	2.36000
1,005.000	2.10000	1.92000	1.79000	1.70000	1.65000
1,030.000	1.71000	1.85000	1.93000	1.95000	1.95000
1,055.000	1.95000	1.95000	1.95000	1.92000	1.84000
1,080.000	1.73000	1.65000	1.61000	1.59000	1.58000
1,105.000	1.57000	1.56000	1.54000	1.47000	1.37000
1,130.000	1.29000	1.19000	1.07000	1.00000	1.02000
1,155.000	1.09000	1.14000	1.22000	1.33000	1.38000
1,180.000	1.35000	1.27000	1.21000	1.12000	1.01000
1,205.000	0.95000	0.98000	1.05000	1.09000	1.11000
1,230.000	1.12000	1.13000	1.13000	1.14000	1.13000
1,255.000	1.06000	0.96000	0.92000	0.95000	1.03000
1,280.000	1.06000	1.02000	0.93000	0.89000	0.93000
1,305.000	1.01000	1.05000	1.00000	0.92000	0.88000
1,330.000	0.93000	1.01000	1.05000	1.00000	0.92000
1,355.000	0.86000	0.84000	0.82000	0.81000	0.80000
1,380.000	0.80000	0.79000	0.79000	0.79000	0.78000
1,405.000	0.78000	0.78000	0.78000	0.78000	0.78000
1,430.000	0.77000	0.77000	0.77000	0.74000	0.61000
1,455.000	0.41000	0.28000	0.21000	0.17000	0.13000
1,480.000	0.11000	0.09000	0.07000	0.06000	0.05000
1,505.000	0.05000	0.04000	0.04000	0.03000	0.03000
1,530.000	0.02000	0.02000	0.02000	0.01000	0.01000
1,555.000	0.01000	(N/A)	(N/A)	(N/A)	(N/A)

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Elevation — Scenario: Scenario - 2yr 24hr
Label: Basin 1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	2,211.50	2,211.50	2,211.50	2,211.51	2,211.51
15.000	2,211.53	2,211.54	2,211.56	2,211.58	2,211.60
30.000	2,211.62	2,211.64	2,211.66	2,211.68	2,211.70
45.000	2,211.72	2,211.74	2,211.75	2,211.77	2,211.79
60.000	2,211.81	2,211.83	2,211.84	2,211.86	2,211.87
75.000	2,211.88	2,211.89	2,211.90	2,211.90	2,211.91
90.000	2,211.91	2,211.91	2,211.92	2,211.92	2,211.92
105.000	2,211.92	2,211.93	2,211.93	2,211.93	2,211.94
120.000	2,211.95	2,211.95	2,211.96	2,211.97	2,211.98
135.000	2,211.99	2,212.00	2,212.00	2,212.01	2,212.02
150.000	2,212.03	2,212.04	2,212.05	2,212.06	2,212.07
165.000	2,212.09	2,212.10	2,212.12	2,212.14	2,212.16
180.000	2,212.18	2,212.21	2,212.23	2,212.25	2,212.27
195.000	2,212.30	2,212.32	2,212.34	2,212.37	2,212.39
210.000	2,212.41	2,212.44	2,212.46	2,212.48	2,212.51
225.000	2,212.54	2,212.57	2,212.59	2,212.63	2,212.66
240.000	2,212.69	2,212.73	2,212.77	2,212.81	2,212.85
255.000	2,212.90	2,212.94	2,212.98	2,213.03	2,213.08
270.000	2,213.13	2,213.19	2,213.24	2,213.30	2,213.36
285.000	2,213.42	2,213.48	2,213.54	2,213.60	2,213.67
300.000	2,213.73	2,213.80	2,213.87	2,213.94	2,214.00
315.000	2,214.02	2,214.04	2,214.05	2,214.07	2,214.09
330.000	2,214.10	2,214.12	2,214.14	2,214.16	2,214.18
345.000	2,214.20	2,214.22	2,214.24	2,214.27	2,214.29
360.000	2,214.31	2,214.34	2,214.36	2,214.39	2,214.41
375.000	2,214.44	2,214.46	2,214.49	2,214.51	2,214.54
390.000	2,214.56	2,214.58	2,214.60	2,214.62	2,214.65
405.000	2,214.67	2,214.69	2,214.72	2,214.74	2,214.77
420.000	2,214.79	2,214.82	2,214.85	2,214.87	2,214.90
435.000	2,214.92	2,214.95	2,214.98	2,215.00	2,215.03
450.000	2,215.05	2,215.07	2,215.10	2,215.13	2,215.15
465.000	2,215.18	2,215.21	2,215.23	2,215.26	2,215.29
480.000	2,215.32	2,215.35	2,215.39	2,215.42	2,215.45
495.000	2,215.49	2,215.52	2,215.56	2,215.59	2,215.63
510.000	2,215.66	2,215.70	2,215.74	2,215.77	2,215.81
525.000	2,215.85	2,215.89	2,215.93	2,215.97	2,216.01
540.000	2,216.05	2,216.09	2,216.13	2,216.17	2,216.21
555.000	2,216.25	2,216.30	2,216.34	2,216.39	2,216.44
570.000	2,216.49	2,216.53	2,216.58	2,216.63	2,216.67
585.000	2,216.72	2,216.77	2,216.82	2,216.87	2,216.92
600.000	2,216.97	2,217.02	2,217.07	2,217.12	2,217.16

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
615.000	2,217.21	2,217.25	2,217.28	2,217.32	2,217.35
630.000	2,217.39	2,217.42	2,217.46	2,217.49	2,217.53
645.000	2,217.57	2,217.60	2,217.64	2,217.68	2,217.72
660.000	2,217.76	2,217.80	2,217.84	2,217.88	2,217.91
675.000	2,217.95	2,217.99	2,218.02	2,218.05	2,218.09
690.000	2,218.12	2,218.15	2,218.18	2,218.21	2,218.24
705.000	2,218.26	2,218.29	2,218.31	2,218.34	2,218.36
720.000	2,218.39	2,218.41	2,218.44	2,218.46	2,218.49
735.000	2,218.52	2,218.55	2,218.59	2,218.62	2,218.65
750.000	2,218.69	2,218.72	2,218.76	2,218.79	2,218.83
765.000	2,218.87	2,218.91	2,218.94	2,218.98	2,219.02
780.000	2,219.06	2,219.09	2,219.13	2,219.17	2,219.21
795.000	2,219.26	2,219.30	2,219.34	2,219.39	2,219.44
810.000	2,219.48	2,219.53	2,219.57	2,219.61	2,219.64
825.000	2,219.68	2,219.71	2,219.73	2,219.76	2,219.79
840.000	2,219.81	2,219.83	2,219.86	2,219.88	2,219.91
855.000	2,219.93	2,219.96	2,219.98	2,220.01	2,220.04
870.000	2,220.06	2,220.09	2,220.11	2,220.14	2,220.16
885.000	2,220.18	2,220.21	2,220.23	2,220.25	2,220.28
900.000	2,220.30	2,220.32	2,220.34	2,220.36	2,220.38
915.000	2,220.40	2,220.42	2,220.44	2,220.46	2,220.48
930.000	2,220.50	2,220.51	2,220.53	2,220.54	2,220.56
945.000	2,220.57	2,220.58	2,220.59	2,220.60	2,220.61
960.000	2,220.62	2,220.62	2,220.63	2,220.63	2,220.63
975.000	2,220.62	2,220.61	2,220.60	2,220.58	2,220.57
990.000	2,220.55	2,220.53	2,220.51	2,220.49	2,220.47
1,005.000	2,220.45	2,220.43	2,220.40	2,220.38	2,220.36
1,020.000	2,220.33	2,220.31	2,220.29	2,220.27	2,220.24
1,035.000	2,220.22	2,220.20	2,220.18	2,220.16	2,220.14
1,050.000	2,220.12	2,220.10	2,220.08	2,220.06	2,220.03
1,065.000	2,220.01	2,219.99	2,219.97	2,219.95	2,219.93
1,080.000	2,219.91	2,219.89	2,219.87	2,219.85	2,219.82
1,095.000	2,219.80	2,219.78	2,219.76	2,219.74	2,219.72
1,110.000	2,219.70	2,219.68	2,219.66	2,219.64	2,219.61
1,125.000	2,219.59	2,219.57	2,219.55	2,219.53	2,219.50
1,140.000	2,219.48	2,219.46	2,219.43	2,219.41	2,219.39
1,155.000	2,219.37	2,219.34	2,219.32	2,219.30	2,219.28
1,170.000	2,219.26	2,219.24	2,219.22	2,219.20	2,219.18
1,185.000	2,219.16	2,219.14	2,219.12	2,219.10	2,219.08
1,200.000	2,219.06	2,219.04	2,219.02	2,219.00	2,218.98
1,215.000	2,218.96	2,218.94	2,218.92	2,218.90	2,218.88

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Elevation Scenario: Scenario - 2yr 24hr
Label: Basin 1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
1,230.000	2,218.86	2,218.84	2,218.82	2,218.80	2,218.79
1,245.000	2,218.77	2,218.75	2,218.73	2,218.72	2,218.70
1,260.000	2,218.68	2,218.66	2,218.64	2,218.63	2,218.61
1,275.000	2,218.59	2,218.58	2,218.56	2,218.54	2,218.53
1,290.000	2,218.51	2,218.50	2,218.48	2,218.46	2,218.45
1,305.000	2,218.43	2,218.42	2,218.40	2,218.39	2,218.37
1,320.000	2,218.36	2,218.34	2,218.33	2,218.32	2,218.30
1,335.000	2,218.29	2,218.28	2,218.27	2,218.25	2,218.24
1,350.000	2,218.23	2,218.22	2,218.20	2,218.19	2,218.18
1,365.000	2,218.17	2,218.16	2,218.14	2,218.13	2,218.12
1,380.000	2,218.11	2,218.10	2,218.09	2,218.08	2,218.07
1,395.000	2,218.06	2,218.05	2,218.04	2,218.03	2,218.02
1,410.000	2,218.01	2,218.00	2,217.99	2,217.98	2,217.97
1,425.000	2,217.96	2,217.95	2,217.94	2,217.93	2,217.92
1,440.000	2,217.91	2,217.91	2,217.90	2,217.89	2,217.88
1,455.000	2,217.87	2,217.85	2,217.84	2,217.83	2,217.82
1,470.000	2,217.81	2,217.79	2,217.78	2,217.77	2,217.76
1,485.000	2,217.75	2,217.73	2,217.72	2,217.71	2,217.70
1,500.000	2,217.69	2,217.68	2,217.67	2,217.65	2,217.64
1,515.000	2,217.63	2,217.62	2,217.61	2,217.60	2,217.59
1,530.000	2,217.58	2,217.57	2,217.56	2,217.55	2,217.54
1,545.000	2,217.53	2,217.52	2,217.51	2,217.50	2,217.49
1,560.000	2,217.48	2,217.47	2,217.46	2,217.45	2,217.44
1,575.000	2,217.43	2,217.42	2,217.41	2,217.40	2,217.39
1,590.000	2,217.38	2,217.37	2,217.36	2,217.35	2,217.34
1,605.000	2,217.33	2,217.32	2,217.31	2,217.30	2,217.29
1,620.000	2,217.28	2,217.28	2,217.27	2,217.26	2,217.25
1,635.000	2,217.24	2,217.23	2,217.22	2,217.21	2,217.20
1,650.000	2,217.19	2,217.18	2,217.17	2,217.16	2,217.15
1,665.000	2,217.14	2,217.13	2,217.12	2,217.11	2,217.10
1,680.000	2,217.09	2,217.09	2,217.08	2,217.07	2,217.06
1,695.000	2,217.05	2,217.04	2,217.03	2,217.02	2,217.01
1,710.000	2,217.00	2,216.99	2,216.98	2,216.97	2,216.96
1,725.000	2,216.95	2,216.94	2,216.93	2,216.92	2,216.91
1,740.000	2,216.90	2,216.89	2,216.88	2,216.87	2,216.86
1,755.000	2,216.85	2,216.84	2,216.83	2,216.82	2,216.81
1,770.000	2,216.80	2,216.79	2,216.78	2,216.77	2,216.76
1,785.000	2,216.75	2,216.74	2,216.73	2,216.72	2,216.71
1,800.000	2,216.70	2,216.69	2,216.68	2,216.67	2,216.66
1,815.000	2,216.65	2,216.64	2,216.63	2,216.62	2,216.61
1,830.000	2,216.60	2,216.59	2,216.58	2,216.58	2,216.57

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Elevation Scenario: Scenario - 2yr 24hr
Label: Basin 1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
1,845.000	2,216.56	2,216.55	2,216.54	2,216.53	2,216.52
1,860.000	2,216.51	2,216.50	2,216.49	2,216.48	2,216.46
1,875.000	2,216.45	2,216.44	2,216.43	2,216.42	2,216.41
1,890.000	2,216.40	2,216.39	2,216.38	2,216.37	2,216.36
1,905.000	2,216.35	2,216.34	2,216.33	2,216.32	2,216.31
1,920.000	2,216.30	2,216.29	2,216.28	2,216.27	2,216.26
1,935.000	2,216.25	2,216.24	2,216.23	2,216.21	2,216.20
1,950.000	2,216.19	2,216.18	2,216.17	2,216.16	2,216.15
1,965.000	2,216.14	2,216.13	2,216.12	2,216.11	2,216.10
1,980.000	2,216.09	2,216.08	2,216.07	2,216.06	2,216.05
1,995.000	2,216.04	2,216.03	2,216.02	2,216.01	2,216.00
2,010.000	2,215.98	2,215.97	2,215.96	2,215.95	2,215.94
2,025.000	2,215.93	2,215.92	2,215.91	2,215.90	2,215.89
2,040.000	2,215.88	2,215.86	2,215.85	2,215.84	2,215.83
2,055.000	2,215.82	2,215.81	2,215.80	2,215.79	2,215.78
2,070.000	2,215.77	2,215.75	2,215.74	2,215.73	2,215.72
2,085.000	2,215.71	2,215.70	2,215.69	2,215.68	2,215.67
2,100.000	2,215.66	2,215.64	2,215.63	2,215.62	2,215.61
2,115.000	2,215.60	2,215.59	2,215.58	2,215.57	2,215.56
2,130.000	2,215.55	2,215.53	2,215.52	2,215.51	2,215.50
2,145.000	2,215.49	2,215.48	2,215.47	2,215.45	2,215.44
2,160.000	2,215.43	2,215.42	2,215.41	2,215.40	2,215.39
2,175.000	2,215.37	2,215.36	2,215.35	2,215.34	2,215.33
2,190.000	2,215.32	2,215.30	2,215.29	2,215.28	2,215.27
2,205.000	2,215.26	2,215.25	2,215.23	2,215.22	2,215.21
2,220.000	2,215.20	2,215.19	2,215.18	2,215.16	2,215.15
2,235.000	2,215.14	2,215.13	2,215.12	2,215.11	2,215.09
2,250.000	2,215.08	2,215.07	2,215.06	2,215.05	2,215.04
2,265.000	2,215.02	2,215.01	2,215.00	2,214.99	2,214.97
2,280.000	2,214.96	2,214.95	2,214.93	2,214.92	2,214.91
2,295.000	2,214.89	2,214.88	2,214.87	2,214.85	2,214.84
2,310.000	2,214.83	2,214.81	2,214.80	2,214.78	2,214.77
2,325.000	2,214.76	2,214.74	2,214.73	2,214.72	2,214.70
2,340.000	2,214.69	2,214.68	2,214.66	2,214.65	2,214.64
2,355.000	2,214.62	2,214.61	2,214.59	2,214.58	2,214.57
2,370.000	2,214.55	2,214.54	2,214.53	2,214.51	2,214.50
2,385.000	2,214.48	2,214.46	2,214.45	2,214.43	2,214.41
2,400.000	2,214.39	2,214.38	2,214.36	2,214.34	2,214.32
2,415.000	2,214.30	2,214.29	2,214.27	2,214.25	2,214.23
2,430.000	2,214.22	2,214.20	2,214.18	2,214.16	2,214.14
2,445.000	2,214.13	2,214.11	2,214.09	2,214.07	2,214.06

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Elevation — Scenario: Scenario - 2yr 24hr
Label: Basin 1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
2,460.000	2,214.04	2,214.02	2,214.00	2,213.95	2,213.89
2,475.000	2,213.83	2,213.77	2,213.72	2,213.66	2,213.60
2,490.000	2,213.54	2,213.48	2,213.42	2,213.36	2,213.30
2,505.000	2,213.24	2,213.19	2,213.13	2,213.07	2,213.01
2,520.000	2,212.95	2,212.89	2,212.83	2,212.77	2,212.71
2,535.000	2,212.65	2,212.59	2,212.53	2,212.48	2,212.42
2,550.000	2,212.37	2,212.32	2,212.27	2,212.22	2,212.17
2,565.000	2,212.11	2,212.06	2,212.01	2,211.96	2,211.91
2,580.000	2,211.87	2,211.84	2,211.80	2,211.77	2,211.75
2,595.000	2,211.72	2,211.70	2,211.68	2,211.66	2,211.65
2,610.000	2,211.63	2,211.62	2,211.61	2,211.60	2,211.59
2,625.000	2,211.58	2,211.57	2,211.56	2,211.56	2,211.55
2,640.000	2,211.55	2,211.54	2,211.54	2,211.54	2,211.53
2,655.000	2,211.53	2,211.53	2,211.52	2,211.52	2,211.52
2,670.000	2,211.52	2,211.52	2,211.52	2,211.51	2,211.51
2,685.000	2,211.51	2,211.51	2,211.51	2,211.51	2,211.51
2,700.000	2,211.51	2,211.51	2,211.51	2,211.51	2,211.51
2,715.000	2,211.51	2,211.50	2,211.50	2,211.50	2,211.50
2,730.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,745.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,760.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,775.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,790.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,805.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,820.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,835.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,850.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,865.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,880.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,895.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,910.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,925.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,940.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,955.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,970.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
2,985.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,000.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,015.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,030.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,045.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,060.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Elevation Scenario: Scenario - 2yr 24hr
Label: Basin 1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
3,075.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,090.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,105.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,120.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,135.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,150.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,165.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,180.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,195.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,210.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,225.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,240.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,255.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,270.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,285.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,300.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,315.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,330.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,345.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,360.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,375.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,390.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,405.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,420.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,435.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,450.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,465.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,480.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,495.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,510.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,525.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,540.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,555.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,570.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,585.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,600.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,615.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,630.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,645.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,660.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,675.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Elevation — Scenario: Scenario - 2yr 24hr
Label: Basin 1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
3,690.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,705.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,720.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,735.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,750.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,765.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,780.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,795.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,810.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,825.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,840.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,855.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,870.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,885.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,900.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,915.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,930.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,945.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,960.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,975.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
3,990.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,005.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,020.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,035.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,050.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,065.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,080.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,095.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,110.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,125.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,140.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,155.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,170.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,185.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,200.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,215.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,230.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,245.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,260.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,275.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,290.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Elevation	Scenario: Scenario - 2yr 24hr
Label: Basin 1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
4,305.000	2,211.50	2,211.50	2,211.50	2,211.50	2,211.50
4,320.000	2,211.50	(N/A)	(N/A)	(N/A)	(N/A)

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Elevation | Scenario: Scenario - 2yr 24hr
Label: Basin 2 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
15.000	2,281.50	2,281.51	2,281.51	2,281.51	2,281.52
30.000	2,281.52	2,281.53	2,281.54	2,281.55	2,281.55
45.000	2,281.56	2,281.57	2,281.58	2,281.59	2,281.60
60.000	2,281.62	2,281.63	2,281.64	2,281.65	2,281.66
75.000	2,281.68	2,281.69	2,281.70	2,281.71	2,281.72
90.000	2,281.74	2,281.75	2,281.76	2,281.77	2,281.78
105.000	2,281.79	2,281.80	2,281.81	2,281.82	2,281.83
120.000	2,281.84	2,281.85	2,281.86	2,281.87	2,281.88
135.000	2,281.90	2,281.91	2,281.92	2,281.93	2,281.94
150.000	2,281.95	2,281.97	2,281.98	2,281.99	2,282.00
165.000	2,282.01	2,282.03	2,282.04	2,282.05	2,282.07
180.000	2,282.08	2,282.09	2,282.11	2,282.12	2,282.14
195.000	2,282.15	2,282.17	2,282.18	2,282.19	2,282.21
210.000	2,282.22	2,282.24	2,282.25	2,282.26	2,282.28
225.000	2,282.29	2,282.31	2,282.32	2,282.33	2,282.35
240.000	2,282.36	2,282.38	2,282.39	2,282.41	2,282.42
255.000	2,282.44	2,282.45	2,282.47	2,282.48	2,282.50
270.000	2,282.52	2,282.54	2,282.56	2,282.58	2,282.60
285.000	2,282.62	2,282.64	2,282.66	2,282.68	2,282.71
300.000	2,282.73	2,282.75	2,282.77	2,282.80	2,282.82
315.000	2,282.84	2,282.86	2,282.89	2,282.91	2,282.93
330.000	2,282.95	2,282.96	2,282.98	2,283.00	2,283.02
345.000	2,283.04	2,283.07	2,283.09	2,283.11	2,283.13
360.000	2,283.15	2,283.18	2,283.20	2,283.22	2,283.25
375.000	2,283.27	2,283.30	2,283.32	2,283.35	2,283.37
390.000	2,283.40	2,283.43	2,283.45	2,283.48	2,283.51
405.000	2,283.53	2,283.56	2,283.59	2,283.62	2,283.65
420.000	2,283.68	2,283.71	2,283.74	2,283.77	2,283.80
435.000	2,283.83	2,283.86	2,283.89	2,283.92	2,283.95
450.000	2,283.98	2,284.00	2,284.01	2,284.02	2,284.03
465.000	2,284.04	2,284.05	2,284.06	2,284.07	2,284.08
480.000	2,284.10	2,284.11	2,284.12	2,284.13	2,284.14
495.000	2,284.16	2,284.17	2,284.18	2,284.20	2,284.21
510.000	2,284.23	2,284.24	2,284.26	2,284.27	2,284.29
525.000	2,284.30	2,284.32	2,284.34	2,284.35	2,284.37
540.000	2,284.39	2,284.40	2,284.42	2,284.44	2,284.46
555.000	2,284.48	2,284.50	2,284.51	2,284.52	2,284.54
570.000	2,284.55	2,284.57	2,284.58	2,284.60	2,284.62
585.000	2,284.63	2,284.65	2,284.67	2,284.68	2,284.70
600.000	2,284.72	2,284.73	2,284.75	2,284.77	2,284.79

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Elevation Scenario: Scenario - 2yr 24hr
Label: Basin 2 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
615.000	2,284.80	2,284.82	2,284.84	2,284.85	2,284.87
630.000	2,284.88	2,284.90	2,284.91	2,284.92	2,284.94
645.000	2,284.95	2,284.97	2,284.98	2,285.00	2,285.01
660.000	2,285.02	2,285.04	2,285.05	2,285.06	2,285.08
675.000	2,285.09	2,285.11	2,285.12	2,285.13	2,285.15
690.000	2,285.16	2,285.17	2,285.19	2,285.20	2,285.22
705.000	2,285.23	2,285.24	2,285.26	2,285.27	2,285.28
720.000	2,285.29	2,285.31	2,285.32	2,285.33	2,285.35
735.000	2,285.36	2,285.37	2,285.39	2,285.40	2,285.42
750.000	2,285.44	2,285.45	2,285.47	2,285.49	2,285.51
765.000	2,285.53	2,285.54	2,285.56	2,285.58	2,285.60
780.000	2,285.62	2,285.64	2,285.66	2,285.68	2,285.70
795.000	2,285.73	2,285.75	2,285.77	2,285.79	2,285.82
810.000	2,285.84	2,285.87	2,285.89	2,285.92	2,285.94
825.000	2,285.96	2,285.99	2,286.01	2,286.03	2,286.05
840.000	2,286.07	2,286.09	2,286.11	2,286.13	2,286.15
855.000	2,286.16	2,286.18	2,286.20	2,286.22	2,286.24
870.000	2,286.26	2,286.28	2,286.30	2,286.32	2,286.34
885.000	2,286.36	2,286.37	2,286.39	2,286.41	2,286.43
900.000	2,286.45	2,286.47	2,286.49	2,286.51	2,286.53
915.000	2,286.54	2,286.56	2,286.58	2,286.60	2,286.61
930.000	2,286.63	2,286.65	2,286.67	2,286.68	2,286.70
945.000	2,286.72	2,286.73	2,286.75	2,286.76	2,286.78
960.000	2,286.79	2,286.80	2,286.82	2,286.83	2,286.84
975.000	2,286.85	2,286.86	2,286.87	2,286.88	2,286.88
990.000	2,286.89	2,286.89	2,286.90	2,286.90	2,286.90
1,005.000	2,286.90	2,286.91	2,286.91	2,286.91	2,286.91
1,020.000	2,286.91	2,286.91	2,286.91	2,286.91	2,286.91
1,035.000	2,286.90	2,286.90	2,286.90	2,286.90	2,286.90
1,050.000	2,286.90	2,286.90	2,286.90	2,286.90	2,286.90
1,065.000	2,286.90	2,286.89	2,286.89	2,286.89	2,286.89
1,080.000	2,286.89	2,286.89	2,286.89	2,286.89	2,286.88
1,095.000	2,286.88	2,286.88	2,286.88	2,286.88	2,286.87
1,110.000	2,286.87	2,286.87	2,286.87	2,286.87	2,286.86
1,125.000	2,286.86	2,286.86	2,286.86	2,286.85	2,286.85
1,140.000	2,286.85	2,286.84	2,286.84	2,286.84	2,286.83
1,155.000	2,286.83	2,286.83	2,286.82	2,286.82	2,286.82
1,170.000	2,286.81	2,286.81	2,286.81	2,286.80	2,286.80
1,185.000	2,286.80	2,286.79	2,286.79	2,286.79	2,286.78
1,200.000	2,286.78	2,286.78	2,286.77	2,286.77	2,286.77
1,215.000	2,286.76	2,286.76	2,286.75	2,286.75	2,286.75

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Elevation Scenario: Scenario - 2yr 24hr
Label: Basin 2 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
1,230.000	2,286.74	2,286.74	2,286.74	2,286.73	2,286.73
1,245.000	2,286.73	2,286.72	2,286.72	2,286.72	2,286.71
1,260.000	2,286.71	2,286.70	2,286.70	2,286.70	2,286.69
1,275.000	2,286.69	2,286.69	2,286.68	2,286.68	2,286.67
1,290.000	2,286.67	2,286.67	2,286.66	2,286.66	2,286.65
1,305.000	2,286.65	2,286.65	2,286.64	2,286.64	2,286.64
1,320.000	2,286.63	2,286.63	2,286.62	2,286.62	2,286.62
1,335.000	2,286.61	2,286.61	2,286.60	2,286.60	2,286.60
1,350.000	2,286.59	2,286.59	2,286.58	2,286.58	2,286.58
1,365.000	2,286.57	2,286.57	2,286.56	2,286.56	2,286.56
1,380.000	2,286.55	2,286.55	2,286.54	2,286.54	2,286.53
1,395.000	2,286.53	2,286.53	2,286.52	2,286.52	2,286.51
1,410.000	2,286.51	2,286.50	2,286.50	2,286.50	2,286.49
1,425.000	2,286.49	2,286.48	2,286.48	2,286.47	2,286.47
1,440.000	2,286.47	2,286.46	2,286.46	2,286.45	2,286.45
1,455.000	2,286.44	2,286.44	2,286.43	2,286.43	2,286.42
1,470.000	2,286.42	2,286.41	2,286.41	2,286.40	2,286.40
1,485.000	2,286.39	2,286.38	2,286.38	2,286.37	2,286.37
1,500.000	2,286.36	2,286.36	2,286.35	2,286.34	2,286.34
1,515.000	2,286.33	2,286.33	2,286.32	2,286.31	2,286.31
1,530.000	2,286.30	2,286.30	2,286.29	2,286.28	2,286.28
1,545.000	2,286.27	2,286.27	2,286.26	2,286.25	2,286.25
1,560.000	2,286.24	2,286.23	2,286.23	2,286.22	2,286.22
1,575.000	2,286.21	2,286.20	2,286.20	2,286.19	2,286.19
1,590.000	2,286.18	2,286.17	2,286.17	2,286.16	2,286.16
1,605.000	2,286.15	2,286.14	2,286.14	2,286.13	2,286.13
1,620.000	2,286.12	2,286.11	2,286.11	2,286.10	2,286.10
1,635.000	2,286.09	2,286.08	2,286.08	2,286.07	2,286.06
1,650.000	2,286.06	2,286.05	2,286.05	2,286.04	2,286.03
1,665.000	2,286.03	2,286.02	2,286.02	2,286.01	2,286.00
1,680.000	2,286.00	2,285.99	2,285.99	2,285.98	2,285.97
1,695.000	2,285.97	2,285.96	2,285.96	2,285.95	2,285.94
1,710.000	2,285.94	2,285.93	2,285.92	2,285.92	2,285.91
1,725.000	2,285.91	2,285.90	2,285.89	2,285.89	2,285.88
1,740.000	2,285.88	2,285.87	2,285.86	2,285.86	2,285.85
1,755.000	2,285.85	2,285.84	2,285.83	2,285.83	2,285.82
1,770.000	2,285.82	2,285.81	2,285.80	2,285.80	2,285.79
1,785.000	2,285.79	2,285.78	2,285.77	2,285.77	2,285.76
1,800.000	2,285.76	2,285.75	2,285.74	2,285.74	2,285.73
1,815.000	2,285.73	2,285.72	2,285.71	2,285.71	2,285.70
1,830.000	2,285.70	2,285.69	2,285.68	2,285.68	2,285.67

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Elevation Scenario: Scenario - 2yr 24hr
Label: Basin 2 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
1,845.000	2,285.67	2,285.66	2,285.65	2,285.65	2,285.64
1,860.000	2,285.64	2,285.63	2,285.62	2,285.62	2,285.61
1,875.000	2,285.61	2,285.60	2,285.60	2,285.59	2,285.58
1,890.000	2,285.58	2,285.57	2,285.57	2,285.56	2,285.55
1,905.000	2,285.55	2,285.54	2,285.54	2,285.53	2,285.53
1,920.000	2,285.52	2,285.51	2,285.51	2,285.50	2,285.50
1,935.000	2,285.49	2,285.48	2,285.48	2,285.47	2,285.47
1,950.000	2,285.46	2,285.45	2,285.45	2,285.44	2,285.44
1,965.000	2,285.43	2,285.43	2,285.42	2,285.41	2,285.41
1,980.000	2,285.40	2,285.40	2,285.39	2,285.38	2,285.38
1,995.000	2,285.37	2,285.37	2,285.36	2,285.35	2,285.35
2,010.000	2,285.34	2,285.34	2,285.33	2,285.33	2,285.32
2,025.000	2,285.31	2,285.31	2,285.30	2,285.30	2,285.29
2,040.000	2,285.28	2,285.28	2,285.27	2,285.27	2,285.26
2,055.000	2,285.26	2,285.25	2,285.24	2,285.24	2,285.23
2,070.000	2,285.23	2,285.22	2,285.22	2,285.21	2,285.20
2,085.000	2,285.20	2,285.19	2,285.19	2,285.18	2,285.18
2,100.000	2,285.17	2,285.16	2,285.16	2,285.15	2,285.15
2,115.000	2,285.14	2,285.14	2,285.13	2,285.13	2,285.12
2,130.000	2,285.11	2,285.11	2,285.10	2,285.10	2,285.09
2,145.000	2,285.09	2,285.08	2,285.07	2,285.07	2,285.06
2,160.000	2,285.06	2,285.05	2,285.05	2,285.04	2,285.04
2,175.000	2,285.03	2,285.02	2,285.02	2,285.01	2,285.01
2,190.000	2,285.00	2,285.00	2,284.99	2,284.98	2,284.98
2,205.000	2,284.97	2,284.96	2,284.96	2,284.95	2,284.94
2,220.000	2,284.94	2,284.93	2,284.92	2,284.92	2,284.91
2,235.000	2,284.91	2,284.90	2,284.89	2,284.89	2,284.88
2,250.000	2,284.87	2,284.87	2,284.86	2,284.85	2,284.85
2,265.000	2,284.84	2,284.83	2,284.83	2,284.82	2,284.82
2,280.000	2,284.81	2,284.80	2,284.80	2,284.79	2,284.78
2,295.000	2,284.78	2,284.77	2,284.77	2,284.76	2,284.75
2,310.000	2,284.75	2,284.74	2,284.73	2,284.73	2,284.72
2,325.000	2,284.72	2,284.71	2,284.70	2,284.70	2,284.69
2,340.000	2,284.68	2,284.68	2,284.67	2,284.67	2,284.66
2,355.000	2,284.65	2,284.65	2,284.64	2,284.64	2,284.63
2,370.000	2,284.62	2,284.62	2,284.61	2,284.60	2,284.60
2,385.000	2,284.59	2,284.59	2,284.58	2,284.57	2,284.57
2,400.000	2,284.56	2,284.56	2,284.55	2,284.54	2,284.54
2,415.000	2,284.53	2,284.53	2,284.52	2,284.51	2,284.51
2,430.000	2,284.50	2,284.49	2,284.49	2,284.48	2,284.47
2,445.000	2,284.46	2,284.45	2,284.44	2,284.43	2,284.43

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Elevation Scenario: Scenario - 2yr 24hr
Label: Basin 2 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
2,460.000	2,284.42	2,284.41	2,284.40	2,284.39	2,284.39
2,475.000	2,284.38	2,284.37	2,284.36	2,284.35	2,284.34
2,490.000	2,284.34	2,284.33	2,284.32	2,284.31	2,284.30
2,505.000	2,284.30	2,284.29	2,284.28	2,284.27	2,284.26
2,520.000	2,284.25	2,284.25	2,284.24	2,284.23	2,284.22
2,535.000	2,284.21	2,284.21	2,284.20	2,284.19	2,284.18
2,550.000	2,284.18	2,284.17	2,284.16	2,284.15	2,284.14
2,565.000	2,284.14	2,284.13	2,284.12	2,284.11	2,284.10
2,580.000	2,284.10	2,284.09	2,284.08	2,284.07	2,284.07
2,595.000	2,284.06	2,284.05	2,284.04	2,284.03	2,284.03
2,610.000	2,284.02	2,284.01	2,284.00	2,283.99	2,283.96
2,625.000	2,283.94	2,283.91	2,283.88	2,283.86	2,283.83
2,640.000	2,283.81	2,283.78	2,283.76	2,283.73	2,283.71
2,655.000	2,283.69	2,283.66	2,283.64	2,283.61	2,283.59
2,670.000	2,283.57	2,283.54	2,283.52	2,283.50	2,283.47
2,685.000	2,283.45	2,283.43	2,283.40	2,283.38	2,283.36
2,700.000	2,283.34	2,283.32	2,283.29	2,283.27	2,283.25
2,715.000	2,283.23	2,283.21	2,283.19	2,283.16	2,283.14
2,730.000	2,283.12	2,283.10	2,283.08	2,283.06	2,283.04
2,745.000	2,283.02	2,283.00	2,282.98	2,282.96	2,282.94
2,760.000	2,282.92	2,282.90	2,282.89	2,282.87	2,282.85
2,775.000	2,282.83	2,282.81	2,282.79	2,282.78	2,282.76
2,790.000	2,282.74	2,282.72	2,282.71	2,282.69	2,282.67
2,805.000	2,282.65	2,282.64	2,282.62	2,282.61	2,282.59
2,820.000	2,282.57	2,282.56	2,282.54	2,282.53	2,282.51
2,835.000	2,282.50	2,282.48	2,282.47	2,282.46	2,282.44
2,850.000	2,282.43	2,282.42	2,282.41	2,282.39	2,282.38
2,865.000	2,282.37	2,282.36	2,282.35	2,282.33	2,282.32
2,880.000	2,282.31	2,282.30	2,282.29	2,282.28	2,282.27
2,895.000	2,282.26	2,282.25	2,282.23	2,282.22	2,282.21
2,910.000	2,282.20	2,282.19	2,282.18	2,282.17	2,282.16
2,925.000	2,282.16	2,282.15	2,282.14	2,282.13	2,282.12
2,940.000	2,282.11	2,282.10	2,282.09	2,282.08	2,282.07
2,955.000	2,282.06	2,282.06	2,282.05	2,282.04	2,282.03
2,970.000	2,282.02	2,282.02	2,282.01	2,282.00	2,281.99
2,985.000	2,281.98	2,281.98	2,281.97	2,281.96	2,281.96
3,000.000	2,281.95	2,281.94	2,281.93	2,281.93	2,281.92
3,015.000	2,281.92	2,281.91	2,281.90	2,281.90	2,281.89
3,030.000	2,281.88	2,281.88	2,281.87	2,281.87	2,281.86
3,045.000	2,281.86	2,281.85	2,281.84	2,281.84	2,281.83
3,060.000	2,281.83	2,281.82	2,281.82	2,281.81	2,281.81

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Elevation Scenario: Scenario - 2yr 24hr
Label: Basin 2 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
3,075.000	2,281.80	2,281.80	2,281.80	2,281.79	2,281.79
3,090.000	2,281.78	2,281.78	2,281.77	2,281.77	2,281.76
3,105.000	2,281.76	2,281.76	2,281.75	2,281.75	2,281.75
3,120.000	2,281.74	2,281.74	2,281.73	2,281.73	2,281.73
3,135.000	2,281.72	2,281.72	2,281.72	2,281.71	2,281.71
3,150.000	2,281.71	2,281.70	2,281.70	2,281.70	2,281.69
3,165.000	2,281.69	2,281.69	2,281.69	2,281.68	2,281.68
3,180.000	2,281.68	2,281.67	2,281.67	2,281.67	2,281.67
3,195.000	2,281.66	2,281.66	2,281.66	2,281.66	2,281.65
3,210.000	2,281.65	2,281.65	2,281.65	2,281.64	2,281.64
3,225.000	2,281.64	2,281.64	2,281.64	2,281.63	2,281.63
3,240.000	2,281.63	2,281.63	2,281.63	2,281.62	2,281.62
3,255.000	2,281.62	2,281.62	2,281.62	2,281.61	2,281.61
3,270.000	2,281.61	2,281.61	2,281.61	2,281.61	2,281.60
3,285.000	2,281.60	2,281.60	2,281.60	2,281.60	2,281.60
3,300.000	2,281.60	2,281.59	2,281.59	2,281.59	2,281.59
3,315.000	2,281.59	2,281.59	2,281.59	2,281.58	2,281.58
3,330.000	2,281.58	2,281.58	2,281.58	2,281.58	2,281.58
3,345.000	2,281.58	2,281.57	2,281.57	2,281.57	2,281.57
3,360.000	2,281.57	2,281.57	2,281.57	2,281.57	2,281.57
3,375.000	2,281.56	2,281.56	2,281.56	2,281.56	2,281.56
3,390.000	2,281.56	2,281.56	2,281.56	2,281.56	2,281.56
3,405.000	2,281.56	2,281.55	2,281.55	2,281.55	2,281.55
3,420.000	2,281.55	2,281.55	2,281.55	2,281.55	2,281.55
3,435.000	2,281.55	2,281.55	2,281.55	2,281.55	2,281.54
3,450.000	2,281.54	2,281.54	2,281.54	2,281.54	2,281.54
3,465.000	2,281.54	2,281.54	2,281.54	2,281.54	2,281.54
3,480.000	2,281.54	2,281.54	2,281.54	2,281.54	2,281.54
3,495.000	2,281.53	2,281.53	2,281.53	2,281.53	2,281.53
3,510.000	2,281.53	2,281.53	2,281.53	2,281.53	2,281.53
3,525.000	2,281.53	2,281.53	2,281.53	2,281.53	2,281.53
3,540.000	2,281.53	2,281.53	2,281.53	2,281.53	2,281.53
3,555.000	2,281.53	2,281.53	2,281.52	2,281.52	2,281.52
3,570.000	2,281.52	2,281.52	2,281.52	2,281.52	2,281.52
3,585.000	2,281.52	2,281.52	2,281.52	2,281.52	2,281.52
3,600.000	2,281.52	2,281.52	2,281.52	2,281.52	2,281.52
3,615.000	2,281.52	2,281.52	2,281.52	2,281.52	2,281.52
3,630.000	2,281.52	2,281.52	2,281.52	2,281.52	2,281.52
3,645.000	2,281.52	2,281.52	2,281.52	2,281.52	2,281.52
3,660.000	2,281.51	2,281.51	2,281.51	2,281.51	2,281.51
3,675.000	2,281.51	2,281.51	2,281.51	2,281.51	2,281.51

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Elevation Scenario: Scenario - 2yr 24hr
Label: Basin 2 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
3,690.000	2,281.51	2,281.51	2,281.51	2,281.51	2,281.51
3,705.000	2,281.51	2,281.51	2,281.51	2,281.51	2,281.51
3,720.000	2,281.51	2,281.51	2,281.51	2,281.51	2,281.51
3,735.000	2,281.51	2,281.51	2,281.51	2,281.51	2,281.51
3,750.000	2,281.51	2,281.51	2,281.51	2,281.51	2,281.51
3,765.000	2,281.51	2,281.51	2,281.51	2,281.51	2,281.51
3,780.000	2,281.51	2,281.51	2,281.51	2,281.51	2,281.51
3,795.000	2,281.51	2,281.51	2,281.51	2,281.51	2,281.51
3,810.000	2,281.51	2,281.51	2,281.51	2,281.51	2,281.51
3,825.000	2,281.51	2,281.51	2,281.51	2,281.51	2,281.51
3,840.000	2,281.51	2,281.51	2,281.51	2,281.51	2,281.51
3,855.000	2,281.51	2,281.51	2,281.51	2,281.51	2,281.51
3,870.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
3,885.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
3,900.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
3,915.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
3,930.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
3,945.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
3,960.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
3,975.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
3,990.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,005.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,020.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,035.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,050.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,065.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,080.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,095.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,110.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,125.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,140.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,155.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,170.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,185.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,200.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,215.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,230.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,245.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,260.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,275.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,290.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Elevation
Scenario: Scenario - 2yr 24hr
Label: Basin 2 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
4,305.000	2,281.50	2,281.50	2,281.50	2,281.50	2,281.50
4,320.000	2,281.50	(N/A)	(N/A)	(N/A)	(N/A)

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Volume Scenario: Scenario - 2yr 24hr
Label: Basin 1

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
0.000	0.000	0.000	14.000	59.000	138.000
15.000	252.000	389.000	540.000	706.000	885.000
30.000	1,078.000	1,276.000	1,469.000	1,657.000	1,835.000
45.000	2,004.000	2,165.000	2,322.000	2,482.000	2,650.000
60.000	2,825.000	3,000.000	3,164.000	3,308.000	3,427.000
75.000	3,518.000	3,589.000	3,648.000	3,697.000	3,740.000
90.000	3,776.000	3,808.000	3,836.000	3,861.000	3,883.000
105.000	3,902.000	3,921.000	3,945.000	3,981.000	4,033.000
120.000	4,101.000	4,179.000	4,259.000	4,340.000	4,418.000
135.000	4,494.000	4,565.000	4,635.000	4,705.000	4,777.000
150.000	4,851.000	4,929.000	5,015.000	5,115.000	5,237.000
165.000	5,383.000	5,547.000	5,722.000	5,907.000	6,098.000
180.000	6,293.000	6,493.000	6,696.000	6,902.000	7,110.000
195.000	7,322.000	7,535.000	7,750.000	7,966.000	8,183.000
210.000	8,401.000	8,621.000	8,840.000	9,061.000	9,276.000
225.000	9,497.000	9,721.000	9,952.000	10,200.000	10,468.000
240.000	10,759.000	11,067.000	11,388.000	11,717.000	12,052.000
255.000	12,392.000	12,740.000	13,097.000	13,471.000	13,867.000
270.000	14,287.000	14,726.000	15,179.000	15,641.000	16,110.000
285.000	16,584.000	17,065.000	17,553.000	18,055.000	18,580.000
300.000	19,128.000	19,691.000	20,251.000	20,792.000	21,365.000
315.000	21,779.000	22,174.000	22,563.000	22,958.000	23,368.000
330.000	23,796.000	24,241.000	24,704.000	25,190.000	25,705.000
345.000	26,250.000	26,822.000	27,413.000	28,021.000	28,644.000
360.000	29,282.000	29,935.000	30,609.000	31,312.000	32,049.000
375.000	32,824.000	33,630.000	34,464.000	35,185.000	35,851.000
390.000	36,529.000	37,223.000	37,934.000	38,670.000	39,438.000
405.000	40,238.000	41,066.000	41,918.000	42,790.000	43,681.000
420.000	44,589.000	45,514.000	46,456.000	47,414.000	48,386.000
435.000	49,374.000	50,380.000	51,408.000	52,455.000	53,395.000
450.000	54,360.000	55,350.000	56,360.000	57,397.000	58,463.000
465.000	59,560.000	60,684.000	61,835.000	63,015.000	64,228.000
480.000	65,475.000	66,755.000	68,070.000	69,432.000	70,851.000
495.000	72,328.000	73,800.000	75,273.000	76,772.000	78,293.000
510.000	79,832.000	81,391.000	82,972.000	84,583.000	86,227.000
525.000	87,907.000	89,619.000	91,360.000	93,135.000	94,929.000
540.000	96,682.000	98,471.000	100,297.000	102,174.000	104,111.000
555.000	106,109.000	108,160.000	110,256.000	112,399.000	114,589.000
570.000	116,827.000	119,027.000	121,228.000	123,471.000	125,757.000
585.000	128,086.000	130,455.000	132,861.000	135,309.000	137,802.000
600.000	140,340.000	142,855.000	145,299.000	147,667.000	149,912.000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Volume Scenario: Scenario - 2yr 24hr
Label: Basin 1

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
615.000	152,021.000	154,025.000	155,936.000	157,781.000	159,590.000
630.000	161,370.000	163,138.000	164,924.000	166,769.000	168,642.000
645.000	170,589.000	172,598.000	174,640.000	176,702.000	178,773.000
660.000	180,848.000	182,921.000	184,984.000	187,028.000	189,045.000
675.000	191,031.000	192,989.000	194,870.000	196,685.000	198,471.000
690.000	200,230.000	201,957.000	203,645.000	205,279.000	206,849.000
705.000	208,353.000	209,804.000	211,220.000	212,613.000	213,995.000
720.000	215,370.000	216,751.000	218,167.000	219,668.000	221,295.000
735.000	223,003.000	224,797.000	226,659.000	228,578.000	230,543.000
750.000	232,548.000	234,586.000	236,656.000	238,765.000	240,921.000
765.000	243,122.000	245,357.000	247,615.000	249,898.000	252,155.000
780.000	254,392.000	256,662.000	258,979.000	261,379.000	263,886.000
795.000	266,508.000	269,217.000	271,980.000	274,785.000	277,617.000
810.000	280,471.000	283,243.000	285,902.000	288,414.000	290,711.000
825.000	292,772.000	294,650.000	296,413.000	298,087.000	299,697.000
840.000	301,253.000	302,775.000	304,293.000	305,839.000	307,441.000
855.000	309,109.000	310,825.000	312,560.000	314,269.000	315,927.000
870.000	317,569.000	319,199.000	320,819.000	322,431.000	324,036.000
885.000	325,633.000	327,219.000	328,792.000	330,342.000	331,863.000
900.000	333,355.000	334,820.000	336,261.000	337,673.000	339,053.000
915.000	340,402.000	341,722.000	343,015.000	344,276.000	345,503.000
930.000	346,696.000	347,813.000	348,874.000	349,862.000	350,756.000
945.000	351,555.000	352,277.000	352,949.000	353,581.000	354,185.000
960.000	354,764.000	355,288.000	355,689.000	355,860.000	355,715.000
975.000	355,235.000	354,496.000	353,594.000	352,570.000	351,460.000
990.000	350,279.000	349,042.000	347,755.000	346,401.000	344,963.000
1,005.000	343,482.000	341,969.000	340,434.000	338,881.000	337,317.000
1,020.000	335,743.000	334,168.000	332,602.000	331,064.000	329,566.000
1,035.000	328,111.000	326,691.000	325,293.000	323,913.000	322,545.000
1,050.000	321,189.000	319,841.000	318,503.000	317,175.000	315,857.000
1,065.000	314,549.000	313,234.000	311,880.000	310,521.000	309,152.000
1,080.000	307,770.000	306,381.000	304,991.000	303,603.000	302,220.000
1,095.000	300,843.000	299,474.000	298,114.000	296,763.000	295,422.000
1,110.000	294,090.000	292,765.000	291,443.000	290,116.000	288,779.000
1,125.000	287,430.000	286,072.000	284,706.000	283,328.000	281,935.000
1,140.000	280,479.000	279,004.000	277,535.000	276,084.000	274,660.000
1,155.000	273,264.000	271,895.000	270,551.000	269,238.000	267,962.000
1,170.000	266,721.000	265,508.000	264,310.000	263,118.000	261,922.000
1,185.000	260,721.000	259,515.000	258,306.000	257,087.000	255,856.000
1,200.000	254,612.000	253,362.000	252,118.000	250,885.000	249,630.000
1,215.000	248,409.000	247,215.000	246,043.000	244,892.000	243,759.000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Volume Scenario: Scenario - 2yr 24hr
Label: Basin 1

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
1,230.000	242,643.000	241,543.000	240,459.000	239,389.000	238,332.000
1,245.000	237,290.000	236,260.000	235,237.000	234,211.000	233,178.000
1,260.000	232,135.000	231,092.000	230,059.000	229,045.000	228,058.000
1,275.000	227,099.000	226,164.000	225,242.000	224,322.000	223,398.000
1,290.000	222,466.000	221,525.000	220,564.000	219,628.000	218,725.000
1,305.000	217,857.000	217,017.000	216,193.000	215,375.000	214,556.000
1,320.000	213,732.000	212,912.000	212,105.000	211,321.000	210,568.000
1,335.000	209,846.000	209,148.000	208,465.000	207,786.000	207,101.000
1,350.000	206,411.000	205,720.000	205,032.000	204,350.000	203,676.000
1,365.000	203,010.000	202,353.000	201,706.000	201,067.000	200,439.000
1,380.000	199,822.000	199,215.000	198,618.000	198,030.000	197,452.000
1,395.000	196,884.000	196,326.000	195,776.000	195,236.000	194,706.000
1,410.000	194,185.000	193,667.000	193,138.000	192,613.000	192,095.000
1,425.000	191,582.000	191,074.000	190,572.000	190,075.000	189,584.000
1,440.000	189,098.000	188,614.000	188,122.000	187,607.000	187,056.000
1,455.000	186,467.000	185,850.000	185,219.000	184,577.000	183,931.000
1,470.000	183,284.000	182,636.000	181,990.000	181,347.000	180,707.000
1,485.000	180,072.000	179,441.000	178,815.000	178,193.000	177,577.000
1,500.000	176,966.000	176,361.000	175,761.000	175,168.000	174,581.000
1,515.000	174,001.000	173,427.000	172,858.000	172,295.000	171,738.000
1,530.000	171,185.000	170,638.000	170,098.000	169,564.000	169,035.000
1,545.000	168,513.000	167,995.000	167,484.000	166,974.000	166,454.000
1,560.000	165,935.000	165,419.000	164,905.000	164,393.000	163,883.000
1,575.000	163,375.000	162,870.000	162,366.000	161,864.000	161,365.000
1,590.000	160,867.000	160,372.000	159,878.000	159,387.000	158,897.000
1,605.000	158,409.000	157,924.000	157,440.000	156,959.000	156,479.000
1,620.000	156,001.000	155,525.000	155,051.000	154,575.000	154,092.000
1,635.000	153,609.000	153,127.000	152,645.000	152,163.000	151,683.000
1,650.000	151,202.000	150,722.000	150,243.000	149,764.000	149,285.000
1,665.000	148,807.000	148,329.000	147,852.000	147,375.000	146,899.000
1,680.000	146,423.000	145,947.000	145,472.000	144,997.000	144,523.000
1,695.000	144,050.000	143,576.000	143,104.000	142,631.000	142,159.000
1,710.000	141,691.000	141,198.000	140,709.000	140,221.000	139,733.000
1,725.000	139,245.000	138,758.000	138,272.000	137,786.000	137,300.000
1,740.000	136,815.000	136,330.000	135,846.000	135,363.000	134,880.000
1,755.000	134,397.000	133,915.000	133,433.000	132,952.000	132,471.000
1,770.000	131,991.000	131,512.000	131,032.000	130,554.000	130,076.000
1,785.000	129,598.000	129,121.000	128,644.000	128,168.000	127,692.000
1,800.000	127,216.000	126,742.000	126,267.000	125,793.000	125,320.000
1,815.000	124,847.000	124,375.000	123,903.000	123,432.000	122,961.000
1,830.000	122,490.000	122,020.000	121,551.000	121,082.000	120,613.000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Volume Scenario: Scenario - 2yr 24hr
Label: Basin 1

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
1,845.000	120,145.000	119,678.000	119,211.000	118,744.000	118,278.000
1,860.000	117,812.000	117,337.000	116,848.000	116,359.000	115,870.000
1,875.000	115,382.000	114,895.000	114,408.000	113,921.000	113,435.000
1,890.000	112,950.000	112,465.000	111,981.000	111,497.000	111,014.000
1,905.000	110,531.000	110,049.000	109,568.000	109,086.000	108,606.000
1,920.000	108,126.000	107,646.000	107,167.000	106,689.000	106,211.000
1,935.000	105,734.000	105,257.000	104,780.000	104,304.000	103,829.000
1,950.000	103,354.000	102,880.000	102,406.000	101,933.000	101,461.000
1,965.000	100,988.000	100,517.000	100,046.000	99,575.000	99,105.000
1,980.000	98,636.000	98,167.000	97,698.000	97,230.000	96,763.000
1,995.000	96,296.000	95,829.000	95,364.000	94,898.000	94,424.000
2,010.000	93,933.000	93,444.000	92,955.000	92,466.000	91,978.000
2,025.000	91,491.000	91,004.000	90,518.000	90,033.000	89,548.000
2,040.000	89,063.000	88,580.000	88,097.000	87,614.000	87,132.000
2,055.000	86,651.000	86,170.000	85,690.000	85,210.000	84,731.000
2,070.000	84,253.000	83,775.000	83,297.000	82,821.000	82,345.000
2,085.000	81,869.000	81,394.000	80,920.000	80,446.000	79,973.000
2,100.000	79,500.000	79,028.000	78,557.000	78,086.000	77,616.000
2,115.000	77,146.000	76,677.000	76,209.000	75,741.000	75,274.000
2,130.000	74,807.000	74,341.000	73,875.000	73,410.000	72,946.000
2,145.000	72,458.000	71,968.000	71,478.000	70,989.000	70,501.000
2,160.000	70,013.000	69,526.000	69,039.000	68,554.000	68,069.000
2,175.000	67,584.000	67,100.000	66,617.000	66,135.000	65,653.000
2,190.000	65,171.000	64,691.000	64,211.000	63,732.000	63,253.000
2,205.000	62,775.000	62,297.000	61,821.000	61,345.000	60,869.000
2,220.000	60,394.000	59,920.000	59,447.000	58,974.000	58,501.000
2,235.000	58,030.000	57,559.000	57,088.000	56,618.000	56,149.000
2,250.000	55,681.000	55,213.000	54,746.000	54,279.000	53,813.000
2,265.000	53,348.000	52,883.000	52,419.000	51,888.000	51,353.000
2,280.000	50,822.000	50,294.000	49,770.000	49,249.000	48,732.000
2,295.000	48,218.000	47,707.000	47,200.000	46,697.000	46,196.000
2,310.000	45,700.000	45,206.000	44,716.000	44,229.000	43,746.000
2,325.000	43,265.000	42,788.000	42,315.000	41,845.000	41,378.000
2,340.000	40,914.000	40,453.000	39,996.000	39,542.000	39,091.000
2,355.000	38,643.000	38,199.000	37,758.000	37,320.000	36,885.000
2,370.000	36,453.000	36,024.000	35,599.000	35,176.000	34,757.000
2,385.000	34,212.000	33,671.000	33,136.000	32,605.000	32,080.000
2,400.000	31,560.000	31,045.000	30,535.000	30,031.000	29,531.000
2,415.000	29,037.000	28,548.000	28,063.000	27,584.000	27,110.000
2,430.000	26,640.000	26,176.000	25,716.000	25,261.000	24,812.000
2,445.000	24,367.000	23,926.000	23,491.000	23,060.000	22,634.000

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
2,460.000	22,213.000	21,796.000	21,384.000	20,853.000	20,384.000
2,475.000	19,914.000	19,445.000	18,975.000	18,506.000	18,037.000
2,490.000	17,567.000	17,095.000	16,618.000	16,141.000	15,663.000
2,505.000	15,186.000	14,708.000	14,231.000	13,754.000	13,276.000
2,520.000	12,799.000	12,322.000	11,844.000	11,367.000	10,889.000
2,535.000	10,412.000	9,935.000	9,457.000	8,986.000	8,508.000
2,550.000	8,030.000	7,552.000	7,074.000	6,596.000	6,118.000
2,565.000	5,640.000	5,162.000	4,684.000	4,226.000	3,809.000
2,580.000	3,434.000	3,095.000	2,791.000	2,516.000	2,269.000
2,595.000	2,046.000	1,845.000	1,664.000	1,501.000	1,354.000
2,610.000	1,222.000	1,102.000	995.000	898.000	811.000
2,625.000	732.000	662.000	598.000	540.000	489.000
2,640.000	442.000	400.000	362.000	328.000	297.000
2,655.000	269.000	244.000	222.000	202.000	183.000
2,670.000	167.000	152.000	139.000	127.000	116.000
2,685.000	106.000	97.000	89.000	82.000	76.000
2,700.000	70.000	65.000	60.000	56.000	52.000
2,715.000	49.000	46.000	43.000	40.000	38.000
2,730.000	36.000	34.000	32.000	31.000	30.000
2,745.000	28.000	27.000	26.000	25.000	25.000
2,760.000	24.000	23.000	23.000	22.000	22.000
2,775.000	21.000	21.000	20.000	20.000	20.000
2,790.000	20.000	19.000	19.000	19.000	19.000
2,805.000	19.000	19.000	18.000	18.000	18.000
2,820.000	18.000	18.000	18.000	18.000	18.000
2,835.000	18.000	18.000	18.000	18.000	18.000
2,850.000	18.000	18.000	18.000	17.000	17.000
2,865.000	17.000	17.000	17.000	17.000	17.000
2,880.000	17.000	17.000	17.000	17.000	17.000
2,895.000	17.000	17.000	17.000	17.000	17.000
2,910.000	17.000	17.000	17.000	17.000	17.000
2,925.000	17.000	17.000	17.000	17.000	17.000
2,940.000	17.000	17.000	17.000	17.000	17.000
2,955.000	17.000	17.000	17.000	17.000	17.000
2,970.000	17.000	17.000	17.000	17.000	17.000
2,985.000	17.000	17.000	17.000	17.000	17.000
3,000.000	17.000	17.000	17.000	17.000	17.000
3,015.000	17.000	17.000	17.000	17.000	17.000
3,030.000	17.000	17.000	17.000	17.000	17.000
3,045.000	17.000	17.000	17.000	17.000	17.000
3,060.000	17.000	17.000	17.000	17.000	17.000

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
3,075.000	17.000	17.000	17.000	17.000	17.000
3,090.000	17.000	17.000	17.000	17.000	17.000
3,105.000	17.000	17.000	17.000	17.000	17.000
3,120.000	17.000	17.000	17.000	17.000	17.000
3,135.000	17.000	17.000	17.000	17.000	17.000
3,150.000	17.000	17.000	17.000	17.000	17.000
3,165.000	17.000	17.000	17.000	17.000	17.000
3,180.000	17.000	17.000	17.000	17.000	17.000
3,195.000	17.000	17.000	17.000	17.000	17.000
3,210.000	17.000	17.000	17.000	17.000	17.000
3,225.000	17.000	17.000	17.000	17.000	17.000
3,240.000	17.000	17.000	17.000	17.000	17.000
3,255.000	17.000	17.000	17.000	17.000	17.000
3,270.000	17.000	17.000	17.000	17.000	17.000
3,285.000	17.000	17.000	17.000	17.000	17.000
3,300.000	17.000	17.000	17.000	17.000	17.000
3,315.000	17.000	17.000	17.000	17.000	17.000
3,330.000	17.000	17.000	17.000	17.000	17.000
3,345.000	17.000	17.000	17.000	17.000	17.000
3,360.000	17.000	17.000	17.000	17.000	17.000
3,375.000	17.000	17.000	17.000	17.000	17.000
3,390.000	17.000	17.000	17.000	17.000	17.000
3,405.000	17.000	17.000	17.000	17.000	17.000
3,420.000	17.000	17.000	17.000	17.000	17.000
3,435.000	17.000	17.000	17.000	17.000	17.000
3,450.000	17.000	17.000	17.000	17.000	17.000
3,465.000	17.000	17.000	17.000	17.000	17.000
3,480.000	17.000	17.000	17.000	17.000	17.000
3,495.000	17.000	17.000	17.000	17.000	17.000
3,510.000	17.000	17.000	17.000	17.000	17.000
3,525.000	17.000	17.000	17.000	17.000	17.000
3,540.000	17.000	17.000	17.000	17.000	17.000
3,555.000	17.000	17.000	17.000	17.000	17.000
3,570.000	17.000	17.000	17.000	17.000	17.000
3,585.000	17.000	17.000	17.000	17.000	17.000
3,600.000	17.000	17.000	17.000	17.000	17.000
3,615.000	17.000	17.000	17.000	17.000	17.000
3,630.000	17.000	17.000	17.000	17.000	17.000
3,645.000	17.000	17.000	17.000	17.000	17.000
3,660.000	17.000	17.000	17.000	17.000	17.000
3,675.000	17.000	17.000	17.000	17.000	17.000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Volume Scenario: Scenario - 2yr 24hr
Label: Basin 1

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
3,690.000	17.000	17.000	17.000	17.000	17.000
3,705.000	17.000	17.000	17.000	17.000	17.000
3,720.000	17.000	17.000	17.000	17.000	17.000
3,735.000	17.000	17.000	17.000	17.000	17.000
3,750.000	17.000	17.000	17.000	17.000	17.000
3,765.000	17.000	17.000	17.000	17.000	17.000
3,780.000	17.000	17.000	17.000	17.000	17.000
3,795.000	17.000	17.000	17.000	17.000	17.000
3,810.000	17.000	17.000	17.000	17.000	17.000
3,825.000	17.000	17.000	17.000	17.000	17.000
3,840.000	17.000	17.000	17.000	17.000	17.000
3,855.000	17.000	17.000	17.000	17.000	17.000
3,870.000	17.000	17.000	17.000	17.000	17.000
3,885.000	17.000	17.000	17.000	17.000	17.000
3,900.000	17.000	17.000	17.000	17.000	17.000
3,915.000	17.000	17.000	17.000	17.000	17.000
3,930.000	17.000	17.000	17.000	17.000	17.000
3,945.000	17.000	17.000	17.000	17.000	17.000
3,960.000	17.000	17.000	17.000	17.000	17.000
3,975.000	17.000	17.000	17.000	17.000	17.000
3,990.000	17.000	17.000	17.000	17.000	17.000
4,005.000	17.000	17.000	17.000	17.000	17.000
4,020.000	17.000	17.000	17.000	17.000	17.000
4,035.000	17.000	17.000	17.000	17.000	17.000
4,050.000	17.000	17.000	17.000	17.000	17.000
4,065.000	17.000	17.000	17.000	17.000	17.000
4,080.000	17.000	17.000	17.000	17.000	17.000
4,095.000	17.000	17.000	17.000	17.000	17.000
4,110.000	17.000	17.000	17.000	17.000	17.000
4,125.000	17.000	17.000	17.000	17.000	17.000
4,140.000	17.000	17.000	17.000	17.000	17.000
4,155.000	17.000	17.000	17.000	17.000	17.000
4,170.000	17.000	17.000	17.000	17.000	17.000
4,185.000	17.000	17.000	17.000	17.000	17.000
4,200.000	17.000	17.000	17.000	17.000	17.000
4,215.000	17.000	17.000	17.000	17.000	17.000
4,230.000	17.000	17.000	17.000	17.000	17.000
4,245.000	17.000	17.000	17.000	17.000	17.000
4,260.000	17.000	17.000	17.000	17.000	17.000
4,275.000	17.000	17.000	17.000	17.000	17.000
4,290.000	17.000	17.000	17.000	17.000	17.000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Volume   Scenario: Scenario - 2yr 24hr
Label: Basin 1

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
4,305.000	17.000	17.000	17.000	17.000	17.000
4,320.000	17.000	(N/A)	(N/A)	(N/A)	(N/A)

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Volume Scenario: Scenario - 2yr 24hr
Label: Basin 2

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
0.000	0.000	0.000	2.000	7.000	17.000
15.000	33.000	57.000	91.000	135.000	190.000
30.000	257.000	332.000	415.000	505.000	601.000
45.000	703.000	809.000	919.000	1,033.000	1,150.000
60.000	1,272.000	1,399.000	1,530.000	1,664.000	1,801.000
75.000	1,938.000	2,075.000	2,208.000	2,339.000	2,465.000
90.000	2,587.000	2,706.000	2,824.000	2,939.000	3,053.000
105.000	3,166.000	3,279.000	3,389.000	3,500.000	3,611.000
120.000	3,725.000	3,841.000	3,960.000	4,082.000	4,208.000
135.000	4,335.000	4,465.000	4,594.000	4,723.000	4,853.000
150.000	4,982.000	5,112.000	5,240.000	5,370.000	5,501.000
165.000	5,636.000	5,774.000	5,915.000	6,060.000	6,209.000
180.000	6,362.000	6,516.000	6,672.000	6,828.000	6,985.000
195.000	7,142.000	7,299.000	7,455.000	7,612.000	7,768.000
210.000	7,924.000	8,080.000	8,234.000	8,388.000	8,541.000
225.000	8,693.000	8,843.000	8,995.000	9,146.000	9,299.000
240.000	9,454.000	9,612.000	9,772.000	9,937.000	10,105.000
255.000	10,276.000	10,449.000	10,623.000	10,798.000	10,969.000
270.000	11,149.000	11,333.000	11,521.000	11,714.000	11,910.000
285.000	12,111.000	12,314.000	12,519.000	12,726.000	12,936.000
300.000	13,149.000	13,365.000	13,585.000	13,805.000	14,025.000
315.000	14,242.000	14,455.000	14,661.000	14,860.000	15,052.000
330.000	15,239.000	15,424.000	15,611.000	15,800.000	15,994.000
345.000	16,192.000	16,395.000	16,602.000	16,814.000	17,029.000
360.000	17,248.000	17,469.000	17,692.000	17,917.000	18,146.000
375.000	18,377.000	18,613.000	18,852.000	19,096.000	19,344.000
390.000	19,596.000	19,851.000	20,108.000	20,368.000	20,629.000
405.000	20,891.000	21,157.000	21,427.000	21,702.000	21,982.000
420.000	22,265.000	22,551.000	22,838.000	23,127.000	23,416.000
435.000	23,707.000	23,997.000	24,288.000	24,580.000	24,874.000
450.000	25,171.000	25,537.000	25,794.000	26,060.000	26,334.000
465.000	26,616.000	26,908.000	27,209.000	27,520.000	27,841.000
480.000	28,172.000	28,515.000	28,869.000	29,236.000	29,618.000
495.000	30,015.000	30,429.000	30,858.000	31,304.000	31,767.000
510.000	32,245.000	32,737.000	33,243.000	33,761.000	34,292.000
525.000	34,837.000	35,395.000	35,968.000	36,558.000	37,166.000
540.000	37,792.000	38,436.000	39,099.000	39,783.000	40,491.000
555.000	41,223.000	41,981.000	42,591.000	43,166.000	43,760.000
570.000	44,372.000	45,002.000	45,650.000	46,315.000	46,998.000
585.000	47,700.000	48,419.000	49,156.000	49,912.000	50,688.000
600.000	51,483.000	52,295.000	53,120.000	53,953.000	54,788.000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Volume Scenario: Scenario - 2yr 24hr
Label: Basin 2

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
615.000	55,617.000	56,433.000	57,231.000	58,006.000	58,755.000
630.000	59,483.000	60,198.000	60,910.000	61,625.000	62,350.000
645.000	63,091.000	63,852.000	64,637.000	65,450.000	66,198.000
660.000	66,930.000	67,673.000	68,423.000	69,179.000	69,937.000
675.000	70,698.000	71,458.000	72,217.000	72,975.000	73,732.000
690.000	74,487.000	75,242.000	75,995.000	76,746.000	77,492.000
705.000	78,232.000	78,965.000	79,692.000	80,411.000	81,122.000
720.000	81,828.000	82,535.000	83,249.000	83,974.000	84,718.000
735.000	85,485.000	86,280.000	87,107.000	87,970.000	88,869.000
750.000	89,802.000	90,761.000	91,742.000	92,745.000	93,756.000
765.000	94,773.000	95,809.000	96,866.000	97,942.000	99,038.000
780.000	100,154.000	101,288.000	102,441.000	103,617.000	104,818.000
795.000	106,047.000	107,306.000	108,596.000	109,918.000	111,271.000
810.000	112,652.000	114,052.000	115,457.000	116,861.000	118,250.000
825.000	119,617.000	120,950.000	122,231.000	123,447.000	124,619.000
840.000	125,752.000	126,857.000	127,949.000	129,032.000	130,112.000
855.000	131,195.000	132,283.000	133,381.000	134,490.000	135,609.000
870.000	136,737.000	137,868.000	138,998.000	140,125.000	141,250.000
885.000	142,372.000	143,493.000	144,613.000	145,732.000	146,847.000
900.000	147,959.000	149,066.000	150,169.000	151,260.000	152,333.000
915.000	153,400.000	154,459.000	155,512.000	156,556.000	157,593.000
930.000	158,620.000	159,639.000	160,647.000	161,642.000	162,621.000
945.000	163,580.000	164,518.000	165,425.000	166,307.000	167,166.000
960.000	168,004.000	168,821.000	169,613.000	170,372.000	171,086.000
975.000	171,744.000	172,337.000	172,856.000	173,296.000	173,657.000
990.000	173,949.000	174,189.000	174,391.000	174,561.000	174,701.000
1,005.000	174,813.000	174,899.000	174,962.000	175,002.000	175,022.000
1,020.000	175,021.000	175,004.000	174,974.000	174,933.000	174,885.000
1,035.000	174,832.000	174,777.000	174,721.000	174,667.000	174,614.000
1,050.000	174,561.000	174,508.000	174,454.000	174,399.000	174,343.000
1,065.000	174,285.000	174,225.000	174,163.000	174,098.000	174,029.000
1,080.000	173,955.000	173,875.000	173,790.000	173,697.000	173,599.000
1,095.000	173,496.000	173,388.000	173,276.000	173,160.000	173,040.000
1,110.000	172,919.000	172,794.000	172,667.000	172,535.000	172,398.000
1,125.000	172,256.000	172,108.000	171,952.000	171,789.000	171,617.000
1,140.000	171,437.000	171,249.000	171,055.000	170,854.000	170,648.000
1,155.000	170,439.000	170,228.000	170,019.000	169,813.000	169,610.000
1,170.000	169,410.000	169,215.000	169,023.000	168,834.000	168,646.000
1,185.000	168,460.000	168,272.000	168,081.000	167,885.000	167,683.000
1,200.000	167,474.000	167,260.000	167,041.000	166,819.000	166,594.000
1,215.000	166,368.000	166,143.000	165,919.000	165,699.000	165,482.000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Volume Scenario: Scenario - 2yr 24hr
Label: Basin 2

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
1,230.000	165,268.000	165,056.000	164,845.000	164,635.000	164,426.000
1,245.000	164,216.000	164,006.000	163,795.000	163,583.000	163,370.000
1,260.000	163,154.000	162,934.000	162,710.000	162,483.000	162,254.000
1,275.000	162,025.000	161,796.000	161,568.000	161,342.000	161,117.000
1,290.000	160,892.000	160,666.000	160,436.000	160,205.000	159,972.000
1,305.000	159,739.000	159,507.000	159,276.000	159,047.000	158,820.000
1,320.000	158,593.000	158,366.000	158,136.000	157,903.000	157,669.000
1,335.000	157,434.000	157,201.000	156,970.000	156,741.000	156,514.000
1,350.000	156,287.000	156,059.000	155,828.000	155,593.000	155,354.000
1,365.000	155,112.000	154,869.000	154,624.000	154,378.000	154,132.000
1,380.000	153,884.000	153,636.000	153,387.000	153,138.000	152,888.000
1,395.000	152,638.000	152,388.000	152,138.000	151,887.000	151,636.000
1,410.000	151,385.000	151,134.000	150,882.000	150,628.000	150,372.000
1,425.000	150,116.000	149,860.000	149,604.000	149,349.000	149,094.000
1,440.000	148,839.000	148,584.000	148,326.000	148,065.000	147,800.000
1,455.000	147,528.000	147,249.000	146,961.000	146,663.000	146,357.000
1,470.000	146,041.000	145,720.000	145,395.000	145,066.000	144,735.000
1,485.000	144,400.000	144,063.000	143,725.000	143,384.000	143,042.000
1,500.000	142,697.000	142,352.000	142,005.000	141,658.000	141,310.000
1,515.000	140,962.000	140,612.000	140,262.000	139,911.000	139,560.000
1,530.000	139,209.000	138,858.000	138,505.000	138,153.000	137,799.000
1,545.000	137,446.000	137,094.000	136,741.000	136,388.000	136,035.000
1,560.000	135,682.000	135,329.000	134,976.000	134,623.000	134,270.000
1,575.000	133,916.000	133,563.000	133,211.000	132,859.000	132,506.000
1,590.000	132,153.000	131,800.000	131,448.000	131,095.000	130,743.000
1,605.000	130,391.000	130,040.000	129,689.000	129,338.000	128,987.000
1,620.000	128,636.000	128,285.000	127,933.000	127,583.000	127,232.000
1,635.000	126,882.000	126,532.000	126,182.000	125,833.000	125,484.000
1,650.000	125,136.000	124,788.000	124,440.000	124,091.000	123,743.000
1,665.000	123,394.000	123,046.000	122,698.000	122,350.000	122,003.000
1,680.000	121,654.000	121,299.000	120,944.000	120,589.000	120,235.000
1,695.000	119,882.000	119,529.000	119,176.000	118,823.000	118,471.000
1,710.000	118,120.000	117,768.000	117,417.000	117,067.000	116,717.000
1,725.000	116,367.000	116,017.000	115,668.000	115,320.000	114,971.000
1,740.000	114,623.000	114,276.000	113,929.000	113,582.000	113,235.000
1,755.000	112,889.000	112,544.000	112,198.000	111,853.000	111,509.000
1,770.000	111,165.000	110,821.000	110,477.000	110,134.000	109,791.000
1,785.000	109,449.000	109,107.000	108,765.000	108,424.000	108,083.000
1,800.000	107,743.000	107,402.000	107,063.000	106,723.000	106,384.000
1,815.000	106,045.000	105,707.000	105,369.000	105,031.000	104,694.000
1,830.000	104,357.000	104,020.000	103,684.000	103,348.000	103,013.000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Volume
Scenario: Scenario - 2yr 24hr
Label: Basin 2

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
1,845.000	102,678.000	102,343.000	102,009.000	101,674.000	101,341.000
1,860.000	101,007.000	100,674.000	100,342.000	100,009.000	99,678.000
1,875.000	99,346.000	99,015.000	98,684.000	98,353.000	98,023.000
1,890.000	97,693.000	97,364.000	97,035.000	96,706.000	96,378.000
1,905.000	96,049.000	95,722.000	95,394.000	95,067.000	94,741.000
1,920.000	94,414.000	94,088.000	93,763.000	93,437.000	93,107.000
1,935.000	92,773.000	92,440.000	92,107.000	91,775.000	91,443.000
1,950.000	91,112.000	90,780.000	90,450.000	90,119.000	89,789.000
1,965.000	89,460.000	89,130.000	88,801.000	88,473.000	88,145.000
1,980.000	87,817.000	87,489.000	87,162.000	86,836.000	86,509.000
1,995.000	86,183.000	85,858.000	85,533.000	85,208.000	84,883.000
2,010.000	84,559.000	84,236.000	83,912.000	83,589.000	83,267.000
2,025.000	82,945.000	82,623.000	82,301.000	81,980.000	81,659.000
2,040.000	81,339.000	81,019.000	80,699.000	80,380.000	80,061.000
2,055.000	79,742.000	79,424.000	79,106.000	78,789.000	78,471.000
2,070.000	78,155.000	77,838.000	77,522.000	77,206.000	76,891.000
2,085.000	76,576.000	76,261.000	75,947.000	75,633.000	75,320.000
2,100.000	75,006.000	74,693.000	74,381.000	74,069.000	73,757.000
2,115.000	73,446.000	73,134.000	72,824.000	72,513.000	72,203.000
2,130.000	71,894.000	71,584.000	71,275.000	70,967.000	70,658.000
2,145.000	70,350.000	70,043.000	69,735.000	69,428.000	69,122.000
2,160.000	68,816.000	68,510.000	68,204.000	67,899.000	67,594.000
2,175.000	67,290.000	66,986.000	66,682.000	66,378.000	66,075.000
2,190.000	65,772.000	65,435.000	65,081.000	64,729.000	64,378.000
2,205.000	64,029.000	63,682.000	63,337.000	62,993.000	62,651.000
2,220.000	62,310.000	61,972.000	61,634.000	61,299.000	60,965.000
2,235.000	60,633.000	60,302.000	59,973.000	59,646.000	59,320.000
2,250.000	58,996.000	58,673.000	58,352.000	58,033.000	57,715.000
2,265.000	57,399.000	57,084.000	56,771.000	56,459.000	56,149.000
2,280.000	55,840.000	55,533.000	55,227.000	54,923.000	54,621.000
2,295.000	54,320.000	54,020.000	53,722.000	53,425.000	53,130.000
2,310.000	52,836.000	52,544.000	52,253.000	51,964.000	51,676.000
2,325.000	51,390.000	51,105.000	50,821.000	50,539.000	50,258.000
2,340.000	49,979.000	49,701.000	49,424.000	49,149.000	48,875.000
2,355.000	48,603.000	48,332.000	48,062.000	47,793.000	47,526.000
2,370.000	47,261.000	46,996.000	46,733.000	46,472.000	46,211.000
2,385.000	45,952.000	45,695.000	45,438.000	45,183.000	44,929.000
2,400.000	44,677.000	44,425.000	44,175.000	43,927.000	43,679.000
2,415.000	43,433.000	43,188.000	42,944.000	42,702.000	42,461.000
2,430.000	42,221.000	41,907.000	41,574.000	41,244.000	40,916.000
2,445.000	40,590.000	40,267.000	39,946.000	39,627.000	39,311.000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Volume Scenario: Scenario - 2yr 24hr
Label: Basin 2

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
2,460.000	38,998.000	38,686.000	38,377.000	38,070.000	37,765.000
2,475.000	37,463.000	37,163.000	36,865.000	36,570.000	36,276.000
2,490.000	35,985.000	35,696.000	35,409.000	35,124.000	34,842.000
2,505.000	34,561.000	34,283.000	34,006.000	33,732.000	33,460.000
2,520.000	33,190.000	32,922.000	32,656.000	32,392.000	32,130.000
2,535.000	31,870.000	31,612.000	31,356.000	31,102.000	30,850.000
2,550.000	30,599.000	30,351.000	30,105.000	29,860.000	29,617.000
2,565.000	29,377.000	29,138.000	28,900.000	28,665.000	28,432.000
2,580.000	28,200.000	27,970.000	27,742.000	27,516.000	27,291.000
2,595.000	27,068.000	26,847.000	26,628.000	26,410.000	26,194.000
2,610.000	25,980.000	25,767.000	25,556.000	25,245.000	24,996.000
2,625.000	24,748.000	24,502.000	24,257.000	24,014.000	23,772.000
2,640.000	23,531.000	23,293.000	23,055.000	22,819.000	22,585.000
2,655.000	22,352.000	22,120.000	21,890.000	21,661.000	21,434.000
2,670.000	21,208.000	20,984.000	20,760.000	20,538.000	20,314.000
2,685.000	20,092.000	19,871.000	19,652.000	19,434.000	19,218.000
2,700.000	19,004.000	18,791.000	18,579.000	18,369.000	18,161.000
2,715.000	17,954.000	17,749.000	17,545.000	17,343.000	17,142.000
2,730.000	16,942.000	16,744.000	16,548.000	16,353.000	16,159.000
2,745.000	15,967.000	15,776.000	15,586.000	15,398.000	15,212.000
2,760.000	15,028.000	14,845.000	14,664.000	14,484.000	14,306.000
2,775.000	14,130.000	13,955.000	13,782.000	13,610.000	13,440.000
2,790.000	13,271.000	13,104.000	12,939.000	12,774.000	12,612.000
2,805.000	12,450.000	12,290.000	12,132.000	11,975.000	11,819.000
2,820.000	11,665.000	11,512.000	11,361.000	11,211.000	11,062.000
2,835.000	10,919.000	10,775.000	10,631.000	10,488.000	10,347.000
2,850.000	10,207.000	10,069.000	9,932.000	9,798.000	9,664.000
2,865.000	9,532.000	9,402.000	9,273.000	9,145.000	9,019.000
2,880.000	8,895.000	8,772.000	8,650.000	8,529.000	8,410.000
2,895.000	8,293.000	8,176.000	8,061.000	7,947.000	7,835.000
2,910.000	7,724.000	7,614.000	7,505.000	7,397.000	7,291.000
2,925.000	7,186.000	7,082.000	6,979.000	6,878.000	6,778.000
2,940.000	6,678.000	6,580.000	6,483.000	6,387.000	6,292.000
2,955.000	6,198.000	6,106.000	6,014.000	5,923.000	5,834.000
2,970.000	5,745.000	5,658.000	5,571.000	5,485.000	5,401.000
2,985.000	5,318.000	5,236.000	5,155.000	5,076.000	4,998.000
3,000.000	4,921.000	4,845.000	4,771.000	4,697.000	4,625.000
3,015.000	4,554.000	4,484.000	4,415.000	4,347.000	4,280.000
3,030.000	4,214.000	4,150.000	4,086.000	4,023.000	3,961.000
3,045.000	3,900.000	3,840.000	3,781.000	3,723.000	3,666.000
3,060.000	3,609.000	3,554.000	3,499.000	3,445.000	3,392.000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Volume
Scenario: Scenario - 2yr 24hr
Label: Basin 2

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
3,075.000	3,340.000	3,289.000	3,238.000	3,188.000	3,139.000
3,090.000	3,091.000	3,043.000	2,996.000	2,950.000	2,905.000
3,105.000	2,860.000	2,816.000	2,773.000	2,730.000	2,688.000
3,120.000	2,647.000	2,606.000	2,566.000	2,527.000	2,488.000
3,135.000	2,449.000	2,412.000	2,375.000	2,338.000	2,302.000
3,150.000	2,267.000	2,232.000	2,198.000	2,164.000	2,130.000
3,165.000	2,098.000	2,065.000	2,034.000	2,002.000	1,972.000
3,180.000	1,941.000	1,911.000	1,882.000	1,853.000	1,824.000
3,195.000	1,796.000	1,769.000	1,742.000	1,715.000	1,688.000
3,210.000	1,662.000	1,637.000	1,612.000	1,587.000	1,562.000
3,225.000	1,538.000	1,515.000	1,491.000	1,468.000	1,446.000
3,240.000	1,424.000	1,402.000	1,380.000	1,359.000	1,338.000
3,255.000	1,317.000	1,297.000	1,277.000	1,258.000	1,238.000
3,270.000	1,219.000	1,200.000	1,182.000	1,164.000	1,146.000
3,285.000	1,128.000	1,111.000	1,094.000	1,077.000	1,060.000
3,300.000	1,044.000	1,028.000	1,012.000	997.000	981.000
3,315.000	966.000	951.000	937.000	922.000	908.000
3,330.000	894.000	880.000	867.000	853.000	840.000
3,345.000	827.000	815.000	802.000	790.000	778.000
3,360.000	766.000	754.000	742.000	731.000	720.000
3,375.000	709.000	698.000	687.000	676.000	666.000
3,390.000	656.000	646.000	636.000	626.000	616.000
3,405.000	607.000	597.000	588.000	579.000	570.000
3,420.000	562.000	553.000	544.000	536.000	528.000
3,435.000	520.000	512.000	504.000	496.000	488.000
3,450.000	481.000	474.000	466.000	459.000	452.000
3,465.000	445.000	438.000	431.000	425.000	418.000
3,480.000	412.000	406.000	399.000	393.000	387.000
3,495.000	381.000	375.000	369.000	364.000	358.000
3,510.000	353.000	347.000	342.000	337.000	331.000
3,525.000	326.000	321.000	316.000	312.000	307.000
3,540.000	302.000	297.000	293.000	288.000	284.000
3,555.000	280.000	275.000	271.000	267.000	263.000
3,570.000	259.000	255.000	251.000	247.000	243.000
3,585.000	239.000	236.000	232.000	228.000	225.000
3,600.000	222.000	218.000	215.000	211.000	208.000
3,615.000	205.000	202.000	199.000	196.000	193.000
3,630.000	190.000	187.000	184.000	181.000	178.000
3,645.000	176.000	173.000	170.000	168.000	165.000
3,660.000	162.000	160.000	157.000	155.000	153.000
3,675.000	150.000	148.000	146.000	144.000	141.000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Volume
Scenario: Scenario - 2yr 24hr
Label: Basin 2

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
3,690.000	139.000	137.000	135.000	133.000	131.000
3,705.000	129.000	127.000	125.000	123.000	121.000
3,720.000	119.000	117.000	116.000	114.000	112.000
3,735.000	110.000	109.000	107.000	105.000	104.000
3,750.000	102.000	100.000	99.000	97.000	96.000
3,765.000	94.000	93.000	92.000	90.000	89.000
3,780.000	87.000	86.000	85.000	83.000	82.000
3,795.000	81.000	80.000	78.000	77.000	76.000
3,810.000	75.000	74.000	73.000	71.000	70.000
3,825.000	69.000	68.000	67.000	66.000	65.000
3,840.000	64.000	63.000	62.000	61.000	60.000
3,855.000	59.000	58.000	57.000	57.000	56.000
3,870.000	55.000	54.000	53.000	52.000	52.000
3,885.000	51.000	50.000	49.000	48.000	48.000
3,900.000	47.000	46.000	46.000	45.000	44.000
3,915.000	43.000	43.000	42.000	42.000	41.000
3,930.000	40.000	40.000	39.000	38.000	38.000
3,945.000	37.000	37.000	36.000	36.000	35.000
3,960.000	34.000	34.000	33.000	33.000	32.000
3,975.000	32.000	31.000	31.000	30.000	30.000
3,990.000	30.000	29.000	29.000	28.000	28.000
4,005.000	27.000	27.000	26.000	26.000	26.000
4,020.000	25.000	25.000	25.000	24.000	24.000
4,035.000	23.000	23.000	23.000	22.000	22.000
4,050.000	22.000	21.000	21.000	21.000	20.000
4,065.000	20.000	20.000	19.000	19.000	19.000
4,080.000	19.000	18.000	18.000	18.000	17.000
4,095.000	17.000	17.000	17.000	16.000	16.000
4,110.000	16.000	16.000	15.000	15.000	15.000
4,125.000	15.000	14.000	14.000	14.000	14.000
4,140.000	14.000	13.000	13.000	13.000	13.000
4,155.000	13.000	12.000	12.000	12.000	12.000
4,170.000	12.000	11.000	11.000	11.000	11.000
4,185.000	11.000	11.000	10.000	10.000	10.000
4,200.000	10.000	10.000	10.000	10.000	9.000
4,215.000	9.000	9.000	9.000	9.000	9.000
4,230.000	9.000	8.000	8.000	8.000	8.000
4,245.000	8.000	8.000	8.000	8.000	7.000
4,260.000	7.000	7.000	7.000	7.000	7.000
4,275.000	7.000	7.000	7.000	6.000	6.000
4,290.000	6.000	6.000	6.000	6.000	6.000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Time vs. Volume
Scenario: Scenario - 2yr 24hr
Label: Basin 2

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
4,305.000	6.000	6.000	6.000	6.000	5.000
4,320.000	5.000	(N/A)	(N/A)	(N/A)	(N/A)

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Outlet Input Data   Scenario: Scenario - 2yr 24hr
Label: Outlet Basin1

Requested Pond Water Surface Elevations	
Minimum (Headwater)	2,211.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	2,227.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 1	Forward	TW	2,217.26	2,227.00
Stand Pipe	Riser - 1	Forward	TW	2,221.98	2,227.00
User Defined Table	Underdrain	Forward	TW	0.00	2,227.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Outlet Input Data | Scenario: Scenario - 2yr 24hr

Label: Outlet Basin1

Structure ID: Underdrain
Structure Type: User Defined Table

Elevation (ft)	Flow (ft^3/s)
2,211.50	0.00000
2,212.00	2.66204
2,213.00	2.66204
2,214.00	2.66204
2,215.00	2.66204
2,216.00	2.66204
2,217.00	2.66204
2,218.00	2.66204
2,219.00	2.66204
2,220.00	2.66204
2,221.00	2.66204
2,222.00	2.66204
2,223.00	2.66204
2,224.00	2.66204
2,225.00	2.66204
2,226.00	2.66204
2,227.00	2.66204

Structure ID: Orifice - 1
Structure Type: Orifice-Circular

Number of Openings	1
Elevation	2,217.26 ft
Orifice Diameter	15.0 in
Orifice Coefficient	0.600

Structure ID: Riser - 1
Structure Type: Stand Pipe

Number of Openings	1
Elevation	2,221.98 ft
Diameter	24.0 in
Orifice Area	3.1 ft^2
Orifice Coefficient	0.600
Weir Length	6.28 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	True

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Outlet Input Data　　Scenario: Scenario - 2yr 24hr
Label: Outlet Basin1

Structure ID: TW
Structure Type: TW Setup, DS Channel

Tailwater Type	Free Outfall

Convergence Tolerances

Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Outlet Input Data
Scenario: Scenario - 2yr 24hr
Label: Outlet Basin2

Requested Pond Water Surface Elevations	
Minimum (Headwater)	2,281.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	2,292.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 2	Forward	TW	2,286.73	2,292.00
Stand Pipe	Riser - 2	Forward	TW	2,288.00	2,292.00
Orifice-Circular	Underdrain	Forward	TW	2,281.50	2,292.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Outlet Input Data — Scenario: Scenario - 2yr 24hr
Label: Outlet Basin2

Structure ID: Riser - 2 Structure Type: Stand Pipe	
Number of Openings	1
Elevation	2,288.00 ft
Diameter	24.0 in
Orifice Area	3.1 ft²
Orifice Coefficient	0.600
Weir Length	6.28 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	True

Structure ID: Orifice - 2 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	2,286.73 ft
Orifice Diameter	5.0 in
Orifice Coefficient	0.600

Structure ID: Underdrain Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	2,281.50 ft
Orifice Diameter	6.0 in
Orifice Coefficient	0.600

Structure ID: TW Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Outlet Input Data Scenario: Scenario - 2yr 24hr
Label: Outlet Basin2

Convergence Tolerances	
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Elevation-Volume-Flow Table (Pond) Scenario: Scenario - 2yr 24hr
Label: Basin 1

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	2,211.50 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00000 ft³/s
Flow (Initial Infiltration)	0.00000 ft³/s
Flow (Initial, Total)	0.00000 ft³/s
Time Increment	3.000 min

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
2,211.50	0.00000	0.000	9,200	0.00000	0.00000	0.00000
2,212.00	2.66204	4,600.000	9,200	0.00000	2.66204	53.77315
2,212.50	2.66204	9,194.186	8,050	0.00000	2.66204	104.81966
2,213.00	2.66204	13,219.186	8,050	0.00000	2.66204	149.54188
2,213.50	2.66204	17,244.186	8,050	0.00000	2.66204	194.26410
2,214.00	2.66204	21,337.541	23,000	0.00000	2.66204	239.74583
2,214.50	2.66204	34,752.040	30,850	0.00000	2.66204	388.79582
2,215.00	2.66204	52,379.430	39,851	0.00000	2.66204	584.65570
2,215.50	2.66204	72,892.805	42,214	0.00000	2.66204	812.58210
2,216.00	2.66204	94,604.396	44,644	0.00000	2.66204	1,053.82199
2,216.50	2.66204	117,531.609	47,076	0.00000	2.66204	1,308.56880
2,217.00	2.66204	141,690.666	49,571	0.00000	2.66204	1,577.00278
2,217.26	2.66204	154,747.335	50,867	0.00000	2.66204	1,722.07687
2,217.50	2.87636	167,100.503	52,078	0.00000	2.87636	1,859.54862
2,218.00	4.48605	193,779.172	54,647	0.00000	4.48605	2,157.58797
2,218.50	7.11264	221,747.163	57,235	0.00000	7.11264	2,470.97000
2,219.00	8.89890	251,024.319	59,883	0.00000	8.89890	2,798.05800
2,219.50	10.16815	281,627.837	62,540	0.00000	10.16815	3,139.36634
2,220.00	11.25185	313,574.173	65,255	0.00000	11.25185	3,495.40933
2,220.50	12.21338	346,881.771	67,985	0.00000	12.21338	3,866.45528
2,221.00	13.08660	381,568.506	70,771	0.00000	13.08660	4,252.73666
2,221.50	13.89212	417,651.172	73,568	0.00000	13.89212	4,654.46070
2,221.98	14.62029	453,924.000	76,328	0.00000	14.62029	5,058.22029
2,222.00	14.68175	455,145.981	76,420	0.00000	14.68175	5,071.85931
2,222.50	22.33742	494,067.597	79,275	0.00000	22.33742	5,511.97739
2,223.00	31.26142	534,430.077	82,183	0.00000	31.26142	5,969.37338
2,223.50	35.27539	576,248.051	85,097	0.00000	35.27539	6,438.03151
2,224.00	38.73699	619,535.612	88,062	0.00000	38.73699	6,922.46602
2,224.50	41.83742	664,307.363	91,034	0.00000	41.83742	7,423.03035

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Elevation-Volume-Flow Table (Pond) Scenario: Scenario - 2yr 24hr
Label: Basin 1

Elevation (ft)	Outflow (ft^3/s)	Storage (ft^3)	Area (ft^2)	Infiltration (ft^3/s)	Flow (Total) (ft^3/s)	2S/t + O (ft^3/s)
2,225.00	44.67633	710,577.427	94,055	0.00000	44.67633	7,939.98107
2,225.50	47.31375	758,360.455	97,085	0.00000	47.31375	8,473.54103
2,226.00	49.78933	807,670.676	100,164	0.00000	49.78933	9,023.90795
2,226.50	52.13092	858,698.398	103,959	0.00000	52.13092	9,593.22422
2,227.00	54.35904	911,641.436	107,825	0.00000	54.35904	10,183.70833

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Level Pool Pond Routing Summary   Scenario: Scenario - 2yr 24hr
Label: Basin 1 (IN)

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	2,211.50 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00000 ft³/s
Flow (Initial Infiltration)	0.00000 ft³/s
Flow (Initial, Total)	0.00000 ft³/s
Time Increment	3.000 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	25.71000 ft³/s	Time to Peak (Flow, In)	810.000 min
Flow (Peak Outlet)	12.44280 ft³/s	Time to Peak (Flow, Outlet)	969.000 min

Elevation (Water Surface, Peak)	2,220.63 ft
Volume (Peak)	355,860.354 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	707,994.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	707,977.000 ft³
Volume (Retained)	16.000 ft³
Volume (Unrouted)	-2.000 ft³
Error (Mass Balance)	0.0 %

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Pond Inflow Summary Scenario: Scenario - 2yr 24hr
Label: Basin 1 (IN)

Summary for Hydrograph Addition at 'Basin 1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	DA-D/5
<Catchment to Outflow Node>	DMA B and C

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (min)	Flow (Peak) (ft^3/s)
Flow (From)	DA-D/5	360,360.000	810.000	13.25000
Flow (From)	DMA B and C	345,972.000	810.000	12.46000
Flow (In)	Basin 1	707,994.180	810.000	25.71000

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Elevation-Volume-Flow Table (Pond) Scenario: Scenario - 2yr 24hr
Label: Basin 2

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	2,281.50 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00000 ft³/s
Flow (Initial Infiltration)	0.00000 ft³/s
Flow (Initial, Total)	0.00000 ft³/s
Time Increment	3.000 min

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
2,281.50	0.00000	0.000	10,972	0.00000	0.00000	0.00000
2,282.00	0.47252	5,486.000	10,972	0.00000	0.47252	61.42807
2,282.50	0.81843	10,965.064	9,600	0.00000	0.81843	122.65247
2,283.00	1.05658	15,765.064	9,600	0.00000	1.05658	176.22396
2,283.50	1.25017	20,565.064	9,600	0.00000	1.25017	229.75087
2,284.00	1.41756	25,446.584	27,429	0.00000	1.41756	284.15738
2,284.50	1.56717	42,167.435	39,839	0.00000	1.56717	470.09422
2,285.00	1.70369	65,670.786	54,559	0.00000	1.70369	731.37909
2,285.50	1.83006	93,325.011	56,061	0.00000	1.83006	1,038.77462
2,286.00	1.94824	121,735.485	57,584	0.00000	1.94824	1,354.56475
2,286.50	2.05966	150,841.469	58,842	0.00000	2.05966	1,678.07598
2,286.73	2.10894	164,442.204	59,426	0.00000	2.10894	1,829.24454
2,287.00	2.30342	180,579.953	60,114	0.00000	2.30342	2,008.74734
2,287.50	2.75796	210,948.934	61,364	0.00000	2.75796	2,346.63500
2,288.00	3.03880	241,946.165	62,627	0.00000	3.03880	2,691.32952
2,288.50	9.93973	273,569.879	63,870	0.00000	9.93973	3,049.60505
2,289.00	18.60749	305,818.094	65,125	0.00000	18.60749	3,416.58631
2,289.50	22.20012	338,688.786	66,360	0.00000	22.20012	3,785.40885
2,290.00	25.24648	372,179.729	67,606	0.00000	25.24648	4,160.57680
2,290.50	27.94175	406,288.891	68,832	0.00000	27.94175	4,542.26277
2,291.00	30.38647	441,014.054	70,070	0.00000	30.38647	4,930.54263
2,291.50	32.64058	476,360.593	71,318	0.00000	32.64058	5,325.53606
2,292.00	34.74327	512,333.882	72,577	0.00000	34.74327	5,727.34195

Fairway Canyon 4C 2yr Proposed Conditions

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	2,281.50 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00000 ft³/s
Flow (Initial Infiltration)	0.00000 ft³/s
Flow (Initial, Total)	0.00000 ft³/s
Time Increment	3.000 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	9.68400 ft³/s	Time to Peak (Flow, In)	816.000 min
Flow (Peak Outlet)	2.23669 ft³/s	Time to Peak (Flow, Outlet)	1,017.000 min

Elevation (Water Surface, Peak)	2,286.91 ft
Volume (Peak)	175,021.797 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	284,591.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	284,586.000 ft³
Volume (Retained)	5.000 ft³
Volume (Unrouted)	0.000 ft³
Error (Mass Balance)	0.0 %

Fairway Canyon 4C 2yr Proposed Conditions

Subsection: Pond Inflow Summary Scenario: Scenario - 2yr 24hr
Label: Basin 2 (IN)

Summary for Hydrograph Addition at 'Basin 2'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	DMA A (North)

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (min)	Flow (Peak) (ft^3/s)
Flow (From)	DMA A (North)	284,590.500	815.000	9.70000
Flow (In)	Basin 2	284,591.160	816.000	9.68400

Fairway Canyon 4C 2yr Proposed Conditions

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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.**	☑ **Maintain and periodically repaint or replace inlet markings.** ☑ **Provide stormwater pollution prevention information to new site owners, lessees, or operators.** ☑ **See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** ☑ **Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."**
❑ B. **Interior floor drains and elevator shaft sump pumps**		❑ **State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.**	☑ **Inspect and maintain drains to prevent blockages and overflow.**
❑ C. **Interior parking garages**		❑ **State that parking garage floor drains will be plumbed to the sanitary sewer.**	❑ **Inspect and maintain drains to prevent blockages and overflow.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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.**

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

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
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.**

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

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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

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1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ 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

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:

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 ___________________ of 20___, by and between _____________________________, ("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 _______________________(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,

9. 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.

10. 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.

11. 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.

12. 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.

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

14. 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:

By: ____________	By: ____________
Name: Nick Emsick	Name: ____________
Title: President	Title: ____________
Organization: Meritage Homes	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~~ TEXAS)
County of ~~Riverside~~ BEXAR)

On August 14, 2024, before me, Rayanne Miller, notary public, personally appeared Nicholas Emsek 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: RMiller (Seal)

NOTARY PUBLIC STATE OF TEXAS
RAYANNE NICOLE MILLER
Notary ID #132944616
My Commission Expires
February 26, 2025

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 ______________, 20___, before me, ___________________________, notary public, personally appeared ______________ who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

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

Signature: ______________________________ (Seal)

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 _______________, 20___, before me, ___________________________, notary public, personally appeared ______________ who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

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

Signature: ________________________________ (Seal)

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 _______________, 20___, before me, ___________________________, notary public, personally appeared ______________ who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

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

Signature: ________________________________ (Seal)

EXHIBIT “A”
LEGAL DESCRIPTION

EXHIBIT “A”

LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF BEAUMONT, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

TRACT NO. 31462-17, BEING A DIVISION OF PARCEL 2 OF PARCEL MAP NO. 38953, IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, RECORDED IN BOOK _______, PAGES _______ THROUGH ______ INCLUSIVE OF PARCEL MAPS, RECORDS OF SAID COUNTY.

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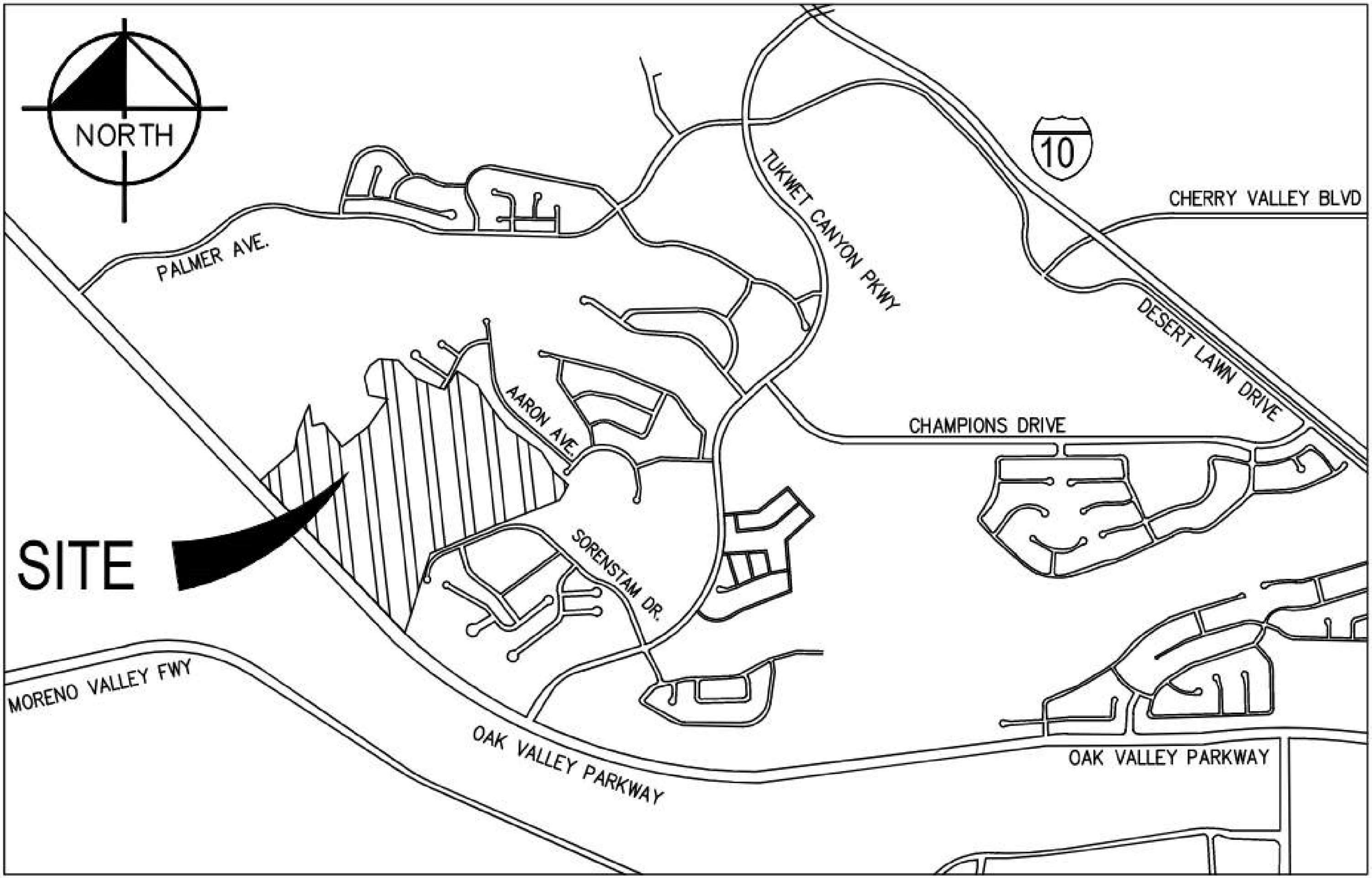
PORTION OF APN: 413-790-074

EXHIBIT "B"
DIAGRAM OF PROPERTY



VICINITY MAP

NOT TO SCALE

EXHIBIT "C"
WQMP

LEGEND

PROP. CONTOUR

PROPERTY LINE

DMA BOUNDARY

RIGHT–OF–WAY

DMA X
XX AC

DMA NAME
AREA (IN ACRES)

NORTH

GRAPHIC SCALE IN FEET
0 200 400 800

REVISIONS DATE BY

SCALE: 1" = 200'
DATE: 6/3/24
DESIGNED: JN
CHECKED: LAC
PLN CK REF:
F.B.

Kimley»Horn
3801 UNIVERSITY AVE, SUITE 300, RIVERSIDE, CA 92501
PHONE: (951) 543-9868 WWW.KIMLEY-HORN.COM

195261012
SHEET
OF SHEETS
DWG. NO.

BMP Inspection and Maintenance Plan

BMP	Responsible Party	Inspection/Maintenance Activities Required	Minimum Frequency of Activities
Parking Area Maintenance	Owner	Parking lots and private streets must be swept.	Quarterly (minimum), weekly during rainy season (oct-may)
Drainage System Maintenance	Owner	Inspect, clean and maintain drainage facilities.	Prior to rainy season and after every rain event greater than 0.5 inches.
Plaza and Sidewalk Cleaning	Owner	Litter shall be picked up. Sidewalk and plaza areas shall be swept.	Weekly
Landscape Maintenance	Owner	Vegetated Areas Mowing and/or trimming of vegetation must be performed on a regular schedule based on specific site conditions. Vegetated areas must be inspected at least annually for erosion and scour. Vegetated areas should also be inspected at least annually for unwanted growth, which should be removed with minimum disruption to the planting soil bed and remaining vegetation. When establishing or restoring vegetation, biweekly inspections of vegetation health should be performed during the first growing season or until the vegetation is established. Once established, inspections of vegetation health, density, and diversity should be performed at least twice annually during both the growing and non-growing seasons. The vegetative cover should be maintained at 85 percent. If vegetation has greater than 50 percent damage, the area should be reestablished in accordance with the original specifications and the inspection requirements presented above. All use of fertilizers, mechanical treatments, pesticides and other means to assure optimum vegetation health should not compromise the intended purpose of the bioretention system. All vegetation deficiencies should be addressed without the use of fertilizers and pesticides whenever possible.	Weekly

BMP Inspection and Maintenance Plan

BMP	Responsible Party	Inspection/Maintenance Activities Required	Minimum Frequency of Activities
Efficient Irrigation	Owner	Irrigation systems must be inspected to ensure proper functionality. Timers must be inspected to avoid overwatering and water cycle and duration shall be adjusted seasonally by landscape maintenance contractor.	Weekly
Storm Drain Signage	Owner	Maintain legibility of stenciling and signs.	Yearly
Trash Storage Areas	Owner	Trash and waste storage areas must be inspected to ensure receptacles are not collecting storm water. Trash enclosure areas shall be swept and cleaned, dumpsters shall be emptied. Lids must always be maintained closed.	Weekly
Bioretention Basins	Owner	Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. Remove trash and debris. Replace damaged grass and/or plants. Replace surface mulch later as needed to maintain a 2-3 inch soil cover. Inspect areas for ponding after storm events. Inspect/clean inlets and outlets annually.	Annually

BMP Inspection and Maintenance Log

Date	Inspection/Maintenance Task Performed	Inspector

BMP Inspection and Maintenance Log

Date	Inspection/Maintenance Task Performed	Inspector

Stormwater BMP Inspection and Maintenance Log

Facility Name	
Address	
Begin Date	End Date

Date	BMP ID#	BMP Description	Inspected by:	Cause for Inspection	Exceptions Noted	Comments and Actions Taken

Instructions: Record all inspections and maintenance for all treatment BMPs on this form. Use additional log sheets and/or attach extended comments or documentation as necessary. Submit a copy of the completed log with the annual independent inspectors' report to the municipality, and start a new log at that time.

- BMP ID# — Always use ID# from the Operation and Maintenance Manual.
- Inspected by — Note all inspections and maintenance on this form, including the required independent annual inspection.
- Cause for inspection — Note if the inspection is routine, pre-rainy-season, post-storm, annual, or in response to a noted problem or complaint.
- Exceptions noted — Note any condition that requires correction or indicates a need for maintenance.
- Comments and actions taken — Describe any maintenance done and need for follow-up.

Appendix 10: Educational Materials

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

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)

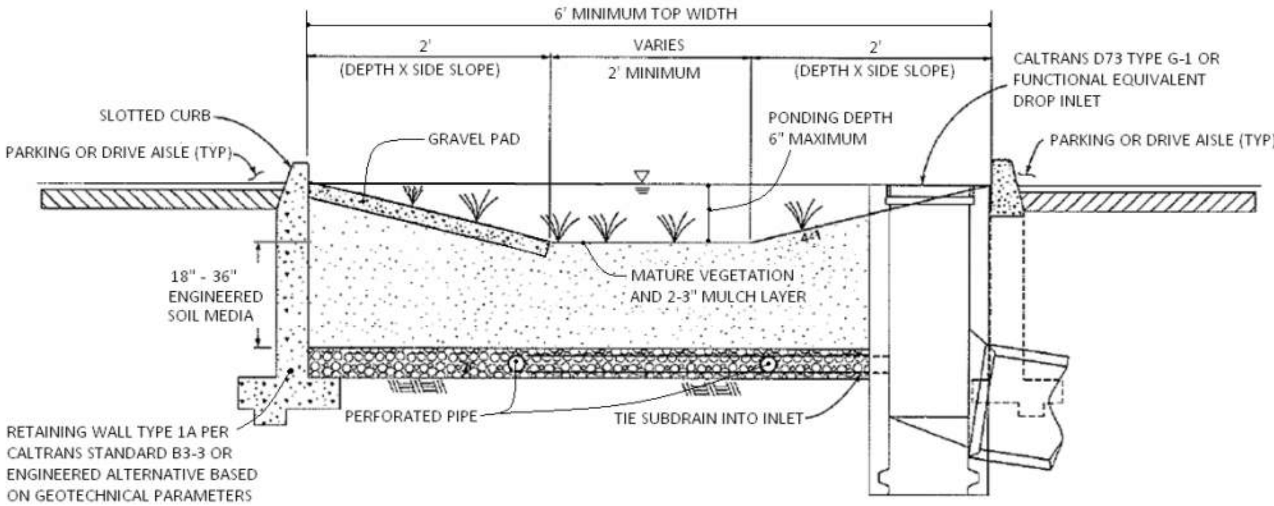


Figure 1: Standard Layout for a Bioretention Facility

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.

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.

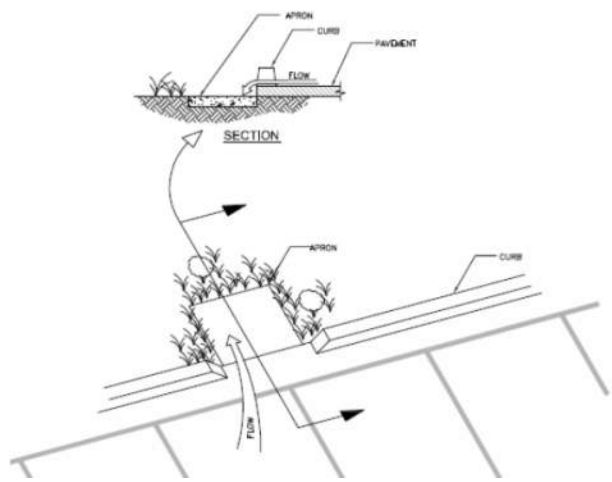


Figure 3: Apron located in a Bioretention Facility

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

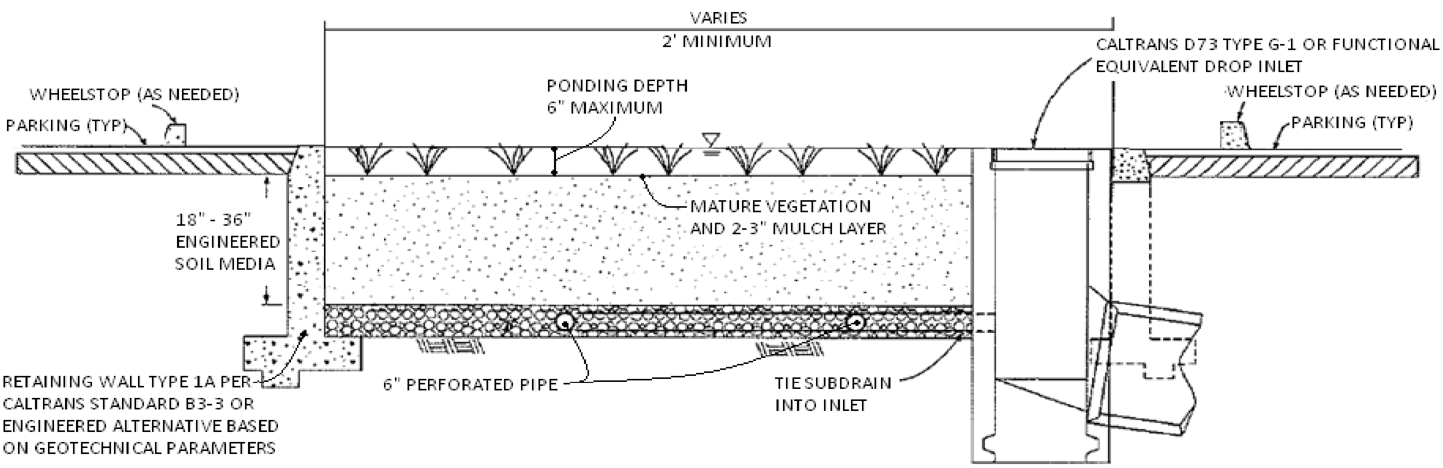
6” Check Dam Spacing	
Slope	**Spacing**
1%	*25'*
2%	*15'*
3%	*10'*

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.

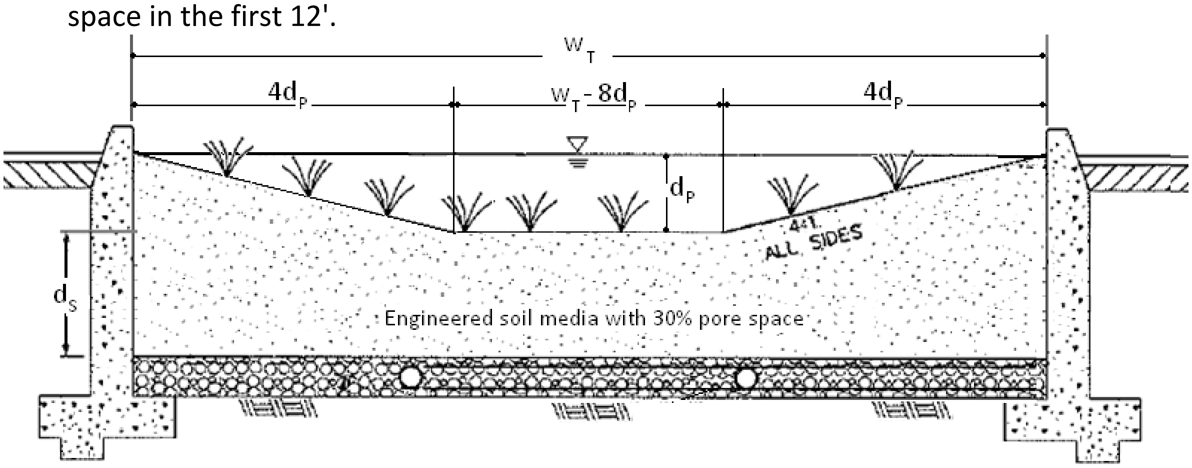
2) Enter the Design Volume, $V_{BMP,}$ determined from Section 2.1 of this Handbook.

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.

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

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:

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

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

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

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

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

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

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

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

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

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

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

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

13) Describe the vegetation used within the Bioretention Facility.

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

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	✓
Oil and Grease	
Organics	

California Stormwater Quality Association

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and stormwater that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

Approach

Pollution Prevention

Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Suggested Protocols

Catch Basins/Inlet Structures

- Staff should regularly inspect facilities to ensure compliance with the following:
  - Immediate repair of any deterioration threatening structural integrity.
  - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - Stenciling of catch basins and inlets (see SC34 Waste Handling and Disposal).

- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.

- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.

- Keep accurate logs of the number of catch basins cleaned.

- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.

- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.

- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.

- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.

- Conduct routine maintenance at each pump station.

- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.

- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS.

Illicit Connections and Discharges

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:

  - Is there evidence of spills such as paints, discoloring, etc?

- Are there any odors associated with the drainage system?
- Record locations of apparent illegal discharges/illicit connections?
- Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- Eliminate the discharge once the origin of flow is established.

■ Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.

■ Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

■ Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.

■ Establish a system for tracking incidents. The system should be designed to identify the following:

- Illegal dumping hot spots
- Types and quantities (in some cases) of wastes
- Patterns in time of occurrence (time of day/night, month, or year)
- Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
- Responsible parties

■ Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.

■ Refer to fact sheet SC-10 Non-Stormwater Discharges.

Training

■ Train crews in proper maintenance activities, including record keeping and disposal.

■ Allow only properly trained individuals to handle hazardous materials/wastes.

■ Have staff involved in detection and removal of illicit connections trained in the following:

- OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).

- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).

- Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Spill Response and Prevention

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.

- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.

- Refer to fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Other Considerations (Limitations and Regulations)

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.

- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and prohibition against disposal of flushed effluent to sanitary sewer in some areas.

- Regulations may include adoption of substantial penalties for illegal dumping and disposal.

- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget.

- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The primary cost is for staff time. Cost depends on how aggressively a program is implemented. Other cost considerations for an illegal dumping program include:

  - Purchase and installation of signs.

  - Rental of vehicle(s) to haul illegally-disposed items and material to landfills.

  - Rental of heavy equipment to remove larger items (e.g., car bodies) from channels.

  - Purchase of landfill space to dispose of illegally-dumped items and material.

- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.

- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.

- Arrangements must be made for proper disposal of collected wastes.

- Technical staff are required to detect and investigate illegal dumping violations.

Supplemental Information

Further Detail of the BMP

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing resuspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm sewer flushing.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

Ferguson, B.K. 1991. Urban Stream Reclamation, p. 324-322, Journal of Soil and Water Conservation.

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Storm Drain System Cleaning. On line:
http://www.epa.gov/npdes/menuofbmps/poll_16.htm

Landscape Maintenance SC-73

Objectives

- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	
Bacteria	
Oil and Grease	
Organics	
Oxygen Demanding	☑

Description

Landscape maintenance activities include vegetation removal; herbicide and insecticide application; fertilizer application; watering; and other gardening and lawn care practices. Vegetation control typically involves a combination of chemical (herbicide) application and mechanical methods. All of these maintenance practices have the potential to contribute pollutants to the storm drain system. The major objectives of this BMP are to minimize the discharge of pesticides, herbicides and fertilizers to the storm drain system and receiving waters; prevent the disposal of landscape waste into the storm drain system by collecting and properly disposing of clippings and cuttings, and educating employees and the public.

Approach

Pollution Prevention

- Implement an integrated pest management (IPM) program. IPM is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools.

- Choose low water using flowers, trees, shrubs, and groundcover.

- Consider alternative landscaping techniques such as naturescaping and xeriscaping.

- Conduct appropriate maintenance (i.e. properly timed fertilizing, weeding, pest control, and pruning) to help preserve the landscapes water efficiency.

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- Consider grass cycling (grass cycling is the natural recycling of grass by leaving the clippings on the lawn when mowing. Grass clippings decompose quickly and release valuable nutrients back into the lawn).

Suggested Protocols

Mowing, Trimming, and Weeding

- Whenever possible use mechanical methods of vegetation removal (e.g mowing with tractor-type or push mowers, hand cutting with gas or electric powered weed trimmers) rather than applying herbicides. Use hand weeding where practical.

- Avoid loosening the soil when conducting mechanical or manual weed control, this could lead to erosion. Use mulch or other erosion control measures when soils are exposed.

- Performing mowing at optimal times. Mowing should not be performed if significant rain events are predicted.

- Mulching mowers may be recommended for certain flat areas. Other techniques may be employed to minimize mowing such as selective vegetative planting using low maintenance grasses and shrubs.

- Collect lawn and garden clippings, pruning waste, tree trimmings, and weeds. Chip if necessary, and compost or dispose of at a landfill (see waste management section of this fact sheet).

- Place temporarily stockpiled material away from watercourses, and berm or cover stockpiles to prevent material releases to storm drains.

Planting

- Determine existing native vegetation features (location, species, size, function, importance) and consider the feasibility of protecting them. Consider elements such as their effect on drainage and erosion, hardiness, maintenance requirements, and possible conflicts between preserving vegetation and the resulting maintenance needs.

- Retain and/or plant selected native vegetation whose features are determined to be beneficial, where feasible. Native vegetation usually requires less maintenance (e.g., irrigation, fertilizer) than planting new vegetation.

- Consider using low water use groundcovers when planting or replanting.

Waste Management

- Compost leaves, sticks, or other collected vegetation or dispose of at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.

- Place temporarily stockpiled material away from watercourses and storm drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.

- Reduce the use of high nitrogen fertilizers that produce excess growth requiring more frequent mowing or trimming.

- Avoid landscape wastes in and around storm drain inlets by either using bagging equipment or by manually picking up the material.

Irrigation

- Where practical, use automatic timers to minimize runoff.
- Use popup sprinkler heads in areas with a lot of activity or where there is a chance the pipes may be broken. Consider the use of mechanisms that reduce water flow to sprinkler heads if broken.
- Ensure that there is no runoff from the landscaped area(s) if re-claimed water is used for irrigation.
- If bailing of muddy water is required (e.g. when repairing a water line leak), do not put it in the storm drain; pour over landscaped areas.
- Irrigate slowly or pulse irrigate to prevent runoff and then only irrigate as much as is needed.
- Apply water at rates that do not exceed the infiltration rate of the soil.

Fertilizer and Pesticide Management

- Utilize a comprehensive management system that incorporates integrated pest management (IPM) techniques. There are many methods and types of IPM, including the following:
  - Mulching can be used to prevent weeds where turf is absent, fencing installed to keep rodents out, and netting used to keep birds and insects away from leaves and fruit.
  - Visible insects can be removed by hand (with gloves or tweezers) and placed in soapy water or vegetable oil. Alternatively, insects can be sprayed off the plant with water or in some cases vacuumed off of larger plants.
  - Store-bought traps, such as species-specific, pheromone-based traps or colored sticky cards, can be used.
  - Slugs can be trapped in small cups filled with beer that are set in the ground so the slugs can get in easily.
  - In cases where microscopic parasites, such as bacteria and fungi, are causing damage to plants, the affected plant material can be removed and disposed of (pruning equipment should be disinfected with bleach to prevent spreading the disease organism).
  - Small mammals and birds can be excluded using fences, netting, tree trunk guards.
  - Beneficial organisms, such as bats, birds, green lacewings, ladybugs, praying mantis, ground beetles, parasitic nematodes, trichogramma wasps, seed head weevils, and spiders that prey on detrimental pest species can be promoted.
- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.

- Use pesticides only if there is an actual pest problem (not on a regular preventative schedule).
- Do not use pesticides if rain is expected. Apply pesticides only when wind speeds are low (less than 5 mph).
- Do not mix or prepare pesticides for application near storm drains.
- Prepare the minimum amount of pesticide needed for the job and use the lowest rate that will effectively control the pest.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Calibrate fertilizer and pesticide application equipment to avoid excessive application.
- Periodically test soils for determining proper fertilizer use.
- Sweep pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Purchase only the amount of pesticide that you can reasonably use in a given time period (month or year depending on the product).
- Triple rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Dispose of empty pesticide containers according to the instructions on the container label.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.
- Inspect pesticide/fertilizer equipment and transportation vehicles daily.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution. Pesticide application must be under the supervision of a California qualified pesticide applicator.
- Train/encourage municipal maintenance crews to use IPM techniques for managing public green areas.
- Annually train employees within departments responsible for pesticide application on the appropriate portions of the agency's IPM Policy, SOPs, and BMPs, and the latest IPM techniques.

- Employees who are not authorized and trained to apply pesticides should be periodically (at least annually) informed that they cannot use over-the-counter pesticides in or around the workplace.

- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup

- Have spill cleanup materials readily available and in a know in location

- Cleanup spills immediately and use dry methods if possible.

- Properly dispose of spill cleanup material.

Other Considerations

- The Federal Pesticide, Fungicide, and Rodenticide Act and California Title 3, Division 6, Pesticides and Pest Control Operations place strict controls over pesticide application and handling and specify training, annual refresher, and testing requirements. The regulations generally cover: a list of approved pesticides and selected uses, updated regularly; general application information; equipment use and maintenance procedures; and record keeping. The California Department of Pesticide Regulations and the County Agricultural Commission coordinate and maintain the licensing and certification programs. All public agency employees who apply pesticides and herbicides in "agricultural use" areas such as parks, golf courses, rights-of-way and recreation areas should be properly certified in accordance with state regulations. Contracts for landscape maintenance should include similar requirements.

- All employees who handle pesticides should be familiar with the most recent material safety data sheet (MSDS) files.

- Municipalities do not have the authority to regulate the use of pesticides by school districts, however the California Healthy Schools Act of 2000 (AB 2260) has imposed requirements on California school districts regarding pesticide use in schools. Posting of notification prior to the application of pesticides is now required, and IPM is stated as the preferred approach to pest management in schools.

Requirements

Costs

Additional training of municipal employees will be required to address IPM techniques and BMPs. IPM methods will likely increase labor cost for pest control which may be offset by lower chemical costs.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

Waste Management

Composting is one of the better disposal alternatives if locally available. Most municipalities either have or are planning yard waste composting facilities as a means of reducing the amount of waste going to the landfill. Lawn clippings from municipal maintenance programs as well as private sources would probably be compatible with most composting facilities

Contractors and Other Pesticide Users

Municipal agencies should develop and implement a process to ensure that any contractor employed to conduct pest control and pesticide application on municipal property engages in pest control methods consistent with the IPM Policy adopted by the agency. Specifically, municipalities should require contractors to follow the agency's IPM policy, SOPs, and BMPs; provide evidence to the agency of having received training on current IPM techniques when feasible; provide documentation of pesticide use on agency property to the agency in a timely manner.

References and Resources

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. 1995. King County Surface Water Management. July. On-line: http://dnr.metrokc.gov/wlr/dss/spcm.htm

Los Angeles County Stormwater Quality Model Programs. Public Agency Activities http://ladpw.org/wmd/npdes/model_links.cfm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Orange County Stormwater Program http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Landscaping and Lawn Care. Office of Water. Office of Wastewater Management. On-line: http://www.epa.gov/npdes/menuofbmps/poll_8.htm

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.

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

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

– 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.

After the Storm

A Citizen's Guide to Understanding Stormwater

For more information contact:

or visit

www.epa.gov/npdes/stormwater

www.epa.gov/nps

United States Environmental Protection Agency

EPA 833-B-03-002

January 2003

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THE YEAR OF CLEAN WATER

What is stormwater runoff?

Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

Why is stormwater runoff a problem?

Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

The effects of pollution

Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.

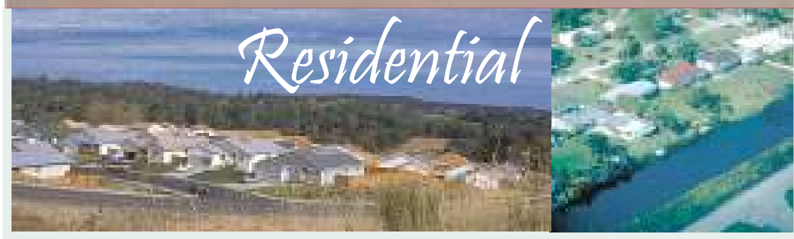
- Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.

- Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.

Stormwater Pollution Solutions

Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.

Residential



Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

Lawn care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

- Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- Cover piles of dirt or mulch being used in landscaping projects.

Auto care

Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.

- Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

Septic systems

Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.

- Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- Don't dispose of household hazardous waste in sinks or toilets.

Pet waste

Pet waste can be a major source of bacteria and excess nutrients in local waters.

- When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.

Residential landscaping

Permeable Pavement—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

Rain Barrels—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.

Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.

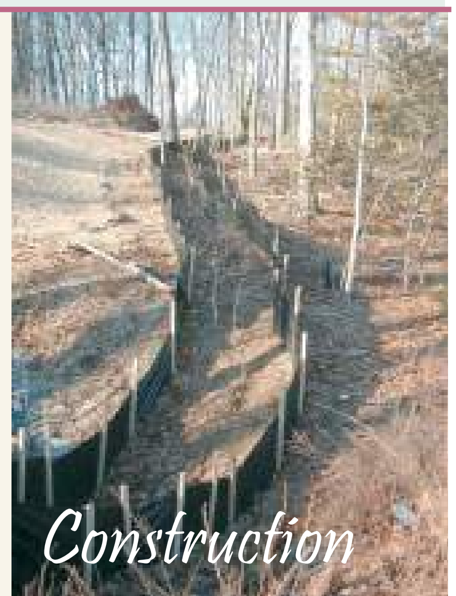
Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.

Commercial

Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

- Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- Cover grease storage and dumpsters and keep them clean to avoid leaks.
- Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

Construction



Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

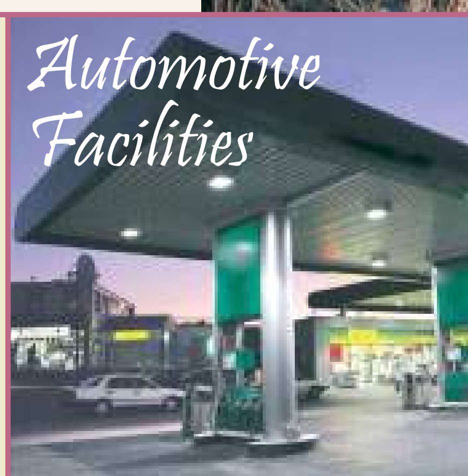
- Divert stormwater away from disturbed or exposed areas of the construction site.
- Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.

Agriculture

Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.

- Keep livestock away from streambanks and provide them a water source away from waterbodies.
- Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- Vegetate riparian areas along waterways.
- Rotate animal grazing to prevent soil erosion in fields.
- Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.

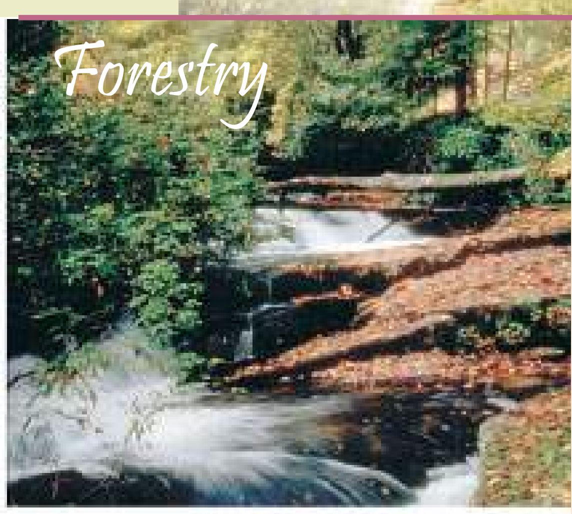
Automotive Facilities



Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- Clean up spills immediately and properly dispose of cleanup materials.
- Provide cover over fueling stations and design or retrofit facilities for spill containment.
- Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- Install and maintain oil/water separators.

Forestry



Improperly managed logging operations can result in erosion and sedimentation.

- Conduct preharvest planning to prevent erosion and lower costs.
- Use logging methods and equipment that minimize soil disturbance.
- Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
- Construct stream crossings so that they minimize erosion and physical changes to streams.
- Expedite revegetation of cleared areas.

Landscaping and garden maintenance activities can be major contributors to water pollution. Soils, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!

In Riverside County, report illegal discharges into the storm drain, call
1-800-506-2555
"Only Rain Down the Storm Drain"

Important Links:

Riverside County Household Hazardous Waste Collection Information
1-800-304-2226 or www.rivcowm.org

Riverside County Backyard Composting Program
1-800-366-SAVE

Integrated Pest Management (IPM) Solutions
www.ipm.ucdavis.edu

California Master Gardener Programs
www.mastergardeners.org
www.camastergardeners.ucdavis.edu

California Native Plant Society
www.cnps.org

The Riverside County "Only Rain Down the Storm Drain" Pollution Prevention Program gratefully acknowledges Orange County's Storm Water Program for their contribution to this brochure.

...Only Rain Down ...the Storm Drain

What you should know for... Landscape and Gardening

Best Management tips for:

- Professionals
- Novices
- Landscapers
- Gardeners
- Cultivators

Tips for Landscape & Gardening

This brochure will help you to get the most of your lawn and gardening efforts and keep our waterways clean. Clean waterways provide recreation, establish thriving fish habitats, secure safe sanctuaries for wildlife, and add beauty to our communities. NEVER allow gardening products or waste water to enter the street, gutter or storm drain.

General Landscaping Tips

- Protect stockpiles and materials from wind and rain by storing them under tarps or secured plastic sheeting.
- Prevent erosion of slopes by planting fast-growing, dense ground covering plants. These will shield and bind the soil.

- Plant native vegetation to reduce the amount of water, fertilizers and pesticides applied to the landscape.
- Never apply pesticides or fertilizers when rain is predicted within the next 48 hours.

Garden & Lawn Maintenance

- Do not overwater. Use irrigation practices such as drip irrigation, soaker hoses or micro-spray systems. Periodically inspect and fix leaks and misdirected sprinklers.
- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of green waste by composting, hauling it to a permitted landfill, or recycling it through your city's program.

- Consider recycling your green waste and adding "nature's own fertilizer" to your lawn or garden.
- Read labels and use only as directed. Do not over-apply pesticides or fertilizers. Apply to spots as needed, rather than blanketing an entire area.
- Store pesticides, fertilizers and other chemicals in a dry covered area to prevent exposure that may result in the deterioration of containers and packaging.
- Rinse empty pesticide containers and re-use rinse water as you would use the product. Do not dump rinse water down storm drains or sewers. Dispose of empty containers in the trash.
- When available, use non-toxic alternatives to traditional pesticides, and use pesticides specifically designed to control the pest you are targeting.
- Try natural long-term common sense solutions first. Integrated Pest Management (IPM) can provide landscaping guidance and solutions, such as:
  - **Physical Controls** - Try hand picking, barriers, traps or caulking holes to control weeds and pests.
  - **Biological Controls** - Use predatory insects to control harmful pests.
  - **Chemical Controls** - Check out www.ipm.ucdavis.edu before using chemicals. Remember, all chemicals should be used cautiously and in moderation.
- If fertilizer is spilled, sweep up the spill before irrigating. If the spill is liquid, apply an absorbent material such as cat litter, and then sweep it up and dispose of it in the trash.
- Take unwanted pesticides to a Household Waste Collection Center to be recycled.
- *Dumping toxics into the street, gutter or storm drain is illegal!*

www.bewaterwise.com Great water conservation tips and drought tolerant garden designs.

www.ourwaterourworld.com Learn how to safely manage home and garden pests.

Additional information can also be found on the back of this brochure.

Helpful telephone numbers and links:

Riverside County Stormwater Protection Partners

Flood Control District	(951) 955-1200
County of Riverside	(951) 955-1000
City of Banning	(951) 922-3105
City of Beaumont	(951) 769-8520
City of Calimesa	(909) 795-9801
City of Canyon Lake	(951) 244-2955
Cathedral City	(760) 770-0327
City of Coachella	(760) 398-4978
City of Corona	(951) 736-2447
City of Desert Hot Springs	(760) 329-6411
City of Eastvale	(951) 361-0900
City of Hemet	(951) 765-2300
City of Indian Wells	(760) 346-2489
City of Indio	(760) 391-4000
City of Lake Elsinore	(951) 674-3124
City of La Quinta	(760) 777-7000
City of Menifee	(951) 672-6777
City of Moreno Valley	(951) 413-3000
City of Murrieta	(951) 304-2489
City of Norco	(951) 270-5607
City of Palm Desert	(760) 346-0611
City of Palm Springs	(760) 323-8299
City of Perris	(951) 943-6100
City of Rancho Mirage	(760) 324-4511
City of Riverside	(951) 361-0900
City of San Jacinto	(951) 654-7337
City of Temecula	(951) 694-6444
City of Wildomar	(951) 677-7751

REPORT ILLEGAL STORM DRAIN DISPOSAL
1-800-506-2555 or e-mail us at
fcnpdes@rcflood.org

- Riverside County Flood Control and Water Conservation District
  www.rcflood.org

Online resources include:

- California Storm Water Quality Association
  www.casqa.org
- State Water Resources Control Board
  www.waterboards.ca.gov
- Power Washers of North America
  www.thepwna.org

Stormwater Pollution

What you should know for...

Outdoor Cleaning Activities and Professional Mobile Service Providers

Storm drain pollution prevention information for:

- Car Washing / Mobile Detailers
- Window and Carpet Cleaners
- Power Washers
- Waterproofers / Street Sweepers
- Equipment cleaners or degreasers and all mobile service providers

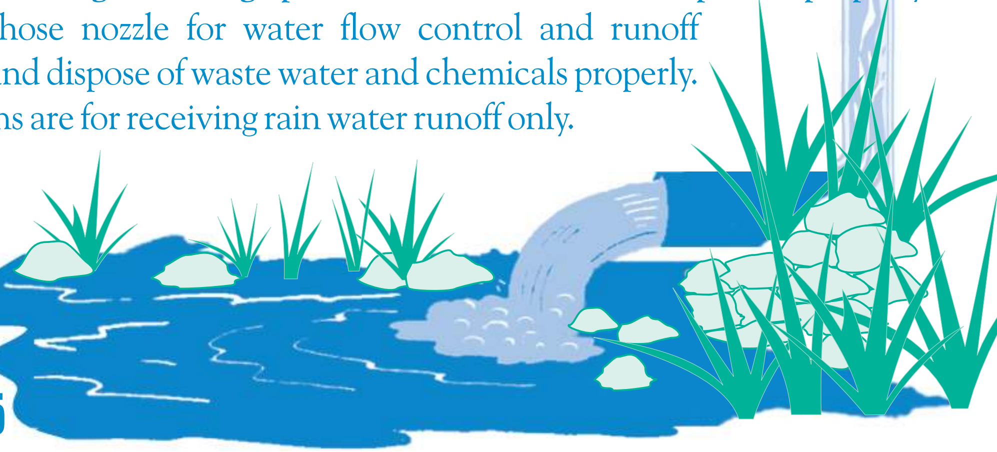
Do you know where street flows actually go?

Storm drains are NOT connected to sanitary sewer systems and treatment plants!

The primary purpose of storm drains is to carry *rain* water away from developed areas to prevent flooding. Pollutants discharged to storm drains are transported directly into rivers, lakes and streams. Soaps, degreasers, automotive fluids, litter and a host of materials are washed off buildings, sidewalks, plazas and parking areas. Vehicles and equipment must be properly managed to prevent the pollution of local waterways.

Unintentional spills by mobile service operators can flow into storm drains and pollute our waterways. **Avoid mishaps.** *Always* have a **Spill Response Kit** on hand to clean up unintentional spills. Only emergency **Mechanical** repairs should be done in City streets, using drip pans for spills. **Plumbing** should be done on private property. Always store chemicals in a leak-proof container and keep covered when not in use. **Window/Power Washing** waste water shouldn't be released into the streets, but should be disposed of in a sanitary sewer, landscaped area or in the soil. Soiled **Carpet Cleaning** wash water should be filtered before being discharged into the sanitary sewer. Dispose of all filter debris properly. **Car Washing/Detailing** operators should wash cars on private property and use a regulated hose nozzle for water flow control and runoff prevention. Capture and dispose of waste water and chemicals properly. Remember, storm drains are for receiving rain water runoff only.

REPORT ILLEGAL STORM DRAIN DISPOSAL
1-800-506-2555



Help Protect Our Waterways!

Use these guidelines for Outdoor Cleaning Activities and Wash Water Disposal

Did you know that disposing of pollutants into the street, gutter, storm drain or body of water is *PROHIBITED* by law and can result in stiff penalties?

Best Management Practices

Waste wash water from Mechanics, Plumbers, Window/Power Washers, Carpet Cleaners, Car Washing and Mobile Detailing activities may contain significant quantities of motor oil, grease, chemicals, dirt, detergents, brake pad dust, litter and other materials.

Best Management Practices, or BMPs as they are known, are guides to prevent pollutants from entering the storm drains. ***Each of us*** can do our part to keep stormwater clean by using the suggested BMPs below:

Simple solutions for both light and heavy duty jobs:

Do...consider dry cleaning methods first such as a mop, broom, rag or wire brush. Always keep a spill response kit on site.

Do...prepare the work area before power cleaning by using sand bags, rubber mats, vacuum booms, containment pads or temporary berms to keep wash water away from the gutters and storm drains.

Do...use vacuums or other machines to remove and collect loose debris or litter before applying water.

Do...obtain the property owner's permission to dispose of ***small amounts*** of power washing waste water on to landscaped, gravel or unpaved surfaces.

Do...check your local sanitary sewer agency's policies on wash water disposal regulations before disposing of wash water into the sewer. (See list on reverse side)

Do...be aware that if discharging to landscape areas, soapy wash water may damage landscaping. Residual wash water may remain on paved surfaces to evaporate. Sweep up solid residuals and dispose of properly. Vacuum booms are another option for capturing and collecting wash water.

Do...check to see if local ordinances prevent certain activities.

Do not let...wash or waste water from sidewalk, plaza or building cleaning go into a street or storm drain.

Report illegal storm drain disposal
Call Toll Free
1-800-506-2555

Using Cleaning Agents

Try using biodegradable/phosphate-free products. They are easier on the environment, but don't confuse them with being toxic free. Soapy water entering the storm drain system can impact the delicate aquatic environment.

When cleaning surfaces with a ***high-pressure washer*** or ***steam cleaner***, additional precautions should be taken to prevent the discharge of pollutants into the storm drain system. These two methods of surface cleaning can loosen additional material that can contaminate local waterways.

Think Water Conservation

Minimize water use by using high pressure, low volume nozzles. Be sure to check all hoses for leaks. Water is a precious resource, don't let it flow freely and be sure to shut it off in between uses.

Screening Wash Water

Conduct thorough dry cleanup before washing exterior surfaces, such as buildings and decks ***with loose paint***, sidewalks or plaza areas. Keep debris from entering the storm drain after cleaning by first passing the wash water through a "20 mesh" or finer screen to catch the solid materials, then dispose of the mesh in a refuse container. Do not let the remaining wash water enter a street, gutter or storm drain.

Drain Inlet Protection & Collection of Wash Water

- Prior to any washing, block all storm drains with an impervious barrier such as sandbags or berms, or seal the storm drain with plugs or other appropriate materials.
- Create a containment area with berms and traps or take advantage of a low spot to keep wash water contained.
- Wash vehicles and equipment on grassy or gravel areas so that the wash water can seep into the ground.
- Pump or vacuum up all wash water in the contained area.

Concrete/Coring/Saw Cutting and Drilling Projects

Protect any down-gradient inlets by using dry activity techniques whenever possible. If water is used, minimize the amount of water used during the coring/drilling or saw cutting process. Place a barrier of sandbags and/or absorbent berms to protect the storm drain inlet or watercourse. Use a shovel or wet vacuum to remove the residue from the pavement. Do not wash residue or particulate matter into a storm drain inlet or watercourse.

StormTek™

Trash capture made easy

Your community deserves waterways free from trash and other pollutants. As a California State Water Board certified trash capture device, thousands of StormTek devices are already in the field, helping to keep waterways clear.

HIGHLIGHTS:

- ✓ Quick, seamless installation
- ✓ Easy cleaning and maintenance
- ✓ Fits a variety of catch basin sizes & shapes
- ✓ Allows use of up to 90% of the catch basin vault
- ✓ Industry-leading 5-year warranty

Trusted by numerous cities, counties and major corporations

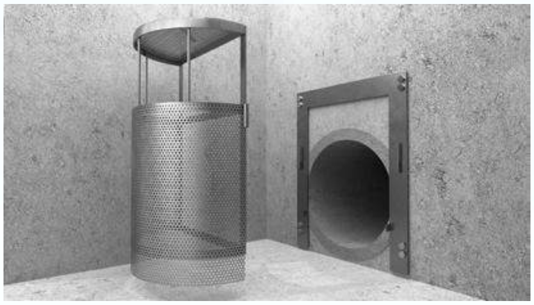
Caltrans CALIFORNIA DEPARTMENT OF TRANSPORTATION · AC TRANSIT · amazon · STARBUCKS COFFEE · Google

The City of SAN DIEGO · City of SACRAMENTO · CITY OF VENTURA · CITY OF SAN JOSE CAPITAL OF SILICON VALLEY

StormTek™

Trash capture made easy

HOW STORMTEK MAKES TRASH CAPTURE EASY



✔ **FITS IN EXISTING INFRASTRUCTURE**

StormTek attaches to the existing catch basin wall in front of the outflow pipe.

✔ **BUILT TO LAST**

Made from heavy gauge stainless steel, StormTek units are built to last for decades.

✔ **VERSATILE**

Fabricated to meet a wide variety of catch basin outflow pipe sizes and shapes.

✔ **DESIGNED FOR COMPLIANCE**

Meets even the rigorous California State Water Board requirements.

✔ **EASY TO INSTALL AND MAINTAIN**

Simple to install, remove, clean and replace.

HOW TO GET STARTED

1 **SCHEDULE A CONSULTATION**

No-cost consultation with one of our trash capture experts

2 **RECEIVE A QUOTE**

Review our no-obligation proposal for customized StormTek devices.

3 **CAPTURE TRASH!**

Follow our detailed instructions, to install your StormTek devices.

SWIMS

Storm Water Inspection & Maintenance Services

P.O. Box 1627
Discovery Bay, CA 94505
(866) 967-9467
www.StormTekClean.com