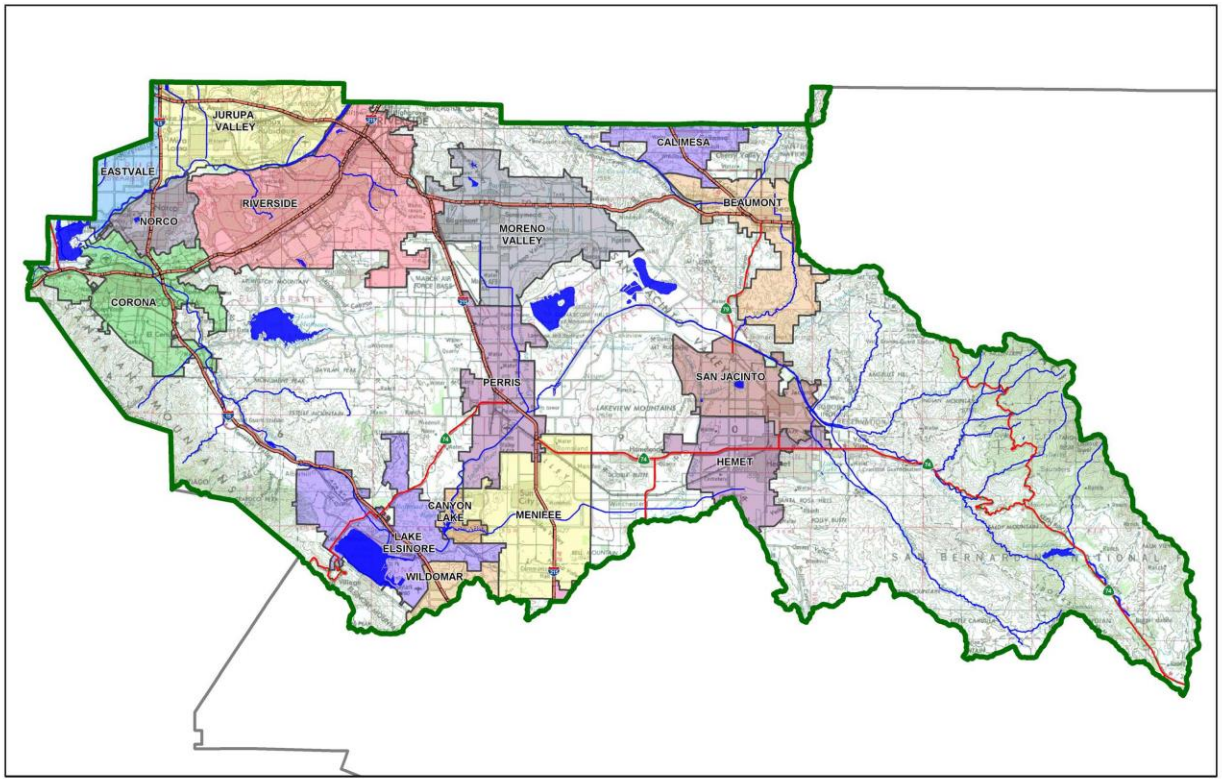
Project Specific Water Quality Management Plan

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

Project Title: Temescal Industrial

Development No: TBI

Design Review/Case No: PPT230049



☒ **Preliminary**
☐ **Final**

Original Date Prepared: 12/4/2023

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

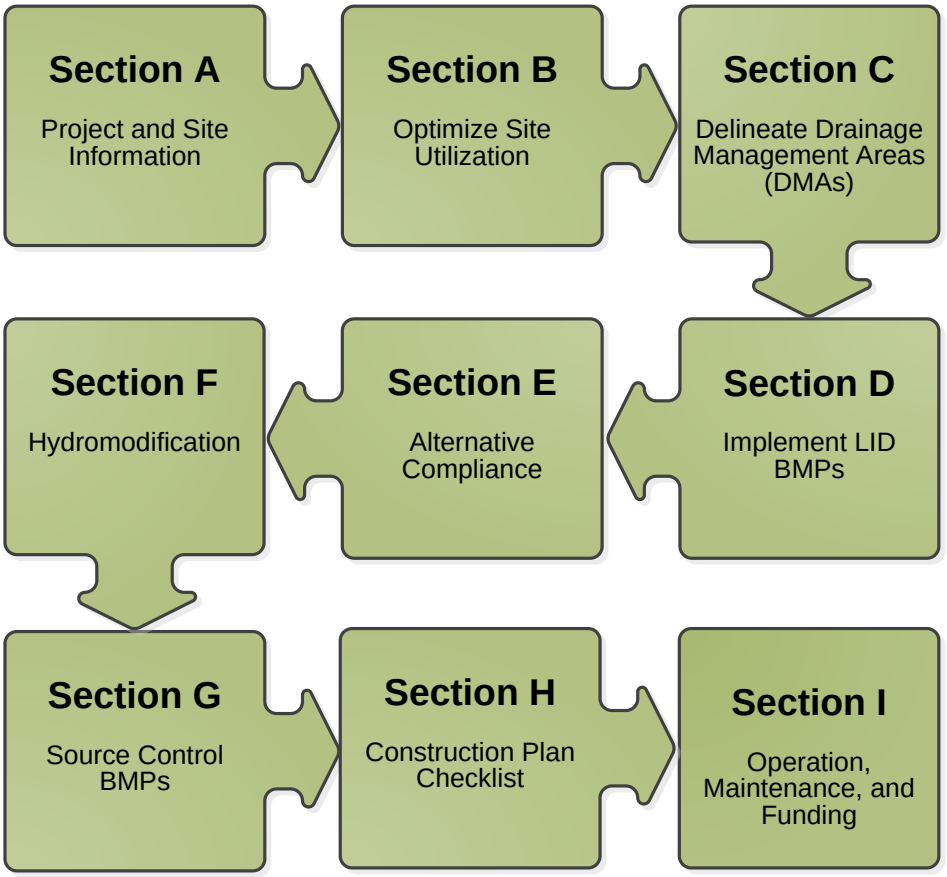
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A Brief Introduction

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



OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for MCP Industries, Inc. by Kimley-Horn and Associates for the Temescal Commercial project.

This WQMP is intended to comply with the requirements of Riverside County for R8-2010-0033 which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under City of Moreno Valley Water Quality Ordinance (Municipal Code Section 8.10).

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

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

PREPARER'S CERTIFICATION

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

Preparer's Signature	07/22/2024 Date
Nikki Kerry, PE Preparer's Printed Name	Civil Engineer Preparer's Title/Position

Preparer's Licensure: RCE No. 58449

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Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	Light Industrial/Office, New Public Roadways
Planning Area:	N/A
Community Name:	N/A
Development Name:	Temescal Commercial
PROJECT LOCATION	
Latitude & Longitude (DMS): 33.773589, -117.488976	
Project Watershed and Sub-Watershed: Santa Ana Watershed	
APN(s): 283-180-001, 283-180-002, 283-180-020, 283-180-021, 283-260-020	
Map Book and Page No.: 283 Pg 18	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Industrial, New Public & Private Roadways
Proposed or Potential SIC Code(s)	4225
Area of Impervious Project Footprint (SF)	529,380 S.F.
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	137,910 S.F.
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)	391,470 S.F.
Is the project located within any MSHCP Criteria Cell?	☐ Y ☒ N
If so, identify the Cell number:	N/A
Are there any natural hydrologic features on the project site?	☒ Y ☐ N
Is a Geotechnical Report attached?	☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	B
What is the Water Quality Design Storm Depth for the project?	0.85 in

A.1 Maps and Site Plans

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

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

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

A.2 Identify Receiving Waters

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

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Canyon Lake (Railroad Canyon Reservoir)	N/A	AGR, GWR, MUN, REC1, REC2, WARM, WILD	~16.5 Miles
Elsinore, Lake	**Bacterial Indicators** – Pathogens **Nutrients** – Nutrients, Organic Enrichment / Low Dissolved Oxygen **Toxicity** – Sediment Toxicity, Unknown Toxicity,	REC1, REC2, WARM, WILD	~21.9 Miles
Bedford Canyon Creek		GWR, REC1, REC2, WARM, WILD	

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

Table A.2 Other Applicable Permits

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

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

Section B: Optimize Site Utilization (LID Principles)

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

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

Site Optimization

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

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

The existing drainage patterns were identified and preserved as part of the proposed development. In the existing condition the site generally drains from the southwest corner of the site to the northeast corner of the site. Surface runoff flows across the site and is discharged offsite toward an adjacent valley flow in the adjacent property. The east facing portion of the site drains toward Temescal Canyon Road to be collected in an existing storm drain system.

The proposed development will maintain the existing drainage patterns, in that the site will drain from the southwest corner of the site to the northeast corner of the site. Low flows within proposed Ben Garrett Drive will discharge into a perforated Corrugated Metal Pipe (CMP) Detention system #3 via DVert structures installed in the proposed public catch basins while high flows will be conveyed into a proposed storm drain line, which connects to an existing storm drain in Temescal Canyon Road. Proposed onsite flows will be captured via a proposed onsite storm drain and will be treated for first-flush via hydrodynamic separator prior to entering a Perforated CMP Pipe system for water quality volume capture for infiltration and discharge offsite to the northeast. Katherine Way is a proposed private drive aisle and flow from this area will be captured and treated within the onsite CMP detention system on the west side of the site.

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

No, existing natural vegetation will not be protected. All vegetation existing within the project limits will be removed. However, the entire site is being mitigated for treatment of runoff.

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

No, the proposed development will not preserve natural infiltration capacity due to the lack of available surface area. A Perforated CMP Pipe system will be installed for stormwater infiltration.

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

The new impervious areas within the project area include a new building and new asphalt surface parking. New impervious area was minimized to provide the number of parking stalls required by the project, maintain fire department access onto the site and optimize site circulation. In comparison to the existing condition the proposed development will provide additional landscaping.

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

The runoff for storms up to the 85th percentile storm will be directed toward two (2) on-site Perforated CMP systems and (1) off-site Perforated CMP system where runoff will be treated. Larger storms will discharge offsite to the north toward existing vegetation or to the west and ultimately discharges into the public storm drain system.

This Preliminary Water Quality Management Plan is for the first project of three being implemented for the Temescal projects. This first project, which this report is for, is implementing a commercial building, private drive and improvements along Benn Garrett Drive. The second speculative project being planned in this area is the retail section in the northeast lots of the allotted area. The third speculative project will be the residential section located to the west of the proposed private street of Katherine Way. All three of these projects will have their own separate WQMP reports.

Section C: Delineate Drainage Management Areas (DMAs)

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

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	DMA Type
DMA - 1	Concrete/Asphalt /Ornamental Landscape	158,994	Type D
DMA – 2	Concrete/Asphalt/Building/Ornamental Landscape	348,480	Type D
DMA – 3	Soil/Gravel	41,382	Type A
DMA – 4	Concrete/Asphalt/Soil	124,146	Type D
DMA-5	Soil/Gravel	150,718	Type B
DMA-6	Concrete/Asphalt/Soil	23,522	Type D

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

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

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
DMA-3	124,146	Gravel	NA

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]
5	Soil	150,718	0.85	N/A	0	0.85

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

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

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

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

DMA Name or ID	BMP Name or ID
DMA-1	CMP Detention System #1
DMA-2	CMP Detention System #2

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

Section D: Implement LID BMPs

D.1 Infiltration Applicability

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

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

Geotechnical Report

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

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

Infiltration Feasibility

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

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:	N/A	
…have any DMAs located within 100 feet of a water supply well?		X
If Yes, list affected DMAs:	N/A	
…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:	N/A	
…have measured in-situ infiltration rates of less than 1.6 inches / hour?		X
If Yes, list affected DMAs:	N/A	
…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:	N/A	
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		X
Describe here:	N/A	

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

D.2 Harvest and Use Assessment

Please check what applies*:*

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

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

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

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

Irrigation Use Feasibility

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

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

Total Area of Irrigated Landscape: N/A

Type of Landscaping (Conservation Design or Active Turf): 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 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: N/A

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

Enter your EIATIA factor: N/A

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

Minimum required irrigated area: N/A

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)
N/A	N/A

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: N/A

Project Type: 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 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: N/A

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).

Enter your TUTIA factor: N/A

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

Minimum number of toilet users: N/A

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)**
N/A	N/A

Other Non-Potable Use Feasibility

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

N/A

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

Average Daily Demand: N/A

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

Total Area of Impervious Surfaces: N/A

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

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

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

Minimum required use: N/A

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

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

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

D.3 Bioretention and Biotreatment Assessment

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

Select one of the following:

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

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

D.4 Feasibility Assessment Summaries

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

Table D.2 LID Prioritization Summary Matrix

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

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

DMA 3 is proposed as 100% pervious and therefore self-treating. It will contain an 18-foot pervious gravel fire road and the remaining area will keep its original pervious condition.

DMA 5 is proposed as 100% pervious and proposed 1.5-foot berms will allow this Drainage Management Area to act as a self-retaining area.

DMAs 4 and 6 consist of proposed roadway and roadway improvements. These drainage areas will be untreated. The proposed onsite infiltration BMPs will be oversized to accommodate the DCV from Drainage Management areas 4 and 6 that are not being treated.

D.5 LID BMP Sizing

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

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Area x Runoff Factor	*CMP Detention System 1*		
	[A]		[B]	[C]	[A] x [C]			
DMA 1	119,104	Concrete or Asphalt	1	0.89	106,240.8	*Design Storm Depth (in)*	*Minimum Design Capture Volume or Design Flow Rate (cubic feet or cfs)*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*
	39,890	Ornamental Landscaping	0.1	0.11	4,406.2			
Total	158,558				110,258.1	0.85	7,837.5 cf	***31415* cf***

*Proposed Volume provided includes detention storage volume

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Area x Runoff Factor	*CMP Detention System 2*		
	[A]		[B]	[C]	[A] x [C]			
DMA 2	308,403	Concrete or Asphalt	1	0.89	275,095.5	*Design Storm Depth (in)*	*Minimum Design Capture Volume or Design Flow Rate (cubic feet or cfs)*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*
	40,077	Ornamental Landscaping	0.1	0.11	54,426.8			
Total	348,480				279,522.3	0.85	19,800 cf	***96,208* cf***

* Proposed Volume provided includes detention storage volume

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Area x Runoff Factor	*CMP Detention System #3*		
	[A]		[B]	[C]	[A] x [C]			
DMA 4	112,124	Concrete or Asphalt	1	0.89	100,014.6	*Design Storm Depth (in)*	*Minimum Design Capture Volume or Design Flow Rate (cubic feet or cfs)*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*
	12,458	Ornamental landscaping	0.1	.11	1,376.1			
Total	124,582				101,390.7	0.85	7,181.8	**

** This DMA is going untreated and BMPs for DMA 1 and 2 oversized to accommodate DMA 4 DCV

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Area x Runoff Factor	*CMP Detention System #3*		
	[A]		[B]	[C]	[A] x [C]			
DMA 6	21,170	Concrete or Asphalt	1	0.89	18,883.6	*Design Storm Depth (in)*	*Minimum Design Capture Volume or Design Flow Rate (cubic feet or cfs)*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*
	2,352	Ornamental landscaping	0.1	.11	259.8			
Total	23,522				19,143.4	0.85	1,356	**

** This DMA is going untreated and BMPs for DMA 1 and 2 oversized to accommodate DMA 6 DCV

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

See Table E.3

Section E: Alternative Compliance (LID Waiver Program)

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

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

- *Or* -

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

E.1 Identify Pollutants of Concern

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

Table E.1 Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features (check those that apply)	General Pollutant Categories							
	Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease
☐ Detached Residential Development	P	N	P	P	N	P	P	P
☐ Attached Residential Development	P	N	P	P	N	P	P	P(2)

☒	Commercial/Industrial Development	P[3]	P	P[1]	P[1]	P[5]	P[1]	P	P
☐	Automotive Repair Shops	N	P	N	N	P[4, 5]	N	P	P
☐	Restaurants (>5,000 ft^2)	P	N	N	N	N	N	P	P
☐	Hillside Development (>5,000 ft^2)	P	N	P	P	N	P	P	P
☒	Parking Lots (>5,000 ft^2)	P[6]	P	P[1]	P[1]	P[4]	P[1]	P	P
☐	Retail Gasoline Outlets	N	P	N	N	P	N	P	P
Project Priority Pollutant(s) of Concern		☒	☒	☐	☐	☒	☐	☒	☒

P = Potential

N = Not Potential

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

[2] A potential Pollutant if the project includes uncovered parking areas; otherwise not expected

[3] A potential Pollutant is land use involving animal waste

[4] Specifically petroleum hydrocarbons

[5] Specifically solvents

[6] Bacterial indicators are routinely detected in pavement runoff

E.2 Stormwater Credits

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

Table E.2 Water Quality Credits

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

[1]Cannot Exceed 50%

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

E.3 Sizing Criteria

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

Table E.3 Treatment Control BMP Sizing

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

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

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

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

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

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

E.4 Treatment Control BMP Selection

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

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

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

Table E.4 Treatment Control BMP Selection

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

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

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

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

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

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

If Yes, HCOC criteria do not apply. – The project disturbs less than one acre and increases the pervious area.

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

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

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

N/A

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

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration	INSERT VALUE	INSERT VALUE	INSERT VALUE
Flow Rate (cfs)	INSERT VALUE	INSERT VALUE	INSERT VALUE

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

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

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

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

Stormwater runoff from the project discharges to Canyon Lake and Lake Elsinore, both of which are engineered and regularly maintained to ensure design flor capacity. Additionally, no sensitive habitat areas are identified on the Sensitivity Maps.

F.2 HCOC Mitigation

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

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

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

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

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

HCOC condition C is implemented for the proposed project. Proposed flows are mitigated down to within plus or minus 10% of existing flows. 2 year 24 hour flow mitigation calculations are provided in Appendix 7.

Section G: Source Control BMPs

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

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

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

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

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

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
On-site storm drain inlets	Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify. **(CASQQ BMP SD-13, "Storm Drain Signage")**	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-74 "Drainage System Maintenance" provided in Appendix 8 of this report.
Landscape/ Outdoor pesticide use	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 ensure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions. **(CASQA BMP SD-10, "Site Design and Landscape Planning" and SD-12, "Efficient Irrigation")**	Maintain landscaping using minimum or no pesticides. For Bioswales: Remove any dead or diseased vegetation See applicable operational BMPs in "What you should know for…..Landscape and Gardening" at http://rcflood.org/stormwater/Downloads/LandscapeGardenBrochure.pdf. Provide IPM information to new owners, lessees and operators. Applicable operational BMPS in "What you should know for…. Landscape and Gardening": • Never apply pesticides or fertilizers when rain is predicted within the next 48 hours. • Do not overwater. Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Dispose of green waste by composting, hauling it to a permitted landfill, or recycling it through city's program.
Plazas, sidewalks, and parking lots.	None	Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect wash water containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Refuse Areas	Proposed outdoor trash enclosures will be covered.	Signs will be posted on/ near outdoor trash enclosures stating, “Do nor dump hazardous materials here”. Trash enclosures will be inspected regularly, repaired when necessary. Litter will be inspected and picked up daily. Spills will be cleaned up immediately. Spill control materials will be kept readily available on-site.

Section H: Construction Plan Checklist

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

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)
Detention Chamber #1	Chambermaxx	Preliminary WQMP Exhibit
Detention Chamber #2	Chambermaxx	Preliminary WQMP Exhibit

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

Section I: Operation, Maintenance and Funding

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

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

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

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

Maintenance Mechanism: MCP Industries, Inc. is required to maintain the landscaping, irrigation, pavement, and stormwater BMPs as part of the lease agreement.

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

☐ Y ☒ N

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

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

LEGEND

- PROPERTY LINE
- CENTER LINE
- LOT LINE
- EASEMENT LINE
- DRAINAGE AREA BOUNDARY (DA)
- LIMITS OF DETENTION SYSTEMS
- PROPOSED STORM DRAIN
- FLOW ARROW
- X / XX — DMA NAME / DMA AREA (AC)
- BUILDING (100% IMPERVIOUS)
- PAVEMENT/GRAVEL (100% IMPERVIOUS)
- LANDSCAPE / NATIVE SOIL (100% PERVIOUS)
- PROP INTERIM STABILIZED GRAVEL ACCESS ROAD

NOTE:

1. FOR EACH BMP, ALL ROCK OR SAND TO BE PLACED IN POST-CONSTRUCTION BMPS SHALL BE CLEAN-WASHED ROCK TO THE SATISFACTION OF THE GRADING INSPECTOR.
2. FOR ALL BIORETENTION/BIOFILTRATION BMPS, IMMEDIATELY BELOW THE SOIL MEDIA (BSM) INCLUDE A SECTION OF 3" SAND, THEN 3" PEAGRAVEL. ALL SUBDRAINS SHALL BE SCHEDULE 40 WITH A MINIMUM SLOPE OF 0.5%.

WATER QUALITY SUMMARY TABLE

DMA	SURFACE TYPE	AREA (SF)	AREA (AC)	BMP ID	BMP TYPE	REQUIRED QBMP (CFS)	PROPOSED Q (CFS)	REQUIRED VBMP (CF)	PROPOSED V (CF)
DMA-1	CONCRETE/ASPHALT	119104	3.65	CMP DETENTION SYSTEM #1	CMP	N/A	N/A	7837	31,415*
	BUILDING	0							
	ORNAMENTAL LANDSCAPE	39890							
DMA-2	CONCRETE/ASPHALT	127013	8.00	CMP DETENTION SYSTEM #2	CMP	N/A	N/A	19800	96,208*
	BUILDING (ROOFS)	181390							
	ORNAMENTAL LANDSCAPE	40077							
DMA-3	CONCRETE/ASPHALT	0	0.95	SELF TREATING	SELF TREATING	N/A	N/A	N/A	N/A
	BUILDING	0							
	SOIL	41382							
DMA-4	CONCRETE/ASPHALT	112124	2.86	**	N/A	N/A	N/A	7182	**
	BUILDING	0							
	SOIL	12458							
DMA-5	SOIL/GRAVEL	150718	3.4600	SELF RETAINING	SELF RETAINING	N/A	N/A	N/A	N/A
DMA-6	CONCRETE/ASPHALT	21170	0.5400	**	N/A	N/A	N/A	1356	**
	ORNAMENTAL LANDSCAPE	2352							

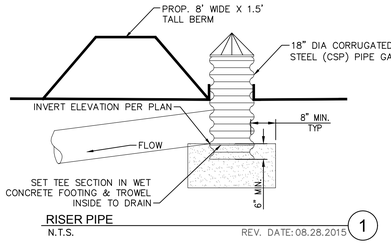
* PROVIDED VOLUME INCLUDES DETENTION STORAGE
** DMA-4 AND DMA-6 GO UNTREATED AND ONSITE CMP DETENTION SYSTEMS HAVE SUFFICIENT ADDITIONAL CAPACITY TO OFFSET THE UNMITIGATED DCV FROM DMA-4 AND DMA-6.

SITE PLAN NOTES

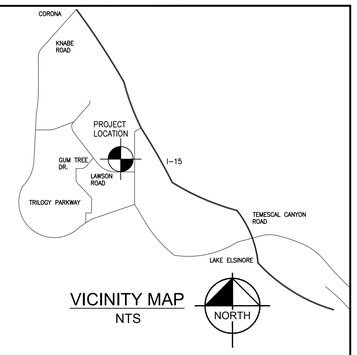
1. PROPOSED CATCH BASIN WITH PRE-TREATMENT FILTER.
2. (NOT USED)
3. (NOT USED)
4. PROPOSED CMP INFILTRATION/DETENTION SYSTEM SEE CONTECH DETAILS IN APPENDIX 6.
5. PROPOSED PRIVATE STORM DRAIN
6. PROPOSED 8' WIDE X 1.5' HIGH BERM FOR ROUGH GRADED PAD
7. PROPOSED RISER STRUCTURE PER DETAIL 1 ON THIS SHEET.
8. PROPOSED 18" STORM DRAIN OVERFLOW PIPE
9. PROPOSED STABILIZED GRAVEL ACCESS ROAD
10. DETENTION SYSTEM CONNECTOR PIPE
11. PROPOSED OUTFLOW CONTROL STRUCTURE

STRUCTURAL BMP NOTES

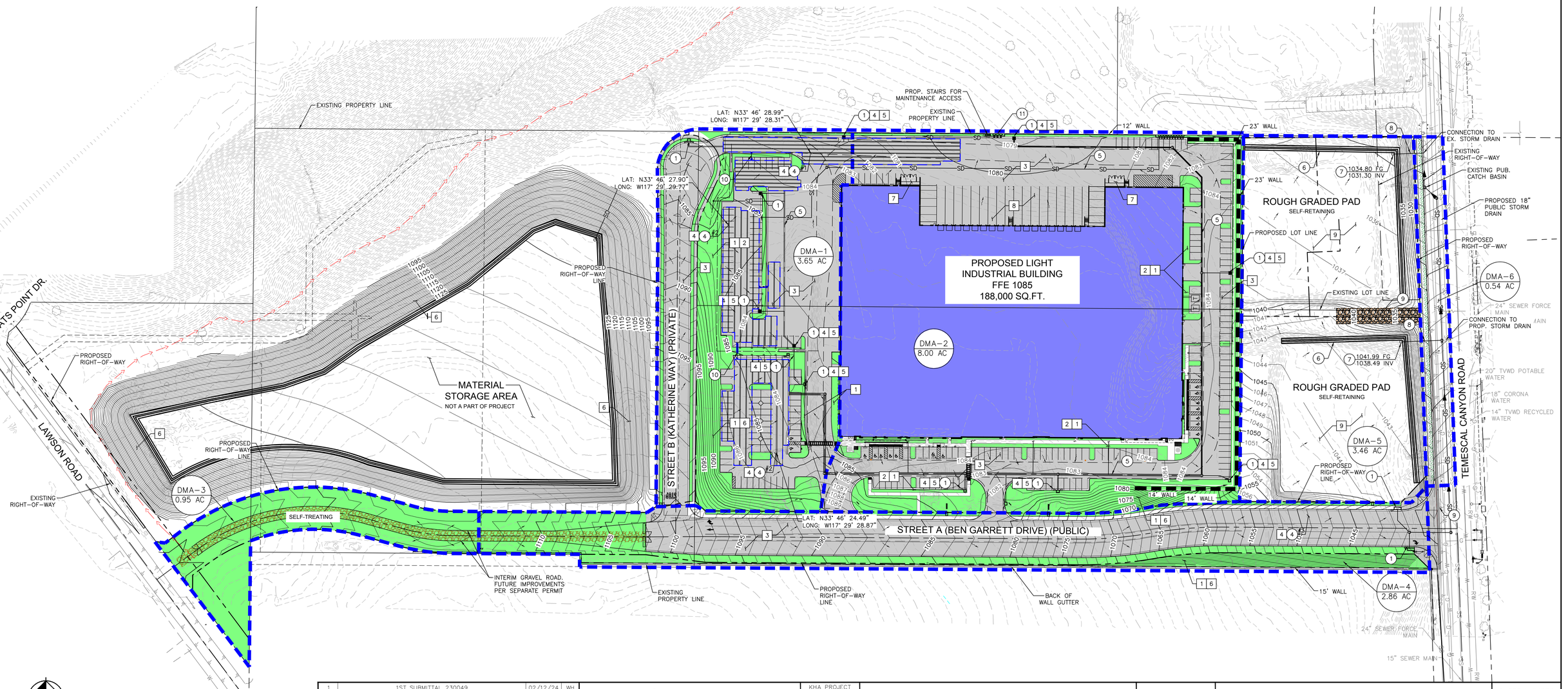
1. IRRIGATION SYSTEM AND LANDSCAPE MAINTENANCE
2. COMMON AREA LITTER CONTROL
3. STREET SWEEPING PRIVATE STREETS AND PARKING LOTS
4. DRAINAGE FACILITY INSPECTION AND MAINTENACE
5. MS4 STENCILING AND SIGNAGE
6. PROTECT SLOPES AND CHANNELS
7. TRASH STORAGE AREAS WITH SIGNAGE NEARBY STATING, "DO NOT DUMP HAZARDOUS MATERIALS HERE".
8. LOADING DOCKS
9. HYDROSEED ROUGH GRADED PAD



RISER PIPE
N.T.S.
REV. DATE: 08.28.2015
1



VICINITY MAP
NTS



NORTH
GRAPHIC SCALE IN FEET
0 30 60 120

Know what's below. Call before you dig.

No.	REVISIONS	DATE	BY
1	1ST SUBMITTAL 230049	02/12/24	WH
2	2ND SUBMITTAL 230049	07/24/24	BA
3	3RD SUBMITTAL 230049	08/23/24	BA

Kimley»Horn

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WWW.KIMLEY-HORN.COM

KHA PROJECT 099894001
DATE 8/26/2024
SCALE AS SHOWN
DESIGNED BY ML
DRAWN BY WH
CHECKED BY NK

TEMESCAL INDUSTRIAL
RIVERSIDE COUNTY CALIFORNIA

PRELIMINARY WQMP EXHIBIT

SHEET NUMBER

Plotted By:Liedermon, Cameron Sheet Set:Kha Layout:EXHIBIT August 26, 2024 12:21:28pm K:\ORA_LDEV\099894001 — Temescal Canyon\CADD\Entitlement\Entitlement Exhibits\Preliminary WQMP Exhibit — Entitlement 1\WQMP Exhibit.dwg
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Location Map

Temescale Canyon Project

Legend

Park

PROJECT SITE

Temescal Valley Elementary

Knabe Rd

Wildrose Ranch Community Park

Montecito Ranch Park

Arcilla

15

Tom's Farms

Temescal Canyon Rd

Temescal Valley

Trilogy Pkwy

Glen Ivy Golf Club

Google Earth

Image Landsat / Copernicus

N

3000 ft

R 07 W | R 06 W | R 05 W | R 04 W | R 03 W | R 02 W | R 01 W | R 01 E | R 02 E | R 03 E | R 04 E | R 05 E

T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S

0.85 MiraLoma
0.61 RiversideNorth
0.54 RiversideSouth
0.68 PigeonPass
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.50 LakeMathews
0.68 PerrisReservoir
0.87 VistaGrandeGS
0.70 SanJacintoNWS
1.18 Idyllwild
0.58 SunCity
0.68 Winchester
0.70 ElsinoreNWS
1.11 ElCarisoStation
0.90 HurkeyCreek
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley

Project Location
0.85 in

Santa Ana River Watershed
Santa Margarita Watershed

JURUPA VALLEY | EASTVALE | NORCO | CORONA | RIVERSIDE | MORENO VALLEY | CALIMESA | BEAUMONT | SAN JACINTO | PERRIS | CANYON LAKE | LAKE ELSINORE | WILDOMAR | MENIFEE | HEMET | MURRIETA | TEMECULA

06	05	04	03	02	01
07	08	09	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

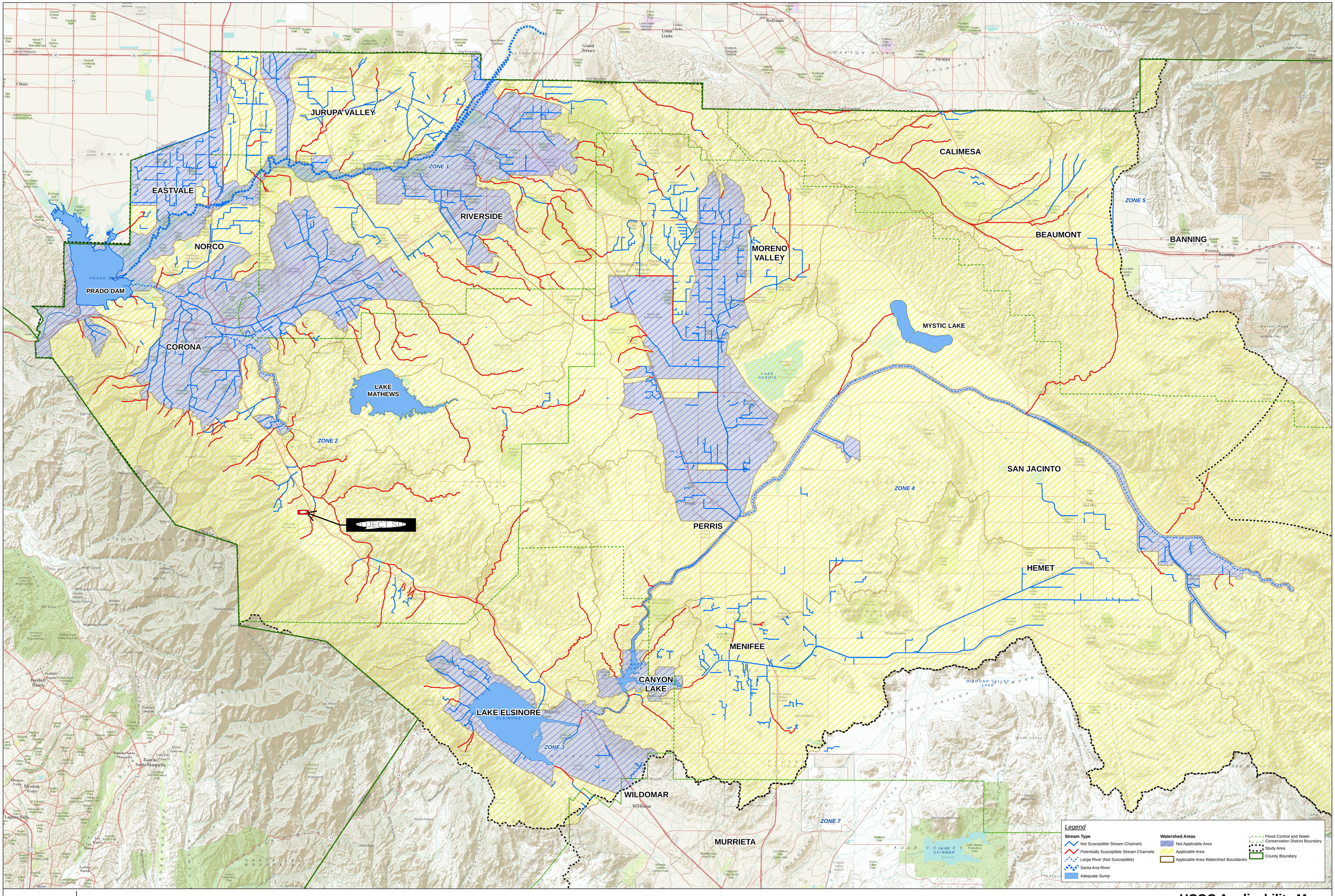
N

Rain Gage Locations

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Isohyetal Map for the 85th Percentile 24 hour Storm Event

July 2011

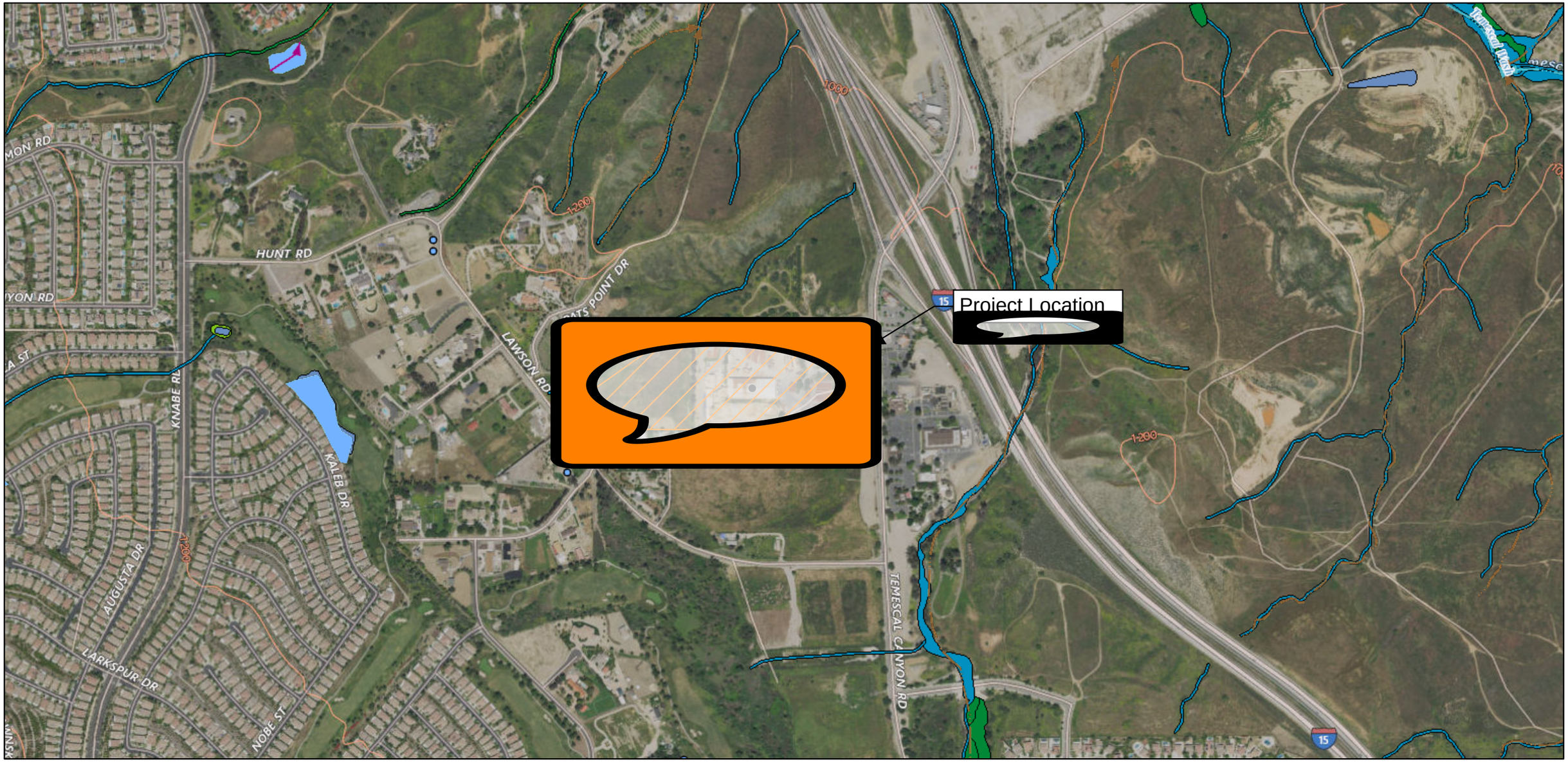


HCOC Applicability Map

Hydromodification Susceptibility Documentation Report and Mapping
Riverside County Flood Control and Water Conservation District

Map 2

Temescal Canyon



3/30/2022, 2:06:50 PM

1:9,028

0 485 970 1,940 ft

0 145 290 580 m

Waterbody - Large Scale
- Estuary
- Ice Mass
- Lake Pond
- Playa
- Reservoir
- Swamp Marsh

Area - Large Scale
- Area of Complex Channels
- Area to be Submerged
- BayInlet
- Bridge
- CanalDitch
- DamWeir
- Flume
- Foreshore
- Hazard Zone
- Inundation Area
- Lock Chamber
- Rapids
- SeaOcean
- Special Use Zone
- Spillway
- StreamRiver
- Submerged Stream
- Wash
- Water IntakeOutflow

Flowline - Large Scale
- Perennial
- Intermittent
- Ephemeral
- Artificial Path
- Canal Ditch
- Coastline
- Connector
- Pipeline
- Underground Conduit

Flow Direction
- Connector
- CanalDitch
- Underground Conduit
- StreamRiver
- StreamRiver - Perennial
- StreamRiver - Intermittent
- StreamRiver - Ephemeral
- Pipeline
- Artificial Path

Line - Large Scale
- Line
- Tunnel

Point Event
- Dam
- Gaging Station

Point
- Dam/Weir
- Other

Wetlands
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland

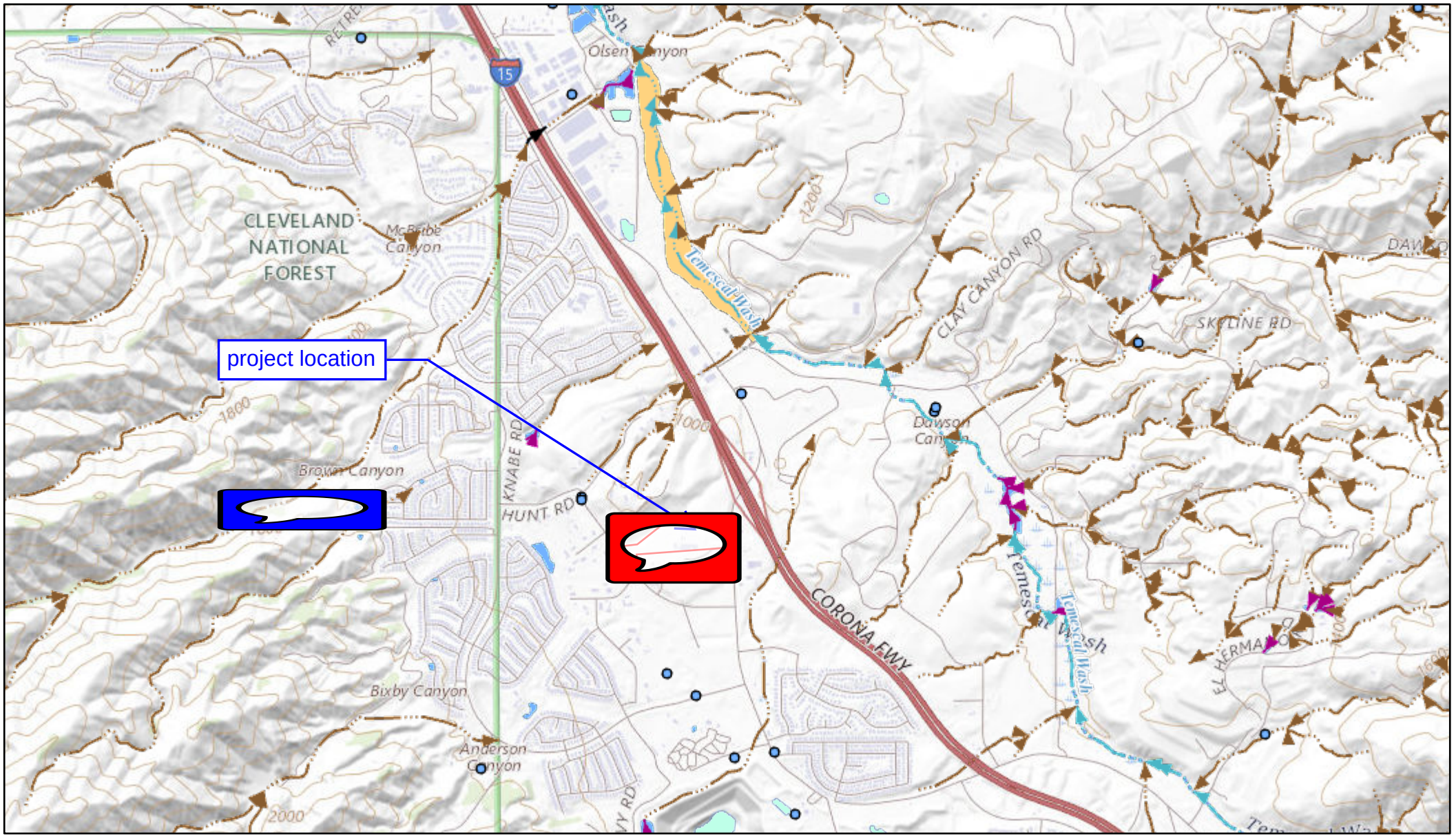
Divergence Structure
Other

U.S. Fish and Wildlife Service, National Standards and Support Team, wetlands_team@fws.gov, USGS The National Map: Orthoimagery and US Topo. Data refreshed January, 2022., USGS TNM – National Hydrography Dataset. Data Refreshed January, 2022.

USGS

2021 USGS

The National Map Advanced Viewer



3/30/2022, 1:35:46 PM

1:36,112

0 0.25 0.5 1 mi

0 0.4 0.8 1.6 km

Waterbody - Large Scale
- Estuary
- Ice Mass
- Lake Pond
- Playa
- Reservoir
- Swamp Marsh

Area - Large Scale
- Area of Complex Channels
- Area to be Submerged
- BayInlet

- Bridge
- CanalDitch
- DamWeir
- Flume
- Foreshore
- Hazard Zone
- Inundation Area
- Lock Chamber
- Rapids
- SeaOcean
- Special Use Zone
- Spillway

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census

USGS

2021 USGS

Appendix 2: Construction Plans

Grading and Drainage Plans

PROJECT DESCRIPTION:	LIGHT INDUSTRIAL/OFFICE
OWNER:	MCP INDUSTRIES, INC. 4350 VON KARMAN AVENUE, SUITE 200 NEWPORT BEACH, CA 92660 PHONE: 949-544-3539 EMAIL: MFREED99@COX.NET
APPLICANT:	MCP INDUSTRIES, INC. 4350 VON KARMAN AVENUE, SUITE 200 NEWPORT BEACH, CA 92660 PHONE: 949-544-3539 EMAIL: MFREED99@COX.NET
PREPARED FOR:	MCP INDUSTRIES, INC. 4350 VON KARMAN AVENUE, SUITE 200 NEWPORT BEACH, CA 92660 PHONE: 949-544-3539 EMAIL: MFREED99@COX.NET
PREPARER:	KIMLEY-HORN ASSOCIATES 1100 TOWN & COUNTRY ROAD, SUITE 700 ORANGE, CA 92868 PHONE: 714-939-1031 EMAIL: NIKKI.KERRY@KIMLEY-HORN.COM

PROJECT INFORMATION

ASSESSORS PARCEL NUMBER:	283-180-002, 283-180-020,283-180-021
GROSS PROJECT ACREAGE:	INDUSTRIAL: 10.80 ACRES COMMERCIAL: 3.49 ACRES
NET PROJECT ACREAGE:	29.22 ACRES
VACATION/DEDICATION ACREAGE:	0.32 ACRES (VACATION) AND 0.02 ACRES (DEDICATION)
PROJECT DIMENSIONS (APROX.):	810' x 570'
EXISTING STRUCTURE DEMO DIM.:	STRUCTURE 1: 121' X 302' STRUCTURE 2: 63' X 288'
FEMA FLOODPLAIN DESIGNATION:	ZONE X, MAP 06065C1390G

NOTE: PROJECT SITE PARCEL BOUNDARIES AFTER LOT LINE ADJUSTMENT ARE SHOWN.

EARTHWORK ESTIMATE:

CUT = 261,000 CY

FILL = 261,000 CY

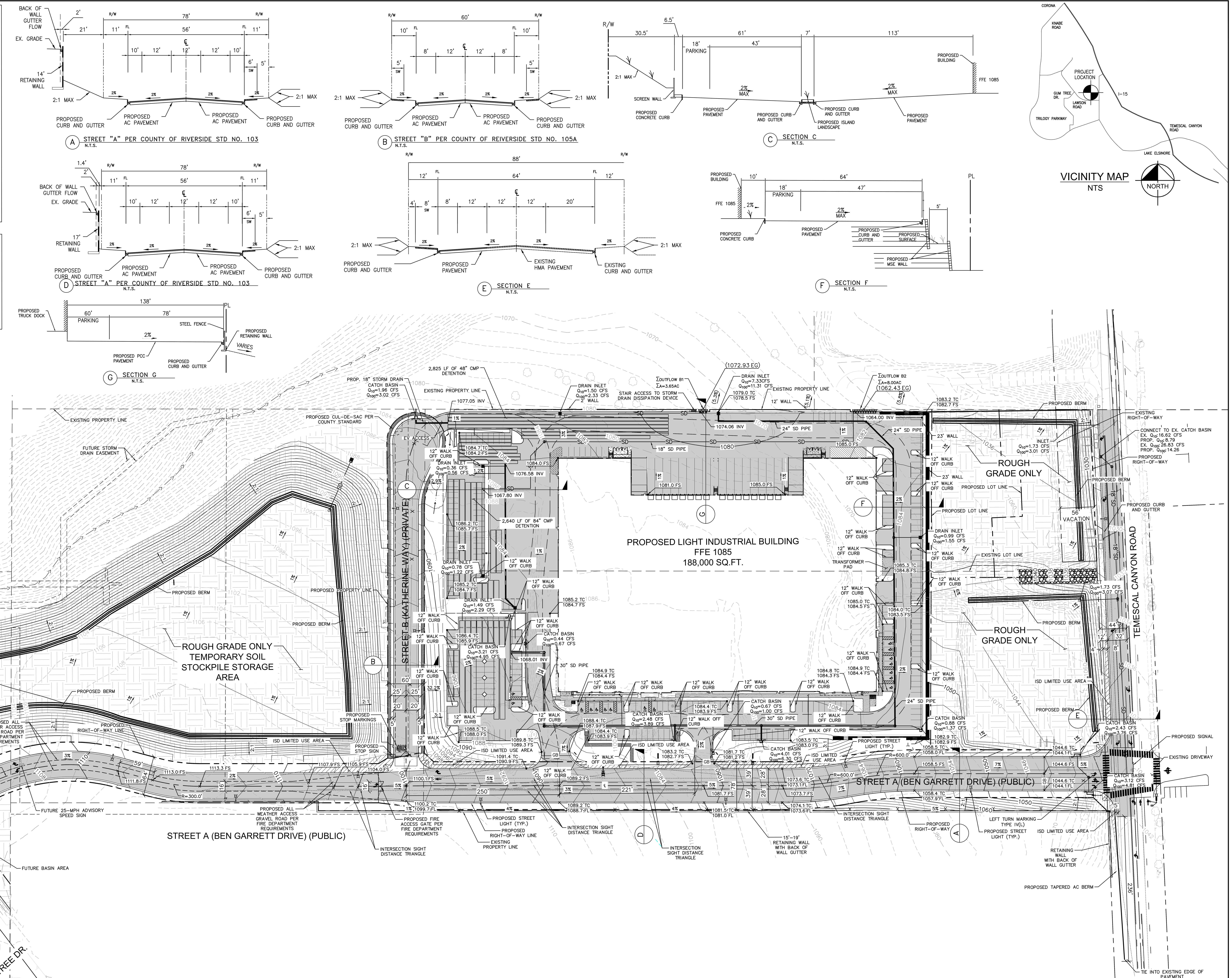
NET = 0 CY

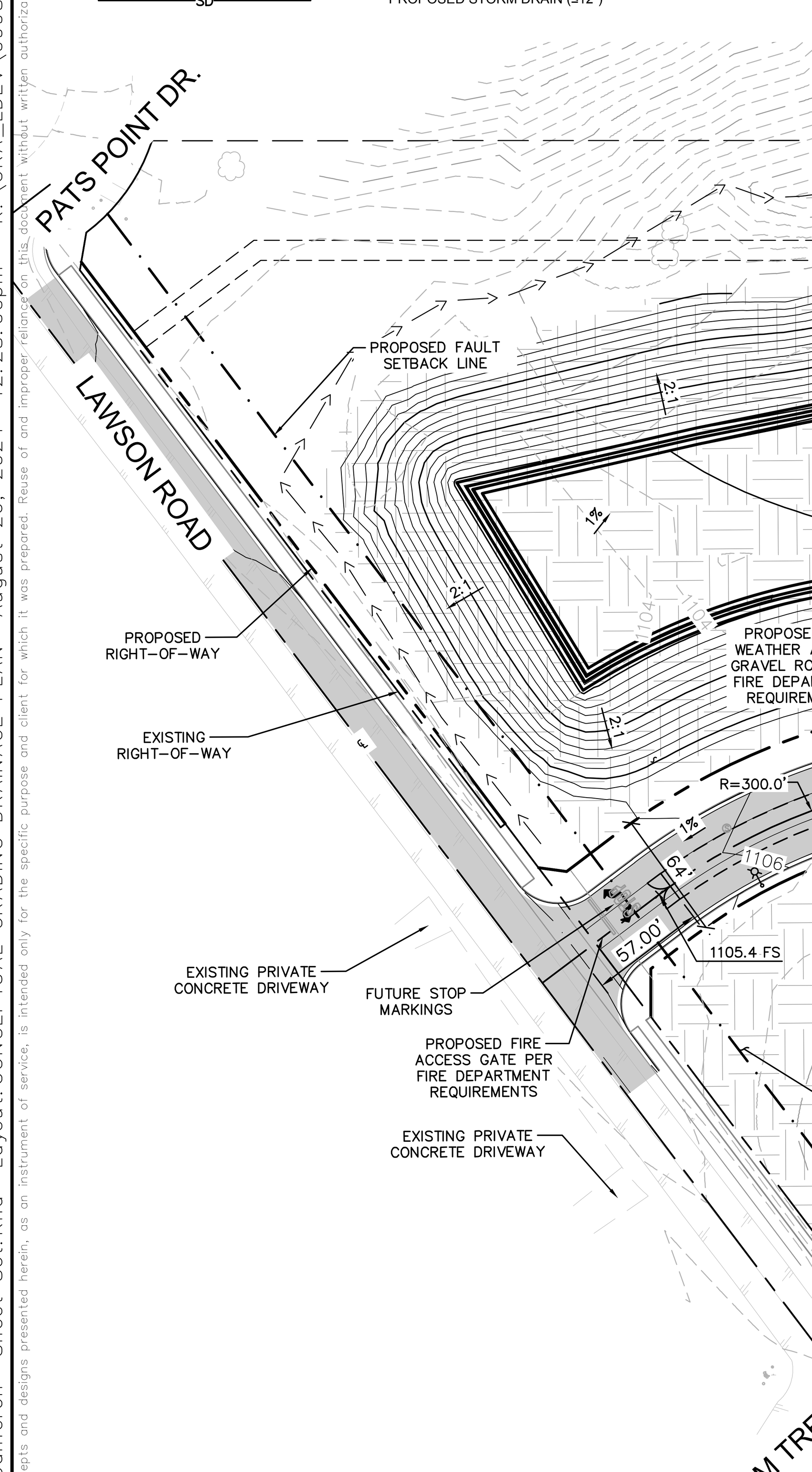
NOTE:
THE ABOVE QUANTITIES ARE APPROXIMATE IN PLACE VOLUMES CALCULATED FROM THE EXISTING GROUND TO THE PROPOSED FINISHED GRADE. EXISTING GROUND IS DEFINED BY THE CONTOURS AND SPOT GRADES ON THE BASE SURVEY. PROPOSED FINISHED GRADE IS DEFINED AS THE FINAL GRADE AS INDICATED ON THE GRADING PLAN(S).

THE EARTHWORK QUANTITIES ABOVE ARE FOR PERMIT PURPOSES ONLY. THEY HAVE NOT BEEN FACTORED TO ACCOUNT FOR CHANGES IN VOLUME DUE TO BULKING, CLEARING AND GRUBBING, SHRINKAGE, OVER- EXCAVATION AND RE-COMPACTION, AND CONSTRUCTION METHODS. NOR DO THEY ACCOUNT FOR THE THICKNESS OF PAVEMENT SECTIONS, FOOTINGS, SLABS, REUSE OF PULVERIZED MATERIALS THAT WILL UNDERLIE NEW PAVEMENTS, ETC. THE CONTRACTOR SHALL RELY ON THEIR OWN EARTHWORK ESTIMATES FOR BIDDING PURPOSES.

LEGEND

- PROPERTY LINE
- PROPOSED CENTER LINE
- PROPOSED RIGHT-OF-WAY LINE
- EXISTING LOT LINE
- PROPOSED EASEMENT LINE
- INTERSECTION SIGHT DISTANCE TRIANGLE
- (XX.XX TC) (XX.XX FS) — EXISTING CONDITION ELEVATION
- XX.XX TC / XX.XX FS — PROPOSED CONDITION ELEVATION
- PROPOSED PAVEMENT
- DISTURBED AREA
- PROPOSED 16-FEET WIDE EVA
- INTERSECTION SIGHT DISTANCE LIMITED USE AREA
- FLOWLINE
- PROPOSED STORM DRAIN (>12")
- PROPOSED STORM DRAIN (≤12")





NORTH

GRAPHIC SCALE IN FEET
0 30 60 120

Know what's below. Call before you dig.

No.	REVISIONS	DATE	BY
1	1ST SUBMITTAL 230049	02/12/24	WH
2	2ND SUBMITTAL 230049	07/24/24	BA
3	3RD SUBMITTAL 230049	08/23/24	BA

Kimley»Horn

© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1100 TOWN AND COUNTRY RD SUITE 700, ORANGE, CA 92868
PHONE: 714-939-1030 FAX: 714-938-9488
WWW.KIMLEY-HORN.COM

KHA PROJECT 099894001
DATE 8/26/2024
SCALE AS SHOWN
DESIGNED BY ML
DRAWN BY WH
CHECKED BY NK

TEMESCAL COMMERCIAL

RIVERSIDE COUNTY CALIFORNIA

CONCEPTUAL GRADING DRAINAGE PLAN

SHEET NUMBER

LEGEND

- PROPERTY LINE
- PROPOSED CENTER LINE
- PROPOSED RIGHT-OF-WAY LINE
- EXISTING LOT LINE
- PROPOSED EASEMENT
- PROPOSED SETBACK LINE
- PROPOSED WATER LINE
- EXISTING WATER LINE
- PROPOSED FIRE WATER LINE
- PROPOSED SEWER LINE
- EXISTING SEWER LINE
- PROPOSED STORM DRAIN LINE
- EXISTING STORM DRAIN LINE
- PROPOSED RECYCLED WATER LINE
- EXISTING RECYCLED WATER LINE
- EXISTING GAS LINE
- EXISTING EDGE OF PAVEMENT LINE
- PROPOSED SEWER MANHOLE
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED DRYWELL
- PROPOSED BACKFLOW PREVENTER
- PROPOSED GRATE INLET
- PROPOSED CURB INLET
- PROPOSED PARKWAY DRAIN
- PROPOSED STORM CAPTURE DETENTION SYSTEM

NOTE TO CONTRACTOR

PRECISE LOCATION OF EXISTING GAS LINE ON PROJECT FRONTATGE OF TEMESCAL CANYON ROAD TO BE VERIFIED IN FIELD.

UTILITY PURVEYORS

WATER/SEWER TEMESCAL VALLEY WATER DISTRICT TEMESCALVWP.COM (951) 277-1414	ELECTRICAL SOUTHERN CALIFORNIA EDISON SCE.COM (800) 655-4555	CABLE/PHONE AT&T 2690 TUSCANY ST. #102 BLDG. D-4, CORONA, CA 92881 (800) 288-2020
STORM DRAIN R.C.F.C.D. RCFLOOD.ORG (951) 955-1200	GAS SOUTHERN CALIFORNIA GAS SOCALGAS.COM (800) 427-2000	SCHOOL DISTRICT CORONA-NORCO UNIFIED SCHOOL DISTRICT CNUSD.K12.CA.US (951) 736-5000

NOTE

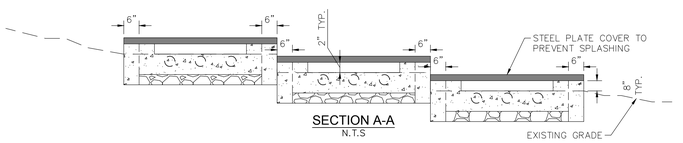
1. ALL UTILITY SIZES & MATERIALS ARE PRELIMINARY. FINAL PIPE SIZING TO BE DETERMINED PER JURISDICTIONAL STANDARDS OR AS A RESULT OF A CAPACITY STUDY AS DEEMED NECESSARY BY THE AGENCY HAVING JURISDICTION.
2. TO COMPLY WITH THE COUNTY'S WATER QUALITY MANAGEMENT PLAN, BIOFILTRATION, IN THE FORM OF BIOFILTRATION BASINS, WILL BE IMPLEMENTED TO TREAT THE 85TH PERCENTILE STORM EVENT UPSTREAM OF THE PROPOSED DETENTION TANKS.

FLOOD ZONE

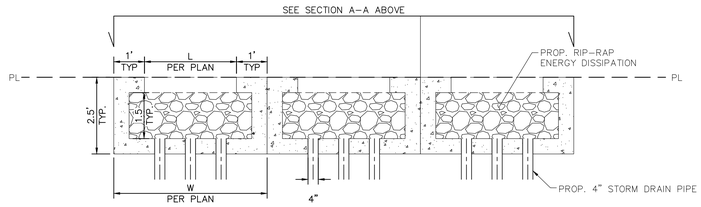
THIS PROPERTY LIES WITHIN ZONE "X" OF FLOOD INSURANCE RATE MAP IDENTIFIED AS MAP NO. 06065C1390G.

ZONE "X" IS DEFINED AS AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN.

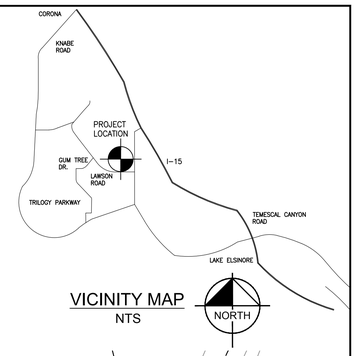
NOTES:
1. L,W, AND NUMBER OF STRUCTURES ("COUNT") SPECIFIED ON PLAN.
2. ONE 4" STORM DRAIN PIPE FOR EVERY FOOT OF "L" PER STRUCTURE.
3. STRUCTURES TO BE STEPPED TO MORE CLOSELY MATCH SLOPE OF EXISTING GRADE ALONG PROPERTY LINE.
4. STRUCTURES TO BE CONSTRUCTED OF 3,000 PSI P.C.C CONCRETE.
5. RIP RAP NO.3 RSP PER CALTRANS SECTION 72. ROCK GRADATION FOR METHOD B PLACEMENT.



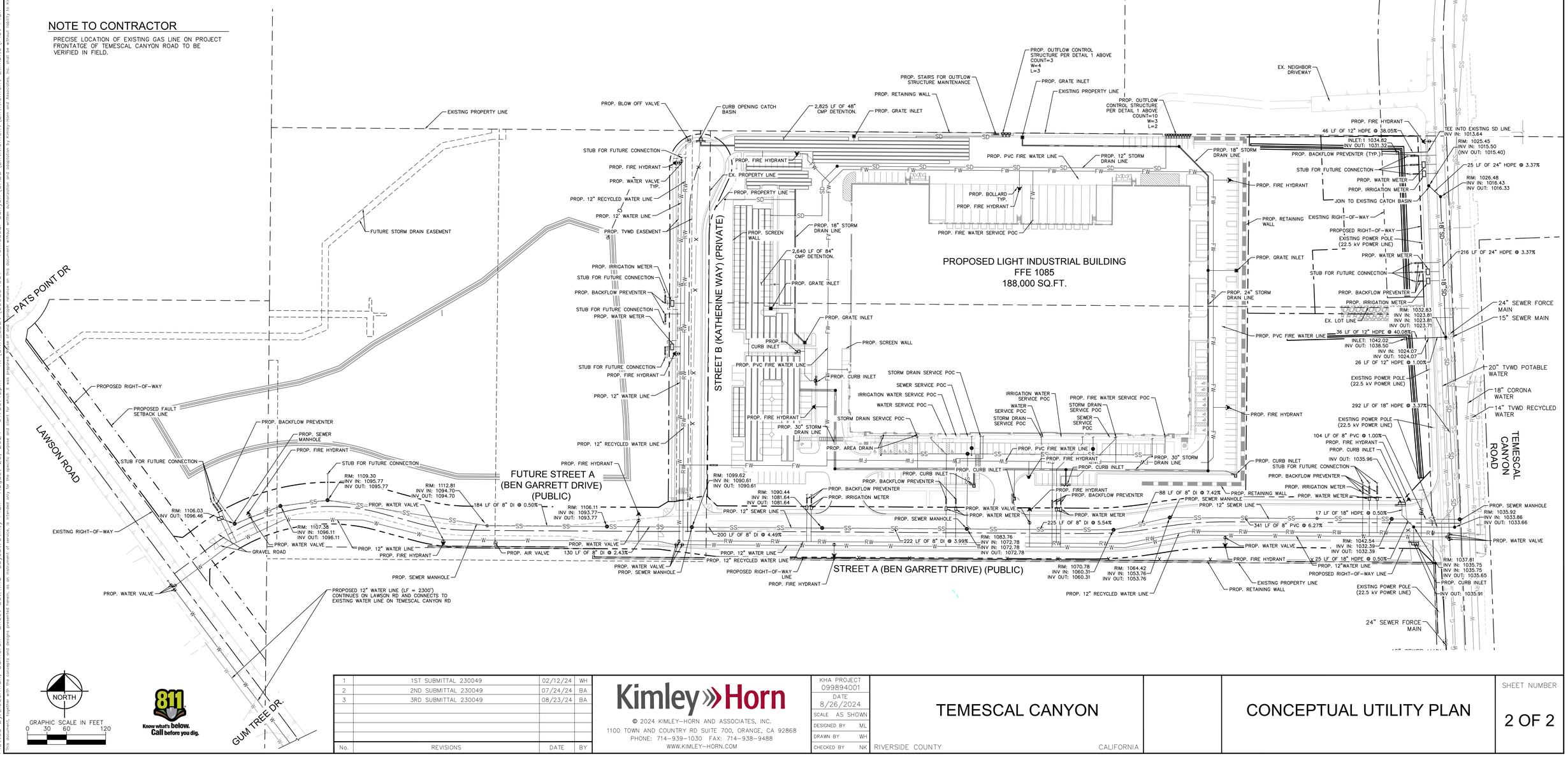
SECTION A-A
N.T.S



1 OUTFLOW CONTROL STRUCTURE DETAIL
N.T.S



VICINITY MAP
NTS



NORTH
GRAPHIC SCALE IN FEET
0 30 60 120

811 Know what's below. Call before you dig.

No.	REVISIONS	DATE	BY
1	1ST SUBMITTAL 230049	02/12/24	WH
2	2ND SUBMITTAL 230049	07/24/24	BA
3	3RD SUBMITTAL 230049	08/23/24	BA

Kimley»Horn

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1100 TOWN AND COUNTRY RD SUITE 700, ORANGE, CA 92868
PHONE: 714-939-1030 FAX: 714-938-9488
WWW.KIMLEY-HORN.COM

KHA PROJECT	099894001
DATE	8/26/2024
SCALE	AS SHOWN
DESIGNED BY	ML
DRAWN BY	WH
CHECKED BY	NK

TEMESCAL CANYON

RIVERSIDE COUNTY CALIFORNIA

CONCEPTUAL UTILITY PLAN

SHEET NUMBER 2 OF 2

Plotted By:Liedermon, Cameron Sheet Set:Kha Layout:Utility Plan August 26, 2024 01:39:12pm K:\ORA_LDEV\099894001 - Temescal Canyon\CADD\Entitlement\Entitlement Exhibits\Plot Plan - Entitlement 1\Utility Plan - Entitlement 1.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

Universal Engineering Sciences (UES)
14538 Meridian Parkway, Suite A
Riverside, CA 92518
p. 951.571.4081 | teamUES.com

August 26, 2024 UES Job No. 4930.2400014.0000

MCP Industries, Inc.
c/o Axxcess Realty Advisor, LLC
4350 Von Karman Ave., Ste. 200
Newport Beach, California 92660

ATTENTION: Mr. Mark Freed

SUBJECT: On-site Infiltration Evaluation
Mission Clay Products
23835 Temescal Canyon Road
Corona, California

REFERENCE: Infiltration Test Report
Mission Clay Products
23835 Temescal Canyon Road
Corona, California
Prepared by UES, July 13, 2024

Dear Mr. Freed,

As requested, Universal Engineering Sciences (UES) is presenting herein our evaluation of on-site stormwater infiltration at the subject site. UES performed infiltration tests at the site in July of 2024.

SUMMARY OF TESTING

We have performed percolation testing at the proposed development area per the guidelines in *Riverside County – Low Impact Development BMP Design Handbook (2011)*. Percolation testing was performed at four boring locations at depths ranging from 18 to 20 feet below ground surface. Infiltration rates range from 0.09 to 7.16 inches per hour. Three of the tests were performed in the clayey on-site materials with percolation rates of 0.09, 0.12, and 0.13 inches per hour. One test was performed in the silty sand layer with a percolation rate of 7.16 inches per hour.

As shown on the attached cross section, which was derived from the boring logs, there are significant layers of the silty sand material at the site. Moreover, areas of the clayey material are also shown on the attached cross section.

CONCLUSIONS AND RECOMMENDATIONS

Based on conversations with the County of Riverside, the on-site clayey material with infiltration rates less than one are not suitable for the infiltration proposed. Accordingly, it is our opinion that an infiltration gallery be constructed of the silty sandy material on site with the higher percolation rate.

This solution is based on the actual amount of material encountered during grading operations. Infiltration testing of this material will be conducted when the material is placed.

As shown on the attached cross section which depicts B-7, B-8, B-9, B-10, B-11, B-12 and B-14, there is a signification thickness of the material represented by the 7.16 inches per hour perc rate. The on-site infiltration system will be established in this material. Based on boring information we estimate an air void volume of 3,780 cubic feet per foot assuming 20% air void.

All conclusions and recommendations that have not been superseded in this letter remain applicable to the *Geotechnical Engineering Report* referenced for this project. We trust that this letter provides sufficient information for your project needs.

LIMITATIONS

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical engineers practicing in this or similar localities. No warranties, either expressed or implied, are intended or made. If you have any questions regarding this project, please do not hesitate to call.

Respectfully,

UES

Hector Cruz, EIT
Project Engineer

Dean Stanphill, PE, GE, CEM
Principal



Attachments: Figure 1 – Boring locations

Figure 2 – Cross Section



LEGEND

B-14	APPROXIMATE BORING LOCATION
P-4	APPROXIMATE PERCOLATION TEST LOCATION
C___C'	GEOLOGIC CROSS SECTION

Universal Engineering Sciences

Inspection | Testing | Geotechnical | Environmental & Construction Engineering | Civil Engineering | Surveying

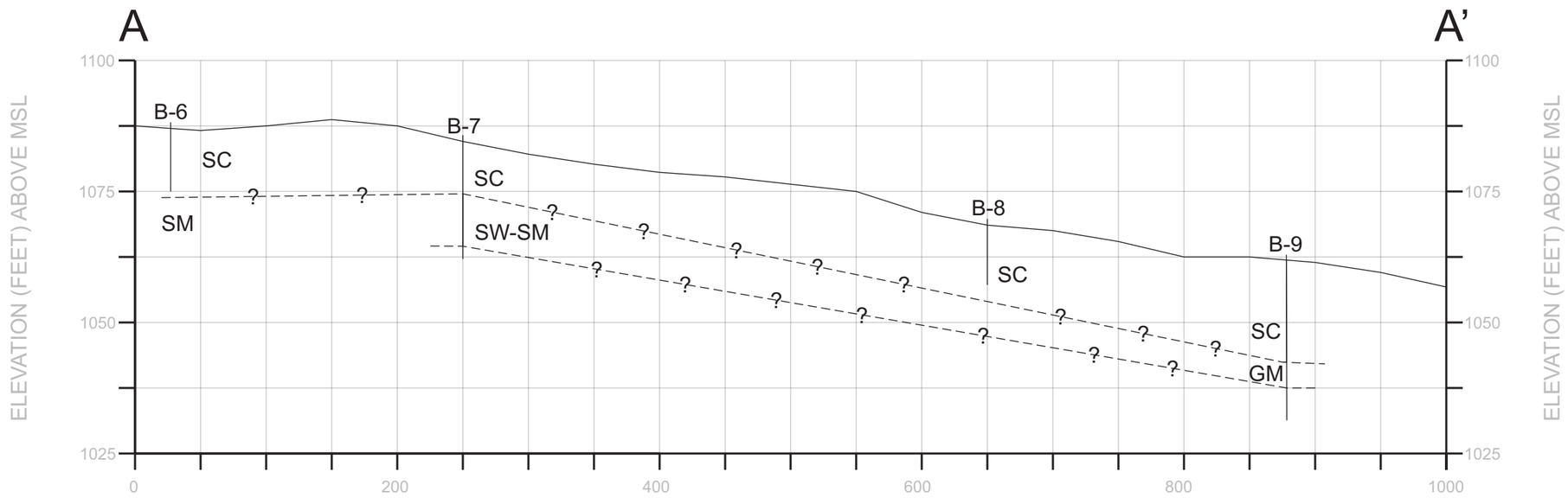
EXPLORATION AND GEOLOGIC MAP

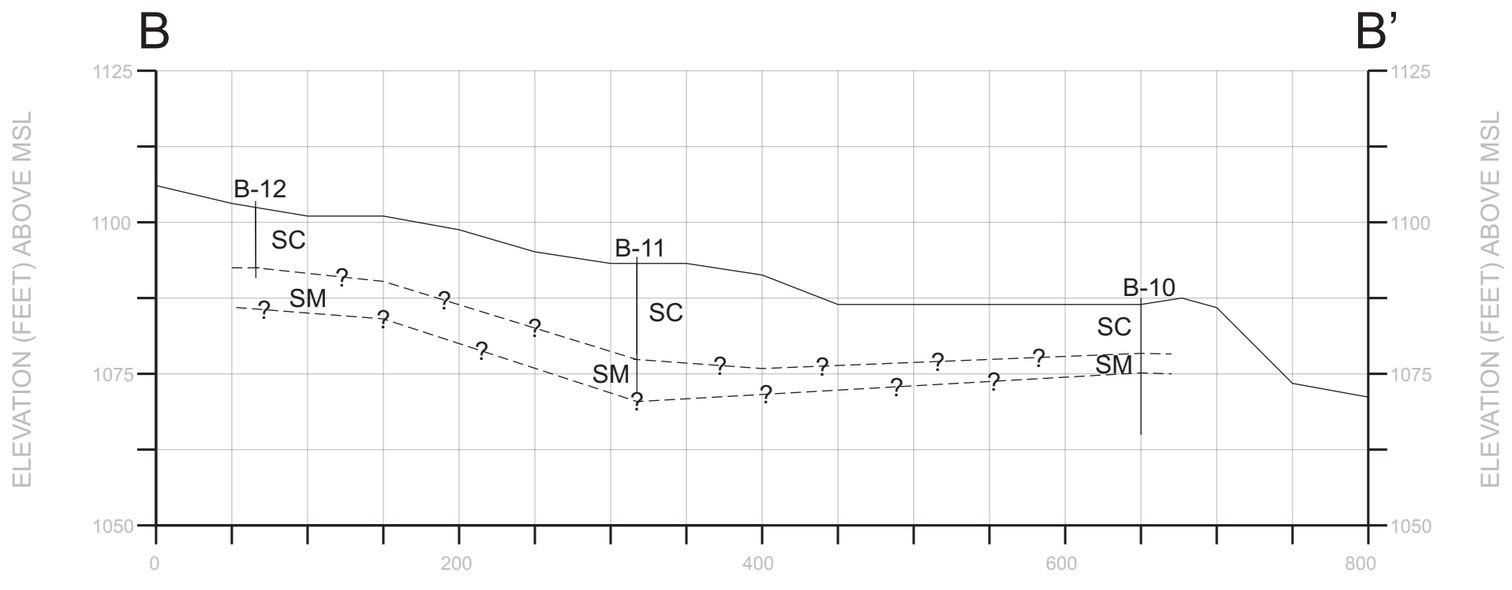
MISSION CLAY PRODUCTS
23835 TEMESCAL CANYON ROAD
CORONA, CALIFORNIA

UES JOB NO: 4930.2400014.0000

DATE: AUG 2024

FIGURE: 1





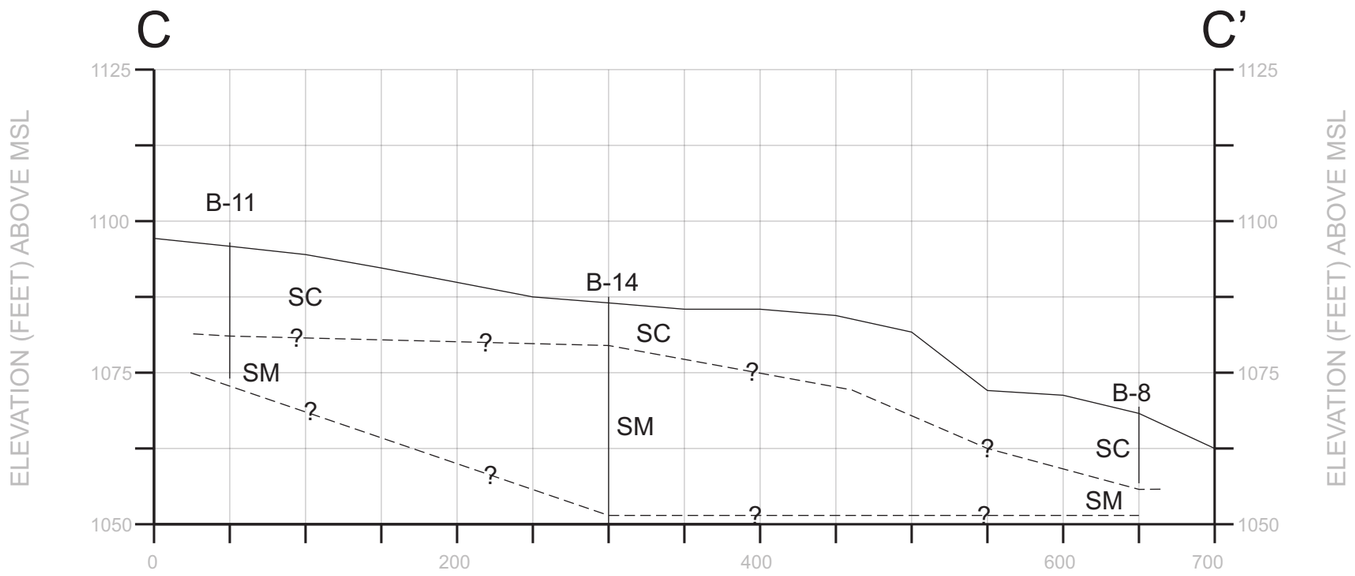
EXPLANATION

B-1	APPROXIMATE BORING LOCATION
?	APPROXIMATE SOIL TYPE CHANGE QUERIED WHERE UNCERTAIN
SC	SANDY CLAY - LOWER PERCOLATION
SM	SILTY SAND - HIGHER PERCOLATION
GM	SILTY GRAVEL
SW-SM	WELL-GRADED SAND WITH SILT AND GRAVEL

Universal Engineering Sciences
Inspection | Testing | Geotechnical | Environmental & Construction Engineering | Civil Engineering | Surveying

GEOLOGIC CROSS SECTION A-A' AND B-B'
MISSION CLAY PRODUCTS
23835 TEMESCAL CANYON ROAD
CORONA, CALIFORNIA

UES JOB NO: 4930.2400014
SCALE:
DATE: AUG 2023
FIGURE: 2



EXPLANATION

B-1	APPROXIMATE BORING LOCATION
?	APPROXIMATE SOIL TYPE CHANGE QUERIED WHERE UNCERTAIN
SC	SANDY CLAY - LOWER PERCOLATION
SM	SILTY SAND - HIGHER PERCOLATION

Universal Engineering Sciences
Inspection | Testing | Geotechnical | Environmental & Construction Engineering | Civil Engineering | Surveying

GEOLOGIC CROSS SECTION C-C'
MISSION CLAY PRODUCTS
23835 TEMESCAL CANYON ROAD
CORONA, CALIFORNIA

UES JOB NO: 4930.2400014
SCALE:
DATE: AUG 2023
FIGURE: 2B

Infiltration Test Report

MISSION CLAY PRODUCTS
23835 Temescal Canyon Road
Corona, California

Prepared for:
MCP Industries, Inc.
4350 Von Karman Ave., Ste. 200
Newport Beach, CA 92660

Prepared By:
UES
14538 Meridian Parkway A,
March Air Reserve Base, CA 92518

June 13, 2024
Project No. 4930.2400014

UES
14538 Meridian Parkway A,
March Air Reserve Base, CA 92518
p. 951.571.4081 | TeamUES.com

Project No. 4930.24000014
June 13, 2024

MCP Industries, Inc.
c/o Axxcess Realty Advisor, LLC
4350 Von Karman Ave., Ste. 200
Newport Beach, CA 92660

Subject: Infiltration Test Report
Mission Clay Products
23835 Temescal Canyon Road
Corona, California

MCP Industries, Inc.,

UES is pleased to submit this Infiltration Test Report for the Mission Clay Products located in Corona, California. This report includes the results from the field exploration, laboratory testing program, and infiltration testing.

UES appreciates the opportunity to provide our services and we look forward to continuing participation during the design and construction phases of this project. UES also has great interest in providing construction services, including materials testing and inspection services during the construction of this project, and will be glad to meet with you to further discuss how we can be of assistance as the project advances.

If there are questions pertaining to this report, or if UES may be of further service, please contact us at your convenience.

Respectfully,
UES

Hector Cruz, EIT
Project Engineer

Hans F. Tolksdorf, PE, GE
Principal Geotechnical Engineer



UES
14538 Meridian Parkway A,
March Air Reserve Base, CA 92518
p. 951.571.4081 | TeamUES.com

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1.1 Authorization 1
1.2 Proposed Development 1
1.3 Previous Studies 1
2.0 Site Information 1
2.1 Site Description 1
3.0 Field Exploration & Laboratory Program 2
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3.5 Percolation Test and Infiltration Rate 2
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4.1 Plan Review 4
5.0 Geotechnical Risk and Limitations 4
6.0 References 4

Figures

Figure 1 - Site Location Map
Figure 2 - Percolation Test Location Map

Appendices

Appendix A – Field Exploration Logs
Appendix B – Laboratory Testing
Appendix C – Percolation Test and Infiltration Rates

1.0 INTRODUCTION

We have performed percolation testing at the proposed development area located at Mission Clay Products in Corona, California. The purpose of this investigation was to evaluate the nature and percolation characteristic of the subsurface soil in order to provide recommendations for the design of infiltration systems at the site.

The investigation included four borings to a depth of 18 feet to 20 feet below ground surface for in-situ percolation testing. It is our understanding that infiltration rates provided in this letter are to be used for the design and construction of infiltration systems.

1.1 AUTHORIZATION

Construction Testing & Engineering, South, Inc. (CTE) dba UES, Consultant, has completed a field exploration and geotechnical evaluation for Mission Clay Products. Mr. Craig Morris, representing BBG KRG, authorized UES services via signed proposal dated March 10, 2024.

1.2 PROPOSED DEVELOPMENT

We understand the project will consist of the design and construction of a large retention basin. Review of a Mission Clay Products Site Plan drawing dated May 9, 2024, prepared by Kimley-Horn indicates the proposed infiltration system is located on the northwest side of the property. Proposed infiltration system will be in addition to the future commercial development of project site.

1.3 PREVIOUS STUDIES

A geotechnical investigation report was conducted by Construction Testing & Engineering, South, Inc. (CTE 2018) analyzing the subsurface conditions for the proposed Commercial development. The previous geotechnical report included findings based on 15 exploratory borings located within and adjacent to subject site. The findings of the previous borings and laboratory testing was reviewed for preparation of the geotechnical criteria prepared for this report. No other previous geologic, geotechnical or environmental studies were provided to Construction Testing & Engineering, South, Inc. dba UES for review at the time of this investigation.

2.0 SITE INFORMATION

2.1 SITE DESCRIPTION

The proposed infiltration system is located at the northwest side of the Mission Clay Products located on Ben Garrett Road in Corona, California (Figure 1). The proposed development area property is bounded to the north, west, and south by vacant undeveloped land, and to the west by Temescal Canyon Road.

The topography of the site ranges from 1,087 feet in the north to 1,104 feet in the south relative to the North American Vertical Datum of 1988 (NAVD88) based on review of the Lake Mathews Quadrangle California – Riverside County 7.5-Minute series topography map.

3.0 FIELD EXPLORATION & LABORATORY PROGRAM

3.1 FIELD ACTIVITIES

Four (4) test borings were drilled on May 16, 2024 using a CME-75 truck-mounted drilling rig equipped with an eight-inch outer diameter hollow stem auger. The borings were advanced to depths of 18 feet to 20 feet below ground surface to test the anticipated bottom elevation of the proposed infiltration system relative to the actual ground surface level on site. Depths of the infiltration testing were based on correspondence for anticipated depths of infiltration system. The four borings were set up for "deep" percolation testing referencing *Riverside County – Low Impact Development BMP Design Handbook (2011)*.

3.2 LAB PROGRAM

Laboratory tests were conducted on representative soil samples to evaluate their physical properties and engineering characteristics. Specific laboratory tests included:

- Moisture Content
- #200 Wash

The laboratory testing was conducted to determine the soil classification and physical properties of the on-site soils. Test method descriptions and laboratory results are presented in Appendix B.

3.3 SUBSURFACE CONDITIONS

The soil conditions encountered within the borings for percolation testing consisted of interbedded layers of silty sand and clayey sand in a medium dense to dense condition. Based on the laboratory test results, the subsurface soils consisted of fines contents around 24 percent. Based on the laboratory test results, the subsurface soils moisture contents are between 3.7 and 11.1 percent. More detailed descriptions are provided in the Exploration Logs in Appendix A.

3.4 GROUNDWATER

Groundwater was not encountered in the borings to a maximum depth of 20 feet, performed on May 16, 2024. Available groundwater data indicates the depth to groundwater at nearby monitoring wells are more than 90 feet below ground surface, or elevation of 997 feet above mean sea level (amsl). In the referenced geotechnical investigation report (CTE, 2018), groundwater was not encountered.

Groundwater levels at the site should be expected to fluctuate throughout the year based on variations in seasonal precipitation, local irrigation, and other factors. Perched ground water conditions may exist in subsurface layers of higher permeability underlain by layers of low permeability.

3.5 PERCOLATION TEST AND INFILTRATION RATE

Testing was performed in accordance with published guidelines in the " *Riverside County – Low Impact Development BMP Design Handbook*" prepared by Riverside County Flood Control and Water Conservation District, dated September 2011.

Percolation testing was performed at four boring locations. Test borings were drilled to depths of 18 feet to 20 feet below ground surface, to the anticipated bottom of the basin using an eight-inch diameter auger.

Bottom of test hole was covered with 2 inches of gravel, lined with perforated/slotted pipe, and presoaked prior to testing. Testing procedures for sandy soils ran for a total of six, 10 minute readings for a total test time of one hour. Testing procedures for non-sandy soils measured readings every 30 minutes for at least 6 hours. The percolation rates that were obtained during field testing were converted to infiltration rates utilizing the "Porchet Method". The following table presents a summary of the test results for each location.

Table 1: Infiltration Rates

Boring Number	Depth Below Existing Ground Surface (ft)	Soil Description	*Infiltration Rate (inches per hour)
P-1	18	Clayey Sand (SC)	0.13
P-2	18	Clayey Sand (SC)	0.09
P-3	20	Clayey Sand (SC)	0.12
P-4	20	Silty Sand (SM)	7.16

* No factor of safety has been applied to this rate.

Infiltration rates can be affected by siltation, debris, degree of saturation, subsurface inconsistencies, and compaction from grading. Based on soil layers from the previous geotechnical report, the soils are predominately silty sand to clayey sand with isolated layers of more permeable well graded sand material. An appropriate factor of safety should be applied per referenced guidelines to produce design infiltration rate. Results included in Appendix C.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations regarding the proposed infiltration systems are based on the percolation testing as discussed herein and the guidelines in *Riverside County – Low Impact Development BMP Design Handbook (2011).*

- Infiltration rates range from 0.09 to 7.16 inches per hour. Based on the percolation test borings and our previous geotechnical investigation, typical soil layers are silty sand to clayey sand, therefore we recommend a design infiltration rate be determined using the lower rates. An appropriate factor of safety should be applied per referenced guidelines to produce design infiltration rate.
- Infiltration systems should be designed for the highest reported groundwater recorded at the site at an elevation of 997 feet amsl, or approximately 90 to 107 feet below the ground surface.
- Proposed infiltration systems should be setback from building foundations and adjacent properties to avoid the development of a localized perched groundwater condition that could result in damage to building foundations and pavement improvements.
- Infiltration systems should not be constructed adjacent to retaining structures.
- Our Geotechnical Investigation Report dated November 6, 2018, should be used in combination with this letter for design and construction of proposed infiltration systems.

4.1 PLAN REVIEW

We recommend that our firm be retained to review the final plans and specifications to determine if the intent of our recommendations has been implemented in those documents. We would be pleased to submit a proposal to provide these services upon request.

5.0 GEOTECHNICAL RISK AND LIMITATIONS

Our recommendations are based upon the information provided regarding the proposed construction, combined with our analysis of site conditions revealed by the field exploration and laboratory testing programs. We have used prudent engineering and geologic judgment based upon the information provided and the data generated from our investigation. This report has been prepared in substantial compliance with generally accepted geotechnical engineering practices that exist in the area of the project at the time the report was prepared. No warranty, either express or implied, is provided.

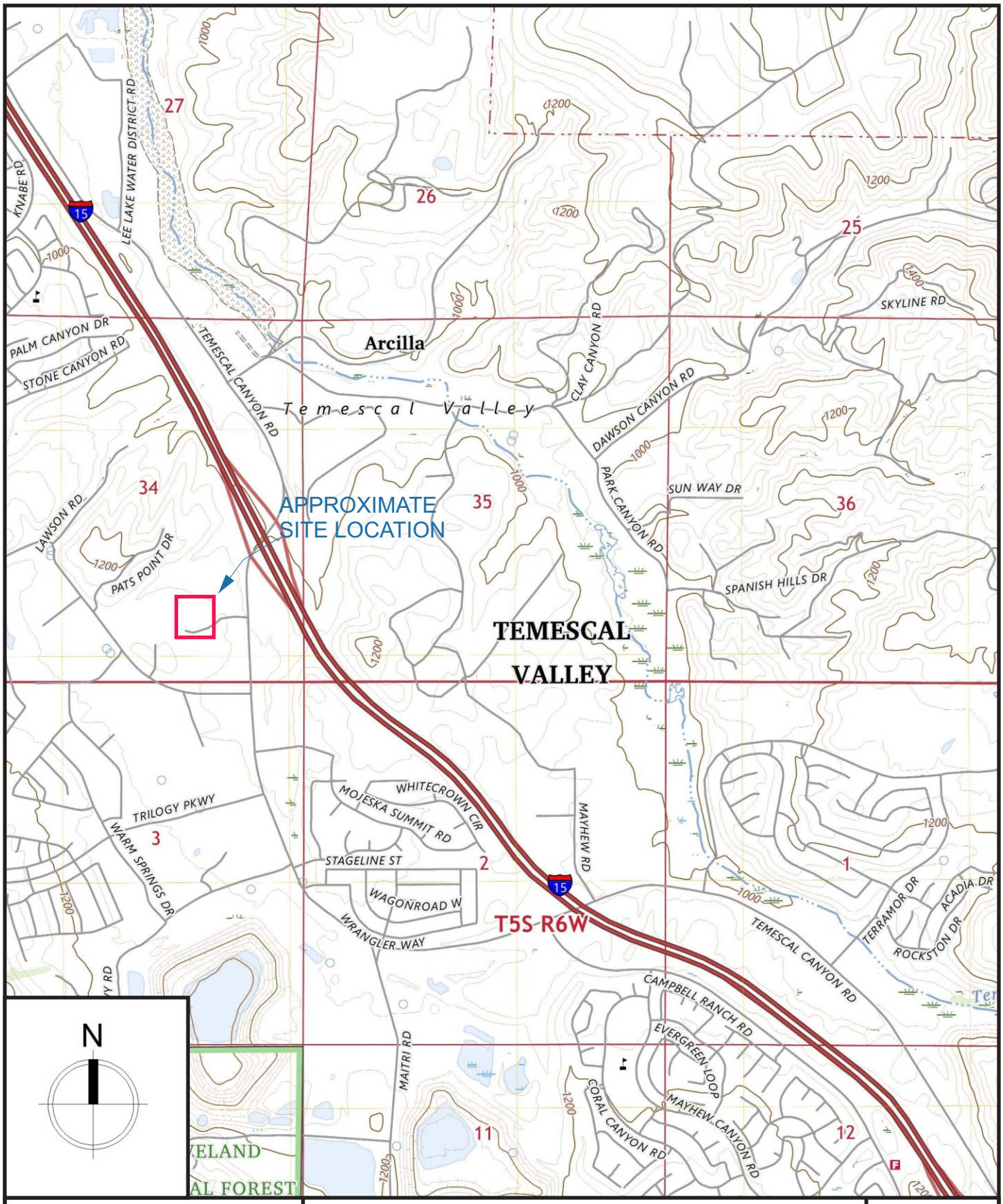
If the proposed construction is modified or relocated or, if it is found during construction that subsurface conditions differ from those we encountered at our boring and/or CPT locations, we should be afforded the opportunity to review the new information or changed conditions to determine if our conclusions and recommendations must be modified.

We emphasize that this report is applicable only to the proposed construction and the investigated site. This report should not be utilized for construction on any other site. This report is considered valid for the proposed construction for a period of two years following the date of this report. If construction has not started within two years, we must re-evaluate the recommendations of this report and update the report, if necessary.

6.0 REFERENCES

1. California Department of Water Resources (DWR), accessed online, Water Data Library, http://www.water.ca.gov/waterdatalibrary/.
2. Construction Testing & Engineering, South, Inc., 2018, Report of Geotechnical Investigation, Proposed Commercial Development, APN 283-280-020, 283-180-001, 283-180-002, 283-180-021, 283-180-020, Temescal Canyon Road, Corona, California, November 6, 2018.
3. County of Riverside, 2011, Riverside County - Low Impact Development BMP Design Handbook Appendix A – Infiltration Testing, Revision date September, 2011.
4. TopoView, 2023, USGS Lake Mathews Quadrangle California - Riverside County 7.5-Minute Series https://ngmdb.usgs.gov/topoview/.

FIGURES



Project: 4930.2400014.0000	Figure 1
Scale: 1" ~ 2000' Date: JUN 2024	
Base Map: USGS Topographic Map 7.5' Quadrangles from US TOPO Product Standard, 2011. Thematic info: UES	

SITE LOCATION MAP

MISSION CLAY PRODUCTS
23835 TEMESCAL CANYON ROAD
CORONA, CALIFORNIA

UES



LEGEND

⊙ P-4 APPROXIMATE PERCOLATION TEST LOCATION

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EXPLORATION AND GEOLOGIC MAP
MISSION CLAY PRODUCTS
23835 TEMESCAL CANYON ROAD
CORONA, CALIFORNIA

CTE JOB NO: 4930.2400014.0000
DATE: JUN 2024
FIGURE: 2

Appendix A

Field Exploration Logs

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DEFINITION OF TERMS

PRIMARY DIVISIONS			SYMBOLS	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS < 5% FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES LITTLE OR NO FINES
			GP	POORLY GRADED GRAVELS OR GRAVEL SAND MIXTURES, LITTLE OF NO FINES
		GRAVELS WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, NON-PLASTIC FINES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, PLASTIC FINES
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS < 5% FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTURES, NON-PLASTIC FINES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES, PLASTIC FINES
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50		ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, SLIGHTLY PLASTIC CLAYEY SILTS
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY, SANDY, SILTS OR LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTY CLAYS
HIGHLY ORGANIC SOILS			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS

GRAIN SIZES

BOULDERS	COBBLES	GRAVEL		SAND			SILTS AND CLAYS
		COARSE	FINE	COARSE	MEDIUM	FINE	

12" 3" 3/4" 4 10 40 200

CLEAR SQUARE SIEVE OPENING U.S. STANDARD SIEVE SIZE

ADDITIONAL TESTS

(OTHER THAN TEST PIT AND BORING LOG COLUMN HEADINGS)

MAX- Maximum Dry Density
GS- Grain Size Distribution
SE- Sand Equivalent
EI- Expansion Index
CHM- Sulfate and Chloride Content , pH, Resistivity
COR - Corrosivity
SD- Sample Disturbed
PM- Permeability
SG- Specific Gravity
HA- Hydrometer Analysis
AL- Atterberg Limits
RV- R-Value
CN- Consolidation
CP- Collapse Potential
HC- Hydrocollapse
REM- Remolded
PP- Pocket Penetrometer
WA- Wash Analysis
DS- Direct Shear
UC- Unconfined Compression
MD- Moisture/Density
M- Moisture
SC- Swell Compression
OI- Organic Impurities

FIGURE: BL1

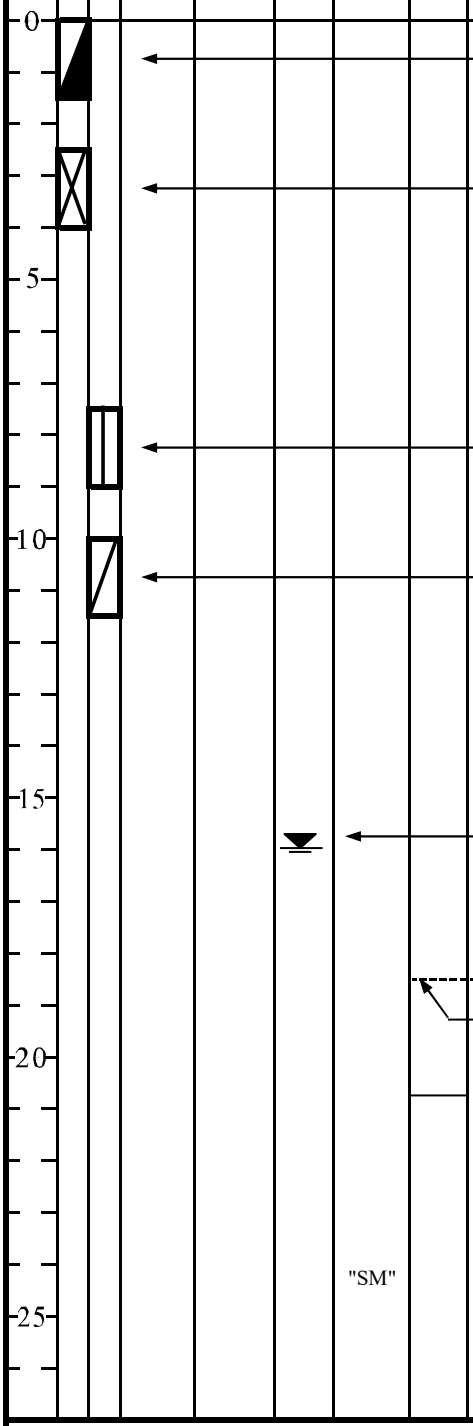
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PROJECT:	DRILLER:	SHEET: of
CTE JOB NO:	DRILL METHOD:	DRILLING DATE:
LOGGED BY:	SAMPLE METHOD:	ELEVATION:

BORING LEGEND

Depth (Feet) | Bulk Sample | Driven Type | Blows/Foot | Dry Density (pcf) | Moisture (%) | U.S.C.S. Symbol | Graphic Log | DESCRIPTION | Laboratory Tests



Block or Chunk Sample

Bulk Sample

Standard Penetration Test

Modified Split-Barrel Drive Sampler (Cal Sampler)

Groundwater Table

Soil Type or Classification Change

? ? ? ? ? ? ?

Formation Change [(Approximate boundaries queried (?)]

"SM"

Quotes are placed around classifications where the soils exist in situ as bedrock

FIGURE: BL2

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UES PROJECT:	Infiltration Testing Temescal Canyon	DRILLER:	24/7 Drilling	SHEET:	1 of 1
PROJECT NO:	4930.2400014	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	5/16/2024
LOGGED BY:	HC REVIEWED BY: HFT	SAMPLE METHOD:	140lb/30" Autohammer	GND EL:	1089'

BORING: P-1

Depth (Feet)	Sample Bulk	Sample Driven Type	Blows/6-inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0								**Old Alluvial Fan Deposits (Qof)** Clayey SAND, with gravel, medium dense, dry to moist red brown.	
5			5 5 12		11.1		SC	Clayey SAND, with coarse sand and fine gravel, medium dense moist, red brown	M
10			12 20 21		4.9			Clayey SAND, with gravel, dense, moist, red brown	M
15			13 16 22		10.3				M
20								Boring Terminated at Approximately 18 feet bgs. No Groundwater Encountered.	
25									

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UES PROJECT:	Infiltration Testing Temescal Canyon	DRILLER:	24/7 Drilling	SHEET:	1 of 1
PROJECT NO:	4930.2400014	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	5/16/2024
LOGGED BY:	HC REVIEWED BY: HFT	SAMPLE METHOD:	140lb/30" Autohammer	GND EL:	1090'

BORING: P-2

Depth (Feet)	Sample Bulk	Sample Driven Type	Blows/6-inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0								**Old Alluvial Fan Deposits (Qof)** Clayey SAND, with gravel, medium dense, dry to moist red brown.	
5		■	5 9 10		7.3		SC	Clayey SAND, with coarse sand and fine gravel, medium dense moist, red brown	M
10		■	13 19 26		5.8		SM	Silty SAND with gravel, dense, moist, red brown/grey	M
15		■	7 13 15		9.8		SC	Clayey SAND, with coarse sand and fine gravel, medium dense moist, red brown	M
		■	15 14 16		4.2			-dense	M
20								Boring Terminated at Approximately 18 feet bgs. No Groundwater Encountered.	
25									

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UES PROJECT:	Infiltration Testing Temescal Canyon	DRILLER:	24/7 Drilling	SHEET:	1 of 1
PROJECT NO:	4930.2400014	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	5/16/2024
LOGGED BY:	HC REVIEWED BY: HFT	SAMPLE METHOD:	140lb/30" Autohammer	GND EL:	1090'

BORING: P-3

Depth (Feet)	Bulk Sample	Driven Type	Blows/6-inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0								**Old Alluvial Fan Deposits (Qof)** Clayey SAND, with gravel, medium dense, dry to moist red brown.	
5		■	14 19 24		5.3		SC	Clayey SAND, with coarse sand and fine gravel, dense moist, red brown	M
10		■	11 15 20		7.9			Clayey SAND, with gravel, dense, moist, red brown	M
15		■	12 13 21		9.5			-dense	M
		■	12 15 12		3.7			-medium dense	M
20								Boring Terminated at Approximately 20 feet bgs. No Groundwater Encountered.	
25									

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UES PROJECT:	Infiltration Testing Temescal Canyon	DRILLER:	24/7 Drilling	SHEET:	1 of 1
PROJECT NO:	4930.2400014	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	5/16/2024
LOGGED BY:	HC REVIEWED BY: HFT	SAMPLE METHOD:	140lb/30" Autohammer	GND EL:	1099'

BORING: P-4

Depth (Feet)	Bulk Sample	Driven Type	Blows/6-inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0								**Old Alluvial Fan Deposits (Qof)** Clayey SAND, with gravel, medium dense, dry to moist red brown.	
5		■	12 13 14		9.1		SC	Clayey SAND, with coarse sand and fine gravel, medium dense moist, red brown	M
10		■	11 13 14		8.2			Clayey SAND, with gravel, medium dense, moist, light brown	M
15		■	15 18 20		6.1		SM	Silty SAND with gravel, moist, dense, light brown/grey	M
		■	14 19 18		7.5				M, WA
20								Boring Terminated at Approximately 20 feet bgs. No Groundwater Encountered.	
25									

Appendix B

Laboratory Testing

MOISTURE & DENSITY TEST

In Accordance with ASTM D2937

Project Name:

UES Job Number: 4930. 2400014 **Date Sampled:** May 16, 2024

Lab Number: 9919 **Date Tested:** May 17, 2024

BORING NO.	B-1	B-1	B-1	B-2	B-2	B-2	B-2	B-3
DEPTH (ft.)	5	10	11.5	5	10	15	16.5	5
SAMPLE HT. (in.)								
TARE NO.	410	697	503	513	505	689	625	516
GROSS WET WT.	240.2	255.7	241.4	252.9	252.4	256.3	170.8	255.5
GROSS DRY WT.	217.6	244.3	220.0	236.5	239.2	234.6	164.5	243.2
TARE WT.	13.8	12.6	12.6	12.6	12.6	12.7	12.7	12.7
RING WT.								
WT. OF WATER.	22.6	11.4	21.4	16.4	13.2	21.7	6.3	12.3
NET DRY WT.	203.8	231.7	207.4	223.9	226.6	221.9	151.8	230.5
% MOISTURE	11.1	4.9	10.3	7.3	5.8	9.8	4.2	5.3
DRY DENSITY (pcf)								
WET DENSITY (pcf)								

Tested by: NG Reviewed by: SP

MOISTURE & DENSITY TEST

In Accordance with ASTM D2937

Project Name:

UES Job Number: 4930. 2400014 **Date Sampled:** May 16, 2024

Lab Number: 9919 **Date Tested:** May 17, 2024

BORING NO.	B-3	B-3	B-3	B-4	B-4	B-4	B-4	
DEPTH (ft.)	10	15	16.5	5	10	15	16.5	
SAMPLE HT. (in.)								
TARE NO.	542	512	520	532	528	687	572	
GROSS WET WT.	246.2	250.4	120.3	257.0	255.1	258.7	256.7	
GROSS DRY WT.	229.2	229.8	116.5	236.7	236.8	244.6	239.6	
TARE WT.	12.7	12.6	12.6	12.6	12.8	12.7	12.7	
RING WT.								
WT. OF WATER.	17.0	20.6	3.8	20.3	18.3	14.1	17.1	
NET DRY WT.	216.5	217.2	103.9	224.1	224.0	231.9	226.9	
% MOISTURE	7.9	9.5	3.7	9.1	8.2	6.1	7.5	
DRY DENSITY (pcf)								
WET DENSITY (pcf)								

Tested by: NG Reviewed by: SP

MATERIALS IN AGGREGATE & SOILS FINER THAN NO. 200 SIEVE BY WASHING ASTM C117

PROJECT NAME Infiltration Testing Temescal Canyon Road

PROJECT NO. 4930. 2400014

LABORATORY NO. 9919

SAMPLE NO.	B-4 16.5'			
INITIAL DRY WT. (1)	227.2			
FINAL DRY WT (2)	171.8			
CHANGE (3)	55.4			
PERCENT PASSING NO. 200 (3 / 1)	24.40%			

Tested in accordance with ASTM C117.

DATE TESTED: 5/20/2024

TESTED BY: NG

REVIEWED BY: SP

Appendix C
Percolation Test and Infiltration Rate

Percolation Test Data Sheet

Project: 4930.2400014
Date: June 3, 2024

Test Hole No: P1
Hole Depth, D_T (feet): 18
Diameter (inches): 8
Soil Description: Clayey Sand (SC)

Tested Infiltration Rate[1]
0.13 in/hr

Sandy Soil Criteria Test

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Great than or Equal to 6"? (Y/N)
1	7:00	7:25	25	190.08	191.16	1.08	No
2	7:30	7:55	25	191.16	192.24	1.08	No

Trial Readings

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	8:00	8:30	30	190.08	191.16	1.08	27.78
2	8:30	9:00	30	191.16	192.24	1.08	27.78
3	9:00	9:30	30	192.24	194.64	2.40	12.50
4	9:30	10:00	30	192.12	193.08	0.96	31.25
5	10:00	10:30	30	192.48	193.32	0.84	35.71
6	10:30	11:00	30	192.36	193.44	1.08	27.78
7	11:00	11:30	30	192.48	193.32	0.84	35.71
8	11:30	12:00	30	192.24	193.08	0.84	35.71
9	12:00	12:30	30	191.16	192.24	1.08	27.78
10	12:30	1:00	30	192.24	193.08	0.84	35.71
11	1:00	1:30	30	192.00	192.84	0.84	35.71
12	1:30	2:00	30	191.40	192.24	0.84	35.71

Comments:

1Tested infiltration rate from Riverside County Deign Handbook for Low Impact Development Best management practices.

No factor of safety is applied to this rate.

Percolation Test Data Sheet

Project: 4930.2400014
Date: June 3, 2024

Test Hole No: P2
Hole Depth, D_T (feet): 18
Diameter (inches): 8
Soil Description: Clayey Sand (SC)

Tested Infiltration Rate[1]
0.09 in/hr

Sandy Soil Criteria Test

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Great than or Equal to 6"? (Y/N)
1	7:00	7:25	25	193.32	194.16	0.84	No
2	7:30	7:55	25	193.32	194.16	0.84	No

Trial Readings

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	8:00	8:30	30	192.24	193.56	1.32	22.73
2	8:30	9:00	30	191.76	192.24	0.48	62.50
3	9:00	9:30	30	192.24	192.96	0.72	41.67
4	9:30	10:00	30	192.96	193.32	0.36	83.33
5	10:00	10:30	30	193.32	194.04	0.72	41.67
6	10:30	11:00	30	192.00	192.60	0.60	50.00
7	11:00	11:30	30	192.00	192.72	0.72	41.67
8	11:30	12:00	30	193.32	194.04	0.72	41.67
9	12:00	12:30	30	192.24	192.96	0.72	41.67
10	12:30	1:00	30	193.32	194.04	0.72	41.67
11	1:00	1:30	30	192.00	192.60	0.60	50.00
12	1:30	2:00	30	192.00	192.60	0.60	50.00

Comments:

1Tested infiltration rate from Riverside County Deign Handbook for Low Impact Development Best management practices.

No factor of safety is applied to this rate.

Percolation Test Data Sheet

Project: 4930.2400014
Date: June 3, 2024

Test Hole No: P3
Hole Depth, D_T (feet): 20
Diameter (inches): 8
Soil Description: Clayey Sand (SC)

Tested Infiltration Rate[1]
0.12 in/hr

Sandy Soil Criteria Test

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Great than or Equal to 6"? (Y/N)
1	7:00	7:25	25	206.40	213.36	6.96	Yes
2	7:30	7:55	25	213.36	215.52	2.16	No

Trial Readings

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	8:00	8:30	30	214.68	215.28	0.60	50.00
2	8:30	9:00	30	214.68	215.28	0.60	50.00
3	9:00	9:30	30	217.32	217.80	0.48	62.50
4	9:30	10:00	30	216.60	217.44	0.84	35.71
5	10:00	10:30	30	216.48	217.32	0.84	35.71
6	10:30	11:00	30	216.84	217.68	0.84	35.71
7	11:00	11:30	30	217.56	217.80	0.24	125.00
8	11:30	12:00	30	217.32	217.68	0.36	83.33
9	12:00	12:30	30	217.32	217.68	0.36	83.33
10	12:30	1:00	30	216.60	217.32	0.72	41.67
11	1:00	1:30	30	216.24	216.48	0.24	125.00
12	1:30	2:00	30	216.60	217.32	0.72	41.67

Comments:

1Tested infiltration rate from Riverside County Deign Handbook for Low Impact Development Best management practices.

No factor of safety is applied to this rate.

Percolation Test Data Sheet

Project: 4930.2400014
Date: June 3, 2024

Test Hole No: P4
Hole Depth, D_T (feet): 20
Diameter (inches): 8
Soil Description: Silty Sand (SM)

Tested Infiltration Rate[1]
7.16 in/hr

Sandy Soil Criteria Test							
Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Great than or Equal to 6"? (Y/N)
1	7:00	7:25	25	218.16	230.16	12.00	Yes
2	7:30	7:55	25	217.32	228.00	10.68	Yes

Trial Readings							
Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	8:00	8:30	10	216.12	228.00	11.88	0.84
2	8:30	9:00	10	218.28	228.12	9.84	1.02
3	9:00	9:30	10	217.20	228.00	10.80	0.93
4	9:30	10:00	10	214.80	227.88	13.08	0.76
5	10:00	10:30	10	215.76	227.88	12.12	0.83
6	10:30	11:00	10	215.88	227.88	12.00	0.83

Comments:

1Tested infiltration rate from Riverside County Deign Handbook for Low Impact Development Best management practices.

No factor of safety is applied to this rate.

CTE SOUTH Construction Testing & Engineering, South, Inc.

Inspection | Testing | Geotechnical | Environmental & Construction Engineering | Civil Engineering | Surveying

GEOTECHNICAL INVESTIGATION
PROPOSED COMMERCIAL DEVELOPMENT
APN 283-280-020, 283-180-001, 283-180-002, 283-180-021, 283-180-020
TEMESCAL CANYON ROAD
COUNTY OF RIVERSIDE, CALIFORNIA

PREPARED FOR:

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CTE JOB NO. 40-3639G **NOVEMBER 6, 2018 (REV)**

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1.0 EXECUTIVE SUMMARY

This geotechnical report was performed to provide site-specific geotechnical information for the proposed development located between Lawson and Temescal Canyon Roads in the community Temescal Valley, an unincorporated area of Riverside County. The site location is shown on Figure 1.

The proposed project is understood to consist of commercial development. The buildings are anticipated to be multiple story structures. The structures will be founded on shallow footings with slab-on-grade base floors. Construction will also include exterior flatwork, pavements, underground utilities, runoff mitigation measures, and retaining walls. Grading will create level pads for the proposed structures.

The field investigation was conducted on August 10 and 16, 2018 and consisted of 15 subsurface borings. Based on our investigation and review of geologic maps, the site is underlain by Old Alluvial Fan Deposits of late to middle Pleistocene Age. In the western portion of the site stockpiled soil, disturbed surficial material and underlying observed porosity in the near surface will required removal and recompaction on the order of 6 to 12 feet, as recommended herein. The eastern portion of the site, developed by Mission Clay Products, and consists of level stepped pads produced by previous cut and fill grading operations. Artificial fills encountered at some boring locations were on the order of 5 feet. Groundwater was not encountered at the time of our investigation.

Based on our investigation and geologic literature review, Parcel APN 283-280-020 and a portion of APN 283-180-02 are located in an Alquist-Priolo earthquake fault study zone and County of Riverside fault zone. An evaluation of the fault rupture hazard is being performed including additional subsurface investigations, the results of which will be presented in a separate report.

Due to the proximity of the site to the Glen Ivy North Fault and the general seismicity of the region, ground shaking due to seismic activity on local and distant faults will be a significant geologic hazard at the site.

Based on our investigation, the proposed development at the site is considered feasible from a geotechnical standpoint, provided the recommendations herein are implemented during project design and construction.

2.0 INTRODUCTION AND SCOPE OF SERVICES

2.1 Introduction

CTE, South, Inc. has prepared this report for MCP Industries, Inc. Presented herein are the results of the subsurface investigation performed as well as recommendations regarding the geotechnical engineering and dynamic loading criteria for the proposed construction.

The proposed project is understood to consist of commercial development. The locations and types of structures have not been determined and may consist of multiple story steel framed, concrete tilt-up, and wood framed construction on the order of four to five stories. The structures will be founded on shallow footings with slab-on-grade base floor. Construction will also include exterior flatwork, pavements, underground utilities, runoff mitigation measures and retaining walls.

2.2 Scope of Services

Our scope of services included:

- Review of readily available geologic and geotechnical literature pertinent to the site.
- Explorations to determine subsurface soil, rock, and groundwater conditions to the depths influenced by the proposed development.
- Laboratory testing of representative soil samples to provide data to evaluate the geotechnical design characteristics of the site foundation soils.
- Definition of the general geology and evaluation of potential geologic hazards at the site.
- Preparation of this report detailing the investigation performed and providing conclusions and geotechnical engineering recommendations for design and construction. Included in the report are site geology and hazards, seismic effects and design parameters, earthwork recommendations, foundation design parameters including lateral resistance, retaining wall design parameters, and pavement section recommendations.

3.0 SITE DESCRIPTION AND PROPOSED CONSTRUCTION

The site is located in the community of Temescal Valley, California, an unincorporated area of Riverside County. The site is comprised of five parcels with APN numbers 283-180-001, 283-180-002, 283-180-020, 283-180-021, and 283-280-020. The approximate geographic center of

the site has coordinates of 33.77398N and 117.49133W. The site area is approximately 28.8 acres. Site elevations range from approximately 1100 feet on the west to 1064 feet on the east. The three easterly parcels of the site are developed by structures for a clay products company, on a relatively level, graded pad. The two westerly parcels are undeveloped. The ground surface there is sparsely vegetated with brush and grasses, and slopes gently downward generally to the north-northeast. A natural drainage channel exists within the northwestern portion of the site. The site is bounded by Temescal Canyon Road to the east and Lawson Road to the west. Undeveloped parcels border the site to the north, and residential and vacant parcels border the site to the south. We understand that the existing structures at the site will be demolished.

4.0 FIELD AND LABORATORY INVESTIGATION

4.1 Field Investigation

Our field investigation was performed on August 10 and 16, 2018 and included 15 exploratory borings identified as B-1 thru B-15. The exploration locations are shown on Figure 2.

The explorations were excavated to investigate and obtain samples of the subsurface soils. The borings were excavated using a truck-mounted, eight-inch diameter, hollow-stem auger drill rig to a maximum explored depth of 51½ feet below the existing surface.

Soils encountered within the explorations were classified in the field in accordance with the Unified Soil Classification System. The field descriptions were later modified (as appropriate) based on the results of our laboratory-testing program. In general, soil samples were obtained at

5-foot intervals with standard split spoon (SPT and California Modified) samplers. Specifics of the soils encountered can be found in the Exploration Logs, which are presented in Appendix A.

4.2 Laboratory Analyses

Laboratory tests were conducted on representative soil samples to evaluate their physical properties and engineering characteristics. Specific laboratory tests included: maximum dry density and optimum moisture content, in-place moisture and density, "R" value, expansion index, direct shear, consolidation/swell, gradation, Atterberg limits, and chemical analyses. These tests were conducted to determine the material strengths, physical properties, and corrosivity of the on-site soils. Test method descriptions and laboratory results are presented in Appendix B.

5.0 GEOLOGY

5.1 General Physiographic Setting

Geomorphically, the subject site is situated on the westerly margin of the Perris structural block. The Perris structural block lies within the Peninsular Ranges Geomorphic Province and is a relatively stable, rectangular area located between the Elsinore and San Jacinto fault zones. These faults are major components of the San Andreas Fault system which consists of a series of *en echelon* northwest-striking right-lateral faults and pull-apart basins. The Perris block consists of phyllite, schist, and gneiss of Mesozoic- to possible Paleozoic-age meta-sedimentary rocks intruded by plutonic rocks of the Cretaceous-age Peninsular Ranges batholith. Tertiary-age sediments, Miocene-age volcanics, and Quaternary-age sediments unconformably cap the older Mesozoic-age rocks in this portion of the Perris block.

5.2 Site Geologic Conditions

Based on our investigation and geologic mapping (Morton et al, 2001), the site is underlain by old alluvial fan deposits (Qof) of middle to late Pleistocene Age. Below is a brief description of the materials encountered during the investigation. More detailed descriptions are provided in the Exploration Logs in Appendix A.

5.2.1 Artificial Fill (Qaf)

Undocumented fill encountered at Boring locations B-7, B-10, and B-14 was observed to be on the order of 2 to 5 feet thick and consists of Clayey Sand, with gravel in a loose to medium dense condition. Undocumented fill, on the order of 2 ½ feet, was observed at boring location B-13, located outside of the clay plant on the western edge. Materials observed consisted of organics, block, pipe fragments, and clay fines from the clay products building.

Stockpiled soil material, located on Parcel APN 283-280-020, was observed to be on the order of 5 to 6 feet high and covers a significant portion of this parcel. Observations of the drainage on the northwest side of the parcel indicate that undocumented fill may be on the order of 10 feet in depth. These soils are considered unsuitable for the support of structures in their present condition.

5.2.2 Old Alluvial Fan Deposits (Qof)

Old alluvial fan deposits, locally underlie the artificial fill, but were typically encountered in the borings from the existing ground surface to the maximum explored of 51½ feet. The materials, in general, were found to consist of interbedded layers of silty and clayey sand, with gravel in a loose to dense, and dry to moist condition. Qof was observed to unconformably overlie the Silverado formation at Boring at B-1.

5.2.3 Silverado Formation (Tsi)

The Silverado formation was encountered in boring location B-1 at a depth of approximately 35 feet, and consisted of red brown lean clay and sandy lean clay in a stiff to hard condition and clayey sand with gravel in a dense and moist condition.

5.3 Groundwater Conditions

Groundwater was not encountered in the borings. Groundwater levels will likely fluctuate during periods of high precipitation. Groundwater is not expected to impact the proposed development, although grading or construction could be adversely affected if performed during or following periods of wet weather.

5.4 Geologic Hazards

From our investigation, it appears that geologic hazards at the site are limited primarily to those caused by strong shaking from earthquake-generated ground motions. Presented here are the geologic hazards that are considered for potential impacts to site development.

5.4.1 Surface Fault Rupture

As defined by the California Geological Survey, an active fault is one that has had surface displacement within the Holocene Epoch (roughly the last 11,000 years). This definition is used in delineating Earthquake Fault Zones as mandated by the Alquist-Priolo Special Studies Zones Act of 1972 and revised in 1994 as the Alquist-Priolo Earthquake Fault Zoning Act. The name Special Studies Zones was changed to Earthquake Fault Zones as a result of a 1993 amendment. Special Publication - 42 was most recently revised in 2007 and is subject to periodic amendments. The intent of this

act is to require fault investigations on sites located within Earthquake Fault Zones to preclude the construction of structures for human occupancy across the trace of an active fault.

The western portion of the site (specifically parcel APN 283-280-020 and a portion of APN 283-180-001) is located within an Alquist-Priolo Earthquake Fault Study Zone and a County of Riverside Fault Study Zone. A fault study is being performed to evaluate the potential for surface fault rupture and results will be presented in a separate report.

5.4.2 Local and Regional Faulting

The California Geological Survey broadly groups faults as "Class A" or "Class B" (Cao et al, 2003). Class A faults are identified based upon relatively well-defined paleoseismic activity, and a fault slip rate of more than 5 millimeters per year (mm/yr). In contrast Class B faults have comparatively less defined paleoseismic activity and are considered to have a fault slip rate less than 5 mm/yr. The following Table 1 presents the ten nearest active faults to the site and includes magnitude and fault classification.

TABLE 1
NEAR SITE FAULT PARAMETERS

FAULT NAME	APPROXIMATE DISTANCE FROM SITE (mi)	MAXIMUM EARTHQUAKE MAGNITUDE	CLASSIFICATION
Elsinore-Glen Ivy	0	6.8	A
Chino-Central Ave. (Elsinore)	6.3	6.7	B
Whittier	10.2	6.8	A
Elsinore-Temecula	12.4	6.8	A
San Jacinto-San Bernardino	21.8	6.7	A
San Jacinto-San Jacinto Valley	22.3	6.9	A
Elysian Park Thrust	24.9	6.7	B
Newport-Inglewood (L.A. Basin)	25.5	7.1	B
Compton Thrust	26.1	6.4	B
Sierra Madre	27.5	7.1	B

A regional fault activity map is presented on Figure 3.

5.4.3 Liquefaction Evaluation

Liquefaction occurs when saturated fine sands, silts or low plasticity clays lose their physical strength during earthquake-induced shaking and behave as a liquid. This is due to loss of point-to-point grain contact and transfer of normal stress to the pore water. Liquefaction potential varies with groundwater level, soil type, material gradation, relative density, and the intensity and duration of ground shaking.

Based on the absence of groundwater within the top fifty feet of the site soil profile, the potential for liquefaction of site soils is considered very low.

5.4.4 Seismic Settlement Evaluation

Seismic settlement (dynamic densification) occurs when loose to medium dense granular soils densify during seismic events The underlying site materials consisted predominantly of loose to dense silty clayey sand with gravel, and silty sand with gravel and clay. To evaluate potential for seismic settlement, a quantitative analysis was performed using the computer program LiquefyPro (CivilTech, 2006) and the data obtained from the boring logs. Two borings, B-1 and B-14, were used in the evaluation to determine potential differential settlement. A peak ground acceleration of 0.895g and earthquake magnitude of 6.8 were used. The output files for the analyses are presented in Appendix C. The analysis has estimated total seismically-induced settlement of approximately 2.76 to 4.35 inches near Boring B-14 and Boring B-1, respectively. Seismically-induced differential settlement will be approximately 1.6 inches.

Near surface loose, collapsible and disturbed materials present on the site will be mitigated through removal and replacement as compacted fill, as recommended herein, in order to facilitate the proposed construction. Therefore, in our opinion, the potential for seismic settlement of these materials is considered low.

5.4.5 Compressible and Expansive Soils

Based on laboratory testing, the soils within the upper six to eight feet of the ground surface are potentially collapsible. Fill encountered at the site is generally considered to be compressible under the proposed loading conditions. Surficial soils were also found to be locally disturbed and weathered. Therefore, it is recommended that the fill, disturbed soils and collapsible soils be over-excavated, processed and compacted. Based on the investigation data, underlying dense native material is not considered to be subject to significant compressibility under the proposed loads.

Based on geologic observation and laboratory testing, the near-surface materials at the site are anticipated to exhibit a very low expansion potential (Expansion Index of less than 20). Therefore, the recommendations provided herein are based upon the anticipated very low expansion potential of the site soils encountered. Additional evaluation of soil expansion potential should be conducted during grading and upon completion of rough grading and building pad construction.

5.4.6 Tsunami and Seiche Evaluation

Due to site elevation and distance from the Pacific Ocean, the site is not considered to be subject to damage from tsunamis. Based on the absence of large bodies of water in the area, seiche (oscillatory waves in standing bodies of water) damage is also not expected.

5.4.7 Landsliding

No features typically associated with landsliding were noted during the site investigation. In the reference review, no evidence of landslides was found to have occurred within the

area of the site. Therefore, the potential for landsliding to affect the site is considered very low.

5.4.8 Flood Zones

Based on Federal Emergency Management Agency flood zone map (FEMA, 2008), site improvement areas are located in an "Area of Minimal Flood Hazard." Therefore, the chance of flooding at the site is considered low.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 General

Based on our investigation, the proposed construction on the site is feasible from a geotechnical standpoint, provided the recommendations in this report are incorporated into design and construction of the project. Preliminary recommendations for the design and construction of the proposed development are included in the subsequent sections of this report. Additional recommendations could be required based on the actual conditions encountered during earthwork and/or improvement construction. Recommendations presented herein are based on foundation soil with a low expansion potential.

6.2 Site Preparation

6.2.1 General

Prior to grading, the site should be cleared of existing debris, factory residue and deleterious materials. Foundations and buried utilities from existing structures on the site

should be removed and replaced with compacted fill. In areas to receive structures or distress-sensitive improvements, expansive, surficial eroded, desiccated, burrowed, or otherwise loose or disturbed soils should be removed to the depth of competent material. Organic and other deleterious materials not suitable for use as structural backfill should be disposed of offsite at a legal disposal site.

6.2.2 Remedial Grading and Excavations

Due to the presence of disturbed and collapsible soils encountered in the upper approximately 8 feet of the explorations, remedial grading will be required. Where new construction is planned, the site should be excavated to a depth 8 or more feet below existing grade or finish grade, whichever is deeper. The soils exposed at the bottom of the over-excavations should be documented by a geotechnical representative of this office to determine their suitability.

Temporary, unsurcharged excavations up to four feet deep may be cut vertically. Deeper excavations should be sloped back or shored. Temporary sloped excavations should be cut at a slope of 1:1 (horizontal:vertical) or flatter. Permanent slopes should be no steeper than 2:1. Vehicles and storage loads should not be placed within 10 feet of the top of the excavation. If temporary slopes are to be maintained during the rainy season, berms are recommended along the tops of slopes to divert runoff water from entering the excavation and eroding the slope faces.

6.2.3 Preparation of Areas to Receive Fill

Exposed excavation bottoms and subgrade surfaces to receive fill should be scarified to a minimum depth of 12 inches, brought to 2 percent or more above optimum moisture

content and compacted to at least 90 percent of the maximum dry density as determined by ASTM D 1557.

6.2.4 Fill Placement and Compaction

Structural fill and backfill should be compacted to at least 90 percent of the maximum dry density (as determined by ASTM D 1557) at moisture content 2 percent or more above optimum. The upper 12-inches of pavement subgrade should be compacted to at least 95 percent of the maximum dry density (per ASTM D 1557). The optimum lift thickness for fill soils will be dependent on the type of compaction equipment being utilized. Generally, fill should be placed in uniform horizontal lifts not exceeding 8 inches in loose thickness. Placement and compaction of fill should be performed in general conformance with geotechnical recommendations and local ordinances.

Soils generated from on-site excavations are anticipated to be suitable for use as structural fill, provided they are free from deleterious material. Rocks or other soil fragments greater than four inches in size should not be used in the fills. Proposed import material should be evaluated by the project geotechnical engineer prior to being placed at the site. Import materials should consist of non-corrosive, granular material with an expansion index less than 20.

6.2.5 Utility Trenches

Utility trenches should be excavated in accordance with the recommendations presented in Section 6.2.2. Backfill should be placed in loose lifts no greater than eight inches and

mechanically compacted to a relative compaction of at least 90 percent of the maximum dry density (per ASTM D 1557) at a moisture content 2 or more percent above optimum.

6.3 Foundations and Slab Recommendations

6.3.1 General

Foundations and slabs for the proposed structures should be designed in accordance with structural considerations and the following minimum preliminary geotechnical recommendations. Foundations are expected to be supported in properly compacted fill materials. These recommendations assume that the fill soils will have a very low expansion potential (Expansion Index < 20).

6.3.2 Shallow Foundations

Following site grading, it is our opinion that the use of isolated and continuous footings will be geotechnically suitable for this project. We recommend that continuous footings be constructed following the criteria presented in Table 2 below. The values presented are CBC minimums. The structural engineer should provide footing dimensions and reinforcement based on the foundation design values presented in this report.

TABLE 2
MINIMUM FOOTING WIDTH AND EMBEDMENT DEPTH

NUMBER OF FLOORS SUPPORTED BY THE FOOTING	MINIMUM WIDTH OF FOOTING(inches)	MINIMUM DEPTH OF FOOTING BELOW LOWEST ADJACENT SUBGRADE (inches)
1	12	18
2	15	18
3	18	18

Isolated footings should be a minimum of 24 inches in dimension and founded at least 18 inches below lowest adjacent rough grade elevation or top of slab.

Foundation dimensions should be based on an allowable bearing pressure of 2,000 pounds per square foot (psf) for the minimum footing dimensions noted above. The allowable bearing value may be increased by one-third for short-duration loading which includes the effects of wind or seismic forces.

Footing reinforcement within continuous footings should consist of a minimum of four number 4 bars, two located at the top of the footing and two located at the bottom. This minimum reinforcement is due to geotechnical conditions and is not to be used in lieu of that needed for structural considerations. Reinforcement for isolated footings should be determined by the structural engineer. Garage door grade beams should be at least 12 inches deep and reinforced as above.

Lateral loads for structures supported on spread footings may be resisted by soil friction and by the passive resistance of the soils. A coefficient of friction of 0.30 may be used between foundations or the floor slabs and the supporting soils. The allowable passive resistance of the soils may be assumed equal to the pressure developed by a fluid with a density of 250 pounds per square foot/foot. A one-third increase in the passive value may be used for wind or seismic loads. The frictional resistance and the passive resistance may be combined without reduction in determining the total lateral resistance.

6.3.3 Settlement of Shallow Foundations

We have analyzed settlement potential during construction and for long-term performance. Construction settlement is expected to occur as loads are applied and structures are brought to their operational weight. Long-term settlement is expected to occur over time as a result of compression of wetted or partially saturated soil. Anticipated settlements are related to an applied bearing pressure of 2,000 psf.

It is anticipated that shallow foundations designed and constructed as recommended will experience maximum total settlement of 1 inch or less and differential static settlement of 1/2 inch or less over a distance of 40 feet or more.

6.3.4 Concrete Slabs-On-Grade

Concrete slabs-on-grade should be designed for the anticipated loading. Lightly loaded concrete slabs should measure a minimum of 4.5 inches thick and be reinforced with a minimum of number 3 reinforcing bars placed on 18-inch centers, each way at mid-slab height. A modulus of subgrade reaction of 125 pci may be used for elastic design. Concrete slabs subjected to heavier loads may require thicker slab sections and/or increased reinforcement as per the project structural engineer. The correct placement of the reinforcement in the slab is vital for satisfactory performance under normal conditions. The floor slab and foundations should generally be tied together by extending the slab reinforcement into the footings, or as recommended by the structural engineer.

In areas to receive moisture-sensitive floor covering or used to store moisture-sensitive materials, a polyethylene or visqueen moisture vapor retarder (10-mil or thicker) should

be placed beneath the slab. A 4-inch layer of crushed stone should underlie the moisture vapor retarder. To protect the membrane during steel and concrete placement, a maximum two-inch layer of similar material may be placed over the moisture vapor retarder.

As an alternative, a post-tensioned slab may be constructed. Based on our analysis, the following design recommendations may be used:

Allowable Bearing Capacity- 2,000 psf

Building Pad Over-excavation- 8 feet

Friction Coefficient- 0.3

Lateral Load Resistance- 250 pcf

Modulus of Subgrade Reaction- 125 pci (uncorrected)

The following Table 3 presents our recommendations for a post-tensioned slab based on the methods of the Post Tensioning Institute:

Table 3 Post-Tension Recommendations		
Expansion Index		Low to Medium
Assumed Percent Clay		50
Clay Type		Montmorillonite
Approximate Depth of Constant Suction (feet)		7.0
Approximate Soil Suction (pF)		3.6
Approximate Velocity or Moisture Flow (Inches per Month)		0.7
Thornwaite Index		-20
Average Edge Moisture Variation Depth, em (Feet)	Center Lift	5.3
	Edge Lift	2.5
Anticipated Swell, ym (Inches)	Center Lift	3.2
	Edge Lift	0.8

It is recommended that a water-cement ratio of 0.5 or less be used for concrete, and that the slab be moist-cured for at least five days in accordance with methods recommended by the American Concrete Institute. On-site quality control should be used to confirm the design conditions.

6.3.5 Pipe Bedding and Thrust Blocks

We recommend that pipes be supported on a minimum of 6 inches of sand, gravel, or crushed rock. The pipe bedding material should be placed around the pipe, without

voids, and to an elevation of at least 12 inches above the top of the pipe. The pipe bedding material should be compacted in accordance with the recommendations in the earthwork section of this report.

Thrust forces may be resisted by thrust blocks and/or the friction between the pipe and adjacent soil. Thrust blocks may be designed using a passive resistance equal to the pressure developed by a fluid with a density of 250 pounds per cubic foot.

6.4 Seismic Design Criteria

The seismic ground motion values listed in the Table 4 below were derived in accordance with the ASCE 7-10 Standard. This was accomplished by establishing the Site Class based on the soil properties at the site, and then calculating the site coefficients and parameters using the United States Geological Survey Seismic Design Maps application. These values are intended for the design of structures to resist the effects of earthquake ground motions for the site coordinates 33.77398°N and 117.49133°W, as underlain by soils corresponding to Site Class D.

TABLE 4
SEISMIC GROUND MOTION VALUES

PARAMETER	VALUE	CBC REFERENCE (2016)
Site Class	D	ASCE 7, Chapter 20
Mapped Spectral Response Acceleration Parameter, S_S	2.315g	Figure 1613.3.1 (1)
Mapped Spectral Response Acceleration Parameter, S_1	0.913g	Figure 1613.3.1 (2)
Seismic Coefficient, F_a	1.000	Table 1613.3.3 (1)
Seismic Coefficient, F_v	1.500	Table 1613.3.3 (2)
MCE Spectral Response Acceleration Parameter, S_{MS}	2.315g	Section 1613.3.3
MCE Spectral Response Acceleration Parameter, S_{M1}	1.370g	Section 1613.3.3
Design Spectral Response Acceleration Parameter, S_{DS}	1.543g	Section 1613.3.4
Design Spectral Response Acceleration Parameter, S_{D1}	0.913g	Section 1613.3.4
Peak Ground Acceleration, PGA_M	0.895g	ASCE 7, Equation 11.8-1
Seismic Design Category	E	ASCE 7, Chapter 11

6.5 Vehicular Pavements

Pavement sections were evaluated using a design 'R' value of 10, correlating to a modulus of subgrade reaction of approximately 125 pci for site subgrade soil. The pavement section recommendations are based on the assumption that the subgrade soil (the top 12-inches minimum) will be compacted to a minimum of 95 percent of the maximum dry density (per ASTM D 1557).

If concrete pavement is used, it should have a minimum modulus of rupture (flexural strength) of 600 psi. We estimate that a 4,500 psi 28-day compressive strength concrete would generally provide the minimum required flexural strength; however, other mix designs could also meet the

requirements. As such, we recommend that the contractor submit the proposed mix design with necessary documentation to offer a proper level of confidence in the proposed concrete materials. Recommended concrete pavement sections are presented below in Table 5.

TABLE 5

PORTLAND CEMENT CONCRETE (PCC) PAVEMENT SECTION

Traffic Area	Assumed Traffic Index	Design Modulus of Subgrade Reaction (pci)	PCC Thickness (inches)
Parking Lots	5.0	125	6
Drive Lanes	6.0	125	6

An unreinforced pavement with the minimum thickness indicated above should generally be constructed with maximum joint spacing of 24 times the pavement thickness, in both directions, and in nearly square patterns. As an alternative, the concrete pavement could be constructed with typical minimal reinforcement consisting of #4 bars at 18 inches, on-center, both ways, at or above mid-slab height and with proper concrete cover.

Recommended asphalt concrete pavement sections are presented below in Table 6.

TABLE 6

PRELIMINARY ASPHALT CONCRETE (AC) PAVEMENT SECTIONS

Traffic Area	Assumed Traffic Index	Design 'R' Value	AC Thickness (inches)	Aggregate Base Thickness* (inches)
Parking Lots	5.0	10	3	9.0
Drive Lanes	6.0	10	3	12-1/2

* Minimum R Value of 78.

In addition, it is recommended that pavement areas conform to the following criteria:

- Placement and construction of the recommended pavement section should be performed in accordance with the Standard Specifications for Public Works Construction (Greenbook, latest edition).
- Aggregate base should conform to the specification for Caltrans Class 2 Aggregate Base (Caltrans, 2015) or Greenbook Crushed Aggregate Base.
- Pavement sections are prepared assuming that periodic maintenance will be done, including sealing of cracks and other measures.

6.6 Retaining Walls

If retaining walls are proposed, the following recommendations should be incorporated into design and construction. For the design of walls where the surface of the backfill is level, it may be assumed that the on-site sandy soils will exert an active lateral pressure equal to that developed by a fluid with a density of 40 pounds per cubic foot (pcf). The active pressure should be used for walls free to yield at the top at least 0.2 percent of the wall height. For walls restrained at the top so that such movement is not permitted, a pressure corresponding to an equivalent fluid density of 60 pcf should be used, based on at-rest soil conditions. These

pressures should be increased by 20 pcf for walls retaining soils inclined at 2:1 (horizontal:vertical).

For cantilever retaining walls (yielding walls) 6 feet or more in height, lateral pressures due to earthquake motions may be calculated based on work by Seed and Whitman (1970). The total lateral thrust against a properly drained and backfilled cantilever retaining wall above the groundwater level can be expressed as:

$$P_{AE} = P_A + \Delta P_{AE}$$

For non-yielding (or "restrained") walls, the total lateral thrust may be similarly calculated based on work by Wood (1973):

$$P_{KE} = P_K + \Delta P_{KE}$$

Where:

P_A = Static Active Thrust

P_K = Static Restrained Wall Thrust

ΔP_{AE} = Dynamic Active Thrust Increment = $(3/8)\ k_h\ \gamma H^2$

ΔP_{KE} = Dynamic Restrained Thrust Increment = $k_h\ \gamma H^2$

k_h = 2/3 Peak Ground Acceleration =2/3 (PGA_M) = 0.60g

H = Total Height of the Wall

γ = Total Unit Weight of Soil ≈ 135 pounds per cubic foot

The increment of dynamic thrust in both cases should be distributed as an inverted triangle, with a resultant located at 0.6H above the bottom of the wall.

Recommendations for waterproofing the walls to reduce moisture infiltration should be provided by the project architect or structural engineer.

We recommend that walls be backfilled with soil having an expansion index of 20 or less with less than 30 percent passing the #200 sieve. The backfill area should include the zone defined by a 1:1 sloping plane, extended back from the base of the wall footing. Wall backfill should be compacted to at least 90 percent relative compaction, based on ASTM D 1557. Backfill should not be placed until walls have achieved adequate structural strength. Heavy compaction equipment, which could cause distress to walls, should not be used.

The recommended lateral earth pressures presented herein assume that drainage will be provided behind the walls to prevent the accumulation of hydrostatic pressures. A backdrain system (similar to that shown on Figure 4) should be provided to reduce the potential for the accumulation of hydrostatic pressures.

6.7 Corrosive Soils

Sulfate-containing solutions or soil can have a deleterious effect on the in-service performance of concrete. In order to evaluate the foundation environment, representative samples of site soils were laboratory tested for pH, resistivity, soluble sulfate and chloride. The results of the tests are summarized below in Table 7.

TABLE 7
SUMMARY OF CHEMICAL ANALYSES

Sample Location	pH	Resistivity (ohm-cm)	Sulfate (mg/kg)	Chloride (mg/kg)
B-5 @ 0-3 ft.	5.4	7,000	ND*	ND*
B-9 @ 5-10 feet	6.0	2,600	21	9.2

*ND – Not Detected

Based on ACI 18 Building Code and Commentary Table 4.3.1, a sulfate exposure of 21 mg/kg considered *negligible*. We recommend that Type V cement be used. We further recommend that at least a 3-inch thick concrete cover be maintained over the reinforcing steel in concrete in contact with the soil.

Based on the results of the resistivity tests, site soil appears to be *moderately corrosive* to ferrous metals. We recommend plastic pipes be used. CTE does not practice in the field of corrosion engineering. Therefore, a corrosion engineer could be consulted to determine the appropriate protection for metallic improvements in contact with site soils.

6.8 Exterior Flatwork

Exterior concrete flatwork should have a minimum thickness of 4.5 inches, unless otherwise specified by the project architect. To reduce the potential for distress to exterior flatwork caused by minor settlement of foundation soils, we recommend that such flatwork be installed with

crack-control joints at appropriate spacing as recommended by the structural engineer. Flatwork, such as driveways, sidewalks, and architectural features, should be installed with crack control joints. Extra reinforcement is recommended at re-entrant corners and driveways. Subgrade should be prepared in accordance with the earthwork recommendations provided herein. Positive drainage should be established and maintained adjacent to all flatwork as per the recommendations of the project civil engineer of record.

6.9 Drainage

Positive drainage should be established around site structures and is defined as drainage away from structures and improvements as recommended by the project civil engineer of record. To facilitate this, the proper use of construction elements such as roof drains and gutters, downspouts, earthen and/or concrete swales, slopes, external slabs-on-grade, and sub-drains may be employed. The project civil engineer should thoroughly evaluate the on-site drainage and make provisions as necessary to keep surface water from entering structural areas.

6.10 Plan Review

CTE should be authorized to review project grading and foundation plans and the project specifications before the start of earthwork to identify potential conflicts with the recommendations contained in this report.

7.0 LIMITATIONS

The recommendations provided in this report are based on the anticipated construction and the subsurface conditions found in our explorations. The interpolated subsurface conditions should be checked in the field during construction to document that conditions are as anticipated.

Recommendations provided in this report are based on the understanding and assumption that CTE will provide the observation and testing services for the project. Earthwork should be observed and tested to document that grading activity has been performed according to the recommendations contained within this report. The project geotechnical engineer should evaluate footing excavations prior to placement of reinforcing steel.

The field evaluation, laboratory testing and geotechnical analysis presented in this report have been conducted according to current engineering practice and the standard of care exercised by reputable geotechnical consultants performing similar tasks in this area. No other warranty, expressed or implied, is made regarding the conclusions, recommendations and opinions expressed in this report. Variations may exist and conditions not observed or described in this report may be encountered during construction.

This report is applicable to the site for a period of three years after the issue date provided the project remains as described herein. Modifications to the standard of practice and regulatory requirements may necessitate an update to this report prior to the three years from issue.

Our conclusions and recommendations are based on an analysis of the observed conditions. If conditions different from those described in this report are encountered, our office should be notified and additional recommendations, if required, will be provided upon request. CTE

should review project specifications for all earthwork, foundation, and shoring-related activities prior to the solicitation of construction bids.

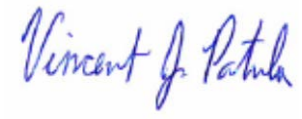
We appreciate this opportunity to be of service on this project. If you have any questions regarding this report, please do not hesitate to contact the undersigned

Respectfully submitted,
Construction Testing & Engineering, Inc.





Clifford A. Craft, GE #243
Senior Geotechnical Engineer



Vincent J. Patula, CEG #2057
Senior Engineering Geologist



Robert L. Ellerbusch
Staff Geologist



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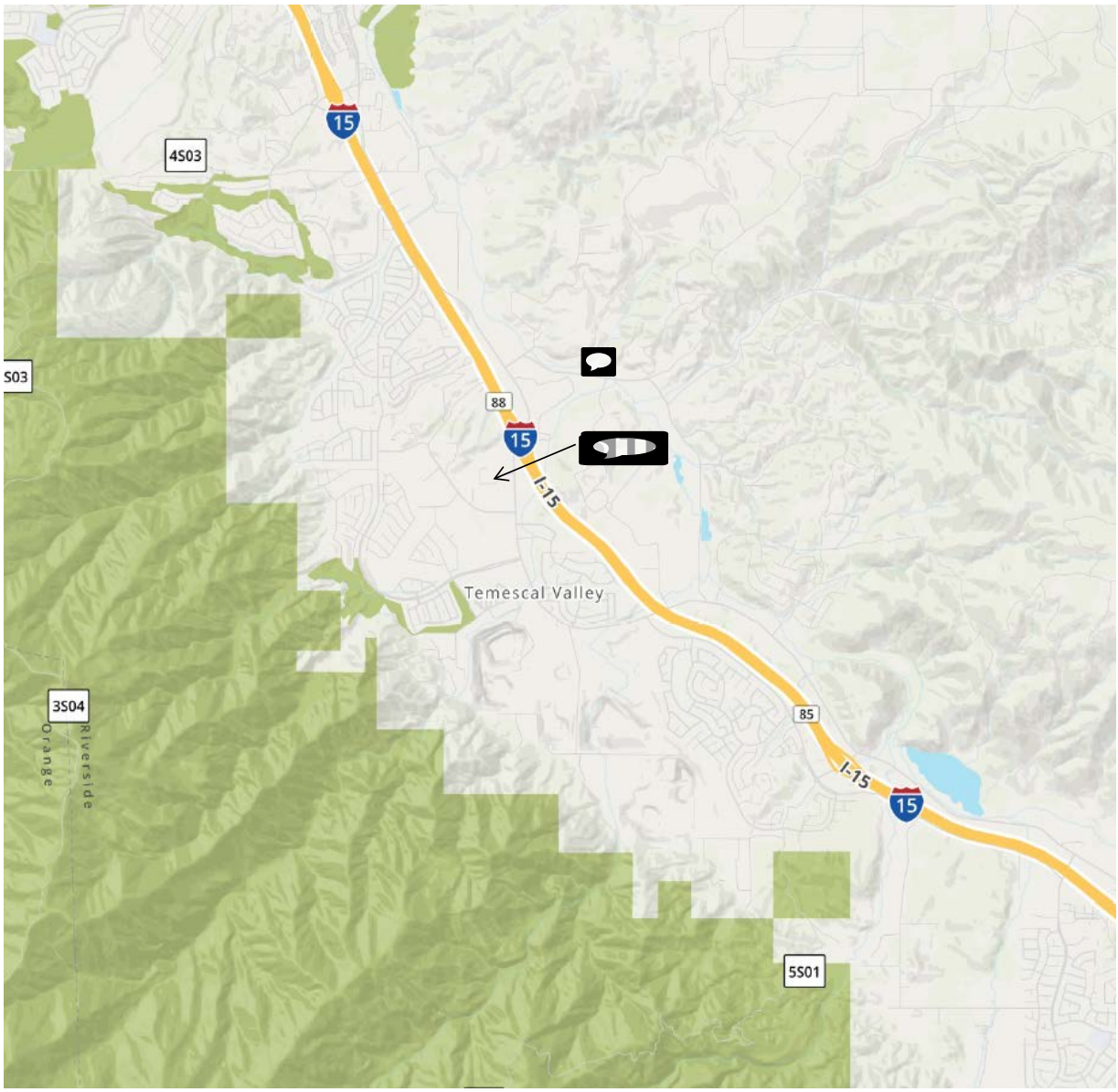
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NORTH

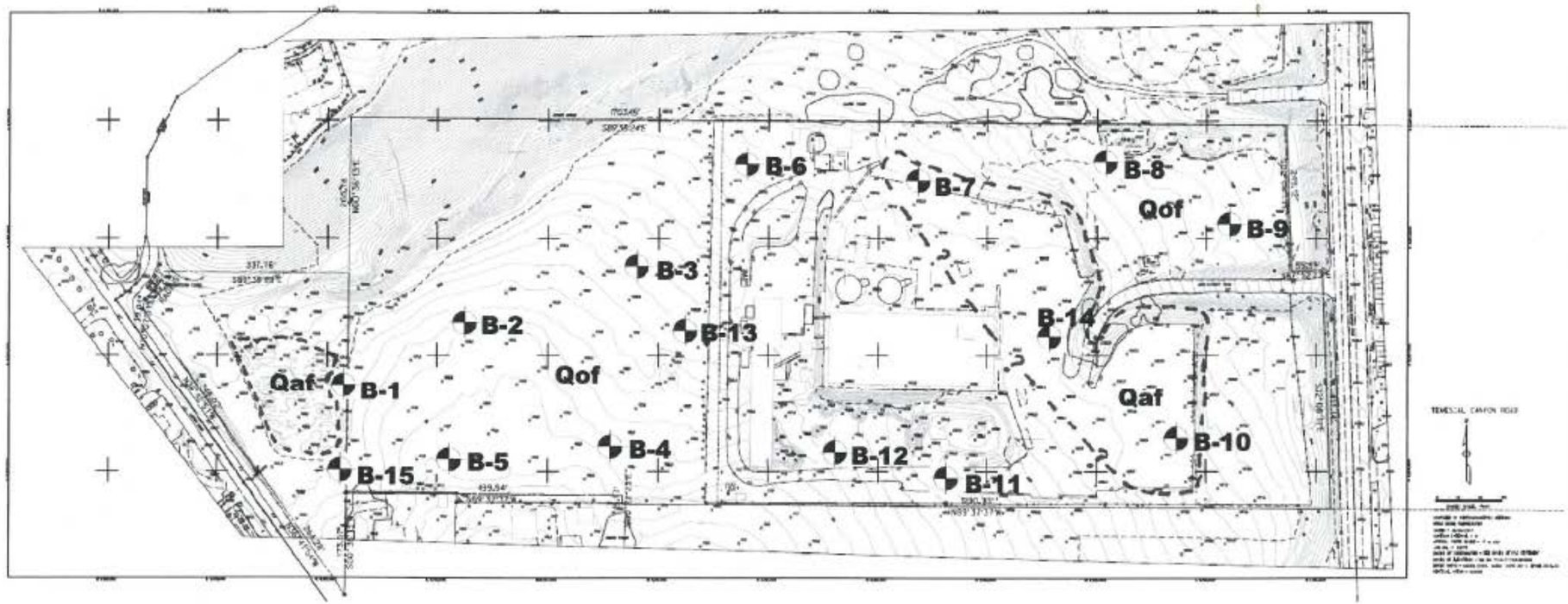
NO SCALE

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SITE LOCATION MAP

PROPOSED COMMERCIAL DEVELOPMENT
TEMESCAL CANYON ROAD, TEMESCAL VALLEY, CA

Job No.	Date	Figure
40-3639G	OCT 2018	1



GEOTECHNICAL LEGEND

B-1 Approximate Boring Location

Qaf Quaternary Artificial Fill

Qof Quaternary Old Alluvial Fan Deposits

- - - ? - - - Approximate Geologic Contact (queried where uncertain)

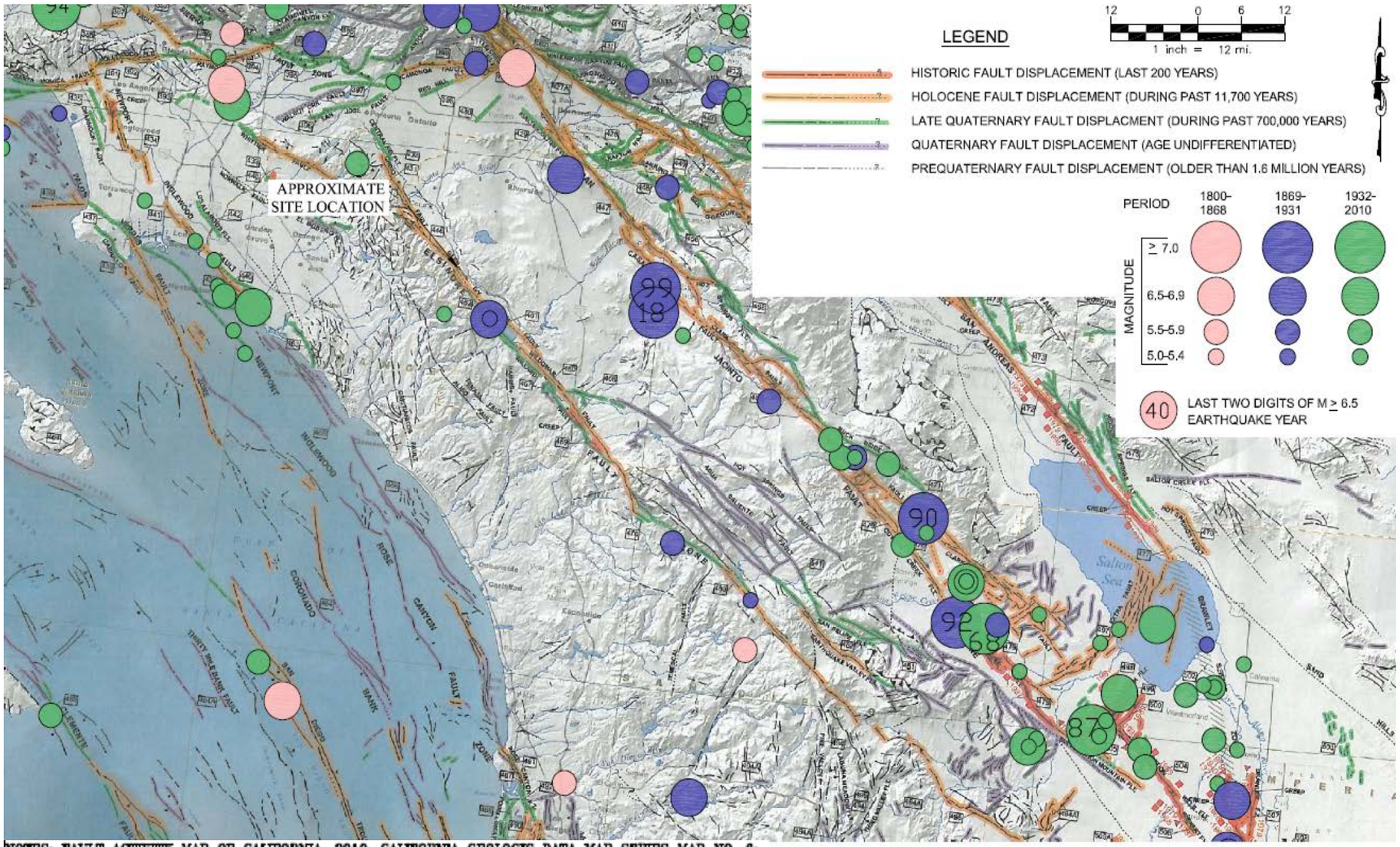
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SITE GEOLOGIC & EXPLORATION LOCATION MAP

PROPOSED COMMERCIAL DEVELOPMENT
TEMESCAL CANYON ROAD, TEMESCAL VALLEY, CA

Job No.	Date	Figure
40-3639G	OCT 2018	2



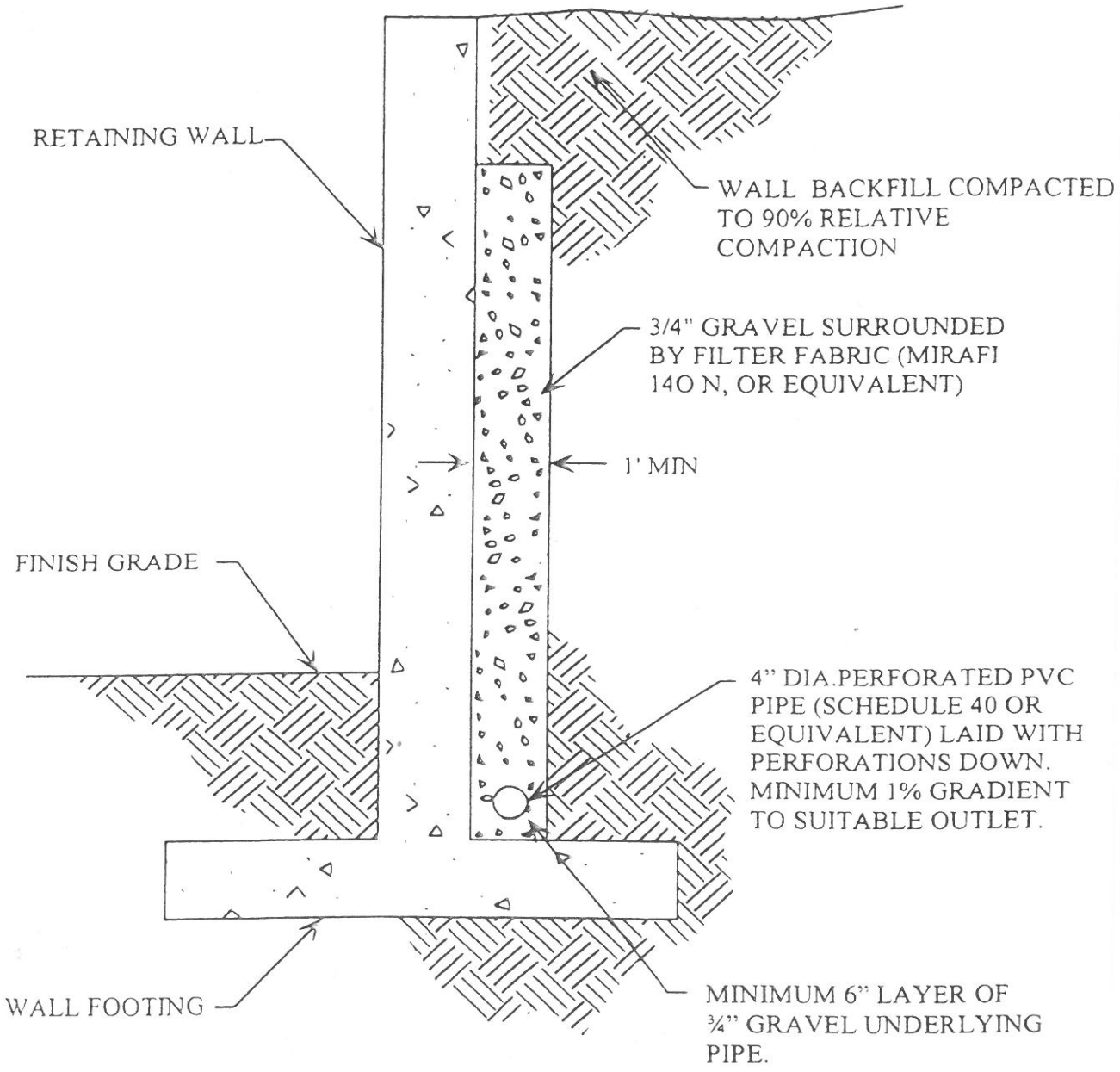
NOTES: FAULT ACTIVITY MAP OF CALIFORNIA, 2010, CALIFORNIA GEOLOGIC DATA MAP SERIES MAP NO. 6;
EPICENTERS OF AND AREAS DAMAGED BY M>5 CALIFORNIA EARTHQUAKES, 1800–1999 ADAPTED AFTER TOPPOZADA, BRANUM, PETERSEN, HALLSTORM, CRAMER, AND REICHLE, 2000, CDMG MAP SHEET 49
REFERENCE FOR ADDITIONAL EXPLANATION; MODIFIED WITH CISN AND USGS SEISMIC MAPS

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REGIONAL FAULT ACTIVITY MAP

PROPOSED COMMERCIAL DEVELOPMENT
TEMESCAL CANYON ROAD, TEMESCAL VALLEY, CA

Job No.	Date	Figure
40-3639G	OCT 2018	3



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RETAINING WALL DRAIN DETAIL

PROPOSED COMMERCIAL DEVELOPMENT
TEMESCAL CANYON ROAD, TEMESCAL VALLEY, CA

Job No.	Date	Figure
40-3639G	OCT 2018	4

APPENDIX A

FIELD EXPLORATION METHODS AND EXPLORATION LOGS

APPENDIX A

FIELD EXPLORATION METHODS AND EXPLORATION LOGS

Soil Boring Methods

Relatively "Undisturbed" Soil Samples

Relatively "undisturbed" soil samples were collected using a modified California-drive sampler (2.4-inch inside diameter, 3-inch outside diameter) lined with sample rings. Drive sampling was conducted in general accordance with ASTM D-3550. The steel sampler was driven into the bottom of the borehole with successive drops of a 140-pound weight falling 30-inches. Blow counts (N) required for sampler penetration are shown on the boring logs in the column "Blows/Foot." The soil was retained in brass rings (2.4 inches in diameter, 1.0 inch in height) and sealed in waterproof plastic containers for shipment to the CTE, South, Inc. geotechnical laboratory.

Disturbed Soil Sampling

Bulk soil samples were collected for laboratory analysis using two methods. Standard Penetration Tests (SPT) were performed according to ASTM D-1586 at selected depths in the borings using a standard (1.4-inches inside diameter, 2-inches outside diameter) split-barrel sampler. The steel sampler was driven into the bottom of the borehole with successive drops of a 140-pound weight falling 30-inches. Blow counts (N) required for sampler penetration are shown on the boring logs in the column "Blows/Foot." Samples collected in this manner were placed in sealed plastic bags. Bulk soil samples of the drill cuttings were also collected in large plastic bags. The disturbed soil samples were returned to the CTE, South, Inc. geotechnical laboratory for analysis.

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DEFINITION OF TERMS

PRIMARY DIVISIONS			SYMBOLS	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	**GRAVELS** MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS < 5% FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES LITTLE OR NO FINES
			GP	POORLY GRADED GRAVELS OR GRAVEL SAND MIXTURES, LITTLE OF NO FINES
		GRAVELS WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, NON-PLASTIC FINES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, PLASTIC FINES
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS < 5% FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTURES, NON-PLASTIC FINES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES, PLASTIC FINES
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	**SILTS AND CLAYS** LIQUID LIMIT IS LESS THAN 50		ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, SLIGHTLY PLASTIC CLAYEY SILTS
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY, SANDY, SILTS OR LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTY CLAYS
HIGHLY ORGANIC SOILS			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS

GRAIN SIZES

BOULDERS	COBBLES	GRAVEL		SAND			SILTS AND CLAYS
		COARSE	FINE	COARSE	MEDIUM	FINE	

12" 3" 3/4" 4 10 40 200

CLEAR SQUARE SIEVE OPENING U.S. STANDARD SIEVE SIZE

ADDITIONAL TESTS

(OTHER THAN TEST PIT AND BORING LOG COLUMN HEADINGS)

MAX- Maximum Dry Density
GS- Grain Size Distribution
SE- Sand Equivalent
EI- Expansion Index
CHM- Sulfate and Chloride Content , pH, Resistivity
COR - Corrosivity
SD- Sample Disturbed
PM- Permeability
SG- Specific Gravity
HA- Hydrometer Analysis
AL- Atterberg Limits
RV- R-Value
CN- Consolidation
CP- Collapse Potential
HC- Hydrocollapse
RDS- Remolded Direct Shear
PP- Pocket Penetrometer
WA- Wash Analysis
DS- Direct Shear
UC- Unconfined Compression
MD- Moisture/Density
M- Moisture
SC- Swell Compression
OI- Organic Impurities

FIGURE: BL1

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PROJECT:	DRILLER:	SHEET: of
CTE JOB NO:	DRILL METHOD:	DRILLING DATE:
LOGGED BY:	SAMPLE METHOD:	ELEVATION:

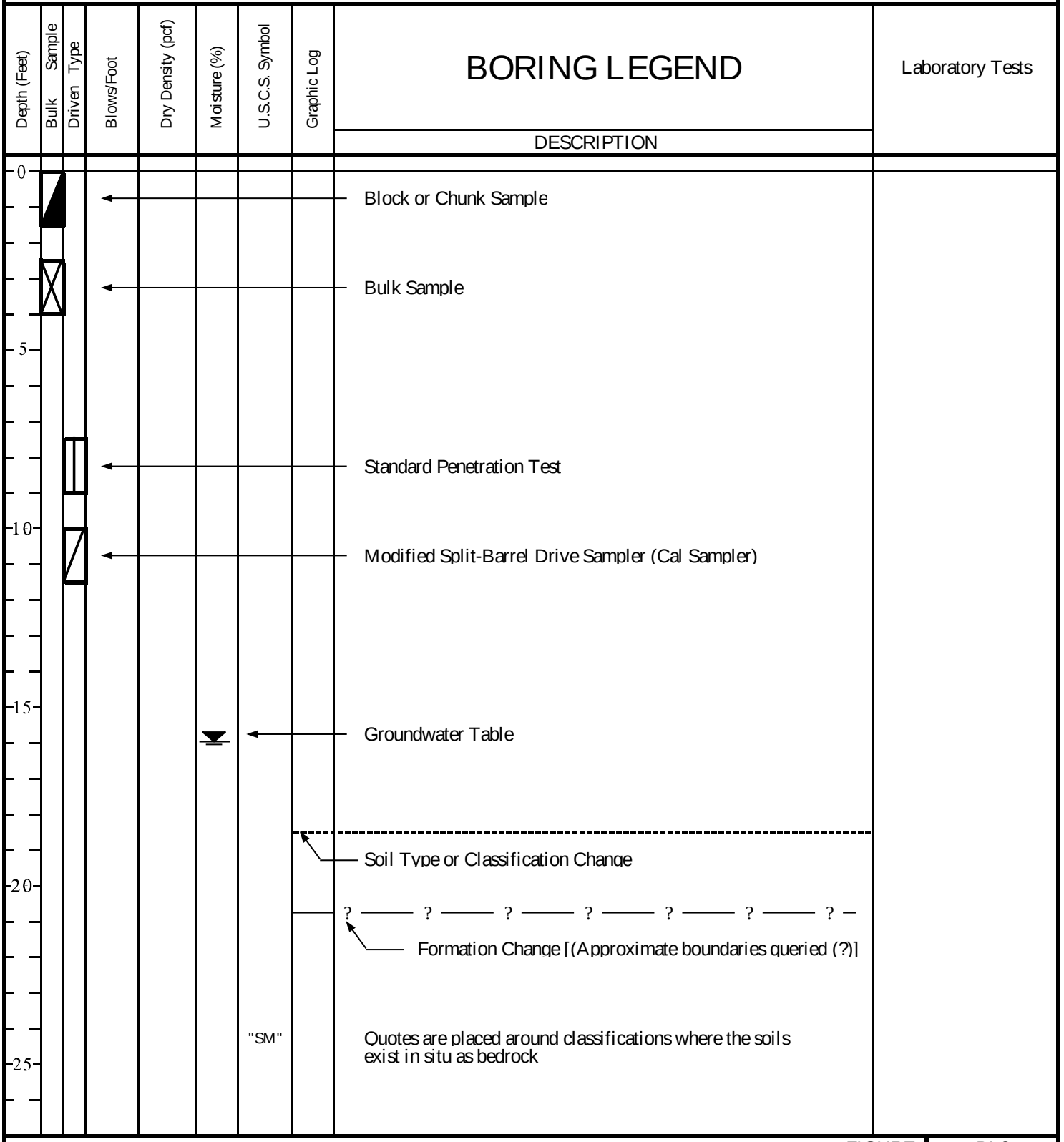


FIGURE: BL2

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	1 of 3
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/16/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1105 msl

BORING: B-1

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SM		**Old Alluvial Fan Deposits(Qof)** Silty SAND,with gravel,dry to damp, light brown,slight clay content	
5			8 11 12		5.0	SC-SM		Silty Clayey SAND with gravel, medium-dense,damp to moist, light brown, concentrations of coaarse sand to fine gravel with fine grained matrix. Gravel content increase to 10 feet.	WA (25% fines) M
10			15 26 32	120.0	6.2			dense	MD
						SC		Clayey SAND, with gravel,medium-dense to dense, moist,red brown. Coarse sand and fine gravel, angular, dark grey shale.	
15			9 7 11		5.3			Clayey SAND with Gravel,medium-dense,moist,red brown	WA (16% fines) M
								at 18' encountered layer of large gravel and cobbles	
20			7 22 25	127.0	3.8	SW-SC		Well-graded SAND with clay and gravel,medium-dense, damp to moist, red brown,	WA (8% fines) MD
								at 23 to 25 feet observed smaller, flatter, subangular, pebbles	
25						SC			

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	2 of 3
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/16/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1105"msl

BORING: B-1 Cont'd.

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
25			11 26 28		3.3	SC		Clayey SAND with Gravel, very dense,damp,light grey	WA (14% fines) M
30				108.7	3.6	SM		Silty SAND,damp,ligh brown, medium to coarse sand, iron staining.	MD
			10 14 19		5.0	SC		Clayey SAND with gravel, dense,damp, light brown	WA (18% fines) M
35			5 11 17		12.5	CL		**Silverado Formation (Tsi)** Lean CLAY,very stiff, moist, red brown	M
			4 6 11		11.6			Lean CLAY,very stiff, moist, red brown	AL (LL=27, PI=11) M
40			6 19 16		9.5			Sandy Lean CLAY,with gravel,hard,moist, red brown	M
			14 35 43		5.8			Sandy Lean CLAY,with gravel,hard, red brown	M
45			9 11 21		NR	SC		Clayey,SAND,with gravel, dense,damp to moist,red brown	
			15 20 24		4.9				WA (14% fines) M
50						CL		Lean Clay, stiff, moist, red brown	

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	3 of 3
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/16/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1093' msl

BORING: B-1 Cont'd.

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
50			3 5 8		13.4	CL		Lean Clay, stiff, moist, red brown	M
								Boring terminated at 51.5 feet bgs No groundwater encountered	
55									
60									
65									
70									
75									

Boring B-1c

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	1 of 1
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/16/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1109'msl

BORING: B-2

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SC		**Old Alluvial Fan Deposits(Qof)** Clayey SAND, with gravel, loose to medium-dense,dry to damp, red brown. Medium to large gravels encountered in upper five feet and are described as angular, iron stain surface, dark grey, shale.	
5			18 24 24	118.6	8.8			Clayey SAND with gravel, medium-dense, damp to moist, red brown,	AL (LL=30, PI=20) GS (28% fines) MD EI RV
10			6 8 10		6.4			Clayey SAND with gravel, medium-dense, damp to moist, brown, Concentrations of coarse sand observed.	M
15			14 25 25	118.6	6.4			Clayey SAND with gravel, medium-dense, damp to moist, red brown,weatherd at 16 1/2 to 17 1/2 cobble layer encountered,iron staining, weathered	MD
20			9 14 18		5.3			Clayey SAND with gravel,dense, damp to moist, red brown,weatherd	M
25								Boring terminated at 21.5 feet bgs No groundwater emcounted	

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	1 of 1
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/16/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1101' msl

BORING: B-3

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SC		**Old Alluvial Fan Deposits(Qof)** Clayey SAND, with gravel, loose to medium-dense,dry to damp, red brown. Medium to large gravels encountered in upper five feet and are described as angular, iron stain surface, dark grey, shale.	
5		▯	2 4 7		6.6			Clayey SAND with gravel, medium-dense, damp to moist, red brown,	M
10		▨	50	NR		GW		Gravel layer, NR	
						SC			
15		▯	8 12 21		7.3			Clayey SAND with gravel, dense, moist, red brown red brown,	M
								at 18 feet cobble layer encountered.	
20		▨	8 11 16		15.4			Clayey SAND with gravel, medium-dense, moist, red brown,	M
								Boring terminated at 21.5 feet bgs No groundwater emcounted	
25									

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	1 of 1
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/16/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1108' msl

BORING: B-4

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SC		**Old Alluvial Fan Deposits(Qof)** Clayey SAND, with gravel, loose to medium-dense,dry to damp, brown to light brown.	
									EI
5			5 8 11	NR		SM		Silty SAND, medium dense	
10			18 43 17			SC		Clayey SAND, with gravel, dense, damp to moist brown to light brown to yellow brown. Iron staining present,fine to large gravel. Gravel described as dark grey shale, angular.	
15			7 9 9		9.2			Clayey SAND with gravel, medium-dense, moist, red brown,weatherd.	M
20			8 16 26	110.6	11.6			Clayey SAND with gravel, medium- dense, moist, red brown,weathered, large gravel in shoe.	MD
								Boring terminated at 21.5 feet bgs No groundwater emcounted	
25									

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	1 of 1
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/16/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1113' msl

BORING: B-5

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SC		**Old Alluvial Fan Deposits(Qof)** Clayey SAND, with gravel, loose to medium-dense,dry to damp, red brown.	CHM
5			5 10 14	114.6	6.2			Clayey SAND, with gravel, medium-dense, damp to moist red brown.	CN, MD
						GW		Gravel and cobble layer between 7 to 9 feet	
						SC			
10			9 13 12		5.7	SM SC		Silty SAND, with gravel, medium-dense,dry to damp, light grey Clayey SAND, with gravel, dense, damp to moist red brown. Fine gravel dark gray, angular	M
15			12 17 13	120.7	7.3			Clayey SAND, with gravel,med-dense , damp to moist red brown.Coarse sand and fine gravel.	MD
						CL		Lean CLAY,stiff,moist,brown,ocasional fine to medium gravel.	
20			4 7 10		12.9				M
								Boring terminated at 21.5 feet bgs No groundwater emcounted	
25									

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	1 of 1
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/10/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1087' msl

BORING: B-6

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SC		**Old Alluvial Fan Deposits(Qof)** Clayey SAND, with gravel, loose to medium-dense,dry to damp, red brown.	MAX RDS
5			14 9 11			GM		Silty Gravel,medium-dense, dry to damp, brown, observed flat subangular gravel	
						SC		Clayey SAND, with coarse sand and fine gravel, loose,dry to, damp, red brown	
10			4 6 9						
								Boring terminated at 11.5 feet bgs No groundwater encountered	
15									
20									
25									

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	1 of 1
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/16/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1086' msl

BORING: B-7

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SC		**Artificial Fill (Qaf)** 3" of AC over 7 inches of Aggregate Base Clayey Sand,with gravel, yellow brown, fine gravel	
						SC		**Old Alluvial Fan Deposits(Qof)** Clayey SAND, with gravel, medium-dense,moist, light yellow brown, blocky	
5			9 11 14		7.7				M
10			7 9 13	106.6	6.3	SW-SM		Well-graded SAND with silt and gravel, medium-dense,moist, light brown,	GS (10% fines) MD
15			7 8 10		3.9			Well-graded SAND with silt and gravel, medium-dense,moist, light brown,	M
20			17 35 50	124.3	11.7	SC		Clayey SAND,with sand and gravel, very dense, moist,dark brown, iron staing contacts in sample,coarse sand and fine gravel, fractured shale, granite gravel is weathered in place, and exhibits iron staining.	photo MD
25								Boring terminated at 21.5 feet bgs No groundwater emcounted	

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	1 of 1
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/10/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1069' msl

BORING: B-8

Depth (Feet)	Sample Bulk	Sample Driven	Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0							GP		6-inches of gravel cover	
							SC		**Old Alluvial Fan Deposits(Qof)** Clayey SAND, with gravel, loose to medium-dense,moist, dark brown.	
5				4 9 13		7.5			Clayey SAND, with gravel, medium-dense,moist, dark brown.Becomes light yellow brown at 6 feet.	M
10				7 7 12		4.7			Clayey SAND, with gravel, medium-dense, damp to moist,light yellow brown	M
									Boring terminated at 11.5 feet bgs No groundwater encountered	
15										
20										
25										

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	1 of 2
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/16/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1063' msl

BORING: B-9

Depth (Feet)	Sample Bulk	Sample Driven	Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0							SC		**Old Alluvial Fan Deposits(Qof)** Clayey SAND, with gravel, loose to medium-dense,moist, dark brown. Coarse sand and fine gravel to 5 feet	
5				5 9 11	103.2	12.6			Clayey SAND, with gravel, medium-dense,moist, light brown. Coarse sand and fine gravel, angular, some iron staining to approximatley 19 1/2ft	CHM MD
10				5 6 50/3"	NR					
15										
20				50/1"	NR		GM		Silty GRAVEL, medium-dense ,light brown, increase in gravel to 24 feet.	
25							SC			

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	2 of 2
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/16/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1063' msl

BORING: B-9 Cont'd.

Depth (Feet)	Sample Bulk	Sample Driven	Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
25				20 25 30		5.7	SC		Clayey SAND, with gravel, dense,moist, light brown.	M
							GM		Silty GRAVEL, medium-dense, light brown	
30				50/6"		2.4			rock in shoe	
									Boring terminated at 30.5 feet bgs No groundwater encountered	M
35										
40										
45										
50										

Boring B-9b

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	1 of 1
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/10/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1085' msl

BORING: B-10

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0								**3" AC over 7 " Base**	
						SC		**Artificial Fill (Qaf)** Clayey SAND, with gravel, loose to medium-dense,moist, dark to reddish brown.small to large gravel, clay pipe fragements	
5			8 7 8	NR		SC		**Old Alluvial Fan Deposits(Qof)** Clayey SAND, with gravel, loose to medium-dense,moist, dark to reddish brown.	
						SM		Silty SAND with Gravel, gravel subrounded	GS (38% fines)
					8.0				M
10			8 11 13	101.6	9.1	SC		Clayey SAND, with gravel, medium-dense, moist, brown.	MD MAX RDS
						GW		Gravel layer 14 to 15 feet	
15			12 16 10		6.8	SC		-transition to lighter brown	M
20			12 40 45	120.2	11.2			- matrix tightly surrounding gravel, iron staining, dense	M
								Boring terminated at 21.5 feet bgs No groundwater emcounted	
25									

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	1 of 1
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/10/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1100' msl

BORING: B-11

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SC		**Old Alluvial Fan Deposits(Qof)** Clayey SAND, with gravel, loose to medium-dense,dry to damp, dark brown.	
5			3 7 7		8.2			Clayey SAND, with gravel, medium-dense to dense, moist, brown.	RV M
10			15 27 35	127.1	6.0			-from 10 to 15 feet increase in gravel, iron staing observed,	MD
15			4 9 21		4.4	SM		Silty SAND,with gravel,medium-dense to dense,dry to damp, light brown	M
20			23 36 34	106.4	3.8 3.6				M MD
25								Boring terminated at 21.5 feet bgs No groundwater emcounted	

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	1 of 1
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/10/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1106' msl

BORING: B-12

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SC		**Old Alluvial Fan Deposits(Qof)** Clayey SAND, with gravel, medium-dense,dry to damp, brown.	
			8 10 12	NR					
5			6 12 15		6.7				M
10			11 14 21		5.2	SM		Silty SAND with gravel, dense, dry to damp, small to medium gravel, iron staining	GS (18% fines) M
								Boring terminated at 11.5 feet bgs No groundwater encountered	
15									
20									
25									

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	1 of 1
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/16/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1102' msl

BORING: B-13

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SC		**Artificial Fill (Qaf)** Clayey SAND, with gravel, loose, dry, broken pipe , organics, block,	
			2 6 8		9.3	SC		**Old Alluvial Fan Deposits(Qof)** Clayey SAND, with gravel, medium-dense,moist, brown to red brown.	M
5			5 7 8		10.4			- cobble layer encountered at 4 to 5 feet Clayey SAND, with gravel, medium-dense,moist, brown, iron stained	M
								-cobble layer 8 to 9 feet	
10			21 26 32	126.0	5.7			Clayey SAND, with gravel, medium-dense, moist, red brown, iron stained. Intact sample exhibit granitic pebbles, weathered siltstone, clayey sand matrix.	MD
								Boring terminated at 11.5 feet bgs No groundwater encountered	
15									
20									
25									

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	1 of 3
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/10/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1087' msl

BORING: B-14

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0								**3" AC over 7 " Base**	
						SC		**Artificial Fill (af)** Clayey SAND, with gravel, loose to medium-dense,moist, dark brown.small to large gravel, clay pipe fragements	
						SC-SM		**Old Alluvial Fan Deposits(Qof)** Silty Clayey SAND, with gravel, loose to medium-dense,moist, dark to reddish brown.	
5			8 10 10	113.3	8.4				AL (LL=23, PI=6) CN, MD
						SM		Silty SAND, with gravel, dense, damp to moist,light brown light brown.	
10			11 14 17		6.6				WA (23% fines) M
15			17 37 44					Silty SAND, with gravel,dense	
20			7 16 21					Silty SAND, with gravel,dense	WA (18% fines)
25						SP			

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	2 of 3
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/10/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1087' msl

BORING: B-14 Cont'd.

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
25			14 24 15			SP		Poorly Graded SAND, medium-dense, damp to moist light brown	
						SM		Silty SAND, with gravel, dense, damp to moist,light brown light brown.	
30			9 11 21		2.2				M
35			20 50/3"			GM		Silty Gravel with sand, very dense, dry to damp, light brown, some iron staining	
40			16 25 50/4"		3.2				M
45			13 21 27	110.8	15.3	SC		Clayey SAND, with gravel, medium-dense, moist, red brown, medium to coarse sand	MD
50									

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	3 of 3
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/10/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1087' msl

BORING: B-14 Cont'd.

Depth (Feet)	Sample Bulk	Sample Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
50			10 22 34		4.8	SC		Clayey SAND, with gravel, very-dense, damp to moist, red brown, medium to coarse sand	M
								Boring terminated at 51.5 feet bgs No groundwater encountered	
55									
60									
65									
70									
75									

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PROJECT:	Proposed Commercial Development	DRILLER:	2R Drilling CME 75	SHEET:	1 of 1
CTE JOB NO:	40-3639G	DRILL METHOD:	8" Hollow Stem Auger	DRILLING DATE:	8/10/2018
LOGGED BY:	V.P.	SAMPLE METHOD:	140 lb/30" Autohammer	ELEVATION:	~1105' msl

BORING: B-15

Depth (Feet)	Bulk Sample	Driven Type	Blows/6 inches	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SC		**Old Alluvial Fan Deposits(Qof)** Clayey SAND, with gravel, moist, red brown.	
5			3 6 8		6.9			Clayey SAND, with gravel, medium-dense, damp to moist light brown, iron staining	M
10			5 5 12		5.7			Clayey SAND, with gravel, medium-dense, damp to moist light brown.	M
								Boring terminated at 11.5 feet bgs No groundwater encountered	
15									
20									
25									

APPENDIX B

LABORATORY METHODS AND RESULTS

APPENDIX B
LABORATORY METHODS AND RESULTS

Laboratory tests were performed on selected soil samples to evaluate their engineering properties. Tests were performed following test methods of the American Society for Testing and Materials (ASTM), or other accepted standards. The following presents a brief description of the various test methods used. Laboratory results are presented in the following section of this Appendix.

Atterberg Limits
The liquid limit and plasticity index were determined on selected soil samples in accordance with ASTM D4318.

Chemical Analysis
Soil materials were collected and tested for Sulfate and Chloride content, pH, and Resistivity by Caltrans Test Methods.

Classification
Soils were classified visually according to the Unified Soil Classification System. Visual classifications were supplemented by laboratory testing of selected samples according to ASTM D 2487.

Consolidation/Collapse
To assess compressibility and collapse potential when loaded and wetted, relatively undisturbed samples were subjected to consolidation/collapse in accordance with ASTM D 2435.

Direct Shear
Direct shear tests were performed on samples remolded to 90 percent of the maximum dry density at near optimum moisture content. Direct shear testing was performed in accordance with ASTM D 3080. The samples were inundated during shearing to represent adverse field conditions.

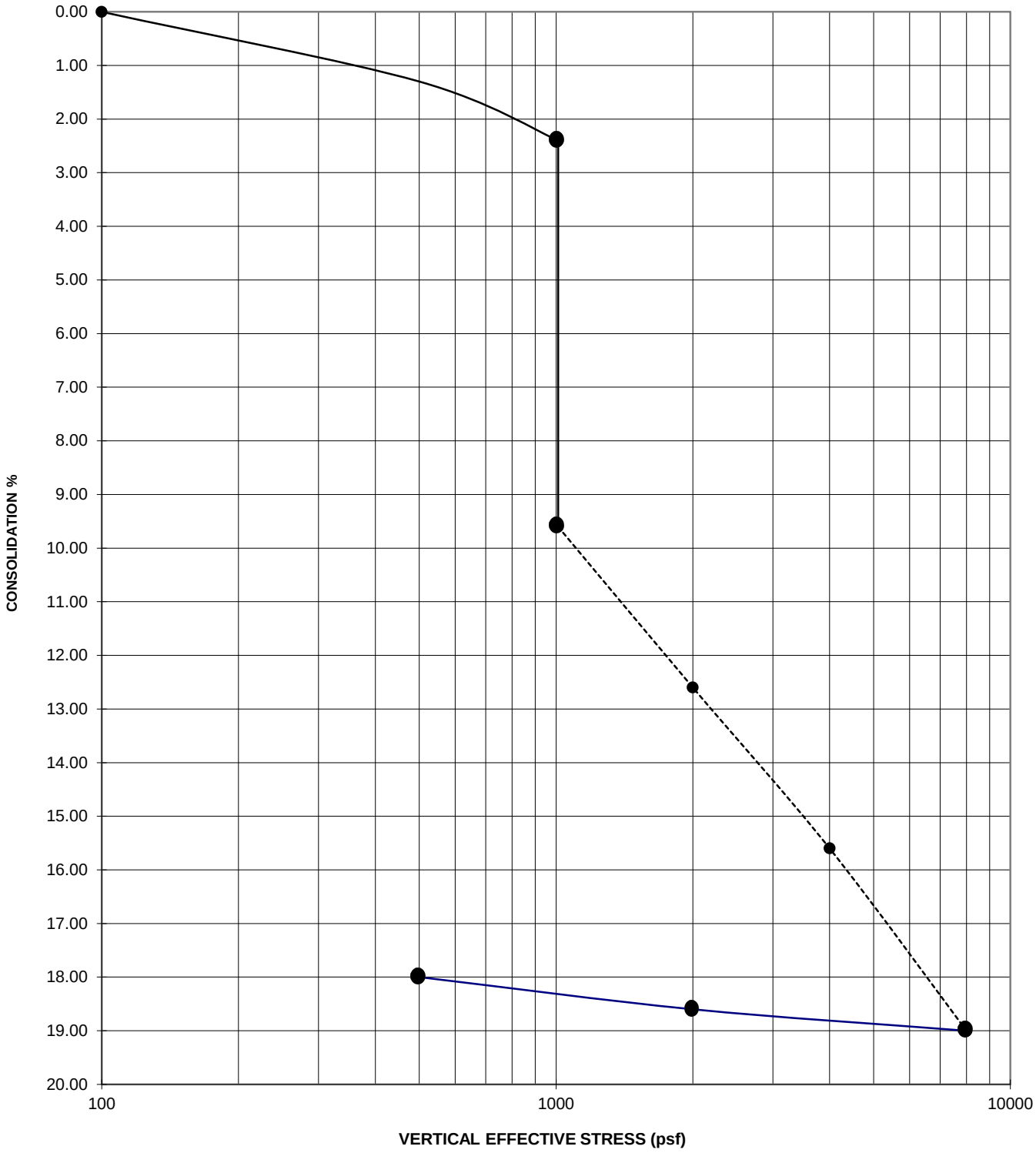
Expansion Index
Expansion Index testing was performed on a selected sample of the on-site soils according to ASTM D 4829.

In-Place Moisture/Density
The in-place moisture content and dry unit weight of selected relatively undisturbed samples in accordance with ASTM D 2216 and D 2937, respectively.

Moisture-Density Relations
Laboratory maximum dry density and optimum moisture content were evaluated according to ASTM D 1557.

Resistance “R” Value
The resistance “R”-value was measured by CTM 301. The graphically determined “R” value at an exudation pressure of 300 pounds per square inch was determined and used for pavement section calculation.

Sieve Analysis (Gradation)
Sieve analyses and 200 washes were performed on selected representative samples according to ASTM C 136 and D 1140 to determine grain-size distribution.



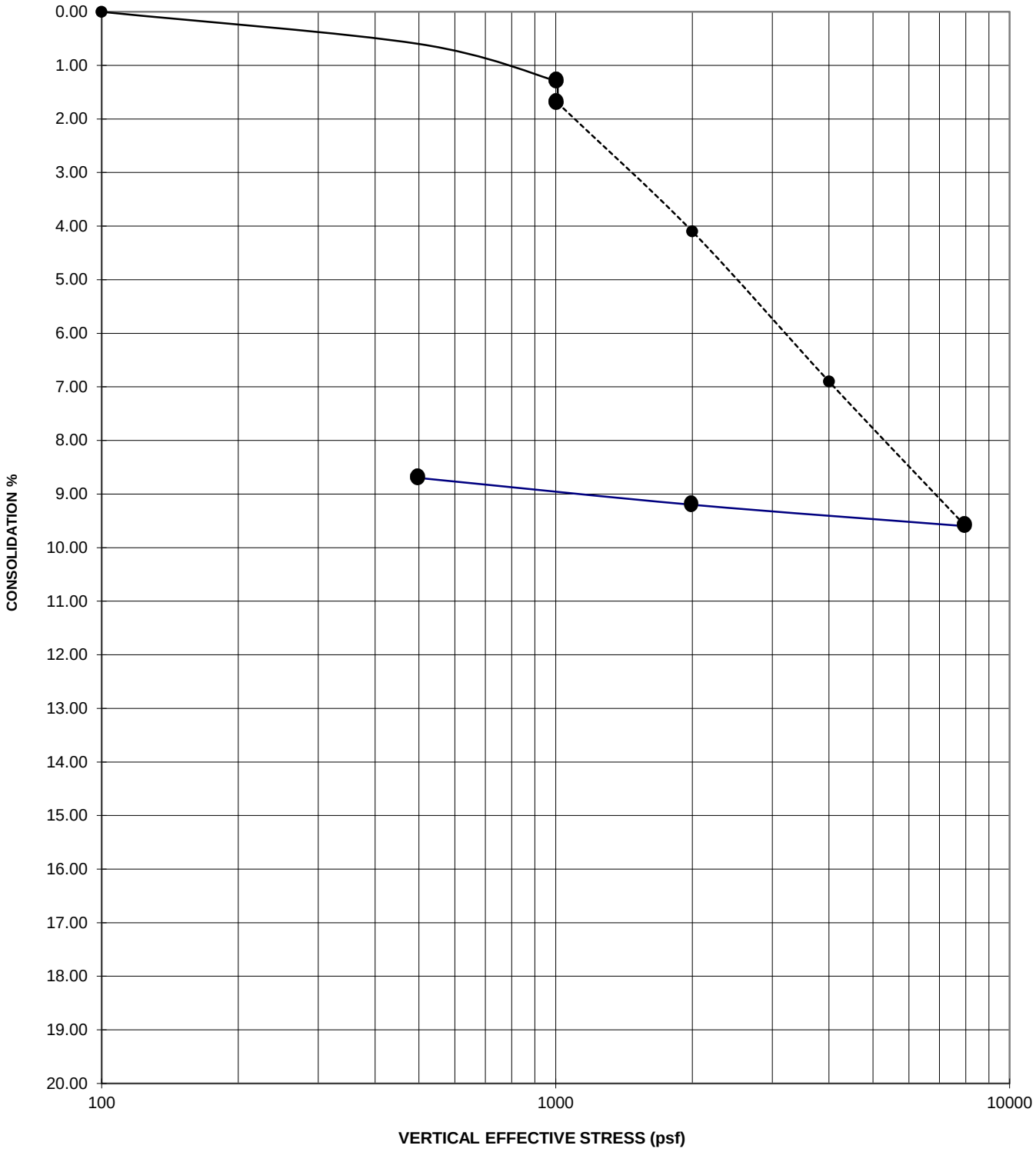
SWELL/CONSOLIDATION TEST

Sample Designation	Depth (ft)	Symbol	Legend
B-5	5.5-6	●	FIELD MOISTURE
Initial Dry Density, pcf	Initial Moisture Content, %	Sample saturated	SAMPLE SATURATED
114.6	6.2	at 1000 psf	REBOUND

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CTE JOB NO: 40-3639

Proposed Commercial Dev.

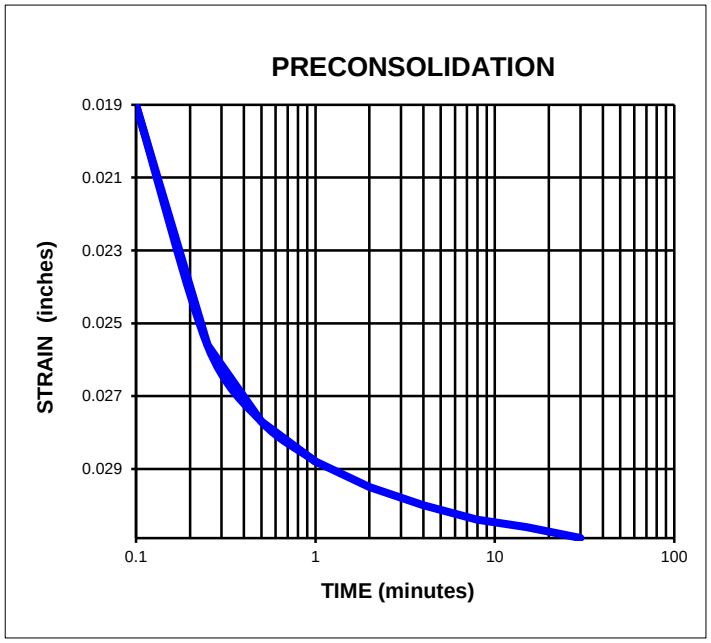


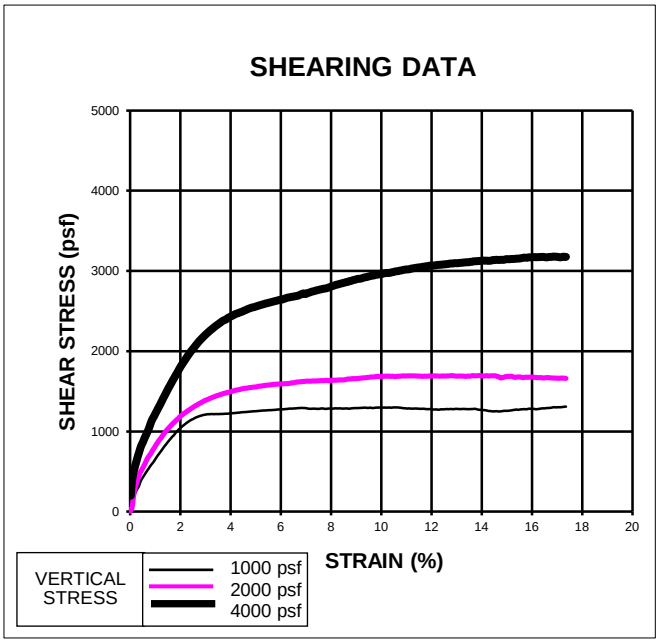
SWELL/CONSOLIDATION TEST			
Sample Designation	Depth (ft)	Symbol	Legend
B-14	6-6.5	●	FIELD MOISTURE
Initial Dry Density, pcf	Initial Moisture Content, %	Sample saturated	SAMPLE SATURATED
113.3	8.4	at 1000 psf	REBOUND

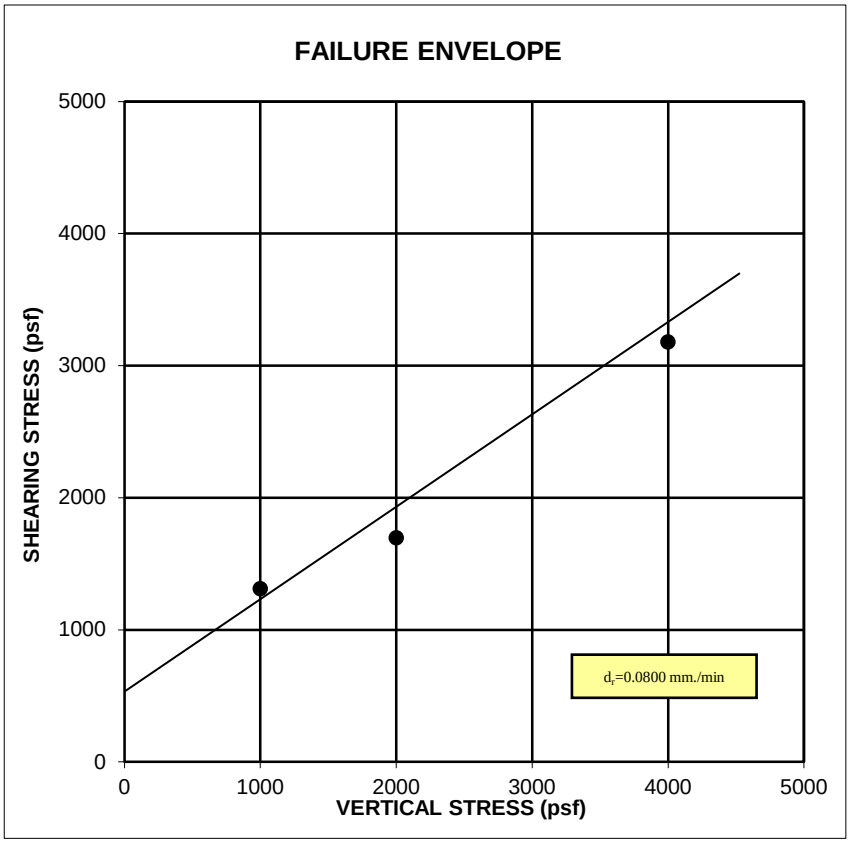
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CTE JOB NO: 40-3639

Proposed Commercial Dev.

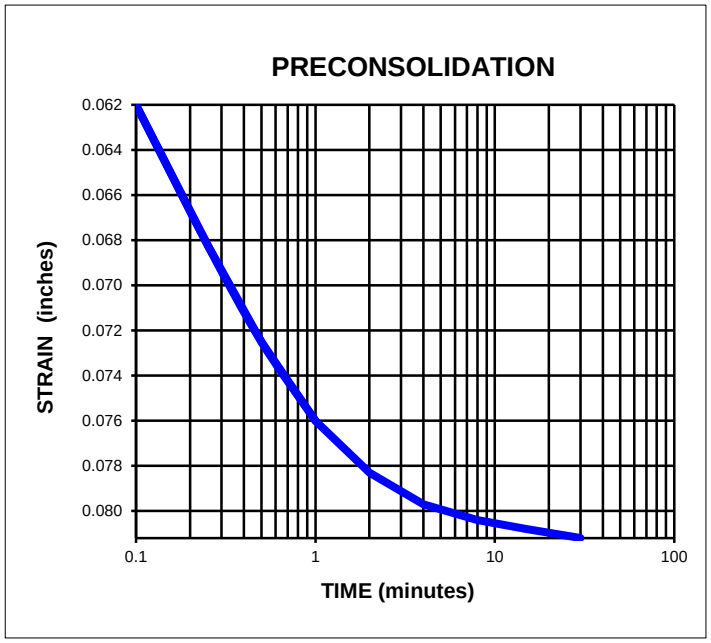


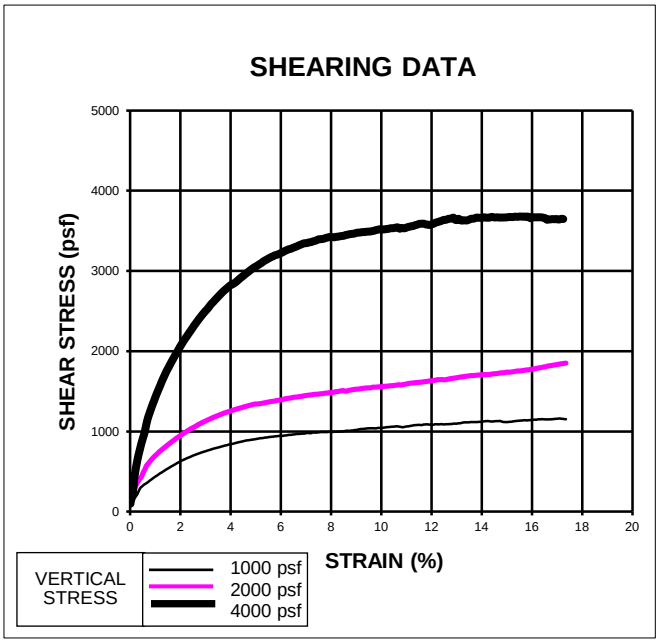


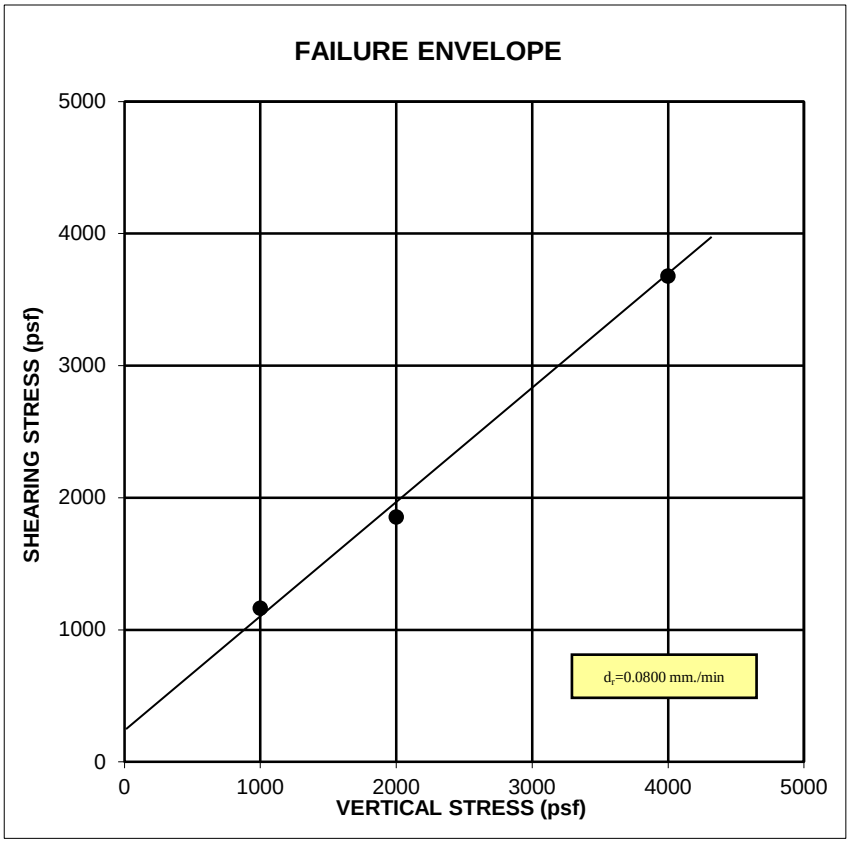


SHEAR STRENGTH TEST - ASTM D3080

Job Name:	Commercial Development - Temescal Canyon			Initial Dry Density (pcf):	119.4
Project Number:	40-3639G	Sample Date:	8/16/2018	Initial Moisture (%):	8.2
Lab Number:	28778	Test Date:	8/30/2018	Final Moisture (%):	18.2
Sample Location:	B-6 @ 1-5'	Tested by:	RCV	Cohesion:	560 psf
Sample Description:	Moderate brown SC (Remolded @ 90%)			Angle Of Friction:	32.6







SHEAR STRENGTH TEST - ASTM D3080

Job Name:	Commercial Development - Temescal Canyon			Initial Dry Density (pcf):	118.2
Project Number:	40-3639G	Sample Date:	8/16/2018	Initial Moisture (%):	8.3
Lab Number:	28778	Test Date:	8/31/2018	Final Moisture (%):	18.5
Sample Location:	B-10 @ 11-14'	Tested by:	RCV	Cohesion:	240 psf
Sample Description:	Moderate brown SC (Remolded @ 90%)			Angle Of Friction:	40.4

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REPORT OF RESISTANCE 'R' VALUE-EXPANSION PRESSURE

Project Name: Commercial Development - Temescal Canyon
Project No.: 40-3639G
Sample Location: B-2 @ 5-10'
Soil Description: Light brown SC w/ gravel
Test Procedure: Cal 301

Lab No.: 28778
Sampled By: V.P. **Date:** 8/16/2018
Submitted By: V.P. **Date:** 8/16/2018
Tested By: Larry Sachs **Date:** 8/30/2018
Reviewed By: Chase Velarde **Date:** 8/31/2018

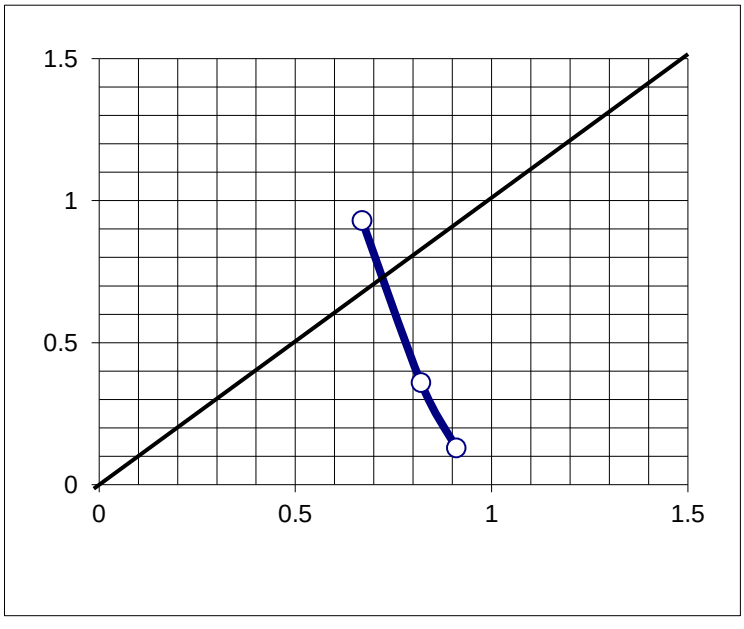
Specimen/ Mold No.	1	2	3	
Compactor Air Pressure, ft.lbs.	350	190	80	
Initial Moisture, %	4.2	4.2	4.2	
Wet Weight / Tare (g)	1950.7	1950.7	1950.7	
Dry Weight / Tare (g)	1902.0	1902.0	1902.0	
Tare (g)	750.1	750.1	750.1	
Water Added, ml	90	100	115	
Moisture at Compaction, %	12.0	12.9	14.2	
Wt. Of Briquette and Mold, g	3238	3252	3230	
Wt. Of Mold, g	2095	2110	2096	
Wt. Of Briquitte,g	1143	1142	1134	
Height of Briquette, in	2.47	2.50	2.53	
Dry Density, pcf	125.2	122.6	119.0	
Stabilometer PH @ 1000 lbs	41	57	64	
Stabilometer PH @ 2000 lbs	97	125	140	
Displacement	3.75	4.05	6.05	
R' Value	30	14	5	
Corrected 'R' Value	30	14	5	
Exudation Pressure, lbs	7250	4200	2450	
Exudation Pressure, psi	580	336	196	
Stabilometer Thickness - ft	0.67	0.82	0.91	
Expansion Pressure	0.0028	0.0011	0.0004	
Expansion Press, Thick-ft	0.93	0.36	0.13	

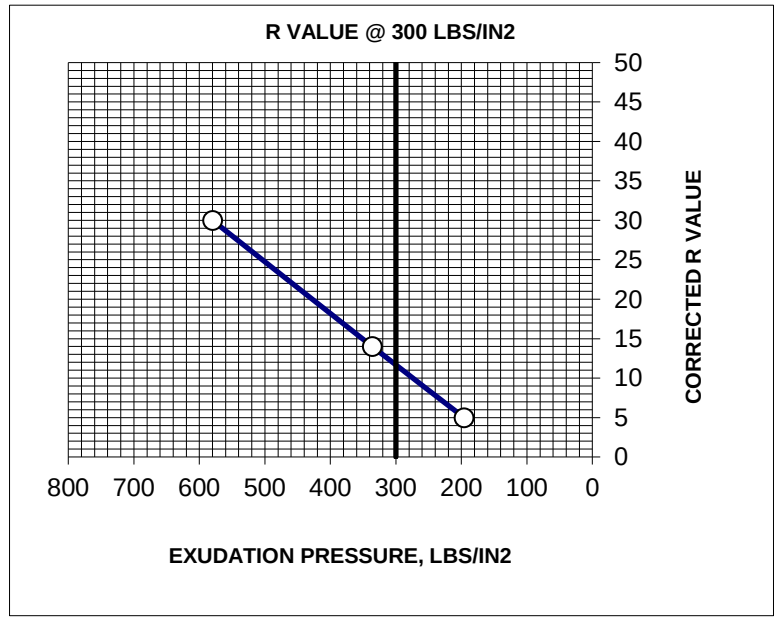
Exudation 11

Expansion 25

R-value **11**

TI	4.5
Expansion	25





Cover Thickness by Expansion Pressure-Feet

Expansion From Graph:	0.72

Chase Velarde
Laboratory Manager

Construction Testing & Engineering, Inc.

Inspection | Testing | Geotechnical | Environmental & Construction Engineering | Civil Engineering | Surveying

REPORT OF RESISTANCE 'R' VALUE-EXPANSION PRESSURE

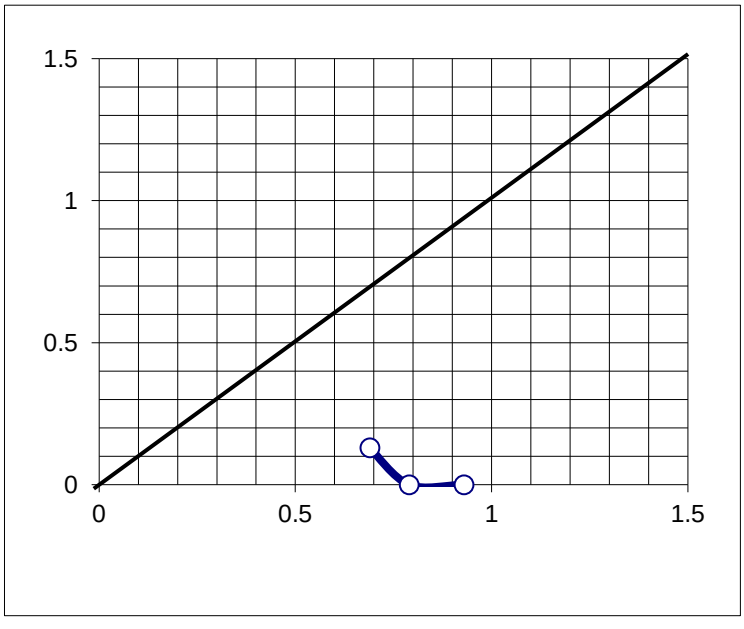
Project Name: Commercial Development - Temescal Canyon
Project No.: 40-3639G
Sample Location: B-11 @ 5-10'
Soil Description: Moderate brown SC w/ gravel
Test Procedure: Cal 301

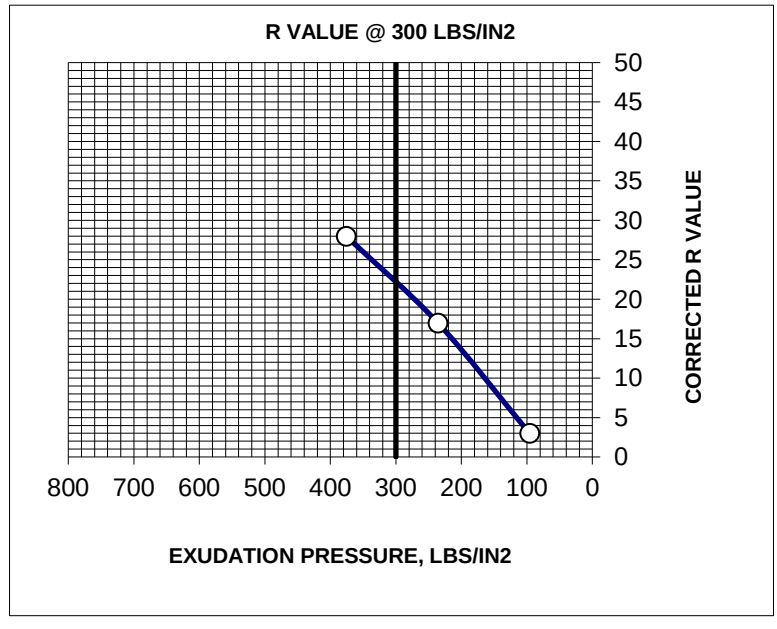
Lab No.: 28778
Sampled By: V.P. **Date:** 8/16/2018
Submitted By: V.P. **Date:** 8/16/2018
Tested By: Larry Sachs **Date:** 8/30/2018
Reviewed By: Chase Velarde **Date:** 8/31/2018

Specimen/ Mold No.	7	8	9	
Compactor Air Pressure, ft.lbs.	320	210	50	
Initial Moisture, %	2.5	2.5	2.5	
Wet Weight / Tare (g)	1471.3	1471.3	1471.3	
Dry Weight / Tare (g)	1442.0	1442.0	1442.0	
Tare (g)	271.0	271.0	271.0	
Water Added, ml	90	100	115	
Moisture at Compaction, %	10.2	11.0	12.3	
Wt. Of Briquette and Mold, g	3245	3268	3264	
Wt. Of Mold, g	2077	2077	2077	
Wt. Of Briquitte,g	1168	1191	1187	
Height of Briquette, in	2.56	2.53	2.58	
Dry Density, pcf	125.5	128.5	124.1	
Stabilometer PH @ 1000 lbs	41	54	70	
Stabilometer PH @ 2000 lbs	99	116	144	
Displacement	3.95	4.55	6.81	
R' Value	28	17	3	
Corrected 'R' Value	28	17	3	
Exudation Pressure, lbs	4700	2950	1200	
Exudation Pressure, psi	376	236	96	
Stabilometer Thickness - ft	0.69	0.79	0.93	
Expansion Pressure	0.0004	0.0000	0.0000	
Expansion Press, Thick-ft	0.13	0.00	0.00	

Exudation	22
Expansion	51
R-value	**22**

TI	4.5
Expansion	51





Cover Thickness by Expansion Pressure-Feet

Expansion From Graph:	0.47

Chase Velarde
Laboratory Manager

EXPANSION INDEX TEST

ASTM D 4829

CTE Project Number: **40-3639G**

Project Name: **Proposed Commercial Development, Temescal Valley, CA**

Sample ID: B-2 @ 5-10 ft.
Sample Description: Clayey Sand with Gravel

Test Start Date:	Time:	Initial Reading:
8-31-2018	7:53 am	0.0091

Test Finish Date:	Time:	Final Reading:
9-1-2018	7:53 am	0.0245

Specimen Moisture Content: 12.0 %
Specimen Dry Density: 104.5 pcf
Specimen Percent Saturation: 55.1 %

Expansion (inches): 0.0154

Expansion Index: **15**

Expansion Potential: **Very Low**

EXPANSION INDEX TEST

ASTM D 4829

CTE Project Number: **40-3639G**

Project Name: **Proposed Commercial Development, Temescal Valley, CA**

Sample ID: B-4 @ 2.5-5 ft.
Sample Description: Silty Clayey Sand with Gravel

Test Start Date:	Time:	Initial Reading:
8-30-2018	7:10 am	0.0002

Test Finish Date:	Time:	Final Reading:
8-31-2018	7:10 am	0.0055

Specimen Moisture Content: 9.0 %
Specimen Dry Density: 107.1 pcf
Specimen Percent Saturation: 45.1 %

Expansion (inches): 0.0053

Expansion Index: 5

Expansion Potential: Very Low

LABORATORY COMPACTION OF SOIL (MODIFIED PROCTOR)

ASTM D 1557

Project Name:	Commercial Development	**Sampled By:**	VP	**Date:**	8/16/18
CTE Project No.:	40-3639G	**Tested By:**	JF	**Date:**	8/21/18
Lab No.:	8772	**Reviewed By:**	RE	**Date:**	8/21/18
Sample ID:	B-6 @ 1-5'				
Sample Description:	Brown Silty Clayey Sand w/scattered gravel				

TEST NO.	1	2	3	4	
Wt. Comp. Soil + Mold (lbs)	16.628	16.796	16.430	16.188	
Wt. of Mold (lbs)	5.967	5.967	5.967	5.967	
Net Wt. of Soil (lbs)	10.661	10.829	10.463	10.221	
Wet Wt. of Soil + Cont. (g)	1355.4	1331.9	1391.8	1288.8	
Dry Wt. of Soil + Cont. (g)	1297.0	1262.3	1301.8	1248.8	
Wt. of Container (g)	499.5	499.2	496.7	497.8	
Moisture Content (%)	7.3	9.1	11.2	5.3	
Wet Density (pcf)	142.0	144.2	139.3	136.1	
Dry Density (pcf)	132.3	132.1	125.3	129.2	

Preparation Method: Dry [ ] Moist [X]

Mechanical Rammer [ ] Manual Rammer [X]

Hammer Weight: 10.0 lb.

Drop: 18 in.

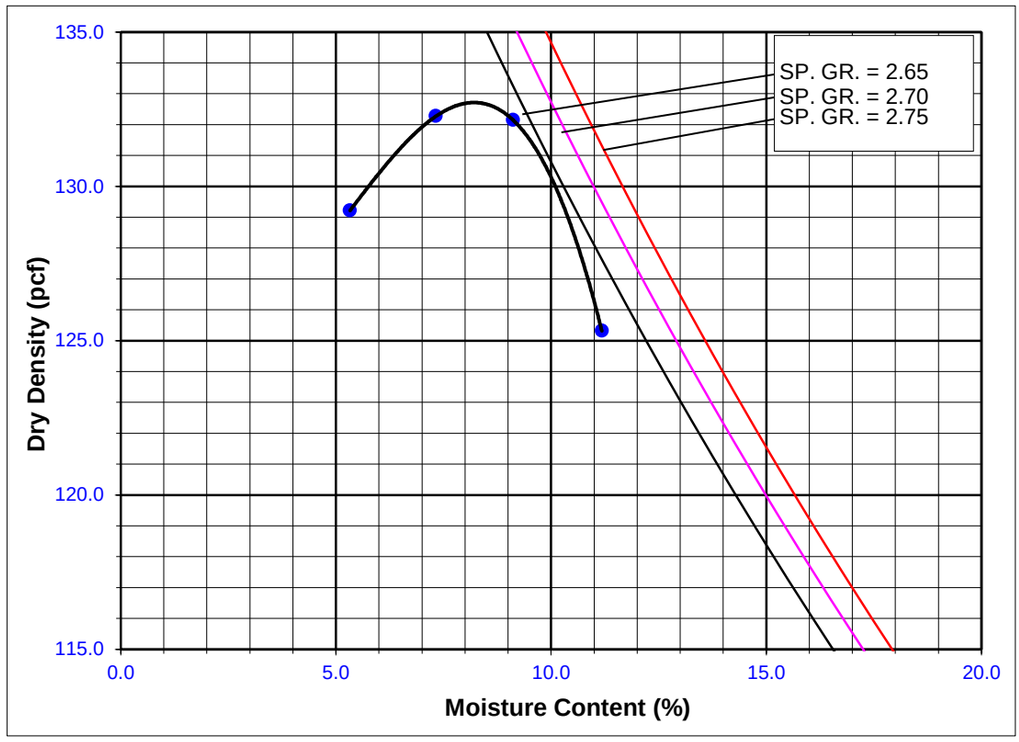
Mold Volume ($ft.^3$): 0.07510

METHOD USED

[ ] **Method A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if No.4 retained =/< 25%

[ ] **Method B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if 3/8" retained =/< 25%

[X] **Method C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
May be used if 3/4" retained =/< 30%



OVERSIZE FRACTION

Total Sample Weight (g): 16037

Weight Retained (g)		Percent Retained
625	Plus 3/4"	3.9
	Plus 3/8"	
	Plus #4	

Maximum Dry Density (pcf): 132.7

Optimum Moisture Content (%): 8.2

Rock Correction Applied per ASTM D 4718

Maximum Dry Density (pcf): N/A

Optimum Moisture Content (%): N/A

LABORATORY COMPACTION OF SOIL (MODIFIED PROCTOR)

ASTM D 1557

Project Name:	Commercial Development	**Sampled By:**	VP	**Date:**	8/16/18
CTE Project No.:	40-3639G	**Tested By:**	JF	**Date:**	8/21/18
Lab No.:	8772	**Reviewed By:**	RE	**Date:**	8/21/18
Sample ID:	B-10 @ 11-14'				
Sample Description:	Brown Silty Clayey Sand w/Gravel				

TEST NO.	1	2	3	4	
Wt. Comp. Soil + Mold (lbs)	16.609	16.682	16.432	16.275	
Wt. of Mold (lbs)	5.967	5.967	5.967	5.967	
Net Wt. of Soil (lbs)	10.642	10.715	10.465	10.308	
Wet Wt. of Soil + Cont. (g)	1301.5	1731.5	1447.2	1279.5	
Dry Wt. of Soil + Cont. (g)	1242.2	1633.7	1365.0	1232.9	
Wt. of Container (g)	499.5	650.4	655.4	497.8	
Moisture Content (%)	8.0	9.9	11.6	6.3	
Wet Density (pcf)	141.7	142.7	139.3	137.3	
Dry Density (pcf)	131.2	129.8	124.9	129.1	

Preparation Method: Dry [ ] Moist [X]

Mechanical Rammer [ ]
Manual Rammer [X]

Hammer Weight: 10.0 lb.

Drop: 18 in.

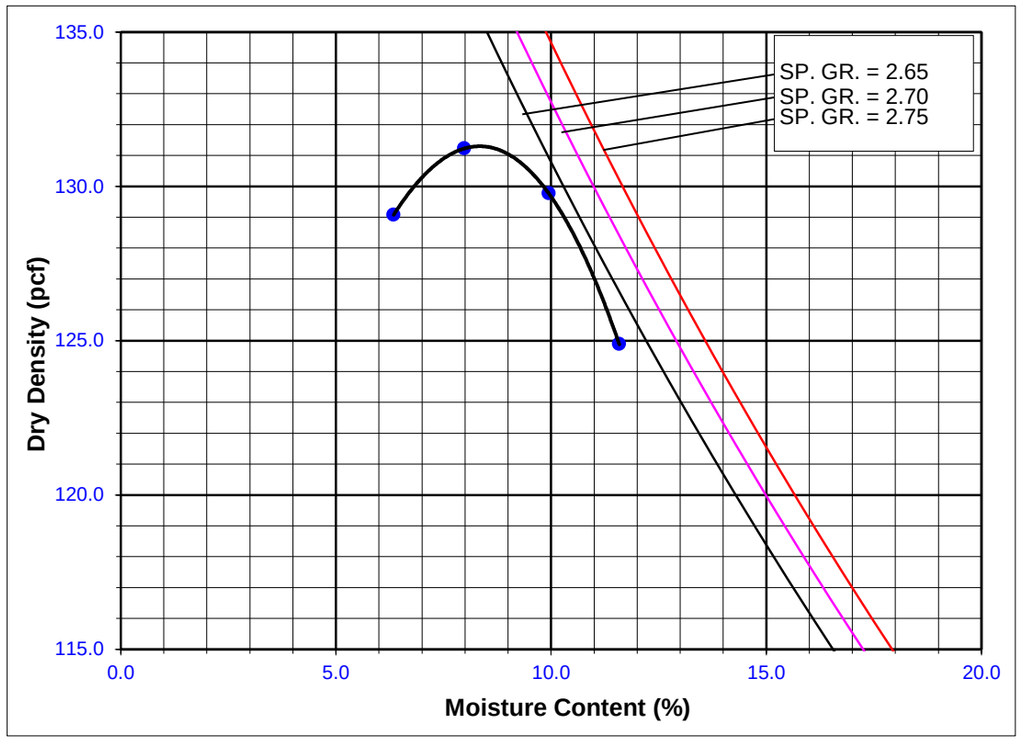
Mold Volume (ft.^{3}): 0.07510

METHOD USED

[ ] **Method A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if No.4 retained =/< 25%

[ ] **Method B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if 3/8" retained =/< 25%

[X] **Method C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
May be used if 3/4" retained =/< 30%



OVERSIZE FRACTION

Total Sample Weight (g): 17350

Weight Retained (g)		Percent Retained
2896	Plus 3/4"	16.7
	Plus 3/8"	
	Plus #4	

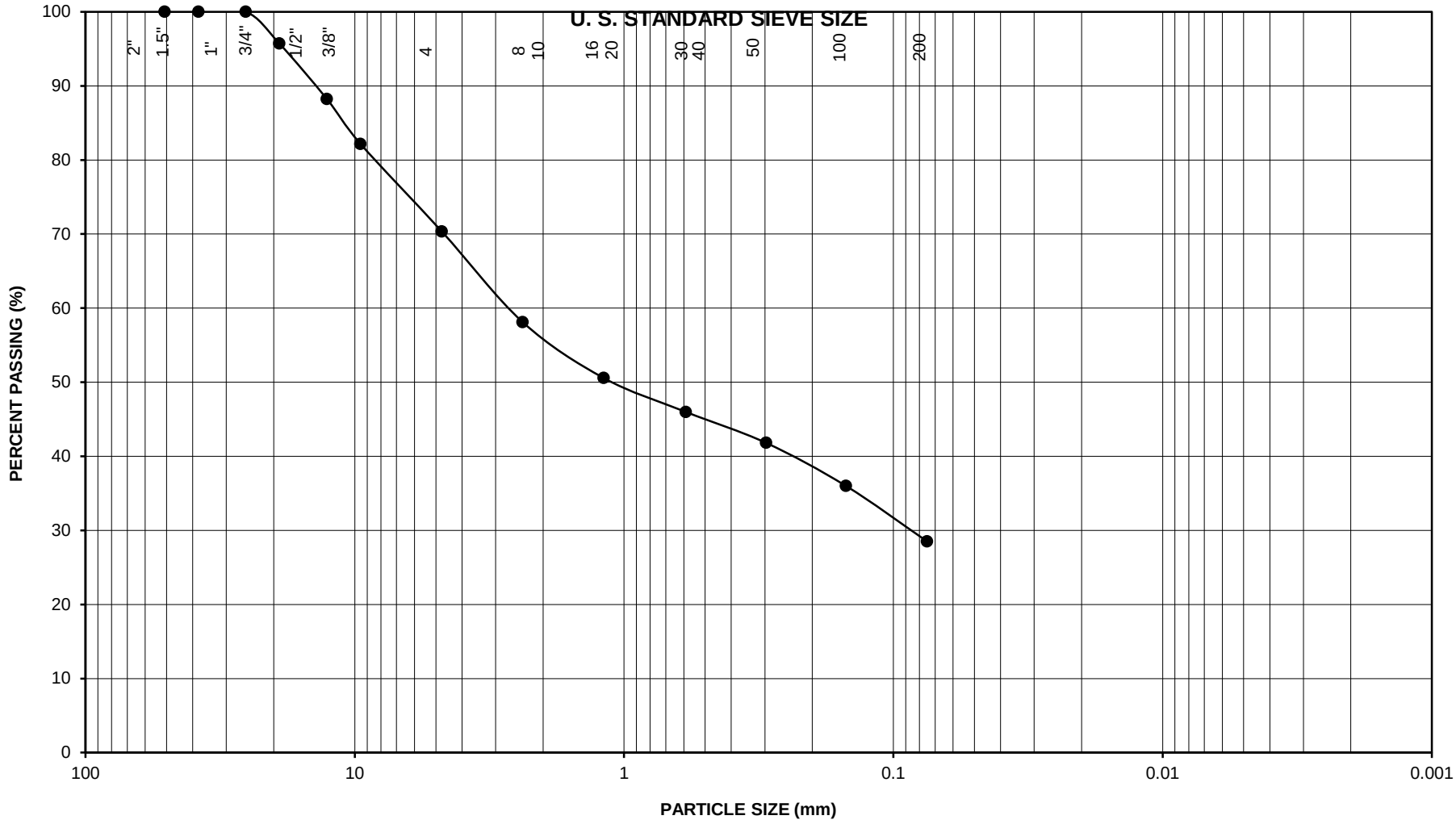
Maximum Dry Density (pcf): 131.3

Optimum Moisture Content (%): 8.3

Rock Correction Applied per ASTM D 4718

Maximum Dry Density (pcf): 136.0

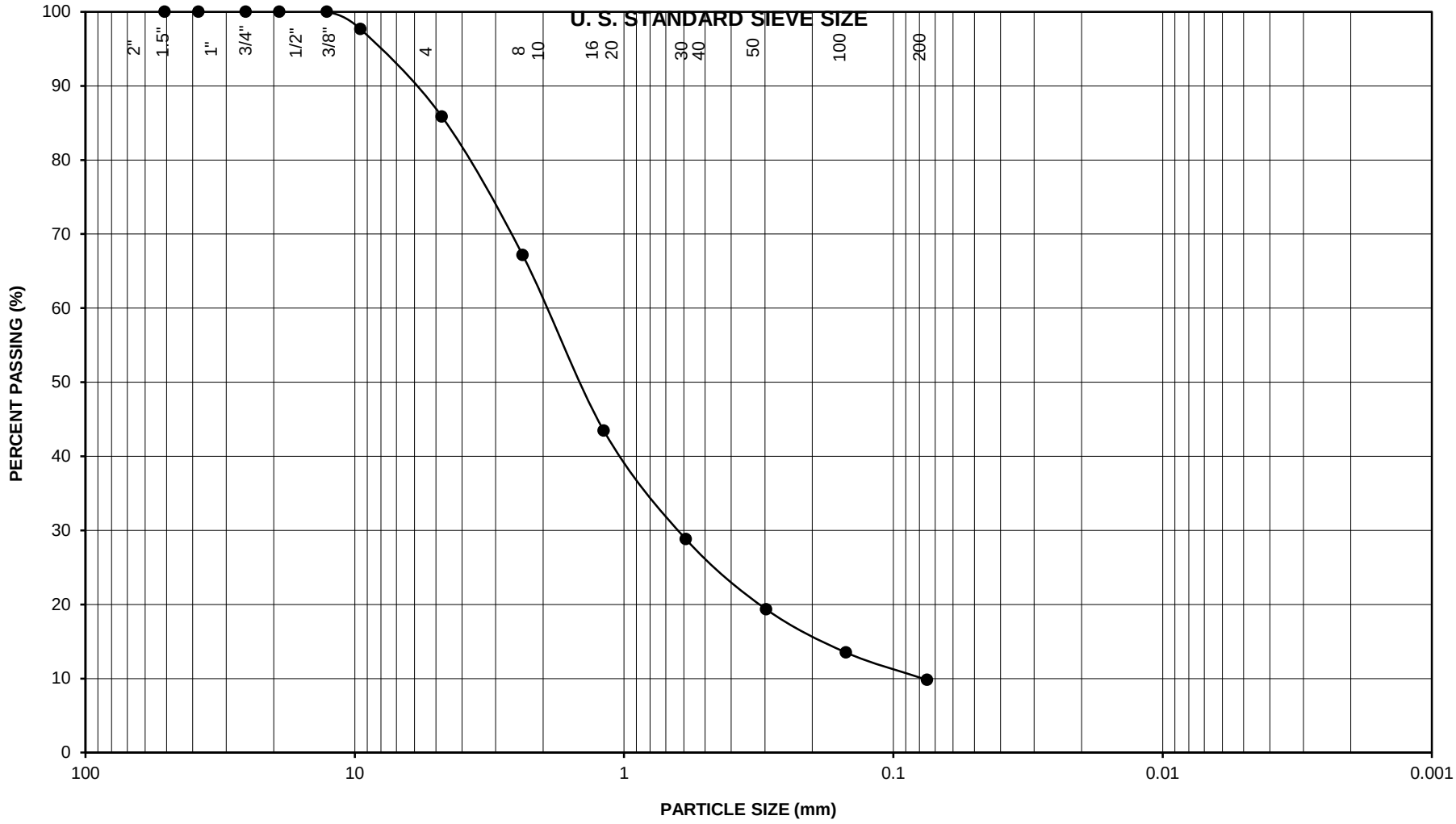
Optimum Moisture Content (%): 7.0



PARTICLE SIZE ANALYSIS

Sample Designation	Sample Depth (feet)	Symbol	Liquid Limit (%)	Plasticity Index	Classification
B-2	6-6.5	●			SC w/Gravel
		■			

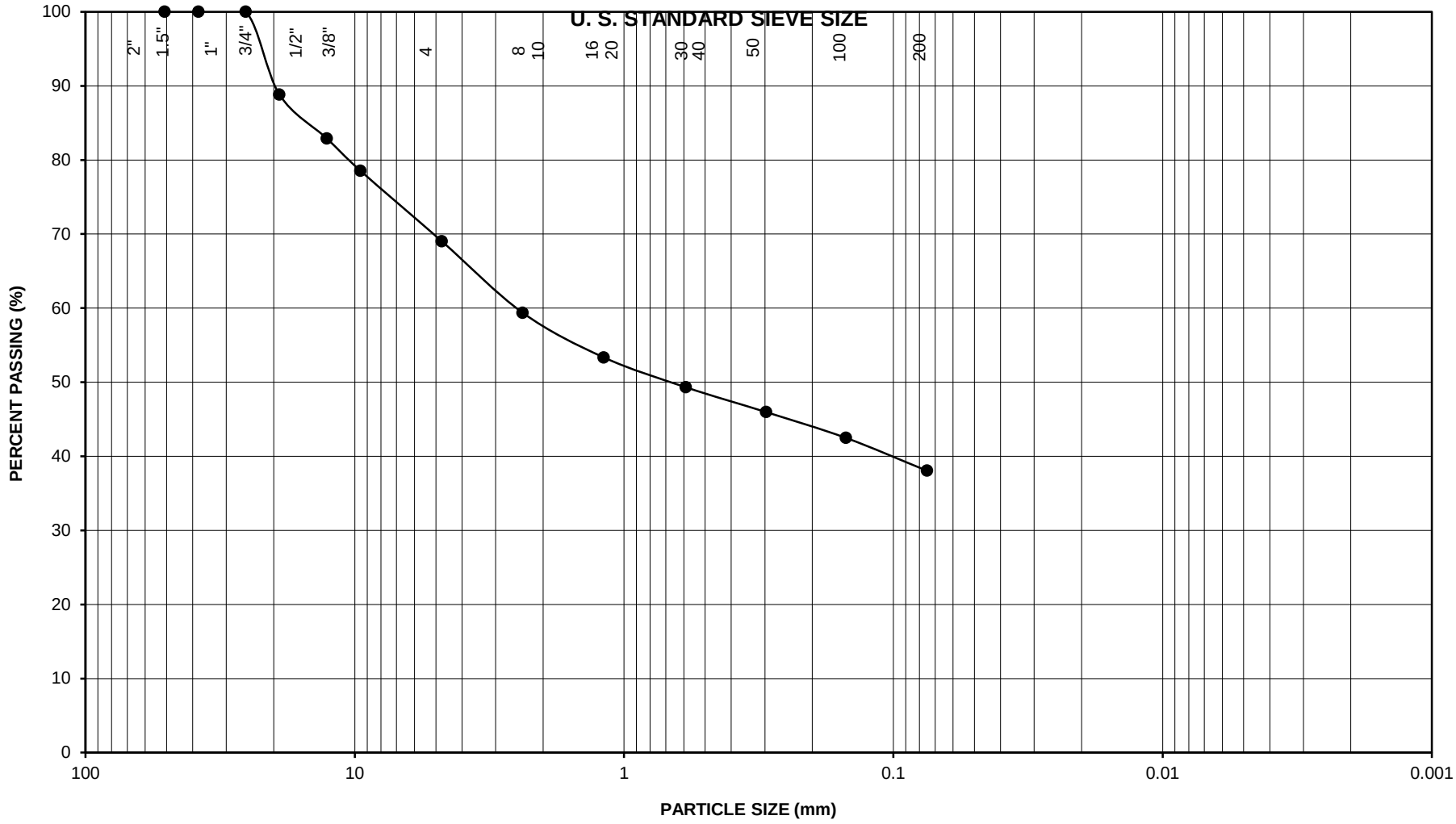
CTE JOB NUMBER: 40-3639G Commercial Development



PARTICLE SIZE ANALYSIS

Sample Designation	Sample Depth (feet)	Symbol	Liquid Limit (%)	Plasticity Index	Classification
B-7	11-11.5	●			SW-SM w/Grav
		■			

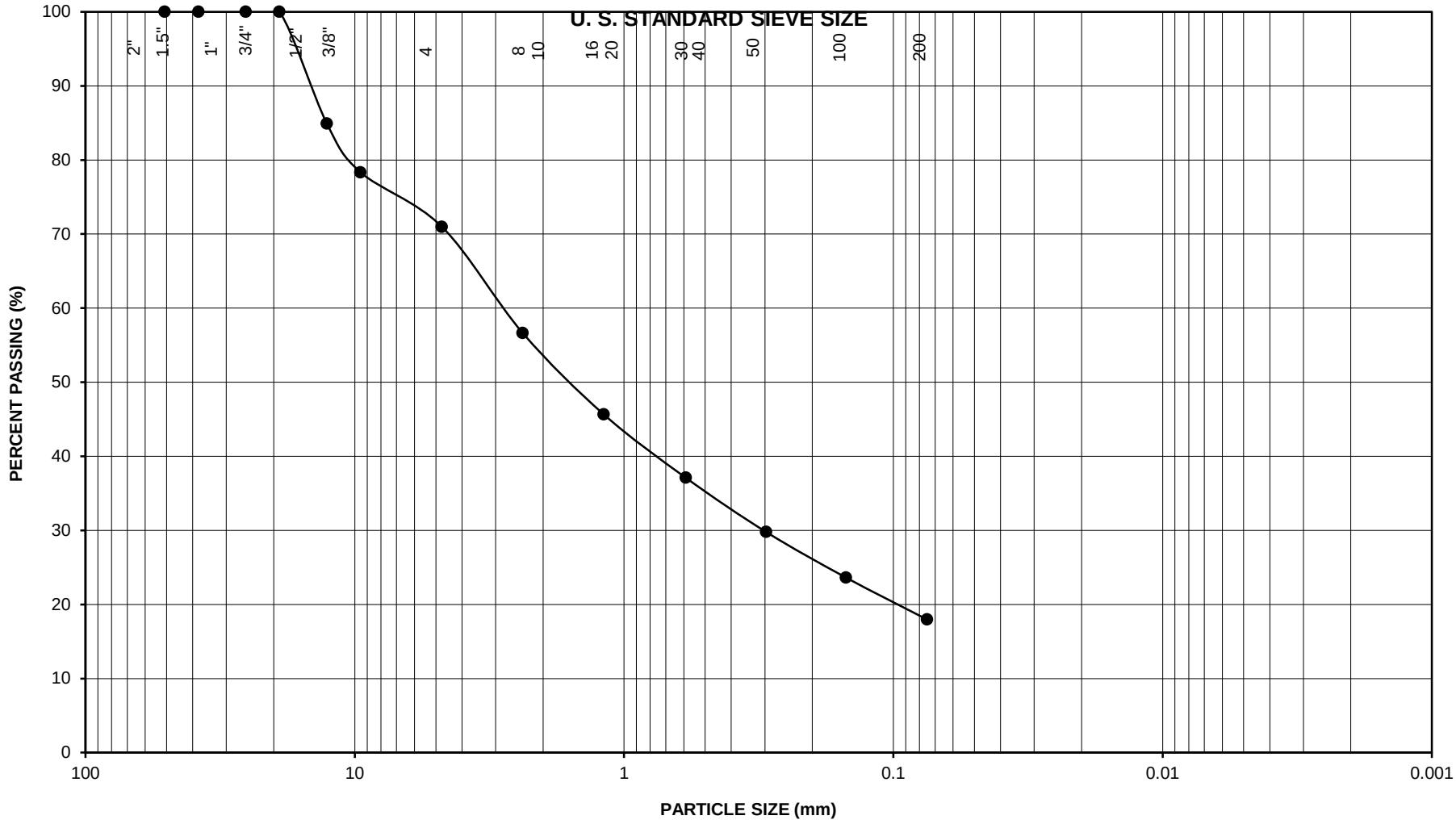
CTE JOB NUMBER: 40-3639G Commercial Development



PARTICLE SIZE ANALYSIS

Sample Designation	Sample Depth (feet)	Symbol	Liquid Limit (%)	Plasticity Index	Classification
B-10	8-10	●			SC w/Gravel
		■			

CTE JOB NUMBER: 40-3639G Commercial Development



PARTICLE SIZE ANALYSIS

Sample Designation	Sample Depth (feet)	Symbol	Liquid Limit (%)	Plasticity Index	Classification
B-12	10-11.5	●			SC-SM w/Grav
		■			

CTE JOB NUMBER: 40-3639G Commercial Development

BABCOCK Laboratories, Inc.
The Standard of Excellence for Over 100 Years

Client Name: Construction Testing & Eng., Inc.
Contact: Robert Ellerbusch
Address: 14538 Meridian Parkway, Suite A
Riverside, CA 92518

Report Date: 30-Aug-2018

Analytical Report: Page 1 of 4
Project Name: Const. Test.-Soils
Project Number: Residential Dev. Temescal Cyn. - Corona CA
Work Order Number: B8H3072
Received on Ice (Y/N): No Temp: 31 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Sample Identification

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B8H3072-01	40-3639: B-5 @ 0-3'	Soil	08/16/18 00:00	Vincent J. Patula	08/24/18 13:57	Jason Collins
B8H3072-02	40-3639: B-9 @ 5-10'	Soil	08/16/18 00:00	Vincent J. Patula	08/24/18 13:57	Jason Collins

BABCOCK Laboratories, Inc.
The Standard of Excellence for Over 100 Years

Client Name: Construction Testing & Eng., Inc.
Contact: Robert Ellerbusch
Address: 14538 Meridian Parkway, Suite A
Riverside, CA 92518

Report Date: 30-Aug-2018

Project Name: Const. Test.-Soils
Project Number: Residential Dev. Temescal Cyn. - Corona CA
Work Order Number: B8H3072
Received on Ice (Y/N): No Temp: 31 °C

Laboratory Reference Number
B8H3072-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
40-3639: B-5 @ 0-3'	Soil	08/16/18 00:00	08/24/18 13:57

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Anions							
Chloride	ND	5.0	mg/kg	Cal Trans 422	08/28/18 16:20	RER	
Sulfate	ND	5.0	mg/kg	Cal Trans 417	08/28/18 16:20	RER	
Saturated Paste							
pH	5.4	0.1	pH Units	S-1.10 W.S.	08/28/18 18:08	TML	
Minimum Resistivity	7000	10	ohm-cm	Cal Trans 643	08/28/18 18:08	TML	

BABCOCK Laboratories, Inc.
The Standard of Excellence for Over 100 Years

Client Name: Construction Testing & Eng., Inc.
Contact: Robert Ellerbusch
Address: 14538 Meridian Parkway, Suite A
Riverside, CA 92518

Report Date: 30-Aug-2018

Project Name: Const. Test.-Soils
Project Number: Residential Dev. Temescal Cyn. - Corona CA
Work Order Number: B8H3072

Received on Ice (Y/N): No Temp: 31 °C

Laboratory Reference Number
B8H3072-02

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
40-3639: B-9 @ 5-10'	Soil	08/16/18 00:00	08/24/18 13:57

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Anions							
Chloride	9.2	5.0	mg/kg	Cal Trans 422	08/28/18 14:54	RER	
Sulfate	21	5.0	mg/kg	Cal Trans 417	08/28/18 14:54	RER	
Saturated Paste							
pH	6.0	0.1	pH Units	S-1.10 W.S.	08/28/18 18:08	TML	
Minimum Resistivity	2600	10	ohm-cm	Cal Trans 643	08/28/18 18:08	TML	

BABCOCK Laboratories, Inc.
The Standard of Excellence for Over 100 Years

Client Name: Construction Testing & Eng., Inc.
Contact: Robert Ellerbusch
Address: 14538 Meridian Parkway, Suite A
Riverside, CA 92518

Report Date: 30-Aug-2018

Project Name: Const. Test.-Soils
Project Number: Residential Dev. Temescal Cyn. - Corona CA
Work Order Number: B8H3072
Received on Ice (Y/N): No Temp: 31 °C

Notes and Definitions

ND:	Analyte NOT DETECTED at or above the Method Detection Limit **(if MDL is reported)**, otherwise at or above the Reportable Detection Limit (RDL)
NR:	Not Reported
RDL:	Reportable Detection Limit
MDL:	Method Detection Limit
* / ''' :	NELAP does not offer accreditation for this analyte/method/matrix combination

Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.



KayeLani A. Marshall

cc:

e-Short_No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

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EPA No. CA00102
NELAP No. OR4035
LACSD No. 10119

APPENDIX C

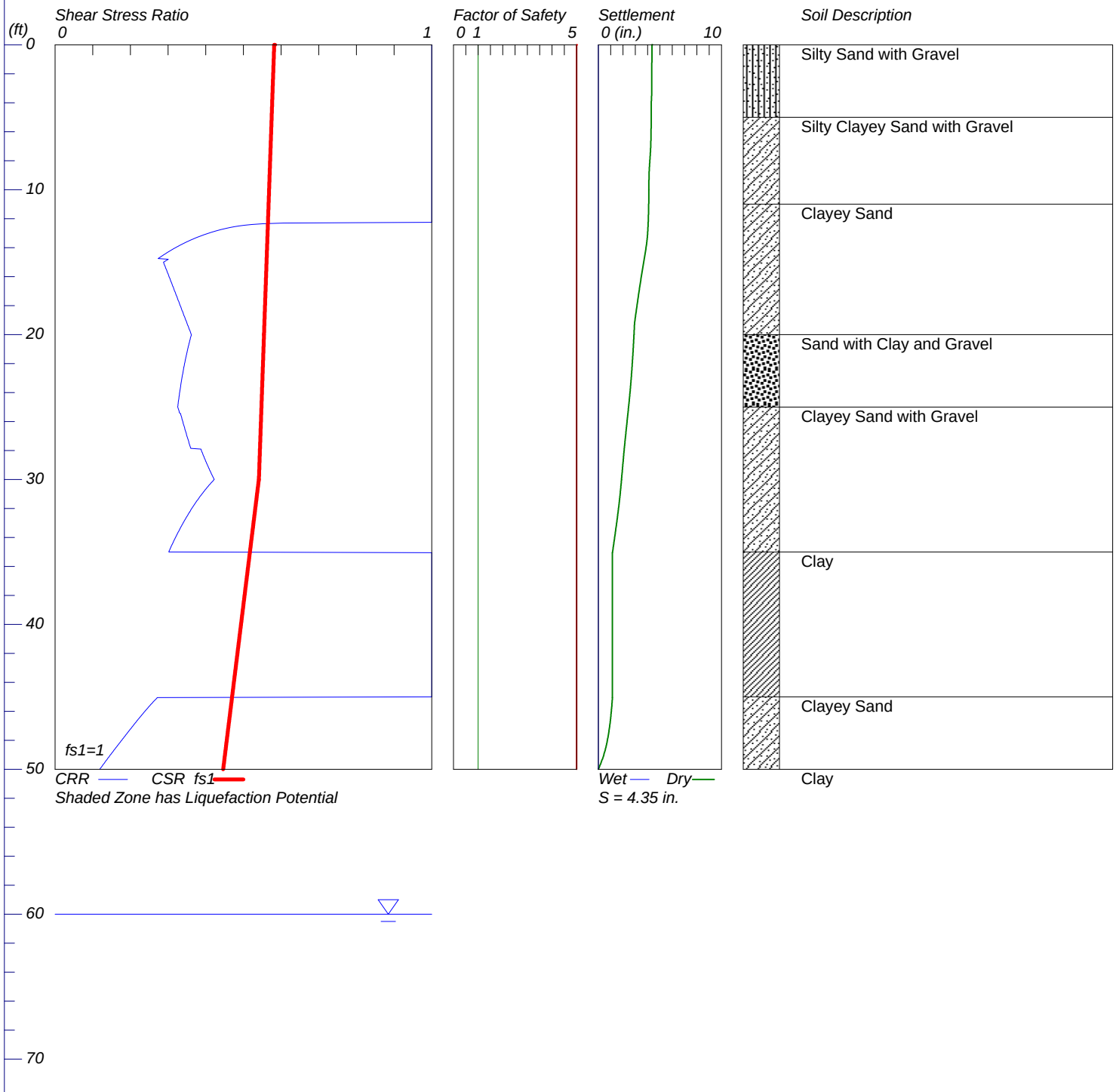
SEISMIC SETTLEMENT ANALYSIS

LIQUEFACTION ANALYSIS

Proposed Commercial Dev. Temescal Cyn

Hole No.=B-1 Water Depth=60 ft Surface Elev.=~1093

Magnitude=6.8
Acceleration=0.895g



LiquefyPro CivilTech Software USA www.civiltech.com

****
LIQUEFACTION ANALYSIS CALCULATION SHEET

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****
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Input File Name: \\Server\projects\40-3639G Proposed Residential Development\B1.liq
Title: Proposed Commercial Dev. Temescal Cyn
Subtitle: 40-3639G

Surface Elev.=~1093
Hole No.=B-1
Depth of Hole= 50.0 ft
Water Table during Earthquake= 60.0 ft
Water Table during In-Situ Testing= 60.0 ft
Max. Acceleration= 0.89 g
Earthquake Magnitude= 6.8

Input Data:
Surface Elev.=~1093
Hole No.=B-1
Depth of Hole=50.0 ft
Water Table during Earthquake= 60.0 ft
Water Table during In-Situ Testing= 60.0 ft
Max. Acceleration=0.89 g
Earthquake Magnitude=6.8

Earthquake Magnitude=6.8
2. Settlement Analysis Method: Ishihara / Yoshimine*
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1
9. User request factor of safety (apply to CSR) , User= 1
Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*
* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.0	23.0	120.0	25.0
5.0	23.0	120.0	25.0
10.0	35.0	120.0	20.0
15.0	18.0	120.0	16.0
20.0	28.0	125.0	8.0
25.0	27.0	120.0	14.0
30.0	33.0	110.0	18.0
35.0	28.0	120.0	NoLiq
40.0	35.0	120.0	NoLiq
45.0	32.0	120.0	14.0

50.0 13.0 120.0 NoLiq

Output Results:

Settlement of saturated sands=0.00 in.
Settlement of dry sands=4.35 in.
Total settlement of saturated and dry sands=4.35 in.
Differential Settlement=2.173 to 2.868 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.57	0.58	5.00	0.00	4.35	4.35
0.05	2.57	0.58	5.00	0.00	4.35	4.35
0.10	2.57	0.58	5.00	0.00	4.35	4.35
0.15	2.57	0.58	5.00	0.00	4.34	4.34
0.20	2.57	0.58	5.00	0.00	4.34	4.34
0.25	2.57	0.58	5.00	0.00	4.34	4.34
0.30	2.57	0.58	5.00	0.00	4.34	4.34
0.35	2.57	0.58	5.00	0.00	4.34	4.34
0.40	2.57	0.58	5.00	0.00	4.34	4.34
0.45	2.57	0.58	5.00	0.00	4.34	4.34
0.50	2.57	0.58	5.00	0.00	4.34	4.34
0.55	2.57	0.58	5.00	0.00	4.34	4.34
0.60	2.57	0.58	5.00	0.00	4.34	4.34
0.65	2.57	0.58	5.00	0.00	4.34	4.34
0.70	2.57	0.58	5.00	0.00	4.34	4.34
0.75	2.57	0.58	5.00	0.00	4.34	4.34
0.80	2.57	0.58	5.00	0.00	4.34	4.34
0.85	2.57	0.58	5.00	0.00	4.34	4.34
0.90	2.57	0.58	5.00	0.00	4.34	4.34
0.95	2.57	0.58	5.00	0.00	4.34	4.34
1.00	2.57	0.58	5.00	0.00	4.34	4.34
1.05	2.57	0.58	5.00	0.00	4.34	4.34
1.10	2.57	0.58	5.00	0.00	4.34	4.34
1.15	2.57	0.58	5.00	0.00	4.34	4.34
1.20	2.57	0.58	5.00	0.00	4.34	4.34
1.25	2.57	0.58	5.00	0.00	4.34	4.34
1.30	2.57	0.58	5.00	0.00	4.34	4.34
1.35	2.57	0.58	5.00	0.00	4.34	4.34
1.40	2.57	0.58	5.00	0.00	4.34	4.34
1.45	2.57	0.58	5.00	0.00	4.34	4.34
1.50	2.57	0.58	5.00	0.00	4.34	4.34
1.55	2.57	0.58	5.00	0.00	4.34	4.34
1.60	2.57	0.58	5.00	0.00	4.34	4.34
1.65	2.57	0.58	5.00	0.00	4.34	4.34
1.70	2.57	0.58	5.00	0.00	4.34	4.34
1.75	2.57	0.58	5.00	0.00	4.34	4.34
1.80	2.57	0.58	5.00	0.00	4.34	4.34
1.85	2.57	0.58	5.00	0.00	4.34	4.34
1.90	2.57	0.58	5.00	0.00	4.34	4.34
1.95	2.57	0.58	5.00	0.00	4.34	4.34
2.00	2.57	0.58	5.00	0.00	4.34	4.34
2.05	2.57	0.58	5.00	0.00	4.34	4.34
2.10	2.57	0.58	5.00	0.00	4.34	4.34
2.15	2.57	0.58	5.00	0.00	4.34	4.34
2.20	2.57	0.58	5.00	0.00	4.34	4.34
2.25	2.57	0.58	5.00	0.00	4.34	4.34
2.30	2.57	0.58	5.00	0.00	4.34	4.34
2.35	2.57	0.58	5.00	0.00	4.34	4.34
2.40	2.57	0.58	5.00	0.00	4.34	4.34
2.45	2.57	0.58	5.00	0.00	4.34	4.34
2.50	2.57	0.58	5.00	0.00	4.34	4.34

				B1.sum		
2.55	2.57	0.58	5.00	0.00	4.34	4.34
2.60	2.57	0.58	5.00	0.00	4.34	4.34
2.65	2.57	0.58	5.00	0.00	4.34	4.34
2.70	2.57	0.58	5.00	0.00	4.34	4.34
2.75	2.57	0.58	5.00	0.00	4.34	4.34
2.80	2.57	0.58	5.00	0.00	4.34	4.34
2.85	2.57	0.58	5.00	0.00	4.34	4.34
2.90	2.57	0.58	5.00	0.00	4.34	4.34
2.95	2.57	0.58	5.00	0.00	4.34	4.34
3.00	2.57	0.58	5.00	0.00	4.33	4.33
3.05	2.57	0.58	5.00	0.00	4.33	4.33
3.10	2.57	0.58	5.00	0.00	4.33	4.33
3.15	2.57	0.58	5.00	0.00	4.33	4.33
3.20	2.57	0.58	5.00	0.00	4.33	4.33
3.25	2.57	0.58	5.00	0.00	4.33	4.33
3.30	2.57	0.58	5.00	0.00	4.33	4.33
3.35	2.57	0.58	5.00	0.00	4.33	4.33
3.40	2.57	0.58	5.00	0.00	4.33	4.33
3.45	2.57	0.58	5.00	0.00	4.33	4.33
3.50	2.57	0.58	5.00	0.00	4.32	4.32
3.55	2.57	0.58	5.00	0.00	4.32	4.32
3.60	2.57	0.58	5.00	0.00	4.32	4.32
3.65	2.57	0.58	5.00	0.00	4.32	4.32
3.70	2.57	0.58	5.00	0.00	4.32	4.32
3.75	2.57	0.58	5.00	0.00	4.31	4.31
3.80	2.57	0.58	5.00	0.00	4.31	4.31
3.85	2.57	0.58	5.00	0.00	4.30	4.30
3.90	2.57	0.58	5.00	0.00	4.30	4.30
3.95	2.57	0.58	5.00	0.00	4.30	4.30
4.00	2.57	0.58	5.00	0.00	4.30	4.30
4.05	2.57	0.58	5.00	0.00	4.30	4.30
4.10	2.57	0.58	5.00	0.00	4.30	4.30
4.15	2.57	0.58	5.00	0.00	4.30	4.30
4.20	2.57	0.58	5.00	0.00	4.30	4.30
4.25	2.57	0.58	5.00	0.00	4.30	4.30
4.30	2.57	0.58	5.00	0.00	4.30	4.30
4.35	2.57	0.58	5.00	0.00	4.30	4.30
4.40	2.57	0.58	5.00	0.00	4.30	4.30
4.45	2.57	0.58	5.00	0.00	4.30	4.30
4.50	2.57	0.58	5.00	0.00	4.30	4.30
4.55	2.57	0.58	5.00	0.00	4.30	4.30
4.60	2.57	0.58	5.00	0.00	4.30	4.30
4.65	2.57	0.58	5.00	0.00	4.30	4.30
4.70	2.57	0.58	5.00	0.00	4.30	4.30
4.75	2.57	0.58	5.00	0.00	4.30	4.30
4.80	2.57	0.58	5.00	0.00	4.30	4.30
4.85	2.57	0.58	5.00	0.00	4.30	4.30
4.90	2.57	0.58	5.00	0.00	4.30	4.30
4.95	2.57	0.58	5.00	0.00	4.30	4.30
5.00	2.57	0.57	5.00	0.00	4.29	4.29
5.05	2.57	0.57	5.00	0.00	4.29	4.29
5.10	2.57	0.57	5.00	0.00	4.29	4.29
5.15	2.57	0.57	5.00	0.00	4.29	4.29
5.20	2.57	0.57	5.00	0.00	4.29	4.29
5.25	2.57	0.57	5.00	0.00	4.29	4.29
5.30	2.57	0.57	5.00	0.00	4.29	4.29
5.35	2.57	0.57	5.00	0.00	4.29	4.29
5.40	2.57	0.57	5.00	0.00	4.29	4.29
5.45	2.57	0.57	5.00	0.00	4.29	4.29
5.50	2.57	0.57	5.00	0.00	4.29	4.29
5.55	2.57	0.57	5.00	0.00	4.29	4.29
5.60	2.57	0.57	5.00	0.00	4.29	4.29
5.65	2.57	0.57	5.00	0.00	4.29	4.29

				B1.sum		
5.70	2.57	0.57	5.00	0.00	4.29	4.29
5.75	2.57	0.57	5.00	0.00	4.28	4.28
5.80	2.57	0.57	5.00	0.00	4.28	4.28
5.85	2.57	0.57	5.00	0.00	4.28	4.28
5.90	2.57	0.57	5.00	0.00	4.28	4.28
5.95	2.57	0.57	5.00	0.00	4.28	4.28
6.00	2.57	0.57	5.00	0.00	4.28	4.28
6.05	2.57	0.57	5.00	0.00	4.28	4.28
6.10	2.57	0.57	5.00	0.00	4.28	4.28
6.15	2.57	0.57	5.00	0.00	4.28	4.28
6.20	2.57	0.57	5.00	0.00	4.28	4.28
6.25	2.57	0.57	5.00	0.00	4.28	4.28
6.30	2.57	0.57	5.00	0.00	4.27	4.27
6.35	2.57	0.57	5.00	0.00	4.27	4.27
6.40	2.57	0.57	5.00	0.00	4.27	4.27
6.45	2.57	0.57	5.00	0.00	4.27	4.27
6.50	2.57	0.57	5.00	0.00	4.27	4.27
6.55	2.57	0.57	5.00	0.00	4.27	4.27
6.60	2.57	0.57	5.00	0.00	4.27	4.27
6.65	2.57	0.57	5.00	0.00	4.26	4.26
6.70	2.57	0.57	5.00	0.00	4.26	4.26
6.75	2.57	0.57	5.00	0.00	4.26	4.26
6.80	2.57	0.57	5.00	0.00	4.26	4.26
6.85	2.57	0.57	5.00	0.00	4.26	4.26
6.90	2.57	0.57	5.00	0.00	4.26	4.26
6.95	2.57	0.57	5.00	0.00	4.25	4.25
7.00	2.57	0.57	5.00	0.00	4.25	4.25
7.05	2.57	0.57	5.00	0.00	4.25	4.25
7.10	2.57	0.57	5.00	0.00	4.25	4.25
7.15	2.57	0.57	5.00	0.00	4.24	4.24
7.20	2.57	0.57	5.00	0.00	4.24	4.24
7.25	2.57	0.57	5.00	0.00	4.24	4.24
7.30	2.57	0.57	5.00	0.00	4.23	4.23
7.35	2.57	0.57	5.00	0.00	4.23	4.23
7.40	2.57	0.57	5.00	0.00	4.23	4.23
7.45	2.57	0.57	5.00	0.00	4.22	4.22
7.50	2.57	0.57	5.00	0.00	4.22	4.22
7.55	2.57	0.57	5.00	0.00	4.22	4.22
7.60	2.57	0.57	5.00	0.00	4.21	4.21
7.65	2.57	0.57	5.00	0.00	4.21	4.21
7.70	2.57	0.57	5.00	0.00	4.21	4.21
7.75	2.57	0.57	5.00	0.00	4.20	4.20
7.80	2.57	0.57	5.00	0.00	4.20	4.20
7.85	2.57	0.57	5.00	0.00	4.19	4.19
7.90	2.57	0.57	5.00	0.00	4.19	4.19
7.95	2.57	0.57	5.00	0.00	4.18	4.18
8.00	2.57	0.57	5.00	0.00	4.18	4.18
8.05	2.57	0.57	5.00	0.00	4.18	4.18
8.10	2.57	0.57	5.00	0.00	4.17	4.17
8.15	2.57	0.57	5.00	0.00	4.17	4.17
8.20	2.57	0.57	5.00	0.00	4.16	4.16
8.25	2.57	0.57	5.00	0.00	4.16	4.16
8.30	2.57	0.57	5.00	0.00	4.16	4.16
8.35	2.57	0.57	5.00	0.00	4.15	4.15
8.40	2.57	0.57	5.00	0.00	4.15	4.15
8.45	2.57	0.57	5.00	0.00	4.15	4.15
8.50	2.57	0.57	5.00	0.00	4.14	4.14
8.55	2.57	0.57	5.00	0.00	4.14	4.14
8.60	2.57	0.57	5.00	0.00	4.14	4.14
8.65	2.57	0.57	5.00	0.00	4.13	4.13
8.70	2.57	0.57	5.00	0.00	4.13	4.13
8.75	2.57	0.57	5.00	0.00	4.13	4.13
8.80	2.57	0.57	5.00	0.00	4.12	4.12

				B1.sum		
8.85	2.57	0.57	5.00	0.00	4.12	4.12
8.90	2.57	0.57	5.00	0.00	4.12	4.12
8.95	2.57	0.57	5.00	0.00	4.11	4.11
9.00	2.57	0.57	5.00	0.00	4.11	4.11
9.05	2.57	0.57	5.00	0.00	4.11	4.11
9.10	2.57	0.57	5.00	0.00	4.11	4.11
9.15	2.57	0.57	5.00	0.00	4.11	4.11
9.20	2.57	0.57	5.00	0.00	4.11	4.11
9.25	2.57	0.57	5.00	0.00	4.11	4.11
9.30	2.57	0.57	5.00	0.00	4.11	4.11
9.35	2.57	0.57	5.00	0.00	4.11	4.11
9.40	2.57	0.57	5.00	0.00	4.11	4.11
9.45	2.57	0.57	5.00	0.00	4.11	4.11
9.50	2.57	0.57	5.00	0.00	4.11	4.11
9.55	2.57	0.57	5.00	0.00	4.11	4.11
9.60	2.57	0.57	5.00	0.00	4.11	4.11
9.65	2.57	0.57	5.00	0.00	4.10	4.10
9.70	2.57	0.57	5.00	0.00	4.10	4.10
9.75	2.57	0.57	5.00	0.00	4.10	4.10
9.80	2.57	0.57	5.00	0.00	4.10	4.10
9.85	2.57	0.57	5.00	0.00	4.10	4.10
9.90	2.57	0.57	5.00	0.00	4.10	4.10
9.95	2.57	0.57	5.00	0.00	4.10	4.10
10.00	2.57	0.57	5.00	0.00	4.10	4.10
10.05	2.57	0.57	5.00	0.00	4.10	4.10
10.10	2.57	0.57	5.00	0.00	4.10	4.10
10.15	2.57	0.57	5.00	0.00	4.10	4.10
10.20	2.57	0.57	5.00	0.00	4.10	4.10
10.25	2.57	0.57	5.00	0.00	4.10	4.10
10.30	2.57	0.57	5.00	0.00	4.10	4.10
10.35	2.57	0.57	5.00	0.00	4.10	4.10
10.40	2.57	0.57	5.00	0.00	4.10	4.10
10.45	2.57	0.57	5.00	0.00	4.10	4.10
10.50	2.57	0.57	5.00	0.00	4.10	4.10
10.55	2.57	0.57	5.00	0.00	4.09	4.09
10.60	2.57	0.57	5.00	0.00	4.09	4.09
10.65	2.57	0.57	5.00	0.00	4.09	4.09
10.70	2.57	0.57	5.00	0.00	4.09	4.09
10.75	2.57	0.57	5.00	0.00	4.09	4.09
10.80	2.57	0.57	5.00	0.00	4.09	4.09
10.85	2.57	0.57	5.00	0.00	4.09	4.09
10.90	2.57	0.57	5.00	0.00	4.09	4.09
10.95	2.57	0.57	5.00	0.00	4.09	4.09
11.00	2.57	0.57	5.00	0.00	4.09	4.09
11.05	2.57	0.57	5.00	0.00	4.09	4.09
11.10	2.57	0.57	5.00	0.00	4.09	4.09
11.15	2.57	0.57	5.00	0.00	4.08	4.08
11.20	2.57	0.57	5.00	0.00	4.08	4.08
11.25	2.57	0.57	5.00	0.00	4.08	4.08
11.30	2.57	0.57	5.00	0.00	4.08	4.08
11.35	2.57	0.57	5.00	0.00	4.08	4.08
11.40	2.57	0.57	5.00	0.00	4.08	4.08
11.45	2.57	0.57	5.00	0.00	4.08	4.08
11.50	2.57	0.57	5.00	0.00	4.08	4.08
11.55	2.57	0.57	5.00	0.00	4.07	4.07
11.60	2.57	0.57	5.00	0.00	4.07	4.07
11.65	2.57	0.57	5.00	0.00	4.07	4.07
11.70	2.57	0.57	5.00	0.00	4.07	4.07
11.75	2.57	0.57	5.00	0.00	4.07	4.07
11.80	2.57	0.57	5.00	0.00	4.07	4.07
11.85	2.57	0.57	5.00	0.00	4.06	4.06
11.90	2.57	0.57	5.00	0.00	4.06	4.06
11.95	2.57	0.57	5.00	0.00	4.06	4.06

				B1.sum		
12.00	2.57	0.57	5.00	0.00	4.06	4.06
12.05	2.57	0.57	5.00	0.00	4.06	4.06
12.10	2.57	0.57	5.00	0.00	4.05	4.05
12.15	2.57	0.57	5.00	0.00	4.05	4.05
12.20	2.57	0.57	5.00	0.00	4.05	4.05
12.25	2.57	0.57	5.00	0.00	4.05	4.05
12.30	0.61	0.57	5.00	0.00	4.05	4.05
12.35	0.55	0.56	5.00	0.00	4.04	4.04
12.40	0.52	0.56	5.00	0.00	4.04	4.04
12.45	0.50	0.56	5.00	0.00	4.04	4.04
12.50	0.49	0.56	5.00	0.00	4.03	4.03
12.55	0.48	0.56	5.00	0.00	4.03	4.03
12.60	0.47	0.56	5.00	0.00	4.03	4.03
12.65	0.46	0.56	5.00	0.00	4.03	4.03
12.70	0.45	0.56	5.00	0.00	4.02	4.02
12.75	0.44	0.56	5.00	0.00	4.02	4.02
12.80	0.43	0.56	5.00	0.00	4.02	4.02
12.85	0.43	0.56	5.00	0.00	4.01	4.01
12.90	0.42	0.56	5.00	0.00	4.01	4.01
12.95	0.41	0.56	5.00	0.00	4.00	4.00
13.00	0.41	0.56	5.00	0.00	4.00	4.00
13.05	0.40	0.56	5.00	0.00	4.00	4.00
13.10	0.40	0.56	5.00	0.00	3.99	3.99
13.15	0.39	0.56	5.00	0.00	3.99	3.99
13.20	0.39	0.56	5.00	0.00	3.98	3.98
13.25	0.38	0.56	5.00	0.00	3.98	3.98
13.30	0.38	0.56	5.00	0.00	3.97	3.97
13.35	0.37	0.56	5.00	0.00	3.97	3.97
13.40	0.37	0.56	5.00	0.00	3.96	3.96
13.45	0.36	0.56	5.00	0.00	3.95	3.95
13.50	0.36	0.56	5.00	0.00	3.95	3.95
13.55	0.35	0.56	5.00	0.00	3.94	3.94
13.60	0.35	0.56	5.00	0.00	3.93	3.93
13.65	0.35	0.56	5.00	0.00	3.93	3.93
13.70	0.34	0.56	5.00	0.00	3.92	3.92
13.75	0.34	0.56	5.00	0.00	3.91	3.91
13.80	0.33	0.56	5.00	0.00	3.90	3.90
13.85	0.33	0.56	5.00	0.00	3.90	3.90
13.90	0.33	0.56	5.00	0.00	3.89	3.89
13.95	0.32	0.56	5.00	0.00	3.88	3.88
14.00	0.32	0.56	5.00	0.00	3.87	3.87
14.05	0.32	0.56	5.00	0.00	3.86	3.86
14.10	0.31	0.56	5.00	0.00	3.85	3.85
14.15	0.31	0.56	5.00	0.00	3.84	3.84
14.20	0.31	0.56	5.00	0.00	3.84	3.84
14.25	0.30	0.56	5.00	0.00	3.83	3.83
14.30	0.30	0.56	5.00	0.00	3.82	3.82
14.35	0.30	0.56	5.00	0.00	3.81	3.81
14.40	0.29	0.56	5.00	0.00	3.80	3.80
14.45	0.29	0.56	5.00	0.00	3.79	3.79
14.50	0.29	0.56	5.00	0.00	3.78	3.78
14.55	0.29	0.56	5.00	0.00	3.77	3.77
14.60	0.28	0.56	5.00	0.00	3.76	3.76
14.65	0.28	0.56	5.00	0.00	3.75	3.75
14.70	0.28	0.56	5.00	0.00	3.74	3.74
14.75	0.27	0.56	5.00	0.00	3.73	3.73
14.80	0.30	0.56	5.00	0.00	3.72	3.72
14.85	0.30	0.56	5.00	0.00	3.71	3.71
14.90	0.29	0.56	5.00	0.00	3.70	3.70
14.95	0.29	0.56	5.00	0.00	3.69	3.69
15.00	0.29	0.56	5.00	0.00	3.68	3.68
15.05	0.29	0.56	5.00	0.00	3.67	3.67
15.10	0.29	0.56	5.00	0.00	3.66	3.66

				B1.sum		
15.15	0.29	0.56	5.00	0.00	3.65	3.65
15.20	0.29	0.56	5.00	0.00	3.64	3.64
15.25	0.29	0.56	5.00	0.00	3.63	3.63
15.30	0.29	0.56	5.00	0.00	3.62	3.62
15.35	0.29	0.56	5.00	0.00	3.61	3.61
15.40	0.29	0.56	5.00	0.00	3.60	3.60
15.45	0.29	0.56	5.00	0.00	3.59	3.59
15.50	0.30	0.56	5.00	0.00	3.58	3.58
15.55	0.30	0.56	5.00	0.00	3.57	3.57
15.60	0.30	0.56	5.00	0.00	3.56	3.56
15.65	0.30	0.56	5.00	0.00	3.55	3.55
15.70	0.30	0.56	5.00	0.00	3.54	3.54
15.75	0.30	0.56	5.00	0.00	3.54	3.54
15.80	0.30	0.56	5.00	0.00	3.53	3.53
15.85	0.30	0.56	5.00	0.00	3.52	3.52
15.90	0.30	0.56	5.00	0.00	3.51	3.51
15.95	0.30	0.56	5.00	0.00	3.50	3.50
16.00	0.30	0.56	5.00	0.00	3.49	3.49
16.05	0.30	0.56	5.00	0.00	3.48	3.48
16.10	0.30	0.56	5.00	0.00	3.47	3.47
16.15	0.30	0.56	5.00	0.00	3.46	3.46
16.20	0.31	0.56	5.00	0.00	3.45	3.45
16.25	0.31	0.56	5.00	0.00	3.44	3.44
16.30	0.31	0.56	5.00	0.00	3.43	3.43
16.35	0.31	0.56	5.00	0.00	3.42	3.42
16.40	0.31	0.56	5.00	0.00	3.41	3.41
16.45	0.31	0.56	5.00	0.00	3.41	3.41
16.50	0.31	0.56	5.00	0.00	3.40	3.40
16.55	0.31	0.56	5.00	0.00	3.39	3.39
16.60	0.31	0.56	5.00	0.00	3.38	3.38
16.65	0.31	0.56	5.00	0.00	3.37	3.37
16.70	0.31	0.56	5.00	0.00	3.36	3.36
16.75	0.31	0.56	5.00	0.00	3.35	3.35
16.80	0.31	0.56	5.00	0.00	3.34	3.34
16.85	0.32	0.56	5.00	0.00	3.33	3.33
16.90	0.32	0.56	5.00	0.00	3.33	3.33
16.95	0.32	0.56	5.00	0.00	3.32	3.32
17.00	0.32	0.56	5.00	0.00	3.31	3.31
17.05	0.32	0.56	5.00	0.00	3.30	3.30
17.10	0.32	0.56	5.00	0.00	3.29	3.29
17.15	0.32	0.56	5.00	0.00	3.28	3.28
17.20	0.32	0.56	5.00	0.00	3.27	3.27
17.25	0.32	0.56	5.00	0.00	3.26	3.26
17.30	0.32	0.56	5.00	0.00	3.26	3.26
17.35	0.32	0.56	5.00	0.00	3.25	3.25
17.40	0.32	0.56	5.00	0.00	3.24	3.24
17.45	0.32	0.56	5.00	0.00	3.23	3.23
17.50	0.32	0.56	5.00	0.00	3.22	3.22
17.55	0.33	0.56	5.00	0.00	3.21	3.21
17.60	0.33	0.56	5.00	0.00	3.20	3.20
17.65	0.33	0.56	5.00	0.00	3.20	3.20
17.70	0.33	0.56	5.00	0.00	3.19	3.19
17.75	0.33	0.56	5.00	0.00	3.18	3.18
17.80	0.33	0.56	5.00	0.00	3.17	3.17
17.85	0.33	0.56	5.00	0.00	3.16	3.16
17.90	0.33	0.56	5.00	0.00	3.15	3.15
17.95	0.33	0.56	5.00	0.00	3.14	3.14
18.00	0.33	0.56	5.00	0.00	3.14	3.14
18.05	0.33	0.56	5.00	0.00	3.13	3.13
18.10	0.33	0.56	5.00	0.00	3.12	3.12
18.15	0.33	0.56	5.00	0.00	3.11	3.11
18.20	0.34	0.56	5.00	0.00	3.10	3.10
18.25	0.34	0.56	5.00	0.00	3.09	3.09

18.30	0.34	0.56	5.00	0.00	3.09	3.09
18.35	0.34	0.56	5.00	0.00	3.08	3.08
18.40	0.34	0.56	5.00	0.00	3.07	3.07
18.45	0.34	0.56	5.00	0.00	3.06	3.06
18.50	0.34	0.56	5.00	0.00	3.05	3.05
18.55	0.34	0.56	5.00	0.00	3.04	3.04
18.60	0.34	0.56	5.00	0.00	3.04	3.04
18.65	0.34	0.56	5.00	0.00	3.03	3.03
18.70	0.34	0.56	5.00	0.00	3.02	3.02
18.75	0.34	0.56	5.00	0.00	3.01	3.01
18.80	0.34	0.56	5.00	0.00	3.00	3.00
18.85	0.34	0.56	5.00	0.00	3.00	3.00
18.90	0.35	0.56	5.00	0.00	2.99	2.99
18.95	0.35	0.56	5.00	0.00	2.98	2.98
19.00	0.35	0.56	5.00	0.00	2.97	2.97
19.05	0.35	0.56	5.00	0.00	2.96	2.96
19.10	0.35	0.56	5.00	0.00	2.96	2.96
19.15	0.35	0.56	5.00	0.00	2.95	2.95
19.20	0.35	0.56	5.00	0.00	2.94	2.94
19.25	0.35	0.56	5.00	0.00	2.94	2.94
19.30	0.35	0.56	5.00	0.00	2.93	2.93
19.35	0.35	0.56	5.00	0.00	2.93	2.93
19.40	0.35	0.56	5.00	0.00	2.93	2.93
19.45	0.35	0.56	5.00	0.00	2.93	2.93
19.50	0.35	0.56	5.00	0.00	2.92	2.92
19.55	0.36	0.56	5.00	0.00	2.92	2.92
19.60	0.36	0.56	5.00	0.00	2.92	2.92
19.65	0.36	0.56	5.00	0.00	2.91	2.91
19.70	0.36	0.56	5.00	0.00	2.91	2.91
19.75	0.36	0.55	5.00	0.00	2.91	2.91
19.80	0.36	0.55	5.00	0.00	2.90	2.90
19.85	0.36	0.55	5.00	0.00	2.90	2.90
19.90	0.36	0.55	5.00	0.00	2.90	2.90
19.95	0.36	0.55	5.00	0.00	2.90	2.90
20.00	0.36	0.55	5.00	0.00	2.89	2.89
20.05	0.36	0.55	5.00	0.00	2.89	2.89
20.10	0.36	0.55	5.00	0.00	2.89	2.89
20.15	0.36	0.55	5.00	0.00	2.88	2.88
20.20	0.36	0.55	5.00	0.00	2.88	2.88
20.25	0.36	0.55	5.00	0.00	2.88	2.88
20.30	0.36	0.55	5.00	0.00	2.87	2.87
20.35	0.36	0.55	5.00	0.00	2.87	2.87
20.40	0.36	0.55	5.00	0.00	2.87	2.87
20.45	0.36	0.55	5.00	0.00	2.87	2.87
20.50	0.36	0.55	5.00	0.00	2.86	2.86
20.55	0.36	0.55	5.00	0.00	2.86	2.86
20.60	0.36	0.55	5.00	0.00	2.86	2.86
20.65	0.36	0.55	5.00	0.00	2.85	2.85
20.70	0.35	0.55	5.00	0.00	2.85	2.85
20.75	0.35	0.55	5.00	0.00	2.85	2.85
20.80	0.35	0.55	5.00	0.00	2.84	2.84
20.85	0.35	0.55	5.00	0.00	2.84	2.84
20.90	0.35	0.55	5.00	0.00	2.84	2.84
20.95	0.35	0.55	5.00	0.00	2.83	2.83
21.00	0.35	0.55	5.00	0.00	2.83	2.83
21.05	0.35	0.55	5.00	0.00	2.83	2.83
21.10	0.35	0.55	5.00	0.00	2.82	2.82
21.15	0.35	0.55	5.00	0.00	2.82	2.82
21.20	0.35	0.55	5.00	0.00	2.81	2.81
21.25	0.35	0.55	5.00	0.00	2.81	2.81
21.30	0.35	0.55	5.00	0.00	2.81	2.81
21.35	0.35	0.55	5.00	0.00	2.80	2.80
21.40	0.35	0.55	5.00	0.00	2.80	2.80

				B1.sum		
21.45	0.35	0.55	5.00	0.00	2.80	2.80
21.50	0.35	0.55	5.00	0.00	2.79	2.79
21.55	0.35	0.55	5.00	0.00	2.79	2.79
21.60	0.35	0.55	5.00	0.00	2.79	2.79
21.65	0.35	0.55	5.00	0.00	2.78	2.78
21.70	0.35	0.55	5.00	0.00	2.78	2.78
21.75	0.35	0.55	5.00	0.00	2.77	2.77
21.80	0.35	0.55	5.00	0.00	2.77	2.77
21.85	0.34	0.55	5.00	0.00	2.77	2.77
21.90	0.34	0.55	5.00	0.00	2.76	2.76
21.95	0.34	0.55	5.00	0.00	2.76	2.76
22.00	0.34	0.55	5.00	0.00	2.75	2.75
22.05	0.34	0.55	5.00	0.00	2.75	2.75
22.10	0.34	0.55	5.00	0.00	2.75	2.75
22.15	0.34	0.55	5.00	0.00	2.74	2.74
22.20	0.34	0.55	5.00	0.00	2.74	2.74
22.25	0.34	0.55	5.00	0.00	2.73	2.73
22.30	0.34	0.55	5.00	0.00	2.73	2.73
22.35	0.34	0.55	5.00	0.00	2.73	2.73
22.40	0.34	0.55	5.00	0.00	2.72	2.72
22.45	0.34	0.55	5.00	0.00	2.72	2.72
22.50	0.34	0.55	5.00	0.00	2.71	2.71
22.55	0.34	0.55	5.00	0.00	2.71	2.71
22.60	0.34	0.55	5.00	0.00	2.70	2.70
22.65	0.34	0.55	5.00	0.00	2.70	2.70
22.70	0.34	0.55	5.00	0.00	2.69	2.69
22.75	0.34	0.55	5.00	0.00	2.69	2.69
22.80	0.34	0.55	5.00	0.00	2.69	2.69
22.85	0.34	0.55	5.00	0.00	2.68	2.68
22.90	0.34	0.55	5.00	0.00	2.68	2.68
22.95	0.34	0.55	5.00	0.00	2.67	2.67
23.00	0.34	0.55	5.00	0.00	2.67	2.67
23.05	0.34	0.55	5.00	0.00	2.66	2.66
23.10	0.34	0.55	5.00	0.00	2.66	2.66
23.15	0.34	0.55	5.00	0.00	2.65	2.65
23.20	0.34	0.55	5.00	0.00	2.65	2.65
23.25	0.34	0.55	5.00	0.00	2.64	2.64
23.30	0.33	0.55	5.00	0.00	2.64	2.64
23.35	0.33	0.55	5.00	0.00	2.63	2.63
23.40	0.33	0.55	5.00	0.00	2.63	2.63
23.45	0.33	0.55	5.00	0.00	2.62	2.62
23.50	0.33	0.55	5.00	0.00	2.62	2.62
23.55	0.33	0.55	5.00	0.00	2.61	2.61
23.60	0.33	0.55	5.00	0.00	2.61	2.61
23.65	0.33	0.55	5.00	0.00	2.60	2.60
23.70	0.33	0.55	5.00	0.00	2.60	2.60
23.75	0.33	0.55	5.00	0.00	2.59	2.59
23.80	0.33	0.55	5.00	0.00	2.59	2.59
23.85	0.33	0.55	5.00	0.00	2.58	2.58
23.90	0.33	0.55	5.00	0.00	2.58	2.58
23.95	0.33	0.55	5.00	0.00	2.57	2.57
24.00	0.33	0.55	5.00	0.00	2.57	2.57
24.05	0.33	0.55	5.00	0.00	2.56	2.56
24.10	0.33	0.55	5.00	0.00	2.56	2.56
24.15	0.33	0.55	5.00	0.00	2.55	2.55
24.20	0.33	0.55	5.00	0.00	2.55	2.55
24.25	0.33	0.55	5.00	0.00	2.54	2.54
24.30	0.33	0.55	5.00	0.00	2.54	2.54
24.35	0.33	0.55	5.00	0.00	2.53	2.53
24.40	0.33	0.55	5.00	0.00	2.52	2.52
24.45	0.33	0.55	5.00	0.00	2.52	2.52
24.50	0.33	0.55	5.00	0.00	2.51	2.51
24.55	0.33	0.55	5.00	0.00	2.51	2.51

				B1.sum		
24.60	0.33	0.55	5.00	0.00	2.50	2.50
24.65	0.33	0.55	5.00	0.00	2.50	2.50
24.70	0.33	0.55	5.00	0.00	2.49	2.49
24.75	0.33	0.55	5.00	0.00	2.48	2.48
24.80	0.33	0.55	5.00	0.00	2.48	2.48
24.85	0.33	0.55	5.00	0.00	2.47	2.47
24.90	0.33	0.55	5.00	0.00	2.47	2.47
24.95	0.33	0.55	5.00	0.00	2.46	2.46
25.00	0.33	0.55	5.00	0.00	2.45	2.45
25.05	0.33	0.55	5.00	0.00	2.45	2.45
25.10	0.33	0.55	5.00	0.00	2.44	2.44
25.15	0.33	0.55	5.00	0.00	2.43	2.43
25.20	0.33	0.55	5.00	0.00	2.43	2.43
25.25	0.33	0.55	5.00	0.00	2.42	2.42
25.30	0.33	0.55	5.00	0.00	2.42	2.42
25.35	0.33	0.55	5.00	0.00	2.41	2.41
25.40	0.33	0.55	5.00	0.00	2.40	2.40
25.45	0.33	0.55	5.00	0.00	2.40	2.40
25.50	0.33	0.55	5.00	0.00	2.39	2.39
25.55	0.33	0.55	5.00	0.00	2.39	2.39
25.60	0.33	0.55	5.00	0.00	2.38	2.38
25.65	0.34	0.55	5.00	0.00	2.37	2.37
25.70	0.34	0.55	5.00	0.00	2.37	2.37
25.75	0.34	0.55	5.00	0.00	2.36	2.36
25.80	0.34	0.55	5.00	0.00	2.36	2.36
25.85	0.34	0.55	5.00	0.00	2.35	2.35
25.90	0.34	0.55	5.00	0.00	2.34	2.34
25.95	0.34	0.55	5.00	0.00	2.34	2.34
26.00	0.34	0.55	5.00	0.00	2.33	2.33
26.05	0.34	0.55	5.00	0.00	2.32	2.32
26.10	0.34	0.55	5.00	0.00	2.32	2.32
26.15	0.34	0.55	5.00	0.00	2.31	2.31
26.20	0.34	0.55	5.00	0.00	2.31	2.31
26.25	0.34	0.55	5.00	0.00	2.30	2.30
26.30	0.34	0.55	5.00	0.00	2.29	2.29
26.35	0.34	0.55	5.00	0.00	2.29	2.29
26.40	0.34	0.55	5.00	0.00	2.28	2.28
26.45	0.34	0.55	5.00	0.00	2.28	2.28
26.50	0.34	0.55	5.00	0.00	2.27	2.27
26.55	0.35	0.55	5.00	0.00	2.26	2.26
26.60	0.35	0.55	5.00	0.00	2.26	2.26
26.65	0.35	0.55	5.00	0.00	2.25	2.25
26.70	0.35	0.55	5.00	0.00	2.24	2.24
26.75	0.35	0.55	5.00	0.00	2.24	2.24
26.80	0.35	0.55	5.00	0.00	2.23	2.23
26.85	0.35	0.55	5.00	0.00	2.23	2.23
26.90	0.35	0.55	5.00	0.00	2.22	2.22
26.95	0.35	0.55	5.00	0.00	2.21	2.21
27.00	0.35	0.55	5.00	0.00	2.21	2.21
27.05	0.35	0.55	5.00	0.00	2.20	2.20
27.10	0.35	0.54	5.00	0.00	2.20	2.20
27.15	0.35	0.54	5.00	0.00	2.19	2.19
27.20	0.35	0.54	5.00	0.00	2.18	2.18
27.25	0.35	0.54	5.00	0.00	2.18	2.18
27.30	0.35	0.54	5.00	0.00	2.17	2.17
27.35	0.35	0.54	5.00	0.00	2.17	2.17
27.40	0.35	0.54	5.00	0.00	2.16	2.16
27.45	0.36	0.54	5.00	0.00	2.15	2.15
27.50	0.36	0.54	5.00	0.00	2.15	2.15
27.55	0.36	0.54	5.00	0.00	2.14	2.14
27.60	0.36	0.54	5.00	0.00	2.14	2.14
27.65	0.36	0.54	5.00	0.00	2.13	2.13
27.70	0.36	0.54	5.00	0.00	2.12	2.12

				B1.sum		
27.75	0.36	0.54	5.00	0.00	2.12	2.12
27.80	0.36	0.54	5.00	0.00	2.11	2.11
27.85	0.36	0.54	5.00	0.00	2.10	2.10
27.90	0.39	0.54	5.00	0.00	2.10	2.10
27.95	0.39	0.54	5.00	0.00	2.09	2.09
28.00	0.39	0.54	5.00	0.00	2.09	2.09
28.05	0.39	0.54	5.00	0.00	2.08	2.08
28.10	0.39	0.54	5.00	0.00	2.08	2.08
28.15	0.39	0.54	5.00	0.00	2.07	2.07
28.20	0.39	0.54	5.00	0.00	2.07	2.07
28.25	0.39	0.54	5.00	0.00	2.06	2.06
28.30	0.39	0.54	5.00	0.00	2.06	2.06
28.35	0.39	0.54	5.00	0.00	2.05	2.05
28.40	0.39	0.54	5.00	0.00	2.05	2.05
28.45	0.40	0.54	5.00	0.00	2.04	2.04
28.50	0.40	0.54	5.00	0.00	2.04	2.04
28.55	0.40	0.54	5.00	0.00	2.03	2.03
28.60	0.40	0.54	5.00	0.00	2.03	2.03
28.65	0.40	0.54	5.00	0.00	2.02	2.02
28.70	0.40	0.54	5.00	0.00	2.02	2.02
28.75	0.40	0.54	5.00	0.00	2.01	2.01
28.80	0.40	0.54	5.00	0.00	2.00	2.00
28.85	0.40	0.54	5.00	0.00	2.00	2.00
28.90	0.40	0.54	5.00	0.00	1.99	1.99
28.95	0.40	0.54	5.00	0.00	1.99	1.99
29.00	0.40	0.54	5.00	0.00	1.98	1.98
29.05	0.41	0.54	5.00	0.00	1.98	1.98
29.10	0.41	0.54	5.00	0.00	1.97	1.97
29.15	0.41	0.54	5.00	0.00	1.97	1.97
29.20	0.41	0.54	5.00	0.00	1.96	1.96
29.25	0.41	0.54	5.00	0.00	1.96	1.96
29.30	0.41	0.54	5.00	0.00	1.95	1.95
29.35	0.41	0.54	5.00	0.00	1.95	1.95
29.40	0.41	0.54	5.00	0.00	1.94	1.94
29.45	0.41	0.54	5.00	0.00	1.94	1.94
29.50	0.41	0.54	5.00	0.00	1.93	1.93
29.55	0.41	0.54	5.00	0.00	1.93	1.93
29.60	0.42	0.54	5.00	0.00	1.92	1.92
29.65	0.42	0.54	5.00	0.00	1.92	1.92
29.70	0.42	0.54	5.00	0.00	1.91	1.91
29.75	0.42	0.54	5.00	0.00	1.91	1.91
29.80	0.42	0.54	5.00	0.00	1.90	1.90
29.85	0.42	0.54	5.00	0.00	1.90	1.90
29.90	0.42	0.54	5.00	0.00	1.89	1.89
29.95	0.42	0.54	5.00	0.00	1.89	1.89
30.00	0.42	0.54	5.00	0.00	1.88	1.88
30.05	0.42	0.54	5.00	0.00	1.88	1.88
30.10	0.42	0.54	5.00	0.00	1.87	1.87
30.15	0.42	0.54	5.00	0.00	1.87	1.87
30.20	0.42	0.54	5.00	0.00	1.86	1.86
30.25	0.41	0.54	5.00	0.00	1.85	1.85
30.30	0.41	0.54	5.00	0.00	1.85	1.85
30.35	0.41	0.54	5.00	0.00	1.84	1.84
30.40	0.41	0.54	5.00	0.00	1.84	1.84
30.45	0.41	0.54	5.00	0.00	1.83	1.83
30.50	0.41	0.54	5.00	0.00	1.83	1.83
30.55	0.40	0.54	5.00	0.00	1.82	1.82
30.60	0.40	0.54	5.00	0.00	1.82	1.82
30.65	0.40	0.54	5.00	0.00	1.81	1.81
30.70	0.40	0.54	5.00	0.00	1.80	1.80
30.75	0.40	0.54	5.00	0.00	1.80	1.80
30.80	0.40	0.54	5.00	0.00	1.79	1.79
30.85	0.39	0.54	5.00	0.00	1.79	1.79

				B1.sum		
30.90	0.39	0.54	5.00	0.00	1.78	1.78
30.95	0.39	0.54	5.00	0.00	1.78	1.78
31.00	0.39	0.54	5.00	0.00	1.77	1.77
31.05	0.39	0.54	5.00	0.00	1.76	1.76
31.10	0.39	0.54	5.00	0.00	1.76	1.76
31.15	0.39	0.54	5.00	0.00	1.75	1.75
31.20	0.38	0.54	5.00	0.00	1.74	1.74
31.25	0.38	0.54	5.00	0.00	1.74	1.74
31.30	0.38	0.53	5.00	0.00	1.73	1.73
31.35	0.38	0.53	5.00	0.00	1.73	1.73
31.40	0.38	0.53	5.00	0.00	1.72	1.72
31.45	0.38	0.53	5.00	0.00	1.71	1.71
31.50	0.38	0.53	5.00	0.00	1.71	1.71
31.55	0.37	0.53	5.00	0.00	1.70	1.70
31.60	0.37	0.53	5.00	0.00	1.69	1.69
31.65	0.37	0.53	5.00	0.00	1.69	1.69
31.70	0.37	0.53	5.00	0.00	1.68	1.68
31.75	0.37	0.53	5.00	0.00	1.67	1.67
31.80	0.37	0.53	5.00	0.00	1.67	1.67
31.85	0.37	0.53	5.00	0.00	1.66	1.66
31.90	0.37	0.53	5.00	0.00	1.65	1.65
31.95	0.36	0.53	5.00	0.00	1.64	1.64
32.00	0.36	0.53	5.00	0.00	1.64	1.64
32.05	0.36	0.53	5.00	0.00	1.63	1.63
32.10	0.36	0.53	5.00	0.00	1.62	1.62
32.15	0.36	0.53	5.00	0.00	1.62	1.62
32.20	0.36	0.53	5.00	0.00	1.61	1.61
32.25	0.36	0.53	5.00	0.00	1.60	1.60
32.30	0.36	0.53	5.00	0.00	1.59	1.59
32.35	0.35	0.53	5.00	0.00	1.59	1.59
32.40	0.35	0.53	5.00	0.00	1.58	1.58
32.45	0.35	0.53	5.00	0.00	1.57	1.57
32.50	0.35	0.53	5.00	0.00	1.56	1.56
32.55	0.35	0.53	5.00	0.00	1.55	1.55
32.60	0.35	0.53	5.00	0.00	1.55	1.55
32.65	0.35	0.53	5.00	0.00	1.54	1.54
32.70	0.35	0.53	5.00	0.00	1.53	1.53
32.75	0.35	0.53	5.00	0.00	1.52	1.52
32.80	0.34	0.53	5.00	0.00	1.52	1.52
32.85	0.34	0.53	5.00	0.00	1.51	1.51
32.90	0.34	0.53	5.00	0.00	1.50	1.50
32.95	0.34	0.53	5.00	0.00	1.49	1.49
33.00	0.34	0.53	5.00	0.00	1.48	1.48
33.05	0.34	0.53	5.00	0.00	1.48	1.48
33.10	0.34	0.53	5.00	0.00	1.47	1.47
33.15	0.34	0.53	5.00	0.00	1.46	1.46
33.20	0.34	0.53	5.00	0.00	1.45	1.45
33.25	0.33	0.53	5.00	0.00	1.45	1.45
33.30	0.33	0.53	5.00	0.00	1.44	1.44
33.35	0.33	0.53	5.00	0.00	1.43	1.43
33.40	0.33	0.52	5.00	0.00	1.42	1.42
33.45	0.33	0.52	5.00	0.00	1.41	1.41
33.50	0.33	0.52	5.00	0.00	1.40	1.40
33.55	0.33	0.52	5.00	0.00	1.40	1.40
33.60	0.33	0.52	5.00	0.00	1.39	1.39
33.65	0.33	0.52	5.00	0.00	1.38	1.38
33.70	0.33	0.52	5.00	0.00	1.37	1.37
33.75	0.32	0.52	5.00	0.00	1.36	1.36
33.80	0.32	0.52	5.00	0.00	1.36	1.36
33.85	0.32	0.52	5.00	0.00	1.35	1.35
33.90	0.32	0.52	5.00	0.00	1.34	1.34
33.95	0.32	0.52	5.00	0.00	1.33	1.33
34.00	0.32	0.52	5.00	0.00	1.32	1.32

				B1.sum		
34.05	0.32	0.52	5.00	0.00	1.31	1.31
34.10	0.32	0.52	5.00	0.00	1.31	1.31
34.15	0.32	0.52	5.00	0.00	1.30	1.30
34.20	0.32	0.52	5.00	0.00	1.29	1.29
34.25	0.32	0.52	5.00	0.00	1.28	1.28
34.30	0.31	0.52	5.00	0.00	1.27	1.27
34.35	0.31	0.52	5.00	0.00	1.26	1.26
34.40	0.31	0.52	5.00	0.00	1.26	1.26
34.45	0.31	0.52	5.00	0.00	1.25	1.25
34.50	0.31	0.52	5.00	0.00	1.24	1.24
34.55	0.31	0.52	5.00	0.00	1.23	1.23
34.60	0.31	0.52	5.00	0.00	1.22	1.22
34.65	0.31	0.52	5.00	0.00	1.21	1.21
34.70	0.31	0.52	5.00	0.00	1.20	1.20
34.75	0.31	0.52	5.00	0.00	1.20	1.20
34.80	0.31	0.52	5.00	0.00	1.19	1.19
34.85	0.30	0.52	5.00	0.00	1.18	1.18
34.90	0.30	0.52	5.00	0.00	1.17	1.17
34.95	0.30	0.52	5.00	0.00	1.16	1.16
35.00	0.30	0.52	5.00	0.00	1.15	1.15
35.05	2.00	0.52	5.00	0.00	1.14	1.14
35.10	2.00	0.52	5.00	0.00	1.14	1.14
35.15	2.00	0.52	5.00	0.00	1.14	1.14
35.20	2.00	0.52	5.00	0.00	1.14	1.14
35.25	2.00	0.52	5.00	0.00	1.14	1.14
35.30	2.00	0.52	5.00	0.00	1.14	1.14
35.35	2.00	0.52	5.00	0.00	1.14	1.14
35.40	2.00	0.52	5.00	0.00	1.14	1.14
35.45	2.00	0.52	5.00	0.00	1.14	1.14
35.50	2.00	0.51	5.00	0.00	1.14	1.14
35.55	2.00	0.51	5.00	0.00	1.14	1.14
35.60	2.00	0.51	5.00	0.00	1.14	1.14
35.65	2.00	0.51	5.00	0.00	1.14	1.14
35.70	2.00	0.51	5.00	0.00	1.14	1.14
35.75	2.00	0.51	5.00	0.00	1.14	1.14
35.80	2.00	0.51	5.00	0.00	1.14	1.14
35.85	2.00	0.51	5.00	0.00	1.14	1.14
35.90	2.00	0.51	5.00	0.00	1.14	1.14
35.95	2.00	0.51	5.00	0.00	1.14	1.14
36.00	2.00	0.51	5.00	0.00	1.14	1.14
36.05	2.00	0.51	5.00	0.00	1.14	1.14
36.10	2.00	0.51	5.00	0.00	1.14	1.14
36.15	2.00	0.51	5.00	0.00	1.14	1.14
36.20	2.00	0.51	5.00	0.00	1.14	1.14
36.25	2.00	0.51	5.00	0.00	1.14	1.14
36.30	2.00	0.51	5.00	0.00	1.14	1.14
36.35	2.00	0.51	5.00	0.00	1.14	1.14
36.40	2.00	0.51	5.00	0.00	1.14	1.14
36.45	2.00	0.51	5.00	0.00	1.14	1.14
36.50	2.00	0.51	5.00	0.00	1.14	1.14
36.55	2.00	0.51	5.00	0.00	1.14	1.14
36.60	2.00	0.51	5.00	0.00	1.14	1.14
36.65	2.00	0.51	5.00	0.00	1.14	1.14
36.70	2.00	0.51	5.00	0.00	1.14	1.14
36.75	2.00	0.51	5.00	0.00	1.14	1.14
36.80	2.00	0.51	5.00	0.00	1.14	1.14
36.85	2.00	0.51	5.00	0.00	1.14	1.14
36.90	2.00	0.51	5.00	0.00	1.14	1.14
36.95	2.00	0.51	5.00	0.00	1.14	1.14
37.00	2.00	0.51	5.00	0.00	1.14	1.14
37.05	2.00	0.51	5.00	0.00	1.14	1.14
37.10	2.00	0.51	5.00	0.00	1.14	1.14
37.15	2.00	0.51	5.00	0.00	1.14	1.14

				B1.sum		
37.20	2.00	0.51	5.00	0.00	1.14	1.14
37.25	2.00	0.51	5.00	0.00	1.14	1.14
37.30	2.00	0.51	5.00	0.00	1.14	1.14
37.35	2.00	0.51	5.00	0.00	1.14	1.14
37.40	2.00	0.51	5.00	0.00	1.14	1.14
37.45	2.00	0.51	5.00	0.00	1.14	1.14
37.50	2.00	0.51	5.00	0.00	1.14	1.14
37.55	2.00	0.51	5.00	0.00	1.14	1.14
37.60	2.00	0.50	5.00	0.00	1.14	1.14
37.65	2.00	0.50	5.00	0.00	1.14	1.14
37.70	2.00	0.50	5.00	0.00	1.14	1.14
37.75	2.00	0.50	5.00	0.00	1.14	1.14
37.80	2.00	0.50	5.00	0.00	1.14	1.14
37.85	2.00	0.50	5.00	0.00	1.14	1.14
37.90	2.00	0.50	5.00	0.00	1.14	1.14
37.95	2.00	0.50	5.00	0.00	1.14	1.14
38.00	2.00	0.50	5.00	0.00	1.14	1.14
38.05	2.00	0.50	5.00	0.00	1.14	1.14
38.10	2.00	0.50	5.00	0.00	1.14	1.14
38.15	2.00	0.50	5.00	0.00	1.14	1.14
38.20	2.00	0.50	5.00	0.00	1.14	1.14
38.25	2.00	0.50	5.00	0.00	1.14	1.14
38.30	2.00	0.50	5.00	0.00	1.14	1.14
38.35	2.00	0.50	5.00	0.00	1.14	1.14
38.40	2.00	0.50	5.00	0.00	1.14	1.14
38.45	2.00	0.50	5.00	0.00	1.14	1.14
38.50	2.00	0.50	5.00	0.00	1.14	1.14
38.55	2.00	0.50	5.00	0.00	1.14	1.14
38.60	2.00	0.50	5.00	0.00	1.14	1.14
38.65	2.00	0.50	5.00	0.00	1.14	1.14
38.70	2.00	0.50	5.00	0.00	1.14	1.14
38.75	2.00	0.50	5.00	0.00	1.14	1.14
38.80	2.00	0.50	5.00	0.00	1.14	1.14
38.85	2.00	0.50	5.00	0.00	1.14	1.14
38.90	2.00	0.50	5.00	0.00	1.14	1.14
38.95	2.00	0.50	5.00	0.00	1.14	1.14
39.00	2.00	0.50	5.00	0.00	1.14	1.14
39.05	2.00	0.50	5.00	0.00	1.14	1.14
39.10	2.00	0.50	5.00	0.00	1.14	1.14
39.15	2.00	0.50	5.00	0.00	1.14	1.14
39.20	2.00	0.50	5.00	0.00	1.14	1.14
39.25	2.00	0.50	5.00	0.00	1.14	1.14
39.30	2.00	0.50	5.00	0.00	1.14	1.14
39.35	2.00	0.50	5.00	0.00	1.14	1.14
39.40	2.00	0.50	5.00	0.00	1.14	1.14
39.45	2.00	0.50	5.00	0.00	1.14	1.14
39.50	2.00	0.50	5.00	0.00	1.14	1.14
39.55	2.00	0.50	5.00	0.00	1.14	1.14
39.60	2.00	0.50	5.00	0.00	1.14	1.14
39.65	2.00	0.50	5.00	0.00	1.14	1.14
39.70	2.00	0.50	5.00	0.00	1.14	1.14
39.75	2.00	0.49	5.00	0.00	1.14	1.14
39.80	2.00	0.49	5.00	0.00	1.14	1.14
39.85	2.00	0.49	5.00	0.00	1.14	1.14
39.90	2.00	0.49	5.00	0.00	1.14	1.14
39.95	2.00	0.49	5.00	0.00	1.14	1.14
40.00	2.00	0.49	5.00	0.00	1.14	1.14
40.05	2.00	0.49	5.00	0.00	1.14	1.14
40.10	2.00	0.49	5.00	0.00	1.14	1.14
40.15	2.00	0.49	5.00	0.00	1.14	1.14
40.20	2.00	0.49	5.00	0.00	1.14	1.14
40.25	2.00	0.49	5.00	0.00	1.14	1.14
40.30	2.00	0.49	5.00	0.00	1.14	1.14

				B1.sum		
40.35	2.00	0.49	5.00	0.00	1.14	1.14
40.40	2.00	0.49	5.00	0.00	1.14	1.14
40.45	2.00	0.49	5.00	0.00	1.14	1.14
40.50	2.00	0.49	5.00	0.00	1.14	1.14
40.55	2.00	0.49	5.00	0.00	1.14	1.14
40.60	2.00	0.49	5.00	0.00	1.14	1.14
40.65	2.00	0.49	5.00	0.00	1.14	1.14
40.70	2.00	0.49	5.00	0.00	1.14	1.14
40.75	2.00	0.49	5.00	0.00	1.14	1.14
40.80	2.00	0.49	5.00	0.00	1.14	1.14
40.85	2.00	0.49	5.00	0.00	1.14	1.14
40.90	2.00	0.49	5.00	0.00	1.14	1.14
40.95	2.00	0.49	5.00	0.00	1.14	1.14
41.00	2.00	0.49	5.00	0.00	1.14	1.14
41.05	2.00	0.49	5.00	0.00	1.14	1.14
41.10	2.00	0.49	5.00	0.00	1.14	1.14
41.15	2.00	0.49	5.00	0.00	1.14	1.14
41.20	2.00	0.49	5.00	0.00	1.14	1.14
41.25	2.00	0.49	5.00	0.00	1.14	1.14
41.30	2.00	0.49	5.00	0.00	1.14	1.14
41.35	2.00	0.49	5.00	0.00	1.14	1.14
41.40	2.00	0.49	5.00	0.00	1.14	1.14
41.45	2.00	0.49	5.00	0.00	1.14	1.14
41.50	2.00	0.49	5.00	0.00	1.14	1.14
41.55	2.00	0.49	5.00	0.00	1.14	1.14
41.60	2.00	0.49	5.00	0.00	1.14	1.14
41.65	2.00	0.49	5.00	0.00	1.14	1.14
41.70	2.00	0.49	5.00	0.00	1.14	1.14
41.75	2.00	0.49	5.00	0.00	1.14	1.14
41.80	2.00	0.49	5.00	0.00	1.14	1.14
41.85	2.00	0.48	5.00	0.00	1.14	1.14
41.90	2.00	0.48	5.00	0.00	1.14	1.14
41.95	2.00	0.48	5.00	0.00	1.14	1.14
42.00	2.00	0.48	5.00	0.00	1.14	1.14
42.05	2.00	0.48	5.00	0.00	1.14	1.14
42.10	2.00	0.48	5.00	0.00	1.14	1.14
42.15	2.00	0.48	5.00	0.00	1.14	1.14
42.20	2.00	0.48	5.00	0.00	1.14	1.14
42.25	2.00	0.48	5.00	0.00	1.14	1.14
42.30	2.00	0.48	5.00	0.00	1.14	1.14
42.35	2.00	0.48	5.00	0.00	1.14	1.14
42.40	2.00	0.48	5.00	0.00	1.14	1.14
42.45	2.00	0.48	5.00	0.00	1.14	1.14
42.50	2.00	0.48	5.00	0.00	1.14	1.14
42.55	2.00	0.48	5.00	0.00	1.14	1.14
42.60	2.00	0.48	5.00	0.00	1.14	1.14
42.65	2.00	0.48	5.00	0.00	1.14	1.14
42.70	2.00	0.48	5.00	0.00	1.14	1.14
42.75	2.00	0.48	5.00	0.00	1.14	1.14
42.80	2.00	0.48	5.00	0.00	1.14	1.14
42.85	2.00	0.48	5.00	0.00	1.14	1.14
42.90	2.00	0.48	5.00	0.00	1.14	1.14
42.95	2.00	0.48	5.00	0.00	1.14	1.14
43.00	2.00	0.48	5.00	0.00	1.14	1.14
43.05	2.00	0.48	5.00	0.00	1.14	1.14
43.10	2.00	0.48	5.00	0.00	1.14	1.14
43.15	2.00	0.48	5.00	0.00	1.14	1.14
43.20	2.00	0.48	5.00	0.00	1.14	1.14
43.25	2.00	0.48	5.00	0.00	1.14	1.14
43.30	2.00	0.48	5.00	0.00	1.14	1.14
43.35	2.00	0.48	5.00	0.00	1.14	1.14
43.40	2.00	0.48	5.00	0.00	1.14	1.14
43.45	2.00	0.48	5.00	0.00	1.14	1.14

				B1.sum		
43.50	2.00	0.48	5.00	0.00	1.14	1.14
43.55	2.00	0.48	5.00	0.00	1.14	1.14
43.60	2.00	0.48	5.00	0.00	1.14	1.14
43.65	2.00	0.48	5.00	0.00	1.14	1.14
43.70	2.00	0.48	5.00	0.00	1.14	1.14
43.75	2.00	0.48	5.00	0.00	1.14	1.14
43.80	2.00	0.48	5.00	0.00	1.14	1.14
43.85	2.00	0.48	5.00	0.00	1.14	1.14
43.90	2.00	0.48	5.00	0.00	1.14	1.14
43.95	2.00	0.47	5.00	0.00	1.14	1.14
44.00	2.00	0.47	5.00	0.00	1.14	1.14
44.05	2.00	0.47	5.00	0.00	1.14	1.14
44.10	2.00	0.47	5.00	0.00	1.14	1.14
44.15	2.00	0.47	5.00	0.00	1.14	1.14
44.20	2.00	0.47	5.00	0.00	1.14	1.14
44.25	2.00	0.47	5.00	0.00	1.14	1.14
44.30	2.00	0.47	5.00	0.00	1.14	1.14
44.35	2.00	0.47	5.00	0.00	1.14	1.14
44.40	2.00	0.47	5.00	0.00	1.14	1.14
44.45	2.00	0.47	5.00	0.00	1.14	1.14
44.50	2.00	0.47	5.00	0.00	1.14	1.14
44.55	2.00	0.47	5.00	0.00	1.14	1.14
44.60	2.00	0.47	5.00	0.00	1.14	1.14
44.65	2.00	0.47	5.00	0.00	1.14	1.14
44.70	2.00	0.47	5.00	0.00	1.14	1.14
44.75	2.00	0.47	5.00	0.00	1.14	1.14
44.80	2.00	0.47	5.00	0.00	1.14	1.14
44.85	2.00	0.47	5.00	0.00	1.14	1.14
44.90	2.00	0.47	5.00	0.00	1.14	1.14
44.95	2.00	0.47	5.00	0.00	1.14	1.14
45.00	2.00	0.47	5.00	0.00	1.14	1.14
45.05	0.27	0.47	5.00	0.00	1.14	1.14
45.10	0.27	0.47	5.00	0.00	1.14	1.14
45.15	0.27	0.47	5.00	0.00	1.13	1.13
45.20	0.27	0.47	5.00	0.00	1.13	1.13
45.25	0.26	0.47	5.00	0.00	1.13	1.13
45.30	0.26	0.47	5.00	0.00	1.12	1.12
45.35	0.26	0.47	5.00	0.00	1.12	1.12
45.40	0.26	0.47	5.00	0.00	1.11	1.11
45.45	0.26	0.47	5.00	0.00	1.11	1.11
45.50	0.26	0.47	5.00	0.00	1.10	1.10
45.55	0.25	0.47	5.00	0.00	1.10	1.10
45.60	0.25	0.47	5.00	0.00	1.09	1.09
45.65	0.25	0.47	5.00	0.00	1.09	1.09
45.70	0.25	0.47	5.00	0.00	1.08	1.08
45.75	0.25	0.47	5.00	0.00	1.08	1.08
45.80	0.24	0.47	5.00	0.00	1.07	1.07
45.85	0.24	0.47	5.00	0.00	1.07	1.07
45.90	0.24	0.47	5.00	0.00	1.06	1.06
45.95	0.24	0.47	5.00	0.00	1.06	1.06
46.00	0.24	0.47	5.00	0.00	1.05	1.05
46.05	0.24	0.46	5.00	0.00	1.05	1.05
46.10	0.24	0.46	5.00	0.00	1.04	1.04
46.15	0.23	0.46	5.00	0.00	1.04	1.04
46.20	0.23	0.46	5.00	0.00	1.03	1.03
46.25	0.23	0.46	5.00	0.00	1.02	1.02
46.30	0.23	0.46	5.00	0.00	1.02	1.02
46.35	0.23	0.46	5.00	0.00	1.01	1.01
46.40	0.23	0.46	5.00	0.00	1.01	1.01
46.45	0.22	0.46	5.00	0.00	1.00	1.00
46.50	0.22	0.46	5.00	0.00	0.99	0.99
46.55	0.22	0.46	5.00	0.00	0.99	0.99
46.60	0.22	0.46	5.00	0.00	0.98	0.98

				B1.sum		
46.65	0.22	0.46	5.00	0.00	0.97	0.97
46.70	0.22	0.46	5.00	0.00	0.97	0.97
46.75	0.21	0.46	5.00	0.00	0.96	0.96
46.80	0.21	0.46	5.00	0.00	0.95	0.95
46.85	0.21	0.46	5.00	0.00	0.94	0.94
46.90	0.21	0.46	5.00	0.00	0.94	0.94
46.95	0.21	0.46	5.00	0.00	0.93	0.93
47.00	0.21	0.46	5.00	0.00	0.92	0.92
47.05	0.21	0.46	5.00	0.00	0.91	0.91
47.10	0.20	0.46	5.00	0.00	0.91	0.91
47.15	0.20	0.46	5.00	0.00	0.90	0.90
47.20	0.20	0.46	5.00	0.00	0.89	0.89
47.25	0.20	0.46	5.00	0.00	0.88	0.88
47.30	0.20	0.46	5.00	0.00	0.87	0.87
47.35	0.20	0.46	5.00	0.00	0.86	0.86
47.40	0.19	0.46	5.00	0.00	0.85	0.85
47.45	0.19	0.46	5.00	0.00	0.85	0.85
47.50	0.19	0.46	5.00	0.00	0.84	0.84
47.55	0.19	0.46	5.00	0.00	0.83	0.83
47.60	0.19	0.46	5.00	0.00	0.82	0.82
47.65	0.19	0.46	5.00	0.00	0.81	0.81
47.70	0.19	0.46	5.00	0.00	0.80	0.80
47.75	0.18	0.46	5.00	0.00	0.79	0.79
47.80	0.18	0.46	5.00	0.00	0.78	0.78
47.85	0.18	0.46	5.00	0.00	0.77	0.77
47.90	0.18	0.46	5.00	0.00	0.75	0.75
47.95	0.18	0.46	5.00	0.00	0.74	0.74
48.00	0.18	0.46	5.00	0.00	0.73	0.73
48.05	0.18	0.46	5.00	0.00	0.72	0.72
48.10	0.17	0.46	5.00	0.00	0.71	0.71
48.15	0.17	0.46	5.00	0.00	0.70	0.70
48.20	0.17	0.45	5.00	0.00	0.68	0.68
48.25	0.17	0.45	5.00	0.00	0.67	0.67
48.30	0.17	0.45	5.00	0.00	0.66	0.66
48.35	0.17	0.45	5.00	0.00	0.65	0.65
48.40	0.16	0.45	5.00	0.00	0.63	0.63
48.45	0.16	0.45	5.00	0.00	0.62	0.62
48.50	0.16	0.45	5.00	0.00	0.60	0.60
48.55	0.16	0.45	5.00	0.00	0.59	0.59
48.60	0.16	0.45	5.00	0.00	0.57	0.57
48.65	0.16	0.45	5.00	0.00	0.56	0.56
48.70	0.16	0.45	5.00	0.00	0.54	0.54
48.75	0.15	0.45	5.00	0.00	0.53	0.53
48.80	0.15	0.45	5.00	0.00	0.51	0.51
48.85	0.15	0.45	5.00	0.00	0.49	0.49
48.90	0.15	0.45	5.00	0.00	0.48	0.48
48.95	0.15	0.45	5.00	0.00	0.46	0.46
49.00	0.15	0.45	5.00	0.00	0.44	0.44
49.05	0.15	0.45	5.00	0.00	0.42	0.42
49.10	0.14	0.45	5.00	0.00	0.41	0.41
49.15	0.14	0.45	5.00	0.00	0.39	0.39
49.20	0.14	0.45	5.00	0.00	0.37	0.37
49.25	0.14	0.45	5.00	0.00	0.35	0.35
49.30	0.14	0.45	5.00	0.00	0.32	0.32
49.35	0.14	0.45	5.00	0.00	0.30	0.30
49.40	0.14	0.45	5.00	0.00	0.28	0.28
49.45	0.13	0.45	5.00	0.00	0.26	0.26
49.50	0.13	0.45	5.00	0.00	0.24	0.24
49.55	0.13	0.45	5.00	0.00	0.22	0.22
49.60	0.13	0.45	5.00	0.00	0.19	0.19
49.65	0.13	0.45	5.00	0.00	0.17	0.17
49.70	0.13	0.45	5.00	0.00	0.15	0.15
49.75	0.13	0.45	5.00	0.00	0.12	0.12

49.80	0.12	0.45	5.00	0.00	0.10	0.10
49.85	0.12	0.45	5.00	0.00	0.07	0.07
49.90	0.12	0.45	5.00	0.00	0.05	0.05
49.95	0.12	0.45	5.00	0.00	0.03	0.03
50.00	0.12	0.45	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units Depth = ft, Stress or Pressure = tsf (atm), Unit Weight = pcf, Settlement = in.

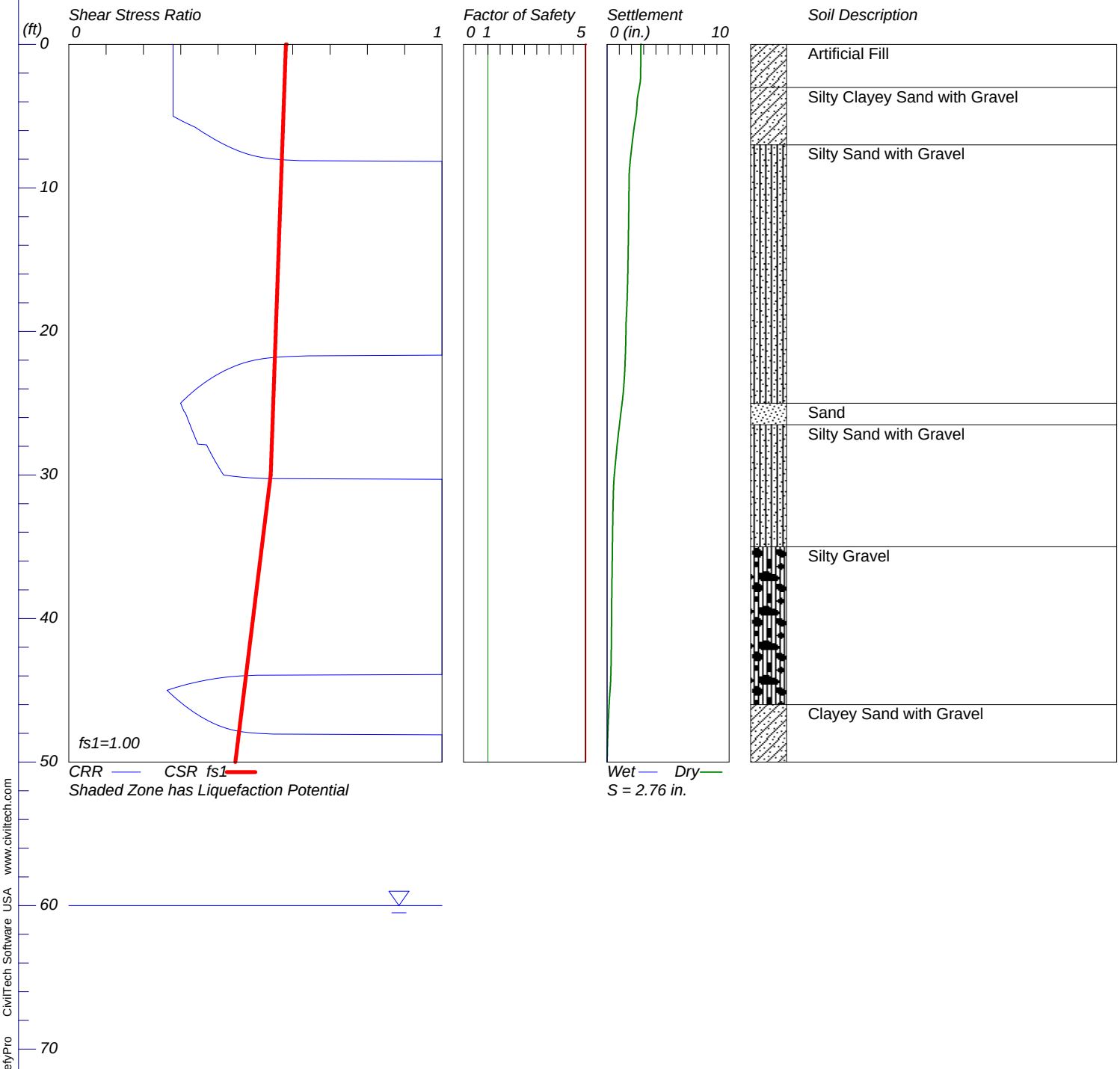
CRRm Cyclic resistance ratio from soils
CSRfs Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRfs
S_sat Settlement from saturated sands
S_dry Settlement from dry sands
S_all Total settlement from saturated and dry sands
NoLiq No-Liquefy Soils

LIQUEFACTION ANALYSIS

Proposed Commercial Dev. Temescal Cyn

Hole No.=B-14 Water Depth=60 ft Surface Elev.=~1075

Magnitude=6.8
Acceleration=.895g



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LIQUEFACTION ANALYSIS CALCULATION SHEET

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Input File Name: \\Server\projects\40-3639G Proposed Residential Development\B14.liq
Title: Proposed Commercial Dev. Temescal Cyn
Subtitle: 40-3639G

Surface Elev.=~1075
Hole No.=B-14
Depth of Hole= 50.0 ft
Water Table during Earthquake= 60.0 ft
Water Table during In-Situ Testing= 60.0 ft
Max. Acceleration= 0.89 g
Earthquake Magnitude= 6.8

Input Data:
Surface Elev.=~1075
Hole No.=B-14
Depth of Hole=50.0 ft
Water Table during Earthquake= 60.0 ft
Water Table during In-Situ Testing= 60.0 ft
Max. Acceleration=0.89 g
Earthquake Magnitude=6.8

Earthquake Magnitude=6.8
2. Settlement Analysis Method: Ishihara / Yoshimine*
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1
9. User request factor of safety (apply to CSR) , User= 1
Plot one CSR curve (fs1=User)
10. Use Curve Smoothing: Yes*
* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.0	12.0	120.0	25.0
5.0	12.0	120.0	25.0
10.0	31.0	120.0	23.0
15.0	48.0	120.0	20.0
20.0	37.0	120.0	18.0
25.0	23.0	120.0	20.0
30.0	32.0	120.0	20.0
35.0	100.0	130.0	10.0
40.0	100.0	130.0	10.0
45.0	29.0	125.0	20.0

50.0	56.0	125.0	20.0

Output Results:

Settlement of saturated sands=0.00 in.
Settlement of dry sands=2.76 in.
Total settlement of saturated and dry sands=2.76 in.
Differential Settlement=1.381 to 1.823 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	0.28	0.58	5.00	0.00	2.76	2.76
0.05	0.28	0.58	5.00	0.00	2.76	2.76
0.10	0.28	0.58	5.00	0.00	2.76	2.76
0.15	0.28	0.58	5.00	0.00	2.76	2.76
0.20	0.28	0.58	5.00	0.00	2.76	2.76
0.25	0.28	0.58	5.00	0.00	2.76	2.76
0.30	0.28	0.58	5.00	0.00	2.76	2.76
0.35	0.28	0.58	5.00	0.00	2.76	2.76
0.40	0.28	0.58	5.00	0.00	2.76	2.76
0.45	0.28	0.58	5.00	0.00	2.76	2.76
0.50	0.28	0.58	5.00	0.00	2.76	2.76
0.55	0.28	0.58	5.00	0.00	2.76	2.76
0.60	0.28	0.58	5.00	0.00	2.76	2.76
0.65	0.28	0.58	5.00	0.00	2.76	2.76
0.70	0.28	0.58	5.00	0.00	2.76	2.76
0.75	0.28	0.58	5.00	0.00	2.76	2.76
0.80	0.28	0.58	5.00	0.00	2.76	2.76
0.85	0.28	0.58	5.00	0.00	2.76	2.76
0.90	0.28	0.58	5.00	0.00	2.76	2.76
0.95	0.28	0.58	5.00	0.00	2.76	2.76
1.00	0.28	0.58	5.00	0.00	2.76	2.76
1.05	0.28	0.58	5.00	0.00	2.76	2.76
1.10	0.28	0.58	5.00	0.00	2.76	2.76
1.15	0.28	0.58	5.00	0.00	2.76	2.76
1.20	0.28	0.58	5.00	0.00	2.76	2.76
1.25	0.28	0.58	5.00	0.00	2.76	2.76
1.30	0.28	0.58	5.00	0.00	2.76	2.76
1.35	0.28	0.58	5.00	0.00	2.76	2.76
1.40	0.28	0.58	5.00	0.00	2.76	2.76
1.45	0.28	0.58	5.00	0.00	2.76	2.76
1.50	0.28	0.58	5.00	0.00	2.76	2.76
1.55	0.28	0.58	5.00	0.00	2.76	2.76
1.60	0.28	0.58	5.00	0.00	2.75	2.75
1.65	0.28	0.58	5.00	0.00	2.75	2.75
1.70	0.28	0.58	5.00	0.00	2.75	2.75
1.75	0.28	0.58	5.00	0.00	2.75	2.75
1.80	0.28	0.58	5.00	0.00	2.75	2.75
1.85	0.28	0.58	5.00	0.00	2.75	2.75
1.90	0.28	0.58	5.00	0.00	2.75	2.75
1.95	0.28	0.58	5.00	0.00	2.75	2.75
2.00	0.28	0.58	5.00	0.00	2.75	2.75
2.05	0.28	0.58	5.00	0.00	2.75	2.75
2.10	0.28	0.58	5.00	0.00	2.75	2.75
2.15	0.28	0.58	5.00	0.00	2.75	2.75
2.20	0.28	0.58	5.00	0.00	2.74	2.74
2.25	0.28	0.58	5.00	0.00	2.74	2.74
2.30	0.28	0.58	5.00	0.00	2.74	2.74
2.35	0.28	0.58	5.00	0.00	2.74	2.74
2.40	0.28	0.58	5.00	0.00	2.74	2.74
2.45	0.28	0.58	5.00	0.00	2.73	2.73
2.50	0.28	0.58	5.00	0.00	2.73	2.73

2.55	0.28	0.58	5.00	0.00	2.72	2.72
2.60	0.28	0.58	5.00	0.00	2.72	2.72
2.65	0.28	0.58	5.00	0.00	2.71	2.71
2.70	0.28	0.58	5.00	0.00	2.70	2.70
2.75	0.28	0.58	5.00	0.00	2.69	2.69
2.80	0.28	0.58	5.00	0.00	2.68	2.68
2.85	0.28	0.58	5.00	0.00	2.67	2.67
2.90	0.28	0.58	5.00	0.00	2.66	2.66
2.95	0.28	0.58	5.00	0.00	2.65	2.65
3.00	0.28	0.58	5.00	0.00	2.64	2.64
3.05	0.28	0.58	5.00	0.00	2.63	2.63
3.10	0.28	0.58	5.00	0.00	2.62	2.62
3.15	0.28	0.58	5.00	0.00	2.61	2.61
3.20	0.28	0.58	5.00	0.00	2.60	2.60
3.25	0.28	0.58	5.00	0.00	2.59	2.59
3.30	0.28	0.58	5.00	0.00	2.58	2.58
3.35	0.28	0.58	5.00	0.00	2.57	2.57
3.40	0.28	0.58	5.00	0.00	2.56	2.56
3.45	0.28	0.58	5.00	0.00	2.55	2.55
3.50	0.28	0.58	5.00	0.00	2.54	2.54
3.55	0.28	0.58	5.00	0.00	2.53	2.53
3.60	0.28	0.58	5.00	0.00	2.52	2.52
3.65	0.28	0.58	5.00	0.00	2.51	2.51
3.70	0.28	0.58	5.00	0.00	2.50	2.50
3.75	0.28	0.58	5.00	0.00	2.49	2.49
3.80	0.28	0.58	5.00	0.00	2.48	2.48
3.85	0.28	0.58	5.00	0.00	2.47	2.47
3.90	0.28	0.58	5.00	0.00	2.46	2.46
3.95	0.28	0.58	5.00	0.00	2.46	2.46
4.00	0.28	0.58	5.00	0.00	2.46	2.46
4.05	0.28	0.58	5.00	0.00	2.46	2.46
4.10	0.28	0.58	5.00	0.00	2.46	2.46
4.15	0.28	0.58	5.00	0.00	2.45	2.45
4.20	0.28	0.58	5.00	0.00	2.45	2.45
4.25	0.28	0.58	5.00	0.00	2.45	2.45
4.30	0.28	0.58	5.00	0.00	2.44	2.44
4.35	0.28	0.58	5.00	0.00	2.44	2.44
4.40	0.28	0.58	5.00	0.00	2.44	2.44
4.45	0.28	0.58	5.00	0.00	2.43	2.43
4.50	0.28	0.58	5.00	0.00	2.43	2.43
4.55	0.28	0.58	5.00	0.00	2.42	2.42
4.60	0.28	0.58	5.00	0.00	2.42	2.42
4.65	0.28	0.58	5.00	0.00	2.41	2.41
4.70	0.28	0.58	5.00	0.00	2.41	2.41
4.75	0.28	0.58	5.00	0.00	2.40	2.40
4.80	0.28	0.58	5.00	0.00	2.40	2.40
4.85	0.28	0.58	5.00	0.00	2.39	2.39
4.90	0.28	0.58	5.00	0.00	2.38	2.38
4.95	0.28	0.58	5.00	0.00	2.37	2.37
5.00	0.28	0.57	5.00	0.00	2.36	2.36
5.05	0.28	0.57	5.00	0.00	2.35	2.35
5.10	0.29	0.57	5.00	0.00	2.34	2.34
5.15	0.29	0.57	5.00	0.00	2.33	2.33
5.20	0.29	0.57	5.00	0.00	2.32	2.32
5.25	0.30	0.57	5.00	0.00	2.31	2.31
5.30	0.30	0.57	5.00	0.00	2.30	2.30
5.35	0.30	0.57	5.00	0.00	2.30	2.30
5.40	0.31	0.57	5.00	0.00	2.29	2.29
5.45	0.31	0.57	5.00	0.00	2.28	2.28
5.50	0.32	0.57	5.00	0.00	2.27	2.27
5.55	0.32	0.57	5.00	0.00	2.26	2.26
5.60	0.32	0.57	5.00	0.00	2.25	2.25
5.65	0.33	0.57	5.00	0.00	2.24	2.24

5.70	0.33	0.57	5.00	0.00	2.23	2.23
5.75	0.34	0.57	5.00	0.00	2.22	2.22
5.80	0.34	0.57	5.00	0.00	2.22	2.22
5.85	0.34	0.57	5.00	0.00	2.21	2.21
5.90	0.35	0.57	5.00	0.00	2.20	2.20
5.95	0.35	0.57	5.00	0.00	2.19	2.19
6.00	0.35	0.57	5.00	0.00	2.18	2.18
6.05	0.36	0.57	5.00	0.00	2.18	2.18
6.10	0.36	0.57	5.00	0.00	2.17	2.17
6.15	0.36	0.57	5.00	0.00	2.16	2.16
6.20	0.36	0.57	5.00	0.00	2.15	2.15
6.25	0.37	0.57	5.00	0.00	2.15	2.15
6.30	0.37	0.57	5.00	0.00	2.14	2.14
6.35	0.37	0.57	5.00	0.00	2.13	2.13
6.40	0.38	0.57	5.00	0.00	2.12	2.12
6.45	0.38	0.57	5.00	0.00	2.12	2.12
6.50	0.38	0.57	5.00	0.00	2.11	2.11
6.55	0.39	0.57	5.00	0.00	2.10	2.10
6.60	0.39	0.57	5.00	0.00	2.09	2.09
6.65	0.39	0.57	5.00	0.00	2.09	2.09
6.70	0.40	0.57	5.00	0.00	2.08	2.08
6.75	0.40	0.57	5.00	0.00	2.07	2.07
6.80	0.40	0.57	5.00	0.00	2.06	2.06
6.85	0.41	0.57	5.00	0.00	2.06	2.06
6.90	0.41	0.57	5.00	0.00	2.05	2.05
6.95	0.41	0.57	5.00	0.00	2.04	2.04
7.00	0.42	0.57	5.00	0.00	2.04	2.04
7.05	0.42	0.57	5.00	0.00	2.03	2.03
7.10	0.43	0.57	5.00	0.00	2.02	2.02
7.15	0.43	0.57	5.00	0.00	2.02	2.02
7.20	0.43	0.57	5.00	0.00	2.01	2.01
7.25	0.44	0.57	5.00	0.00	2.00	2.00
7.30	0.44	0.57	5.00	0.00	2.00	2.00
7.35	0.45	0.57	5.00	0.00	1.99	1.99
7.40	0.45	0.57	5.00	0.00	1.98	1.98
7.45	0.46	0.57	5.00	0.00	1.98	1.98
7.50	0.46	0.57	5.00	0.00	1.97	1.97
7.55	0.47	0.57	5.00	0.00	1.96	1.96
7.60	0.47	0.57	5.00	0.00	1.96	1.96
7.65	0.48	0.57	5.00	0.00	1.95	1.95
7.70	0.49	0.57	5.00	0.00	1.95	1.95
7.75	0.49	0.57	5.00	0.00	1.94	1.94
7.80	0.50	0.57	5.00	0.00	1.93	1.93
7.85	0.51	0.57	5.00	0.00	1.93	1.93
7.90	0.52	0.57	5.00	0.00	1.92	1.92
7.95	0.54	0.57	5.00	0.00	1.92	1.92
8.00	0.55	0.57	5.00	0.00	1.91	1.91
8.05	0.58	0.57	5.00	0.00	1.90	1.90
8.10	0.62	0.57	5.00	0.00	1.90	1.90
8.15	2.57	0.57	5.00	0.00	1.89	1.89
8.20	2.57	0.57	5.00	0.00	1.89	1.89
8.25	2.57	0.57	5.00	0.00	1.88	1.88
8.30	2.57	0.57	5.00	0.00	1.87	1.87
8.35	2.57	0.57	5.00	0.00	1.87	1.87
8.40	2.57	0.57	5.00	0.00	1.87	1.87
8.45	2.57	0.57	5.00	0.00	1.86	1.86
8.50	2.57	0.57	5.00	0.00	1.86	1.86
8.55	2.57	0.57	5.00	0.00	1.85	1.85
8.60	2.57	0.57	5.00	0.00	1.85	1.85
8.65	2.57	0.57	5.00	0.00	1.84	1.84
8.70	2.57	0.57	5.00	0.00	1.84	1.84
8.75	2.57	0.57	5.00	0.00	1.83	1.83
8.80	2.57	0.57	5.00	0.00	1.83	1.83

8.85	2.57	0.57	5.00	0.00	1.82	1.82
8.90	2.57	0.57	5.00	0.00	1.82	1.82
8.95	2.57	0.57	5.00	0.00	1.81	1.81
9.00	2.57	0.57	5.00	0.00	1.81	1.81
9.05	2.57	0.57	5.00	0.00	1.81	1.81
9.10	2.57	0.57	5.00	0.00	1.81	1.81
9.15	2.57	0.57	5.00	0.00	1.81	1.81
9.20	2.57	0.57	5.00	0.00	1.81	1.81
9.25	2.57	0.57	5.00	0.00	1.81	1.81
9.30	2.57	0.57	5.00	0.00	1.81	1.81
9.35	2.57	0.57	5.00	0.00	1.81	1.81
9.40	2.57	0.57	5.00	0.00	1.81	1.81
9.45	2.57	0.57	5.00	0.00	1.80	1.80
9.50	2.57	0.57	5.00	0.00	1.80	1.80
9.55	2.57	0.57	5.00	0.00	1.80	1.80
9.60	2.57	0.57	5.00	0.00	1.80	1.80
9.65	2.57	0.57	5.00	0.00	1.80	1.80
9.70	2.57	0.57	5.00	0.00	1.80	1.80
9.75	2.57	0.57	5.00	0.00	1.80	1.80
9.80	2.57	0.57	5.00	0.00	1.80	1.80
9.85	2.57	0.57	5.00	0.00	1.80	1.80
9.90	2.57	0.57	5.00	0.00	1.80	1.80
9.95	2.57	0.57	5.00	0.00	1.80	1.80
10.00	2.57	0.57	5.00	0.00	1.80	1.80
10.05	2.57	0.57	5.00	0.00	1.80	1.80
10.10	2.57	0.57	5.00	0.00	1.80	1.80
10.15	2.57	0.57	5.00	0.00	1.80	1.80
10.20	2.57	0.57	5.00	0.00	1.79	1.79
10.25	2.57	0.57	5.00	0.00	1.79	1.79
10.30	2.57	0.57	5.00	0.00	1.79	1.79
10.35	2.57	0.57	5.00	0.00	1.79	1.79
10.40	2.57	0.57	5.00	0.00	1.79	1.79
10.45	2.57	0.57	5.00	0.00	1.79	1.79
10.50	2.57	0.57	5.00	0.00	1.79	1.79
10.55	2.57	0.57	5.00	0.00	1.79	1.79
10.60	2.57	0.57	5.00	0.00	1.79	1.79
10.65	2.57	0.57	5.00	0.00	1.79	1.79
10.70	2.57	0.57	5.00	0.00	1.79	1.79
10.75	2.57	0.57	5.00	0.00	1.79	1.79
10.80	2.57	0.57	5.00	0.00	1.79	1.79
10.85	2.57	0.57	5.00	0.00	1.79	1.79
10.90	2.57	0.57	5.00	0.00	1.79	1.79
10.95	2.57	0.57	5.00	0.00	1.78	1.78
11.00	2.57	0.57	5.00	0.00	1.78	1.78
11.05	2.57	0.57	5.00	0.00	1.78	1.78
11.10	2.57	0.57	5.00	0.00	1.78	1.78
11.15	2.57	0.57	5.00	0.00	1.78	1.78
11.20	2.57	0.57	5.00	0.00	1.78	1.78
11.25	2.57	0.57	5.00	0.00	1.78	1.78
11.30	2.57	0.57	5.00	0.00	1.78	1.78
11.35	2.57	0.57	5.00	0.00	1.78	1.78
11.40	2.57	0.57	5.00	0.00	1.78	1.78
11.45	2.57	0.57	5.00	0.00	1.78	1.78
11.50	2.57	0.57	5.00	0.00	1.78	1.78
11.55	2.57	0.57	5.00	0.00	1.78	1.78
11.60	2.57	0.57	5.00	0.00	1.78	1.78
11.65	2.57	0.57	5.00	0.00	1.77	1.77
11.70	2.57	0.57	5.00	0.00	1.77	1.77
11.75	2.57	0.57	5.00	0.00	1.77	1.77
11.80	2.57	0.57	5.00	0.00	1.77	1.77
11.85	2.57	0.57	5.00	0.00	1.77	1.77
11.90	2.57	0.57	5.00	0.00	1.77	1.77
11.95	2.57	0.57	5.00	0.00	1.77	1.77

12.00	2.57	0.57	5.00	0.00	1.77	1.77
12.05	2.57	0.57	5.00	0.00	1.77	1.77
12.10	2.57	0.57	5.00	0.00	1.77	1.77
12.15	2.57	0.57	5.00	0.00	1.77	1.77
12.20	2.57	0.57	5.00	0.00	1.77	1.77
12.25	2.57	0.57	5.00	0.00	1.77	1.77
12.30	2.57	0.57	5.00	0.00	1.77	1.77
12.35	2.57	0.56	5.00	0.00	1.76	1.76
12.40	2.57	0.56	5.00	0.00	1.76	1.76
12.45	2.57	0.56	5.00	0.00	1.76	1.76
12.50	2.57	0.56	5.00	0.00	1.76	1.76
12.55	2.57	0.56	5.00	0.00	1.76	1.76
12.60	2.57	0.56	5.00	0.00	1.76	1.76
12.65	2.57	0.56	5.00	0.00	1.76	1.76
12.70	2.57	0.56	5.00	0.00	1.76	1.76
12.75	2.57	0.56	5.00	0.00	1.76	1.76
12.80	2.57	0.56	5.00	0.00	1.76	1.76
12.85	2.57	0.56	5.00	0.00	1.76	1.76
12.90	2.57	0.56	5.00	0.00	1.76	1.76
12.95	2.57	0.56	5.00	0.00	1.75	1.75
13.00	2.57	0.56	5.00	0.00	1.75	1.75
13.05	2.57	0.56	5.00	0.00	1.75	1.75
13.10	2.57	0.56	5.00	0.00	1.75	1.75
13.15	2.57	0.56	5.00	0.00	1.75	1.75
13.20	2.57	0.56	5.00	0.00	1.75	1.75
13.25	2.57	0.56	5.00	0.00	1.75	1.75
13.30	2.57	0.56	5.00	0.00	1.75	1.75
13.35	2.57	0.56	5.00	0.00	1.75	1.75
13.40	2.57	0.56	5.00	0.00	1.75	1.75
13.45	2.57	0.56	5.00	0.00	1.75	1.75
13.50	2.57	0.56	5.00	0.00	1.74	1.74
13.55	2.57	0.56	5.00	0.00	1.74	1.74
13.60	2.57	0.56	5.00	0.00	1.74	1.74
13.65	2.57	0.56	5.00	0.00	1.74	1.74
13.70	2.57	0.56	5.00	0.00	1.74	1.74
13.75	2.57	0.56	5.00	0.00	1.74	1.74
13.80	2.57	0.56	5.00	0.00	1.74	1.74
13.85	2.57	0.56	5.00	0.00	1.74	1.74
13.90	2.57	0.56	5.00	0.00	1.74	1.74
13.95	2.57	0.56	5.00	0.00	1.74	1.74
14.00	2.57	0.56	5.00	0.00	1.74	1.74
14.05	2.57	0.56	5.00	0.00	1.73	1.73
14.10	2.57	0.56	5.00	0.00	1.73	1.73
14.15	2.57	0.56	5.00	0.00	1.73	1.73
14.20	2.57	0.56	5.00	0.00	1.73	1.73
14.25	2.57	0.56	5.00	0.00	1.73	1.73
14.30	2.57	0.56	5.00	0.00	1.73	1.73
14.35	2.57	0.56	5.00	0.00	1.73	1.73
14.40	2.57	0.56	5.00	0.00	1.73	1.73
14.45	2.57	0.56	5.00	0.00	1.73	1.73
14.50	2.57	0.56	5.00	0.00	1.73	1.73
14.55	2.57	0.56	5.00	0.00	1.72	1.72
14.60	2.57	0.56	5.00	0.00	1.72	1.72
14.65	2.57	0.56	5.00	0.00	1.72	1.72
14.70	2.57	0.56	5.00	0.00	1.72	1.72
14.75	2.57	0.56	5.00	0.00	1.72	1.72
14.80	2.57	0.56	5.00	0.00	1.72	1.72
14.85	2.57	0.56	5.00	0.00	1.72	1.72
14.90	2.57	0.56	5.00	0.00	1.72	1.72
14.95	2.57	0.56	5.00	0.00	1.72	1.72
15.00	2.57	0.56	5.00	0.00	1.72	1.72
15.05	2.57	0.56	5.00	0.00	1.72	1.72
15.10	2.57	0.56	5.00	0.00	1.71	1.71

15.15	2.57	0.56	5.00	0.00	1.71	1.71
15.20	2.57	0.56	5.00	0.00	1.71	1.71
15.25	2.57	0.56	5.00	0.00	1.71	1.71
15.30	2.57	0.56	5.00	0.00	1.71	1.71
15.35	2.57	0.56	5.00	0.00	1.71	1.71
15.40	2.57	0.56	5.00	0.00	1.71	1.71
15.45	2.57	0.56	5.00	0.00	1.71	1.71
15.50	2.57	0.56	5.00	0.00	1.71	1.71
15.55	2.57	0.56	5.00	0.00	1.71	1.71
15.60	2.57	0.56	5.00	0.00	1.70	1.70
15.65	2.57	0.56	5.00	0.00	1.70	1.70
15.70	2.57	0.56	5.00	0.00	1.70	1.70
15.75	2.57	0.56	5.00	0.00	1.70	1.70
15.80	2.57	0.56	5.00	0.00	1.70	1.70
15.85	2.57	0.56	5.00	0.00	1.70	1.70
15.90	2.57	0.56	5.00	0.00	1.70	1.70
15.95	2.57	0.56	5.00	0.00	1.70	1.70
16.00	2.57	0.56	5.00	0.00	1.70	1.70
16.05	2.57	0.56	5.00	0.00	1.69	1.69
16.10	2.57	0.56	5.00	0.00	1.69	1.69
16.15	2.57	0.56	5.00	0.00	1.69	1.69
16.20	2.57	0.56	5.00	0.00	1.69	1.69
16.25	2.57	0.56	5.00	0.00	1.69	1.69
16.30	2.57	0.56	5.00	0.00	1.69	1.69
16.35	2.57	0.56	5.00	0.00	1.69	1.69
16.40	2.57	0.56	5.00	0.00	1.69	1.69
16.45	2.57	0.56	5.00	0.00	1.68	1.68
16.50	2.57	0.56	5.00	0.00	1.68	1.68
16.55	2.57	0.56	5.00	0.00	1.68	1.68
16.60	2.57	0.56	5.00	0.00	1.68	1.68
16.65	2.57	0.56	5.00	0.00	1.68	1.68
16.70	2.57	0.56	5.00	0.00	1.68	1.68
16.75	2.57	0.56	5.00	0.00	1.68	1.68
16.80	2.57	0.56	5.00	0.00	1.67	1.67
16.85	2.57	0.56	5.00	0.00	1.67	1.67
16.90	2.57	0.56	5.00	0.00	1.67	1.67
16.95	2.57	0.56	5.00	0.00	1.67	1.67
17.00	2.57	0.56	5.00	0.00	1.67	1.67
17.05	2.57	0.56	5.00	0.00	1.67	1.67
17.10	2.57	0.56	5.00	0.00	1.66	1.66
17.15	2.57	0.56	5.00	0.00	1.66	1.66
17.20	2.57	0.56	5.00	0.00	1.66	1.66
17.25	2.57	0.56	5.00	0.00	1.66	1.66
17.30	2.57	0.56	5.00	0.00	1.66	1.66
17.35	2.57	0.56	5.00	0.00	1.66	1.66
17.40	2.57	0.56	5.00	0.00	1.65	1.65
17.45	2.57	0.56	5.00	0.00	1.65	1.65
17.50	2.57	0.56	5.00	0.00	1.65	1.65
17.55	2.57	0.56	5.00	0.00	1.65	1.65
17.60	2.57	0.56	5.00	0.00	1.65	1.65
17.65	2.57	0.56	5.00	0.00	1.65	1.65
17.70	2.57	0.56	5.00	0.00	1.64	1.64
17.75	2.57	0.56	5.00	0.00	1.64	1.64
17.80	2.57	0.56	5.00	0.00	1.64	1.64
17.85	2.57	0.56	5.00	0.00	1.64	1.64
17.90	2.57	0.56	5.00	0.00	1.64	1.64
17.95	2.57	0.56	5.00	0.00	1.63	1.63
18.00	2.57	0.56	5.00	0.00	1.63	1.63
18.05	2.57	0.56	5.00	0.00	1.63	1.63
18.10	2.57	0.56	5.00	0.00	1.63	1.63
18.15	2.57	0.56	5.00	0.00	1.62	1.62
18.20	2.57	0.56	5.00	0.00	1.62	1.62
18.25	2.57	0.56	5.00	0.00	1.62	1.62

18.30	2.57	0.56	5.00	0.00	1.62	1.62
18.35	2.57	0.56	5.00	0.00	1.62	1.62
18.40	2.57	0.56	5.00	0.00	1.61	1.61
18.45	2.57	0.56	5.00	0.00	1.61	1.61
18.50	2.57	0.56	5.00	0.00	1.61	1.61
18.55	2.57	0.56	5.00	0.00	1.61	1.61
18.60	2.57	0.56	5.00	0.00	1.60	1.60
18.65	2.57	0.56	5.00	0.00	1.60	1.60
18.70	2.57	0.56	5.00	0.00	1.60	1.60
18.75	2.57	0.56	5.00	0.00	1.59	1.59
18.80	2.57	0.56	5.00	0.00	1.59	1.59
18.85	2.57	0.56	5.00	0.00	1.59	1.59
18.90	2.57	0.56	5.00	0.00	1.58	1.58
18.95	2.57	0.56	5.00	0.00	1.58	1.58
19.00	2.57	0.56	5.00	0.00	1.58	1.58
19.05	2.57	0.56	5.00	0.00	1.57	1.57
19.10	2.57	0.56	5.00	0.00	1.57	1.57
19.15	2.57	0.56	5.00	0.00	1.57	1.57
19.20	2.57	0.56	5.00	0.00	1.56	1.56
19.25	2.57	0.56	5.00	0.00	1.56	1.56
19.30	2.57	0.56	5.00	0.00	1.56	1.56
19.35	2.57	0.56	5.00	0.00	1.56	1.56
19.40	2.57	0.56	5.00	0.00	1.56	1.56
19.45	2.57	0.56	5.00	0.00	1.56	1.56
19.50	2.57	0.56	5.00	0.00	1.56	1.56
19.55	2.57	0.56	5.00	0.00	1.56	1.56
19.60	2.57	0.56	5.00	0.00	1.55	1.55
19.65	2.57	0.56	5.00	0.00	1.55	1.55
19.70	2.57	0.56	5.00	0.00	1.55	1.55
19.75	2.57	0.55	5.00	0.00	1.55	1.55
19.80	2.57	0.55	5.00	0.00	1.55	1.55
19.85	2.57	0.55	5.00	0.00	1.55	1.55
19.90	2.57	0.55	5.00	0.00	1.55	1.55
19.95	2.57	0.55	5.00	0.00	1.55	1.55
20.00	2.57	0.55	5.00	0.00	1.55	1.55
20.05	2.57	0.55	5.00	0.00	1.54	1.54
20.10	2.57	0.55	5.00	0.00	1.54	1.54
20.15	2.57	0.55	5.00	0.00	1.54	1.54
20.20	2.57	0.55	5.00	0.00	1.54	1.54
20.25	2.57	0.55	5.00	0.00	1.54	1.54
20.30	2.57	0.55	5.00	0.00	1.54	1.54
20.35	2.57	0.55	5.00	0.00	1.54	1.54
20.40	2.57	0.55	5.00	0.00	1.54	1.54
20.45	2.57	0.55	5.00	0.00	1.54	1.54
20.50	2.57	0.55	5.00	0.00	1.53	1.53
20.55	2.57	0.55	5.00	0.00	1.53	1.53
20.60	2.57	0.55	5.00	0.00	1.53	1.53
20.65	2.57	0.55	5.00	0.00	1.53	1.53
20.70	2.57	0.55	5.00	0.00	1.53	1.53
20.75	2.57	0.55	5.00	0.00	1.53	1.53
20.80	2.57	0.55	5.00	0.00	1.53	1.53
20.85	2.57	0.55	5.00	0.00	1.52	1.52
20.90	2.57	0.55	5.00	0.00	1.52	1.52
20.95	2.57	0.55	5.00	0.00	1.52	1.52
21.00	2.57	0.55	5.00	0.00	1.52	1.52
21.05	2.57	0.55	5.00	0.00	1.52	1.52
21.10	2.57	0.55	5.00	0.00	1.52	1.52
21.15	2.57	0.55	5.00	0.00	1.52	1.52
21.20	2.57	0.55	5.00	0.00	1.51	1.51
21.25	2.57	0.55	5.00	0.00	1.51	1.51
21.30	2.57	0.55	5.00	0.00	1.51	1.51
21.35	2.57	0.55	5.00	0.00	1.51	1.51
21.40	2.57	0.55	5.00	0.00	1.51	1.51

21.45	2.57	0.55	5.00	0.00	1.50	1.50
21.50	2.57	0.55	5.00	0.00	1.50	1.50
21.55	2.57	0.55	5.00	0.00	1.50	1.50
21.60	2.57	0.55	5.00	0.00	1.50	1.50
21.65	2.57	0.55	5.00	0.00	1.50	1.50
21.70	0.64	0.55	5.00	0.00	1.50	1.50
21.75	0.58	0.55	5.00	0.00	1.49	1.49
21.80	0.55	0.55	5.00	0.00	1.49	1.49
21.85	0.53	0.55	5.00	0.00	1.49	1.49
21.90	0.52	0.55	5.00	0.00	1.49	1.49
21.95	0.51	0.55	5.00	0.00	1.48	1.48
22.00	0.50	0.55	5.00	0.00	1.48	1.48
22.05	0.49	0.55	5.00	0.00	1.48	1.48
22.10	0.48	0.55	5.00	0.00	1.48	1.48
22.15	0.47	0.55	5.00	0.00	1.48	1.48
22.20	0.47	0.55	5.00	0.00	1.47	1.47
22.25	0.46	0.55	5.00	0.00	1.47	1.47
22.30	0.46	0.55	5.00	0.00	1.47	1.47
22.35	0.45	0.55	5.00	0.00	1.47	1.47
22.40	0.45	0.55	5.00	0.00	1.46	1.46
22.45	0.44	0.55	5.00	0.00	1.46	1.46
22.50	0.44	0.55	5.00	0.00	1.46	1.46
22.55	0.43	0.55	5.00	0.00	1.46	1.46
22.60	0.43	0.55	5.00	0.00	1.45	1.45
22.65	0.42	0.55	5.00	0.00	1.45	1.45
22.70	0.42	0.55	5.00	0.00	1.45	1.45
22.75	0.42	0.55	5.00	0.00	1.44	1.44
22.80	0.41	0.55	5.00	0.00	1.44	1.44
22.85	0.41	0.55	5.00	0.00	1.44	1.44
22.90	0.41	0.55	5.00	0.00	1.44	1.44
22.95	0.40	0.55	5.00	0.00	1.43	1.43
23.00	0.40	0.55	5.00	0.00	1.43	1.43
23.05	0.39	0.55	5.00	0.00	1.43	1.43
23.10	0.39	0.55	5.00	0.00	1.42	1.42
23.15	0.39	0.55	5.00	0.00	1.42	1.42
23.20	0.39	0.55	5.00	0.00	1.42	1.42
23.25	0.38	0.55	5.00	0.00	1.41	1.41
23.30	0.38	0.55	5.00	0.00	1.41	1.41
23.35	0.38	0.55	5.00	0.00	1.40	1.40
23.40	0.37	0.55	5.00	0.00	1.40	1.40
23.45	0.37	0.55	5.00	0.00	1.40	1.40
23.50	0.37	0.55	5.00	0.00	1.39	1.39
23.55	0.36	0.55	5.00	0.00	1.39	1.39
23.60	0.36	0.55	5.00	0.00	1.39	1.39
23.65	0.36	0.55	5.00	0.00	1.38	1.38
23.70	0.36	0.55	5.00	0.00	1.38	1.38
23.75	0.35	0.55	5.00	0.00	1.37	1.37
23.80	0.35	0.55	5.00	0.00	1.37	1.37
23.85	0.35	0.55	5.00	0.00	1.36	1.36
23.90	0.35	0.55	5.00	0.00	1.36	1.36
23.95	0.34	0.55	5.00	0.00	1.35	1.35
24.00	0.34	0.55	5.00	0.00	1.35	1.35
24.05	0.34	0.55	5.00	0.00	1.34	1.34
24.10	0.34	0.55	5.00	0.00	1.34	1.34
24.15	0.33	0.55	5.00	0.00	1.33	1.33
24.20	0.33	0.55	5.00	0.00	1.33	1.33
24.25	0.33	0.55	5.00	0.00	1.32	1.32
24.30	0.33	0.55	5.00	0.00	1.32	1.32
24.35	0.33	0.55	5.00	0.00	1.31	1.31
24.40	0.32	0.55	5.00	0.00	1.31	1.31
24.45	0.32	0.55	5.00	0.00	1.30	1.30
24.50	0.32	0.55	5.00	0.00	1.30	1.30
24.55	0.32	0.55	5.00	0.00	1.29	1.29

24.60	0.32	0.55	5.00	0.00	1.28	1.28
24.65	0.31	0.55	5.00	0.00	1.28	1.28
24.70	0.31	0.55	5.00	0.00	1.27	1.27
24.75	0.31	0.55	5.00	0.00	1.27	1.27
24.80	0.31	0.55	5.00	0.00	1.26	1.26
24.85	0.31	0.55	5.00	0.00	1.25	1.25
24.90	0.30	0.55	5.00	0.00	1.24	1.24
24.95	0.30	0.55	5.00	0.00	1.24	1.24
25.00	0.30	0.55	5.00	0.00	1.23	1.23
25.05	0.30	0.55	5.00	0.00	1.22	1.22
25.10	0.30	0.55	5.00	0.00	1.21	1.21
25.15	0.30	0.55	5.00	0.00	1.21	1.21
25.20	0.30	0.55	5.00	0.00	1.20	1.20
25.25	0.30	0.55	5.00	0.00	1.19	1.19
25.30	0.30	0.55	5.00	0.00	1.19	1.19
25.35	0.31	0.55	5.00	0.00	1.18	1.18
25.40	0.31	0.55	5.00	0.00	1.17	1.17
25.45	0.31	0.55	5.00	0.00	1.16	1.16
25.50	0.31	0.55	5.00	0.00	1.16	1.16
25.55	0.31	0.55	5.00	0.00	1.15	1.15
25.60	0.31	0.55	5.00	0.00	1.14	1.14
25.65	0.31	0.55	5.00	0.00	1.13	1.13
25.70	0.31	0.55	5.00	0.00	1.13	1.13
25.75	0.31	0.55	5.00	0.00	1.12	1.12
25.80	0.31	0.55	5.00	0.00	1.11	1.11
25.85	0.32	0.55	5.00	0.00	1.11	1.11
25.90	0.32	0.55	5.00	0.00	1.10	1.10
25.95	0.32	0.55	5.00	0.00	1.09	1.09
26.00	0.32	0.55	5.00	0.00	1.08	1.08
26.05	0.32	0.55	5.00	0.00	1.08	1.08
26.10	0.32	0.55	5.00	0.00	1.07	1.07
26.15	0.32	0.55	5.00	0.00	1.06	1.06
26.20	0.32	0.55	5.00	0.00	1.06	1.06
26.25	0.32	0.55	5.00	0.00	1.05	1.05
26.30	0.32	0.55	5.00	0.00	1.04	1.04
26.35	0.32	0.55	5.00	0.00	1.03	1.03
26.40	0.32	0.55	5.00	0.00	1.03	1.03
26.45	0.32	0.55	5.00	0.00	1.02	1.02
26.50	0.32	0.55	5.00	0.00	1.01	1.01
26.55	0.33	0.55	5.00	0.00	1.01	1.01
26.60	0.33	0.55	5.00	0.00	1.00	1.00
26.65	0.33	0.55	5.00	0.00	0.99	0.99
26.70	0.33	0.55	5.00	0.00	0.99	0.99
26.75	0.33	0.55	5.00	0.00	0.98	0.98
26.80	0.33	0.55	5.00	0.00	0.97	0.97
26.85	0.33	0.55	5.00	0.00	0.96	0.96
26.90	0.33	0.55	5.00	0.00	0.96	0.96
26.95	0.33	0.55	5.00	0.00	0.95	0.95
27.00	0.33	0.55	5.00	0.00	0.94	0.94
27.05	0.33	0.55	5.00	0.00	0.94	0.94
27.10	0.33	0.54	5.00	0.00	0.93	0.93
27.15	0.33	0.54	5.00	0.00	0.92	0.92
27.20	0.34	0.54	5.00	0.00	0.92	0.92
27.25	0.34	0.54	5.00	0.00	0.91	0.91
27.30	0.34	0.54	5.00	0.00	0.90	0.90
27.35	0.34	0.54	5.00	0.00	0.90	0.90
27.40	0.34	0.54	5.00	0.00	0.89	0.89
27.45	0.34	0.54	5.00	0.00	0.88	0.88
27.50	0.34	0.54	5.00	0.00	0.88	0.88
27.55	0.34	0.54	5.00	0.00	0.87	0.87
27.60	0.34	0.54	5.00	0.00	0.86	0.86
27.65	0.34	0.54	5.00	0.00	0.86	0.86
27.70	0.34	0.54	5.00	0.00	0.85	0.85

27.75	0.34	0.54	5.00	0.00	0.84	0.84
27.80	0.35	0.54	5.00	0.00	0.84	0.84
27.85	0.35	0.54	5.00	0.00	0.83	0.83
27.90	0.37	0.54	5.00	0.00	0.82	0.82
27.95	0.37	0.54	5.00	0.00	0.82	0.82
28.00	0.37	0.54	5.00	0.00	0.81	0.81
28.05	0.37	0.54	5.00	0.00	0.81	0.81
28.10	0.37	0.54	5.00	0.00	0.80	0.80
28.15	0.37	0.54	5.00	0.00	0.79	0.79
28.20	0.37	0.54	5.00	0.00	0.79	0.79
28.25	0.38	0.54	5.00	0.00	0.78	0.78
28.30	0.38	0.54	5.00	0.00	0.78	0.78
28.35	0.38	0.54	5.00	0.00	0.77	0.77
28.40	0.38	0.54	5.00	0.00	0.77	0.77
28.45	0.38	0.54	5.00	0.00	0.76	0.76
28.50	0.38	0.54	5.00	0.00	0.76	0.76
28.55	0.38	0.54	5.00	0.00	0.75	0.75
28.60	0.38	0.54	5.00	0.00	0.74	0.74
28.65	0.38	0.54	5.00	0.00	0.74	0.74
28.70	0.39	0.54	5.00	0.00	0.73	0.73
28.75	0.39	0.54	5.00	0.00	0.73	0.73
28.80	0.39	0.54	5.00	0.00	0.72	0.72
28.85	0.39	0.54	5.00	0.00	0.72	0.72
28.90	0.39	0.54	5.00	0.00	0.71	0.71
28.95	0.39	0.54	5.00	0.00	0.71	0.71
29.00	0.39	0.54	5.00	0.00	0.70	0.70
29.05	0.39	0.54	5.00	0.00	0.69	0.69
29.10	0.39	0.54	5.00	0.00	0.69	0.69
29.15	0.39	0.54	5.00	0.00	0.68	0.68
29.20	0.40	0.54	5.00	0.00	0.68	0.68
29.25	0.40	0.54	5.00	0.00	0.67	0.67
29.30	0.40	0.54	5.00	0.00	0.67	0.67
29.35	0.40	0.54	5.00	0.00	0.66	0.66
29.40	0.40	0.54	5.00	0.00	0.66	0.66
29.45	0.40	0.54	5.00	0.00	0.65	0.65
29.50	0.40	0.54	5.00	0.00	0.65	0.65
29.55	0.40	0.54	5.00	0.00	0.64	0.64
29.60	0.41	0.54	5.00	0.00	0.64	0.64
29.65	0.41	0.54	5.00	0.00	0.63	0.63
29.70	0.41	0.54	5.00	0.00	0.62	0.62
29.75	0.41	0.54	5.00	0.00	0.62	0.62
29.80	0.41	0.54	5.00	0.00	0.61	0.61
29.85	0.41	0.54	5.00	0.00	0.61	0.61
29.90	0.41	0.54	5.00	0.00	0.60	0.60
29.95	0.41	0.54	5.00	0.00	0.60	0.60
30.00	0.41	0.54	5.00	0.00	0.59	0.59
30.05	0.43	0.54	5.00	0.00	0.59	0.59
30.10	0.44	0.54	5.00	0.00	0.58	0.58
30.15	0.46	0.54	5.00	0.00	0.58	0.58
30.20	0.49	0.54	5.00	0.00	0.57	0.57
30.25	0.53	0.54	5.00	0.00	0.57	0.57
30.30	2.51	0.54	5.00	0.00	0.56	0.56
30.35	2.51	0.54	5.00	0.00	0.56	0.56
30.40	2.51	0.54	5.00	0.00	0.56	0.56
30.45	2.51	0.54	5.00	0.00	0.55	0.55
30.50	2.51	0.54	5.00	0.00	0.55	0.55
30.55	2.51	0.54	5.00	0.00	0.55	0.55
30.60	2.51	0.54	5.00	0.00	0.54	0.54
30.65	2.51	0.54	5.00	0.00	0.54	0.54
30.70	2.51	0.54	5.00	0.00	0.54	0.54
30.75	2.51	0.54	5.00	0.00	0.54	0.54
30.80	2.51	0.54	5.00	0.00	0.53	0.53
30.85	2.50	0.54	5.00	0.00	0.53	0.53

30.90	2.50	0.54	5.00	0.00	0.53	0.53
30.95	2.50	0.54	5.00	0.00	0.53	0.53
31.00	2.50	0.54	5.00	0.00	0.52	0.52
31.05	2.50	0.54	5.00	0.00	0.52	0.52
31.10	2.50	0.54	5.00	0.00	0.52	0.52
31.15	2.50	0.54	5.00	0.00	0.52	0.52
31.20	2.50	0.54	5.00	0.00	0.52	0.52
31.25	2.50	0.54	5.00	0.00	0.51	0.51
31.30	2.50	0.53	5.00	0.00	0.51	0.51
31.35	2.50	0.53	5.00	0.00	0.51	0.51
31.40	2.50	0.53	5.00	0.00	0.51	0.51
31.45	2.50	0.53	5.00	0.00	0.51	0.51
31.50	2.49	0.53	5.00	0.00	0.51	0.51
31.55	2.49	0.53	5.00	0.00	0.50	0.50
31.60	2.49	0.53	5.00	0.00	0.50	0.50
31.65	2.49	0.53	5.00	0.00	0.50	0.50
31.70	2.49	0.53	5.00	0.00	0.50	0.50
31.75	2.49	0.53	5.00	0.00	0.50	0.50
31.80	2.49	0.53	5.00	0.00	0.50	0.50
31.85	2.49	0.53	5.00	0.00	0.50	0.50
31.90	2.49	0.53	5.00	0.00	0.50	0.50
31.95	2.49	0.53	5.00	0.00	0.49	0.49
32.00	2.49	0.53	5.00	0.00	0.49	0.49
32.05	2.49	0.53	5.00	0.00	0.49	0.49
32.10	2.49	0.53	5.00	0.00	0.49	0.49
32.15	2.48	0.53	5.00	0.00	0.49	0.49
32.20	2.48	0.53	5.00	0.00	0.49	0.49
32.25	2.48	0.53	5.00	0.00	0.49	0.49
32.30	2.48	0.53	5.00	0.00	0.49	0.49
32.35	2.48	0.53	5.00	0.00	0.48	0.48
32.40	2.48	0.53	5.00	0.00	0.48	0.48
32.45	2.48	0.53	5.00	0.00	0.48	0.48
32.50	2.48	0.53	5.00	0.00	0.48	0.48
32.55	2.48	0.53	5.00	0.00	0.48	0.48
32.60	2.48	0.53	5.00	0.00	0.48	0.48
32.65	2.48	0.53	5.00	0.00	0.48	0.48
32.70	2.48	0.53	5.00	0.00	0.48	0.48
32.75	2.48	0.53	5.00	0.00	0.48	0.48
32.80	2.47	0.53	5.00	0.00	0.47	0.47
32.85	2.47	0.53	5.00	0.00	0.47	0.47
32.90	2.47	0.53	5.00	0.00	0.47	0.47
32.95	2.47	0.53	5.00	0.00	0.47	0.47
33.00	2.47	0.53	5.00	0.00	0.47	0.47
33.05	2.47	0.53	5.00	0.00	0.47	0.47
33.10	2.47	0.53	5.00	0.00	0.47	0.47
33.15	2.47	0.53	5.00	0.00	0.47	0.47
33.20	2.47	0.53	5.00	0.00	0.47	0.47
33.25	2.47	0.53	5.00	0.00	0.47	0.47
33.30	2.47	0.53	5.00	0.00	0.47	0.47
33.35	2.47	0.53	5.00	0.00	0.46	0.46
33.40	2.47	0.52	5.00	0.00	0.46	0.46
33.45	2.46	0.52	5.00	0.00	0.46	0.46
33.50	2.46	0.52	5.00	0.00	0.46	0.46
33.55	2.46	0.52	5.00	0.00	0.46	0.46
33.60	2.46	0.52	5.00	0.00	0.46	0.46
33.65	2.46	0.52	5.00	0.00	0.46	0.46
33.70	2.46	0.52	5.00	0.00	0.46	0.46
33.75	2.46	0.52	5.00	0.00	0.46	0.46
33.80	2.46	0.52	5.00	0.00	0.46	0.46
33.85	2.46	0.52	5.00	0.00	0.45	0.45
33.90	2.46	0.52	5.00	0.00	0.45	0.45
33.95	2.46	0.52	5.00	0.00	0.45	0.45
34.00	2.46	0.52	5.00	0.00	0.45	0.45

34.05	2.46	0.52	5.00	0.00	0.45	0.45
34.10	2.46	0.52	5.00	0.00	0.45	0.45
34.15	2.45	0.52	5.00	0.00	0.45	0.45
34.20	2.45	0.52	5.00	0.00	0.45	0.45
34.25	2.45	0.52	5.00	0.00	0.45	0.45
34.30	2.45	0.52	5.00	0.00	0.45	0.45
34.35	2.45	0.52	5.00	0.00	0.45	0.45
34.40	2.45	0.52	5.00	0.00	0.45	0.45
34.45	2.45	0.52	5.00	0.00	0.44	0.44
34.50	2.45	0.52	5.00	0.00	0.44	0.44
34.55	2.45	0.52	5.00	0.00	0.44	0.44
34.60	2.45	0.52	5.00	0.00	0.44	0.44
34.65	2.45	0.52	5.00	0.00	0.44	0.44
34.70	2.45	0.52	5.00	0.00	0.44	0.44
34.75	2.45	0.52	5.00	0.00	0.44	0.44
34.80	2.44	0.52	5.00	0.00	0.44	0.44
34.85	2.44	0.52	5.00	0.00	0.44	0.44
34.90	2.44	0.52	5.00	0.00	0.44	0.44
34.95	2.44	0.52	5.00	0.00	0.44	0.44
35.00	2.44	0.52	5.00	0.00	0.44	0.44
35.05	2.44	0.52	5.00	0.00	0.44	0.44
35.10	2.44	0.52	5.00	0.00	0.43	0.43
35.15	2.44	0.52	5.00	0.00	0.43	0.43
35.20	2.44	0.52	5.00	0.00	0.43	0.43
35.25	2.44	0.52	5.00	0.00	0.43	0.43
35.30	2.44	0.52	5.00	0.00	0.43	0.43
35.35	2.44	0.52	5.00	0.00	0.43	0.43
35.40	2.44	0.52	5.00	0.00	0.43	0.43
35.45	2.43	0.52	5.00	0.00	0.43	0.43
35.50	2.43	0.51	5.00	0.00	0.43	0.43
35.55	2.43	0.51	5.00	0.00	0.43	0.43
35.60	2.43	0.51	5.00	0.00	0.43	0.43
35.65	2.43	0.51	5.00	0.00	0.43	0.43
35.70	2.43	0.51	5.00	0.00	0.43	0.43
35.75	2.43	0.51	5.00	0.00	0.42	0.42
35.80	2.43	0.51	5.00	0.00	0.42	0.42
35.85	2.43	0.51	5.00	0.00	0.42	0.42
35.90	2.43	0.51	5.00	0.00	0.42	0.42
35.95	2.43	0.51	5.00	0.00	0.42	0.42
36.00	2.43	0.51	5.00	0.00	0.42	0.42
36.05	2.43	0.51	5.00	0.00	0.42	0.42
36.10	2.42	0.51	5.00	0.00	0.42	0.42
36.15	2.42	0.51	5.00	0.00	0.42	0.42
36.20	2.42	0.51	5.00	0.00	0.42	0.42
36.25	2.42	0.51	5.00	0.00	0.42	0.42
36.30	2.42	0.51	5.00	0.00	0.42	0.42
36.35	2.42	0.51	5.00	0.00	0.42	0.42
36.40	2.42	0.51	5.00	0.00	0.41	0.41
36.45	2.42	0.51	5.00	0.00	0.41	0.41
36.50	2.42	0.51	5.00	0.00	0.41	0.41
36.55	2.42	0.51	5.00	0.00	0.41	0.41
36.60	2.42	0.51	5.00	0.00	0.41	0.41
36.65	2.42	0.51	5.00	0.00	0.41	0.41
36.70	2.42	0.51	5.00	0.00	0.41	0.41
36.75	2.42	0.51	5.00	0.00	0.41	0.41
36.80	2.41	0.51	5.00	0.00	0.41	0.41
36.85	2.41	0.51	5.00	0.00	0.41	0.41
36.90	2.41	0.51	5.00	0.00	0.41	0.41
36.95	2.41	0.51	5.00	0.00	0.41	0.41
37.00	2.41	0.51	5.00	0.00	0.40	0.40
37.05	2.41	0.51	5.00	0.00	0.40	0.40
37.10	2.41	0.51	5.00	0.00	0.40	0.40
37.15	2.41	0.51	5.00	0.00	0.40	0.40

37.20	2.41	0.51	5.00	0.00	0.40	0.40
37.25	2.41	0.51	5.00	0.00	0.40	0.40
37.30	2.41	0.51	5.00	0.00	0.40	0.40
37.35	2.41	0.51	5.00	0.00	0.40	0.40
37.40	2.41	0.51	5.00	0.00	0.40	0.40
37.45	2.40	0.51	5.00	0.00	0.40	0.40
37.50	2.40	0.51	5.00	0.00	0.40	0.40
37.55	2.40	0.51	5.00	0.00	0.40	0.40
37.60	2.40	0.50	5.00	0.00	0.39	0.39
37.65	2.40	0.50	5.00	0.00	0.39	0.39
37.70	2.40	0.50	5.00	0.00	0.39	0.39
37.75	2.40	0.50	5.00	0.00	0.39	0.39
37.80	2.40	0.50	5.00	0.00	0.39	0.39
37.85	2.40	0.50	5.00	0.00	0.39	0.39
37.90	2.40	0.50	5.00	0.00	0.39	0.39
37.95	2.40	0.50	5.00	0.00	0.39	0.39
38.00	2.40	0.50	5.00	0.00	0.39	0.39
38.05	2.40	0.50	5.00	0.00	0.39	0.39
38.10	2.40	0.50	5.00	0.00	0.39	0.39
38.15	2.39	0.50	5.00	0.00	0.39	0.39
38.20	2.39	0.50	5.00	0.00	0.39	0.39
38.25	2.39	0.50	5.00	0.00	0.39	0.39
38.30	2.39	0.50	5.00	0.00	0.38	0.38
38.35	2.39	0.50	5.00	0.00	0.38	0.38
38.40	2.39	0.50	5.00	0.00	0.38	0.38
38.45	2.39	0.50	5.00	0.00	0.38	0.38
38.50	2.39	0.50	5.00	0.00	0.38	0.38
38.55	2.39	0.50	5.00	0.00	0.38	0.38
38.60	2.39	0.50	5.00	0.00	0.38	0.38
38.65	2.39	0.50	5.00	0.00	0.38	0.38
38.70	2.39	0.50	5.00	0.00	0.38	0.38
38.75	2.39	0.50	5.00	0.00	0.38	0.38
38.80	2.39	0.50	5.00	0.00	0.38	0.38
38.85	2.38	0.50	5.00	0.00	0.38	0.38
38.90	2.38	0.50	5.00	0.00	0.38	0.38
38.95	2.38	0.50	5.00	0.00	0.38	0.38
39.00	2.38	0.50	5.00	0.00	0.38	0.38
39.05	2.38	0.50	5.00	0.00	0.38	0.38
39.10	2.38	0.50	5.00	0.00	0.38	0.38
39.15	2.38	0.50	5.00	0.00	0.38	0.38
39.20	2.38	0.50	5.00	0.00	0.38	0.38
39.25	2.38	0.50	5.00	0.00	0.38	0.38
39.30	2.38	0.50	5.00	0.00	0.38	0.38
39.35	2.38	0.50	5.00	0.00	0.37	0.37
39.40	2.38	0.50	5.00	0.00	0.37	0.37
39.45	2.38	0.50	5.00	0.00	0.37	0.37
39.50	2.38	0.50	5.00	0.00	0.37	0.37
39.55	2.37	0.50	5.00	0.00	0.37	0.37
39.60	2.37	0.50	5.00	0.00	0.37	0.37
39.65	2.37	0.50	5.00	0.00	0.37	0.37
39.70	2.37	0.50	5.00	0.00	0.37	0.37
39.75	2.37	0.49	5.00	0.00	0.37	0.37
39.80	2.37	0.49	5.00	0.00	0.37	0.37
39.85	2.37	0.49	5.00	0.00	0.37	0.37
39.90	2.37	0.49	5.00	0.00	0.37	0.37
39.95	2.37	0.49	5.00	0.00	0.37	0.37
40.00	2.37	0.49	5.00	0.00	0.37	0.37
40.05	2.37	0.49	5.00	0.00	0.37	0.37
40.10	2.37	0.49	5.00	0.00	0.37	0.37
40.15	2.37	0.49	5.00	0.00	0.37	0.37
40.20	2.37	0.49	5.00	0.00	0.37	0.37
40.25	2.36	0.49	5.00	0.00	0.37	0.37
40.30	2.36	0.49	5.00	0.00	0.37	0.37

40.35	2.36	0.49	5.00	0.00	0.36	0.36
40.40	2.36	0.49	5.00	0.00	0.36	0.36
40.45	2.36	0.49	5.00	0.00	0.36	0.36
40.50	2.36	0.49	5.00	0.00	0.36	0.36
40.55	2.36	0.49	5.00	0.00	0.36	0.36
40.60	2.36	0.49	5.00	0.00	0.36	0.36
40.65	2.36	0.49	5.00	0.00	0.36	0.36
40.70	2.36	0.49	5.00	0.00	0.36	0.36
40.75	2.36	0.49	5.00	0.00	0.36	0.36
40.80	2.36	0.49	5.00	0.00	0.36	0.36
40.85	2.36	0.49	5.00	0.00	0.36	0.36
40.90	2.36	0.49	5.00	0.00	0.36	0.36
40.95	2.35	0.49	5.00	0.00	0.36	0.36
41.00	2.35	0.49	5.00	0.00	0.36	0.36
41.05	2.35	0.49	5.00	0.00	0.36	0.36
41.10	2.35	0.49	5.00	0.00	0.36	0.36
41.15	2.35	0.49	5.00	0.00	0.36	0.36
41.20	2.35	0.49	5.00	0.00	0.36	0.36
41.25	2.35	0.49	5.00	0.00	0.36	0.36
41.30	2.35	0.49	5.00	0.00	0.35	0.35
41.35	2.35	0.49	5.00	0.00	0.35	0.35
41.40	2.35	0.49	5.00	0.00	0.35	0.35
41.45	2.35	0.49	5.00	0.00	0.35	0.35
41.50	2.35	0.49	5.00	0.00	0.35	0.35
41.55	2.35	0.49	5.00	0.00	0.35	0.35
41.60	2.35	0.49	5.00	0.00	0.35	0.35
41.65	2.35	0.49	5.00	0.00	0.35	0.35
41.70	2.34	0.49	5.00	0.00	0.35	0.35
41.75	2.34	0.49	5.00	0.00	0.35	0.35
41.80	2.34	0.49	5.00	0.00	0.35	0.35
41.85	2.34	0.48	5.00	0.00	0.35	0.35
41.90	2.34	0.48	5.00	0.00	0.35	0.35
41.95	2.34	0.48	5.00	0.00	0.35	0.35
42.00	2.34	0.48	5.00	0.00	0.35	0.35
42.05	2.34	0.48	5.00	0.00	0.34	0.34
42.10	2.34	0.48	5.00	0.00	0.34	0.34
42.15	2.34	0.48	5.00	0.00	0.34	0.34
42.20	2.34	0.48	5.00	0.00	0.34	0.34
42.25	2.34	0.48	5.00	0.00	0.34	0.34
42.30	2.34	0.48	5.00	0.00	0.34	0.34
42.35	2.34	0.48	5.00	0.00	0.34	0.34
42.40	2.34	0.48	5.00	0.00	0.34	0.34
42.45	2.33	0.48	5.00	0.00	0.34	0.34
42.50	2.33	0.48	5.00	0.00	0.34	0.34
42.55	2.33	0.48	5.00	0.00	0.34	0.34
42.60	2.33	0.48	5.00	0.00	0.34	0.34
42.65	2.33	0.48	5.00	0.00	0.34	0.34
42.70	2.33	0.48	5.00	0.00	0.34	0.34
42.75	2.33	0.48	5.00	0.00	0.33	0.33
42.80	2.33	0.48	5.00	0.00	0.33	0.33
42.85	2.33	0.48	5.00	0.00	0.33	0.33
42.90	2.33	0.48	5.00	0.00	0.33	0.33
42.95	2.33	0.48	5.00	0.00	0.33	0.33
43.00	2.33	0.48	5.00	0.00	0.33	0.33
43.05	2.33	0.48	5.00	0.00	0.33	0.33
43.10	2.33	0.48	5.00	0.00	0.33	0.33
43.15	2.33	0.48	5.00	0.00	0.33	0.33
43.20	2.32	0.48	5.00	0.00	0.33	0.33
43.25	2.32	0.48	5.00	0.00	0.33	0.33
43.30	2.32	0.48	5.00	0.00	0.32	0.32
43.35	2.32	0.48	5.00	0.00	0.32	0.32
43.40	2.32	0.48	5.00	0.00	0.32	0.32
43.45	2.32	0.48	5.00	0.00	0.32	0.32

43.50	2.32	0.48	5.00	0.00	0.32	0.32
43.55	2.32	0.48	5.00	0.00	0.32	0.32
43.60	2.32	0.48	5.00	0.00	0.32	0.32
43.65	2.32	0.48	5.00	0.00	0.31	0.31
43.70	2.32	0.48	5.00	0.00	0.31	0.31
43.75	2.32	0.48	5.00	0.00	0.31	0.31
43.80	2.32	0.48	5.00	0.00	0.31	0.31
43.85	2.32	0.48	5.00	0.00	0.31	0.31
43.90	2.32	0.48	5.00	0.00	0.31	0.31
43.95	0.50	0.47	5.00	0.00	0.30	0.30
44.00	0.46	0.47	5.00	0.00	0.30	0.30
44.05	0.43	0.47	5.00	0.00	0.30	0.30
44.10	0.42	0.47	5.00	0.00	0.30	0.30
44.15	0.40	0.47	5.00	0.00	0.30	0.30
44.20	0.39	0.47	5.00	0.00	0.29	0.29
44.25	0.38	0.47	5.00	0.00	0.29	0.29
44.30	0.37	0.47	5.00	0.00	0.29	0.29
44.35	0.36	0.47	5.00	0.00	0.29	0.29
44.40	0.35	0.47	5.00	0.00	0.28	0.28
44.45	0.34	0.47	5.00	0.00	0.28	0.28
44.50	0.33	0.47	5.00	0.00	0.28	0.28
44.55	0.32	0.47	5.00	0.00	0.28	0.28
44.60	0.32	0.47	5.00	0.00	0.27	0.27
44.65	0.31	0.47	5.00	0.00	0.27	0.27
44.70	0.30	0.47	5.00	0.00	0.27	0.27
44.75	0.29	0.47	5.00	0.00	0.26	0.26
44.80	0.29	0.47	5.00	0.00	0.26	0.26
44.85	0.28	0.47	5.00	0.00	0.26	0.26
44.90	0.27	0.47	5.00	0.00	0.25	0.25
44.95	0.27	0.47	5.00	0.00	0.25	0.25
45.00	0.26	0.47	5.00	0.00	0.24	0.24
45.05	0.27	0.47	5.00	0.00	0.24	0.24
45.10	0.27	0.47	5.00	0.00	0.23	0.23
45.15	0.27	0.47	5.00	0.00	0.23	0.23
45.20	0.27	0.47	5.00	0.00	0.23	0.23
45.25	0.27	0.47	5.00	0.00	0.22	0.22
45.30	0.28	0.47	5.00	0.00	0.22	0.22
45.35	0.28	0.47	5.00	0.00	0.21	0.21
45.40	0.28	0.47	5.00	0.00	0.21	0.21
45.45	0.28	0.47	5.00	0.00	0.20	0.20
45.50	0.28	0.47	5.00	0.00	0.20	0.20
45.55	0.29	0.47	5.00	0.00	0.20	0.20
45.60	0.29	0.47	5.00	0.00	0.19	0.19
45.65	0.29	0.47	5.00	0.00	0.19	0.19
45.70	0.29	0.47	5.00	0.00	0.19	0.19
45.75	0.30	0.47	5.00	0.00	0.18	0.18
45.80	0.30	0.47	5.00	0.00	0.18	0.18
45.85	0.30	0.47	5.00	0.00	0.17	0.17
45.90	0.30	0.47	5.00	0.00	0.17	0.17
45.95	0.30	0.47	5.00	0.00	0.17	0.17
46.00	0.31	0.47	5.00	0.00	0.16	0.16
46.05	0.31	0.46	5.00	0.00	0.16	0.16
46.10	0.31	0.46	5.00	0.00	0.16	0.16
46.15	0.31	0.46	5.00	0.00	0.15	0.15
46.20	0.32	0.46	5.00	0.00	0.15	0.15
46.25	0.32	0.46	5.00	0.00	0.15	0.15
46.30	0.32	0.46	5.00	0.00	0.15	0.15
46.35	0.33	0.46	5.00	0.00	0.14	0.14
46.40	0.33	0.46	5.00	0.00	0.14	0.14
46.45	0.33	0.46	5.00	0.00	0.14	0.14
46.50	0.33	0.46	5.00	0.00	0.13	0.13
46.55	0.34	0.46	5.00	0.00	0.13	0.13
46.60	0.34	0.46	5.00	0.00	0.13	0.13

46.65	0.34	0.46	5.00	0.00	0.12	0.12
46.70	0.35	0.46	5.00	0.00	0.12	0.12
46.75	0.35	0.46	5.00	0.00	0.12	0.12
46.80	0.35	0.46	5.00	0.00	0.12	0.12
46.85	0.35	0.46	5.00	0.00	0.11	0.11
46.90	0.36	0.46	5.00	0.00	0.11	0.11
46.95	0.36	0.46	5.00	0.00	0.11	0.11
47.00	0.36	0.46	5.00	0.00	0.11	0.11
47.05	0.37	0.46	5.00	0.00	0.10	0.10
47.10	0.37	0.46	5.00	0.00	0.10	0.10
47.15	0.38	0.46	5.00	0.00	0.10	0.10
47.20	0.38	0.46	5.00	0.00	0.10	0.10
47.25	0.38	0.46	5.00	0.00	0.09	0.09
47.30	0.39	0.46	5.00	0.00	0.09	0.09
47.35	0.39	0.46	5.00	0.00	0.09	0.09
47.40	0.40	0.46	5.00	0.00	0.09	0.09
47.45	0.40	0.46	5.00	0.00	0.08	0.08
47.50	0.41	0.46	5.00	0.00	0.08	0.08
47.55	0.41	0.46	5.00	0.00	0.08	0.08
47.60	0.42	0.46	5.00	0.00	0.08	0.08
47.65	0.42	0.46	5.00	0.00	0.08	0.08
47.70	0.43	0.46	5.00	0.00	0.07	0.07
47.75	0.44	0.46	5.00	0.00	0.07	0.07
47.80	0.44	0.46	5.00	0.00	0.07	0.07
47.85	0.45	0.46	5.00	0.00	0.07	0.07
47.90	0.47	0.46	5.00	0.00	0.07	0.07
47.95	0.48	0.46	5.00	0.00	0.06	0.06
48.00	0.51	0.46	5.00	0.00	0.06	0.06
48.05	0.55	0.46	5.00	0.00	0.06	0.06
48.10	2.26	0.46	5.00	0.00	0.06	0.06
48.15	2.26	0.46	5.00	0.00	0.06	0.06
48.20	2.26	0.45	5.00	0.00	0.05	0.05
48.25	2.26	0.45	5.00	0.00	0.05	0.05
48.30	2.26	0.45	5.00	0.00	0.05	0.05
48.35	2.26	0.45	5.00	0.00	0.05	0.05
48.40	2.26	0.45	5.00	0.00	0.05	0.05
48.45	2.26	0.45	5.00	0.00	0.05	0.05
48.50	2.26	0.45	5.00	0.00	0.04	0.04
48.55	2.26	0.45	5.00	0.00	0.04	0.04
48.60	2.26	0.45	5.00	0.00	0.04	0.04
48.65	2.26	0.45	5.00	0.00	0.04	0.04
48.70	2.26	0.45	5.00	0.00	0.04	0.04
48.75	2.26	0.45	5.00	0.00	0.04	0.04
48.80	2.26	0.45	5.00	0.00	0.03	0.03
48.85	2.25	0.45	5.00	0.00	0.03	0.03
48.90	2.25	0.45	5.00	0.00	0.03	0.03
48.95	2.25	0.45	5.00	0.00	0.03	0.03
49.00	2.25	0.45	5.00	0.00	0.03	0.03
49.05	2.25	0.45	5.00	0.00	0.03	0.03
49.10	2.25	0.45	5.00	0.00	0.02	0.02
49.15	2.25	0.45	5.00	0.00	0.02	0.02
49.20	2.25	0.45	5.00	0.00	0.02	0.02
49.25	2.25	0.45	5.00	0.00	0.02	0.02
49.30	2.25	0.45	5.00	0.00	0.02	0.02
49.35	2.25	0.45	5.00	0.00	0.02	0.02
49.40	2.25	0.45	5.00	0.00	0.02	0.02
49.45	2.25	0.45	5.00	0.00	0.01	0.01
49.50	2.25	0.45	5.00	0.00	0.01	0.01
49.55	2.25	0.45	5.00	0.00	0.01	0.01
49.60	2.25	0.45	5.00	0.00	0.01	0.01
49.65	2.25	0.45	5.00	0.00	0.01	0.01
49.70	2.24	0.45	5.00	0.00	0.01	0.01
49.75	2.24	0.45	5.00	0.00	0.01	0.01

49.80	2.24	0.45	5.00	0.00	0.00	0.00
49.85	2.24	0.45	5.00	0.00	0.00	0.00
49.90	2.24	0.45	5.00	0.00	0.00	0.00
49.95	2.24	0.45	5.00	0.00	0.00	0.00
50.00	2.24	0.45	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units Depth = ft, Stress or Pressure = tsf (atm), Unit Weight = pcf, Settlement = in.

CRRm Cyclic resistance ratio from soils
CSRfs Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRfs
S_sat Settlement from saturated sands
S_dry Settlement from dry sands
S_all Total settlement from saturated and dry sands
NoLiq No-Liquefy Soils

Appendix 4: Historical Site Conditions

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

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

Santa Ana Watershed - BMP Design 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
Date: 8/26/2024
Designed by: Cameron Liederman
Case No:
Company Project Number/Name: Temescal Industrial

BMP Identification

BMP NAME / ID: DMA 1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

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

D_{85}= 0.85 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)*
1	*119,104*	*Concrete or Asphalt*	*1.00*	*0.89*	*106240.8*			
1	*39890*	*Ornamental Landscaping*	*0.1*	*0.11*	*4406.2*			
	158994	***Total***			110647	0.85	*7837.5*	-

Notes:

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 — Date: 8/26/2024

Designed by: Cameron Liederman — Case No:

Company Project Number/Name: Temescal Industrial

BMP Identification

BMP NAME / ID: DMA 2

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}= 0.85 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)*
2	*308403*	*Concrete or Asphalt*	*1*	*0.89*	*275095.5*			
2	*40077*	*Ornamental Landscaping*	*0.1*	*0.11*	*4426.8*			
	348480		***Total***		**279522.3**	**0.85**	***19799.5***	***61,189***

Notes:

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 — Date: 8/26/2024

Designed by: Cameron Liederman — Case No:

Company Project Number/Name: Temescal Industrial

BMP Identification

BMP NAME / ID: DMA 4

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}= 0.85 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)*
2	*112124*	*Concrete or Asphalt*	*1*	*0.89*	*100014.6*			
2	*12458*	*Ornamental Landscaping*	*0.1*	*0.11*	*1376.1*			
	124582	***Total***			**101390.7**	**0.85**	**7181.8**	**-**

Notes:

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	Date	8/26/2024
Designed by	Cameron Liederman	Case No	
Company Project Number/Name	Temescal Industrial		

BMP Identification

BMP NAME / ID: DMA 6

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} = 0.85 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)*
2	*21170*	*Concrete or Asphalt*	*1*	*0.89*	*18883.6*			
2	*2352*	*Ornamental Landscaping*	*0.1*	*0.11*	*259.8*			
	23522		***Total***		**19143.4**	**0.85**	***1356***	**-**

Notes:

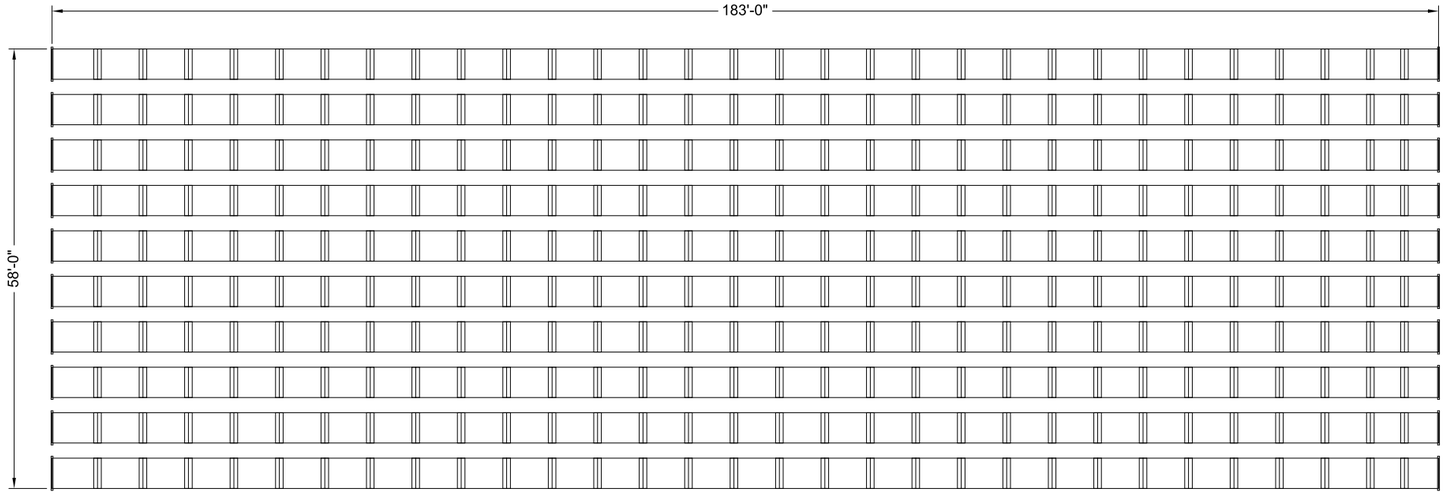
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 1,830 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 31,415 CF
- PIPE STORAGE VOLUME = 22,996 CF
- BACKFILL STORAGE VOLUME = 8,561 CF
- TOTAL STORAGE PROVIDED = 31,558 CF
- STONE VOID = 40%

PIPE DETAILS
- DIAMETER = 48"
- CORRUGATION = 2 2/3x1/2
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 24"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 0"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 0"



ASSEMBLY
SCALE: 1" = 20'

NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

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CONTECH DYODS DRAWING

DYO55936 Temescal
DMA 1
Corona, CA
DETENTION SYSTEM

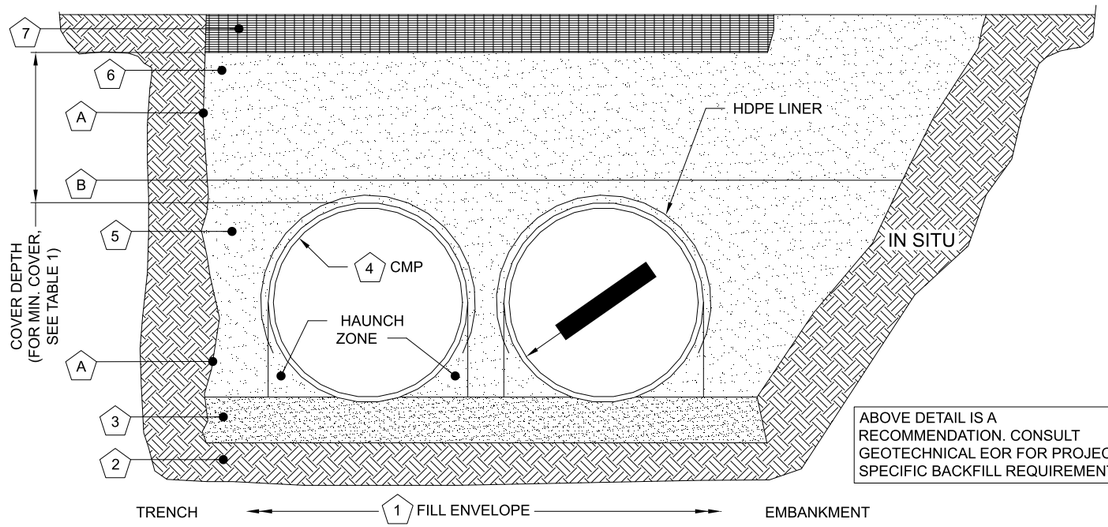
PROJECT No.:	SEQ. No.:	DATE:
38717	55936	7/22/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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TABLE 1:

DIAMETER, D	MIN. COVER	CORR. PROFILE
6"-10"	12"	1 1/2" x 1/4"
12"-48"	12"	2 2/3" x 1/2"
>48"-96"	12"	3" x 1", 5" x 1"
>96"	D/8	3" x 1", 5" x 1"

- STRUCTURAL BACKFILL MUST EXTEND TO LIMITS OF THE TABLE
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT.



ABOVE DETAIL IS A RECOMMENDATION. CONSULT GEOTECHNICAL EOR FOR PROJECT SPECIFIC BACKFILL REQUIREMENTS.

MINIMUM WIDTH DEPENDS ON SITE CONDITIONS AND ENGINEERING JUDGEMENT

INSTALLATION NOTES

1. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES.
2. OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.
3. AN HDPE MEMBRANE LINER WILL BE PLACED ON THE CROWN OF EACH PIPE TO PROVIDE AN IMPERMEABLE BARRIER AGAINST ENVIRONMENTAL CHANGES THAT MAY ADVERSELY AFFECT THE SYSTEM OVER TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL TECHNICAL DETAILS.

TABLE 2: PERFORATED STANDARD

CMP RETENTION STANDARD BACKFILL SPECIFICATIONS

	MATERIAL LOCATION	MATERIAL SPECIFICATION	DESCRIPTION	
1	FILL ENVELOPE WIDTH	PER ENGINEER OF RECORD	MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE. THE SUGGESTED MINIMUM TRENCH WIDTH, OR EOR RECOMMENDATION: PIPE ≤ 12": D + 16" PIPE > 12": 1.5D + 12"	MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE: PIPE < 24": 3.0D PIPE 24" - 144": D + 4'0" PIPE > 144": D + 10'0"
2	FOUNDATION	**AASHTO 26.5.2** - PER ENGINEER OF RECORD	PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND FOUNDATION BROUGHT BACK TO GRADE WITH A FILL MATERIAL APPROVED BY THE ENGINEER OF RECORD.	
3	BEDDING	**AASHTO M 43: 3, 357, 4, 467, 5, 56, 57**	ENGINEER OF RECORD TO DETERMINE IF BEDDING IS REQUIRED. PIPE MAY BE PLACED ON THE TRENCH BOTTOM OF A RELATIVELY LOOSE, NATIVE SUITABLE WELL GRADED GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, 2" MIN DEPTH. THE BEDDING MATERIAL MAY BE SUITABLE OPEN GRADED GRANULAR BEDDING CONFORMING TO AASHTO SOIL CLASSIFICATIONS A1, A2, OR A3 WITH MAXIMUM PARTICLE SIZE OF 3" PER AASHTO 26.3.8.1	
4	CORRUGATED METAL PIPE			
5	BACKFILL	FREE-DRAINING, ANGULAR, NATURALLY OCCURRING WASHED-STONE PER **AASHTO M 43: 3, 357, 4, 467, 5, 56, 57** OR APPROVED EQUAL *	HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION WITHOUT SOFT SPOTS. BACKFILL SHALL BE PLACED IN 8" +/- LOOSE LIFTS AND COMPACTED TO 90% STANDARD PROCTOR PER AASHTO T 99. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHOULD BE ADVANCED ALONG THE LENGTH OF THE SYSTEM TO AVOID DIFFERENTIAL LOADING. WHERE CONVENTIONAL COMPACTION TESTING IS NOT PRACTICAL, THE MATERIAL SHALL BE MECHANICALLY COMPACTED UNTIL NO FURTHER YIELDING OF MATERIAL IS OBSERVED UNDER THE COMPACTOR. **IN AREAS WITH HIGH WATER TABLE FLUCTUATIONS THAT INTERACT WITH THE PIPE ZONE, CONSIDER INSTALLING A GEOTEXTILE SEPARATION LAYER TO PREVENT SOIL MIGRATION.	
6	COVER MATERIAL	UP TO MIN. COVER - **AASHTO M 145: A-1, A-2, A-3** ABOVE MIN. COVER - PER ENGINEER OF RECORD	COVER MATERIAL MAY INCLUDE NON-BITUMINOUS, GRANULAR ROADBASE MATERIAL WITHIN MIN COVER LIMITS	
7	RIGID OR FLEXIBLE PAVEMENT (IF APPLICABLE)	PER ENGINEER OF RECORD	FLEXIBLE PAVEMENT SHOULD NOT BE COUNTED AS PART OF THE FILL HEIGHT OVER THE CMP. FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD.	
A	OPTIONAL SIDE GEOTEXTILE	NONE	GEOTEXTILE LAYER IS RECOMMENDED ON SIDES OF EXCAVATION TO PREVENT SOIL MIGRATION.	
B	GEOTEXTILE BETWEEN LAYERS	NONE	IF SOIL TYPES DIFFER AT ANY POINT ABOVE PIPE INVERT, A GEOTEXTILE LAYER IS RECOMMENDED TO BE PLACED BETWEEN THE LAYERS TO PREVENT SOIL MIGRATION.	

NOTES:
- FOR MULTIPLE BARREL INSTALLATIONS, THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE THE PIPE DIAMETER /2 BUT NO LESS THAN 12" FOR DIAMETERS <72". FOR 72" AND LARGER DIAMETERS, THE MINIMUM SPACING IS 36". CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING.

* APPROVED REGIONAL EQUIVALENTS FOR SECTION 5 INCLUDE CA-7, MIDOT 6AA, 6A, OR 5G, PROVIDED THEY MEET THE PARTICLE SIZES INDICATED.

MANUFACTURER RECOMMENDED BACKFILL

NOT TO SCALE

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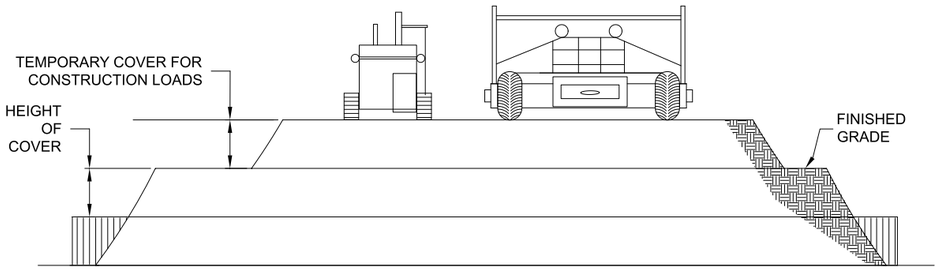
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DMA 1
Corona, CA
DETENTION SYSTEM

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SHEET NO.: 1		

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CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM

SCALE: N.T.S.

SPECIFICATION FOR DESIGNED DETENTION SYSTEM:

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE DESIGNED DETENTION SYSTEM DETAILED IN THE PROJECT PLANS.

MATERIAL
THE MATERIAL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-274 OR ASTM A-92.

THE GALVANIZED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-218 OR ASTM A-929.

THE POLYMER COATED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-246 OR ASTM A-742.

THE ALUMINUM COILS SHALL CONFORM TO THE APPLICABLE OF AASHTO M-197 OR ASTM B-744.

CONSTRUCTION LOADS
CONSTRUCTION LOADS MAY BE HIGHER THAN FINAL LOADS. FOLLOW THE MANUFACTURER'S OR NCSPA GUIDELINES.

PIPE
THE PIPE SHALL BE MANUFACTURED IN ACCORDANCE TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2: AASHTO M-36 OR ASTM A-760

GALVANIZED: AASHTO M-36 OR ASTM A-760

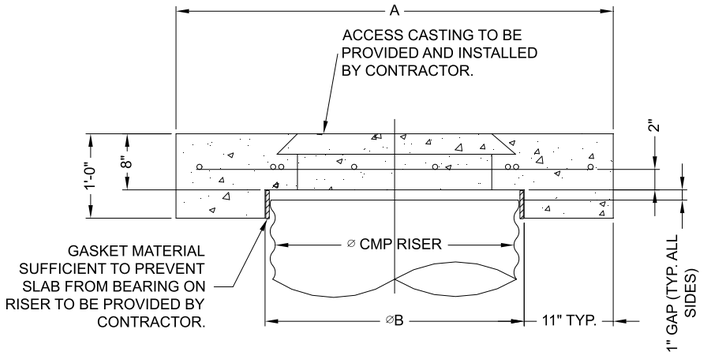
APPLICABLE POLYMER COATED: AASHTO M-245 OR ASTM A-762

ALUMINUM: AASHTO M-196 OR ASTM B-745

APPLICABLE
HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH NCSP'S (NATIONAL CORRUGATED STEEL PIPE ASSOCIATION) FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL. SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR ALUMINUM PIPE.
REQUIREMENTS
INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II DIVISION II OR ASTM A-798 (FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL) OR ASTM B-788 (FOR ALUMINUM PIPE) AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

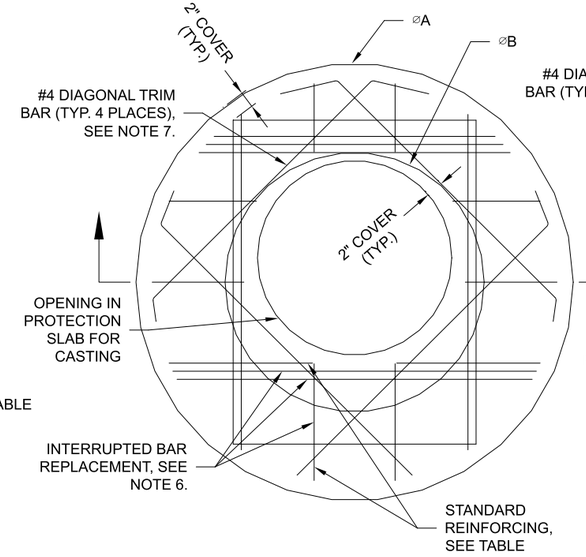
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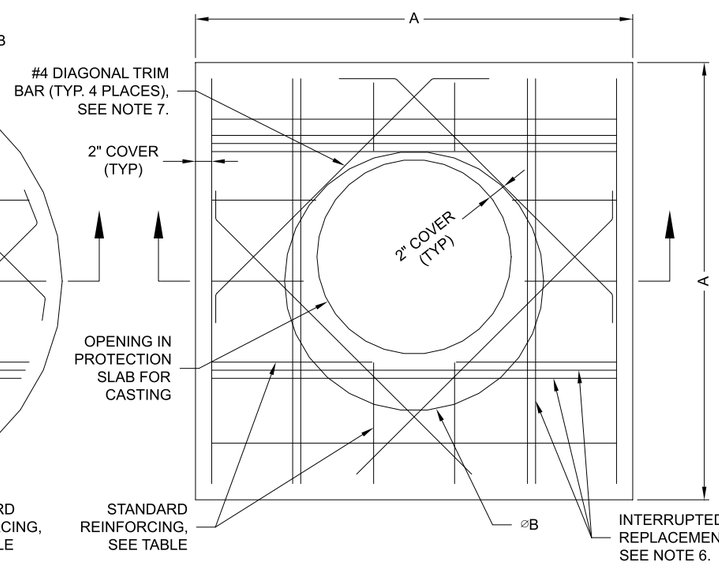
SECTION VIEW

REINFORCING TABLE				
⌀ CMP RISER	A	⌀ B	REINFORCING	**BEARING PRESSURE (PSF)
24"	⌀ 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	⌀ 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	⌀ 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	⌀ 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	⌀ 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

MANHOLE CAP DETAIL

SCALE: N.T.S.

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CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO55936 Temescal
DMA 1
Corona, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
38717	55936	7/22/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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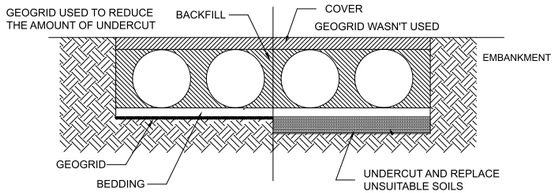
CMP DETENTION INSTALLATION GUIDE

PROPER INSTALLATION OF A FLEXIBLE UNDERGROUND DETENTION SYSTEM WILL ENSURE LONG-TERM PERFORMANCE. THE CONFIGURATION OF THESE SYSTEMS OFTEN REQUIRES SPECIAL CONSTRUCTION PRACTICES THAT DIFFER FROM CONVENTIONAL FLEXIBLE PIPE CONSTRUCTION. CONTECH ENGINEERED SOLUTIONS STRONGLY SUGGESTS SCHEDULING A PRE-CONSTRUCTION MEETING WITH YOUR LOCAL SALES ENGINEER TO DETERMINE IF ADDITIONAL MEASURES, NOT COVERED IN THIS GUIDE, ARE APPROPRIATE FOR YOUR SITE.

FOUNDATION

CONSTRUCT A FOUNDATION THAT CAN SUPPORT THE DESIGN LOADING APPLIED BY THE PIPE AND ADJACENT BACKFILL WEIGHT AS WELL AS MAINTAIN ITS INTEGRITY DURING CONSTRUCTION.

IF SOFT OR UNSUITABLE SOILS ARE ENCOUNTERED, REMOVE THE POOR SOILS DOWN TO A SUITABLE DEPTH AND THEN BUILD UP TO THE APPROPRIATE ELEVATION WITH A COMPETENT BACKFILL MATERIAL. THE STRUCTURAL FILL MATERIAL GRADATION SHOULD NOT ALLOW THE MIGRATION OF FINES, WHICH CAN CAUSE SETTLEMENT OF THE DETENTION SYSTEM OR PAVEMENT ABOVE. IF THE STRUCTURAL FILL MATERIAL IS NOT COMPATIBLE WITH THE UNDERLYING SOILS AN ENGINEERING FABRIC SHOULD BE USED AS A SEPARATOR. IN SOME CASES, USING A STIFF REINFORCING GEOGRID REDUCES OVER EXCAVATION AND REPLACEMENT FILL QUANTITIES.

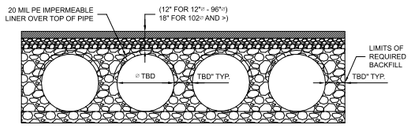


GRADE THE FOUNDATION SUBGRADE TO A UNIFORM OR SLIGHTLY SLOPING GRADE. IF THE SUBGRADE IS CLAY OR RELATIVELY NON-POROUS AND THE CONSTRUCTION SEQUENCE WILL LAST FOR AN EXTENDED PERIOD OF TIME, IT IS BEST TO SLOPE THE GRADE TO ONE END OF THE SYSTEM. THIS WILL ALLOW EXCESS WATER TO DRAIN QUICKLY, PREVENTING SATURATION OF THE SUBGRADE.

GEOMEMBRANE BARRIER

A SITE'S RESISTIVITY MAY CHANGE OVER TIME WHEN VARIOUS TYPES OF SALTING AGENTS ARE USED, SUCH AS ROAD SALTS FOR DEICING AGENTS. IF SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE, A GEOMEMBRANE BARRIER IS RECOMMENDED WITH THE SYSTEM. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM THE USE OF SUCH AGENTS INCLUDING PREMATURE CORROSION AND REDUCED ACTUAL SERVICE LIFE.

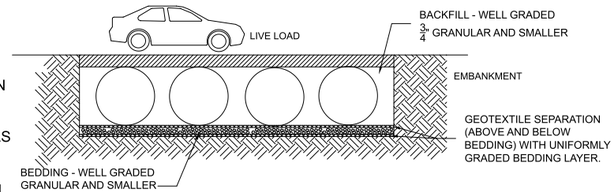
THE PROJECT'S ENGINEER OF RECORD IS TO EVALUATE WHETHER SALTING AGENTS WILL BE USED ON OR NEAR THE PROJECT SITE, AND USE HIS/HER BEST JUDGEMENT TO DETERMINE IF ANY ADDITIONAL PROTECTIVE MEASURES ARE REQUIRED. BELOW IS A TYPICAL DETAIL SHOWING THE PLACEMENT OF A GEOMEMBRANE BARRIER FOR PROJECTS WHERE SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE.



IN-SITU TRENCH WALL

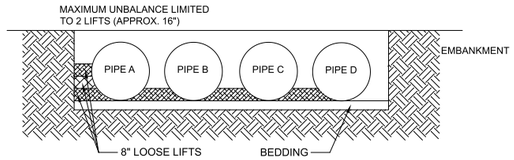
IF EXCAVATION IS REQUIRED, THE TRENCH WALL NEEDS TO BE CAPABLE OF SUPPORTING THE LOAD THAT THE PIPE SHEDS AS THE SYSTEM IS LOADED. IF SOILS ARE NOT CAPABLE OF SUPPORTING THESE LOADS, THE PIPE CAN DEFLECT. PERFORM A SIMPLE SOIL PRESSURE CHECK USING THE APPLIED LOADS TO DETERMINE THE LIMITS OF EXCAVATION BEYOND THE SPRING LINE OF THE OUTER MOST PIPES.

IN MOST CASES THE REQUIREMENTS FOR A SAFE WORK ENVIRONMENT AND PROPER BACKFILL PLACEMENT AND COMPACTION TAKE CARE OF THIS CONCERN.



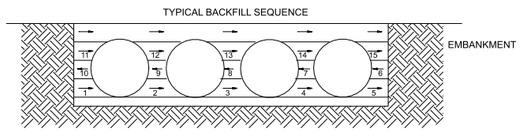
BACKFILL PLACEMENT

MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS.

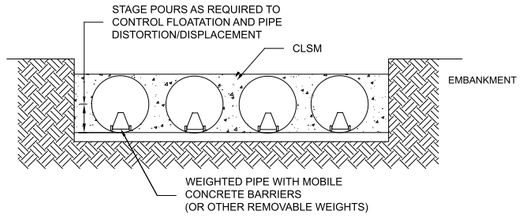


IF AASHTO T99 PROCEDURES ARE DETERMINED INFEASIBLE BY THE GEOTECHNICAL ENGINEER OF RECORD, COMPACTION IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE GEOTECHNICAL ENGINEER OF RECORD (OR REPRESENTATIVE THEREOF) IS SATISFIED WITH THE LEVEL OF COMPACTION.

FOR LARGE SYSTEMS, CONVEYOR SYSTEMS, BACKHOES WITH LONG REACHES OR DRAGLINES WITH STONE BUCKETS MAY BE USED TO PLACE BACKFILL. ONCE MINIMUM COVER FOR CONSTRUCTION LOADING ACROSS THE ENTIRE WIDTH OF THE SYSTEM IS REACHED, ADVANCE THE EQUIPMENT TO THE END OF THE RECENTLY PLACED FILL, AND BEGIN THE SEQUENCE AGAIN UNTIL THE SYSTEM IS COMPLETELY BACKFILLED. THIS TYPE OF CONSTRUCTION SEQUENCE PROVIDES ROOM FOR STOCKPILED BACKFILL DIRECTLY BEHIND THE BACKHOE, AS WELL AS THE MOVEMENT OF CONSTRUCTION TRAFFIC. MATERIAL STOCKPILES ON TOP OF THE BACKFILLED DETENTION SYSTEM SHOULD BE LIMITED TO 8- TO 10-FEET HIGH AND MUST PROVIDE BALANCED LOADING ACROSS ALL BARRELS. TO DETERMINE THE PROPER COVER OVER THE PIPES TO ALLOW THE MOVEMENT OF CONSTRUCTION EQUIPMENT SEE TABLE 1, OR CONTACT YOUR LOCAL CONTECH SALES ENGINEER.



WHEN FLOWABLE FILL IS USED, YOU MUST PREVENT PIPE FLOATATION. TYPICALLY, SMALL LIFTS ARE PLACED BETWEEN THE PIPES AND THEN ALLOWED TO SET-UP PRIOR TO THE PLACEMENT OF THE NEXT LIFT. THE ALLOWABLE THICKNESS OF THE CLSM LIFT IS A FUNCTION OF A PROPER BALANCE BETWEEN THE UPLIFT FORCE OF THE CLSM, THE OPPOSING WEIGHT OF THE PIPE, AND THE EFFECT OF OTHER RESTRAINING MEASURES. THE PIPE CAN CARRY LIMITED FLUID PRESSURE WITHOUT PIPE DISTORTION OR DISPLACEMENT, WHICH ALSO AFFECTS THE CLSM LIFT THICKNESS. YOUR LOCAL CONTECH SALES ENGINEER CAN HELP DETERMINE THE PROPER LIFT THICKNESS.

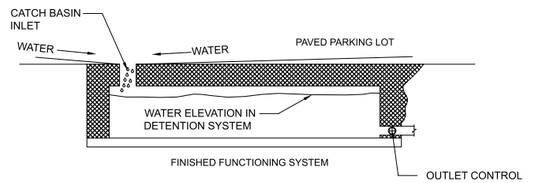


CONSTRUCTION LOADING

TYPICALLY, THE MINIMUM COVER SPECIFIED FOR A PROJECT ASSUMES H-20 LIVE LOAD. BECAUSE CONSTRUCTION LOADS OFTEN EXCEED DESIGN LIVE LOADS, INCREASED TEMPORARY MINIMUM COVER REQUIREMENTS ARE NECESSARY. SINCE CONSTRUCTION EQUIPMENT VARIES FROM JOB TO JOB, IT IS BEST TO ADDRESS EQUIPMENT SPECIFIC MINIMUM COVER REQUIREMENTS WITH YOUR LOCAL CONTECH SALES ENGINEER DURING YOUR PRE-CONSTRUCTION MEETING.

ADDITIONAL CONSIDERATIONS

BECAUSE MOST SYSTEMS ARE CONSTRUCTED BELOW-GRADE, RAINFALL CAN RAPIDLY FILL THE EXCAVATION; POTENTIALLY CAUSING FLOATATION AND MOVEMENT OF THE PREVIOUSLY PLACED PIPES. TO HELP MITIGATE POTENTIAL PROBLEMS, IT IS BEST TO START THE INSTALLATION AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR THE WATER TO ESCAPE. TEMPORARY DIVERSION MEASURES MAY BE REQUIRED FOR HIGH FLOWS DUE TO THE RESTRICTED NATURE OF THE OUTLET PIPE.



CMP DETENTION SYSTEM INSPECTION AND MAINTENANCE

UNDERGROUND STORMWATER DETENTION AND INFILTRATION SYSTEMS MUST BE INSPECTED AND MAINTAINED AT REGULAR INTERVALS FOR PURPOSES OF PERFORMANCE AND LONGEVITY.

INSPECTION

INSPECTION IS THE KEY TO EFFECTIVE MAINTENANCE OF CMP DETENTION SYSTEMS AND IS EASILY PERFORMED. CONTECH RECOMMENDS ONGOING, ANNUAL INSPECTIONS. SITES WITH HIGH TRASH LOAD OR SMALL OUTLET CONTROL ORIFICES MAY NEED MORE FREQUENT INSPECTIONS. THE RATE AT WHICH THE SYSTEM COLLECTS POLLUTANTS WILL DEPEND MORE ON SITE SPECIFIC ACTIVITIES RATHER THAN THE SIZE OR CONFIGURATION OF THE SYSTEM.

INSPECTIONS SHOULD BE PERFORMED MORE OFTEN IN EQUIPMENT WASHDOWN AREAS, IN CLIMATES WHERE SANDING AND/OR SALTING OPERATIONS TAKE PLACE, AND IN OTHER VARIOUS INSTANCES IN WHICH ONE WOULD EXPECT HIGHER ACCUMULATIONS OF SEDIMENT OR ABRASIVE/ CORROSIVE CONDITIONS. A RECORD OF EACH INSPECTION IS TO BE MAINTAINED FOR THE LIFE OF THE SYSTEM

MAINTENANCE

CMP DETENTION SYSTEMS SHOULD BE CLEANED WHEN AN INSPECTION REVEALS ACCUMULATED SEDIMENT OR TRASH IS CLOGGING THE DISCHARGE ORIFICE.

ACCUMULATED SEDIMENT AND TRASH CAN TYPICALLY BE EVACUATED THROUGH THE MANHOLE OVER THE OUTLET ORIFICE. IF MAINTENANCE IS NOT PERFORMED AS RECOMMENDED, SEDIMENT AND TRASH MAY ACCUMULATE IN FRONT OF THE OUTLET ORIFICE. MANHOLE COVERS SHOULD BE SECURELY SEATED FOLLOWING CLEANING ACTIVITIES. CONTECH SUGGESTS THAT ALL SYSTEMS BE DESIGNED WITH AN ACCESS/INSPECTION MANHOLE SITUATED AT OR NEAR THE INLET AND THE OUTLET ORIFICE. SHOULD IT BE NECESSARY TO GET INSIDE THE SYSTEM TO PERFORM MAINTENANCE ACTIVITIES, ALL APPROPRIATE PRECAUTIONS REGARDING CONFINED SPACE ENTRY AND OSHA REGULATIONS SHOULD BE FOLLOWED.

ANNUAL INSPECTIONS ARE BEST PRACTICE FOR ALL UNDERGROUND SYSTEMS. DURING THIS INSPECTION, IF EVIDENCE OF SALTING/DE-ICING AGENTS IS OBSERVED WITHIN THE SYSTEM, IT IS BEST PRACTICE FOR THE SYSTEM TO BE RINSED, INCLUDING ABOVE THE SPRING LINE SOON AFTER THE SPRING THAW AS PART OF THE MAINTENANCE PROGRAM FOR THE SYSTEM.

MAINTAINING AN UNDERGROUND DETENTION OR INFILTRATION SYSTEM IS EASIEST WHEN THERE IS NO FLOW ENTERING THE SYSTEM. FOR THIS REASON, IT IS A GOOD IDEA TO SCHEDULE THE CLEANOUT DURING DRY WEATHER.

THE FOREGOING INSPECTION AND MAINTENANCE EFFORTS HELP ENSURE UNDERGROUND PIPE SYSTEMS USED FOR STORMWATER STORAGE CONTINUE TO FUNCTION AS INTENDED BY IDENTIFYING RECOMMENDED REGULAR INSPECTION AND MAINTENANCE PRACTICES. INSPECTION AND MAINTENANCE RELATED TO THE STRUCTURAL INTEGRITY OF THE PIPE OR THE SOUNDNESS OF PIPE JOINT CONNECTIONS IS BEYOND THE SCOPE OF THIS GUIDE.

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CONTECH CMP DETENTION SYSTEMS

CONTECH **DYODS** DRAWING

DYO55936 Temescal
DMA 1
Corona, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
38717	55936	7/22/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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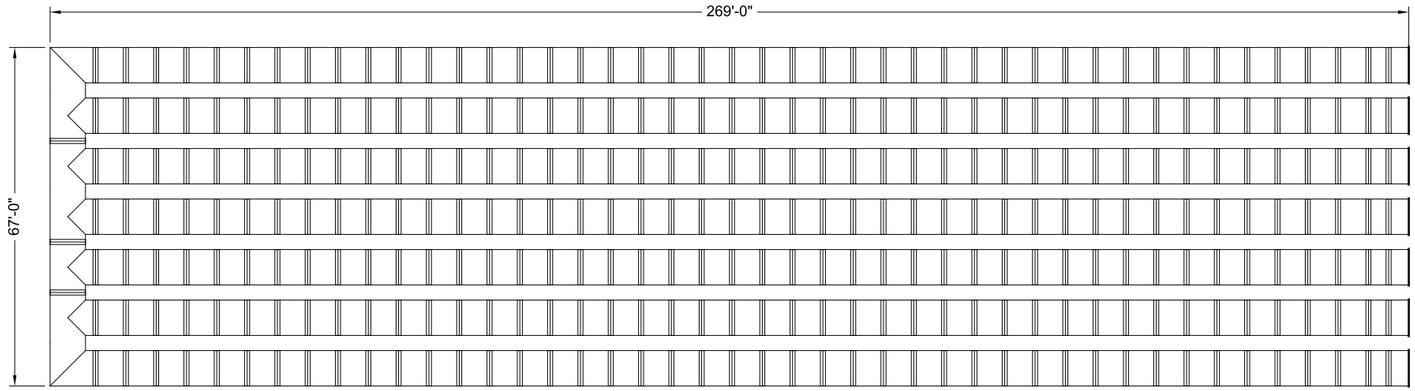
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 1,901 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 96,208 CF
- PIPE STORAGE VOLUME = 73,159 CF
- BACKFILL STORAGE VOLUME = 23,094 CF
- TOTAL STORAGE PROVIDED = 96,253 CF
- STONE VOID = 40%

PIPE DETAILS
- DIAMETER = 84"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 0"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 0"



ASSEMBLY
SCALE: 1" = 30'

NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

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CONTECH® CMP DETENTION SYSTEMS
CONTECH **DYODS** DRAWING

DYO55937 Temescal
DMA 2
Corona, CA
DETENTION SYSTEM

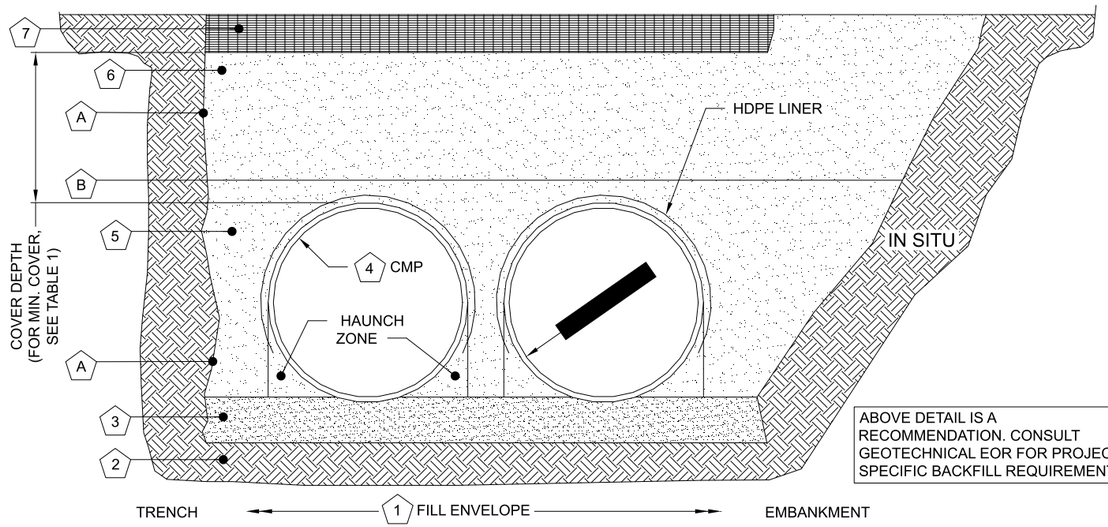
PROJECT No.:	SEQ. No.:	DATE:
38717	55937	7/22/2024
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TABLE 1:

DIAMETER, D	MIN. COVER	CORR. PROFILE
6"-10"	12"	1 1/2" x 1/4"
12"-48"	12"	2 2/3" x 1/2"
>48"-96"	12"	3" x 1", 5" x 1"
>96"	D/8	3" x 1", 5" x 1"

- STRUCTURAL BACKFILL MUST EXTEND TO LIMITS OF THE TABLE
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT.



ABOVE DETAIL IS A RECOMMENDATION. CONSULT GEOTECHNICAL EOR FOR PROJECT SPECIFIC BACKFILL REQUIREMENTS.

MINIMUM WIDTH DEPENDS ON SITE CONDITIONS AND ENGINEERING JUDGEMENT

INSTALLATION NOTES

1. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES.
2. OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.
3. AN HDPE MEMBRANE LINER WILL BE PLACED ON THE CROWN OF EACH PIPE TO PROVIDE AN IMPERMEABLE BARRIER AGAINST ENVIRONMENTAL CHANGES THAT MAY ADVERSELY AFFECT THE SYSTEM OVER TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL TECHNICAL DETAILS.

TABLE 2: PERFORATED STANDARD

CMP RETENTION STANDARD BACKFILL SPECIFICATIONS

	MATERIAL LOCATION	MATERIAL SPECIFICATION	DESCRIPTION	
1	FILL ENVELOPE WIDTH	PER ENGINEER OF RECORD	MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE. THE SUGGESTED MINIMUM TRENCH WIDTH, OR EOR RECOMMENDATION: PIPE ≤ 12": D + 16" PIPE > 12": 1.5D + 12"	MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE: PIPE < 24": 3.0D PIPE 24" - 144": D + 4'0" PIPE > 144": D + 10'0"
2	FOUNDATION	**AASHTO 26.5.2** - PER ENGINEER OF RECORD	PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND FOUNDATION BROUGHT BACK TO GRADE WITH A FILL MATERIAL APPROVED BY THE ENGINEER OF RECORD.	
3	BEDDING	**AASHTO M 43: 3, 357, 4, 467, 5, 56, 57**	ENGINEER OF RECORD TO DETERMINE IF BEDDING IS REQUIRED. PIPE MAY BE PLACED ON THE TRENCH BOTTOM OF A RELATIVELY LOOSE, NATIVE SUITABLE WELL GRADED GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, 2" MIN DEPTH. THE BEDDING MATERIAL MAY BE SUITABLE OPEN GRADED GRANULAR BEDDING CONFORMING TO AASHTO SOIL CLASSIFICATIONS A1, A2, OR A3 WITH MAXIMUM PARTICLE SIZE OF 3" PER AASHTO 26.3.8.1	
4	CORRUGATED METAL PIPE			
5	BACKFILL	FREE-DRAINING, ANGULAR, NATURALLY OCCURRING WASHED-STONE PER **AASHTO M 43: 3, 357, 4, 467, 5, 56, 57** OR APPROVED EQUAL *	HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION WITHOUT SOFT SPOTS. BACKFILL SHALL BE PLACED IN 8" +/- LOOSE LIFTS AND COMPACTED TO 90% STANDARD PROCTOR PER AASHTO T 99. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHOULD BE ADVANCED ALONG THE LENGTH OF THE SYSTEM TO AVOID DIFFERENTIAL LOADING. WHERE CONVENTIONAL COMPACTION TESTING IS NOT PRACTICAL, THE MATERIAL SHALL BE MECHANICALLY COMPACTED UNTIL NO FURTHER YIELDING OF MATERIAL IS OBSERVED UNDER THE COMPACTOR. **IN AREAS WITH HIGH WATER TABLE FLUCTUATIONS THAT INTERACT WITH THE PIPE ZONE, CONSIDER INSTALLING A GEOTEXTILE SEPARATION LAYER TO PREVENT SOIL MIGRATION.	
6	COVER MATERIAL	UP TO MIN. COVER - **AASHTO M 145: A-1, A-2, A-3** ABOVE MIN. COVER - PER ENGINEER OF RECORD	COVER MATERIAL MAY INCLUDE NON-BITUMINOUS, GRANULAR ROADBASE MATERIAL WITHIN MIN COVER LIMITS	
7	RIGID OR FLEXIBLE PAVEMENT (IF APPLICABLE)	PER ENGINEER OF RECORD	FLEXIBLE PAVEMENT SHOULD NOT BE COUNTED AS PART OF THE FILL HEIGHT OVER THE CMP. FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD.	
A	OPTIONAL SIDE GEOTEXTILE	NONE	GEOTEXTILE LAYER IS RECOMMENDED ON SIDES OF EXCAVATION TO PREVENT SOIL MIGRATION.	
B	GEOTEXTILE BETWEEN LAYERS	NONE	IF SOIL TYPES DIFFER AT ANY POINT ABOVE PIPE INVERT, A GEOTEXTILE LAYER IS RECOMMENDED TO BE PLACED BETWEEN THE LAYERS TO PREVENT SOIL MIGRATION.	

NOTES:
- FOR MULTIPLE BARREL INSTALLATIONS, THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE THE PIPE DIAMETER /2 BUT NO LESS THAN 12" FOR DIAMETERS <72". FOR 72" AND LARGER DIAMETERS, THE MINIMUM SPACING IS 36". CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING.

* APPROVED REGIONAL EQUIVALENTS FOR SECTION 5 INCLUDE CA-7, MIDOT 6AA, 6A, OR 5G, PROVIDED THEY MEET THE PARTICLE SIZES INDICATED.

MANUFACTURER RECOMMENDED BACKFILL

NOT TO SCALE

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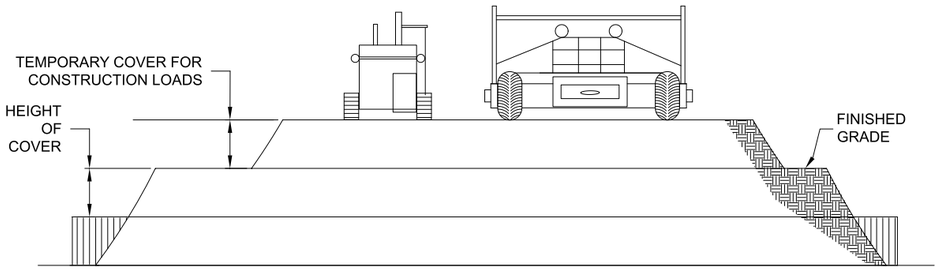
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CONTECH® CMP DETENTION SYSTEMS
CONTECH **DYODS** DRAWING

DYO55937 Temescal
DMA 2
Corona, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
38717	55937	7/22/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM

SCALE: N.T.S.

SPECIFICATION FOR DESIGNED DETENTION SYSTEM:

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE DESIGNED DETENTION SYSTEM DETAILED IN THE PROJECT PLANS.

MATERIAL
THE MATERIAL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-274 OR ASTM A-92.

THE GALVANIZED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-218 OR ASTM A-929.

THE POLYMER COATED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-246 OR ASTM A-742.

THE ALUMINUM COILS SHALL CONFORM TO THE APPLICABLE OF AASHTO M-197 OR ASTM B-744.

CONSTRUCTION LOADS
CONSTRUCTION LOADS MAY BE HIGHER THAN FINAL LOADS. FOLLOW THE MANUFACTURER'S OR NCSPA GUIDELINES.

PIPE
THE PIPE SHALL BE MANUFACTURED IN ACCORDANCE TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2: AASHTO M-36 OR ASTM A-760

GALVANIZED: AASHTO M-36 OR ASTM A-760

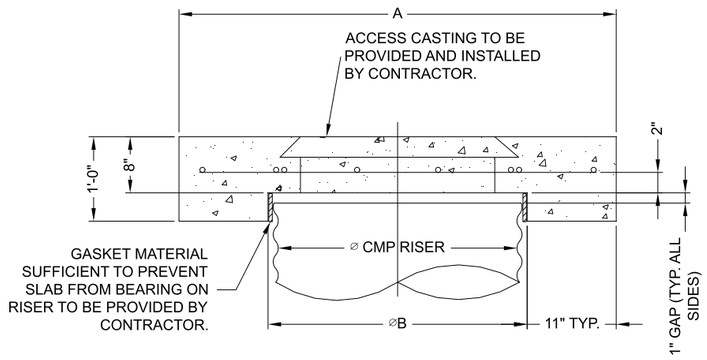
APPLICABLE POLYMER COATED: AASHTO M-245 OR ASTM A-762

ALUMINUM: AASHTO M-196 OR ASTM B-745

APPLICABLE
HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH NCSP'S (NATIONAL CORRUGATED STEEL PIPE ASSOCIATION) FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL. SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR ALUMINUM PIPE.
REQUIREMENTS
INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II DIVISION II OR ASTM A-798 (FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL) OR ASTM B-788 (FOR ALUMINUM PIPE) AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

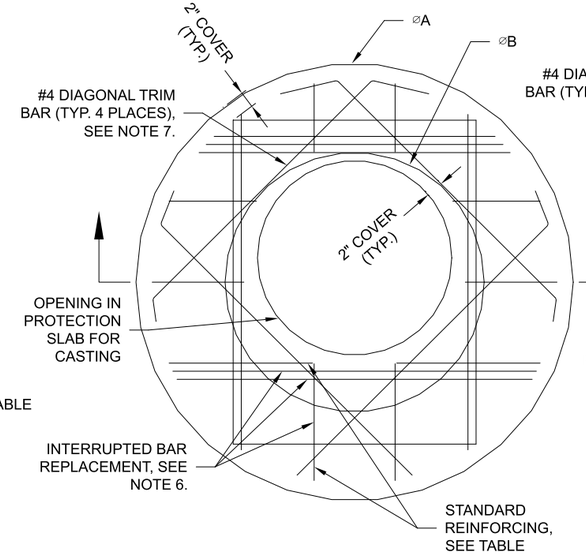
NOTE:
THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.



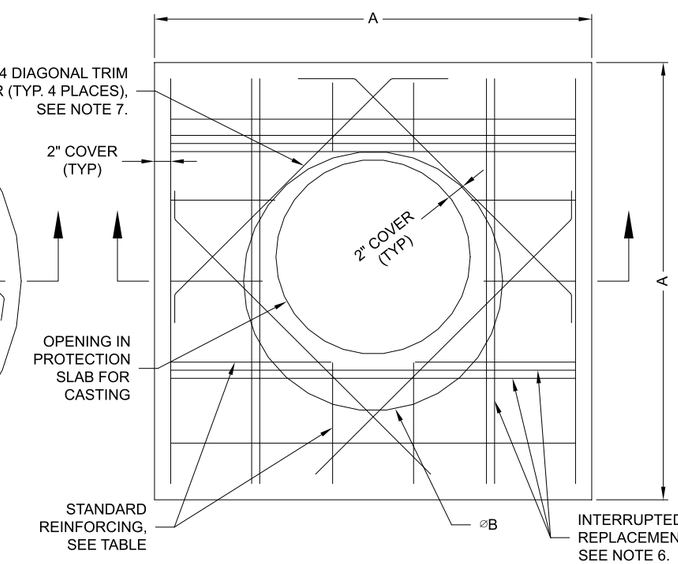
SECTION VIEW

REINFORCING TABLE				
⌀ CMP RISER	A	⌀ B	REINFORCING	**BEARING PRESSURE (PSF)
24"	⌀ 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	⌀ 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	⌀ 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	⌀ 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	⌀ 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

MANHOLE CAP DETAIL

SCALE: N.T.S.

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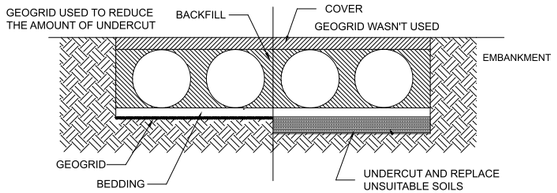
CMP DETENTION INSTALLATION GUIDE

PROPER INSTALLATION OF A FLEXIBLE UNDERGROUND DETENTION SYSTEM WILL ENSURE LONG-TERM PERFORMANCE. THE CONFIGURATION OF THESE SYSTEMS OFTEN REQUIRES SPECIAL CONSTRUCTION PRACTICES THAT DIFFER FROM CONVENTIONAL FLEXIBLE PIPE CONSTRUCTION. CONTECH ENGINEERED SOLUTIONS STRONGLY SUGGESTS SCHEDULING A PRE-CONSTRUCTION MEETING WITH YOUR LOCAL SALES ENGINEER TO DETERMINE IF ADDITIONAL MEASURES, NOT COVERED IN THIS GUIDE, ARE APPROPRIATE FOR YOUR SITE.

FOUNDATION

CONSTRUCT A FOUNDATION THAT CAN SUPPORT THE DESIGN LOADING APPLIED BY THE PIPE AND ADJACENT BACKFILL WEIGHT AS WELL AS MAINTAIN ITS INTEGRITY DURING CONSTRUCTION.

IF SOFT OR UNSUITABLE SOILS ARE ENCOUNTERED, REMOVE THE POOR SOILS DOWN TO A SUITABLE DEPTH AND THEN BUILD UP TO THE APPROPRIATE ELEVATION WITH A COMPETENT BACKFILL MATERIAL. THE STRUCTURAL FILL MATERIAL GRADATION SHOULD NOT ALLOW THE MIGRATION OF FINES, WHICH CAN CAUSE SETTLEMENT OF THE DETENTION SYSTEM OR PAVEMENT ABOVE. IF THE STRUCTURAL FILL MATERIAL IS NOT COMPATIBLE WITH THE UNDERLYING SOILS AN ENGINEERING FABRIC SHOULD BE USED AS A SEPARATOR. IN SOME CASES, USING A STIFF REINFORCING GEOGRID REDUCES OVER EXCAVATION AND REPLACEMENT FILL QUANTITIES.

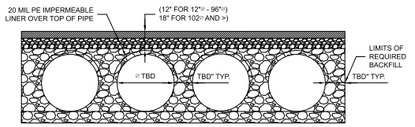


GRADE THE FOUNDATION SUBGRADE TO A UNIFORM OR SLIGHTLY SLOPING GRADE. IF THE SUBGRADE IS CLAY OR RELATIVELY NON-POROUS AND THE CONSTRUCTION SEQUENCE WILL LAST FOR AN EXTENDED PERIOD OF TIME, IT IS BEST TO SLOPE THE GRADE TO ONE END OF THE SYSTEM. THIS WILL ALLOW EXCESS WATER TO DRAIN QUICKLY, PREVENTING SATURATION OF THE SUBGRADE.

GEOMEMBRANE BARRIER

A SITE'S RESISTIVITY MAY CHANGE OVER TIME WHEN VARIOUS TYPES OF SALTING AGENTS ARE USED, SUCH AS ROAD SALTS FOR DEICING AGENTS. IF SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE, A GEOMEMBRANE BARRIER IS RECOMMENDED WITH THE SYSTEM. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM THE USE OF SUCH AGENTS INCLUDING PREMATURE CORROSION AND REDUCED ACTUAL SERVICE LIFE.

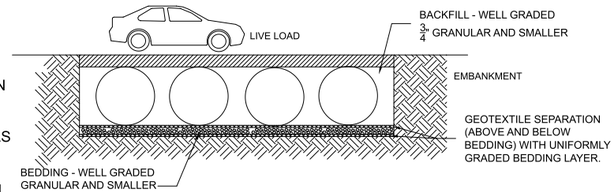
THE PROJECT'S ENGINEER OF RECORD IS TO EVALUATE WHETHER SALTING AGENTS WILL BE USED ON OR NEAR THE PROJECT SITE, AND USE HIS/HER BEST JUDGEMENT TO DETERMINE IF ANY ADDITIONAL PROTECTIVE MEASURES ARE REQUIRED. BELOW IS A TYPICAL DETAIL SHOWING THE PLACEMENT OF A GEOMEMBRANE BARRIER FOR PROJECTS WHERE SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE.



IN-SITU TRENCH WALL

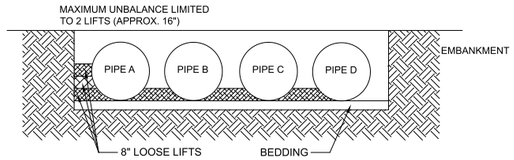
IF EXCAVATION IS REQUIRED, THE TRENCH WALL NEEDS TO BE CAPABLE OF SUPPORTING THE LOAD THAT THE PIPE SHEDS AS THE SYSTEM IS LOADED. IF SOILS ARE NOT CAPABLE OF SUPPORTING THESE LOADS, THE PIPE CAN DEFLECT. PERFORM A SIMPLE SOIL PRESSURE CHECK USING THE APPLIED LOADS TO DETERMINE THE LIMITS OF EXCAVATION BEYOND THE SPRING LINE OF THE OUTER MOST PIPES.

IN MOST CASES THE REQUIREMENTS FOR A SAFE WORK ENVIRONMENT AND PROPER BACKFILL PLACEMENT AND COMPACTION TAKE CARE OF THIS CONCERN.



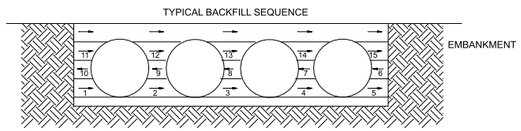
BACKFILL PLACEMENT

MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS.

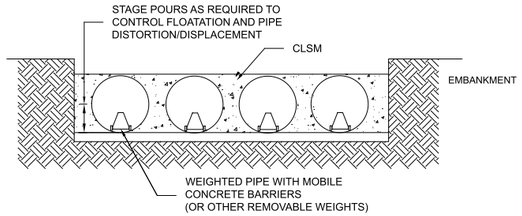


IF AASHTO T99 PROCEDURES ARE DETERMINED INFEASIBLE BY THE GEOTECHNICAL ENGINEER OF RECORD, COMPACTION IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE GEOTECHNICAL ENGINEER OF RECORD (OR REPRESENTATIVE THEREOF) IS SATISFIED WITH THE LEVEL OF COMPACTION.

FOR LARGE SYSTEMS, CONVEYOR SYSTEMS, BACKHOES WITH LONG REACHES OR DRAGLINES WITH STONE BUCKETS MAY BE USED TO PLACE BACKFILL. ONCE MINIMUM COVER FOR CONSTRUCTION LOADING ACROSS THE ENTIRE WIDTH OF THE SYSTEM IS REACHED, ADVANCE THE EQUIPMENT TO THE END OF THE RECENTLY PLACED FILL, AND BEGIN THE SEQUENCE AGAIN UNTIL THE SYSTEM IS COMPLETELY BACKFILLED. THIS TYPE OF CONSTRUCTION SEQUENCE PROVIDES ROOM FOR STOCKPILED BACKFILL DIRECTLY BEHIND THE BACKHOE, AS WELL AS THE MOVEMENT OF CONSTRUCTION TRAFFIC. MATERIAL STOCKPILES ON TOP OF THE BACKFILLED DETENTION SYSTEM SHOULD BE LIMITED TO 8- TO 10-FEET HIGH AND MUST PROVIDE BALANCED LOADING ACROSS ALL BARRELS. TO DETERMINE THE PROPER COVER OVER THE PIPES TO ALLOW THE MOVEMENT OF CONSTRUCTION EQUIPMENT SEE TABLE 1, OR CONTACT YOUR LOCAL CONTECH SALES ENGINEER.



WHEN FLOWABLE FILL IS USED, YOU MUST PREVENT PIPE FLOATATION. TYPICALLY, SMALL LIFTS ARE PLACED BETWEEN THE PIPES AND THEN ALLOWED TO SET-UP PRIOR TO THE PLACEMENT OF THE NEXT LIFT. THE ALLOWABLE THICKNESS OF THE CLSM LIFT IS A FUNCTION OF A PROPER BALANCE BETWEEN THE UPLIFT FORCE OF THE CLSM, THE OPPOSING WEIGHT OF THE PIPE, AND THE EFFECT OF OTHER RESTRAINING MEASURES. THE PIPE CAN CARRY LIMITED FLUID PRESSURE WITHOUT PIPE DISTORTION OR DISPLACEMENT, WHICH ALSO AFFECTS THE CLSM LIFT THICKNESS. YOUR LOCAL CONTECH SALES ENGINEER CAN HELP DETERMINE THE PROPER LIFT THICKNESS.

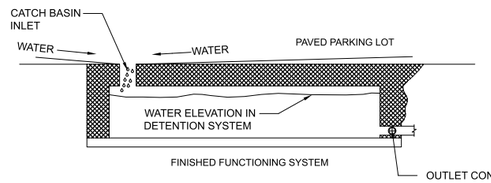


CONSTRUCTION LOADING

TYPICALLY, THE MINIMUM COVER SPECIFIED FOR A PROJECT ASSUMES H-20 LIVE LOAD. BECAUSE CONSTRUCTION LOADS OFTEN EXCEED DESIGN LIVE LOADS, INCREASED TEMPORARY MINIMUM COVER REQUIREMENTS ARE NECESSARY. SINCE CONSTRUCTION EQUIPMENT VARIES FROM JOB TO JOB, IT IS BEST TO ADDRESS EQUIPMENT SPECIFIC MINIMUM COVER REQUIREMENTS WITH YOUR LOCAL CONTECH SALES ENGINEER DURING YOUR PRE-CONSTRUCTION MEETING.

ADDITIONAL CONSIDERATIONS

BECAUSE MOST SYSTEMS ARE CONSTRUCTED BELOW-GRADE, RAINFALL CAN RAPIDLY FILL THE EXCAVATION; POTENTIALLY CAUSING FLOATATION AND MOVEMENT OF THE PREVIOUSLY PLACED PIPES. TO HELP MITIGATE POTENTIAL PROBLEMS, IT IS BEST TO START THE INSTALLATION AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR THE WATER TO ESCAPE. TEMPORARY DIVERSION MEASURES MAY BE REQUIRED FOR HIGH FLOWS DUE TO THE RESTRICTED NATURE OF THE OUTLET PIPE.



CMP DETENTION SYSTEM INSPECTION AND MAINTENANCE

UNDERGROUND STORMWATER DETENTION AND INFILTRATION SYSTEMS MUST BE INSPECTED AND MAINTAINED AT REGULAR INTERVALS FOR PURPOSES OF PERFORMANCE AND LONGEVITY.

INSPECTION

INSPECTION IS THE KEY TO EFFECTIVE MAINTENANCE OF CMP DETENTION SYSTEMS AND IS EASILY PERFORMED. CONTECH RECOMMENDS ONGOING, ANNUAL INSPECTIONS. SITES WITH HIGH TRASH LOAD OR SMALL OUTLET CONTROL ORIFICES MAY NEED MORE FREQUENT INSPECTIONS. THE RATE AT WHICH THE SYSTEM COLLECTS POLLUTANTS WILL DEPEND MORE ON SITE SPECIFIC ACTIVITIES RATHER THAN THE SIZE OR CONFIGURATION OF THE SYSTEM.

INSPECTIONS SHOULD BE PERFORMED MORE OFTEN IN EQUIPMENT WASHDOWN AREAS, IN CLIMATES WHERE SANDING AND/OR SALTING OPERATIONS TAKE PLACE, AND IN OTHER VARIOUS INSTANCES IN WHICH ONE WOULD EXPECT HIGHER ACCUMULATIONS OF SEDIMENT OR ABRASIVE/ CORROSIVE CONDITIONS. A RECORD OF EACH INSPECTION IS TO BE MAINTAINED FOR THE LIFE OF THE SYSTEM

MAINTENANCE

CMP DETENTION SYSTEMS SHOULD BE CLEANED WHEN AN INSPECTION REVEALS ACCUMULATED SEDIMENT OR TRASH IS CLOGGING THE DISCHARGE ORIFICE.

ACCUMULATED SEDIMENT AND TRASH CAN TYPICALLY BE EVACUATED THROUGH THE MANHOLE OVER THE OUTLET ORIFICE. IF MAINTENANCE IS NOT PERFORMED AS RECOMMENDED, SEDIMENT AND TRASH MAY ACCUMULATE IN FRONT OF THE OUTLET ORIFICE. MANHOLE COVERS SHOULD BE SECURELY SEATED FOLLOWING CLEANING ACTIVITIES. CONTECH SUGGESTS THAT ALL SYSTEMS BE DESIGNED WITH AN ACCESS/INSPECTION MANHOLE SITUATED AT OR NEAR THE INLET AND THE OUTLET ORIFICE. SHOULD IT BE NECESSARY TO GET INSIDE THE SYSTEM TO PERFORM MAINTENANCE ACTIVITIES, ALL APPROPRIATE PRECAUTIONS REGARDING CONFINED SPACE ENTRY AND OSHA REGULATIONS SHOULD BE FOLLOWED.

ANNUAL INSPECTIONS ARE BEST PRACTICE FOR ALL UNDERGROUND SYSTEMS. DURING THIS INSPECTION, IF EVIDENCE OF SALTING/DE-ICING AGENTS IS OBSERVED WITHIN THE SYSTEM, IT IS BEST PRACTICE FOR THE SYSTEM TO BE RINSED, INCLUDING ABOVE THE SPRING LINE SOON AFTER THE SPRING THAW AS PART OF THE MAINTENANCE PROGRAM FOR THE SYSTEM.

MAINTAINING AN UNDERGROUND DETENTION OR INFILTRATION SYSTEM IS EASIEST WHEN THERE IS NO FLOW ENTERING THE SYSTEM. FOR THIS REASON, IT IS A GOOD IDEA TO SCHEDULE THE CLEANOUT DURING DRY WEATHER.

THE FOREGOING INSPECTION AND MAINTENANCE EFFORTS HELP ENSURE UNDERGROUND PIPE SYSTEMS USED FOR STORMWATER STORAGE CONTINUE TO FUNCTION AS INTENDED BY IDENTIFYING RECOMMENDED REGULAR INSPECTION AND MAINTENANCE PRACTICES. INSPECTION AND MAINTENANCE RELATED TO THE STRUCTURAL INTEGRITY OF THE PIPE OR THE SOUNDNESS OF PIPE JOINT CONNECTIONS IS BEYOND THE SCOPE OF THIS GUIDE.

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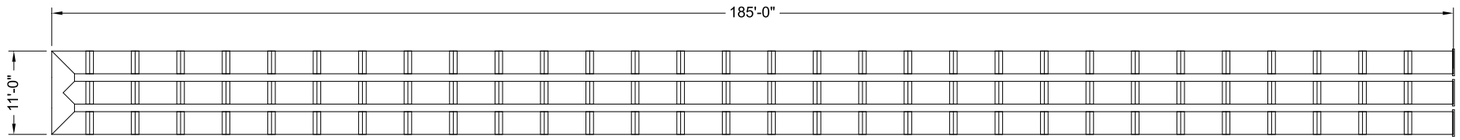
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 557 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 5,260 CF
- PIPE STORAGE VOLUME = 3,937 CF
- BACKFILL STORAGE VOLUME = 1,342 CF
- TOTAL STORAGE PROVIDED = 5,280 CF
- STONE VOID = 40%

PIPE DETAILS
- DIAMETER = 36"
- CORRUGATION = 2 2/3x1/2
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 12"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 0"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 0"



NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

ASSEMBLY

SCALE: 1" = 20'

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CONTECH CMP DETENTION SYSTEMS

CONTECH **DYODS** DRAWING

DYO55245 Temescal
DMA 4
Corona, CA
DETENTION SYSTEM

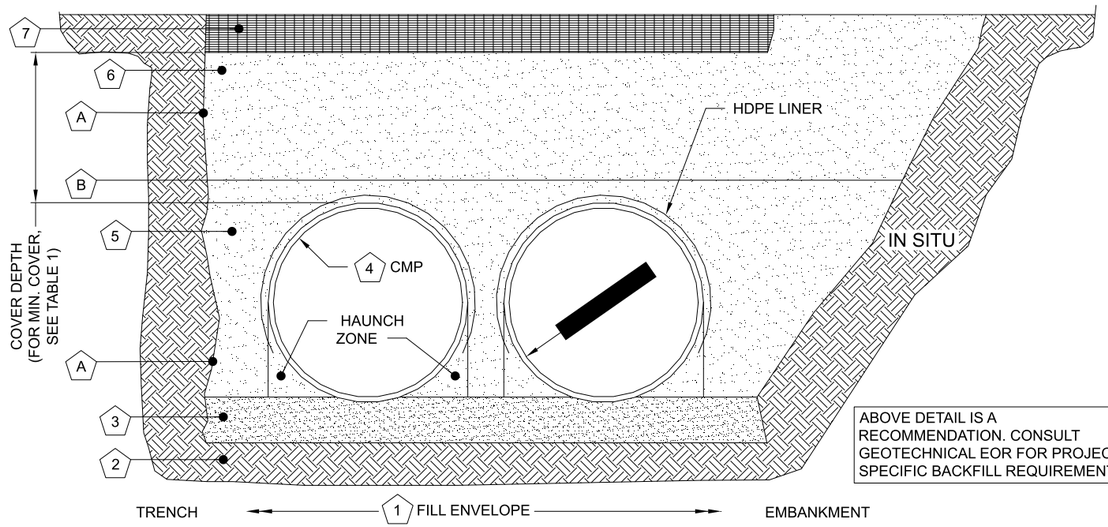
PROJECT No.:	SEQ. No.:	DATE:
38717	55245	7/22/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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TABLE 1:

DIAMETER, D	MIN. COVER	CORR. PROFILE
6"-10"	12"	1 1/2" x 1/4"
12"-48"	12"	2 2/3" x 1/2"
>48"-96"	12"	3" x 1", 5" x 1"
>96"	D/8	3" x 1", 5" x 1"

- STRUCTURAL BACKFILL MUST EXTEND TO LIMITS OF THE TABLE
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT.



ABOVE DETAIL IS A RECOMMENDATION. CONSULT GEOTECHNICAL EOR FOR PROJECT SPECIFIC BACKFILL REQUIREMENTS.

MINIMUM WIDTH DEPENDS ON SITE CONDITIONS AND ENGINEERING JUDGEMENT

INSTALLATION NOTES

1. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES.
2. OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.
3. AN HDPE MEMBRANE LINER WILL BE PLACED ON THE CROWN OF EACH PIPE TO PROVIDE AN IMPERMEABLE BARRIER AGAINST ENVIRONMENTAL CHANGES THAT MAY ADVERSELY AFFECT THE SYSTEM OVER TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL TECHNICAL DETAILS.

TABLE 2: PERFORATED STANDARD

CMP RETENTION STANDARD BACKFILL SPECIFICATIONS

	MATERIAL LOCATION	MATERIAL SPECIFICATION	DESCRIPTION	
1	FILL ENVELOPE WIDTH	PER ENGINEER OF RECORD	MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE. THE SUGGESTED MINIMUM TRENCH WIDTH, OR EOR RECOMMENDATION: PIPE ≤ 12": D + 16" PIPE > 12": 1.5D + 12"	MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE: PIPE < 24": 3.0D PIPE 24" - 144": D + 4'0" PIPE > 144": D + 10'0"
2	FOUNDATION	**AASHTO 26.5.2** - PER ENGINEER OF RECORD	PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND FOUNDATION BROUGHT BACK TO GRADE WITH A FILL MATERIAL APPROVED BY THE ENGINEER OF RECORD.	
3	BEDDING	**AASHTO M 43: 3, 357, 4, 467, 5, 56, 57**	ENGINEER OF RECORD TO DETERMINE IF BEDDING IS REQUIRED. PIPE MAY BE PLACED ON THE TRENCH BOTTOM OF A RELATIVELY LOOSE, NATIVE SUITABLE WELL GRADED GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, 2" MIN DEPTH. THE BEDDING MATERIAL MAY BE SUITABLE OPEN GRADED GRANULAR BEDDING CONFORMING TO AASHTO SOIL CLASSIFICATIONS A1, A2, OR A3 WITH MAXIMUM PARTICLE SIZE OF 3" PER AASHTO 26.3.8.1	
4	CORRUGATED METAL PIPE			
5	BACKFILL	FREE-DRAINING, ANGULAR, NATURALLY OCCURRING WASHED-STONE PER **AASHTO M 43: 3, 357, 4, 467, 5, 56, 57** OR APPROVED EQUAL *	HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION WITHOUT SOFT SPOTS. BACKFILL SHALL BE PLACED IN 8" +/- LOOSE LIFTS AND COMPACTED TO 90% STANDARD PROCTOR PER AASHTO T 99. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHOULD BE ADVANCED ALONG THE LENGTH OF THE SYSTEM TO AVOID DIFFERENTIAL LOADING. WHERE CONVENTIONAL COMPACTION TESTING IS NOT PRACTICAL, THE MATERIAL SHALL BE MECHANICALLY COMPACTED UNTIL NO FURTHER YIELDING OF MATERIAL IS OBSERVED UNDER THE COMPACTOR. **IN AREAS WITH HIGH WATER TABLE FLUCTUATIONS THAT INTERACT WITH THE PIPE ZONE, CONSIDER INSTALLING A GEOTEXTILE SEPARATION LAYER TO PREVENT SOIL MIGRATION.	
6	COVER MATERIAL	UP TO MIN. COVER - **AASHTO M 145: A-1, A-2, A-3** ABOVE MIN. COVER - PER ENGINEER OF RECORD	COVER MATERIAL MAY INCLUDE NON-BITUMINOUS, GRANULAR ROADBASE MATERIAL WITHIN MIN COVER LIMITS	
7	RIGID OR FLEXIBLE PAVEMENT (IF APPLICABLE)	PER ENGINEER OF RECORD	FLEXIBLE PAVEMENT SHOULD NOT BE COUNTED AS PART OF THE FILL HEIGHT OVER THE CMP. FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD.	
A	OPTIONAL SIDE GEOTEXTILE	NONE	GEOTEXTILE LAYER IS RECOMMENDED ON SIDES OF EXCAVATION TO PREVENT SOIL MIGRATION.	
B	GEOTEXTILE BETWEEN LAYERS	NONE	IF SOIL TYPES DIFFER AT ANY POINT ABOVE PIPE INVERT, A GEOTEXTILE LAYER IS RECOMMENDED TO BE PLACED BETWEEN THE LAYERS TO PREVENT SOIL MIGRATION.	

NOTES:
- FOR MULTIPLE BARREL INSTALLATIONS, THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE THE PIPE DIAMETER /2 BUT NO LESS THAN 12" FOR DIAMETERS <72". FOR 72" AND LARGER DIAMETERS, THE MINIMUM SPACING IS 36". CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING.

* APPROVED REGIONAL EQUIVALENTS FOR SECTION 5 INCLUDE CA-7, MIDOT 6AA, 6A, OR 5G, PROVIDED THEY MEET THE PARTICLE SIZES INDICATED.

MANUFACTURER RECOMMENDED BACKFILL

NOT TO SCALE

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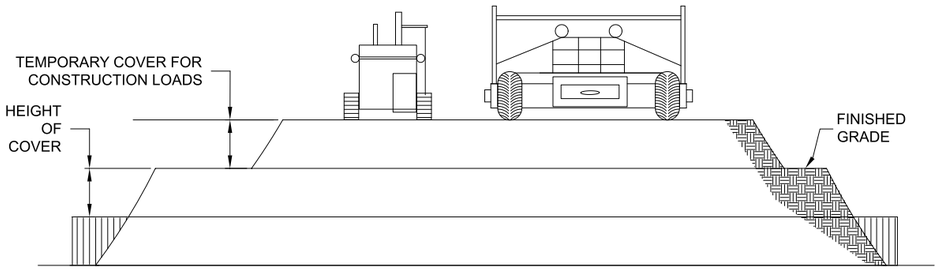
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CONTECH DYODS DRAWING

DYO55245 Temescal
DMA 4
Corona, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
38717	55245	7/22/2024
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CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM

SCALE: N.T.S.

SPECIFICATION FOR DESIGNED DETENTION SYSTEM:

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE DESIGNED DETENTION SYSTEM DETAILED IN THE PROJECT PLANS.

MATERIAL
THE MATERIAL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-274 OR ASTM A-92.

THE GALVANIZED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-218 OR ASTM A-929.

THE POLYMER COATED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-246 OR ASTM A-742.

THE ALUMINUM COILS SHALL CONFORM TO THE APPLICABLE OF AASHTO M-197 OR ASTM B-744.

CONSTRUCTION LOADS
CONSTRUCTION LOADS MAY BE HIGHER THAN FINAL LOADS. FOLLOW THE MANUFACTURER'S OR NCSPA GUIDELINES.

PIPE
THE PIPE SHALL BE MANUFACTURED IN ACCORDANCE TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2: AASHTO M-36 OR ASTM A-760

GALVANIZED: AASHTO M-36 OR ASTM A-760

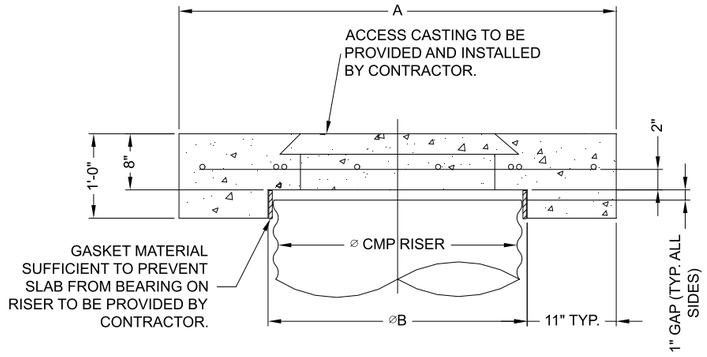
APPLICABLE POLYMER COATED: AASHTO M-245 OR ASTM A-762

ALUMINUM: AASHTO M-196 OR ASTM B-745

APPLICABLE
HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH NCSP'S (NATIONAL CORRUGATED STEEL PIPE ASSOCIATION) FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL. SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR ALUMINUM PIPE.
REQUIREMENTS
INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II DIVISION II OR ASTM A-798 (FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL) OR ASTM B-788 (FOR ALUMINUM PIPE) AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

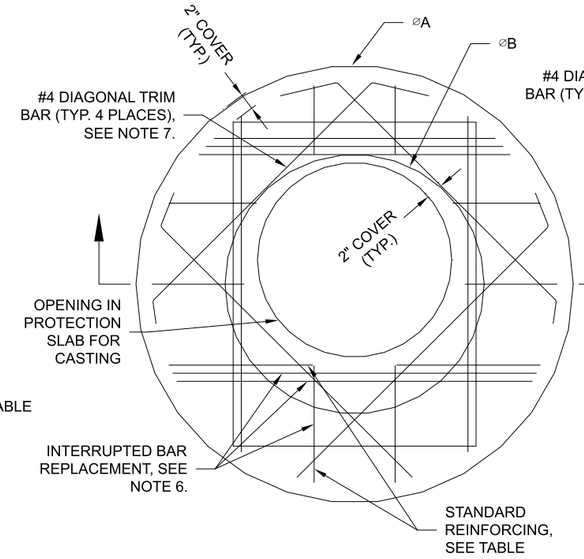
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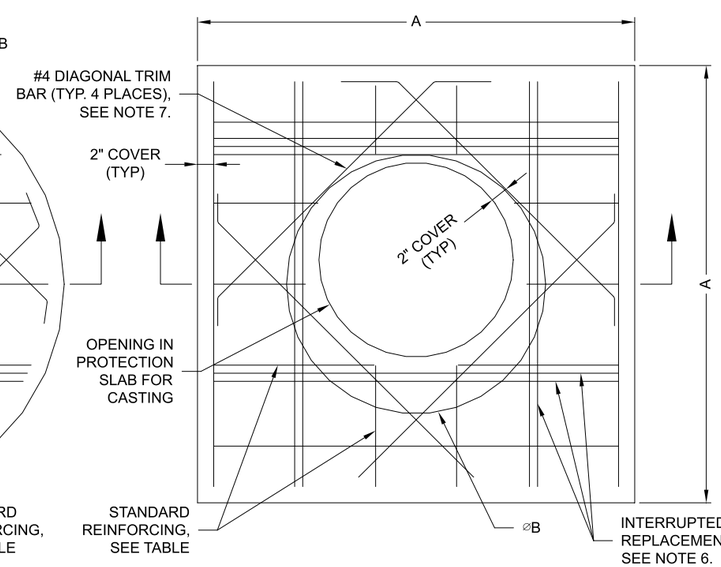
SECTION VIEW

REINFORCING TABLE				
⌀ CMP RISER	A	⌀ B	REINFORCING	**BEARING PRESSURE (PSF)
24"	⌀ 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	⌀ 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	⌀ 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	⌀ 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	⌀ 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

MANHOLE CAP DETAIL

SCALE: N.T.S.

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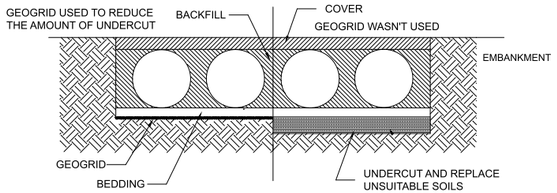
CMP DETENTION INSTALLATION GUIDE

PROPER INSTALLATION OF A FLEXIBLE UNDERGROUND DETENTION SYSTEM WILL ENSURE LONG-TERM PERFORMANCE. THE CONFIGURATION OF THESE SYSTEMS OFTEN REQUIRES SPECIAL CONSTRUCTION PRACTICES THAT DIFFER FROM CONVENTIONAL FLEXIBLE PIPE CONSTRUCTION. CONTECH ENGINEERED SOLUTIONS STRONGLY SUGGESTS SCHEDULING A PRE-CONSTRUCTION MEETING WITH YOUR LOCAL SALES ENGINEER TO DETERMINE IF ADDITIONAL MEASURES, NOT COVERED IN THIS GUIDE, ARE APPROPRIATE FOR YOUR SITE.

FOUNDATION

CONSTRUCT A FOUNDATION THAT CAN SUPPORT THE DESIGN LOADING APPLIED BY THE PIPE AND ADJACENT BACKFILL WEIGHT AS WELL AS MAINTAIN ITS INTEGRITY DURING CONSTRUCTION.

IF SOFT OR UNSUITABLE SOILS ARE ENCOUNTERED, REMOVE THE POOR SOILS DOWN TO A SUITABLE DEPTH AND THEN BUILD UP TO THE APPROPRIATE ELEVATION WITH A COMPETENT BACKFILL MATERIAL. THE STRUCTURAL FILL MATERIAL GRADATION SHOULD NOT ALLOW THE MIGRATION OF FINES, WHICH CAN CAUSE SETTLEMENT OF THE DETENTION SYSTEM OR PAVEMENT ABOVE. IF THE STRUCTURAL FILL MATERIAL IS NOT COMPATIBLE WITH THE UNDERLYING SOILS AN ENGINEERING FABRIC SHOULD BE USED AS A SEPARATOR. IN SOME CASES, USING A STIFF REINFORCING GEOGRID REDUCES OVER EXCAVATION AND REPLACEMENT FILL QUANTITIES.

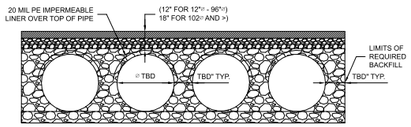


GRADE THE FOUNDATION SUBGRADE TO A UNIFORM OR SLIGHTLY SLOPING GRADE. IF THE SUBGRADE IS CLAY OR RELATIVELY NON-POROUS AND THE CONSTRUCTION SEQUENCE WILL LAST FOR AN EXTENDED PERIOD OF TIME, IT IS BEST TO SLOPE THE GRADE TO ONE END OF THE SYSTEM. THIS WILL ALLOW EXCESS WATER TO DRAIN QUICKLY, PREVENTING SATURATION OF THE SUBGRADE.

GEOMEMBRANE BARRIER

A SITE'S RESISTIVITY MAY CHANGE OVER TIME WHEN VARIOUS TYPES OF SALTING AGENTS ARE USED, SUCH AS ROAD SALTS FOR DEICING AGENTS. IF SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE, A GEOMEMBRANE BARRIER IS RECOMMENDED WITH THE SYSTEM. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM THE USE OF SUCH AGENTS INCLUDING PREMATURE CORROSION AND REDUCED ACTUAL SERVICE LIFE.

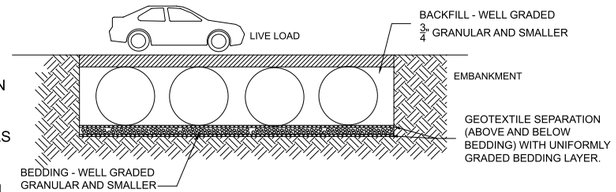
THE PROJECT'S ENGINEER OF RECORD IS TO EVALUATE WHETHER SALTING AGENTS WILL BE USED ON OR NEAR THE PROJECT SITE, AND USE HIS/HER BEST JUDGEMENT TO DETERMINE IF ANY ADDITIONAL PROTECTIVE MEASURES ARE REQUIRED. BELOW IS A TYPICAL DETAIL SHOWING THE PLACEMENT OF A GEOMEMBRANE BARRIER FOR PROJECTS WHERE SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE.



IN-SITU TRENCH WALL

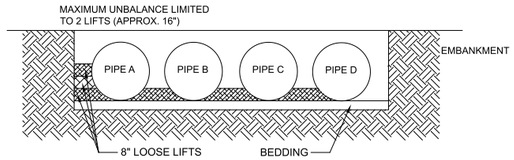
IF EXCAVATION IS REQUIRED, THE TRENCH WALL NEEDS TO BE CAPABLE OF SUPPORTING THE LOAD THAT THE PIPE SHEDS AS THE SYSTEM IS LOADED. IF SOILS ARE NOT CAPABLE OF SUPPORTING THESE LOADS, THE PIPE CAN DEFLECT. PERFORM A SIMPLE SOIL PRESSURE CHECK USING THE APPLIED LOADS TO DETERMINE THE LIMITS OF EXCAVATION BEYOND THE SPRING LINE OF THE OUTER MOST PIPES.

IN MOST CASES THE REQUIREMENTS FOR A SAFE WORK ENVIRONMENT AND PROPER BACKFILL PLACEMENT AND COMPACTION TAKE CARE OF THIS CONCERN.



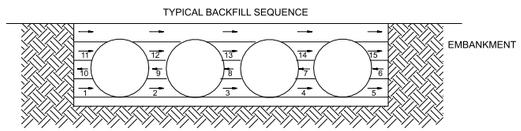
BACKFILL PLACEMENT

MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS.

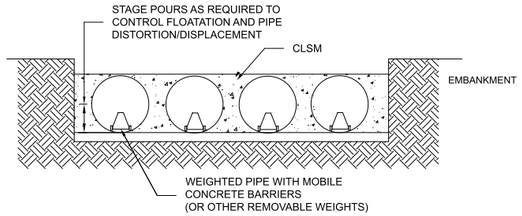


IF AASHTO T99 PROCEDURES ARE DETERMINED INFEASIBLE BY THE GEOTECHNICAL ENGINEER OF RECORD, COMPACTION IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE GEOTECHNICAL ENGINEER OF RECORD (OR REPRESENTATIVE THEREOF) IS SATISFIED WITH THE LEVEL OF COMPACTION.

FOR LARGE SYSTEMS, CONVEYOR SYSTEMS, BACKHOES WITH LONG REACHES OR DRAGLINES WITH STONE BUCKETS MAY BE USED TO PLACE BACKFILL. ONCE MINIMUM COVER FOR CONSTRUCTION LOADING ACROSS THE ENTIRE WIDTH OF THE SYSTEM IS REACHED, ADVANCE THE EQUIPMENT TO THE END OF THE RECENTLY PLACED FILL, AND BEGIN THE SEQUENCE AGAIN UNTIL THE SYSTEM IS COMPLETELY BACKFILLED. THIS TYPE OF CONSTRUCTION SEQUENCE PROVIDES ROOM FOR STOCKPILED BACKFILL DIRECTLY BEHIND THE BACKHOE, AS WELL AS THE MOVEMENT OF CONSTRUCTION TRAFFIC. MATERIAL STOCKPILES ON TOP OF THE BACKFILLED DETENTION SYSTEM SHOULD BE LIMITED TO 8- TO 10-FEET HIGH AND MUST PROVIDE BALANCED LOADING ACROSS ALL BARRELS. TO DETERMINE THE PROPER COVER OVER THE PIPES TO ALLOW THE MOVEMENT OF CONSTRUCTION EQUIPMENT SEE TABLE 1, OR CONTACT YOUR LOCAL CONTECH SALES ENGINEER.



WHEN FLOWABLE FILL IS USED, YOU MUST PREVENT PIPE FLOATATION. TYPICALLY, SMALL LIFTS ARE PLACED BETWEEN THE PIPES AND THEN ALLOWED TO SET-UP PRIOR TO THE PLACEMENT OF THE NEXT LIFT. THE ALLOWABLE THICKNESS OF THE CLSM LIFT IS A FUNCTION OF A PROPER BALANCE BETWEEN THE UPLIFT FORCE OF THE CLSM, THE OPPOSING WEIGHT OF THE PIPE, AND THE EFFECT OF OTHER RESTRAINING MEASURES. THE PIPE CAN CARRY LIMITED FLUID PRESSURE WITHOUT PIPE DISTORTION OR DISPLACEMENT, WHICH ALSO AFFECTS THE CLSM LIFT THICKNESS. YOUR LOCAL CONTECH SALES ENGINEER CAN HELP DETERMINE THE PROPER LIFT THICKNESS.

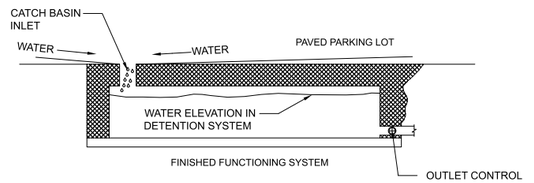


CONSTRUCTION LOADING

TYPICALLY, THE MINIMUM COVER SPECIFIED FOR A PROJECT ASSUMES H-20 LIVE LOAD. BECAUSE CONSTRUCTION LOADS OFTEN EXCEED DESIGN LIVE LOADS, INCREASED TEMPORARY MINIMUM COVER REQUIREMENTS ARE NECESSARY. SINCE CONSTRUCTION EQUIPMENT VARIES FROM JOB TO JOB, IT IS BEST TO ADDRESS EQUIPMENT SPECIFIC MINIMUM COVER REQUIREMENTS WITH YOUR LOCAL CONTECH SALES ENGINEER DURING YOUR PRE-CONSTRUCTION MEETING.

ADDITIONAL CONSIDERATIONS

BECAUSE MOST SYSTEMS ARE CONSTRUCTED BELOW-GRADE, RAINFALL CAN RAPIDLY FILL THE EXCAVATION; POTENTIALLY CAUSING FLOATATION AND MOVEMENT OF THE PREVIOUSLY PLACED PIPES. TO HELP MITIGATE POTENTIAL PROBLEMS, IT IS BEST TO START THE INSTALLATION AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR THE WATER TO ESCAPE. TEMPORARY DIVERSION MEASURES MAY BE REQUIRED FOR HIGH FLOWS DUE TO THE RESTRICTED NATURE OF THE OUTLET PIPE.



CMP DETENTION SYSTEM INSPECTION AND MAINTENANCE

UNDERGROUND STORMWATER DETENTION AND INFILTRATION SYSTEMS MUST BE INSPECTED AND MAINTAINED AT REGULAR INTERVALS FOR PURPOSES OF PERFORMANCE AND LONGEVITY.

INSPECTION

INSPECTION IS THE KEY TO EFFECTIVE MAINTENANCE OF CMP DETENTION SYSTEMS AND IS EASILY PERFORMED. CONTECH RECOMMENDS ONGOING, ANNUAL INSPECTIONS. SITES WITH HIGH TRASH LOAD OR SMALL OUTLET CONTROL ORIFICES MAY NEED MORE FREQUENT INSPECTIONS. THE RATE AT WHICH THE SYSTEM COLLECTS POLLUTANTS WILL DEPEND MORE ON SITE SPECIFIC ACTIVITIES RATHER THAN THE SIZE OR CONFIGURATION OF THE SYSTEM.

INSPECTIONS SHOULD BE PERFORMED MORE OFTEN IN EQUIPMENT WASHDOWN AREAS, IN CLIMATES WHERE SANDING AND/OR SALTING OPERATIONS TAKE PLACE, AND IN OTHER VARIOUS INSTANCES IN WHICH ONE WOULD EXPECT HIGHER ACCUMULATIONS OF SEDIMENT OR ABRASIVE/ CORROSIVE CONDITIONS. A RECORD OF EACH INSPECTION IS TO BE MAINTAINED FOR THE LIFE OF THE SYSTEM

MAINTENANCE

CMP DETENTION SYSTEMS SHOULD BE CLEANED WHEN AN INSPECTION REVEALS ACCUMULATED SEDIMENT OR TRASH IS CLOGGING THE DISCHARGE ORIFICE.

ACCUMULATED SEDIMENT AND TRASH CAN TYPICALLY BE EVACUATED THROUGH THE MANHOLE OVER THE OUTLET ORIFICE. IF MAINTENANCE IS NOT PERFORMED AS RECOMMENDED, SEDIMENT AND TRASH MAY ACCUMULATE IN FRONT OF THE OUTLET ORIFICE. MANHOLE COVERS SHOULD BE SECURELY SEATED FOLLOWING CLEANING ACTIVITIES. CONTECH SUGGESTS THAT ALL SYSTEMS BE DESIGNED WITH AN ACCESS/INSPECTION MANHOLE SITUATED AT OR NEAR THE INLET AND THE OUTLET ORIFICE. SHOULD IT BE NECESSARY TO GET INSIDE THE SYSTEM TO PERFORM MAINTENANCE ACTIVITIES, ALL APPROPRIATE PRECAUTIONS REGARDING CONFINED SPACE ENTRY AND OSHA REGULATIONS SHOULD BE FOLLOWED.

ANNUAL INSPECTIONS ARE BEST PRACTICE FOR ALL UNDERGROUND SYSTEMS. DURING THIS INSPECTION, IF EVIDENCE OF SALTING/DE-ICING AGENTS IS OBSERVED WITHIN THE SYSTEM, IT IS BEST PRACTICE FOR THE SYSTEM TO BE RINSED, INCLUDING ABOVE THE SPRING LINE SOON AFTER THE SPRING THAW AS PART OF THE MAINTENANCE PROGRAM FOR THE SYSTEM.

MAINTAINING AN UNDERGROUND DETENTION OR INFILTRATION SYSTEM IS EASIEST WHEN THERE IS NO FLOW ENTERING THE SYSTEM. FOR THIS REASON, IT IS A GOOD IDEA TO SCHEDULE THE CLEANOUT DURING DRY WEATHER.

THE FOREGOING INSPECTION AND MAINTENANCE EFFORTS HELP ENSURE UNDERGROUND PIPE SYSTEMS USED FOR STORMWATER STORAGE CONTINUE TO FUNCTION AS INTENDED BY IDENTIFYING RECOMMENDED REGULAR INSPECTION AND MAINTENANCE PRACTICES. INSPECTION AND MAINTENANCE RELATED TO THE STRUCTURAL INTEGRITY OF THE PIPE OR THE SOUNDNESS OF PIPE JOINT CONNECTIONS IS BEYOND THE SCOPE OF THIS GUIDE.

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CONTECH CMP DETENTION SYSTEMS

CONTECH **DYODS** DRAWING

DYO55245 Temescal
DMA 4
Corona, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
38717	55245	7/22/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

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 11/30/23 File: temcal242.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

Temescal Canyon Existing A-1 & A-2
2 Year 24 Hour
Kimley-Horn

Drainage Area = 12.62(Ac.) = 0.020 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 12.62(Ac.) = 0.020 Sq. Mi.
USER Entry of lag time in hours
Lag time = 0.376 Hr.
Lag time = 22.56 Min.
25% of lag time = 5.64 Min.
40% of lag time = 9.02 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]
12.62	2.50	31.55

100 YEAR Area rainfall data:

Area(Ac.)[1] Rainfall(In)[2] Weighting[1*2]
12.62 7.00 88.34

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.500(In)
Area Averaged 100-Year Rainfall = 7.000(In)

Point rain (area averaged) = 2.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.500(In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %
12.620 69.00 0.000
Total Area Entered = 12.62(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
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	22.163	1.998	0.254
2	0.167	44.326	6.188	0.787
3	0.250	66.489	10.868	1.382
4	0.333	88.652	14.830	1.886
5	0.417	110.816	15.415	1.961
6	0.500	132.979	11.254	1.431
7	0.583	155.142	7.250	0.922
8	0.667	177.305	4.922	0.626
9	0.750	199.468	3.556	0.452
10	0.833	221.631	2.985	0.380
11	0.917	243.794	2.500	0.318
12	1.000	265.957	2.152	0.274
13	1.083	288.121	1.899	0.241
14	1.167	310.284	1.597	0.203

15	1.250	332.447	1.368	0.174
16	1.333	354.610	1.322	0.168
17	1.417	376.773	1.086	0.138
18	1.500	398.936	0.975	0.124
19	1.583	421.099	0.855	0.109
20	1.667	443.262	0.710	0.090
21	1.750	465.426	0.698	0.089
22	1.833	487.589	0.667	0.085
23	1.917	509.752	0.648	0.082
24	2.000	531.915	0.515	0.066
25	2.083	554.078	0.486	0.062
26	2.167	576.241	0.428	0.054
27	2.250	598.404	0.399	0.051
28	2.333	620.567	0.361	0.046
29	2.417	642.730	0.311	0.039
30	2.500	664.894	0.290	0.037
31	2.583	687.057	0.226	0.029
32	2.667	709.220	0.222	0.028
33	2.750	731.383	0.222	0.028
34	2.833	753.546	0.222	0.028
35	2.917	775.709	0.222	0.028
36	3.000	797.872	0.222	0.028
37	3.083	820.035	0.132	0.017
		Sum = 100.000	Sum=	12.719

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	0.030	(1.006)	0.027	0.003
5	0.42	0.10	0.030	(1.002)	0.027	0.003
6	0.50	0.10	0.030	(0.998)	0.027	0.003
7	0.58	0.10	0.030	(0.994)	0.027	0.003
8	0.67	0.10	0.030	(0.990)	0.027	0.003
9	0.75	0.10	0.030	(0.986)	0.027	0.003
10	0.83	0.13	0.040	(0.982)	0.036	0.004
11	0.92	0.13	0.040	(0.978)	0.036	0.004
12	1.00	0.13	0.040	(0.975)	0.036	0.004
13	1.08	0.10	0.030	(0.971)	0.027	0.003
14	1.17	0.10	0.030	(0.967)	0.027	0.003
15	1.25	0.10	0.030	(0.963)	0.027	0.003
16	1.33	0.10	0.030	(0.959)	0.027	0.003
17	1.42	0.10	0.030	(0.955)	0.027	0.003
18	1.50	0.10	0.030	(0.952)	0.027	0.003

19	1.58	0.10	0.030	(0.948)	0.027	0.003
20	1.67	0.10	0.030	(0.944)	0.027	0.003
21	1.75	0.10	0.030	(0.940)	0.027	0.003
22	1.83	0.13	0.040	(0.936)	0.036	0.004
23	1.92	0.13	0.040	(0.933)	0.036	0.004
24	2.00	0.13	0.040	(0.929)	0.036	0.004
25	2.08	0.13	0.040	(0.925)	0.036	0.004
26	2.17	0.13	0.040	(0.921)	0.036	0.004
27	2.25	0.13	0.040	(0.918)	0.036	0.004
28	2.33	0.13	0.040	(0.914)	0.036	0.004
29	2.42	0.13	0.040	(0.910)	0.036	0.004
30	2.50	0.13	0.040	(0.906)	0.036	0.004
31	2.58	0.17	0.050	(0.903)	0.045	0.005
32	2.67	0.17	0.050	(0.899)	0.045	0.005
33	2.75	0.17	0.050	(0.895)	0.045	0.005
34	2.83	0.17	0.050	(0.892)	0.045	0.005
35	2.92	0.17	0.050	(0.888)	0.045	0.005
36	3.00	0.17	0.050	(0.884)	0.045	0.005
37	3.08	0.17	0.050	(0.881)	0.045	0.005
38	3.17	0.17	0.050	(0.877)	0.045	0.005
39	3.25	0.17	0.050	(0.873)	0.045	0.005
40	3.33	0.17	0.050	(0.870)	0.045	0.005
41	3.42	0.17	0.050	(0.866)	0.045	0.005
42	3.50	0.17	0.050	(0.862)	0.045	0.005
43	3.58	0.17	0.050	(0.859)	0.045	0.005
44	3.67	0.17	0.050	(0.855)	0.045	0.005
45	3.75	0.17	0.050	(0.852)	0.045	0.005
46	3.83	0.20	0.060	(0.848)	0.054	0.006
47	3.92	0.20	0.060	(0.844)	0.054	0.006
48	4.00	0.20	0.060	(0.841)	0.054	0.006
49	4.08	0.20	0.060	(0.837)	0.054	0.006
50	4.17	0.20	0.060	(0.834)	0.054	0.006
51	4.25	0.20	0.060	(0.830)	0.054	0.006
52	4.33	0.23	0.070	(0.827)	0.063	0.007
53	4.42	0.23	0.070	(0.823)	0.063	0.007
54	4.50	0.23	0.070	(0.820)	0.063	0.007
55	4.58	0.23	0.070	(0.816)	0.063	0.007
56	4.67	0.23	0.070	(0.813)	0.063	0.007
57	4.75	0.23	0.070	(0.809)	0.063	0.007
58	4.83	0.27	0.080	(0.806)	0.072	0.008
59	4.92	0.27	0.080	(0.802)	0.072	0.008
60	5.00	0.27	0.080	(0.799)	0.072	0.008
61	5.08	0.20	0.060	(0.795)	0.054	0.006
62	5.17	0.20	0.060	(0.792)	0.054	0.006
63	5.25	0.20	0.060	(0.788)	0.054	0.006
64	5.33	0.23	0.070	(0.785)	0.063	0.007
65	5.42	0.23	0.070	(0.781)	0.063	0.007
66	5.50	0.23	0.070	(0.778)	0.063	0.007
67	5.58	0.27	0.080	(0.775)	0.072	0.008
68	5.67	0.27	0.080	(0.771)	0.072	0.008

69	5.75	0.27	0.080	(0.768)	0.072	0.008
70	5.83	0.27	0.080	(0.764)	0.072	0.008
71	5.92	0.27	0.080	(0.761)	0.072	0.008
72	6.00	0.27	0.080	(0.758)	0.072	0.008
73	6.08	0.30	0.090	(0.754)	0.081	0.009
74	6.17	0.30	0.090	(0.751)	0.081	0.009
75	6.25	0.30	0.090	(0.748)	0.081	0.009
76	6.33	0.30	0.090	(0.744)	0.081	0.009
77	6.42	0.30	0.090	(0.741)	0.081	0.009
78	6.50	0.30	0.090	(0.738)	0.081	0.009
79	6.58	0.33	0.100	(0.734)	0.090	0.010
80	6.67	0.33	0.100	(0.731)	0.090	0.010
81	6.75	0.33	0.100	(0.728)	0.090	0.010
82	6.83	0.33	0.100	(0.724)	0.090	0.010
83	6.92	0.33	0.100	(0.721)	0.090	0.010
84	7.00	0.33	0.100	(0.718)	0.090	0.010
85	7.08	0.33	0.100	(0.715)	0.090	0.010
86	7.17	0.33	0.100	(0.711)	0.090	0.010
87	7.25	0.33	0.100	(0.708)	0.090	0.010
88	7.33	0.37	0.110	(0.705)	0.099	0.011
89	7.42	0.37	0.110	(0.702)	0.099	0.011
90	7.50	0.37	0.110	(0.698)	0.099	0.011
91	7.58	0.40	0.120	(0.695)	0.108	0.012
92	7.67	0.40	0.120	(0.692)	0.108	0.012
93	7.75	0.40	0.120	(0.689)	0.108	0.012
94	7.83	0.43	0.130	(0.686)	0.117	0.013
95	7.92	0.43	0.130	(0.682)	0.117	0.013
96	8.00	0.43	0.130	(0.679)	0.117	0.013
97	8.08	0.50	0.150	(0.676)	0.135	0.015
98	8.17	0.50	0.150	(0.673)	0.135	0.015
99	8.25	0.50	0.150	(0.670)	0.135	0.015
100	8.33	0.50	0.150	(0.667)	0.135	0.015
101	8.42	0.50	0.150	(0.664)	0.135	0.015
102	8.50	0.50	0.150	(0.660)	0.135	0.015
103	8.58	0.53	0.160	(0.657)	0.144	0.016
104	8.67	0.53	0.160	(0.654)	0.144	0.016
105	8.75	0.53	0.160	(0.651)	0.144	0.016
106	8.83	0.57	0.170	(0.648)	0.153	0.017
107	8.92	0.57	0.170	(0.645)	0.153	0.017
108	9.00	0.57	0.170	(0.642)	0.153	0.017
109	9.08	0.63	0.190	(0.639)	0.171	0.019
110	9.17	0.63	0.190	(0.636)	0.171	0.019
111	9.25	0.63	0.190	(0.633)	0.171	0.019
112	9.33	0.67	0.200	(0.630)	0.180	0.020
113	9.42	0.67	0.200	(0.627)	0.180	0.020
114	9.50	0.67	0.200	(0.624)	0.180	0.020
115	9.58	0.70	0.210	(0.621)	0.189	0.021
116	9.67	0.70	0.210	(0.618)	0.189	0.021
117	9.75	0.70	0.210	(0.615)	0.189	0.021
118	9.83	0.73	0.220	(0.612)	0.198	0.022

119	9.92	0.73	0.220	(0.609)	0.198	0.022
120	10.00	0.73	0.220	(0.606)	0.198	0.022
121	10.08	0.50	0.150	(0.603)	0.135	0.015
122	10.17	0.50	0.150	(0.600)	0.135	0.015
123	10.25	0.50	0.150	(0.597)	0.135	0.015
124	10.33	0.50	0.150	(0.594)	0.135	0.015
125	10.42	0.50	0.150	(0.592)	0.135	0.015
126	10.50	0.50	0.150	(0.589)	0.135	0.015
127	10.58	0.67	0.200	(0.586)	0.180	0.020
128	10.67	0.67	0.200	(0.583)	0.180	0.020
129	10.75	0.67	0.200	(0.580)	0.180	0.020
130	10.83	0.67	0.200	(0.577)	0.180	0.020
131	10.92	0.67	0.200	(0.574)	0.180	0.020
132	11.00	0.67	0.200	(0.572)	0.180	0.020
133	11.08	0.63	0.190	(0.569)	0.171	0.019
134	11.17	0.63	0.190	(0.566)	0.171	0.019
135	11.25	0.63	0.190	(0.563)	0.171	0.019
136	11.33	0.63	0.190	(0.560)	0.171	0.019
137	11.42	0.63	0.190	(0.558)	0.171	0.019
138	11.50	0.63	0.190	(0.555)	0.171	0.019
139	11.58	0.57	0.170	(0.552)	0.153	0.017
140	11.67	0.57	0.170	(0.549)	0.153	0.017
141	11.75	0.57	0.170	(0.547)	0.153	0.017
142	11.83	0.60	0.180	(0.544)	0.162	0.018
143	11.92	0.60	0.180	(0.541)	0.162	0.018
144	12.00	0.60	0.180	(0.538)	0.162	0.018
145	12.08	0.83	0.250	(0.536)	0.225	0.025
146	12.17	0.83	0.250	(0.533)	0.225	0.025
147	12.25	0.83	0.250	(0.530)	0.225	0.025
148	12.33	0.87	0.260	(0.528)	0.234	0.026
149	12.42	0.87	0.260	(0.525)	0.234	0.026
150	12.50	0.87	0.260	(0.522)	0.234	0.026
151	12.58	0.93	0.280	(0.520)	0.252	0.028
152	12.67	0.93	0.280	(0.517)	0.252	0.028
153	12.75	0.93	0.280	(0.515)	0.252	0.028
154	12.83	0.97	0.290	(0.512)	0.261	0.029
155	12.92	0.97	0.290	(0.509)	0.261	0.029
156	13.00	0.97	0.290	(0.507)	0.261	0.029
157	13.08	1.13	0.340	(0.504)	0.306	0.034
158	13.17	1.13	0.340	(0.502)	0.306	0.034
159	13.25	1.13	0.340	(0.499)	0.306	0.034
160	13.33	1.13	0.340	(0.497)	0.306	0.034
161	13.42	1.13	0.340	(0.494)	0.306	0.034
162	13.50	1.13	0.340	(0.492)	0.306	0.034
163	13.58	0.77	0.230	(0.489)	0.207	0.023
164	13.67	0.77	0.230	(0.487)	0.207	0.023
165	13.75	0.77	0.230	(0.484)	0.207	0.023
166	13.83	0.77	0.230	(0.482)	0.207	0.023
167	13.92	0.77	0.230	(0.479)	0.207	0.023
168	14.00	0.77	0.230	(0.477)	0.207	0.023

169	14.08	0.90	0.270	(0.474)	0.243	0.027
170	14.17	0.90	0.270	(0.472)	0.243	0.027
171	14.25	0.90	0.270	(0.469)	0.243	0.027
172	14.33	0.87	0.260	(0.467)	0.234	0.026
173	14.42	0.87	0.260	(0.465)	0.234	0.026
174	14.50	0.87	0.260	(0.462)	0.234	0.026
175	14.58	0.87	0.260	(0.460)	0.234	0.026
176	14.67	0.87	0.260	(0.458)	0.234	0.026
177	14.75	0.87	0.260	(0.455)	0.234	0.026
178	14.83	0.83	0.250	(0.453)	0.225	0.025
179	14.92	0.83	0.250	(0.451)	0.225	0.025
180	15.00	0.83	0.250	(0.448)	0.225	0.025
181	15.08	0.80	0.240	(0.446)	0.216	0.024
182	15.17	0.80	0.240	(0.444)	0.216	0.024
183	15.25	0.80	0.240	(0.441)	0.216	0.024
184	15.33	0.77	0.230	(0.439)	0.207	0.023
185	15.42	0.77	0.230	(0.437)	0.207	0.023
186	15.50	0.77	0.230	(0.435)	0.207	0.023
187	15.58	0.63	0.190	(0.432)	0.171	0.019
188	15.67	0.63	0.190	(0.430)	0.171	0.019
189	15.75	0.63	0.190	(0.428)	0.171	0.019
190	15.83	0.63	0.190	(0.426)	0.171	0.019
191	15.92	0.63	0.190	(0.424)	0.171	0.019
192	16.00	0.63	0.190	(0.421)	0.171	0.019
193	16.08	0.13	0.040	(0.419)	0.036	0.004
194	16.17	0.13	0.040	(0.417)	0.036	0.004
195	16.25	0.13	0.040	(0.415)	0.036	0.004
196	16.33	0.13	0.040	(0.413)	0.036	0.004
197	16.42	0.13	0.040	(0.411)	0.036	0.004
198	16.50	0.13	0.040	(0.409)	0.036	0.004
199	16.58	0.10	0.030	(0.407)	0.027	0.003
200	16.67	0.10	0.030	(0.405)	0.027	0.003
201	16.75	0.10	0.030	(0.403)	0.027	0.003
202	16.83	0.10	0.030	(0.401)	0.027	0.003
203	16.92	0.10	0.030	(0.398)	0.027	0.003
204	17.00	0.10	0.030	(0.396)	0.027	0.003
205	17.08	0.17	0.050	(0.394)	0.045	0.005
206	17.17	0.17	0.050	(0.392)	0.045	0.005
207	17.25	0.17	0.050	(0.390)	0.045	0.005
208	17.33	0.17	0.050	(0.389)	0.045	0.005
209	17.42	0.17	0.050	(0.387)	0.045	0.005
210	17.50	0.17	0.050	(0.385)	0.045	0.005
211	17.58	0.17	0.050	(0.383)	0.045	0.005
212	17.67	0.17	0.050	(0.381)	0.045	0.005
213	17.75	0.17	0.050	(0.379)	0.045	0.005
214	17.83	0.13	0.040	(0.377)	0.036	0.004
215	17.92	0.13	0.040	(0.375)	0.036	0.004
216	18.00	0.13	0.040	(0.373)	0.036	0.004
217	18.08	0.13	0.040	(0.371)	0.036	0.004
218	18.17	0.13	0.040	(0.370)	0.036	0.004

219	18.25	0.13	0.040	(0.368)	0.036	0.004
220	18.33	0.13	0.040	(0.366)	0.036	0.004
221	18.42	0.13	0.040	(0.364)	0.036	0.004
222	18.50	0.13	0.040	(0.363)	0.036	0.004
223	18.58	0.10	0.030	(0.361)	0.027	0.003
224	18.67	0.10	0.030	(0.359)	0.027	0.003
225	18.75	0.10	0.030	(0.357)	0.027	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	0.030	(0.351)	0.027	0.003
230	19.17	0.10	0.030	(0.349)	0.027	0.003
231	19.25	0.10	0.030	(0.347)	0.027	0.003
232	19.33	0.13	0.040	(0.346)	0.036	0.004
233	19.42	0.13	0.040	(0.344)	0.036	0.004
234	19.50	0.13	0.040	(0.342)	0.036	0.004
235	19.58	0.10	0.030	(0.341)	0.027	0.003
236	19.67	0.10	0.030	(0.339)	0.027	0.003
237	19.75	0.10	0.030	(0.338)	0.027	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	0.030	(0.332)	0.027	0.003
242	20.17	0.10	0.030	(0.330)	0.027	0.003
243	20.25	0.10	0.030	(0.329)	0.027	0.003
244	20.33	0.10	0.030	(0.328)	0.027	0.003
245	20.42	0.10	0.030	(0.326)	0.027	0.003
246	20.50	0.10	0.030	(0.325)	0.027	0.003
247	20.58	0.10	0.030	(0.323)	0.027	0.003
248	20.67	0.10	0.030	(0.322)	0.027	0.003
249	20.75	0.10	0.030	(0.321)	0.027	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	0.030	(0.316)	0.027	0.003
254	21.17	0.10	0.030	(0.314)	0.027	0.003
255	21.25	0.10	0.030	(0.313)	0.027	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	0.030	(0.308)	0.027	0.003
260	21.67	0.10	0.030	(0.307)	0.027	0.003
261	21.75	0.10	0.030	(0.306)	0.027	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	0.030	(0.302)	0.027	0.003
266	22.17	0.10	0.030	(0.301)	0.027	0.003
267	22.25	0.10	0.030	(0.300)	0.027	0.003
268	22.33	0.07	0.020	(0.299)	0.018	0.002

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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 =     3.0
       Flood volume = Effective rainfall      0.25(In)
        times area      12.6(Ac.)/[(In)/(Ft.)] =       0.3(Ac.Ft)
       Total soil loss =      2.25(In)
       Total soil loss =     2.366(Ac.Ft)
       Total rainfall =      2.50(In)
       Flood volume =       11452.4 Cubic Feet
       Total soil loss =      103071.3 Cubic Feet
       ---------------------------------------------------------------
        Peak flow rate of this hydrograph =      0.396(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      0.00  Q         |         |         |         |
   0+20       0.0001      0.01  Q         |         |         |         |
   0+25       0.0002      0.01  Q         |         |         |         |
   0+30       0.0003      0.02  Q         |         |         |         |
   0+35       0.0005      0.02  Q         |         |         |         |
   0+40       0.0006      0.02  Q         |         |         |         |
   0+45       0.0008      0.03  Q         |         |         |         |
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0+50	0.0010	0.03	Q				
0+55	0.0012	0.03	Q				
1+ 0	0.0015	0.03	Q				
1+ 5	0.0017	0.04	Q				
1+10	0.0020	0.04	Q				
1+15	0.0023	0.04	Q				
1+20	0.0025	0.04	Q				
1+25	0.0028	0.04	Q				
1+30	0.0030	0.04	Q				
1+35	0.0033	0.04	Q				
1+40	0.0035	0.04	Q				
1+45	0.0038	0.04	Q				
1+50	0.0040	0.04	Q				
1+55	0.0043	0.04	Q				
2+ 0	0.0046	0.04	Q				
2+ 5	0.0049	0.04	Q				
2+10	0.0052	0.04	Q				
2+15	0.0055	0.05	Q				
2+20	0.0058	0.05	Q				
2+25	0.0061	0.05	Q				
2+30	0.0064	0.05	Q				
2+35	0.0068	0.05	QV				
2+40	0.0071	0.05	QV				
2+45	0.0075	0.05	QV				
2+50	0.0078	0.05	QV				
2+55	0.0082	0.06	QV				
3+ 0	0.0086	0.06	QV				
3+ 5	0.0090	0.06	QV				
3+10	0.0094	0.06	QV				
3+15	0.0098	0.06	QV				
3+20	0.0102	0.06	QV				
3+25	0.0107	0.06	QV				
3+30	0.0111	0.06	QV				
3+35	0.0115	0.06	QV				
3+40	0.0119	0.06	QV				
3+45	0.0124	0.06	QV				
3+50	0.0128	0.06	QV				
3+55	0.0132	0.06	Q V				
4+ 0	0.0137	0.06	Q V				
4+ 5	0.0141	0.07	Q V				
4+10	0.0146	0.07	Q V				
4+15	0.0151	0.07	Q V				
4+20	0.0156	0.07	Q V				
4+25	0.0161	0.07	Q V				
4+30	0.0166	0.08	Q V				
4+35	0.0171	0.08	Q V				
4+40	0.0177	0.08	Q V				
4+45	0.0182	0.08	Q V				
4+50	0.0188	0.08	Q V				
4+55	0.0194	0.08	Q V				

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5+ 0       0.0200      0.09  Q  V      |          |          |          |
5+ 5       0.0206      0.09  Q  V      |          |          |          |
5+10       0.0212      0.09  Q  V      |          |          |          |
5+15       0.0218      0.09  Q  V      |          |          |          |
5+20       0.0224      0.09  Q  V      |          |          |          |
5+25       0.0230      0.08  Q  V      |          |          |          |
5+30       0.0236      0.08  Q  V      |          |          |          |
5+35       0.0242      0.08  Q  V      |          |          |          |
5+40       0.0248      0.09  Q  V      |          |          |          |
5+45       0.0254      0.09  Q  V      |          |          |          |
5+50       0.0260      0.09  Q  V      |          |          |          |
5+55       0.0267      0.09  Q   V     |          |          |          |
6+ 0       0.0273      0.10  Q   V     |          |          |          |
6+ 5       0.0280      0.10  Q   V     |          |          |          |
6+10       0.0287      0.10  Q   V     |          |          |          |
6+15       0.0294      0.10  Q   V     |          |          |          |
6+20       0.0301      0.10  Q   V     |          |          |          |
6+25       0.0308      0.11  Q   V     |          |          |          |
6+30       0.0315      0.11  Q   V     |          |          |          |
6+35       0.0323      0.11  Q   V     |          |          |          |
6+40       0.0330      0.11  Q    V    |          |          |          |
6+45       0.0338      0.11  Q    V    |          |          |          |
6+50       0.0346      0.11  Q    V    |          |          |          |
6+55       0.0354      0.12  Q    V    |          |          |          |
7+ 0       0.0362      0.12  Q    V    |          |          |          |
7+ 5       0.0370      0.12  Q    V    |          |          |          |
7+10       0.0379      0.12  Q    V    |          |          |          |
7+15       0.0387      0.12  Q    V    |          |          |          |
7+20       0.0396      0.12  Q     V   |          |          |          |
7+25       0.0404      0.12  Q     V   |          |          |          |
7+30       0.0413      0.13  Q     V   |          |          |          |
7+35       0.0422      0.13  Q     V   |          |          |          |
7+40       0.0431      0.13  Q     V   |          |          |          |
7+45       0.0440      0.13  Q     V   |          |          |          |
7+50       0.0450      0.14  Q     V   |          |          |          |
7+55       0.0459      0.14  Q     V   |          |          |          |
8+ 0       0.0469      0.15  Q      V  |          |          |          |
8+ 5       0.0480      0.15  Q      V  |          |          |          |
8+10       0.0490      0.15  Q      V  |          |          |          |
8+15       0.0501      0.16  Q      V  |          |          |          |
8+20       0.0513      0.16  Q      V  |          |          |          |
8+25       0.0524      0.17  Q      V  |          |          |          |
8+30       0.0536      0.17  Q       V |          |          |          |
8+35       0.0548      0.18  Q       V |          |          |          |
8+40       0.0561      0.18  Q       V |          |          |          |
8+45       0.0573      0.18  Q       V |          |          |          |
8+50       0.0586      0.19  Q       V |          |          |          |
8+55       0.0599      0.19  Q        V|          |          |          |
9+ 0       0.0613      0.19  Q        V|          |          |          |
9+ 5       0.0626      0.20  Q        V|          |          |          |
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 9+10       0.0640      0.20  Q        V|         |         |         |
 9+15       0.0654      0.21  Q        V|         |         |         |
 9+20       0.0669      0.21  Q         V         |         |         |
 9+25       0.0684      0.22  Q         V         |         |         |
 9+30       0.0700      0.23  Q         V         |         |         |
 9+35       0.0716      0.23  Q         V         |         |         |
 9+40       0.0732      0.24  Q         |V        |         |         |
 9+45       0.0749      0.24  Q         |V        |         |         |
 9+50       0.0765      0.24  Q         |V        |         |         |
 9+55       0.0783      0.25  Q         |V        |         |         |
10+ 0       0.0800      0.25  |Q        | V        |         |         |
10+ 5       0.0818      0.26  |Q        | V        |         |         |
10+10       0.0835      0.25  |Q        | V        |         |         |
10+15       0.0852      0.25  Q         | V        |         |         |
10+20       0.0868      0.24  Q         |  V       |         |         |
10+25       0.0884      0.22  Q         |  V       |         |         |
10+30       0.0899      0.22  Q         |  V       |         |         |
10+35       0.0913      0.21  Q         |  V       |         |         |
10+40       0.0928      0.21  Q         |   V      |         |         |
10+45       0.0943      0.22  Q         |   V      |         |         |
10+50       0.0958      0.22  Q         |   V      |         |         |
10+55       0.0975      0.23  Q         |   V      |         |         |
11+ 0       0.0991      0.24  Q         |    V     |         |         |
11+ 5       0.1008      0.24  Q         |    V     |         |         |
11+10       0.1024      0.24  Q         |    V     |         |         |
11+15       0.1041      0.24  Q         |    V     |         |         |
11+20       0.1058      0.24  Q         |     V    |         |         |
11+25       0.1075      0.24  Q         |     V    |         |         |
11+30       0.1091      0.24  Q         |     V    |         |         |
11+35       0.1108      0.24  Q         |     V    |         |         |
11+40       0.1124      0.24  Q         |      V   |         |         |
11+45       0.1141      0.24  Q         |      V   |         |         |
11+50       0.1157      0.23  Q         |      V   |         |         |
11+55       0.1173      0.23  Q         |      V   |         |         |
12+ 0       0.1188      0.23  Q         |       V  |         |         |
12+ 5       0.1204      0.23  Q         |       V  |         |         |
12+10       0.1220      0.24  Q         |       V  |         |         |
12+15       0.1237      0.25  Q         |       V  |         |         |
12+20       0.1255      0.26  |Q        |        V |         |         |
12+25       0.1274      0.27  |Q        |        V |         |         |
12+30       0.1294      0.29  |Q        |        V |         |         |
12+35       0.1314      0.30  |Q        |        V |         |         |
12+40       0.1335      0.30  |Q        |         V         |         |
12+45       0.1357      0.31  |Q        |         V         |         |
12+50       0.1379      0.32  |Q        |         V         |         |
12+55       0.1401      0.33  |Q        |         |V        |         |
13+ 0       0.1424      0.33  |Q        |         |V        |         |
13+ 5       0.1447      0.34  |Q        |         | V       |         |
13+10       0.1471      0.35  |Q        |         | V       |         |
13+15       0.1496      0.36  |Q        |         | V       |         |
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13+20       0.1521      0.37  |Q        |          |  V      |          |
13+25       0.1548      0.38  |Q        |          |  V      |          |
13+30       0.1575      0.39  |Q        |          |  V      |          |
13+35       0.1602      0.40  |Q        |          |   V     |          |
13+40       0.1629      0.39  |Q        |          |   V     |          |
13+45       0.1655      0.38  |Q        |          |    V    |          |
13+50       0.1680      0.36  |Q        |          |    V    |          |
13+55       0.1704      0.34  |Q        |          |    V    |          |
14+ 0       0.1726      0.33  |Q        |          |     V   |          |
14+ 5       0.1749      0.32  |Q        |          |     V   |          |
14+10       0.1771      0.32  |Q        |          |     V   |          |
14+15       0.1793      0.32  |Q        |          |      V  |          |
14+20       0.1816      0.33  |Q        |          |      V  |          |
14+25       0.1839      0.33  |Q        |          |      V  |          |
14+30       0.1862      0.34  |Q        |          |       V |          |
14+35       0.1885      0.34  |Q        |          |       V |          |
14+40       0.1908      0.33  |Q        |          |        V|          |
14+45       0.1931      0.33  |Q        |          |        V|          |
14+50       0.1954      0.33  |Q        |          |        V|          |
14+55       0.1977      0.33  |Q        |          |         V          |
15+ 0       0.1999      0.33  |Q        |          |         V          |
15+ 5       0.2022      0.33  |Q        |          |         V          |
15+10       0.2045      0.33  |Q        |          |         |V         |
15+15       0.2067      0.32  |Q        |          |         |V         |
15+20       0.2089      0.32  |Q        |          |         |V         |
15+25       0.2111      0.32  |Q        |          |         | V        |
15+30       0.2132      0.31  |Q        |          |         | V        |
15+35       0.2153      0.31  |Q        |          |         | V        |
15+40       0.2174      0.30  |Q        |          |         |  V       |
15+45       0.2194      0.29  |Q        |          |         |  V       |
15+50       0.2214      0.28  |Q        |          |         |  V       |
15+55       0.2233      0.28  |Q        |          |         |  V       |
16+ 0       0.2252      0.27  |Q        |          |         |   V      |
16+ 5       0.2269      0.26  |Q        |          |         |   V      |
16+10       0.2286      0.25  Q         |          |         |   V      |
16+15       0.2302      0.22  Q         |          |         |    V     |
16+20       0.2315      0.19  Q         |          |         |    V     |
16+25       0.2326      0.16  Q         |          |         |    V     |
16+30       0.2335      0.14  Q         |          |         |    V     |
16+35       0.2344      0.12  Q         |          |         |    V     |
16+40       0.2351      0.11  Q         |          |         |    V     |
16+45       0.2358      0.10  Q         |          |         |    V     |
16+50       0.2365      0.09  Q         |          |         |    V     |
16+55       0.2371      0.09  Q         |          |         |     V    |
17+ 0       0.2376      0.08  Q         |          |         |     V    |
17+ 5       0.2381      0.07  Q         |          |         |     V    |
17+10       0.2386      0.07  Q         |          |         |     V    |
17+15       0.2391      0.07  Q         |          |         |     V    |
17+20       0.2396      0.07  Q         |          |         |     V    |
17+25       0.2401      0.07  Q         |          |         |     V    |
```

17+30	0.2406	0.07	Q	|	|	|	V |
17+35	0.2411	0.07	Q	|	|	|	V |
17+40	0.2416	0.07	Q	|	|	|	V |
17+45	0.2421	0.07	Q	|	|	|	V |
17+50	0.2426	0.07	Q	|	|	|	V |
17+55	0.2431	0.07	Q	|	|	|	V |
18+ 0	0.2435	0.07	Q	|	|	|	V |
18+ 5	0.2440	0.06	Q	|	|	|	V |
18+10	0.2444	0.06	Q	|	|	|	V |
18+15	0.2448	0.06	Q	|	|	|	V |
18+20	0.2452	0.06	Q	|	|	|	V |
18+25	0.2456	0.06	Q	|	|	|	V |
18+30	0.2459	0.06	Q	|	|	|	V |
18+35	0.2463	0.05	Q	|	|	|	V |
18+40	0.2467	0.05	Q	|	|	|	V |
18+45	0.2470	0.05	Q	|	|	|	V |
18+50	0.2474	0.05	Q	|	|	|	V |
18+55	0.2477	0.05	Q	|	|	|	V |
19+ 0	0.2480	0.04	Q	|	|	|	V |
19+ 5	0.2482	0.04	Q	|	|	|	V |
19+10	0.2485	0.04	Q	|	|	|	V |
19+15	0.2487	0.04	Q	|	|	|	V |
19+20	0.2490	0.04	Q	|	|	|	V |
19+25	0.2493	0.04	Q	|	|	|	V |
19+30	0.2495	0.04	Q	|	|	|	V |
19+35	0.2498	0.04	Q	|	|	|	V |
19+40	0.2501	0.04	Q	|	|	|	V |
19+45	0.2504	0.04	Q	|	|	|	V |
19+50	0.2507	0.04	Q	|	|	|	V |
19+55	0.2510	0.04	Q	|	|	|	V |
20+ 0	0.2513	0.04	Q	|	|	|	V |
20+ 5	0.2515	0.04	Q	|	|	|	V |
20+10	0.2518	0.03	Q	|	|	|	V |
20+15	0.2520	0.03	Q	|	|	|	V |
20+20	0.2522	0.04	Q	|	|	|	V |
20+25	0.2525	0.04	Q	|	|	|	V |
20+30	0.2528	0.04	Q	|	|	|	V |
20+35	0.2530	0.04	Q	|	|	|	V |
20+40	0.2533	0.04	Q	|	|	|	V |
20+45	0.2535	0.04	Q	|	|	|	V |
20+50	0.2538	0.04	Q	|	|	|	V |
20+55	0.2540	0.04	Q	|	|	|	V |
21+ 0	0.2543	0.04	Q	|	|	|	V |
21+ 5	0.2545	0.03	Q	|	|	|	V |
21+10	0.2547	0.03	Q	|	|	|	V |
21+15	0.2550	0.03	Q	|	|	|	V |
21+20	0.2552	0.03	Q	|	|	|	V |
21+25	0.2554	0.03	Q	|	|	|	V |
21+30	0.2557	0.03	Q	|	|	|	V |
21+35	0.2559	0.03	Q	|	|	|	V |

21+40	0.2561	0.03	Q	|	|	|	V |
21+45	0.2563	0.03	Q	|	|	|	V |
21+50	0.2565	0.03	Q	|	|	|	V|
21+55	0.2568	0.03	Q	|	|	|	V|
22+ 0	0.2570	0.03	Q	|	|	|	V|
22+ 5	0.2572	0.03	Q	|	|	|	V|
22+10	0.2574	0.03	Q	|	|	|	V|
22+15	0.2577	0.03	Q	|	|	|	V|
22+20	0.2579	0.03	Q	|	|	|	V|
22+25	0.2581	0.03	Q	|	|	|	V|
22+30	0.2583	0.03	Q	|	|	|	V|
22+35	0.2585	0.03	Q	|	|	|	V|
22+40	0.2588	0.03	Q	|	|	|	V|
22+45	0.2590	0.03	Q	|	|	|	V|
22+50	0.2591	0.03	Q	|	|	|	V|
22+55	0.2593	0.03	Q	|	|	|	V|
23+ 0	0.2595	0.03	Q	|	|	|	V|
23+ 5	0.2597	0.03	Q	|	|	|	V|
23+10	0.2599	0.03	Q	|	|	|	V|
23+15	0.2601	0.03	Q	|	|	|	V|
23+20	0.2603	0.03	Q	|	|	|	V|
23+25	0.2604	0.03	Q	|	|	|	V|
23+30	0.2606	0.03	Q	|	|	|	V|
23+35	0.2608	0.03	Q	|	|	|	V|
23+40	0.2610	0.03	Q	|	|	|	V|
23+45	0.2612	0.03	Q	|	|	|	V|
23+50	0.2613	0.03	Q	|	|	|	V|
23+55	0.2615	0.03	Q	|	|	|	V|
24+ 0	0.2617	0.03	Q	|	|	|	V|
24+ 5	0.2619	0.03	Q	|	|	|	V|
24+10	0.2620	0.02	Q	|	|	|	V|
24+15	0.2622	0.02	Q	|	|	|	V|
24+20	0.2623	0.02	Q	|	|	|	V|
24+25	0.2624	0.01	Q	|	|	|	V|
24+30	0.2625	0.01	Q	|	|	|	V|
24+35	0.2625	0.01	Q	|	|	|	V|
24+40	0.2626	0.01	Q	|	|	|	V|
24+45	0.2626	0.01	Q	|	|	|	V|
24+50	0.2626	0.01	Q	|	|	|	V|
24+55	0.2627	0.00	Q	|	|	|	V|
25+ 0	0.2627	0.00	Q	|	|	|	V|
25+ 5	0.2627	0.00	Q	|	|	|	V|
25+10	0.2628	0.00	Q	|	|	|	V|
25+15	0.2628	0.00	Q	|	|	|	V|
25+20	0.2628	0.00	Q	|	|	|	V|
25+25	0.2628	0.00	Q	|	|	|	V|
25+30	0.2628	0.00	Q	|	|	|	V|
25+35	0.2628	0.00	Q	|	|	|	V|
25+40	0.2628	0.00	Q	|	|	|	V|
25+45	0.2629	0.00	Q	|	|	|	V|

25+50	0.2629	0.00	Q	|	|	|	V|
25+55	0.2629	0.00	Q	|	|	|	V|
26+ 0	0.2629	0.00	Q	|	|	|	V|
26+ 5	0.2629	0.00	Q	|	|	|	V|
26+10	0.2629	0.00	Q	|	|	|	V|
26+15	0.2629	0.00	Q	|	|	|	V|
26+20	0.2629	0.00	Q	|	|	|	V|
26+25	0.2629	0.00	Q	|	|	|	V|
26+30	0.2629	0.00	Q	|	|	|	V|
26+35	0.2629	0.00	Q	|	|	|	V|
26+40	0.2629	0.00	Q	|	|	|	V|
26+45	0.2629	0.00	Q	|	|	|	V|
26+50	0.2629	0.00	Q	|	|	|	V|
26+55	0.2629	0.00	Q	|	|	|	V|
27+ 0	0.2629	0.00	Q	|	|	|	V|

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

    Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018, Version 9.0
        Study date  02/27/24 File: tcal2242.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



------------------------------------------------------------------------
Temescal Canyon Existing Area B
2 Year 24 Hour
Kimley-Horn

------------------------------------------------------------------------
Drainage Area =       7.17(Ac.)  =      0.011 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       7.17(Ac.)  =      0.011 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.110 Hr.
Lag time =     6.60 Min.
25% of lag time =     1.65 Min.
40% of lag time =     2.64 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]
        7.17            2.50               17.93

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        7.17            7.00               50.19

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    2.500(In)
Area Averaged 100-Year Rainfall =    7.000(In)

Point rain (area averaged) =    2.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    2.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     7.170           69.00          0.600
 Total Area Entered =      7.17(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)       (Dec.)    (In/Hr)
```

69.0	49.8	0.574	0.600	0.264	1.000	0.264

Sum (F) = 0.264

Area averaged **mean** soil loss (F) (In/Hr) = 0.264

Minimum soil loss rate ((In/Hr)) = 0.132

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.420

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

VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	75.758	12.137	0.877
2	0.167	151.515	42.806	3.093
3	0.250	227.273	21.225	1.534
4	0.333	303.030	8.541	0.617
5	0.417	378.788	5.158	0.373
6	0.500	454.545	3.330	0.241
7	0.583	530.303	2.327	0.168
8	0.667	606.061	1.692	0.122
9	0.750	681.818	1.172	0.085
10	0.833	757.576	0.809	0.058
11	0.917	833.333	0.803	0.058
		Sum = 100.000	Sum=	7.226

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	(0.468)	0.008	0.012
2	0.17	0.07	0.020	(0.466)	0.008	0.012
3	0.25	0.07	0.020	(0.464)	0.008	0.012
4	0.33	0.10	0.030	(0.463)	0.013	0.017
5	0.42	0.10	0.030	(0.461)	0.013	0.017
6	0.50	0.10	0.030	(0.459)	0.013	0.017
7	0.58	0.10	0.030	(0.457)	0.013	0.017
8	0.67	0.10	0.030	(0.455)	0.013	0.017
9	0.75	0.10	0.030	(0.454)	0.013	0.017
10	0.83	0.13	0.040	(0.452)	0.017	0.023
11	0.92	0.13	0.040	(0.450)	0.017	0.023
12	1.00	0.13	0.040	(0.448)	0.017	0.023
13	1.08	0.10	0.030	(0.447)	0.013	0.017
14	1.17	0.10	0.030	(0.445)	0.013	0.017
15	1.25	0.10	0.030	(0.443)	0.013	0.017
16	1.33	0.10	0.030	(0.441)	0.013	0.017
17	1.42	0.10	0.030	(0.439)	0.013	0.017
18	1.50	0.10	0.030	(0.438)	0.013	0.017
19	1.58	0.10	0.030	(0.436)	0.013	0.017
20	1.67	0.10	0.030	(0.434)	0.013	0.017
21	1.75	0.10	0.030	(0.433)	0.013	0.017
22	1.83	0.13	0.040	(0.431)	0.017	0.023
23	1.92	0.13	0.040	(0.429)	0.017	0.023
24	2.00	0.13	0.040	(0.427)	0.017	0.023
25	2.08	0.13	0.040	(0.426)	0.017	0.023
26	2.17	0.13	0.040	(0.424)	0.017	0.023
27	2.25	0.13	0.040	(0.422)	0.017	0.023
28	2.33	0.13	0.040	(0.420)	0.017	0.023
29	2.42	0.13	0.040	(0.419)	0.017	0.023
30	2.50	0.13	0.040	(0.417)	0.017	0.023
31	2.58	0.17	0.050	(0.415)	0.021	0.029
32	2.67	0.17	0.050	(0.414)	0.021	0.029
33	2.75	0.17	0.050	(0.412)	0.021	0.029

139	34	2.83	0.17	0.050	(	0.410)	0.021	0.029
140	35	2.92	0.17	0.050	(	0.408)	0.021	0.029
141	36	3.00	0.17	0.050	(	0.407)	0.021	0.029
142	37	3.08	0.17	0.050	(	0.405)	0.021	0.029
143	38	3.17	0.17	0.050	(	0.403)	0.021	0.029
144	39	3.25	0.17	0.050	(	0.402)	0.021	0.029
145	40	3.33	0.17	0.050	(	0.400)	0.021	0.029
146	41	3.42	0.17	0.050	(	0.398)	0.021	0.029
147	42	3.50	0.17	0.050	(	0.397)	0.021	0.029
148	43	3.58	0.17	0.050	(	0.395)	0.021	0.029
149	44	3.67	0.17	0.050	(	0.393)	0.021	0.029
150	45	3.75	0.17	0.050	(	0.392)	0.021	0.029
151	46	3.83	0.20	0.060	(	0.390)	0.025	0.035
152	47	3.92	0.20	0.060	(	0.388)	0.025	0.035
153	48	4.00	0.20	0.060	(	0.387)	0.025	0.035
154	49	4.08	0.20	0.060	(	0.385)	0.025	0.035
155	50	4.17	0.20	0.060	(	0.384)	0.025	0.035
156	51	4.25	0.20	0.060	(	0.382)	0.025	0.035
157	52	4.33	0.23	0.070	(	0.380)	0.029	0.041
158	53	4.42	0.23	0.070	(	0.379)	0.029	0.041
159	54	4.50	0.23	0.070	(	0.377)	0.029	0.041
160	55	4.58	0.23	0.070	(	0.375)	0.029	0.041
161	56	4.67	0.23	0.070	(	0.374)	0.029	0.041
162	57	4.75	0.23	0.070	(	0.372)	0.029	0.041
163	58	4.83	0.27	0.080	(	0.371)	0.034	0.046
164	59	4.92	0.27	0.080	(	0.369)	0.034	0.046
165	60	5.00	0.27	0.080	(	0.367)	0.034	0.046
166	61	5.08	0.20	0.060	(	0.366)	0.025	0.035
167	62	5.17	0.20	0.060	(	0.364)	0.025	0.035
168	63	5.25	0.20	0.060	(	0.363)	0.025	0.035
169	64	5.33	0.23	0.070	(	0.361)	0.029	0.041
170	65	5.42	0.23	0.070	(	0.359)	0.029	0.041
171	66	5.50	0.23	0.070	(	0.358)	0.029	0.041
172	67	5.58	0.27	0.080	(	0.356)	0.034	0.046
173	68	5.67	0.27	0.080	(	0.355)	0.034	0.046
174	69	5.75	0.27	0.080	(	0.353)	0.034	0.046
175	70	5.83	0.27	0.080	(	0.352)	0.034	0.046
176	71	5.92	0.27	0.080	(	0.350)	0.034	0.046
177	72	6.00	0.27	0.080	(	0.349)	0.034	0.046
178	73	6.08	0.30	0.090	(	0.347)	0.038	0.052
179	74	6.17	0.30	0.090	(	0.345)	0.038	0.052
180	75	6.25	0.30	0.090	(	0.344)	0.038	0.052
181	76	6.33	0.30	0.090	(	0.342)	0.038	0.052
182	77	6.42	0.30	0.090	(	0.341)	0.038	0.052
183	78	6.50	0.30	0.090	(	0.339)	0.038	0.052
184	79	6.58	0.33	0.100	(	0.338)	0.042	0.058
185	80	6.67	0.33	0.100	(	0.336)	0.042	0.058
186	81	6.75	0.33	0.100	(	0.335)	0.042	0.058
187	82	6.83	0.33	0.100	(	0.333)	0.042	0.058
188	83	6.92	0.33	0.100	(	0.332)	0.042	0.058
189	84	7.00	0.33	0.100	(	0.330)	0.042	0.058
190	85	7.08	0.33	0.100	(	0.329)	0.042	0.058
191	86	7.17	0.33	0.100	(	0.327)	0.042	0.058
192	87	7.25	0.33	0.100	(	0.326)	0.042	0.058
193	88	7.33	0.37	0.110	(	0.324)	0.046	0.064
194	89	7.42	0.37	0.110	(	0.323)	0.046	0.064
195	90	7.50	0.37	0.110	(	0.321)	0.046	0.064
196	91	7.58	0.40	0.120	(	0.320)	0.050	0.070
197	92	7.67	0.40	0.120	(	0.318)	0.050	0.070
198	93	7.75	0.40	0.120	(	0.317)	0.050	0.070
199	94	7.83	0.43	0.130	(	0.315)	0.055	0.075
200	95	7.92	0.43	0.130	(	0.314)	0.055	0.075
201	96	8.00	0.43	0.130	(	0.312)	0.055	0.075
202	97	8.08	0.50	0.150	(	0.311)	0.063	0.087
203	98	8.17	0.50	0.150	(	0.310)	0.063	0.087
204	99	8.25	0.50	0.150	(	0.308)	0.063	0.087
205	100	8.33	0.50	0.150	(	0.307)	0.063	0.087
206	101	8.42	0.50	0.150	(	0.305)	0.063	0.087
207	102	8.50	0.50	0.150	(	0.304)	0.063	0.087

208	103	8.58	0.53	0.160	(0.302)	0.067	0.093
209	104	8.67	0.53	0.160	(0.301)	0.067	0.093
210	105	8.75	0.53	0.160	(0.300)	0.067	0.093
211	106	8.83	0.57	0.170	(0.298)	0.071	0.099
212	107	8.92	0.57	0.170	(0.297)	0.071	0.099
213	108	9.00	0.57	0.170	(0.295)	0.071	0.099
214	109	9.08	0.63	0.190	(0.294)	0.080	0.110
215	110	9.17	0.63	0.190	(0.293)	0.080	0.110
216	111	9.25	0.63	0.190	(0.291)	0.080	0.110
217	112	9.33	0.67	0.200	(0.290)	0.084	0.116
218	113	9.42	0.67	0.200	(0.288)	0.084	0.116
219	114	9.50	0.67	0.200	(0.287)	0.084	0.116
220	115	9.58	0.70	0.210	(0.286)	0.088	0.122
221	116	9.67	0.70	0.210	(0.284)	0.088	0.122
222	117	9.75	0.70	0.210	(0.283)	0.088	0.122
223	118	9.83	0.73	0.220	(0.282)	0.092	0.128
224	119	9.92	0.73	0.220	(0.280)	0.092	0.128
225	120	10.00	0.73	0.220	(0.279)	0.092	0.128
226	121	10.08	0.50	0.150	(0.277)	0.063	0.087
227	122	10.17	0.50	0.150	(0.276)	0.063	0.087
228	123	10.25	0.50	0.150	(0.275)	0.063	0.087
229	124	10.33	0.50	0.150	(0.273)	0.063	0.087
230	125	10.42	0.50	0.150	(0.272)	0.063	0.087
231	126	10.50	0.50	0.150	(0.271)	0.063	0.087
232	127	10.58	0.67	0.200	(0.269)	0.084	0.116
233	128	10.67	0.67	0.200	(0.268)	0.084	0.116
234	129	10.75	0.67	0.200	(0.267)	0.084	0.116
235	130	10.83	0.67	0.200	(0.266)	0.084	0.116
236	131	10.92	0.67	0.200	(0.264)	0.084	0.116
237	132	11.00	0.67	0.200	(0.263)	0.084	0.116
238	133	11.08	0.63	0.190	(0.262)	0.080	0.110
239	134	11.17	0.63	0.190	(0.260)	0.080	0.110
240	135	11.25	0.63	0.190	(0.259)	0.080	0.110
241	136	11.33	0.63	0.190	(0.258)	0.080	0.110
242	137	11.42	0.63	0.190	(0.256)	0.080	0.110
243	138	11.50	0.63	0.190	(0.255)	0.080	0.110
244	139	11.58	0.57	0.170	(0.254)	0.071	0.099
245	140	11.67	0.57	0.170	(0.253)	0.071	0.099
246	141	11.75	0.57	0.170	(0.251)	0.071	0.099
247	142	11.83	0.60	0.180	(0.250)	0.076	0.104
248	143	11.92	0.60	0.180	(0.249)	0.076	0.104
249	144	12.00	0.60	0.180	(0.248)	0.076	0.104
250	145	12.08	0.83	0.250	(0.246)	0.105	0.145
251	146	12.17	0.83	0.250	(0.245)	0.105	0.145
252	147	12.25	0.83	0.250	(0.244)	0.105	0.145
253	148	12.33	0.87	0.260	(0.243)	0.109	0.151
254	149	12.42	0.87	0.260	(0.242)	0.109	0.151
255	150	12.50	0.87	0.260	(0.240)	0.109	0.151
256	151	12.58	0.93	0.280	(0.239)	0.118	0.162
257	152	12.67	0.93	0.280	(0.238)	0.118	0.162
258	153	12.75	0.93	0.280	(0.237)	0.118	0.162
259	154	12.83	0.97	0.290	(0.236)	0.122	0.168
260	155	12.92	0.97	0.290	(0.234)	0.122	0.168
261	156	13.00	0.97	0.290	(0.233)	0.122	0.168
262	157	13.08	1.13	0.340	(0.232)	0.143	0.197
263	158	13.17	1.13	0.340	(0.231)	0.143	0.197
264	159	13.25	1.13	0.340	(0.230)	0.143	0.197
265	160	13.33	1.13	0.340	(0.228)	0.143	0.197
266	161	13.42	1.13	0.340	(0.227)	0.143	0.197
267	162	13.50	1.13	0.340	(0.226)	0.143	0.197
268	163	13.58	0.77	0.230	(0.225)	0.097	0.133
269	164	13.67	0.77	0.230	(0.224)	0.097	0.133
270	165	13.75	0.77	0.230	(0.223)	0.097	0.133
271	166	13.83	0.77	0.230	(0.222)	0.097	0.133
272	167	13.92	0.77	0.230	(0.220)	0.097	0.133
273	168	14.00	0.77	0.230	(0.219)	0.097	0.133
274	169	14.08	0.90	0.270	(0.218)	0.113	0.157
275	170	14.17	0.90	0.270	(0.217)	0.113	0.157
276	171	14.25	0.90	0.270	(0.216)	0.113	0.157

277	172	14.33	0.87	0.260	(	0.215)	0.109	0.151
278	173	14.42	0.87	0.260	(	0.214)	0.109	0.151
279	174	14.50	0.87	0.260	(	0.213)	0.109	0.151
280	175	14.58	0.87	0.260	(	0.212)	0.109	0.151
281	176	14.67	0.87	0.260	(	0.210)	0.109	0.151
282	177	14.75	0.87	0.260	(	0.209)	0.109	0.151
283	178	14.83	0.83	0.250	(	0.208)	0.105	0.145
284	179	14.92	0.83	0.250	(	0.207)	0.105	0.145
285	180	15.00	0.83	0.250	(	0.206)	0.105	0.145
286	181	15.08	0.80	0.240	(	0.205)	0.101	0.139
287	182	15.17	0.80	0.240	(	0.204)	0.101	0.139
288	183	15.25	0.80	0.240	(	0.203)	0.101	0.139
289	184	15.33	0.77	0.230	(	0.202)	0.097	0.133
290	185	15.42	0.77	0.230	(	0.201)	0.097	0.133
291	186	15.50	0.77	0.230	(	0.200)	0.097	0.133
292	187	15.58	0.63	0.190	(	0.199)	0.080	0.110
293	188	15.67	0.63	0.190	(	0.198)	0.080	0.110
294	189	15.75	0.63	0.190	(	0.197)	0.080	0.110
295	190	15.83	0.63	0.190	(	0.196)	0.080	0.110
296	191	15.92	0.63	0.190	(	0.195)	0.080	0.110
297	192	16.00	0.63	0.190	(	0.194)	0.080	0.110
298	193	16.08	0.13	0.040	(	0.193)	0.017	0.023
299	194	16.17	0.13	0.040	(	0.192)	0.017	0.023
300	195	16.25	0.13	0.040	(	0.191)	0.017	0.023
301	196	16.33	0.13	0.040	(	0.190)	0.017	0.023
302	197	16.42	0.13	0.040	(	0.189)	0.017	0.023
303	198	16.50	0.13	0.040	(	0.188)	0.017	0.023
304	199	16.58	0.10	0.030	(	0.187)	0.013	0.017
305	200	16.67	0.10	0.030	(	0.186)	0.013	0.017
306	201	16.75	0.10	0.030	(	0.185)	0.013	0.017
307	202	16.83	0.10	0.030	(	0.184)	0.013	0.017
308	203	16.92	0.10	0.030	(	0.183)	0.013	0.017
309	204	17.00	0.10	0.030	(	0.182)	0.013	0.017
310	205	17.08	0.17	0.050	(	0.181)	0.021	0.029
311	206	17.17	0.17	0.050	(	0.181)	0.021	0.029
312	207	17.25	0.17	0.050	(	0.180)	0.021	0.029
313	208	17.33	0.17	0.050	(	0.179)	0.021	0.029
314	209	17.42	0.17	0.050	(	0.178)	0.021	0.029
315	210	17.50	0.17	0.050	(	0.177)	0.021	0.029
316	211	17.58	0.17	0.050	(	0.176)	0.021	0.029
317	212	17.67	0.17	0.050	(	0.175)	0.021	0.029
318	213	17.75	0.17	0.050	(	0.174)	0.021	0.029
319	214	17.83	0.13	0.040	(	0.173)	0.017	0.023
320	215	17.92	0.13	0.040	(	0.173)	0.017	0.023
321	216	18.00	0.13	0.040	(	0.172)	0.017	0.023
322	217	18.08	0.13	0.040	(	0.171)	0.017	0.023
323	218	18.17	0.13	0.040	(	0.170)	0.017	0.023
324	219	18.25	0.13	0.040	(	0.169)	0.017	0.023
325	220	18.33	0.13	0.040	(	0.168)	0.017	0.023
326	221	18.42	0.13	0.040	(	0.168)	0.017	0.023
327	222	18.50	0.13	0.040	(	0.167)	0.017	0.023
328	223	18.58	0.10	0.030	(	0.166)	0.013	0.017
329	224	18.67	0.10	0.030	(	0.165)	0.013	0.017
330	225	18.75	0.10	0.030	(	0.164)	0.013	0.017
331	226	18.83	0.07	0.020	(	0.164)	0.008	0.012
332	227	18.92	0.07	0.020	(	0.163)	0.008	0.012
333	228	19.00	0.07	0.020	(	0.162)	0.008	0.012
334	229	19.08	0.10	0.030	(	0.161)	0.013	0.017
335	230	19.17	0.10	0.030	(	0.160)	0.013	0.017
336	231	19.25	0.10	0.030	(	0.160)	0.013	0.017
337	232	19.33	0.13	0.040	(	0.159)	0.017	0.023
338	233	19.42	0.13	0.040	(	0.158)	0.017	0.023
339	234	19.50	0.13	0.040	(	0.158)	0.017	0.023
340	235	19.58	0.10	0.030	(	0.157)	0.013	0.017
341	236	19.67	0.10	0.030	(	0.156)	0.013	0.017
342	237	19.75	0.10	0.030	(	0.155)	0.013	0.017
343	238	19.83	0.07	0.020	(	0.155)	0.008	0.012
344	239	19.92	0.07	0.020	(	0.154)	0.008	0.012
345	240	20.00	0.07	0.020	(	0.153)	0.008	0.012

241	20.08	0.10	0.030	(0.153)	0.013	0.017
242	20.17	0.10	0.030	(0.152)	0.013	0.017
243	20.25	0.10	0.030	(0.151)	0.013	0.017
244	20.33	0.10	0.030	(0.151)	0.013	0.017
245	20.42	0.10	0.030	(0.150)	0.013	0.017
246	20.50	0.10	0.030	(0.149)	0.013	0.017
247	20.58	0.10	0.030	(0.149)	0.013	0.017
248	20.67	0.10	0.030	(0.148)	0.013	0.017
249	20.75	0.10	0.030	(0.148)	0.013	0.017
250	20.83	0.07	0.020	(0.147)	0.008	0.012
251	20.92	0.07	0.020	(0.146)	0.008	0.012
252	21.00	0.07	0.020	(0.146)	0.008	0.012
253	21.08	0.10	0.030	(0.145)	0.013	0.017
254	21.17	0.10	0.030	(0.145)	0.013	0.017
255	21.25	0.10	0.030	(0.144)	0.013	0.017
256	21.33	0.07	0.020	(0.143)	0.008	0.012
257	21.42	0.07	0.020	(0.143)	0.008	0.012
258	21.50	0.07	0.020	(0.142)	0.008	0.012
259	21.58	0.10	0.030	(0.142)	0.013	0.017
260	21.67	0.10	0.030	(0.141)	0.013	0.017
261	21.75	0.10	0.030	(0.141)	0.013	0.017
262	21.83	0.07	0.020	(0.140)	0.008	0.012
263	21.92	0.07	0.020	(0.140)	0.008	0.012
264	22.00	0.07	0.020	(0.139)	0.008	0.012
265	22.08	0.10	0.030	(0.139)	0.013	0.017
266	22.17	0.10	0.030	(0.138)	0.013	0.017
267	22.25	0.10	0.030	(0.138)	0.013	0.017
268	22.33	0.07	0.020	(0.138)	0.008	0.012
269	22.42	0.07	0.020	(0.137)	0.008	0.012
270	22.50	0.07	0.020	(0.137)	0.008	0.012
271	22.58	0.07	0.020	(0.136)	0.008	0.012
272	22.67	0.07	0.020	(0.136)	0.008	0.012
273	22.75	0.07	0.020	(0.136)	0.008	0.012
274	22.83	0.07	0.020	(0.135)	0.008	0.012
275	22.92	0.07	0.020	(0.135)	0.008	0.012
276	23.00	0.07	0.020	(0.135)	0.008	0.012
277	23.08	0.07	0.020	(0.134)	0.008	0.012
278	23.17	0.07	0.020	(0.134)	0.008	0.012
279	23.25	0.07	0.020	(0.134)	0.008	0.012
280	23.33	0.07	0.020	(0.133)	0.008	0.012
281	23.42	0.07	0.020	(0.133)	0.008	0.012
282	23.50	0.07	0.020	(0.133)	0.008	0.012
283	23.58	0.07	0.020	(0.133)	0.008	0.012
284	23.67	0.07	0.020	(0.133)	0.008	0.012
285	23.75	0.07	0.020	(0.132)	0.008	0.012
286	23.83	0.07	0.020	(0.132)	0.008	0.012
287	23.92	0.07	0.020	(0.132)	0.008	0.012
288	24.00	0.07	0.020	(0.132)	0.008	0.012

(Loss Rate Not Used)

Sum = 100.0 Sum = 17.4

Flood volume = Effective rainfall 1.45(In)

times area 7.2(Ac.)/[(In)/(Ft.)] = 0.9(Ac.Ft)

Total soil loss = 1.05(In)

Total soil loss = 0.627(Ac.Ft)

Total rainfall = 2.50(In)

Flood volume = 37738.8 Cubic Feet

Total soil loss = 27328.1 Cubic Feet

Peak flow rate of this hydrograph = 1.411(CFS)

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24 - H O U R S T O R M

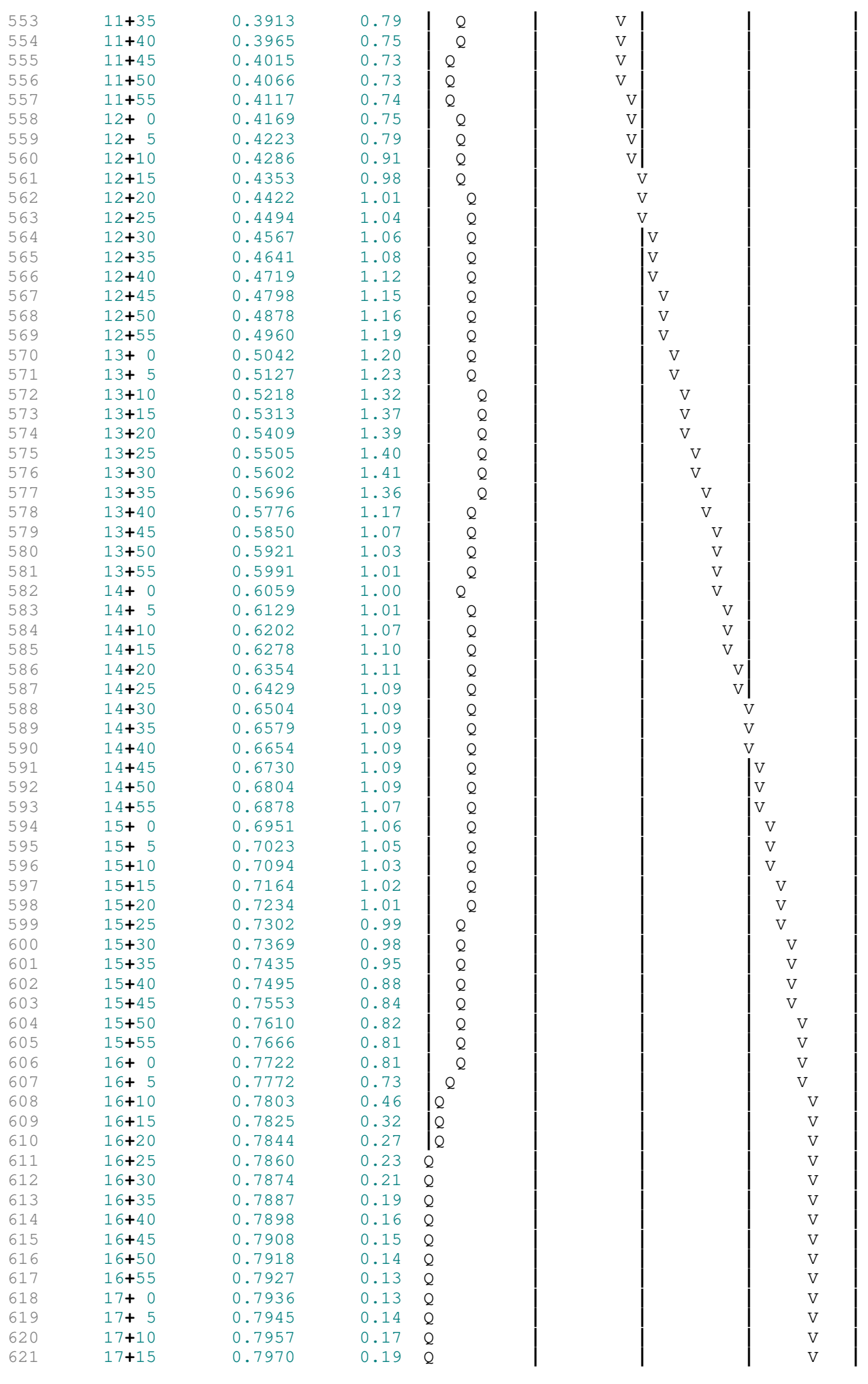
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0

415	0+ 5	0.0001	0.01	Q				
416	0+10	0.0004	0.05	Q				
417	0+15	0.0008	0.06	Q				
418	0+20	0.0014	0.08	Q				
419	0+25	0.0020	0.10	Q				
420	0+30	0.0028	0.11	Q				
421	0+35	0.0036	0.12	Q				
422	0+40	0.0044	0.12	Q				
423	0+45	0.0052	0.12	Q				
424	0+50	0.0061	0.13	Q				
425	0+55	0.0071	0.15	Q				
426	1+ 0	0.0082	0.16	Q				
427	1+ 5	0.0093	0.16	Q				
428	1+10	0.0103	0.14	Q				
429	1+15	0.0112	0.13	Q				
430	1+20	0.0121	0.13	Q				
431	1+25	0.0130	0.13	Q				
432	1+30	0.0138	0.13	Q				
433	1+35	0.0147	0.13	Q				
434	1+40	0.0156	0.13	Q				
435	1+45	0.0165	0.13	Q				
436	1+50	0.0174	0.13	Q				
437	1+55	0.0184	0.15	Q				
438	2+ 0	0.0195	0.16	Q				
439	2+ 5	0.0206	0.16	Q				
440	2+10	0.0217	0.16	QV				
441	2+15	0.0229	0.16	QV				
442	2+20	0.0240	0.17	QV				
443	2+25	0.0251	0.17	QV				
444	2+30	0.0263	0.17	QV				
445	2+35	0.0275	0.17	QV				
446	2+40	0.0288	0.19	QV				
447	2+45	0.0302	0.20	QV				
448	2+50	0.0316	0.20	QV				
449	2+55	0.0330	0.21	QV				
450	3+ 0	0.0344	0.21	QV				
451	3+ 5	0.0358	0.21	QV				
452	3+10	0.0373	0.21	QV				
453	3+15	0.0387	0.21	QV				
454	3+20	0.0402	0.21	QV				
455	3+25	0.0416	0.21	QV				
456	3+30	0.0430	0.21	QV				
457	3+35	0.0445	0.21	Q V				
458	3+40	0.0459	0.21	Q V				
459	3+45	0.0474	0.21	Q V				
460	3+50	0.0489	0.21	Q V				
461	3+55	0.0505	0.23	Q V				
462	4+ 0	0.0521	0.24	Q V				
463	4+ 5	0.0538	0.25	Q V				
464	4+10	0.0555	0.25	Q V				
465	4+15	0.0572	0.25	Q V				
466	4+20	0.0590	0.25	QV				
467	4+25	0.0609	0.27	QV				
468	4+30	0.0628	0.28	QV				
469	4+35	0.0648	0.29	QV				
470	4+40	0.0668	0.29	Q V				
471	4+45	0.0688	0.29	Q V				
472	4+50	0.0708	0.30	Q V				
473	4+55	0.0730	0.32	Q V				
474	5+ 0	0.0752	0.32	Q V				
475	5+ 5	0.0774	0.32	Q V				
476	5+10	0.0794	0.29	Q V				
477	5+15	0.0812	0.27	Q V				
478	5+20	0.0831	0.27	Q V				
479	5+25	0.0850	0.28	Q V				
480	5+30	0.0870	0.29	Q V				
481	5+35	0.0891	0.30	Q V				
482	5+40	0.0912	0.31	Q V				
483	5+45	0.0935	0.32	Q V				

484	5+50	0.0957	0.33	Q V			
485	5+55	0.0980	0.33	Q V			
486	6+ 0	0.1003	0.33	Q V			
487	6+ 5	0.1026	0.34	Q V			
488	6+10	0.1051	0.36	Q V			
489	6+15	0.1076	0.37	Q V			
490	6+20	0.1101	0.37	Q V			
491	6+25	0.1127	0.37	Q V			
492	6+30	0.1153	0.37	Q V			
493	6+35	0.1179	0.38	Q V			
494	6+40	0.1207	0.40	Q V			
495	6+45	0.1235	0.41	Q V			
496	6+50	0.1263	0.41	Q V			
497	6+55	0.1292	0.42	Q V			
498	7+ 0	0.1320	0.42	Q V			
499	7+ 5	0.1349	0.42	Q V			
500	7+10	0.1378	0.42	Q V			
501	7+15	0.1407	0.42	Q V			
502	7+20	0.1436	0.42	Q V			
503	7+25	0.1466	0.44	Q V			
504	7+30	0.1498	0.45	Q V			
505	7+35	0.1529	0.46	Q V			
506	7+40	0.1562	0.48	Q V			
507	7+45	0.1596	0.49	Q V			
508	7+50	0.1630	0.50	Q V			
509	7+55	0.1666	0.52	Q V			
510	8+ 0	0.1703	0.53	Q V			
511	8+ 5	0.1741	0.55	Q V			
512	8+10	0.1781	0.59	Q V			
513	8+15	0.1823	0.61	Q V			
514	8+20	0.1865	0.61	Q V			
515	8+25	0.1908	0.62	Q V			
516	8+30	0.1950	0.62	Q V			
517	8+35	0.1994	0.63	Q V			
518	8+40	0.2039	0.65	Q V			
519	8+45	0.2084	0.66	Q V			
520	8+50	0.2130	0.67	Q V			
521	8+55	0.2178	0.69	Q V			
522	9+ 0	0.2226	0.70	Q V			
523	9+ 5	0.2275	0.71	Q V			
524	9+10	0.2327	0.75	Q V			
525	9+15	0.2380	0.77	Q V			
526	9+20	0.2434	0.79	Q V			
527	9+25	0.2490	0.81	Q V			
528	9+30	0.2547	0.82	Q V			
529	9+35	0.2604	0.83	Q V			
530	9+40	0.2663	0.86	Q V			
531	9+45	0.2723	0.87	Q V			
532	9+50	0.2783	0.88	Q V			
533	9+55	0.2845	0.90	Q V			
534	10+ 0	0.2908	0.91	Q V			
535	10+ 5	0.2968	0.88	Q V			
536	10+10	0.3020	0.76	Q V			
537	10+15	0.3068	0.70	Q V			
538	10+20	0.3114	0.67	Q V			
539	10+25	0.3160	0.66	Q V			
540	10+30	0.3204	0.65	Q V			
541	10+35	0.3250	0.67	Q V			
542	10+40	0.3302	0.75	Q V			
543	10+45	0.3357	0.79	Q V			
544	10+50	0.3412	0.81	Q V			
545	10+55	0.3469	0.82	Q V			
546	11+ 0	0.3525	0.82	Q V			
547	11+ 5	0.3582	0.82	Q V			
548	11+10	0.3638	0.81	Q V			
549	11+15	0.3693	0.80	Q V			
550	11+20	0.3748	0.80	Q V			
551	11+25	0.3804	0.80	Q V			
552	11+30	0.3859	0.80	Q V			



622	17+20	0.7984	0.20	Q			V	
623	17+25	0.7998	0.20	Q			V	
624	17+30	0.8012	0.20	Q			V	
625	17+35	0.8026	0.21	Q			V	
626	17+40	0.8040	0.21	Q			V	
627	17+45	0.8055	0.21	Q			V	
628	17+50	0.8069	0.20	Q			V	
629	17+55	0.8081	0.19	Q			V	
630	18+ 0	0.8094	0.18	Q			V	
631	18+ 5	0.8106	0.17	Q			V	
632	18+10	0.8117	0.17	Q			V	
633	18+15	0.8129	0.17	Q			V	
634	18+20	0.8141	0.17	Q			V	
635	18+25	0.8153	0.17	Q			V	
636	18+30	0.8164	0.17	Q			V	
637	18+35	0.8175	0.16	Q			V	
638	18+40	0.8185	0.14	Q			V	
639	18+45	0.8195	0.14	Q			V	
640	18+50	0.8203	0.13	Q			V	
641	18+55	0.8211	0.11	Q			V	
642	19+ 0	0.8217	0.10	Q			V	
643	19+ 5	0.8224	0.10	Q			V	
644	19+10	0.8232	0.11	Q			V	
645	19+15	0.8240	0.12	Q			V	
646	19+20	0.8249	0.13	Q			V	
647	19+25	0.8259	0.15	Q			V	
648	19+30	0.8270	0.16	Q			V	
649	19+35	0.8280	0.15	Q			V	
650	19+40	0.8290	0.14	Q			V	
651	19+45	0.8299	0.13	Q			V	
652	19+50	0.8308	0.12	Q			V	
653	19+55	0.8315	0.11	Q			V	
654	20+ 0	0.8321	0.10	Q			V	
655	20+ 5	0.8328	0.10	Q			V	
656	20+10	0.8336	0.11	Q			V	
657	20+15	0.8344	0.12	Q			V	
658	20+20	0.8352	0.12	Q			V	
659	20+25	0.8361	0.12	Q			V	
660	20+30	0.8369	0.12	Q			V	
661	20+35	0.8378	0.12	Q			V	
662	20+40	0.8387	0.12	Q			V	
663	20+45	0.8395	0.13	Q			V	
664	20+50	0.8403	0.12	Q			V	
665	20+55	0.8411	0.10	Q			V	
666	21+ 0	0.8417	0.09	Q			V	
667	21+ 5	0.8424	0.10	Q			V	
668	21+10	0.8431	0.11	Q			V	
669	21+15	0.8439	0.12	Q			V	
670	21+20	0.8447	0.12	Q			V	
671	21+25	0.8454	0.10	Q			V	
672	21+30	0.8461	0.09	Q			V	
673	21+35	0.8467	0.09	Q			V	
674	21+40	0.8475	0.11	Q			V	
675	21+45	0.8483	0.12	Q			V	
676	21+50	0.8491	0.12	Q			V	
677	21+55	0.8498	0.10	Q			V	
678	22+ 0	0.8504	0.09	Q			V	
679	22+ 5	0.8510	0.09	Q			V	
680	22+10	0.8518	0.11	Q			V	
681	22+15	0.8526	0.12	Q			V	
682	22+20	0.8534	0.12	Q			V	
683	22+25	0.8541	0.10	Q			V	
684	22+30	0.8547	0.09	Q			V	
685	22+35	0.8553	0.09	Q			V	
686	22+40	0.8559	0.09	Q			V	
687	22+45	0.8565	0.09	Q			V	
688	22+50	0.8571	0.09	Q			V	
689	22+55	0.8577	0.09	Q			V	
690	23+ 0	0.8583	0.08	Q			V	

691	23+ 5	0.8589	0.08	Q	|	|	|	V|
692	23+10	0.8594	0.08	Q	|	|	|	V|
693	23+15	0.8600	0.08	Q	|	|	|	V|
694	23+20	0.8606	0.08	Q	|	|	|	V|
695	23+25	0.8612	0.08	Q	|	|	|	V|
696	23+30	0.8618	0.08	Q	|	|	|	V|
697	23+35	0.8623	0.08	Q	|	|	|	V|
698	23+40	0.8629	0.08	Q	|	|	|	V|
699	23+45	0.8635	0.08	Q	|	|	|	V|
700	23+50	0.8641	0.08	Q	|	|	|	V|
701	23+55	0.8646	0.08	Q	|	|	|	V|
702	24+ 0	0.8652	0.08	Q	|	|	|	V|
703	24+ 5	0.8657	0.07	Q	|	|	|	V|
704	24+10	0.8660	0.04	Q	|	|	|	V|
705	24+15	0.8661	0.02	Q	|	|	|	V|
706	24+20	0.8662	0.01	Q	|	|	|	V|
707	24+25	0.8663	0.01	Q	|	|	|	V|
708	24+30	0.8663	0.01	Q	|	|	|	V|
709	24+35	0.8663	0.00	Q	|	|	|	V|
710	24+40	0.8663	0.00	Q	|	|	|	V|
711	24+45	0.8664	0.00	Q	|	|	|	V|
712	24+50	0.8664	0.00	Q	|	|	|	V|
713	----------							
714								
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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  02/27/24 File: temd1242.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



------------------------------------------------------------------------
Temescal Canyon Existing Area D
2 Year 24 Hour
Kimley-Horn

------------------------------------------------------------------------
Drainage Area =       9.45(Ac.)  =      0.015 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       9.45(Ac.)  =      0.015 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.120 Hr.
Lag time =     7.20 Min.
25% of lag time =     1.80 Min.
40% of lag time =     2.88 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]
        9.45            2.50                23.63

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        9.45            7.00                66.15

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    2.500(In)
Area Averaged 100-Year Rainfall =    7.000(In)

Point rain (area averaged) =    2.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    2.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     9.450           69.00          0.500
 Total Area Entered =      9.45(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)       (Dec.)    (In/Hr)
```

69.0	49.8	0.574	0.500	0.316	1.000	0.316

Sum (F) = 0.316

Area averaged **mean** soil loss (F) (In/Hr) = 0.316

Minimum soil loss rate ((In/Hr)) = 0.158

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.500

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

VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	69.444	10.484	0.998
2	0.167	138.889	39.811	3.792
3	0.250	208.333	23.342	2.223
4	0.333	277.778	9.061	0.863
5	0.417	347.222	5.509	0.525
6	0.500	416.667	3.673	0.350
7	0.583	486.111	2.445	0.233
8	0.667	555.556	1.921	0.183
9	0.750	625.000	1.361	0.130
10	0.833	694.444	0.972	0.093
11	0.917	763.889	0.712	0.068
12	1.000	833.333	0.708	0.067
		Sum = 100.000	Sum=	9.524

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	(0.560)	0.010	0.010
2	0.17	0.07	0.020	(0.557)	0.010	0.010
3	0.25	0.07	0.020	(0.555)	0.010	0.010
4	0.33	0.10	0.030	(0.553)	0.015	0.015
5	0.42	0.10	0.030	(0.551)	0.015	0.015
6	0.50	0.10	0.030	(0.549)	0.015	0.015
7	0.58	0.10	0.030	(0.547)	0.015	0.015
8	0.67	0.10	0.030	(0.545)	0.015	0.015
9	0.75	0.10	0.030	(0.542)	0.015	0.015
10	0.83	0.13	0.040	(0.540)	0.020	0.020
11	0.92	0.13	0.040	(0.538)	0.020	0.020
12	1.00	0.13	0.040	(0.536)	0.020	0.020
13	1.08	0.10	0.030	(0.534)	0.015	0.015
14	1.17	0.10	0.030	(0.532)	0.015	0.015
15	1.25	0.10	0.030	(0.530)	0.015	0.015
16	1.33	0.10	0.030	(0.528)	0.015	0.015
17	1.42	0.10	0.030	(0.525)	0.015	0.015
18	1.50	0.10	0.030	(0.523)	0.015	0.015
19	1.58	0.10	0.030	(0.521)	0.015	0.015
20	1.67	0.10	0.030	(0.519)	0.015	0.015
21	1.75	0.10	0.030	(0.517)	0.015	0.015
22	1.83	0.13	0.040	(0.515)	0.020	0.020
23	1.92	0.13	0.040	(0.513)	0.020	0.020
24	2.00	0.13	0.040	(0.511)	0.020	0.020
25	2.08	0.13	0.040	(0.509)	0.020	0.020
26	2.17	0.13	0.040	(0.507)	0.020	0.020
27	2.25	0.13	0.040	(0.505)	0.020	0.020
28	2.33	0.13	0.040	(0.503)	0.020	0.020
29	2.42	0.13	0.040	(0.501)	0.020	0.020
30	2.50	0.13	0.040	(0.499)	0.020	0.020
31	2.58	0.17	0.050	(0.497)	0.025	0.025
32	2.67	0.17	0.050	(0.494)	0.025	0.025

139	33	2.75	0.17	0.050	(0.492)	0.025	0.025
140	34	2.83	0.17	0.050	(0.490)	0.025	0.025
141	35	2.92	0.17	0.050	(0.488)	0.025	0.025
142	36	3.00	0.17	0.050	(0.486)	0.025	0.025
143	37	3.08	0.17	0.050	(0.484)	0.025	0.025
144	38	3.17	0.17	0.050	(0.482)	0.025	0.025
145	39	3.25	0.17	0.050	(0.480)	0.025	0.025
146	40	3.33	0.17	0.050	(0.478)	0.025	0.025
147	41	3.42	0.17	0.050	(0.476)	0.025	0.025
148	42	3.50	0.17	0.050	(0.474)	0.025	0.025
149	43	3.58	0.17	0.050	(0.472)	0.025	0.025
150	44	3.67	0.17	0.050	(0.470)	0.025	0.025
151	45	3.75	0.17	0.050	(0.468)	0.025	0.025
152	46	3.83	0.20	0.060	(0.466)	0.030	0.030
153	47	3.92	0.20	0.060	(0.464)	0.030	0.030
154	48	4.00	0.20	0.060	(0.463)	0.030	0.030
155	49	4.08	0.20	0.060	(0.461)	0.030	0.030
156	50	4.17	0.20	0.060	(0.459)	0.030	0.030
157	51	4.25	0.20	0.060	(0.457)	0.030	0.030
158	52	4.33	0.23	0.070	(0.455)	0.035	0.035
159	53	4.42	0.23	0.070	(0.453)	0.035	0.035
160	54	4.50	0.23	0.070	(0.451)	0.035	0.035
161	55	4.58	0.23	0.070	(0.449)	0.035	0.035
162	56	4.67	0.23	0.070	(0.447)	0.035	0.035
163	57	4.75	0.23	0.070	(0.445)	0.035	0.035
164	58	4.83	0.27	0.080	(0.443)	0.040	0.040
165	59	4.92	0.27	0.080	(0.441)	0.040	0.040
166	60	5.00	0.27	0.080	(0.439)	0.040	0.040
167	61	5.08	0.20	0.060	(0.437)	0.030	0.030
168	62	5.17	0.20	0.060	(0.435)	0.030	0.030
169	63	5.25	0.20	0.060	(0.434)	0.030	0.030
170	64	5.33	0.23	0.070	(0.432)	0.035	0.035
171	65	5.42	0.23	0.070	(0.430)	0.035	0.035
172	66	5.50	0.23	0.070	(0.428)	0.035	0.035
173	67	5.58	0.27	0.080	(0.426)	0.040	0.040
174	68	5.67	0.27	0.080	(0.424)	0.040	0.040
175	69	5.75	0.27	0.080	(0.422)	0.040	0.040
176	70	5.83	0.27	0.080	(0.420)	0.040	0.040
177	71	5.92	0.27	0.080	(0.419)	0.040	0.040
178	72	6.00	0.27	0.080	(0.417)	0.040	0.040
179	73	6.08	0.30	0.090	(0.415)	0.045	0.045
180	74	6.17	0.30	0.090	(0.413)	0.045	0.045
181	75	6.25	0.30	0.090	(0.411)	0.045	0.045
182	76	6.33	0.30	0.090	(0.409)	0.045	0.045
183	77	6.42	0.30	0.090	(0.407)	0.045	0.045
184	78	6.50	0.30	0.090	(0.406)	0.045	0.045
185	79	6.58	0.33	0.100	(0.404)	0.050	0.050
186	80	6.67	0.33	0.100	(0.402)	0.050	0.050
187	81	6.75	0.33	0.100	(0.400)	0.050	0.050
188	82	6.83	0.33	0.100	(0.398)	0.050	0.050
189	83	6.92	0.33	0.100	(0.397)	0.050	0.050
190	84	7.00	0.33	0.100	(0.395)	0.050	0.050
191	85	7.08	0.33	0.100	(0.393)	0.050	0.050
192	86	7.17	0.33	0.100	(0.391)	0.050	0.050
193	87	7.25	0.33	0.100	(0.389)	0.050	0.050
194	88	7.33	0.37	0.110	(0.388)	0.055	0.055
195	89	7.42	0.37	0.110	(0.386)	0.055	0.055
196	90	7.50	0.37	0.110	(0.384)	0.055	0.055
197	91	7.58	0.40	0.120	(0.382)	0.060	0.060
198	92	7.67	0.40	0.120	(0.381)	0.060	0.060
199	93	7.75	0.40	0.120	(0.379)	0.060	0.060
200	94	7.83	0.43	0.130	(0.377)	0.065	0.065
201	95	7.92	0.43	0.130	(0.375)	0.065	0.065
202	96	8.00	0.43	0.130	(0.374)	0.065	0.065
203	97	8.08	0.50	0.150	(0.372)	0.075	0.075
204	98	8.17	0.50	0.150	(0.370)	0.075	0.075
205	99	8.25	0.50	0.150	(0.368)	0.075	0.075
206	100	8.33	0.50	0.150	(0.367)	0.075	0.075
207	101	8.42	0.50	0.150	(0.365)	0.075	0.075

208	102	8.50	0.50	0.150	(0.363)	0.075	0.075
209	103	8.58	0.53	0.160	(0.362)	0.080	0.080
210	104	8.67	0.53	0.160	(0.360)	0.080	0.080
211	105	8.75	0.53	0.160	(0.358)	0.080	0.080
212	106	8.83	0.57	0.170	(0.356)	0.085	0.085
213	107	8.92	0.57	0.170	(0.355)	0.085	0.085
214	108	9.00	0.57	0.170	(0.353)	0.085	0.085
215	109	9.08	0.63	0.190	(0.351)	0.095	0.095
216	110	9.17	0.63	0.190	(0.350)	0.095	0.095
217	111	9.25	0.63	0.190	(0.348)	0.095	0.095
218	112	9.33	0.67	0.200	(0.346)	0.100	0.100
219	113	9.42	0.67	0.200	(0.345)	0.100	0.100
220	114	9.50	0.67	0.200	(0.343)	0.100	0.100
221	115	9.58	0.70	0.210	(0.341)	0.105	0.105
222	116	9.67	0.70	0.210	(0.340)	0.105	0.105
223	117	9.75	0.70	0.210	(0.338)	0.105	0.105
224	118	9.83	0.73	0.220	(0.337)	0.110	0.110
225	119	9.92	0.73	0.220	(0.335)	0.110	0.110
226	120	10.00	0.73	0.220	(0.333)	0.110	0.110
227	121	10.08	0.50	0.150	(0.332)	0.075	0.075
228	122	10.17	0.50	0.150	(0.330)	0.075	0.075
229	123	10.25	0.50	0.150	(0.329)	0.075	0.075
230	124	10.33	0.50	0.150	(0.327)	0.075	0.075
231	125	10.42	0.50	0.150	(0.325)	0.075	0.075
232	126	10.50	0.50	0.150	(0.324)	0.075	0.075
233	127	10.58	0.67	0.200	(0.322)	0.100	0.100
234	128	10.67	0.67	0.200	(0.321)	0.100	0.100
235	129	10.75	0.67	0.200	(0.319)	0.100	0.100
236	130	10.83	0.67	0.200	(0.317)	0.100	0.100
237	131	10.92	0.67	0.200	(0.316)	0.100	0.100
238	132	11.00	0.67	0.200	(0.314)	0.100	0.100
239	133	11.08	0.63	0.190	(0.313)	0.095	0.095
240	134	11.17	0.63	0.190	(0.311)	0.095	0.095
241	135	11.25	0.63	0.190	(0.310)	0.095	0.095
242	136	11.33	0.63	0.190	(0.308)	0.095	0.095
243	137	11.42	0.63	0.190	(0.307)	0.095	0.095
244	138	11.50	0.63	0.190	(0.305)	0.095	0.095
245	139	11.58	0.57	0.170	(0.304)	0.085	0.085
246	140	11.67	0.57	0.170	(0.302)	0.085	0.085
247	141	11.75	0.57	0.170	(0.301)	0.085	0.085
248	142	11.83	0.60	0.180	(0.299)	0.090	0.090
249	143	11.92	0.60	0.180	(0.298)	0.090	0.090
250	144	12.00	0.60	0.180	(0.296)	0.090	0.090
251	145	12.08	0.83	0.250	(0.295)	0.125	0.125
252	146	12.17	0.83	0.250	(0.293)	0.125	0.125
253	147	12.25	0.83	0.250	(0.292)	0.125	0.125
254	148	12.33	0.87	0.260	(0.290)	0.130	0.130
255	149	12.42	0.87	0.260	(0.289)	0.130	0.130
256	150	12.50	0.87	0.260	(0.287)	0.130	0.130
257	151	12.58	0.93	0.280	(0.286)	0.140	0.140
258	152	12.67	0.93	0.280	(0.284)	0.140	0.140
259	153	12.75	0.93	0.280	(0.283)	0.140	0.140
260	154	12.83	0.97	0.290	(0.282)	0.145	0.145
261	155	12.92	0.97	0.290	(0.280)	0.145	0.145
262	156	13.00	0.97	0.290	(0.279)	0.145	0.145
263	157	13.08	1.13	0.340	(0.277)	0.170	0.170
264	158	13.17	1.13	0.340	(0.276)	0.170	0.170
265	159	13.25	1.13	0.340	(0.275)	0.170	0.170
266	160	13.33	1.13	0.340	(0.273)	0.170	0.170
267	161	13.42	1.13	0.340	(0.272)	0.170	0.170
268	162	13.50	1.13	0.340	(0.270)	0.170	0.170
269	163	13.58	0.77	0.230	(0.269)	0.115	0.115
270	164	13.67	0.77	0.230	(0.268)	0.115	0.115
271	165	13.75	0.77	0.230	(0.266)	0.115	0.115
272	166	13.83	0.77	0.230	(0.265)	0.115	0.115
273	167	13.92	0.77	0.230	(0.264)	0.115	0.115
274	168	14.00	0.77	0.230	(0.262)	0.115	0.115
275	169	14.08	0.90	0.270	(0.261)	0.135	0.135
276	170	14.17	0.90	0.270	(0.260)	0.135	0.135

277	171	14.25	0.90	0.270	(0.258)	0.135	0.135
278	172	14.33	0.87	0.260	(0.257)	0.130	0.130
279	173	14.42	0.87	0.260	(0.256)	0.130	0.130
280	174	14.50	0.87	0.260	(0.254)	0.130	0.130
281	175	14.58	0.87	0.260	(0.253)	0.130	0.130
282	176	14.67	0.87	0.260	(0.252)	0.130	0.130
283	177	14.75	0.87	0.260	(0.250)	0.130	0.130
284	178	14.83	0.83	0.250	(0.249)	0.125	0.125
285	179	14.92	0.83	0.250	(0.248)	0.125	0.125
286	180	15.00	0.83	0.250	(0.247)	0.125	0.125
287	181	15.08	0.80	0.240	(0.245)	0.120	0.120
288	182	15.17	0.80	0.240	(0.244)	0.120	0.120
289	183	15.25	0.80	0.240	(0.243)	0.120	0.120
290	184	15.33	0.77	0.230	(0.242)	0.115	0.115
291	185	15.42	0.77	0.230	(0.240)	0.115	0.115
292	186	15.50	0.77	0.230	(0.239)	0.115	0.115
293	187	15.58	0.63	0.190	(0.238)	0.095	0.095
294	188	15.67	0.63	0.190	(0.237)	0.095	0.095
295	189	15.75	0.63	0.190	(0.235)	0.095	0.095
296	190	15.83	0.63	0.190	(0.234)	0.095	0.095
297	191	15.92	0.63	0.190	(0.233)	0.095	0.095
298	192	16.00	0.63	0.190	(0.232)	0.095	0.095
299	193	16.08	0.13	0.040	(0.231)	0.020	0.020
300	194	16.17	0.13	0.040	(0.229)	0.020	0.020
301	195	16.25	0.13	0.040	(0.228)	0.020	0.020
302	196	16.33	0.13	0.040	(0.227)	0.020	0.020
303	197	16.42	0.13	0.040	(0.226)	0.020	0.020
304	198	16.50	0.13	0.040	(0.225)	0.020	0.020
305	199	16.58	0.10	0.030	(0.224)	0.015	0.015
306	200	16.67	0.10	0.030	(0.223)	0.015	0.015
307	201	16.75	0.10	0.030	(0.221)	0.015	0.015
308	202	16.83	0.10	0.030	(0.220)	0.015	0.015
309	203	16.92	0.10	0.030	(0.219)	0.015	0.015
310	204	17.00	0.10	0.030	(0.218)	0.015	0.015
311	205	17.08	0.17	0.050	(0.217)	0.025	0.025
312	206	17.17	0.17	0.050	(0.216)	0.025	0.025
313	207	17.25	0.17	0.050	(0.215)	0.025	0.025
314	208	17.33	0.17	0.050	(0.214)	0.025	0.025
315	209	17.42	0.17	0.050	(0.213)	0.025	0.025
316	210	17.50	0.17	0.050	(0.212)	0.025	0.025
317	211	17.58	0.17	0.050	(0.211)	0.025	0.025
318	212	17.67	0.17	0.050	(0.209)	0.025	0.025
319	213	17.75	0.17	0.050	(0.208)	0.025	0.025
320	214	17.83	0.13	0.040	(0.207)	0.020	0.020
321	215	17.92	0.13	0.040	(0.206)	0.020	0.020
322	216	18.00	0.13	0.040	(0.205)	0.020	0.020
323	217	18.08	0.13	0.040	(0.204)	0.020	0.020
324	218	18.17	0.13	0.040	(0.203)	0.020	0.020
325	219	18.25	0.13	0.040	(0.202)	0.020	0.020
326	220	18.33	0.13	0.040	(0.201)	0.020	0.020
327	221	18.42	0.13	0.040	(0.200)	0.020	0.020
328	222	18.50	0.13	0.040	(0.199)	0.020	0.020
329	223	18.58	0.10	0.030	(0.198)	0.015	0.015
330	224	18.67	0.10	0.030	(0.197)	0.015	0.015
331	225	18.75	0.10	0.030	(0.197)	0.015	0.015
332	226	18.83	0.07	0.020	(0.196)	0.010	0.010
333	227	18.92	0.07	0.020	(0.195)	0.010	0.010
334	228	19.00	0.07	0.020	(0.194)	0.010	0.010
335	229	19.08	0.10	0.030	(0.193)	0.015	0.015
336	230	19.17	0.10	0.030	(0.192)	0.015	0.015
337	231	19.25	0.10	0.030	(0.191)	0.015	0.015
338	232	19.33	0.13	0.040	(0.190)	0.020	0.020
339	233	19.42	0.13	0.040	(0.189)	0.020	0.020
340	234	19.50	0.13	0.040	(0.188)	0.020	0.020
341	235	19.58	0.10	0.030	(0.187)	0.015	0.015
342	236	19.67	0.10	0.030	(0.187)	0.015	0.015
343	237	19.75	0.10	0.030	(0.186)	0.015	0.015
344	238	19.83	0.07	0.020	(0.185)	0.010	0.010
345	239	19.92	0.07	0.020	(0.184)	0.010	0.010

240	20.00	0.07	0.020	(0.183)	0.010	0.010	
241	20.08	0.10	0.030	(0.182)	0.015	0.015	
242	20.17	0.10	0.030	(0.182)	0.015	0.015	
243	20.25	0.10	0.030	(0.181)	0.015	0.015	
244	20.33	0.10	0.030	(0.180)	0.015	0.015	
245	20.42	0.10	0.030	(0.179)	0.015	0.015	
246	20.50	0.10	0.030	(0.179)	0.015	0.015	
247	20.58	0.10	0.030	(0.178)	0.015	0.015	
248	20.67	0.10	0.030	(0.177)	0.015	0.015	
249	20.75	0.10	0.030	(0.176)	0.015	0.015	
250	20.83	0.07	0.020	(0.176)	0.010	0.010	
251	20.92	0.07	0.020	(0.175)	0.010	0.010	
252	21.00	0.07	0.020	(0.174)	0.010	0.010	
253	21.08	0.10	0.030	(0.174)	0.015	0.015	
254	21.17	0.10	0.030	(0.173)	0.015	0.015	
255	21.25	0.10	0.030	(0.172)	0.015	0.015	
256	21.33	0.07	0.020	(0.172)	0.010	0.010	
257	21.42	0.07	0.020	(0.171)	0.010	0.010	
258	21.50	0.07	0.020	(0.170)	0.010	0.010	
259	21.58	0.10	0.030	(0.170)	0.015	0.015	
260	21.67	0.10	0.030	(0.169)	0.015	0.015	
261	21.75	0.10	0.030	(0.168)	0.015	0.015	
262	21.83	0.07	0.020	(0.168)	0.010	0.010	
263	21.92	0.07	0.020	(0.167)	0.010	0.010	
264	22.00	0.07	0.020	(0.167)	0.010	0.010	
265	22.08	0.10	0.030	(0.166)	0.015	0.015	
266	22.17	0.10	0.030	(0.166)	0.015	0.015	
267	22.25	0.10	0.030	(0.165)	0.015	0.015	
268	22.33	0.07	0.020	(0.165)	0.010	0.010	
269	22.42	0.07	0.020	(0.164)	0.010	0.010	
270	22.50	0.07	0.020	(0.164)	0.010	0.010	
271	22.58	0.07	0.020	(0.163)	0.010	0.010	
272	22.67	0.07	0.020	(0.163)	0.010	0.010	
273	22.75	0.07	0.020	(0.162)	0.010	0.010	
274	22.83	0.07	0.020	(0.162)	0.010	0.010	
275	22.92	0.07	0.020	(0.161)	0.010	0.010	
276	23.00	0.07	0.020	(0.161)	0.010	0.010	
277	23.08	0.07	0.020	(0.161)	0.010	0.010	
278	23.17	0.07	0.020	(0.160)	0.010	0.010	
279	23.25	0.07	0.020	(0.160)	0.010	0.010	
280	23.33	0.07	0.020	(0.160)	0.010	0.010	
281	23.42	0.07	0.020	(0.159)	0.010	0.010	
282	23.50	0.07	0.020	(0.159)	0.010	0.010	
283	23.58	0.07	0.020	(0.159)	0.010	0.010	
284	23.67	0.07	0.020	(0.158)	0.010	0.010	
285	23.75	0.07	0.020	(0.158)	0.010	0.010	
286	23.83	0.07	0.020	(0.158)	0.010	0.010	
287	23.92	0.07	0.020	(0.158)	0.010	0.010	
288	24.00	0.07	0.020	(0.158)	0.010	0.010	

(Loss Rate Not Used)

Sum = 100.0 Sum = 15.0

Flood volume = Effective rainfall 1.25(In)

times area 9.4(Ac.)/[(In)/(Ft.)] = 1.0(Ac.Ft)

Total soil loss = 1.25(In)

Total soil loss = 0.984(Ac.Ft)

Total rainfall = 2.50(In)

Flood volume = 42878.6 Cubic Feet

Total soil loss = 42878.6 Cubic Feet

Peak flow rate of this hydrograph = 1.599(CFS)

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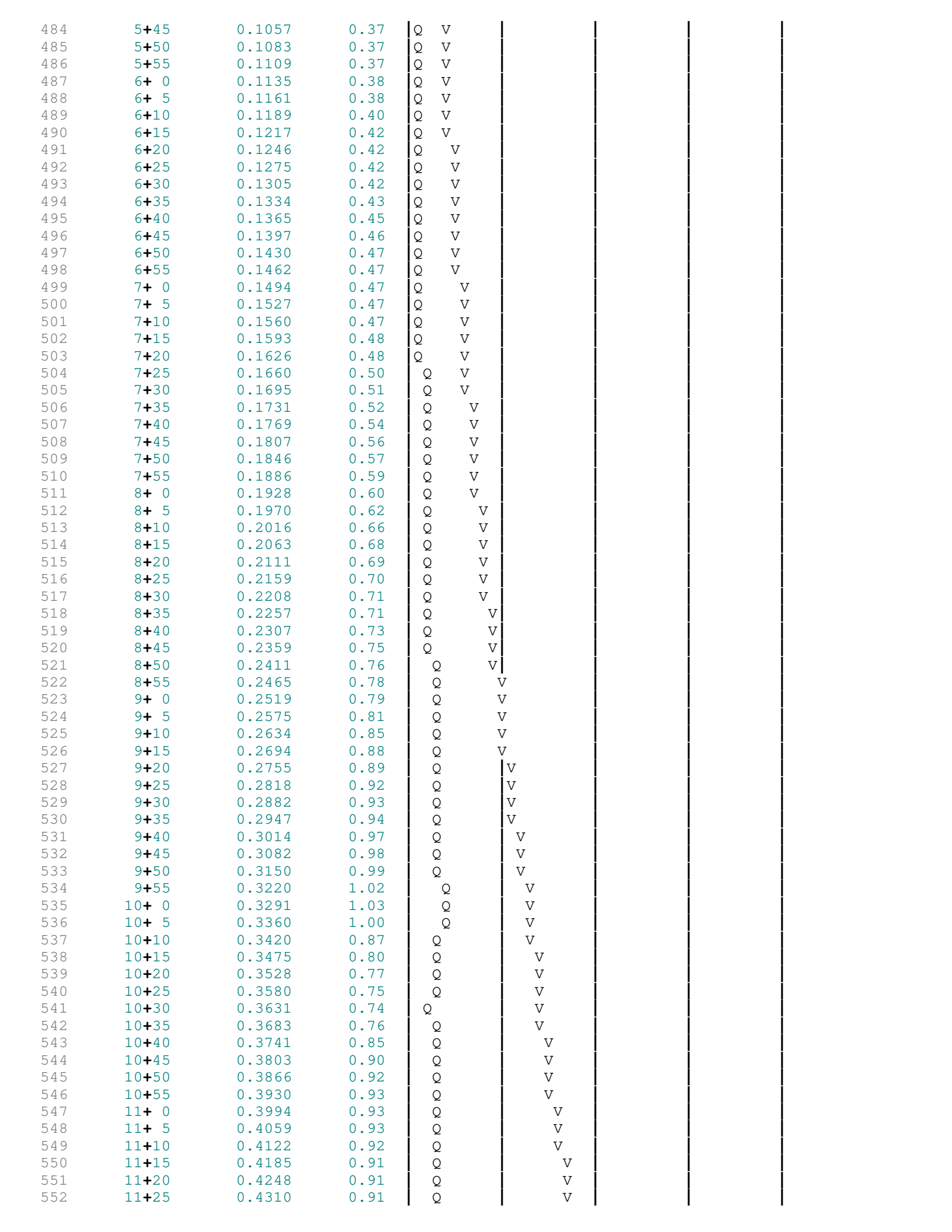
24 - H O U R S T O R M

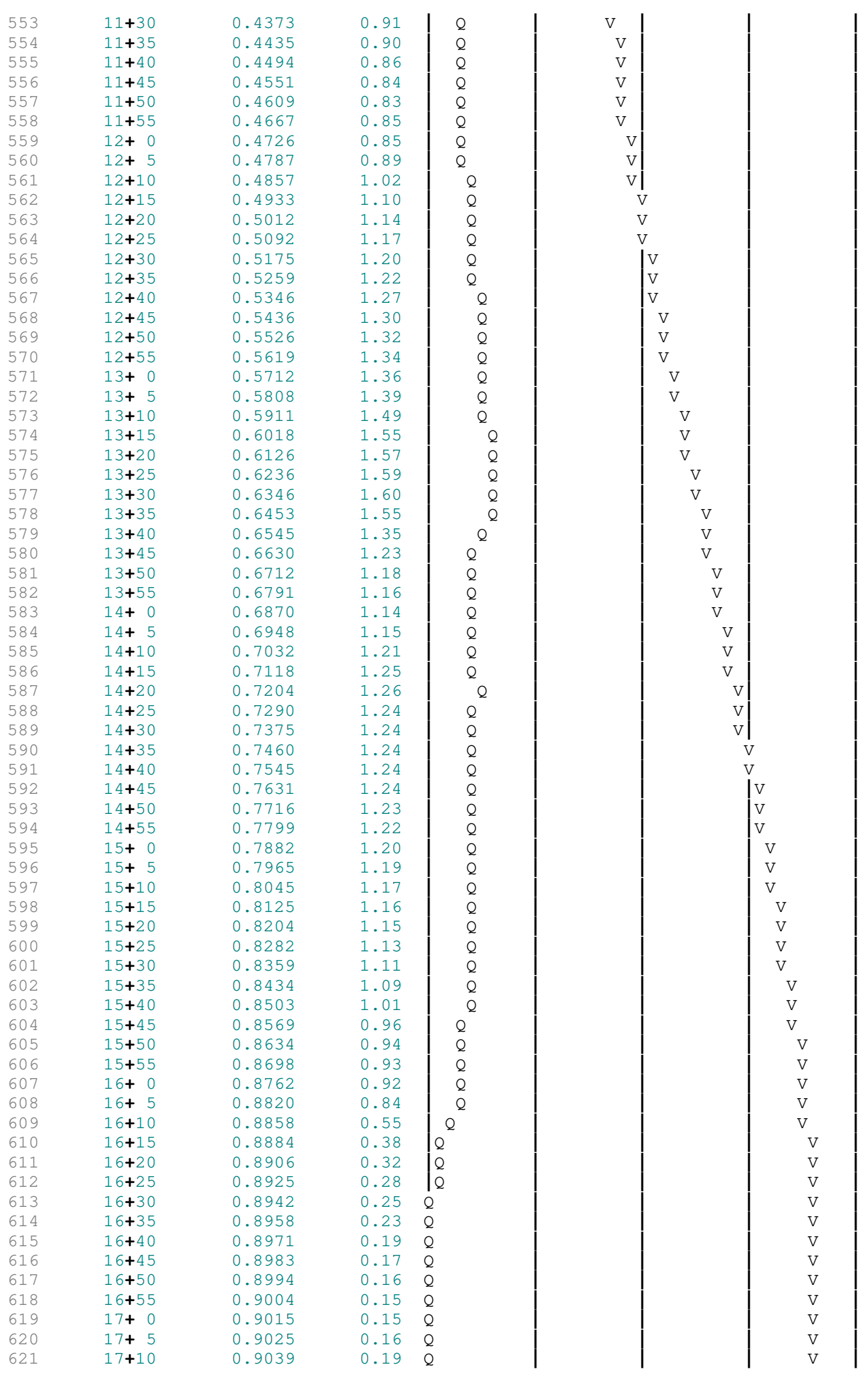
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0

0+ 5	0.0001	0.01	Q				
0+10	0.0004	0.05	Q				
0+15	0.0009	0.07	Q				
0+20	0.0015	0.08	Q				
0+25	0.0022	0.11	Q				
0+30	0.0030	0.12	Q				
0+35	0.0039	0.13	Q				
0+40	0.0049	0.13	Q				
0+45	0.0058	0.14	Q				
0+50	0.0068	0.14	Q				
0+55	0.0079	0.16	Q				
1+ 0	0.0091	0.18	Q				
1+ 5	0.0104	0.18	Q				
1+10	0.0115	0.16	Q				
1+15	0.0125	0.15	Q				
1+20	0.0135	0.15	Q				
1+25	0.0145	0.15	Q				
1+30	0.0155	0.15	Q				
1+35	0.0165	0.14	Q				
1+40	0.0175	0.14	Q				
1+45	0.0185	0.14	Q				
1+50	0.0196	0.15	Q				
1+55	0.0207	0.17	Q				
2+ 0	0.0219	0.18	Q				
2+ 5	0.0232	0.18	Q				
2+10	0.0245	0.18	Q				
2+15	0.0257	0.19	QV				
2+20	0.0270	0.19	QV				
2+25	0.0283	0.19	QV				
2+30	0.0296	0.19	QV				
2+35	0.0310	0.19	QV				
2+40	0.0325	0.21	QV				
2+45	0.0340	0.23	QV				
2+50	0.0356	0.23	QV				
2+55	0.0372	0.23	QV				
3+ 0	0.0388	0.23	QV				
3+ 5	0.0404	0.24	QV				
3+10	0.0421	0.24	QV				
3+15	0.0437	0.24	QV				
3+20	0.0453	0.24	QV				
3+25	0.0470	0.24	QV				
3+30	0.0486	0.24	QV				
3+35	0.0503	0.24	Q V				
3+40	0.0519	0.24	Q V				
3+45	0.0535	0.24	Q V				
3+50	0.0552	0.24	Q V				
3+55	0.0570	0.26	QV				
4+ 0	0.0589	0.27	QV				
4+ 5	0.0608	0.28	QV				
4+10	0.0627	0.28	QV				
4+15	0.0647	0.28	QV				
4+20	0.0667	0.29	QV				
4+25	0.0688	0.31	QV				
4+30	0.0710	0.32	QV				
4+35	0.0732	0.32	QV				
4+40	0.0755	0.33	Q V				
4+45	0.0778	0.33	Q V				
4+50	0.0801	0.34	Q V				
4+55	0.0825	0.36	Q V				
5+ 0	0.0850	0.37	Q V				
5+ 5	0.0875	0.36	Q V				
5+10	0.0898	0.33	Q V				
5+15	0.0919	0.31	Q V				
5+20	0.0940	0.30	Q V				
5+25	0.0962	0.32	Q V				
5+30	0.0985	0.33	Q V				
5+35	0.1008	0.33	Q V				
5+40	0.1032	0.36	Q V				





622	17+15	0.9053	0.21	Q			V	
623	17+20	0.9069	0.22	Q			V	
624	17+25	0.9084	0.23	Q			V	
625	17+30	0.9100	0.23	Q			V	
626	17+35	0.9116	0.23	Q			V	
627	17+40	0.9132	0.23	Q			V	
628	17+45	0.9149	0.24	Q			V	
629	17+50	0.9165	0.23	Q			V	
630	17+55	0.9179	0.21	Q			V	
631	18+ 0	0.9193	0.20	Q			V	
632	18+ 5	0.9207	0.20	Q			V	
633	18+10	0.9221	0.20	Q			V	
634	18+15	0.9234	0.19	Q			V	
635	18+20	0.9247	0.19	Q			V	
636	18+25	0.9260	0.19	Q			V	
637	18+30	0.9274	0.19	Q			V	
638	18+35	0.9286	0.19	Q			V	
639	18+40	0.9298	0.17	Q			V	
640	18+45	0.9309	0.16	Q			V	
641	18+50	0.9319	0.15	Q			V	
642	18+55	0.9327	0.12	Q			V	
643	19+ 0	0.9335	0.11	Q			V	
644	19+ 5	0.9343	0.11	Q			V	
645	19+10	0.9351	0.13	Q			V	
646	19+15	0.9361	0.14	Q			V	
647	19+20	0.9371	0.14	Q			V	
648	19+25	0.9382	0.16	Q			V	
649	19+30	0.9394	0.18	Q			V	
650	19+35	0.9406	0.18	Q			V	
651	19+40	0.9417	0.16	Q			V	
652	19+45	0.9427	0.15	Q			V	
653	19+50	0.9437	0.14	Q			V	
654	19+55	0.9446	0.12	Q			V	
655	20+ 0	0.9453	0.11	Q			V	
656	20+ 5	0.9461	0.11	Q			V	
657	20+10	0.9470	0.13	Q			V	
658	20+15	0.9479	0.14	Q			V	
659	20+20	0.9488	0.14	Q			V	
660	20+25	0.9498	0.14	Q			V	
661	20+30	0.9508	0.14	Q			V	
662	20+35	0.9517	0.14	Q			V	
663	20+40	0.9527	0.14	Q			V	
664	20+45	0.9537	0.14	Q			V	
665	20+50	0.9546	0.14	Q			V	
666	20+55	0.9554	0.12	Q			V	
667	21+ 0	0.9562	0.11	Q			V	
668	21+ 5	0.9569	0.11	Q			V	
669	21+10	0.9578	0.12	Q			V	
670	21+15	0.9587	0.13	Q			V	
671	21+20	0.9596	0.13	Q			V	
672	21+25	0.9604	0.12	Q			V	
673	21+30	0.9611	0.11	Q			V	
674	21+35	0.9619	0.11	Q			V	
675	21+40	0.9627	0.12	Q			V	
676	21+45	0.9636	0.13	Q			V	
677	21+50	0.9646	0.13	Q			V	
678	21+55	0.9653	0.11	Q			V	
679	22+ 0	0.9661	0.11	Q			V	
680	22+ 5	0.9668	0.11	Q			V	
681	22+10	0.9677	0.12	Q			V	
682	22+15	0.9686	0.13	Q			V	
683	22+20	0.9695	0.13	Q			V	
684	22+25	0.9703	0.11	Q			V	
685	22+30	0.9710	0.11	Q			V	
686	22+35	0.9717	0.10	Q			V	
687	22+40	0.9724	0.10	Q			V	
688	22+45	0.9731	0.10	Q			V	
689	22+50	0.9737	0.10	Q			V	
690	22+55	0.9744	0.10	Q			V	

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    23+ 0       0.9751      0.10  Q          |          |          |          V|
    23+ 5       0.9757      0.10  Q          |          |          |          V|
    23+10       0.9764      0.10  Q          |          |          |          V|
    23+15       0.9770      0.10  Q          |          |          |          V|
    23+20       0.9777      0.10  Q          |          |          |          V|
    23+25       0.9783      0.10  Q          |          |          |          V|
    23+30       0.9790      0.10  Q          |          |          |          V|
    23+35       0.9797      0.10  Q          |          |          |          V|
    23+40       0.9803      0.10  Q          |          |          |          V|
    23+45       0.9810      0.10  Q          |          |          |          V|
    23+50       0.9816      0.10  Q          |          |          |          V|
    23+55       0.9823      0.10  Q          |          |          |          V|
    24+ 0       0.9829      0.10  Q          |          |          |          V|
    24+ 5       0.9835      0.09  Q          |          |          |          V|
    24+10       0.9838      0.05  Q          |          |          |          V|
    24+15       0.9840      0.03  Q          |          |          |          V|
    24+20       0.9841      0.02  Q          |          |          |          V|
    24+25       0.9842      0.01  Q          |          |          |          V|
    24+30       0.9843      0.01  Q          |          |          |          V|
    24+35       0.9843      0.01  Q          |          |          |          V|
    24+40       0.9843      0.00  Q          |          |          |          V|
    24+45       0.9843      0.00  Q          |          |          |          V|
    24+50       0.9844      0.00  Q          |          |          |          V|
    24+55       0.9844      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  08/08/24 File: PTC2A242.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



------------------------------------------------------------------------
TEMESCAL CANYON PROPOSED OUTLFOW A
2 YEAR 24 HOUR
KIMLEY HORN

------------------------------------------------------------------------
Drainage Area =      11.27(Ac.)  =      0.018 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      11.27(Ac.)  =      0.018 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.237 Hr.
Lag time =    14.22 Min.
25% of lag time =     3.55 Min.
40% of lag time =     5.69 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]
       11.27            2.50               28.17

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       11.27            7.00               78.89

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    2.500(In)
Area Averaged 100-Year Rainfall =    7.000(In)

Point rain (area averaged) =    2.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    2.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    11.270           69.00          0.100
 Total Area Entered =     11.27(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)       (Dec.)    (In/Hr)
```

69.0	49.8	0.574	0.100	0.522	1.000	0.522

Sum (F) = 0.522

Area averaged **mean** soil loss (F) (In/Hr) = 0.522

Minimum soil loss rate ((In/Hr)) = 0.261

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.824

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

VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	35.162	3.609	0.410
2	0.167	70.323	14.198	1.613
3	0.250	105.485	23.408	2.659
4	0.333	140.647	19.529	2.218
5	0.417	175.809	10.317	1.172
6	0.500	210.970	5.913	0.672
7	0.583	246.132	4.325	0.491
8	0.667	281.294	3.396	0.386
9	0.750	316.456	2.678	0.304
10	0.833	351.617	2.169	0.246
11	0.917	386.779	1.803	0.205
12	1.000	421.941	1.465	0.166
13	1.083	457.103	1.154	0.131
14	1.167	492.264	1.077	0.122
15	1.250	527.426	0.969	0.110
16	1.333	562.588	0.771	0.088
17	1.417	597.750	0.662	0.075
18	1.500	632.911	0.571	0.065
19	1.583	668.073	0.474	0.054
20	1.667	703.235	0.368	0.042
21	1.750	738.397	0.352	0.040
22	1.833	773.558	0.352	0.040
23	1.917	808.720	0.440	0.050
		Sum = 100.000	Sum= 11.358	

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	(0.926)	0.016	0.004
2	0.17	0.07	0.020	(0.922)	0.016	0.004
3	0.25	0.07	0.020	(0.919)	0.016	0.004
4	0.33	0.10	0.030	(0.915)	0.025	0.005
5	0.42	0.10	0.030	(0.912)	0.025	0.005
6	0.50	0.10	0.030	(0.908)	0.025	0.005
7	0.58	0.10	0.030	(0.905)	0.025	0.005
8	0.67	0.10	0.030	(0.901)	0.025	0.005
9	0.75	0.10	0.030	(0.897)	0.025	0.005
10	0.83	0.13	0.040	(0.894)	0.033	0.007
11	0.92	0.13	0.040	(0.890)	0.033	0.007
12	1.00	0.13	0.040	(0.887)	0.033	0.007
13	1.08	0.10	0.030	(0.883)	0.025	0.005
14	1.17	0.10	0.030	(0.880)	0.025	0.005
15	1.25	0.10	0.030	(0.876)	0.025	0.005
16	1.33	0.10	0.030	(0.873)	0.025	0.005
17	1.42	0.10	0.030	(0.869)	0.025	0.005
18	1.50	0.10	0.030	(0.866)	0.025	0.005
19	1.58	0.10	0.030	(0.863)	0.025	0.005
20	1.67	0.10	0.030	(0.859)	0.025	0.005
21	1.75	0.10	0.030	(0.856)	0.025	0.005

139	22	1.83	0.13	0.040	(	0.852)	0.033	0.007
140	23	1.92	0.13	0.040	(	0.849)	0.033	0.007
141	24	2.00	0.13	0.040	(	0.845)	0.033	0.007
142	25	2.08	0.13	0.040	(	0.842)	0.033	0.007
143	26	2.17	0.13	0.040	(	0.838)	0.033	0.007
144	27	2.25	0.13	0.040	(	0.835)	0.033	0.007
145	28	2.33	0.13	0.040	(	0.832)	0.033	0.007
146	29	2.42	0.13	0.040	(	0.828)	0.033	0.007
147	30	2.50	0.13	0.040	(	0.825)	0.033	0.007
148	31	2.58	0.17	0.050	(	0.822)	0.041	0.009
149	32	2.67	0.17	0.050	(	0.818)	0.041	0.009
150	33	2.75	0.17	0.050	(	0.815)	0.041	0.009
151	34	2.83	0.17	0.050	(	0.811)	0.041	0.009
152	35	2.92	0.17	0.050	(	0.808)	0.041	0.009
153	36	3.00	0.17	0.050	(	0.805)	0.041	0.009
154	37	3.08	0.17	0.050	(	0.801)	0.041	0.009
155	38	3.17	0.17	0.050	(	0.798)	0.041	0.009
156	39	3.25	0.17	0.050	(	0.795)	0.041	0.009
157	40	3.33	0.17	0.050	(	0.791)	0.041	0.009
158	41	3.42	0.17	0.050	(	0.788)	0.041	0.009
159	42	3.50	0.17	0.050	(	0.785)	0.041	0.009
160	43	3.58	0.17	0.050	(	0.782)	0.041	0.009
161	44	3.67	0.17	0.050	(	0.778)	0.041	0.009
162	45	3.75	0.17	0.050	(	0.775)	0.041	0.009
163	46	3.83	0.20	0.060	(	0.772)	0.049	0.011
164	47	3.92	0.20	0.060	(	0.768)	0.049	0.011
165	48	4.00	0.20	0.060	(	0.765)	0.049	0.011
166	49	4.08	0.20	0.060	(	0.762)	0.049	0.011
167	50	4.17	0.20	0.060	(	0.759)	0.049	0.011
168	51	4.25	0.20	0.060	(	0.756)	0.049	0.011
169	52	4.33	0.23	0.070	(	0.752)	0.058	0.012
170	53	4.42	0.23	0.070	(	0.749)	0.058	0.012
171	54	4.50	0.23	0.070	(	0.746)	0.058	0.012
172	55	4.58	0.23	0.070	(	0.743)	0.058	0.012
173	56	4.67	0.23	0.070	(	0.739)	0.058	0.012
174	57	4.75	0.23	0.070	(	0.736)	0.058	0.012
175	58	4.83	0.27	0.080	(	0.733)	0.066	0.014
176	59	4.92	0.27	0.080	(	0.730)	0.066	0.014
177	60	5.00	0.27	0.080	(	0.727)	0.066	0.014
178	61	5.08	0.20	0.060	(	0.724)	0.049	0.011
179	62	5.17	0.20	0.060	(	0.720)	0.049	0.011
180	63	5.25	0.20	0.060	(	0.717)	0.049	0.011
181	64	5.33	0.23	0.070	(	0.714)	0.058	0.012
182	65	5.42	0.23	0.070	(	0.711)	0.058	0.012
183	66	5.50	0.23	0.070	(	0.708)	0.058	0.012
184	67	5.58	0.27	0.080	(	0.705)	0.066	0.014
185	68	5.67	0.27	0.080	(	0.702)	0.066	0.014
186	69	5.75	0.27	0.080	(	0.699)	0.066	0.014
187	70	5.83	0.27	0.080	(	0.696)	0.066	0.014
188	71	5.92	0.27	0.080	(	0.693)	0.066	0.014
189	72	6.00	0.27	0.080	(	0.689)	0.066	0.014
190	73	6.08	0.30	0.090	(	0.686)	0.074	0.016
191	74	6.17	0.30	0.090	(	0.683)	0.074	0.016
192	75	6.25	0.30	0.090	(	0.680)	0.074	0.016
193	76	6.33	0.30	0.090	(	0.677)	0.074	0.016
194	77	6.42	0.30	0.090	(	0.674)	0.074	0.016
195	78	6.50	0.30	0.090	(	0.671)	0.074	0.016
196	79	6.58	0.33	0.100	(	0.668)	0.082	0.018
197	80	6.67	0.33	0.100	(	0.665)	0.082	0.018
198	81	6.75	0.33	0.100	(	0.662)	0.082	0.018
199	82	6.83	0.33	0.100	(	0.659)	0.082	0.018
200	83	6.92	0.33	0.100	(	0.656)	0.082	0.018
201	84	7.00	0.33	0.100	(	0.653)	0.082	0.018
202	85	7.08	0.33	0.100	(	0.650)	0.082	0.018
203	86	7.17	0.33	0.100	(	0.647)	0.082	0.018
204	87	7.25	0.33	0.100	(	0.644)	0.082	0.018
205	88	7.33	0.37	0.110	(	0.641)	0.091	0.019
206	89	7.42	0.37	0.110	(	0.638)	0.091	0.019
207	90	7.50	0.37	0.110	(	0.636)	0.091	0.019

208	91	7.58	0.40	0.120	(0.633)	0.099	0.021
209	92	7.67	0.40	0.120	(0.630)	0.099	0.021
210	93	7.75	0.40	0.120	(0.627)	0.099	0.021
211	94	7.83	0.43	0.130	(0.624)	0.107	0.023
212	95	7.92	0.43	0.130	(0.621)	0.107	0.023
213	96	8.00	0.43	0.130	(0.618)	0.107	0.023
214	97	8.08	0.50	0.150	(0.615)	0.124	0.026
215	98	8.17	0.50	0.150	(0.612)	0.124	0.026
216	99	8.25	0.50	0.150	(0.610)	0.124	0.026
217	100	8.33	0.50	0.150	(0.607)	0.124	0.026
218	101	8.42	0.50	0.150	(0.604)	0.124	0.026
219	102	8.50	0.50	0.150	(0.601)	0.124	0.026
220	103	8.58	0.53	0.160	(0.598)	0.132	0.028
221	104	8.67	0.53	0.160	(0.595)	0.132	0.028
222	105	8.75	0.53	0.160	(0.593)	0.132	0.028
223	106	8.83	0.57	0.170	(0.590)	0.140	0.030
224	107	8.92	0.57	0.170	(0.587)	0.140	0.030
225	108	9.00	0.57	0.170	(0.584)	0.140	0.030
226	109	9.08	0.63	0.190	(0.581)	0.157	0.033
227	110	9.17	0.63	0.190	(0.579)	0.157	0.033
228	111	9.25	0.63	0.190	(0.576)	0.157	0.033
229	112	9.33	0.67	0.200	(0.573)	0.165	0.035
230	113	9.42	0.67	0.200	(0.570)	0.165	0.035
231	114	9.50	0.67	0.200	(0.568)	0.165	0.035
232	115	9.58	0.70	0.210	(0.565)	0.173	0.037
233	116	9.67	0.70	0.210	(0.562)	0.173	0.037
234	117	9.75	0.70	0.210	(0.560)	0.173	0.037
235	118	9.83	0.73	0.220	(0.557)	0.181	0.039
236	119	9.92	0.73	0.220	(0.554)	0.181	0.039
237	120	10.00	0.73	0.220	(0.552)	0.181	0.039
238	121	10.08	0.50	0.150	(0.549)	0.124	0.026
239	122	10.17	0.50	0.150	(0.546)	0.124	0.026
240	123	10.25	0.50	0.150	(0.544)	0.124	0.026
241	124	10.33	0.50	0.150	(0.541)	0.124	0.026
242	125	10.42	0.50	0.150	(0.538)	0.124	0.026
243	126	10.50	0.50	0.150	(0.536)	0.124	0.026
244	127	10.58	0.67	0.200	(0.533)	0.165	0.035
245	128	10.67	0.67	0.200	(0.530)	0.165	0.035
246	129	10.75	0.67	0.200	(0.528)	0.165	0.035
247	130	10.83	0.67	0.200	(0.525)	0.165	0.035
248	131	10.92	0.67	0.200	(0.523)	0.165	0.035
249	132	11.00	0.67	0.200	(0.520)	0.165	0.035
250	133	11.08	0.63	0.190	(0.518)	0.157	0.033
251	134	11.17	0.63	0.190	(0.515)	0.157	0.033
252	135	11.25	0.63	0.190	(0.512)	0.157	0.033
253	136	11.33	0.63	0.190	(0.510)	0.157	0.033
254	137	11.42	0.63	0.190	(0.507)	0.157	0.033
255	138	11.50	0.63	0.190	(0.505)	0.157	0.033
256	139	11.58	0.57	0.170	(0.502)	0.140	0.030
257	140	11.67	0.57	0.170	(0.500)	0.140	0.030
258	141	11.75	0.57	0.170	(0.497)	0.140	0.030
259	142	11.83	0.60	0.180	(0.495)	0.148	0.032
260	143	11.92	0.60	0.180	(0.492)	0.148	0.032
261	144	12.00	0.60	0.180	(0.490)	0.148	0.032
262	145	12.08	0.83	0.250	(0.488)	0.206	0.044
263	146	12.17	0.83	0.250	(0.485)	0.206	0.044
264	147	12.25	0.83	0.250	(0.483)	0.206	0.044
265	148	12.33	0.87	0.260	(0.480)	0.214	0.046
266	149	12.42	0.87	0.260	(0.478)	0.214	0.046
267	150	12.50	0.87	0.260	(0.475)	0.214	0.046
268	151	12.58	0.93	0.280	(0.473)	0.231	0.049
269	152	12.67	0.93	0.280	(0.471)	0.231	0.049
270	153	12.75	0.93	0.280	(0.468)	0.231	0.049
271	154	12.83	0.97	0.290	(0.466)	0.239	0.051
272	155	12.92	0.97	0.290	(0.464)	0.239	0.051
273	156	13.00	0.97	0.290	(0.461)	0.239	0.051
274	157	13.08	1.13	0.340	(0.459)	0.280	0.060
275	158	13.17	1.13	0.340	(0.457)	0.280	0.060
276	159	13.25	1.13	0.340	(0.454)	0.280	0.060

277	160	13.33	1.13	0.340	(0.452)	0.280	0.060
278	161	13.42	1.13	0.340	(0.450)	0.280	0.060
279	162	13.50	1.13	0.340	(0.447)	0.280	0.060
280	163	13.58	0.77	0.230	(0.445)	0.190	0.040
281	164	13.67	0.77	0.230	(0.443)	0.190	0.040
282	165	13.75	0.77	0.230	(0.441)	0.190	0.040
283	166	13.83	0.77	0.230	(0.438)	0.190	0.040
284	167	13.92	0.77	0.230	(0.436)	0.190	0.040
285	168	14.00	0.77	0.230	(0.434)	0.190	0.040
286	169	14.08	0.90	0.270	(0.432)	0.222	0.048
287	170	14.17	0.90	0.270	(0.429)	0.222	0.048
288	171	14.25	0.90	0.270	(0.427)	0.222	0.048
289	172	14.33	0.87	0.260	(0.425)	0.214	0.046
290	173	14.42	0.87	0.260	(0.423)	0.214	0.046
291	174	14.50	0.87	0.260	(0.421)	0.214	0.046
292	175	14.58	0.87	0.260	(0.419)	0.214	0.046
293	176	14.67	0.87	0.260	(0.416)	0.214	0.046
294	177	14.75	0.87	0.260	(0.414)	0.214	0.046
295	178	14.83	0.83	0.250	(0.412)	0.206	0.044
296	179	14.92	0.83	0.250	(0.410)	0.206	0.044
297	180	15.00	0.83	0.250	(0.408)	0.206	0.044
298	181	15.08	0.80	0.240	(0.406)	0.198	0.042
299	182	15.17	0.80	0.240	(0.404)	0.198	0.042
300	183	15.25	0.80	0.240	(0.402)	0.198	0.042
301	184	15.33	0.77	0.230	(0.400)	0.190	0.040
302	185	15.42	0.77	0.230	(0.398)	0.190	0.040
303	186	15.50	0.77	0.230	(0.396)	0.190	0.040
304	187	15.58	0.63	0.190	(0.394)	0.157	0.033
305	188	15.67	0.63	0.190	(0.392)	0.157	0.033
306	189	15.75	0.63	0.190	(0.390)	0.157	0.033
307	190	15.83	0.63	0.190	(0.388)	0.157	0.033
308	191	15.92	0.63	0.190	(0.386)	0.157	0.033
309	192	16.00	0.63	0.190	(0.384)	0.157	0.033
310	193	16.08	0.13	0.040	(0.382)	0.033	0.007
311	194	16.17	0.13	0.040	(0.380)	0.033	0.007
312	195	16.25	0.13	0.040	(0.378)	0.033	0.007
313	196	16.33	0.13	0.040	(0.376)	0.033	0.007
314	197	16.42	0.13	0.040	(0.374)	0.033	0.007
315	198	16.50	0.13	0.040	(0.372)	0.033	0.007
316	199	16.58	0.10	0.030	(0.370)	0.025	0.005
317	200	16.67	0.10	0.030	(0.368)	0.025	0.005
318	201	16.75	0.10	0.030	(0.366)	0.025	0.005
319	202	16.83	0.10	0.030	(0.364)	0.025	0.005
320	203	16.92	0.10	0.030	(0.363)	0.025	0.005
321	204	17.00	0.10	0.030	(0.361)	0.025	0.005
322	205	17.08	0.17	0.050	(0.359)	0.041	0.009
323	206	17.17	0.17	0.050	(0.357)	0.041	0.009
324	207	17.25	0.17	0.050	(0.355)	0.041	0.009
325	208	17.33	0.17	0.050	(0.354)	0.041	0.009
326	209	17.42	0.17	0.050	(0.352)	0.041	0.009
327	210	17.50	0.17	0.050	(0.350)	0.041	0.009
328	211	17.58	0.17	0.050	(0.348)	0.041	0.009
329	212	17.67	0.17	0.050	(0.347)	0.041	0.009
330	213	17.75	0.17	0.050	(0.345)	0.041	0.009
331	214	17.83	0.13	0.040	(0.343)	0.033	0.007
332	215	17.92	0.13	0.040	(0.341)	0.033	0.007
333	216	18.00	0.13	0.040	(0.340)	0.033	0.007
334	217	18.08	0.13	0.040	(0.338)	0.033	0.007
335	218	18.17	0.13	0.040	(0.336)	0.033	0.007
336	219	18.25	0.13	0.040	(0.335)	0.033	0.007
337	220	18.33	0.13	0.040	(0.333)	0.033	0.007
338	221	18.42	0.13	0.040	(0.331)	0.033	0.007
339	222	18.50	0.13	0.040	(0.330)	0.033	0.007
340	223	18.58	0.10	0.030	(0.328)	0.025	0.005
341	224	18.67	0.10	0.030	(0.327)	0.025	0.005
342	225	18.75	0.10	0.030	(0.325)	0.025	0.005
343	226	18.83	0.07	0.020	(0.324)	0.016	0.004
344	227	18.92	0.07	0.020	(0.322)	0.016	0.004
345	228	19.00	0.07	0.020	(0.321)	0.016	0.004

229	19.08	0.10	0.030	(	0.319)	0.025	0.005
230	19.17	0.10	0.030	(	0.317)	0.025	0.005
231	19.25	0.10	0.030	(	0.316)	0.025	0.005
232	19.33	0.13	0.040	(	0.315)	0.033	0.007
233	19.42	0.13	0.040	(	0.313)	0.033	0.007
234	19.50	0.13	0.040	(	0.312)	0.033	0.007
235	19.58	0.10	0.030	(	0.310)	0.025	0.005
236	19.67	0.10	0.030	(	0.309)	0.025	0.005
237	19.75	0.10	0.030	(	0.307)	0.025	0.005
238	19.83	0.07	0.020	(	0.306)	0.016	0.004
239	19.92	0.07	0.020	(	0.305)	0.016	0.004
240	20.00	0.07	0.020	(	0.303)	0.016	0.004
241	20.08	0.10	0.030	(	0.302)	0.025	0.005
242	20.17	0.10	0.030	(	0.301)	0.025	0.005
243	20.25	0.10	0.030	(	0.299)	0.025	0.005
244	20.33	0.10	0.030	(	0.298)	0.025	0.005
245	20.42	0.10	0.030	(	0.297)	0.025	0.005
246	20.50	0.10	0.030	(	0.295)	0.025	0.005
247	20.58	0.10	0.030	(	0.294)	0.025	0.005
248	20.67	0.10	0.030	(	0.293)	0.025	0.005
249	20.75	0.10	0.030	(	0.292)	0.025	0.005
250	20.83	0.07	0.020	(	0.291)	0.016	0.004
251	20.92	0.07	0.020	(	0.289)	0.016	0.004
252	21.00	0.07	0.020	(	0.288)	0.016	0.004
253	21.08	0.10	0.030	(	0.287)	0.025	0.005
254	21.17	0.10	0.030	(	0.286)	0.025	0.005
255	21.25	0.10	0.030	(	0.285)	0.025	0.005
256	21.33	0.07	0.020	(	0.284)	0.016	0.004
257	21.42	0.07	0.020	(	0.283)	0.016	0.004
258	21.50	0.07	0.020	(	0.282)	0.016	0.004
259	21.58	0.10	0.030	(	0.281)	0.025	0.005
260	21.67	0.10	0.030	(	0.280)	0.025	0.005
261	21.75	0.10	0.030	(	0.279)	0.025	0.005
262	21.83	0.07	0.020	(	0.278)	0.016	0.004
263	21.92	0.07	0.020	(	0.277)	0.016	0.004
264	22.00	0.07	0.020	(	0.276)	0.016	0.004
265	22.08	0.10	0.030	(	0.275)	0.025	0.005
266	22.17	0.10	0.030	(	0.274)	0.025	0.005
267	22.25	0.10	0.030	(	0.273)	0.025	0.005
268	22.33	0.07	0.020	(	0.272)	0.016	0.004
269	22.42	0.07	0.020	(	0.271)	0.016	0.004
270	22.50	0.07	0.020	(	0.271)	0.016	0.004
271	22.58	0.07	0.020	(	0.270)	0.016	0.004
272	22.67	0.07	0.020	(	0.269)	0.016	0.004
273	22.75	0.07	0.020	(	0.268)	0.016	0.004
274	22.83	0.07	0.020	(	0.268)	0.016	0.004
275	22.92	0.07	0.020	(	0.267)	0.016	0.004
276	23.00	0.07	0.020	(	0.266)	0.016	0.004
277	23.08	0.07	0.020	(	0.266)	0.016	0.004
278	23.17	0.07	0.020	(	0.265)	0.016	0.004
279	23.25	0.07	0.020	(	0.265)	0.016	0.004
280	23.33	0.07	0.020	(	0.264)	0.016	0.004
281	23.42	0.07	0.020	(	0.263)	0.016	0.004
282	23.50	0.07	0.020	(	0.263)	0.016	0.004
283	23.58	0.07	0.020	(	0.263)	0.016	0.004
284	23.67	0.07	0.020	(	0.262)	0.016	0.004
285	23.75	0.07	0.020	(	0.262)	0.016	0.004
286	23.83	0.07	0.020	(	0.262)	0.016	0.004
287	23.92	0.07	0.020	(	0.261)	0.016	0.004
288	24.00	0.07	0.020	(	0.261)	0.016	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.3

Flood volume = Effective rainfall 0.44(In)

times area 11.3(Ac.)/[(In)/(Ft.)] = 0.4(Ac.Ft)

Total soil loss = 2.06(In)

Total soil loss = 1.935(Ac.Ft)

Total rainfall = 2.50(In)

Flood volume = 18000.0 Cubic Feet

Total soil loss = 84273.0 Cubic Feet

Peak flow rate of this hydrograph = 0.648(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	0.0001	0.01	Q				
0+15	0.0002	0.02	Q				
0+20	0.0003	0.03	Q				
0+25	0.0006	0.03	Q				
0+30	0.0008	0.04	Q				
0+35	0.0011	0.04	Q				
0+40	0.0015	0.05	Q				
0+45	0.0018	0.05	Q				
0+50	0.0022	0.05	Q				
0+55	0.0026	0.06	Q				
1+ 0	0.0030	0.06	Q				
1+ 5	0.0035	0.07	Q				
1+10	0.0039	0.07	Q				
1+15	0.0044	0.06	Q				
1+20	0.0048	0.06	Q				
1+25	0.0052	0.06	Q				
1+30	0.0056	0.06	Q				
1+35	0.0060	0.06	Q				
1+40	0.0065	0.06	Q				
1+45	0.0069	0.06	Q				
1+50	0.0073	0.06	Q				
1+55	0.0077	0.06	Q				
2+ 0	0.0082	0.07	Q				
2+ 5	0.0087	0.07	Q				
2+10	0.0092	0.07	Q				
2+15	0.0098	0.08	Q				
2+20	0.0103	0.08	Q				
2+25	0.0108	0.08	QV				
2+30	0.0113	0.08	QV				
2+35	0.0119	0.08	QV				
2+40	0.0125	0.08	QV				
2+45	0.0131	0.09	QV				
2+50	0.0137	0.09	QV				
2+55	0.0143	0.09	QV				
3+ 0	0.0150	0.09	QV				
3+ 5	0.0156	0.10	QV				
3+10	0.0163	0.10	QV				
3+15	0.0170	0.10	QV				
3+20	0.0176	0.10	QV				
3+25	0.0183	0.10	QV				
3+30	0.0190	0.10	QV				
3+35	0.0197	0.10	QV				
3+40	0.0204	0.10	QV				
3+45	0.0210	0.10	Q V				
3+50	0.0217	0.10	Q V				
3+55	0.0224	0.10	Q V				
4+ 0	0.0232	0.11	Q V				
4+ 5	0.0239	0.11	Q V				
4+10	0.0247	0.11	Q V				
4+15	0.0255	0.12	Q V				
4+20	0.0263	0.12	Q V				
4+25	0.0272	0.12	Q V				
4+30	0.0280	0.13	Q V				
4+35	0.0289	0.13	Q V				
4+40	0.0298	0.13	Q V				
4+45	0.0308	0.13	Q V				

484	4+50	0.0317	0.14	Q V	|	|	|	|
485	4+55	0.0327	0.14	Q V	|	|	|	|
486	5+ 0	0.0337	0.14	Q V	|	|	|	|
487	5+ 5	0.0347	0.15	Q V	|	|	|	|
488	5+10	0.0357	0.14	Q V	|	|	|	|
489	5+15	0.0366	0.14	Q V	|	|	|	|
490	5+20	0.0375	0.13	Q V	|	|	|	|
491	5+25	0.0384	0.13	Q V	|	|	|	|
492	5+30	0.0393	0.13	Q V	|	|	|	|
493	5+35	0.0403	0.14	Q V	|	|	|	|
494	5+40	0.0413	0.14	Q V	|	|	|	|
495	5+45	0.0423	0.15	Q V	|	|	|	|
496	5+50	0.0433	0.15	Q V	|	|	|	|
497	5+55	0.0444	0.15	Q V	|	|	|	|
498	6+ 0	0.0454	0.15	Q V	|	|	|	|
499	6+ 5	0.0465	0.16	Q V	|	|	|	|
500	6+10	0.0476	0.16	Q V	|	|	|	|
501	6+15	0.0488	0.17	Q V	|	|	|	|
502	6+20	0.0499	0.17	Q V	|	|	|	|
503	6+25	0.0511	0.17	Q V	|	|	|	|
504	6+30	0.0523	0.17	Q V	|	|	|	|
505	6+35	0.0535	0.18	Q V	|	|	|	|
506	6+40	0.0548	0.18	Q V	|	|	|	|
507	6+45	0.0560	0.18	Q V	|	|	|	|
508	6+50	0.0573	0.19	Q V	|	|	|	|
509	6+55	0.0587	0.19	Q V	|	|	|	|
510	7+ 0	0.0600	0.19	Q V	|	|	|	|
511	7+ 5	0.0613	0.19	Q V	|	|	|	|
512	7+10	0.0627	0.20	Q V	|	|	|	|
513	7+15	0.0640	0.20	Q V	|	|	|	|
514	7+20	0.0654	0.20	Q V	|	|	|	|
515	7+25	0.0668	0.20	Q V	|	|	|	|
516	7+30	0.0682	0.21	Q V	|	|	|	|
517	7+35	0.0697	0.21	Q V	|	|	|	|
518	7+40	0.0711	0.22	Q V	|	|	|	|
519	7+45	0.0727	0.22	Q V	|	|	|	|
520	7+50	0.0743	0.23	Q V	|	|	|	|
521	7+55	0.0759	0.23	Q V	|	|	|	|
522	8+ 0	0.0775	0.24	Q V	|	|	|	|
523	8+ 5	0.0792	0.25	Q V	|	|	|	|
524	8+10	0.0810	0.26	|Q V	|	|	|	|
525	8+15	0.0828	0.27	|Q V	|	|	|	|
526	8+20	0.0847	0.28	|Q V	|	|	|	|
527	8+25	0.0867	0.28	|Q V	|	|	|	|
528	8+30	0.0887	0.29	|Q V	|	|	|	|
529	8+35	0.0907	0.29	|Q V	|	|	|	|
530	8+40	0.0927	0.29	|Q V	|	|	|	|
531	8+45	0.0947	0.30	|Q V	|	|	|	|
532	8+50	0.0969	0.31	|Q V	|	|	|	|
533	8+55	0.0990	0.31	|Q V	|	|	|	|
534	9+ 0	0.1012	0.32	|Q V	|	|	|	|
535	9+ 5	0.1035	0.33	|Q V	|	|	|	|
536	9+10	0.1058	0.34	|Q V	|	|	|	|
537	9+15	0.1082	0.35	|Q V	|	|	|	|
538	9+20	0.1106	0.36	|Q V	|	|	|	|
539	9+25	0.1131	0.37	|Q V	|	|	|	|
540	9+30	0.1157	0.37	|Q |V	|	|	|	|
541	9+35	0.1183	0.38	|Q |V	|	|	|	|
542	9+40	0.1210	0.39	|Q |V	|	|	|	|
543	9+45	0.1238	0.40	|Q |V	|	|	|	|
544	9+50	0.1265	0.40	|Q | V	|	|	|	|
545	9+55	0.1293	0.41	|Q | V	|	|	|	|
546	10+ 0	0.1322	0.42	|Q | V	|	|	|	|
547	10+ 5	0.1351	0.42	|Q | V	|	|	|	|
548	10+10	0.1379	0.40	|Q | V	|	|	|	|
549	10+15	0.1404	0.37	|Q | V	|	|	|	|
550	10+20	0.1428	0.35	|Q | V	|	|	|	|
551	10+25	0.1451	0.33	|Q | V	|	|	|	|
552	10+30	0.1474	0.33	|Q | V	|	|	|	|

553	10+35	0.1496	0.33	Q	V		
554	10+40	0.1519	0.34	Q	V		
555	10+45	0.1544	0.36	Q	V		
556	10+50	0.1569	0.37	Q	V		
557	10+55	0.1596	0.38	Q	V		
558	11+ 0	0.1622	0.39	Q	V		
559	11+ 5	0.1649	0.39	Q	V		
560	11+10	0.1675	0.39	Q	V		
561	11+15	0.1702	0.38	Q	V		
562	11+20	0.1728	0.38	Q	V		
563	11+25	0.1754	0.38	Q	V		
564	11+30	0.1781	0.38	Q	V		
565	11+35	0.1807	0.38	Q	V		
566	11+40	0.1832	0.37	Q	V		
567	11+45	0.1857	0.36	Q	V		
568	11+50	0.1882	0.36	Q	V		
569	11+55	0.1906	0.35	Q	V		
570	12+ 0	0.1931	0.36	Q	V		
571	12+ 5	0.1956	0.36	Q	V		
572	12+10	0.1982	0.39	Q	V		
573	12+15	0.2011	0.42	Q	V		
574	12+20	0.2042	0.45	Q	V		
575	12+25	0.2074	0.46	Q	V		
576	12+30	0.2107	0.48	Q	V		
577	12+35	0.2140	0.49	Q	V		
578	12+40	0.2175	0.50	Q	V		
579	12+45	0.2210	0.51	Q	V		
580	12+50	0.2247	0.53	Q	V		
581	12+55	0.2284	0.54	Q	V		
582	13+ 0	0.2321	0.55	Q	V		
583	13+ 5	0.2360	0.56	Q	V		
584	13+10	0.2399	0.58	Q	V		
585	13+15	0.2441	0.60	Q	V		
586	13+20	0.2484	0.63	Q	V		
587	13+25	0.2528	0.64	Q	V		
588	13+30	0.2573	0.65	Q	V		
589	13+35	0.2617	0.65	Q	V		
590	13+40	0.2660	0.62	Q	V		
591	13+45	0.2699	0.57	Q	V		
592	13+50	0.2736	0.53	Q	V		
593	13+55	0.2771	0.51	Q	V		
594	14+ 0	0.2806	0.50	Q	V		
595	14+ 5	0.2840	0.50	Q	V		
596	14+10	0.2875	0.50	Q	V		
597	14+15	0.2910	0.52	Q	V		
598	14+20	0.2947	0.53	Q	V		
599	14+25	0.2983	0.53	Q	V		
600	14+30	0.3019	0.53	Q	V		
601	14+35	0.3055	0.52	Q	V		
602	14+40	0.3091	0.52	Q	V		
603	14+45	0.3127	0.52	Q	V		
604	14+50	0.3163	0.52	Q	V		
605	14+55	0.3199	0.52	Q	V		
606	15+ 0	0.3234	0.51	Q	V		
607	15+ 5	0.3269	0.51	Q	V		
608	15+10	0.3304	0.50	Q	V		
609	15+15	0.3338	0.50	Q	V		
610	15+20	0.3372	0.49	Q	V		
611	15+25	0.3405	0.48	Q	V		
612	15+30	0.3438	0.48	Q	V		
613	15+35	0.3471	0.47	Q	V		
614	15+40	0.3502	0.46	Q	V		
615	15+45	0.3532	0.44	Q	V		
616	15+50	0.3561	0.42	Q	V		
617	15+55	0.3589	0.41	Q	V		
618	16+ 0	0.3617	0.40	Q	V		
619	16+ 5	0.3643	0.39	Q	V		
620	16+10	0.3667	0.34	Q	V		
621	16+15	0.3686	0.27	Q	V		

622	16+20	0.3700	0.21	Q	|	|	|	V |
623	16+25	0.3712	0.18	Q	|	|	|	V |
624	16+30	0.3723	0.16	Q	|	|	|	V |
625	16+35	0.3732	0.14	Q	|	|	|	V |
626	16+40	0.3741	0.13	Q	|	|	|	V |
627	16+45	0.3749	0.11	Q	|	|	|	V |
628	16+50	0.3756	0.10	Q	|	|	|	V |
629	16+55	0.3763	0.09	Q	|	|	|	V |
630	17+ 0	0.3769	0.09	Q	|	|	|	V |
631	17+ 5	0.3774	0.08	Q	|	|	|	V |
632	17+10	0.3780	0.09	Q	|	|	|	V |
633	17+15	0.3787	0.09	Q	|	|	|	V |
634	17+20	0.3793	0.10	Q	|	|	|	V |
635	17+25	0.3800	0.10	Q	|	|	|	V |
636	17+30	0.3807	0.10	Q	|	|	|	V |
637	17+35	0.3814	0.10	Q	|	|	|	V |
638	17+40	0.3820	0.10	Q	|	|	|	V |
639	17+45	0.3827	0.10	Q	|	|	|	V |
640	17+50	0.3834	0.10	Q	|	|	|	V |
641	17+55	0.3840	0.09	Q	|	|	|	V |
642	18+ 0	0.3846	0.09	Q	|	|	|	V |
643	18+ 5	0.3852	0.09	Q	|	|	|	V |
644	18+10	0.3858	0.08	Q	|	|	|	V |
645	18+15	0.3864	0.08	Q	|	|	|	V |
646	18+20	0.3869	0.08	Q	|	|	|	V |
647	18+25	0.3875	0.08	Q	|	|	|	V |
648	18+30	0.3881	0.08	Q	|	|	|	V |
649	18+35	0.3886	0.08	Q	|	|	|	V |
650	18+40	0.3892	0.08	Q	|	|	|	V |
651	18+45	0.3897	0.07	Q	|	|	|	V |
652	18+50	0.3901	0.07	Q	|	|	|	V |
653	18+55	0.3906	0.06	Q	|	|	|	V |
654	19+ 0	0.3910	0.06	Q	|	|	|	V |
655	19+ 5	0.3913	0.05	Q	|	|	|	V |
656	19+10	0.3917	0.05	Q	|	|	|	V |
657	19+15	0.3921	0.06	Q	|	|	|	V |
658	19+20	0.3925	0.06	Q	|	|	|	V |
659	19+25	0.3929	0.06	Q	|	|	|	V |
660	19+30	0.3934	0.07	Q	|	|	|	V |
661	19+35	0.3939	0.07	Q	|	|	|	V |
662	19+40	0.3944	0.07	Q	|	|	|	V |
663	19+45	0.3948	0.07	Q	|	|	|	V |
664	19+50	0.3953	0.06	Q	|	|	|	V |
665	19+55	0.3957	0.06	Q	|	|	|	V |
666	20+ 0	0.3960	0.05	Q	|	|	|	V |
667	20+ 5	0.3964	0.05	Q	|	|	|	V |
668	20+10	0.3967	0.05	Q	|	|	|	V |
669	20+15	0.3971	0.05	Q	|	|	|	V |
670	20+20	0.3975	0.06	Q	|	|	|	V |
671	20+25	0.3979	0.06	Q	|	|	|	V |
672	20+30	0.3983	0.06	Q	|	|	|	V |
673	20+35	0.3987	0.06	Q	|	|	|	V |
674	20+40	0.3991	0.06	Q	|	|	|	V |
675	20+45	0.3995	0.06	Q	|	|	|	V |
676	20+50	0.3999	0.06	Q	|	|	|	V |
677	20+55	0.4003	0.06	Q	|	|	|	V |
678	21+ 0	0.4006	0.05	Q	|	|	|	V |
679	21+ 5	0.4010	0.05	Q	|	|	|	V |
680	21+10	0.4013	0.05	Q	|	|	|	V |
681	21+15	0.4017	0.05	Q	|	|	|	V |
682	21+20	0.4021	0.05	Q	|	|	|	V |
683	21+25	0.4024	0.05	Q	|	|	|	V |
684	21+30	0.4028	0.05	Q	|	|	|	V |
685	21+35	0.4031	0.05	Q	|	|	|	V|
686	21+40	0.4034	0.05	Q	|	|	|	V|
687	21+45	0.4038	0.05	Q	|	|	|	V|
688	21+50	0.4041	0.05	Q	|	|	|	V|
689	21+55	0.4045	0.05	Q	|	|	|	V|
690	22+ 0	0.4048	0.05	Q	|	|	|	V|

691	22+ 5	0.4052	0.05	Q	|	|	|	V|
692	22+10	0.4055	0.05	Q	|	|	|	V|
693	22+15	0.4058	0.05	Q	|	|	|	V|
694	22+20	0.4062	0.05	Q	|	|	|	V|
695	22+25	0.4066	0.05	Q	|	|	|	V|
696	22+30	0.4069	0.05	Q	|	|	|	V|
697	22+35	0.4072	0.05	Q	|	|	|	V|
698	22+40	0.4075	0.04	Q	|	|	|	V|
699	22+45	0.4078	0.04	Q	|	|	|	V|
700	22+50	0.4081	0.04	Q	|	|	|	V|
701	22+55	0.4084	0.04	Q	|	|	|	V|
702	23+ 0	0.4087	0.04	Q	|	|	|	V|
703	23+ 5	0.4090	0.04	Q	|	|	|	V|
704	23+10	0.4093	0.04	Q	|	|	|	V|
705	23+15	0.4095	0.04	Q	|	|	|	V|
706	23+20	0.4098	0.04	Q	|	|	|	V|
707	23+25	0.4101	0.04	Q	|	|	|	V|
708	23+30	0.4104	0.04	Q	|	|	|	V|
709	23+35	0.4107	0.04	Q	|	|	|	V|
710	23+40	0.4109	0.04	Q	|	|	|	V|
711	23+45	0.4112	0.04	Q	|	|	|	V|
712	23+50	0.4115	0.04	Q	|	|	|	V|
713	23+55	0.4118	0.04	Q	|	|	|	V|
714	24+ 0	0.4120	0.04	Q	|	|	|	V|
715	24+ 5	0.4123	0.04	Q	|	|	|	V|
716	24+10	0.4125	0.03	Q	|	|	|	V|
717	24+15	0.4127	0.02	Q	|	|	|	V|
718	24+20	0.4128	0.02	Q	|	|	|	V|
719	24+25	0.4129	0.01	Q	|	|	|	V|
720	24+30	0.4129	0.01	Q	|	|	|	V|
721	24+35	0.4130	0.01	Q	|	|	|	V|
722	24+40	0.4130	0.01	Q	|	|	|	V|
723	24+45	0.4131	0.01	Q	|	|	|	V|
724	24+50	0.4131	0.00	Q	|	|	|	V|
725	24+55	0.4131	0.00	Q	|	|	|	V|
726	25+ 0	0.4132	0.00	Q	|	|	|	V|
727	25+ 5	0.4132	0.00	Q	|	|	|	V|
728	25+10	0.4132	0.00	Q	|	|	|	V|
729	25+15	0.4132	0.00	Q	|	|	|	V|
730	25+20	0.4132	0.00	Q	|	|	|	V|
731	25+25	0.4132	0.00	Q	|	|	|	V|
732	25+30	0.4132	0.00	Q	|	|	|	V|
733	25+35	0.4132	0.00	Q	|	|	|	V|
734	25+40	0.4132	0.00	Q	|	|	|	V|
735	25+45	0.4132	0.00	Q	|	|	|	V|
736	25+50	0.4132	0.00	Q	|	|	|	V
737	----------	----------	----------	----------	----------	----------	----------	----------
738								
739								
740								
741								

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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  08/08/24 File: PTC2B1242.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



------------------------------------------------------------------------
TEMESCAL CANYON PROPOSED OUTFLOW B1
2 YEAR 24 HOUR
KIMLEY HORN

------------------------------------------------------------------------
Drainage Area =       3.65(Ac.)  =      0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       3.65(Ac.)  =      0.006 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.076 Hr.
Lag time =     4.56 Min.
25% of lag time =     1.14 Min.
40% of lag time =     1.82 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]
        3.65            2.50                9.13

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        3.65            7.00               25.55

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    2.500(In)
Area Averaged 100-Year Rainfall =    7.000(In)

Point rain (area averaged) =    2.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    2.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     3.650           56.00          0.722
 Total Area Entered =      3.65(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	0.722	0.247	1.000	0.247

Sum (F) = 0.247

Area averaged **mean** soil loss (F) (In/Hr) = 0.247

Minimum soil loss rate ((In/Hr)) = 0.124

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.322

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

VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	109.649	22.134	0.814
2	0.167	219.298	48.828	1.796
3	0.250	328.947	14.348	0.528
4	0.333	438.596	6.562	0.241
5	0.417	548.246	3.644	0.134
6	0.500	657.895	2.276	0.084
7	0.583	767.544	1.334	0.049
8	0.667	877.193	0.873	0.032
		Sum = 100.000	Sum=	3.679

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	(0.438)	0.006	0.014
2	0.17	0.07	0.020	(0.437)	0.006	0.014
3	0.25	0.07	0.020	(0.435)	0.006	0.014
4	0.33	0.10	0.030	(0.433)	0.010	0.020
5	0.42	0.10	0.030	(0.432)	0.010	0.020
6	0.50	0.10	0.030	(0.430)	0.010	0.020
7	0.58	0.10	0.030	(0.428)	0.010	0.020
8	0.67	0.10	0.030	(0.426)	0.010	0.020
9	0.75	0.10	0.030	(0.425)	0.010	0.020
10	0.83	0.13	0.040	(0.423)	0.013	0.027
11	0.92	0.13	0.040	(0.421)	0.013	0.027
12	1.00	0.13	0.040	(0.420)	0.013	0.027
13	1.08	0.10	0.030	(0.418)	0.010	0.020
14	1.17	0.10	0.030	(0.417)	0.010	0.020
15	1.25	0.10	0.030	(0.415)	0.010	0.020
16	1.33	0.10	0.030	(0.413)	0.010	0.020
17	1.42	0.10	0.030	(0.412)	0.010	0.020
18	1.50	0.10	0.030	(0.410)	0.010	0.020
19	1.58	0.10	0.030	(0.408)	0.010	0.020
20	1.67	0.10	0.030	(0.407)	0.010	0.020
21	1.75	0.10	0.030	(0.405)	0.010	0.020
22	1.83	0.13	0.040	(0.403)	0.013	0.027
23	1.92	0.13	0.040	(0.402)	0.013	0.027
24	2.00	0.13	0.040	(0.400)	0.013	0.027
25	2.08	0.13	0.040	(0.399)	0.013	0.027
26	2.17	0.13	0.040	(0.397)	0.013	0.027
27	2.25	0.13	0.040	(0.395)	0.013	0.027
28	2.33	0.13	0.040	(0.394)	0.013	0.027
29	2.42	0.13	0.040	(0.392)	0.013	0.027
30	2.50	0.13	0.040	(0.390)	0.013	0.027
31	2.58	0.17	0.050	(0.389)	0.016	0.034
32	2.67	0.17	0.050	(0.387)	0.016	0.034
33	2.75	0.17	0.050	(0.386)	0.016	0.034
34	2.83	0.17	0.050	(0.384)	0.016	0.034
35	2.92	0.17	0.050	(0.383)	0.016	0.034
36	3.00	0.17	0.050	(0.381)	0.016	0.034

139	37	3.08	0.17	0.050	(0.379)	0.016	0.034
140	38	3.17	0.17	0.050	(0.378)	0.016	0.034
141	39	3.25	0.17	0.050	(0.376)	0.016	0.034
142	40	3.33	0.17	0.050	(0.375)	0.016	0.034
143	41	3.42	0.17	0.050	(0.373)	0.016	0.034
144	42	3.50	0.17	0.050	(0.372)	0.016	0.034
145	43	3.58	0.17	0.050	(0.370)	0.016	0.034
146	44	3.67	0.17	0.050	(0.368)	0.016	0.034
147	45	3.75	0.17	0.050	(0.367)	0.016	0.034
148	46	3.83	0.20	0.060	(0.365)	0.019	0.041
149	47	3.92	0.20	0.060	(0.364)	0.019	0.041
150	48	4.00	0.20	0.060	(0.362)	0.019	0.041
151	49	4.08	0.20	0.060	(0.361)	0.019	0.041
152	50	4.17	0.20	0.060	(0.359)	0.019	0.041
153	51	4.25	0.20	0.060	(0.358)	0.019	0.041
154	52	4.33	0.23	0.070	(0.356)	0.023	0.047
155	53	4.42	0.23	0.070	(0.355)	0.023	0.047
156	54	4.50	0.23	0.070	(0.353)	0.023	0.047
157	55	4.58	0.23	0.070	(0.352)	0.023	0.047
158	56	4.67	0.23	0.070	(0.350)	0.023	0.047
159	57	4.75	0.23	0.070	(0.349)	0.023	0.047
160	58	4.83	0.27	0.080	(0.347)	0.026	0.054
161	59	4.92	0.27	0.080	(0.346)	0.026	0.054
162	60	5.00	0.27	0.080	(0.344)	0.026	0.054
163	61	5.08	0.20	0.060	(0.343)	0.019	0.041
164	62	5.17	0.20	0.060	(0.341)	0.019	0.041
165	63	5.25	0.20	0.060	(0.340)	0.019	0.041
166	64	5.33	0.23	0.070	(0.338)	0.023	0.047
167	65	5.42	0.23	0.070	(0.337)	0.023	0.047
168	66	5.50	0.23	0.070	(0.335)	0.023	0.047
169	67	5.58	0.27	0.080	(0.334)	0.026	0.054
170	68	5.67	0.27	0.080	(0.332)	0.026	0.054
171	69	5.75	0.27	0.080	(0.331)	0.026	0.054
172	70	5.83	0.27	0.080	(0.329)	0.026	0.054
173	71	5.92	0.27	0.080	(0.328)	0.026	0.054
174	72	6.00	0.27	0.080	(0.326)	0.026	0.054
175	73	6.08	0.30	0.090	(0.325)	0.029	0.061
176	74	6.17	0.30	0.090	(0.323)	0.029	0.061
177	75	6.25	0.30	0.090	(0.322)	0.029	0.061
178	76	6.33	0.30	0.090	(0.321)	0.029	0.061
179	77	6.42	0.30	0.090	(0.319)	0.029	0.061
180	78	6.50	0.30	0.090	(0.318)	0.029	0.061
181	79	6.58	0.33	0.100	(0.316)	0.032	0.068
182	80	6.67	0.33	0.100	(0.315)	0.032	0.068
183	81	6.75	0.33	0.100	(0.313)	0.032	0.068
184	82	6.83	0.33	0.100	(0.312)	0.032	0.068
185	83	6.92	0.33	0.100	(0.311)	0.032	0.068
186	84	7.00	0.33	0.100	(0.309)	0.032	0.068
187	85	7.08	0.33	0.100	(0.308)	0.032	0.068
188	86	7.17	0.33	0.100	(0.306)	0.032	0.068
189	87	7.25	0.33	0.100	(0.305)	0.032	0.068
190	88	7.33	0.37	0.110	(0.304)	0.035	0.075
191	89	7.42	0.37	0.110	(0.302)	0.035	0.075
192	90	7.50	0.37	0.110	(0.301)	0.035	0.075
193	91	7.58	0.40	0.120	(0.299)	0.039	0.081
194	92	7.67	0.40	0.120	(0.298)	0.039	0.081
195	93	7.75	0.40	0.120	(0.297)	0.039	0.081
196	94	7.83	0.43	0.130	(0.295)	0.042	0.088
197	95	7.92	0.43	0.130	(0.294)	0.042	0.088
198	96	8.00	0.43	0.130	(0.293)	0.042	0.088
199	97	8.08	0.50	0.150	(0.291)	0.048	0.102
200	98	8.17	0.50	0.150	(0.290)	0.048	0.102
201	99	8.25	0.50	0.150	(0.289)	0.048	0.102
202	100	8.33	0.50	0.150	(0.287)	0.048	0.102
203	101	8.42	0.50	0.150	(0.286)	0.048	0.102
204	102	8.50	0.50	0.150	(0.285)	0.048	0.102
205	103	8.58	0.53	0.160	(0.283)	0.052	0.108
206	104	8.67	0.53	0.160	(0.282)	0.052	0.108
207	105	8.75	0.53	0.160	(0.281)	0.052	0.108

208	106	8.83	0.57	0.170	(0.279)	0.055	0.115
209	107	8.92	0.57	0.170	(0.278)	0.055	0.115
210	108	9.00	0.57	0.170	(0.277)	0.055	0.115
211	109	9.08	0.63	0.190	(0.275)	0.061	0.129
212	110	9.17	0.63	0.190	(0.274)	0.061	0.129
213	111	9.25	0.63	0.190	(0.273)	0.061	0.129
214	112	9.33	0.67	0.200	(0.271)	0.064	0.136
215	113	9.42	0.67	0.200	(0.270)	0.064	0.136
216	114	9.50	0.67	0.200	(0.269)	0.064	0.136
217	115	9.58	0.70	0.210	(0.267)	0.068	0.142
218	116	9.67	0.70	0.210	(0.266)	0.068	0.142
219	117	9.75	0.70	0.210	(0.265)	0.068	0.142
220	118	9.83	0.73	0.220	(0.264)	0.071	0.149
221	119	9.92	0.73	0.220	(0.262)	0.071	0.149
222	120	10.00	0.73	0.220	(0.261)	0.071	0.149
223	121	10.08	0.50	0.150	(0.260)	0.048	0.102
224	122	10.17	0.50	0.150	(0.259)	0.048	0.102
225	123	10.25	0.50	0.150	(0.257)	0.048	0.102
226	124	10.33	0.50	0.150	(0.256)	0.048	0.102
227	125	10.42	0.50	0.150	(0.255)	0.048	0.102
228	126	10.50	0.50	0.150	(0.254)	0.048	0.102
229	127	10.58	0.67	0.200	(0.252)	0.064	0.136
230	128	10.67	0.67	0.200	(0.251)	0.064	0.136
231	129	10.75	0.67	0.200	(0.250)	0.064	0.136
232	130	10.83	0.67	0.200	(0.249)	0.064	0.136
233	131	10.92	0.67	0.200	(0.247)	0.064	0.136
234	132	11.00	0.67	0.200	(0.246)	0.064	0.136
235	133	11.08	0.63	0.190	(0.245)	0.061	0.129
236	134	11.17	0.63	0.190	(0.244)	0.061	0.129
237	135	11.25	0.63	0.190	(0.243)	0.061	0.129
238	136	11.33	0.63	0.190	(0.241)	0.061	0.129
239	137	11.42	0.63	0.190	(0.240)	0.061	0.129
240	138	11.50	0.63	0.190	(0.239)	0.061	0.129
241	139	11.58	0.57	0.170	(0.238)	0.055	0.115
242	140	11.67	0.57	0.170	(0.237)	0.055	0.115
243	141	11.75	0.57	0.170	(0.235)	0.055	0.115
244	142	11.83	0.60	0.180	(0.234)	0.058	0.122
245	143	11.92	0.60	0.180	(0.233)	0.058	0.122
246	144	12.00	0.60	0.180	(0.232)	0.058	0.122
247	145	12.08	0.83	0.250	(0.231)	0.080	0.169
248	146	12.17	0.83	0.250	(0.230)	0.080	0.169
249	147	12.25	0.83	0.250	(0.228)	0.080	0.169
250	148	12.33	0.87	0.260	(0.227)	0.084	0.176
251	149	12.42	0.87	0.260	(0.226)	0.084	0.176
252	150	12.50	0.87	0.260	(0.225)	0.084	0.176
253	151	12.58	0.93	0.280	(0.224)	0.090	0.190
254	152	12.67	0.93	0.280	(0.223)	0.090	0.190
255	153	12.75	0.93	0.280	(0.222)	0.090	0.190
256	154	12.83	0.97	0.290	(0.221)	0.093	0.197
257	155	12.92	0.97	0.290	(0.219)	0.093	0.197
258	156	13.00	0.97	0.290	(0.218)	0.093	0.197
259	157	13.08	1.13	0.340	(0.217)	0.109	0.231
260	158	13.17	1.13	0.340	(0.216)	0.109	0.231
261	159	13.25	1.13	0.340	(0.215)	0.109	0.231
262	160	13.33	1.13	0.340	(0.214)	0.109	0.231
263	161	13.42	1.13	0.340	(0.213)	0.109	0.231
264	162	13.50	1.13	0.340	(0.212)	0.109	0.231
265	163	13.58	0.77	0.230	(0.211)	0.074	0.156
266	164	13.67	0.77	0.230	(0.210)	0.074	0.156
267	165	13.75	0.77	0.230	(0.209)	0.074	0.156
268	166	13.83	0.77	0.230	(0.207)	0.074	0.156
269	167	13.92	0.77	0.230	(0.206)	0.074	0.156
270	168	14.00	0.77	0.230	(0.205)	0.074	0.156
271	169	14.08	0.90	0.270	(0.204)	0.087	0.183
272	170	14.17	0.90	0.270	(0.203)	0.087	0.183
273	171	14.25	0.90	0.270	(0.202)	0.087	0.183
274	172	14.33	0.87	0.260	(0.201)	0.084	0.176
275	173	14.42	0.87	0.260	(0.200)	0.084	0.176
276	174	14.50	0.87	0.260	(0.199)	0.084	0.176

277	175	14.58	0.87	0.260	(	0.198)	0.084	0.176
278	176	14.67	0.87	0.260	(	0.197)	0.084	0.176
279	177	14.75	0.87	0.260	(	0.196)	0.084	0.176
280	178	14.83	0.83	0.250	(	0.195)	0.080	0.169
281	179	14.92	0.83	0.250	(	0.194)	0.080	0.169
282	180	15.00	0.83	0.250	(	0.193)	0.080	0.169
283	181	15.08	0.80	0.240	(	0.192)	0.077	0.163
284	182	15.17	0.80	0.240	(	0.191)	0.077	0.163
285	183	15.25	0.80	0.240	(	0.190)	0.077	0.163
286	184	15.33	0.77	0.230	(	0.189)	0.074	0.156
287	185	15.42	0.77	0.230	(	0.188)	0.074	0.156
288	186	15.50	0.77	0.230	(	0.187)	0.074	0.156
289	187	15.58	0.63	0.190	(	0.186)	0.061	0.129
290	188	15.67	0.63	0.190	(	0.185)	0.061	0.129
291	189	15.75	0.63	0.190	(	0.184)	0.061	0.129
292	190	15.83	0.63	0.190	(	0.183)	0.061	0.129
293	191	15.92	0.63	0.190	(	0.182)	0.061	0.129
294	192	16.00	0.63	0.190	(	0.182)	0.061	0.129
295	193	16.08	0.13	0.040	(	0.181)	0.013	0.027
296	194	16.17	0.13	0.040	(	0.180)	0.013	0.027
297	195	16.25	0.13	0.040	(	0.179)	0.013	0.027
298	196	16.33	0.13	0.040	(	0.178)	0.013	0.027
299	197	16.42	0.13	0.040	(	0.177)	0.013	0.027
300	198	16.50	0.13	0.040	(	0.176)	0.013	0.027
301	199	16.58	0.10	0.030	(	0.175)	0.010	0.020
302	200	16.67	0.10	0.030	(	0.174)	0.010	0.020
303	201	16.75	0.10	0.030	(	0.173)	0.010	0.020
304	202	16.83	0.10	0.030	(	0.173)	0.010	0.020
305	203	16.92	0.10	0.030	(	0.172)	0.010	0.020
306	204	17.00	0.10	0.030	(	0.171)	0.010	0.020
307	205	17.08	0.17	0.050	(	0.170)	0.016	0.034
308	206	17.17	0.17	0.050	(	0.169)	0.016	0.034
309	207	17.25	0.17	0.050	(	0.168)	0.016	0.034
310	208	17.33	0.17	0.050	(	0.167)	0.016	0.034
311	209	17.42	0.17	0.050	(	0.167)	0.016	0.034
312	210	17.50	0.17	0.050	(	0.166)	0.016	0.034
313	211	17.58	0.17	0.050	(	0.165)	0.016	0.034
314	212	17.67	0.17	0.050	(	0.164)	0.016	0.034
315	213	17.75	0.17	0.050	(	0.163)	0.016	0.034
316	214	17.83	0.13	0.040	(	0.162)	0.013	0.027
317	215	17.92	0.13	0.040	(	0.162)	0.013	0.027
318	216	18.00	0.13	0.040	(	0.161)	0.013	0.027
319	217	18.08	0.13	0.040	(	0.160)	0.013	0.027
320	218	18.17	0.13	0.040	(	0.159)	0.013	0.027
321	219	18.25	0.13	0.040	(	0.158)	0.013	0.027
322	220	18.33	0.13	0.040	(	0.158)	0.013	0.027
323	221	18.42	0.13	0.040	(	0.157)	0.013	0.027
324	222	18.50	0.13	0.040	(	0.156)	0.013	0.027
325	223	18.58	0.10	0.030	(	0.155)	0.010	0.020
326	224	18.67	0.10	0.030	(	0.155)	0.010	0.020
327	225	18.75	0.10	0.030	(	0.154)	0.010	0.020
328	226	18.83	0.07	0.020	(	0.153)	0.006	0.014
329	227	18.92	0.07	0.020	(	0.152)	0.006	0.014
330	228	19.00	0.07	0.020	(	0.152)	0.006	0.014
331	229	19.08	0.10	0.030	(	0.151)	0.010	0.020
332	230	19.17	0.10	0.030	(	0.150)	0.010	0.020
333	231	19.25	0.10	0.030	(	0.150)	0.010	0.020
334	232	19.33	0.13	0.040	(	0.149)	0.013	0.027
335	233	19.42	0.13	0.040	(	0.148)	0.013	0.027
336	234	19.50	0.13	0.040	(	0.148)	0.013	0.027
337	235	19.58	0.10	0.030	(	0.147)	0.010	0.020
338	236	19.67	0.10	0.030	(	0.146)	0.010	0.020
339	237	19.75	0.10	0.030	(	0.146)	0.010	0.020
340	238	19.83	0.07	0.020	(	0.145)	0.006	0.014
341	239	19.92	0.07	0.020	(	0.144)	0.006	0.014
342	240	20.00	0.07	0.020	(	0.144)	0.006	0.014
343	241	20.08	0.10	0.030	(	0.143)	0.010	0.020
344	242	20.17	0.10	0.030	(	0.142)	0.010	0.020
345	243	20.25	0.10	0.030	(	0.142)	0.010	0.020

244	20.33	0.10	0.030	(	0.141)	0.010	0.020
245	20.42	0.10	0.030	(	0.140)	0.010	0.020
246	20.50	0.10	0.030	(	0.140)	0.010	0.020
247	20.58	0.10	0.030	(	0.139)	0.010	0.020
248	20.67	0.10	0.030	(	0.139)	0.010	0.020
249	20.75	0.10	0.030	(	0.138)	0.010	0.020
250	20.83	0.07	0.020	(	0.138)	0.006	0.014
251	20.92	0.07	0.020	(	0.137)	0.006	0.014
252	21.00	0.07	0.020	(	0.136)	0.006	0.014
253	21.08	0.10	0.030	(	0.136)	0.010	0.020
254	21.17	0.10	0.030	(	0.135)	0.010	0.020
255	21.25	0.10	0.030	(	0.135)	0.010	0.020
256	21.33	0.07	0.020	(	0.134)	0.006	0.014
257	21.42	0.07	0.020	(	0.134)	0.006	0.014
258	21.50	0.07	0.020	(	0.133)	0.006	0.014
259	21.58	0.10	0.030	(	0.133)	0.010	0.020
260	21.67	0.10	0.030	(	0.132)	0.010	0.020
261	21.75	0.10	0.030	(	0.132)	0.010	0.020
262	21.83	0.07	0.020	(	0.131)	0.006	0.014
263	21.92	0.07	0.020	(	0.131)	0.006	0.014
264	22.00	0.07	0.020	(	0.131)	0.006	0.014
265	22.08	0.10	0.030	(	0.130)	0.010	0.020
266	22.17	0.10	0.030	(	0.130)	0.010	0.020
267	22.25	0.10	0.030	(	0.129)	0.010	0.020
268	22.33	0.07	0.020	(	0.129)	0.006	0.014
269	22.42	0.07	0.020	(	0.128)	0.006	0.014
270	22.50	0.07	0.020	(	0.128)	0.006	0.014
271	22.58	0.07	0.020	(	0.128)	0.006	0.014
272	22.67	0.07	0.020	(	0.127)	0.006	0.014
273	22.75	0.07	0.020	(	0.127)	0.006	0.014
274	22.83	0.07	0.020	(	0.127)	0.006	0.014
275	22.92	0.07	0.020	(	0.126)	0.006	0.014
276	23.00	0.07	0.020	(	0.126)	0.006	0.014
277	23.08	0.07	0.020	(	0.126)	0.006	0.014
278	23.17	0.07	0.020	(	0.125)	0.006	0.014
279	23.25	0.07	0.020	(	0.125)	0.006	0.014
280	23.33	0.07	0.020	(	0.125)	0.006	0.014
281	23.42	0.07	0.020	(	0.125)	0.006	0.014
282	23.50	0.07	0.020	(	0.125)	0.006	0.014
283	23.58	0.07	0.020	(	0.124)	0.006	0.014
284	23.67	0.07	0.020	(	0.124)	0.006	0.014
285	23.75	0.07	0.020	(	0.124)	0.006	0.014
286	23.83	0.07	0.020	(	0.124)	0.006	0.014
287	23.92	0.07	0.020	(	0.124)	0.006	0.014
288	24.00	0.07	0.020	(	0.124)	0.006	0.014

(Loss Rate Not Used)

Sum = 100.0 Sum = 20.3

Flood volume = Effective rainfall 1.69(In)

times area 3.6(Ac.)/[(In)/(Ft.)] = 0.5(Ac.Ft)

Total soil loss = 0.80(In)

Total soil loss = 0.245(Ac.Ft)

Total rainfall = 2.50(In)

Flood volume = 22457.7 Cubic Feet

Total soil loss = 10665.8 Cubic Feet

Peak flow rate of this hydrograph = 0.846(CFS)

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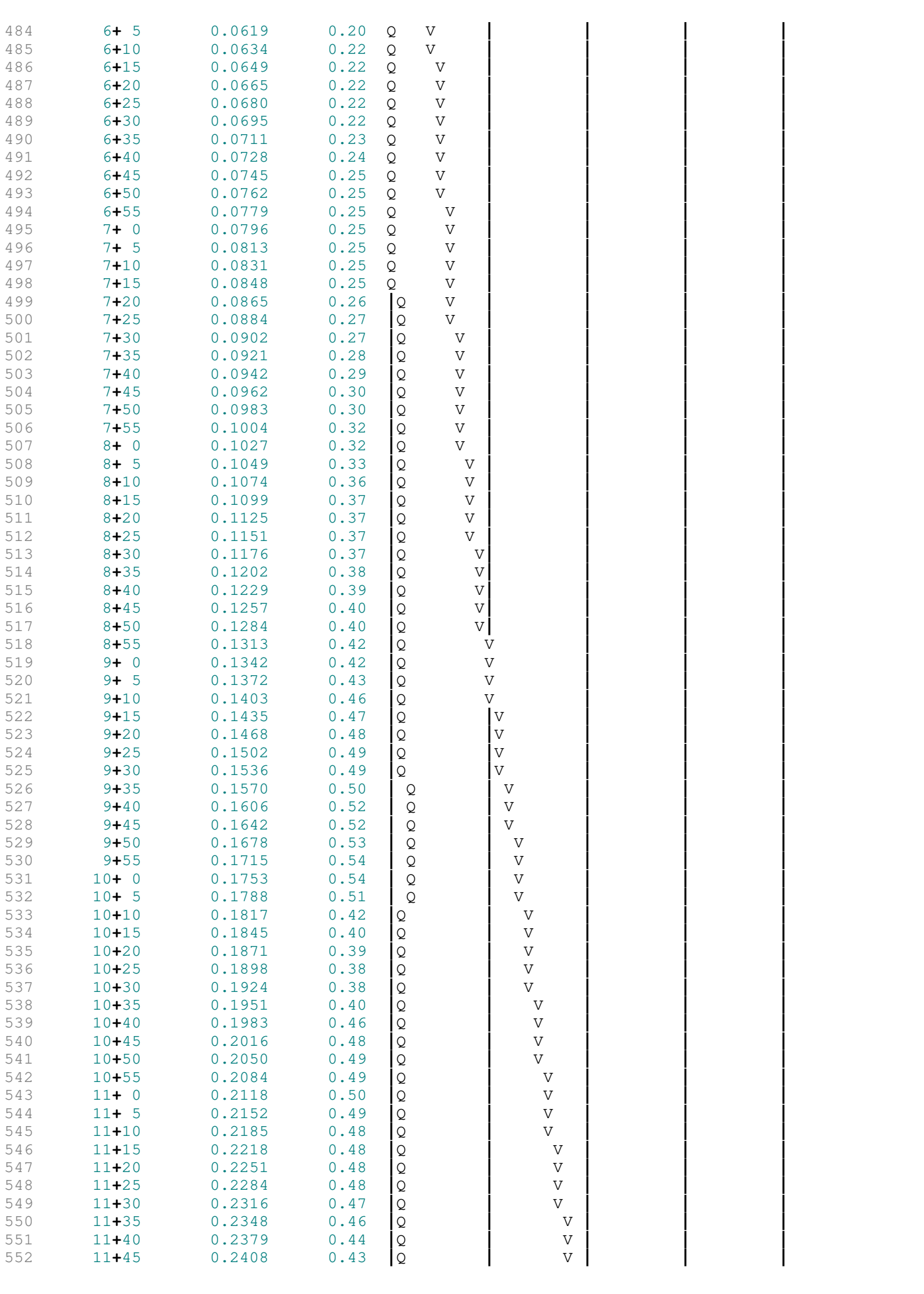
24 - H O U R S T O R M

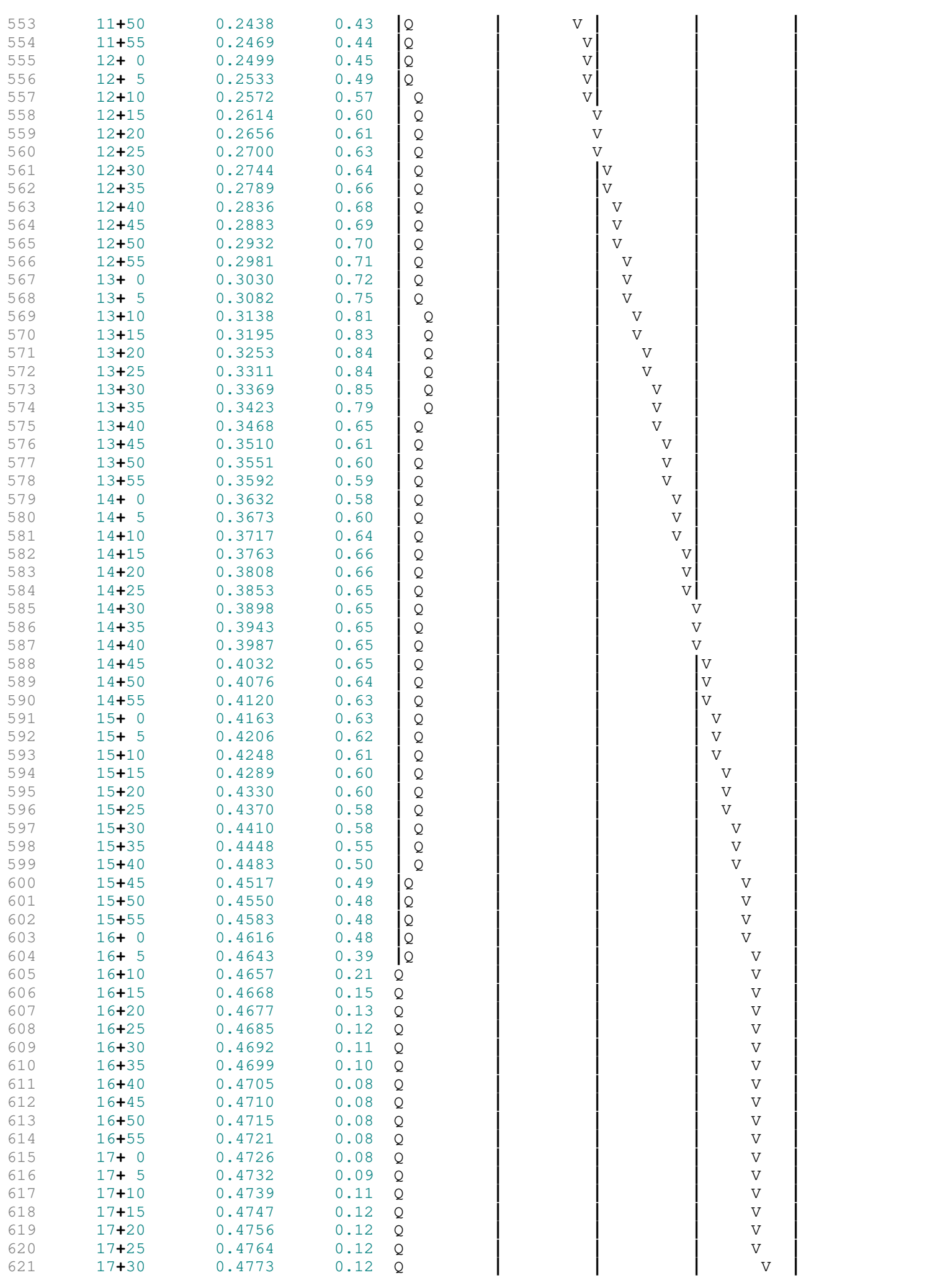
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0001	0.01	Q	|	|	|	|
0+10	0.0003	0.04	Q	|	|	|	|
0+15	0.0006	0.04	Q	|	|	|	|

415	0+20	0.0010	0.05	Q	|	|	|	|
416	0+25	0.0014	0.07	Q	|	|	|	|
417	0+30	0.0019	0.07	Q	|	|	|	|
418	0+35	0.0024	0.07	Q	|	|	|	|
419	0+40	0.0029	0.07	Q	|	|	|	|
420	0+45	0.0034	0.07	Q	|	|	|	|
421	0+50	0.0040	0.08	Q	|	|	|	|
422	0+55	0.0046	0.09	Q	|	|	|	|
423	1+ 0	0.0053	0.10	Q	|	|	|	|
424	1+ 5	0.0059	0.09	Q	|	|	|	|
425	1+10	0.0065	0.08	Q	|	|	|	|
426	1+15	0.0070	0.08	Q	|	|	|	|
427	1+20	0.0075	0.08	Q	|	|	|	|
428	1+25	0.0081	0.08	Q	|	|	|	|
429	1+30	0.0086	0.08	Q	|	|	|	|
430	1+35	0.0091	0.08	Q	|	|	|	|
431	1+40	0.0096	0.07	Q	|	|	|	|
432	1+45	0.0101	0.07	Q	|	|	|	|
433	1+50	0.0107	0.08	Q	|	|	|	|
434	1+55	0.0113	0.09	Q	|	|	|	|
435	2+ 0	0.0120	0.10	Q	|	|	|	|
436	2+ 5	0.0126	0.10	Q	|	|	|	|
437	2+10	0.0133	0.10	QV	|	|	|	|
438	2+15	0.0140	0.10	QV	|	|	|	|
439	2+20	0.0147	0.10	QV	|	|	|	|
440	2+25	0.0154	0.10	QV	|	|	|	|
441	2+30	0.0161	0.10	QV	|	|	|	|
442	2+35	0.0168	0.11	QV	|	|	|	|
443	2+40	0.0176	0.12	QV	|	|	|	|
444	2+45	0.0184	0.12	QV	|	|	|	|
445	2+50	0.0193	0.12	QV	|	|	|	|
446	2+55	0.0201	0.12	QV	|	|	|	|
447	3+ 0	0.0210	0.12	QV	|	|	|	|
448	3+ 5	0.0218	0.12	QV	|	|	|	|
449	3+10	0.0227	0.12	QV	|	|	|	|
450	3+15	0.0236	0.12	QV	|	|	|	|
451	3+20	0.0244	0.12	QV	|	|	|	|
452	3+25	0.0253	0.12	QV	|	|	|	|
453	3+30	0.0261	0.12	Q V	|	|	|	|
454	3+35	0.0270	0.12	Q V	|	|	|	|
455	3+40	0.0279	0.12	Q V	|	|	|	|
456	3+45	0.0287	0.12	Q V	|	|	|	|
457	3+50	0.0296	0.13	Q V	|	|	|	|
458	3+55	0.0306	0.14	Q V	|	|	|	|
459	4+ 0	0.0316	0.15	Q V	|	|	|	|
460	4+ 5	0.0326	0.15	Q V	|	|	|	|
461	4+10	0.0336	0.15	Q V	|	|	|	|
462	4+15	0.0347	0.15	Q V	|	|	|	|
463	4+20	0.0357	0.16	Q V	|	|	|	|
464	4+25	0.0369	0.17	Q V	|	|	|	|
465	4+30	0.0381	0.17	Q V	|	|	|	|
466	4+35	0.0393	0.17	Q V	|	|	|	|
467	4+40	0.0405	0.17	Q V	|	|	|	|
468	4+45	0.0417	0.17	Q V	|	|	|	|
469	4+50	0.0429	0.18	Q V	|	|	|	|
470	4+55	0.0442	0.19	Q V	|	|	|	|
471	5+ 0	0.0456	0.20	Q V	|	|	|	|
472	5+ 5	0.0469	0.19	Q V	|	|	|	|
473	5+10	0.0480	0.16	Q V	|	|	|	|
474	5+15	0.0491	0.16	Q V	|	|	|	|
475	5+20	0.0502	0.16	Q V	|	|	|	|
476	5+25	0.0513	0.17	Q V	|	|	|	|
477	5+30	0.0525	0.17	Q V	|	|	|	|
478	5+35	0.0537	0.18	Q V	|	|	|	|
479	5+40	0.0551	0.19	Q V	|	|	|	|
480	5+45	0.0564	0.20	Q V	|	|	|	|
481	5+50	0.0578	0.20	Q V	|	|	|	|
482	5+55	0.0591	0.20	Q V	|	|	|	|
483	6+ 0	0.0605	0.20	Q V	|	|	|	|





622	17+35	0.4781	0.12	Q	|	|	|	V |
623	17+40	0.4790	0.12	Q	|	|	|	V |
624	17+45	0.4798	0.12	Q	|	|	|	V |
625	17+50	0.4807	0.12	Q	|	|	|	V |
626	17+55	0.4814	0.11	Q	|	|	|	V |
627	18+ 0	0.4821	0.10	Q	|	|	|	V |
628	18+ 5	0.4828	0.10	Q	|	|	|	V |
629	18+10	0.4835	0.10	Q	|	|	|	V |
630	18+15	0.4842	0.10	Q	|	|	|	V |
631	18+20	0.4849	0.10	Q	|	|	|	V |
632	18+25	0.4856	0.10	Q	|	|	|	V |
633	18+30	0.4863	0.10	Q	|	|	|	V |
634	18+35	0.4869	0.09	Q	|	|	|	V |
635	18+40	0.4875	0.08	Q	|	|	|	V |
636	18+45	0.4880	0.08	Q	|	|	|	V |
637	18+50	0.4885	0.07	Q	|	|	|	V |
638	18+55	0.4889	0.06	Q	|	|	|	V |
639	19+ 0	0.4893	0.05	Q	|	|	|	V |
640	19+ 5	0.4897	0.06	Q	|	|	|	V |
641	19+10	0.4902	0.07	Q	|	|	|	V |
642	19+15	0.4906	0.07	Q	|	|	|	V |
643	19+20	0.4912	0.08	Q	|	|	|	V |
644	19+25	0.4918	0.09	Q	|	|	|	V |
645	19+30	0.4925	0.10	Q	|	|	|	V |
646	19+35	0.4931	0.09	Q	|	|	|	V |
647	19+40	0.4937	0.08	Q	|	|	|	V |
648	19+45	0.4942	0.08	Q	|	|	|	V |
649	19+50	0.4947	0.07	Q	|	|	|	V |
650	19+55	0.4951	0.06	Q	|	|	|	V |
651	20+ 0	0.4955	0.05	Q	|	|	|	V |
652	20+ 5	0.4959	0.06	Q	|	|	|	V |
653	20+10	0.4963	0.07	Q	|	|	|	V |
654	20+15	0.4968	0.07	Q	|	|	|	V |
655	20+20	0.4973	0.07	Q	|	|	|	V |
656	20+25	0.4978	0.07	Q	|	|	|	V |
657	20+30	0.4984	0.07	Q	|	|	|	V |
658	20+35	0.4989	0.07	Q	|	|	|	V |
659	20+40	0.4994	0.07	Q	|	|	|	V |
660	20+45	0.4999	0.07	Q	|	|	|	V |
661	20+50	0.5004	0.07	Q	|	|	|	V |
662	20+55	0.5008	0.06	Q	|	|	|	V |
663	21+ 0	0.5011	0.05	Q	|	|	|	V |
664	21+ 5	0.5015	0.06	Q	|	|	|	V |
665	21+10	0.5020	0.07	Q	|	|	|	V |
666	21+15	0.5025	0.07	Q	|	|	|	V |
667	21+20	0.5030	0.07	Q	|	|	|	V |
668	21+25	0.5034	0.06	Q	|	|	|	V |
669	21+30	0.5037	0.05	Q	|	|	|	V |
670	21+35	0.5041	0.06	Q	|	|	|	V |
671	21+40	0.5046	0.07	Q	|	|	|	V |
672	21+45	0.5051	0.07	Q	|	|	|	V |
673	21+50	0.5055	0.07	Q	|	|	|	V |
674	21+55	0.5059	0.06	Q	|	|	|	V |
675	22+ 0	0.5063	0.05	Q	|	|	|	V |
676	22+ 5	0.5067	0.06	Q	|	|	|	V |
677	22+10	0.5072	0.07	Q	|	|	|	V |
678	22+15	0.5077	0.07	Q	|	|	|	V |
679	22+20	0.5081	0.07	Q	|	|	|	V |
680	22+25	0.5085	0.06	Q	|	|	|	V |
681	22+30	0.5089	0.05	Q	|	|	|	V |
682	22+35	0.5092	0.05	Q	|	|	|	V |
683	22+40	0.5096	0.05	Q	|	|	|	V |
684	22+45	0.5099	0.05	Q	|	|	|	V |
685	22+50	0.5103	0.05	Q	|	|	|	V |
686	22+55	0.5106	0.05	Q	|	|	|	V |
687	23+ 0	0.5110	0.05	Q	|	|	|	V |
688	23+ 5	0.5113	0.05	Q	|	|	|	V |
689	23+10	0.5116	0.05	Q	|	|	|	V |
690	23+15	0.5120	0.05	Q	|	|	|	V |

```
    23+20       0.5123      0.05  Q          |          |          |          V|
    23+25       0.5127      0.05  Q          |          |          |          V|
    23+30       0.5130      0.05  Q          |          |          |          V|
    23+35       0.5134      0.05  Q          |          |          |          V|
    23+40       0.5137      0.05  Q          |          |          |          V|
    23+45       0.5141      0.05  Q          |          |          |          V|
    23+50       0.5144      0.05  Q          |          |          |          V|
    23+55       0.5147      0.05  Q          |          |          |          V|
    24+ 0       0.5151      0.05  Q          |          |          |          V|
    24+ 5       0.5154      0.04  Q          |          |          |          V|
    24+10       0.5155      0.01  Q          |          |          |          V|
    24+15       0.5155      0.01  Q          |          |          |          V|
    24+20       0.5155      0.00  Q          |          |          |          V|
    24+25       0.5155      0.00  Q          |          |          |          V|
    24+30       0.5156      0.00  Q          |          |          |          V|
    24+35       0.5156      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  08/08/24 File: PTC2B2242.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



------------------------------------------------------------------------
TEMESCAL CANYON PROPOSED OUFLOW B2
2 YEAR 24 HOUR
KIMLEY HORN

------------------------------------------------------------------------
Drainage Area =       8.00(Ac.)  =      0.013 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       8.00(Ac.)  =      0.013 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.176 Hr.
Lag time =    10.56 Min.
25% of lag time =     2.64 Min.
40% of lag time =     4.22 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]
        8.00            2.50                20.00

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        8.00            7.00                56.00

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    2.500(In)
Area Averaged 100-Year Rainfall =    7.000(In)

Point rain (area averaged) =    2.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    2.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     8.000           56.00          0.900
 Total Area Entered =      8.00(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	0.900	0.134	1.000	0.134

Sum (F) = 0.134

Area averaged **mean** soil loss (F) (In/Hr) = 0.134

Minimum soil loss rate ((In/Hr)) = 0.067

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.188

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

VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	47.348	5.634	0.454
2	0.167	94.697	23.896	1.927
3	0.250	142.045	28.909	2.331
4	0.333	189.394	13.989	1.128
5	0.417	236.742	7.078	0.571
6	0.500	284.091	4.875	0.393
7	0.583	331.439	3.553	0.286
8	0.667	378.788	2.733	0.220
9	0.750	426.136	2.055	0.166
10	0.833	473.485	1.561	0.126
11	0.917	520.833	1.396	0.113
12	1.000	568.182	1.087	0.088
13	1.083	615.530	0.878	0.071
14	1.167	662.879	0.699	0.056
15	1.250	710.227	0.524	0.042
16	1.333	757.576	0.473	0.038
17	1.417	804.924	0.661	0.053
		Sum = 100.000	Sum=	8.063

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	(0.238)	0.004	0.016
2	0.17	0.07	0.020	(0.237)	0.004	0.016
3	0.25	0.07	0.020	(0.236)	0.004	0.016
4	0.33	0.10	0.030	(0.235)	0.006	0.024
5	0.42	0.10	0.030	(0.234)	0.006	0.024
6	0.50	0.10	0.030	(0.233)	0.006	0.024
7	0.58	0.10	0.030	(0.232)	0.006	0.024
8	0.67	0.10	0.030	(0.231)	0.006	0.024
9	0.75	0.10	0.030	(0.230)	0.006	0.024
10	0.83	0.13	0.040	(0.230)	0.008	0.032
11	0.92	0.13	0.040	(0.229)	0.008	0.032
12	1.00	0.13	0.040	(0.228)	0.008	0.032
13	1.08	0.10	0.030	(0.227)	0.006	0.024
14	1.17	0.10	0.030	(0.226)	0.006	0.024
15	1.25	0.10	0.030	(0.225)	0.006	0.024
16	1.33	0.10	0.030	(0.224)	0.006	0.024
17	1.42	0.10	0.030	(0.223)	0.006	0.024
18	1.50	0.10	0.030	(0.222)	0.006	0.024
19	1.58	0.10	0.030	(0.222)	0.006	0.024
20	1.67	0.10	0.030	(0.221)	0.006	0.024
21	1.75	0.10	0.030	(0.220)	0.006	0.024
22	1.83	0.13	0.040	(0.219)	0.008	0.032
23	1.92	0.13	0.040	(0.218)	0.008	0.032
24	2.00	0.13	0.040	(0.217)	0.008	0.032
25	2.08	0.13	0.040	(0.216)	0.008	0.032
26	2.17	0.13	0.040	(0.215)	0.008	0.032
27	2.25	0.13	0.040	(0.214)	0.008	0.032

139	28	2.33	0.13	0.040	(	0.214)	0.008	0.032
140	29	2.42	0.13	0.040	(	0.213)	0.008	0.032
141	30	2.50	0.13	0.040	(	0.212)	0.008	0.032
142	31	2.58	0.17	0.050	(	0.211)	0.009	0.041
143	32	2.67	0.17	0.050	(	0.210)	0.009	0.041
144	33	2.75	0.17	0.050	(	0.209)	0.009	0.041
145	34	2.83	0.17	0.050	(	0.208)	0.009	0.041
146	35	2.92	0.17	0.050	(	0.208)	0.009	0.041
147	36	3.00	0.17	0.050	(	0.207)	0.009	0.041
148	37	3.08	0.17	0.050	(	0.206)	0.009	0.041
149	38	3.17	0.17	0.050	(	0.205)	0.009	0.041
150	39	3.25	0.17	0.050	(	0.204)	0.009	0.041
151	40	3.33	0.17	0.050	(	0.203)	0.009	0.041
152	41	3.42	0.17	0.050	(	0.202)	0.009	0.041
153	42	3.50	0.17	0.050	(	0.202)	0.009	0.041
154	43	3.58	0.17	0.050	(	0.201)	0.009	0.041
155	44	3.67	0.17	0.050	(	0.200)	0.009	0.041
156	45	3.75	0.17	0.050	(	0.199)	0.009	0.041
157	46	3.83	0.20	0.060	(	0.198)	0.011	0.049
158	47	3.92	0.20	0.060	(	0.197)	0.011	0.049
159	48	4.00	0.20	0.060	(	0.197)	0.011	0.049
160	49	4.08	0.20	0.060	(	0.196)	0.011	0.049
161	50	4.17	0.20	0.060	(	0.195)	0.011	0.049
162	51	4.25	0.20	0.060	(	0.194)	0.011	0.049
163	52	4.33	0.23	0.070	(	0.193)	0.013	0.057
164	53	4.42	0.23	0.070	(	0.192)	0.013	0.057
165	54	4.50	0.23	0.070	(	0.192)	0.013	0.057
166	55	4.58	0.23	0.070	(	0.191)	0.013	0.057
167	56	4.67	0.23	0.070	(	0.190)	0.013	0.057
168	57	4.75	0.23	0.070	(	0.189)	0.013	0.057
169	58	4.83	0.27	0.080	(	0.188)	0.015	0.065
170	59	4.92	0.27	0.080	(	0.187)	0.015	0.065
171	60	5.00	0.27	0.080	(	0.187)	0.015	0.065
172	61	5.08	0.20	0.060	(	0.186)	0.011	0.049
173	62	5.17	0.20	0.060	(	0.185)	0.011	0.049
174	63	5.25	0.20	0.060	(	0.184)	0.011	0.049
175	64	5.33	0.23	0.070	(	0.183)	0.013	0.057
176	65	5.42	0.23	0.070	(	0.183)	0.013	0.057
177	66	5.50	0.23	0.070	(	0.182)	0.013	0.057
178	67	5.58	0.27	0.080	(	0.181)	0.015	0.065
179	68	5.67	0.27	0.080	(	0.180)	0.015	0.065
180	69	5.75	0.27	0.080	(	0.179)	0.015	0.065
181	70	5.83	0.27	0.080	(	0.179)	0.015	0.065
182	71	5.92	0.27	0.080	(	0.178)	0.015	0.065
183	72	6.00	0.27	0.080	(	0.177)	0.015	0.065
184	73	6.08	0.30	0.090	(	0.176)	0.017	0.073
185	74	6.17	0.30	0.090	(	0.175)	0.017	0.073
186	75	6.25	0.30	0.090	(	0.175)	0.017	0.073
187	76	6.33	0.30	0.090	(	0.174)	0.017	0.073
188	77	6.42	0.30	0.090	(	0.173)	0.017	0.073
189	78	6.50	0.30	0.090	(	0.172)	0.017	0.073
190	79	6.58	0.33	0.100	(	0.172)	0.019	0.081
191	80	6.67	0.33	0.100	(	0.171)	0.019	0.081
192	81	6.75	0.33	0.100	(	0.170)	0.019	0.081
193	82	6.83	0.33	0.100	(	0.169)	0.019	0.081
194	83	6.92	0.33	0.100	(	0.169)	0.019	0.081
195	84	7.00	0.33	0.100	(	0.168)	0.019	0.081
196	85	7.08	0.33	0.100	(	0.167)	0.019	0.081
197	86	7.17	0.33	0.100	(	0.166)	0.019	0.081
198	87	7.25	0.33	0.100	(	0.165)	0.019	0.081
199	88	7.33	0.37	0.110	(	0.165)	0.021	0.089
200	89	7.42	0.37	0.110	(	0.164)	0.021	0.089
201	90	7.50	0.37	0.110	(	0.163)	0.021	0.089
202	91	7.58	0.40	0.120	(	0.162)	0.023	0.097
203	92	7.67	0.40	0.120	(	0.162)	0.023	0.097
204	93	7.75	0.40	0.120	(	0.161)	0.023	0.097
205	94	7.83	0.43	0.130	(	0.160)	0.024	0.106
206	95	7.92	0.43	0.130	(	0.159)	0.024	0.106
207	96	8.00	0.43	0.130	(	0.159)	0.024	0.106

208	97	8.08	0.50	0.150	(0.158)	0.028	0.122
209	98	8.17	0.50	0.150	(0.157)	0.028	0.122
210	99	8.25	0.50	0.150	(0.157)	0.028	0.122
211	100	8.33	0.50	0.150	(0.156)	0.028	0.122
212	101	8.42	0.50	0.150	(0.155)	0.028	0.122
213	102	8.50	0.50	0.150	(0.154)	0.028	0.122
214	103	8.58	0.53	0.160	(0.154)	0.030	0.130
215	104	8.67	0.53	0.160	(0.153)	0.030	0.130
216	105	8.75	0.53	0.160	(0.152)	0.030	0.130
217	106	8.83	0.57	0.170	(0.151)	0.032	0.138
218	107	8.92	0.57	0.170	(0.151)	0.032	0.138
219	108	9.00	0.57	0.170	(0.150)	0.032	0.138
220	109	9.08	0.63	0.190	(0.149)	0.036	0.154
221	110	9.17	0.63	0.190	(0.149)	0.036	0.154
222	111	9.25	0.63	0.190	(0.148)	0.036	0.154
223	112	9.33	0.67	0.200	(0.147)	0.038	0.162
224	113	9.42	0.67	0.200	(0.147)	0.038	0.162
225	114	9.50	0.67	0.200	(0.146)	0.038	0.162
226	115	9.58	0.70	0.210	(0.145)	0.039	0.171
227	116	9.67	0.70	0.210	(0.144)	0.039	0.171
228	117	9.75	0.70	0.210	(0.144)	0.039	0.171
229	118	9.83	0.73	0.220	(0.143)	0.041	0.179
230	119	9.92	0.73	0.220	(0.142)	0.041	0.179
231	120	10.00	0.73	0.220	(0.142)	0.041	0.179
232	121	10.08	0.50	0.150	(0.141)	0.028	0.122
233	122	10.17	0.50	0.150	(0.140)	0.028	0.122
234	123	10.25	0.50	0.150	(0.140)	0.028	0.122
235	124	10.33	0.50	0.150	(0.139)	0.028	0.122
236	125	10.42	0.50	0.150	(0.138)	0.028	0.122
237	126	10.50	0.50	0.150	(0.138)	0.028	0.122
238	127	10.58	0.67	0.200	(0.137)	0.038	0.162
239	128	10.67	0.67	0.200	(0.136)	0.038	0.162
240	129	10.75	0.67	0.200	(0.136)	0.038	0.162
241	130	10.83	0.67	0.200	(0.135)	0.038	0.162
242	131	10.92	0.67	0.200	(0.134)	0.038	0.162
243	132	11.00	0.67	0.200	(0.134)	0.038	0.162
244	133	11.08	0.63	0.190	(0.133)	0.036	0.154
245	134	11.17	0.63	0.190	(0.132)	0.036	0.154
246	135	11.25	0.63	0.190	(0.132)	0.036	0.154
247	136	11.33	0.63	0.190	(0.131)	0.036	0.154
248	137	11.42	0.63	0.190	(0.130)	0.036	0.154
249	138	11.50	0.63	0.190	(0.130)	0.036	0.154
250	139	11.58	0.57	0.170	(0.129)	0.032	0.138
251	140	11.67	0.57	0.170	(0.128)	0.032	0.138
252	141	11.75	0.57	0.170	(0.128)	0.032	0.138
253	142	11.83	0.60	0.180	(0.127)	0.034	0.146
254	143	11.92	0.60	0.180	(0.126)	0.034	0.146
255	144	12.00	0.60	0.180	(0.126)	0.034	0.146
256	145	12.08	0.83	0.250	(0.125)	0.047	0.203
257	146	12.17	0.83	0.250	(0.125)	0.047	0.203
258	147	12.25	0.83	0.250	(0.124)	0.047	0.203
259	148	12.33	0.87	0.260	(0.123)	0.049	0.211
260	149	12.42	0.87	0.260	(0.123)	0.049	0.211
261	150	12.50	0.87	0.260	(0.122)	0.049	0.211
262	151	12.58	0.93	0.280	(0.121)	0.053	0.227
263	152	12.67	0.93	0.280	(0.121)	0.053	0.227
264	153	12.75	0.93	0.280	(0.120)	0.053	0.227
265	154	12.83	0.97	0.290	(0.120)	0.055	0.235
266	155	12.92	0.97	0.290	(0.119)	0.055	0.235
267	156	13.00	0.97	0.290	(0.118)	0.055	0.235
268	157	13.08	1.13	0.340	(0.118)	0.064	0.276
269	158	13.17	1.13	0.340	(0.117)	0.064	0.276
270	159	13.25	1.13	0.340	(0.117)	0.064	0.276
271	160	13.33	1.13	0.340	(0.116)	0.064	0.276
272	161	13.42	1.13	0.340	(0.115)	0.064	0.276
273	162	13.50	1.13	0.340	(0.115)	0.064	0.276
274	163	13.58	0.77	0.230	(0.114)	0.043	0.187
275	164	13.67	0.77	0.230	(0.114)	0.043	0.187
276	165	13.75	0.77	0.230	(0.113)	0.043	0.187

277	166	13.83	0.77	0.230	(0.113)	0.043	0.187
278	167	13.92	0.77	0.230	(0.112)	0.043	0.187
279	168	14.00	0.77	0.230	(0.111)	0.043	0.187
280	169	14.08	0.90	0.270	(0.111)	0.051	0.219
281	170	14.17	0.90	0.270	(0.110)	0.051	0.219
282	171	14.25	0.90	0.270	(0.110)	0.051	0.219
283	172	14.33	0.87	0.260	(0.109)	0.049	0.211
284	173	14.42	0.87	0.260	(0.109)	0.049	0.211
285	174	14.50	0.87	0.260	(0.108)	0.049	0.211
286	175	14.58	0.87	0.260	(0.107)	0.049	0.211
287	176	14.67	0.87	0.260	(0.107)	0.049	0.211
288	177	14.75	0.87	0.260	(0.106)	0.049	0.211
289	178	14.83	0.83	0.250	(0.106)	0.047	0.203
290	179	14.92	0.83	0.250	(0.105)	0.047	0.203
291	180	15.00	0.83	0.250	(0.105)	0.047	0.203
292	181	15.08	0.80	0.240	(0.104)	0.045	0.195
293	182	15.17	0.80	0.240	(0.104)	0.045	0.195
294	183	15.25	0.80	0.240	(0.103)	0.045	0.195
295	184	15.33	0.77	0.230	(0.103)	0.043	0.187
296	185	15.42	0.77	0.230	(0.102)	0.043	0.187
297	186	15.50	0.77	0.230	(0.102)	0.043	0.187
298	187	15.58	0.63	0.190	(0.101)	0.036	0.154
299	188	15.67	0.63	0.190	(0.101)	0.036	0.154
300	189	15.75	0.63	0.190	(0.100)	0.036	0.154
301	190	15.83	0.63	0.190	(0.100)	0.036	0.154
302	191	15.92	0.63	0.190	(0.099)	0.036	0.154
303	192	16.00	0.63	0.190	(0.099)	0.036	0.154
304	193	16.08	0.13	0.040	(0.098)	0.008	0.032
305	194	16.17	0.13	0.040	(0.098)	0.008	0.032
306	195	16.25	0.13	0.040	(0.097)	0.008	0.032
307	196	16.33	0.13	0.040	(0.097)	0.008	0.032
308	197	16.42	0.13	0.040	(0.096)	0.008	0.032
309	198	16.50	0.13	0.040	(0.096)	0.008	0.032
310	199	16.58	0.10	0.030	(0.095)	0.006	0.024
311	200	16.67	0.10	0.030	(0.095)	0.006	0.024
312	201	16.75	0.10	0.030	(0.094)	0.006	0.024
313	202	16.83	0.10	0.030	(0.094)	0.006	0.024
314	203	16.92	0.10	0.030	(0.093)	0.006	0.024
315	204	17.00	0.10	0.030	(0.093)	0.006	0.024
316	205	17.08	0.17	0.050	(0.092)	0.009	0.041
317	206	17.17	0.17	0.050	(0.092)	0.009	0.041
318	207	17.25	0.17	0.050	(0.091)	0.009	0.041
319	208	17.33	0.17	0.050	(0.091)	0.009	0.041
320	209	17.42	0.17	0.050	(0.090)	0.009	0.041
321	210	17.50	0.17	0.050	(0.090)	0.009	0.041
322	211	17.58	0.17	0.050	(0.089)	0.009	0.041
323	212	17.67	0.17	0.050	(0.089)	0.009	0.041
324	213	17.75	0.17	0.050	(0.089)	0.009	0.041
325	214	17.83	0.13	0.040	(0.088)	0.008	0.032
326	215	17.92	0.13	0.040	(0.088)	0.008	0.032
327	216	18.00	0.13	0.040	(0.087)	0.008	0.032
328	217	18.08	0.13	0.040	(0.087)	0.008	0.032
329	218	18.17	0.13	0.040	(0.086)	0.008	0.032
330	219	18.25	0.13	0.040	(0.086)	0.008	0.032
331	220	18.33	0.13	0.040	(0.086)	0.008	0.032
332	221	18.42	0.13	0.040	(0.085)	0.008	0.032
333	222	18.50	0.13	0.040	(0.085)	0.008	0.032
334	223	18.58	0.10	0.030	(0.084)	0.006	0.024
335	224	18.67	0.10	0.030	(0.084)	0.006	0.024
336	225	18.75	0.10	0.030	(0.084)	0.006	0.024
337	226	18.83	0.07	0.020	(0.083)	0.004	0.016
338	227	18.92	0.07	0.020	(0.083)	0.004	0.016
339	228	19.00	0.07	0.020	(0.082)	0.004	0.016
340	229	19.08	0.10	0.030	(0.082)	0.006	0.024
341	230	19.17	0.10	0.030	(0.082)	0.006	0.024
342	231	19.25	0.10	0.030	(0.081)	0.006	0.024
343	232	19.33	0.13	0.040	(0.081)	0.008	0.032
344	233	19.42	0.13	0.040	(0.080)	0.008	0.032
345	234	19.50	0.13	0.040	(0.080)	0.008	0.032

235	19.58	0.10	0.030	(0.080)	0.006	0.024
236	19.67	0.10	0.030	(0.079)	0.006	0.024
237	19.75	0.10	0.030	(0.079)	0.006	0.024
238	19.83	0.07	0.020	(0.079)	0.004	0.016
239	19.92	0.07	0.020	(0.078)	0.004	0.016
240	20.00	0.07	0.020	(0.078)	0.004	0.016
241	20.08	0.10	0.030	(0.078)	0.006	0.024
242	20.17	0.10	0.030	(0.077)	0.006	0.024
243	20.25	0.10	0.030	(0.077)	0.006	0.024
244	20.33	0.10	0.030	(0.077)	0.006	0.024
245	20.42	0.10	0.030	(0.076)	0.006	0.024
246	20.50	0.10	0.030	(0.076)	0.006	0.024
247	20.58	0.10	0.030	(0.076)	0.006	0.024
248	20.67	0.10	0.030	(0.075)	0.006	0.024
249	20.75	0.10	0.030	(0.075)	0.006	0.024
250	20.83	0.07	0.020	(0.075)	0.004	0.016
251	20.92	0.07	0.020	(0.074)	0.004	0.016
252	21.00	0.07	0.020	(0.074)	0.004	0.016
253	21.08	0.10	0.030	(0.074)	0.006	0.024
254	21.17	0.10	0.030	(0.073)	0.006	0.024
255	21.25	0.10	0.030	(0.073)	0.006	0.024
256	21.33	0.07	0.020	(0.073)	0.004	0.016
257	21.42	0.07	0.020	(0.073)	0.004	0.016
258	21.50	0.07	0.020	(0.072)	0.004	0.016
259	21.58	0.10	0.030	(0.072)	0.006	0.024
260	21.67	0.10	0.030	(0.072)	0.006	0.024
261	21.75	0.10	0.030	(0.072)	0.006	0.024
262	21.83	0.07	0.020	(0.071)	0.004	0.016
263	21.92	0.07	0.020	(0.071)	0.004	0.016
264	22.00	0.07	0.020	(0.071)	0.004	0.016
265	22.08	0.10	0.030	(0.071)	0.006	0.024
266	22.17	0.10	0.030	(0.070)	0.006	0.024
267	22.25	0.10	0.030	(0.070)	0.006	0.024
268	22.33	0.07	0.020	(0.070)	0.004	0.016
269	22.42	0.07	0.020	(0.070)	0.004	0.016
270	22.50	0.07	0.020	(0.069)	0.004	0.016
271	22.58	0.07	0.020	(0.069)	0.004	0.016
272	22.67	0.07	0.020	(0.069)	0.004	0.016
273	22.75	0.07	0.020	(0.069)	0.004	0.016
274	22.83	0.07	0.020	(0.069)	0.004	0.016
275	22.92	0.07	0.020	(0.069)	0.004	0.016
276	23.00	0.07	0.020	(0.068)	0.004	0.016
277	23.08	0.07	0.020	(0.068)	0.004	0.016
278	23.17	0.07	0.020	(0.068)	0.004	0.016
279	23.25	0.07	0.020	(0.068)	0.004	0.016
280	23.33	0.07	0.020	(0.068)	0.004	0.016
281	23.42	0.07	0.020	(0.068)	0.004	0.016
282	23.50	0.07	0.020	(0.068)	0.004	0.016
283	23.58	0.07	0.020	(0.067)	0.004	0.016
284	23.67	0.07	0.020	(0.067)	0.004	0.016
285	23.75	0.07	0.020	(0.067)	0.004	0.016
286	23.83	0.07	0.020	(0.067)	0.004	0.016
287	23.92	0.07	0.020	(0.067)	0.004	0.016
288	24.00	0.07	0.020	(0.067)	0.004	0.016

(Loss Rate Not Used)

Sum = 100.0 Sum = 24.4

Flood volume = Effective rainfall 2.03(In)

times area 8.0(Ac.)/[(In)/(Ft.)] = 1.4(Ac.Ft)

Total soil loss = 0.47(In)

Total soil loss = 0.313(Ac.Ft)

Total rainfall = 2.50(In)

Flood volume = 58950.3 Cubic Feet

Total soil loss = 13648.6 Cubic Feet

Peak flow rate of this hydrograph = 2.166(CFS)

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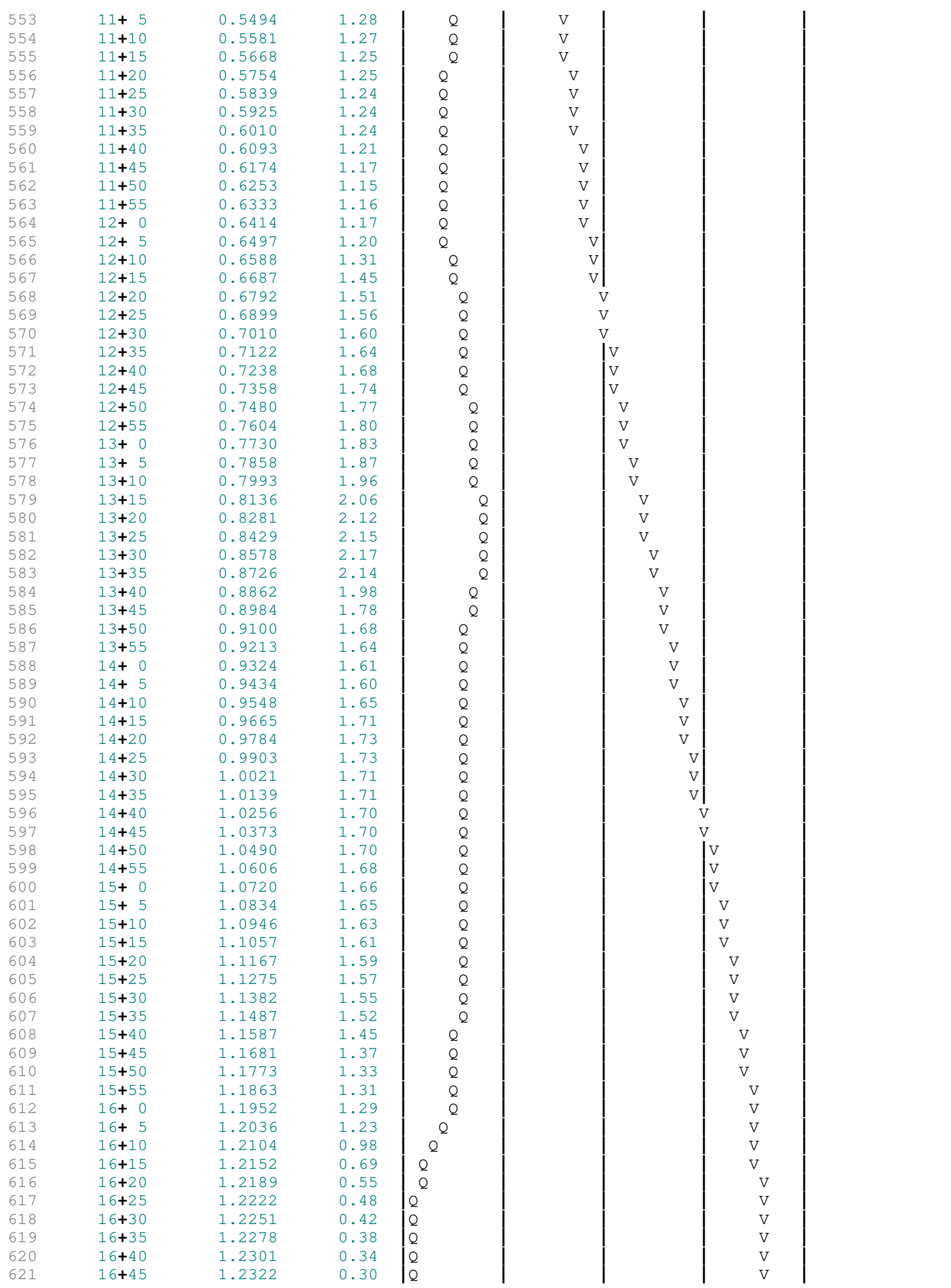
24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0001	0.01	Q				
0+10	0.0003	0.04	Q				
0+15	0.0008	0.08	Q				
0+20	0.0015	0.10	Q				
0+25	0.0024	0.12	Q				
0+30	0.0034	0.15	Q				
0+35	0.0045	0.16	Q				
0+40	0.0057	0.17	Q				
0+45	0.0069	0.18	Q				
0+50	0.0082	0.18	Q				
0+55	0.0096	0.20	Q				
1+ 0	0.0111	0.23	Q				
1+ 5	0.0128	0.23	Q				
1+10	0.0143	0.22	Q				
1+15	0.0157	0.21	Q				
1+20	0.0171	0.20	Q				
1+25	0.0185	0.20	Q				
1+30	0.0199	0.20	Q				
1+35	0.0213	0.20	Q				
1+40	0.0227	0.20	Q				
1+45	0.0241	0.20	Q				
1+50	0.0255	0.20	Q				
1+55	0.0270	0.22	Q				
2+ 0	0.0286	0.24	Q				
2+ 5	0.0303	0.25	Q				
2+10	0.0320	0.25	Q				
2+15	0.0337	0.25	VQ				
2+20	0.0355	0.25	|Q				
2+25	0.0372	0.26	|Q				
2+30	0.0390	0.26	|Q				
2+35	0.0408	0.26	|Q				
2+40	0.0427	0.28	|Q				
2+45	0.0448	0.30	|Q				
2+50	0.0469	0.31	|Q				
2+55	0.0491	0.31	|Q				
3+ 0	0.0512	0.32	|Q				
3+ 5	0.0534	0.32	|Q				
3+10	0.0557	0.32	|Q				
3+15	0.0579	0.32	|Q				
3+20	0.0601	0.32	|Q				
3+25	0.0623	0.32	|Q				
3+30	0.0646	0.33	|Q				
3+35	0.0668	0.33	|Q				
3+40	0.0691	0.33	|QV				
3+45	0.0713	0.33	|QV				
3+50	0.0736	0.33	|QV				
3+55	0.0760	0.35	|QV				
4+ 0	0.0785	0.37	|QV				
4+ 5	0.0811	0.37	|QV				
4+10	0.0837	0.38	|QV				
4+15	0.0863	0.38	|QV				
4+20	0.0890	0.39	|QV				
4+25	0.0918	0.41	|QV				
4+30	0.0948	0.43	|QV				
4+35	0.0978	0.44	|QV				
4+40	0.1008	0.44	|QV				
4+45	0.1039	0.45	|Q V				
4+50	0.1070	0.45	|Q V				
4+55	0.1102	0.47	|Q V				
5+ 0	0.1136	0.49	|Q V				
5+ 5	0.1170	0.49	|Q V				
5+10	0.1203	0.47	|Q V				
5+15	0.1233	0.44	|Q V				

484	5+20	0.1262	0.42	Q V				
485	5+25	0.1291	0.43	Q V				
486	5+30	0.1322	0.45	Q V				
487	5+35	0.1354	0.46	Q V				
488	5+40	0.1386	0.47	Q V				
489	5+45	0.1420	0.49	Q V				
490	5+50	0.1455	0.50	Q V				
491	5+55	0.1490	0.51	Q V				
492	6+ 0	0.1525	0.51	Q V				
493	6+ 5	0.1561	0.52	Q V				
494	6+10	0.1598	0.54	Q V				
495	6+15	0.1636	0.56	Q V				
496	6+20	0.1675	0.57	Q V				
497	6+25	0.1715	0.57	Q V				
498	6+30	0.1755	0.58	Q V				
499	6+35	0.1795	0.58	Q V				
500	6+40	0.1836	0.60	Q V				
501	6+45	0.1879	0.62	Q V				
502	6+50	0.1923	0.63	Q V				
503	6+55	0.1967	0.64	Q V				
504	7+ 0	0.2011	0.64	Q V				
505	7+ 5	0.2055	0.65	Q V				
506	7+10	0.2100	0.65	Q V				
507	7+15	0.2145	0.65	Q V				
508	7+20	0.2190	0.65	Q V				
509	7+25	0.2236	0.67	Q V				
510	7+30	0.2284	0.69	Q V				
511	7+35	0.2332	0.70	Q V				
512	7+40	0.2382	0.73	Q V				
513	7+45	0.2434	0.75	Q V				
514	7+50	0.2486	0.76	Q V				
515	7+55	0.2540	0.79	Q V				
516	8+ 0	0.2596	0.81	Q V				
517	8+ 5	0.2653	0.83	Q V				
518	8+10	0.2713	0.87	Q V				
519	8+15	0.2776	0.91	Q V				
520	8+20	0.2840	0.93	Q V				
521	8+25	0.2905	0.95	Q V				
522	8+30	0.2971	0.95	Q V				
523	8+35	0.3037	0.96	Q V				
524	8+40	0.3105	0.99	Q V				
525	8+45	0.3174	1.01	Q V				
526	8+50	0.3245	1.02	Q V				
527	8+55	0.3317	1.05	Q V				
528	9+ 0	0.3391	1.07	Q V				
529	9+ 5	0.3466	1.09	Q V				
530	9+10	0.3544	1.13	Q V				
531	9+15	0.3625	1.17	Q V				
532	9+20	0.3707	1.20	Q V				
533	9+25	0.3792	1.23	Q V				
534	9+30	0.3878	1.26	Q V				
535	9+35	0.3966	1.27	Q V				
536	9+40	0.4056	1.30	Q V				
537	9+45	0.4147	1.33	Q V				
538	9+50	0.4240	1.34	Q V				
539	9+55	0.4334	1.37	Q V				
540	10+ 0	0.4430	1.39	Q V				
541	10+ 5	0.4525	1.38	Q V				
542	10+10	0.4613	1.28	Q V				
543	10+15	0.4693	1.15	Q V				
544	10+20	0.4768	1.09	Q V				
545	10+25	0.4842	1.07	Q V				
546	10+30	0.4914	1.05	Q V				
547	10+35	0.4986	1.05	Q V				
548	10+40	0.5063	1.12	Q V				
549	10+45	0.5146	1.20	Q V				
550	10+50	0.5232	1.24	Q V				
551	10+55	0.5318	1.26	Q V				
552	11+ 0	0.5406	1.27	Q V				



622	16+50	1.2340	0.27	Q	|	|	|	V |
623	16+55	1.2358	0.25	Q	|	|	|	V |
624	17+ 0	1.2374	0.24	Q	|	|	|	V |
625	17+ 5	1.2390	0.23	Q	|	|	|	V |
626	17+10	1.2408	0.26	Q	|	|	|	V |
627	17+15	1.2428	0.29	Q	|	|	|	V |
628	17+20	1.2449	0.30	Q	|	|	|	V |
629	17+25	1.2470	0.30	Q	|	|	|	V |
630	17+30	1.2491	0.31	Q	|	|	|	V |
631	17+35	1.2513	0.31	Q	|	|	|	V |
632	17+40	1.2534	0.32	Q	|	|	|	V |
633	17+45	1.2556	0.32	Q	|	|	|	V |
634	17+50	1.2578	0.32	Q	|	|	|	V |
635	17+55	1.2599	0.30	Q	|	|	|	V |
636	18+ 0	1.2619	0.28	Q	|	|	|	V |
637	18+ 5	1.2638	0.28	Q	|	|	|	V |
638	18+10	1.2657	0.27	Q	|	|	|	V |
639	18+15	1.2675	0.27	Q	|	|	|	V |
640	18+20	1.2694	0.27	Q	|	|	|	V |
641	18+25	1.2712	0.27	Q	|	|	|	V |
642	18+30	1.2731	0.27	Q	|	|	|	V |
643	18+35	1.2749	0.26	Q	|	|	|	V |
644	18+40	1.2766	0.25	Q	|	|	|	V |
645	18+45	1.2781	0.23	Q	|	|	|	V |
646	18+50	1.2796	0.21	Q	|	|	|	V |
647	18+55	1.2809	0.19	Q	|	|	|	V |
648	19+ 0	1.2821	0.17	Q	|	|	|	V |
649	19+ 5	1.2832	0.16	Q	|	|	|	V |
650	19+10	1.2843	0.17	Q	|	|	|	V |
651	19+15	1.2856	0.18	Q	|	|	|	V |
652	19+20	1.2869	0.19	Q	|	|	|	V |
653	19+25	1.2884	0.21	Q	|	|	|	V |
654	19+30	1.2900	0.23	Q	|	|	|	V |
655	19+35	1.2916	0.24	Q	|	|	|	V |
656	19+40	1.2932	0.23	Q	|	|	|	V |
657	19+45	1.2946	0.21	Q	|	|	|	V |
658	19+50	1.2960	0.20	Q	|	|	|	V |
659	19+55	1.2973	0.18	Q	|	|	|	V |
660	20+ 0	1.2984	0.16	Q	|	|	|	V |
661	20+ 5	1.2995	0.16	Q	|	|	|	V |
662	20+10	1.3006	0.17	Q	|	|	|	V |
663	20+15	1.3019	0.18	Q	|	|	|	V |
664	20+20	1.3032	0.19	Q	|	|	|	V |
665	20+25	1.3045	0.19	Q	|	|	|	V |
666	20+30	1.3058	0.19	Q	|	|	|	V |
667	20+35	1.3071	0.19	Q	|	|	|	V |
668	20+40	1.3085	0.19	Q	|	|	|	V |
669	20+45	1.3098	0.19	Q	|	|	|	V |
670	20+50	1.3111	0.19	Q	|	|	|	V |
671	20+55	1.3123	0.18	Q	|	|	|	V |
672	21+ 0	1.3134	0.16	Q	|	|	|	V |
673	21+ 5	1.3145	0.15	Q	|	|	|	V |
674	21+10	1.3156	0.16	Q	|	|	|	V |
675	21+15	1.3168	0.18	Q	|	|	|	V |
676	21+20	1.3181	0.18	Q	|	|	|	V |
677	21+25	1.3192	0.17	Q	|	|	|	V |
678	21+30	1.3203	0.15	Q	|	|	|	V |
679	21+35	1.3213	0.15	Q	|	|	|	V |
680	21+40	1.3224	0.16	Q	|	|	|	V |
681	21+45	1.3236	0.18	Q	|	|	|	V |
682	21+50	1.3249	0.18	Q	|	|	|	V |
683	21+55	1.3260	0.17	Q	|	|	|	V |
684	22+ 0	1.3271	0.15	Q	|	|	|	V |
685	22+ 5	1.3281	0.15	Q	|	|	|	V |
686	22+10	1.3292	0.16	Q	|	|	|	V |
687	22+15	1.3304	0.18	Q	|	|	|	V |
688	22+20	1.3317	0.18	Q	|	|	|	V |
689	22+25	1.3328	0.17	Q	|	|	|	V |
690	22+30	1.3339	0.15	Q	|	|	|	V |

22+35	1.3348	0.14	Q	|	|	|	V|
22+40	1.3358	0.14	Q	|	|	|	V|
22+45	1.3368	0.14	Q	|	|	|	V|
22+50	1.3377	0.14	Q	|	|	|	V|
22+55	1.3386	0.14	Q	|	|	|	V|
23+ 0	1.3396	0.13	Q	|	|	|	V|
23+ 5	1.3405	0.13	Q	|	|	|	V|
23+10	1.3414	0.13	Q	|	|	|	V|
23+15	1.3423	0.13	Q	|	|	|	V|
23+20	1.3432	0.13	Q	|	|	|	V|
23+25	1.3441	0.13	Q	|	|	|	V|
23+30	1.3450	0.13	Q	|	|	|	V|
23+35	1.3459	0.13	Q	|	|	|	V|
23+40	1.3468	0.13	Q	|	|	|	V|
23+45	1.3477	0.13	Q	|	|	|	V|
23+50	1.3486	0.13	Q	|	|	|	V|
23+55	1.3495	0.13	Q	|	|	|	V|
24+ 0	1.3504	0.13	Q	|	|	|	V|
24+ 5	1.3513	0.12	Q	|	|	|	V|
24+10	1.3519	0.09	Q	|	|	|	V|
24+15	1.3523	0.05	Q	|	|	|	V|
24+20	1.3526	0.04	Q	|	|	|	V|
24+25	1.3527	0.03	Q	|	|	|	V|
24+30	1.3529	0.02	Q	|	|	|	V|
24+35	1.3530	0.02	Q	|	|	|	V|
24+40	1.3531	0.01	Q	|	|	|	V|
24+45	1.3531	0.01	Q	|	|	|	V|
24+50	1.3532	0.01	Q	|	|	|	V|
24+55	1.3532	0.01	Q	|	|	|	V|
25+ 0	1.3533	0.00	Q	|	|	|	V|
25+ 5	1.3533	0.00	Q	|	|	|	V|
25+10	1.3533	0.00	Q	|	|	|	V|
25+15	1.3533	0.00	Q	|	|	|	V|
25+20	1.3533	0.00	Q	|	|	|	V|

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

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        Study date  08/08/24 File: PTC2D242.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



------------------------------------------------------------------------
TEMESCAL CANYON PROPOSED OUTFLOW D
2 YEAR 24 HOUR
KIMLEY HORN

------------------------------------------------------------------------
Drainage Area =       6.33(Ac.)  =      0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       6.33(Ac.)  =      0.010 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.162 Hr.
Lag time =     9.72 Min.
25% of lag time =     2.43 Min.
40% of lag time =     3.89 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]
        6.33            2.50               15.82

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        6.33            7.00               44.31

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    2.500(In)
Area Averaged 100-Year Rainfall =    7.000(In)

Point rain (area averaged) =    2.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    2.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     6.330           69.00          0.270
 Total Area Entered =      6.33(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)       (Dec.)    (In/Hr)
```

69.0	49.8	0.574	0.270	0.434	1.000	0.434

Sum (F) = 0.434

Area averaged **mean** soil loss (F) (In/Hr) = 0.434

Minimum soil loss rate ((In/Hr)) = 0.217

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.685

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

VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	51.440	6.400	0.408
2	0.167	102.881	27.367	1.746
3	0.250	154.321	28.680	1.830
4	0.333	205.761	12.458	0.795
5	0.417	257.202	6.665	0.425
6	0.500	308.642	4.642	0.296
7	0.583	360.082	3.334	0.213
8	0.667	411.523	2.514	0.160
9	0.750	462.963	1.829	0.117
10	0.833	514.403	1.556	0.099
11	0.917	565.844	1.229	0.078
12	1.000	617.284	0.964	0.061
13	1.083	668.724	0.752	0.048
14	1.167	720.165	0.556	0.035
15	1.250	771.605	0.514	0.033
16	1.333	823.045	0.541	0.035
		Sum = 100.000	Sum=	6.379

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	(0.770)	0.014	0.006
2	0.17	0.07	0.020	(0.767)	0.014	0.006
3	0.25	0.07	0.020	(0.764)	0.014	0.006
4	0.33	0.10	0.030	(0.761)	0.021	0.009
5	0.42	0.10	0.030	(0.758)	0.021	0.009
6	0.50	0.10	0.030	(0.755)	0.021	0.009
7	0.58	0.10	0.030	(0.752)	0.021	0.009
8	0.67	0.10	0.030	(0.749)	0.021	0.009
9	0.75	0.10	0.030	(0.747)	0.021	0.009
10	0.83	0.13	0.040	(0.744)	0.027	0.013
11	0.92	0.13	0.040	(0.741)	0.027	0.013
12	1.00	0.13	0.040	(0.738)	0.027	0.013
13	1.08	0.10	0.030	(0.735)	0.021	0.009
14	1.17	0.10	0.030	(0.732)	0.021	0.009
15	1.25	0.10	0.030	(0.729)	0.021	0.009
16	1.33	0.10	0.030	(0.726)	0.021	0.009
17	1.42	0.10	0.030	(0.723)	0.021	0.009
18	1.50	0.10	0.030	(0.720)	0.021	0.009
19	1.58	0.10	0.030	(0.717)	0.021	0.009
20	1.67	0.10	0.030	(0.715)	0.021	0.009
21	1.75	0.10	0.030	(0.712)	0.021	0.009
22	1.83	0.13	0.040	(0.709)	0.027	0.013
23	1.92	0.13	0.040	(0.706)	0.027	0.013
24	2.00	0.13	0.040	(0.703)	0.027	0.013
25	2.08	0.13	0.040	(0.700)	0.027	0.013
26	2.17	0.13	0.040	(0.698)	0.027	0.013
27	2.25	0.13	0.040	(0.695)	0.027	0.013
28	2.33	0.13	0.040	(0.692)	0.027	0.013

139	29	2.42	0.13	0.040	(	0.689)	0.027	0.013
140	30	2.50	0.13	0.040	(	0.686)	0.027	0.013
141	31	2.58	0.17	0.050	(	0.683)	0.034	0.016
142	32	2.67	0.17	0.050	(	0.681)	0.034	0.016
143	33	2.75	0.17	0.050	(	0.678)	0.034	0.016
144	34	2.83	0.17	0.050	(	0.675)	0.034	0.016
145	35	2.92	0.17	0.050	(	0.672)	0.034	0.016
146	36	3.00	0.17	0.050	(	0.669)	0.034	0.016
147	37	3.08	0.17	0.050	(	0.667)	0.034	0.016
148	38	3.17	0.17	0.050	(	0.664)	0.034	0.016
149	39	3.25	0.17	0.050	(	0.661)	0.034	0.016
150	40	3.33	0.17	0.050	(	0.658)	0.034	0.016
151	41	3.42	0.17	0.050	(	0.656)	0.034	0.016
152	42	3.50	0.17	0.050	(	0.653)	0.034	0.016
153	43	3.58	0.17	0.050	(	0.650)	0.034	0.016
154	44	3.67	0.17	0.050	(	0.647)	0.034	0.016
155	45	3.75	0.17	0.050	(	0.645)	0.034	0.016
156	46	3.83	0.20	0.060	(	0.642)	0.041	0.019
157	47	3.92	0.20	0.060	(	0.639)	0.041	0.019
158	48	4.00	0.20	0.060	(	0.637)	0.041	0.019
159	49	4.08	0.20	0.060	(	0.634)	0.041	0.019
160	50	4.17	0.20	0.060	(	0.631)	0.041	0.019
161	51	4.25	0.20	0.060	(	0.628)	0.041	0.019
162	52	4.33	0.23	0.070	(	0.626)	0.048	0.022
163	53	4.42	0.23	0.070	(	0.623)	0.048	0.022
164	54	4.50	0.23	0.070	(	0.620)	0.048	0.022
165	55	4.58	0.23	0.070	(	0.618)	0.048	0.022
166	56	4.67	0.23	0.070	(	0.615)	0.048	0.022
167	57	4.75	0.23	0.070	(	0.612)	0.048	0.022
168	58	4.83	0.27	0.080	(	0.610)	0.055	0.025
169	59	4.92	0.27	0.080	(	0.607)	0.055	0.025
170	60	5.00	0.27	0.080	(	0.605)	0.055	0.025
171	61	5.08	0.20	0.060	(	0.602)	0.041	0.019
172	62	5.17	0.20	0.060	(	0.599)	0.041	0.019
173	63	5.25	0.20	0.060	(	0.597)	0.041	0.019
174	64	5.33	0.23	0.070	(	0.594)	0.048	0.022
175	65	5.42	0.23	0.070	(	0.592)	0.048	0.022
176	66	5.50	0.23	0.070	(	0.589)	0.048	0.022
177	67	5.58	0.27	0.080	(	0.586)	0.055	0.025
178	68	5.67	0.27	0.080	(	0.584)	0.055	0.025
179	69	5.75	0.27	0.080	(	0.581)	0.055	0.025
180	70	5.83	0.27	0.080	(	0.579)	0.055	0.025
181	71	5.92	0.27	0.080	(	0.576)	0.055	0.025
182	72	6.00	0.27	0.080	(	0.574)	0.055	0.025
183	73	6.08	0.30	0.090	(	0.571)	0.062	0.028
184	74	6.17	0.30	0.090	(	0.568)	0.062	0.028
185	75	6.25	0.30	0.090	(	0.566)	0.062	0.028
186	76	6.33	0.30	0.090	(	0.563)	0.062	0.028
187	77	6.42	0.30	0.090	(	0.561)	0.062	0.028
188	78	6.50	0.30	0.090	(	0.558)	0.062	0.028
189	79	6.58	0.33	0.100	(	0.556)	0.068	0.031
190	80	6.67	0.33	0.100	(	0.553)	0.068	0.031
191	81	6.75	0.33	0.100	(	0.551)	0.068	0.031
192	82	6.83	0.33	0.100	(	0.548)	0.068	0.031
193	83	6.92	0.33	0.100	(	0.546)	0.068	0.031
194	84	7.00	0.33	0.100	(	0.543)	0.068	0.031
195	85	7.08	0.33	0.100	(	0.541)	0.068	0.031
196	86	7.17	0.33	0.100	(	0.538)	0.068	0.031
197	87	7.25	0.33	0.100	(	0.536)	0.068	0.031
198	88	7.33	0.37	0.110	(	0.534)	0.075	0.035
199	89	7.42	0.37	0.110	(	0.531)	0.075	0.035
200	90	7.50	0.37	0.110	(	0.529)	0.075	0.035
201	91	7.58	0.40	0.120	(	0.526)	0.082	0.038
202	92	7.67	0.40	0.120	(	0.524)	0.082	0.038
203	93	7.75	0.40	0.120	(	0.521)	0.082	0.038
204	94	7.83	0.43	0.130	(	0.519)	0.089	0.041
205	95	7.92	0.43	0.130	(	0.517)	0.089	0.041
206	96	8.00	0.43	0.130	(	0.514)	0.089	0.041
207	97	8.08	0.50	0.150	(	0.512)	0.103	0.047

208	98	8.17	0.50	0.150	(0.509)	0.103	0.047
209	99	8.25	0.50	0.150	(0.507)	0.103	0.047
210	100	8.33	0.50	0.150	(0.505)	0.103	0.047
211	101	8.42	0.50	0.150	(0.502)	0.103	0.047
212	102	8.50	0.50	0.150	(0.500)	0.103	0.047
213	103	8.58	0.53	0.160	(0.498)	0.110	0.050
214	104	8.67	0.53	0.160	(0.495)	0.110	0.050
215	105	8.75	0.53	0.160	(0.493)	0.110	0.050
216	106	8.83	0.57	0.170	(0.491)	0.116	0.054
217	107	8.92	0.57	0.170	(0.488)	0.116	0.054
218	108	9.00	0.57	0.170	(0.486)	0.116	0.054
219	109	9.08	0.63	0.190	(0.484)	0.130	0.060
220	110	9.17	0.63	0.190	(0.481)	0.130	0.060
221	111	9.25	0.63	0.190	(0.479)	0.130	0.060
222	112	9.33	0.67	0.200	(0.477)	0.137	0.063
223	113	9.42	0.67	0.200	(0.475)	0.137	0.063
224	114	9.50	0.67	0.200	(0.472)	0.137	0.063
225	115	9.58	0.70	0.210	(0.470)	0.144	0.066
226	116	9.67	0.70	0.210	(0.468)	0.144	0.066
227	117	9.75	0.70	0.210	(0.466)	0.144	0.066
228	118	9.83	0.73	0.220	(0.463)	0.151	0.069
229	119	9.92	0.73	0.220	(0.461)	0.151	0.069
230	120	10.00	0.73	0.220	(0.459)	0.151	0.069
231	121	10.08	0.50	0.150	(0.457)	0.103	0.047
232	122	10.17	0.50	0.150	(0.454)	0.103	0.047
233	123	10.25	0.50	0.150	(0.452)	0.103	0.047
234	124	10.33	0.50	0.150	(0.450)	0.103	0.047
235	125	10.42	0.50	0.150	(0.448)	0.103	0.047
236	126	10.50	0.50	0.150	(0.446)	0.103	0.047
237	127	10.58	0.67	0.200	(0.443)	0.137	0.063
238	128	10.67	0.67	0.200	(0.441)	0.137	0.063
239	129	10.75	0.67	0.200	(0.439)	0.137	0.063
240	130	10.83	0.67	0.200	(0.437)	0.137	0.063
241	131	10.92	0.67	0.200	(0.435)	0.137	0.063
242	132	11.00	0.67	0.200	(0.433)	0.137	0.063
243	133	11.08	0.63	0.190	(0.431)	0.130	0.060
244	134	11.17	0.63	0.190	(0.428)	0.130	0.060
245	135	11.25	0.63	0.190	(0.426)	0.130	0.060
246	136	11.33	0.63	0.190	(0.424)	0.130	0.060
247	137	11.42	0.63	0.190	(0.422)	0.130	0.060
248	138	11.50	0.63	0.190	(0.420)	0.130	0.060
249	139	11.58	0.57	0.170	(0.418)	0.116	0.054
250	140	11.67	0.57	0.170	(0.416)	0.116	0.054
251	141	11.75	0.57	0.170	(0.414)	0.116	0.054
252	142	11.83	0.60	0.180	(0.412)	0.123	0.057
253	143	11.92	0.60	0.180	(0.410)	0.123	0.057
254	144	12.00	0.60	0.180	(0.408)	0.123	0.057
255	145	12.08	0.83	0.250	(0.406)	0.171	0.079
256	146	12.17	0.83	0.250	(0.404)	0.171	0.079
257	147	12.25	0.83	0.250	(0.402)	0.171	0.079
258	148	12.33	0.87	0.260	(0.400)	0.178	0.082
259	149	12.42	0.87	0.260	(0.398)	0.178	0.082
260	150	12.50	0.87	0.260	(0.396)	0.178	0.082
261	151	12.58	0.93	0.280	(0.394)	0.192	0.088
262	152	12.67	0.93	0.280	(0.392)	0.192	0.088
263	153	12.75	0.93	0.280	(0.390)	0.192	0.088
264	154	12.83	0.97	0.290	(0.388)	0.199	0.091
265	155	12.92	0.97	0.290	(0.386)	0.199	0.091
266	156	13.00	0.97	0.290	(0.384)	0.199	0.091
267	157	13.08	1.13	0.340	(0.382)	0.233	0.107
268	158	13.17	1.13	0.340	(0.380)	0.233	0.107
269	159	13.25	1.13	0.340	(0.378)	0.233	0.107
270	160	13.33	1.13	0.340	(0.376)	0.233	0.107
271	161	13.42	1.13	0.340	(0.374)	0.233	0.107
272	162	13.50	1.13	0.340	(0.372)	0.233	0.107
273	163	13.58	0.77	0.230	(0.370)	0.158	0.072
274	164	13.67	0.77	0.230	(0.368)	0.158	0.072
275	165	13.75	0.77	0.230	(0.366)	0.158	0.072
276	166	13.83	0.77	0.230	(0.365)	0.158	0.072

277	167	13.92	0.77	0.230	(	0.363)	0.158	0.072
278	168	14.00	0.77	0.230	(	0.361)	0.158	0.072
279	169	14.08	0.90	0.270	(	0.359)	0.185	0.085
280	170	14.17	0.90	0.270	(	0.357)	0.185	0.085
281	171	14.25	0.90	0.270	(	0.355)	0.185	0.085
282	172	14.33	0.87	0.260	(	0.354)	0.178	0.082
283	173	14.42	0.87	0.260	(	0.352)	0.178	0.082
284	174	14.50	0.87	0.260	(	0.350)	0.178	0.082
285	175	14.58	0.87	0.260	(	0.348)	0.178	0.082
286	176	14.67	0.87	0.260	(	0.346)	0.178	0.082
287	177	14.75	0.87	0.260	(	0.345)	0.178	0.082
288	178	14.83	0.83	0.250	(	0.343)	0.171	0.079
289	179	14.92	0.83	0.250	(	0.341)	0.171	0.079
290	180	15.00	0.83	0.250	(	0.339)	0.171	0.079
291	181	15.08	0.80	0.240	(	0.338)	0.164	0.076
292	182	15.17	0.80	0.240	(	0.336)	0.164	0.076
293	183	15.25	0.80	0.240	(	0.334)	0.164	0.076
294	184	15.33	0.77	0.230	(	0.332)	0.158	0.072
295	185	15.42	0.77	0.230	(	0.331)	0.158	0.072
296	186	15.50	0.77	0.230	(	0.329)	0.158	0.072
297	187	15.58	0.63	0.190	(	0.327)	0.130	0.060
298	188	15.67	0.63	0.190	(	0.326)	0.130	0.060
299	189	15.75	0.63	0.190	(	0.324)	0.130	0.060
300	190	15.83	0.63	0.190	(	0.322)	0.130	0.060
301	191	15.92	0.63	0.190	(	0.321)	0.130	0.060
302	192	16.00	0.63	0.190	(	0.319)	0.130	0.060
303	193	16.08	0.13	0.040	(	0.317)	0.027	0.013
304	194	16.17	0.13	0.040	(	0.316)	0.027	0.013
305	195	16.25	0.13	0.040	(	0.314)	0.027	0.013
306	196	16.33	0.13	0.040	(	0.313)	0.027	0.013
307	197	16.42	0.13	0.040	(	0.311)	0.027	0.013
308	198	16.50	0.13	0.040	(	0.309)	0.027	0.013
309	199	16.58	0.10	0.030	(	0.308)	0.021	0.009
310	200	16.67	0.10	0.030	(	0.306)	0.021	0.009
311	201	16.75	0.10	0.030	(	0.305)	0.021	0.009
312	202	16.83	0.10	0.030	(	0.303)	0.021	0.009
313	203	16.92	0.10	0.030	(	0.302)	0.021	0.009
314	204	17.00	0.10	0.030	(	0.300)	0.021	0.009
315	205	17.08	0.17	0.050	(	0.299)	0.034	0.016
316	206	17.17	0.17	0.050	(	0.297)	0.034	0.016
317	207	17.25	0.17	0.050	(	0.296)	0.034	0.016
318	208	17.33	0.17	0.050	(	0.294)	0.034	0.016
319	209	17.42	0.17	0.050	(	0.293)	0.034	0.016
320	210	17.50	0.17	0.050	(	0.291)	0.034	0.016
321	211	17.58	0.17	0.050	(	0.290)	0.034	0.016
322	212	17.67	0.17	0.050	(	0.288)	0.034	0.016
323	213	17.75	0.17	0.050	(	0.287)	0.034	0.016
324	214	17.83	0.13	0.040	(	0.285)	0.027	0.013
325	215	17.92	0.13	0.040	(	0.284)	0.027	0.013
326	216	18.00	0.13	0.040	(	0.283)	0.027	0.013
327	217	18.08	0.13	0.040	(	0.281)	0.027	0.013
328	218	18.17	0.13	0.040	(	0.280)	0.027	0.013
329	219	18.25	0.13	0.040	(	0.278)	0.027	0.013
330	220	18.33	0.13	0.040	(	0.277)	0.027	0.013
331	221	18.42	0.13	0.040	(	0.276)	0.027	0.013
332	222	18.50	0.13	0.040	(	0.274)	0.027	0.013
333	223	18.58	0.10	0.030	(	0.273)	0.021	0.009
334	224	18.67	0.10	0.030	(	0.272)	0.021	0.009
335	225	18.75	0.10	0.030	(	0.270)	0.021	0.009
336	226	18.83	0.07	0.020	(	0.269)	0.014	0.006
337	227	18.92	0.07	0.020	(	0.268)	0.014	0.006
338	228	19.00	0.07	0.020	(	0.267)	0.014	0.006
339	229	19.08	0.10	0.030	(	0.265)	0.021	0.009
340	230	19.17	0.10	0.030	(	0.264)	0.021	0.009
341	231	19.25	0.10	0.030	(	0.263)	0.021	0.009
342	232	19.33	0.13	0.040	(	0.262)	0.027	0.013
343	233	19.42	0.13	0.040	(	0.260)	0.027	0.013
344	234	19.50	0.13	0.040	(	0.259)	0.027	0.013
345	235	19.58	0.10	0.030	(	0.258)	0.021	0.009

236	19.67	0.10	0.030	(0.257)	0.021	0.009
237	19.75	0.10	0.030	(0.256)	0.021	0.009
238	19.83	0.07	0.020	(0.255)	0.014	0.006
239	19.92	0.07	0.020	(0.253)	0.014	0.006
240	20.00	0.07	0.020	(0.252)	0.014	0.006
241	20.08	0.10	0.030	(0.251)	0.021	0.009
242	20.17	0.10	0.030	(0.250)	0.021	0.009
243	20.25	0.10	0.030	(0.249)	0.021	0.009
244	20.33	0.10	0.030	(0.248)	0.021	0.009
245	20.42	0.10	0.030	(0.247)	0.021	0.009
246	20.50	0.10	0.030	(0.246)	0.021	0.009
247	20.58	0.10	0.030	(0.245)	0.021	0.009
248	20.67	0.10	0.030	(0.244)	0.021	0.009
249	20.75	0.10	0.030	(0.243)	0.021	0.009
250	20.83	0.07	0.020	(0.242)	0.014	0.006
251	20.92	0.07	0.020	(0.241)	0.014	0.006
252	21.00	0.07	0.020	(0.240)	0.014	0.006
253	21.08	0.10	0.030	(0.239)	0.021	0.009
254	21.17	0.10	0.030	(0.238)	0.021	0.009
255	21.25	0.10	0.030	(0.237)	0.021	0.009
256	21.33	0.07	0.020	(0.236)	0.014	0.006
257	21.42	0.07	0.020	(0.235)	0.014	0.006
258	21.50	0.07	0.020	(0.234)	0.014	0.006
259	21.58	0.10	0.030	(0.233)	0.021	0.009
260	21.67	0.10	0.030	(0.233)	0.021	0.009
261	21.75	0.10	0.030	(0.232)	0.021	0.009
262	21.83	0.07	0.020	(0.231)	0.014	0.006
263	21.92	0.07	0.020	(0.230)	0.014	0.006
264	22.00	0.07	0.020	(0.229)	0.014	0.006
265	22.08	0.10	0.030	(0.229)	0.021	0.009
266	22.17	0.10	0.030	(0.228)	0.021	0.009
267	22.25	0.10	0.030	(0.227)	0.021	0.009
268	22.33	0.07	0.020	(0.226)	0.014	0.006
269	22.42	0.07	0.020	(0.226)	0.014	0.006
270	22.50	0.07	0.020	(0.225)	0.014	0.006
271	22.58	0.07	0.020	(0.224)	0.014	0.006
272	22.67	0.07	0.020	(0.224)	0.014	0.006
273	22.75	0.07	0.020	(0.223)	0.014	0.006
274	22.83	0.07	0.020	(0.223)	0.014	0.006
275	22.92	0.07	0.020	(0.222)	0.014	0.006
276	23.00	0.07	0.020	(0.222)	0.014	0.006
277	23.08	0.07	0.020	(0.221)	0.014	0.006
278	23.17	0.07	0.020	(0.221)	0.014	0.006
279	23.25	0.07	0.020	(0.220)	0.014	0.006
280	23.33	0.07	0.020	(0.220)	0.014	0.006
281	23.42	0.07	0.020	(0.219)	0.014	0.006
282	23.50	0.07	0.020	(0.219)	0.014	0.006
283	23.58	0.07	0.020	(0.218)	0.014	0.006
284	23.67	0.07	0.020	(0.218)	0.014	0.006
285	23.75	0.07	0.020	(0.218)	0.014	0.006
286	23.83	0.07	0.020	(0.218)	0.014	0.006
287	23.92	0.07	0.020	(0.217)	0.014	0.006
288	24.00	0.07	0.020	(0.217)	0.014	0.006

(Loss Rate Not Used)

Sum = 100.0 Sum = 9.4

Flood volume = Effective rainfall 0.79(In)

times area 6.3(Ac.)/[(In)/(Ft.)] = 0.4(Ac.Ft)

Total soil loss = 1.71(In)

Total soil loss = 0.903(Ac.Ft)

Total rainfall = 2.50(In)

Flood volume = 18094.9 Cubic Feet

Total soil loss = 39349.2 Cubic Feet

Peak flow rate of this hydrograph = 0.667(CFS)

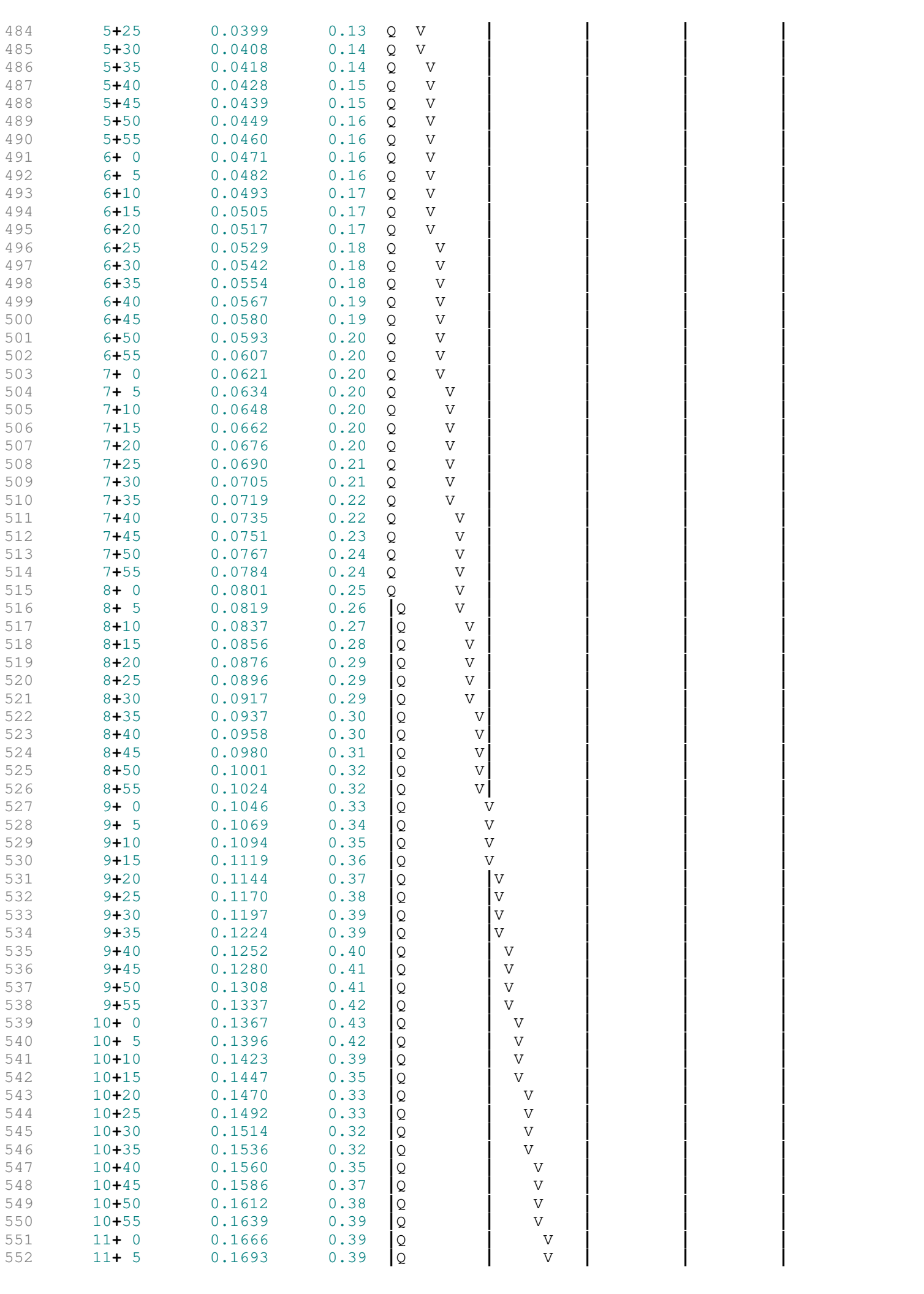
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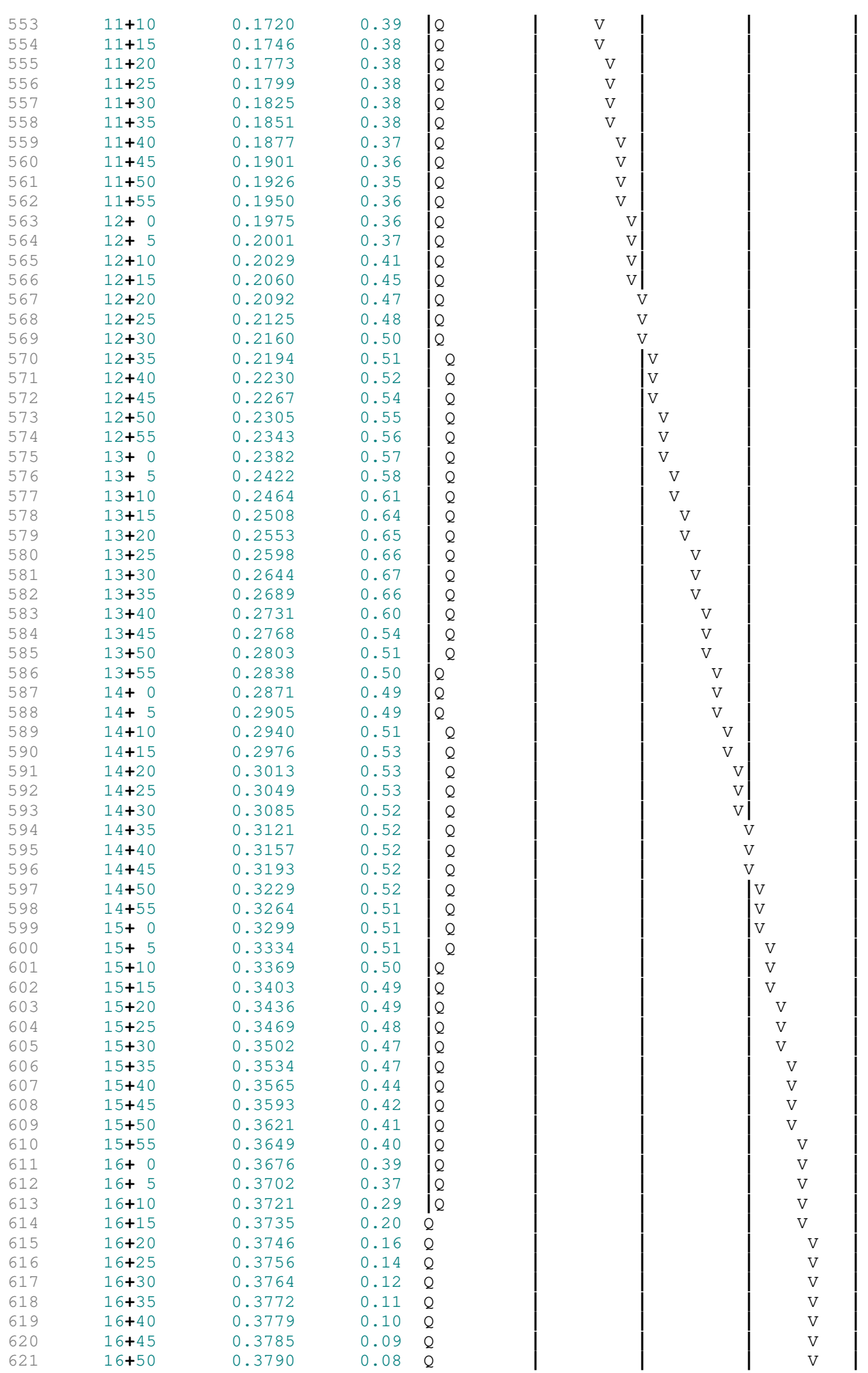
24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0001	0.01	Q				
0+15	0.0003	0.03	Q				
0+20	0.0005	0.03	Q				
0+25	0.0008	0.04	Q				
0+30	0.0011	0.05	Q				
0+35	0.0015	0.05	Q				
0+40	0.0018	0.05	Q				
0+45	0.0022	0.06	Q				
0+50	0.0026	0.06	Q				
0+55	0.0030	0.06	Q				
1+ 0	0.0035	0.07	Q				
1+ 5	0.0040	0.07	Q				
1+10	0.0045	0.07	Q				
1+15	0.0049	0.06	Q				
1+20	0.0054	0.06	Q				
1+25	0.0058	0.06	Q				
1+30	0.0062	0.06	Q				
1+35	0.0067	0.06	Q				
1+40	0.0071	0.06	Q				
1+45	0.0075	0.06	Q				
1+50	0.0079	0.06	Q				
1+55	0.0084	0.07	Q				
2+ 0	0.0089	0.07	Q				
2+ 5	0.0094	0.08	Q				
2+10	0.0099	0.08	Q				
2+15	0.0105	0.08	QV				
2+20	0.0110	0.08	QV				
2+25	0.0116	0.08	QV				
2+30	0.0121	0.08	QV				
2+35	0.0127	0.08	QV				
2+40	0.0133	0.09	QV				
2+45	0.0139	0.09	QV				
2+50	0.0146	0.10	QV				
2+55	0.0152	0.10	QV				
3+ 0	0.0159	0.10	QV				
3+ 5	0.0166	0.10	QV				
3+10	0.0172	0.10	QV				
3+15	0.0179	0.10	QV				
3+20	0.0186	0.10	QV				
3+25	0.0193	0.10	QV				
3+30	0.0200	0.10	QV				
3+35	0.0207	0.10	QV				
3+40	0.0214	0.10	Q V				
3+45	0.0221	0.10	Q V				
3+50	0.0228	0.10	Q V				
3+55	0.0235	0.11	Q V				
4+ 0	0.0243	0.11	Q V				
4+ 5	0.0251	0.12	Q V				
4+10	0.0259	0.12	Q V				
4+15	0.0267	0.12	Q V				
4+20	0.0275	0.12	Q V				
4+25	0.0284	0.13	Q V				
4+30	0.0293	0.13	Q V				
4+35	0.0302	0.13	Q V				
4+40	0.0312	0.14	Q V				
4+45	0.0321	0.14	Q V				
4+50	0.0331	0.14	Q V				
4+55	0.0341	0.15	Q V				
5+ 0	0.0351	0.15	Q V				
5+ 5	0.0362	0.15	Q V				
5+10	0.0372	0.14	Q V				
5+15	0.0381	0.13	Q V				
5+20	0.0390	0.13	Q V				





622	16+55	0.3795	0.07	Q	|	|	|	V |
623	17+ 0	0.3800	0.07	Q	|	|	|	V |
624	17+ 5	0.3805	0.07	Q	|	|	|	V |
625	17+10	0.3810	0.08	Q	|	|	|	V |
626	17+15	0.3816	0.09	Q	|	|	|	V |
627	17+20	0.3823	0.09	Q	|	|	|	V |
628	17+25	0.3829	0.09	Q	|	|	|	V |
629	17+30	0.3836	0.10	Q	|	|	|	V |
630	17+35	0.3842	0.10	Q	|	|	|	V |
631	17+40	0.3849	0.10	Q	|	|	|	V |
632	17+45	0.3856	0.10	Q	|	|	|	V |
633	17+50	0.3863	0.10	Q	|	|	|	V |
634	17+55	0.3869	0.09	Q	|	|	|	V |
635	18+ 0	0.3875	0.09	Q	|	|	|	V |
636	18+ 5	0.3881	0.08	Q	|	|	|	V |
637	18+10	0.3886	0.08	Q	|	|	|	V |
638	18+15	0.3892	0.08	Q	|	|	|	V |
639	18+20	0.3898	0.08	Q	|	|	|	V |
640	18+25	0.3904	0.08	Q	|	|	|	V |
641	18+30	0.3909	0.08	Q	|	|	|	V |
642	18+35	0.3915	0.08	Q	|	|	|	V |
643	18+40	0.3920	0.07	Q	|	|	|	V |
644	18+45	0.3924	0.07	Q	|	|	|	V |
645	18+50	0.3929	0.06	Q	|	|	|	V |
646	18+55	0.3933	0.06	Q	|	|	|	V |
647	19+ 0	0.3936	0.05	Q	|	|	|	V |
648	19+ 5	0.3940	0.05	Q	|	|	|	V |
649	19+10	0.3943	0.05	Q	|	|	|	V |
650	19+15	0.3947	0.06	Q	|	|	|	V |
651	19+20	0.3951	0.06	Q	|	|	|	V |
652	19+25	0.3956	0.07	Q	|	|	|	V |
653	19+30	0.3961	0.07	Q	|	|	|	V |
654	19+35	0.3966	0.07	Q	|	|	|	V |
655	19+40	0.3971	0.07	Q	|	|	|	V |
656	19+45	0.3975	0.06	Q	|	|	|	V |
657	19+50	0.3979	0.06	Q	|	|	|	V |
658	19+55	0.3983	0.06	Q	|	|	|	V |
659	20+ 0	0.3986	0.05	Q	|	|	|	V |
660	20+ 5	0.3990	0.05	Q	|	|	|	V |
661	20+10	0.3993	0.05	Q	|	|	|	V |
662	20+15	0.3997	0.06	Q	|	|	|	V |
663	20+20	0.4001	0.06	Q	|	|	|	V |
664	20+25	0.4005	0.06	Q	|	|	|	V |
665	20+30	0.4009	0.06	Q	|	|	|	V |
666	20+35	0.4013	0.06	Q	|	|	|	V |
667	20+40	0.4017	0.06	Q	|	|	|	V |
668	20+45	0.4022	0.06	Q	|	|	|	V |
669	20+50	0.4026	0.06	Q	|	|	|	V |
670	20+55	0.4029	0.05	Q	|	|	|	V |
671	21+ 0	0.4032	0.05	Q	|	|	|	V |
672	21+ 5	0.4036	0.05	Q	|	|	|	V |
673	21+10	0.4039	0.05	Q	|	|	|	V |
674	21+15	0.4043	0.06	Q	|	|	|	V |
675	21+20	0.4047	0.06	Q	|	|	|	V |
676	21+25	0.4050	0.05	Q	|	|	|	V |
677	21+30	0.4054	0.05	Q	|	|	|	V |
678	21+35	0.4057	0.05	Q	|	|	|	V |
679	21+40	0.4060	0.05	Q	|	|	|	V |
680	21+45	0.4064	0.05	Q	|	|	|	V |
681	21+50	0.4068	0.06	Q	|	|	|	V |
682	21+55	0.4071	0.05	Q	|	|	|	V |
683	22+ 0	0.4074	0.05	Q	|	|	|	V |
684	22+ 5	0.4077	0.05	Q	|	|	|	V |
685	22+10	0.4081	0.05	Q	|	|	|	V |
686	22+15	0.4085	0.05	Q	|	|	|	V |
687	22+20	0.4088	0.06	Q	|	|	|	V |
688	22+25	0.4092	0.05	Q	|	|	|	V |
689	22+30	0.4095	0.05	Q	|	|	|	V |
690	22+35	0.4098	0.04	Q	|	|	|	V |

22+40	0.4101	0.04	Q	|	|	|	V|
22+45	0.4104	0.04	Q	|	|	|	V|
22+50	0.4107	0.04	Q	|	|	|	V|
22+55	0.4110	0.04	Q	|	|	|	V|
23+ 0	0.4113	0.04	Q	|	|	|	V|
23+ 5	0.4115	0.04	Q	|	|	|	V|
23+10	0.4118	0.04	Q	|	|	|	V|
23+15	0.4121	0.04	Q	|	|	|	V|
23+20	0.4124	0.04	Q	|	|	|	V|
23+25	0.4127	0.04	Q	|	|	|	V|
23+30	0.4129	0.04	Q	|	|	|	V|
23+35	0.4132	0.04	Q	|	|	|	V|
23+40	0.4135	0.04	Q	|	|	|	V|
23+45	0.4138	0.04	Q	|	|	|	V|
23+50	0.4140	0.04	Q	|	|	|	V|
23+55	0.4143	0.04	Q	|	|	|	V|
24+ 0	0.4146	0.04	Q	|	|	|	V|
24+ 5	0.4148	0.04	Q	|	|	|	V|
24+10	0.4150	0.03	Q	|	|	|	V|
24+15	0.4151	0.02	Q	|	|	|	V|
24+20	0.4152	0.01	Q	|	|	|	V|
24+25	0.4153	0.01	Q	|	|	|	V|
24+30	0.4153	0.01	Q	|	|	|	V|
24+35	0.4153	0.00	Q	|	|	|	V|
24+40	0.4153	0.00	Q	|	|	|	V|
24+45	0.4154	0.00	Q	|	|	|	V|
24+50	0.4154	0.00	Q	|	|	|	V|
24+55	0.4154	0.00	Q	|	|	|	V|
25+ 0	0.4154	0.00	Q	|	|	|	V|
25+ 5	0.4154	0.00	Q	|	|	|	V|
25+10	0.4154	0.00	Q	|	|	|	V|
25+15	0.4154	0.00	Q	|	|	|	V

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

Appendix 8

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section G of the 2014 SMR 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 31 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
A. **On-site storm drain inlets**	**Locations of inlets.**	**Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.**	**Maintain and periodically repaint or replace inlet markings.** **Provide stormwater pollution prevention information to new site owners, lessees, or operators.** **See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** **Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."**
❑ B. **Interior floor drains and elevator shaft sump pumps**		❑ **State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.**	❑ **Inspect and maintain drains to prevent blockages and overflow.**
❑ C. **Interior parking garages**		❑ **State that parking garage floor drains will be plumbed to the sanitary sewer.**	❑ **Inspect and maintain drains to prevent blockages and overflow.**

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

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ E. **Pools, spas, ponds, decorative fountains, and other water features.**	❑ **Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)**	**If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.**	❑ **See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://www.rcflood.org/stormwater/Downloads/poolsandspas.pdf**
❑ 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://www.rcflood.org/stormwater/downloads/FoodServ.pdf** **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://www.rcflood.org/stormwater/Downloads/IndustrialCommercialFacilities.pdf
❑ 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**

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❑ 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://www.rcflood.org/stormwater/downloads/OutdoorCleaningActivities.pdf** ❑ **Car dealerships and similar may rinse cars with water only.**

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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/

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❑ 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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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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❑ 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.**	

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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



Appendix 10: Education Materials

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

CONTECH®
ENGINEERED SOLUTIONS

ChamberMaxx®
Design Guide



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CONTECH®
ENGINEERED SOLUTIONS

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Detention System Design Tools

Design Your Own Detention System (DYODS®)

Contech's DYODS is an exclusive, online design tool that allows you to design your own detention or infiltration system. DYODS fully automates the layout process for stormwater detention and infiltration systems and produces CAD and PDF files that can be used for creating plans and specs, and for estimating total installed costs.



Features of the new tool include:

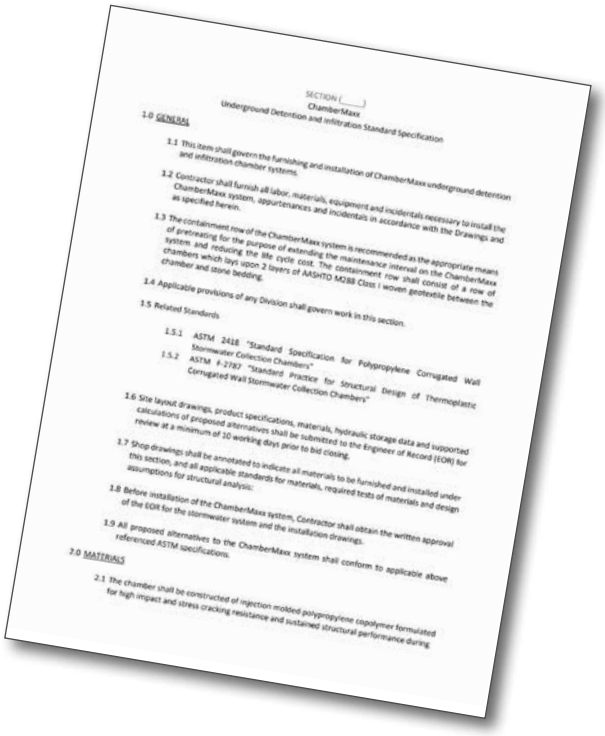
- Optimizes design and layout for cost efficiency
- "Drag and drop" feature allow users to customize layout
- Design multiple systems per project and save for future use
- Provides instant access to customized, project specific drawings
- CAD/PDF files provided for use in creating plans and specs

The DYODS tool is available at www.conteches.com/DYO.

Online Product Design Worksheet (PDW)

Our in-house team of engineers can support you through the entire permitting process. Just enter your information into the online form, and one of our in-house engineers will contact you with specific recommendations for your project.

The Detention Product Design Worksheet is available at www.conteches.com/detentionpdw



Engineering Services & Support

Contech has regional engineering offices and local stormwater consultants trained to provide the following services:

- Regulatory guidance and permitting assistance
- Preliminary standard details and/or site specific final drawings and specifications
- Low Impact Development design assistance
- Engineering calculations for hydraulics/hydrology, buoyancy, and stage-storage
- Review of preliminary site design, feasibility screening, and layout assistance
- Value Engineering - cost estimates and options analysis
- Pre-construction support, project scheduling, and contractor coordination
- Installation and construction support
- Maintenance support, including: guidance manuals, training/demonstrations, and certified contractor identification

ChamberMaxx Overview

The ChamberMaxx corrugated, open-bottom chamber system allows you to meet runoff reduction requirements by providing economic infiltration. Design your low impact development (LID) site by incorporating this belowgrade system to maximize available land for development or green space. ChamberMaxx is most effective on sites where the depth from finished grade to storm sewer outlet is less than 54-inches (1.37-meters).

The ChamberMaxx polypropylene stormwater detention/infiltration chamber has undergone extensive development and structural qualification investigation meeting the performance requirements of the ASTM F2418 Standard Specification for Polypropylene Corrugated Wall Stormwater Collection Chambers. The following is a summary of the design qualification.

The ChamberMaxx chamber is produced by an injection molding process with a high quality UV stabilized co-polymer polypropylene which meets the ASTM F2418 material classification requirement as PP0330B99945 per ASTM D4101. An extensive test program demonstrates that the ChamberMaxx chambers exceed the minimum material performance requirements set forth by the product specification for short term and both 50 and 75 year strength, stiffness, and toughness, including material environmental stress crack resistance (ESCR) which exceeds industry requirements.

The ChamberMaxx structural qualification to ASTM F2418 includes a CANDE FEA predicted installed structural performance which safely meets the AASHTO LRFD Section 12 Design Specification for Buried Structures. As required, performance verification through full scale installation and monitoring was conducted in successful support of the safety of the chamber design and installation.

The ChamberMaxx chamber installation was evaluated for safety with AASHTO load factors for the vehicle and earth fill condition of 1.75 and 1.95 respectively. The general installation capabilities in accordance with AASHTO are:

- Live Load AASHTO Design Truck HS25 (HL93)
- Minimum Cover (HS25): 18 in.
- Maximum Cover, 75 years: 8 ft.

Chamber Manufacturing

The ChamberMaxx chamber and virtually all of its materials of construction are manufactured at ISO 9001 certified US facilities. The chambers are produced with state of the art structural web injection molding equipment resulting in a reliable, high quality product. Weighing approximately 80 pounds, the chamber has a minimum average wall thickness of .175 inches (4.45 mm) and measures approximately 51 x 30 x 91 inches (1.30 x .76 x 2.31 meters) in overall dimension.

A ChamberMaxx system is comprised of start chambers, middle chambers, and end chambers. The end cap of the chamber is integrated into the start and end chambers, thereby making chamber installation fast and efficient.

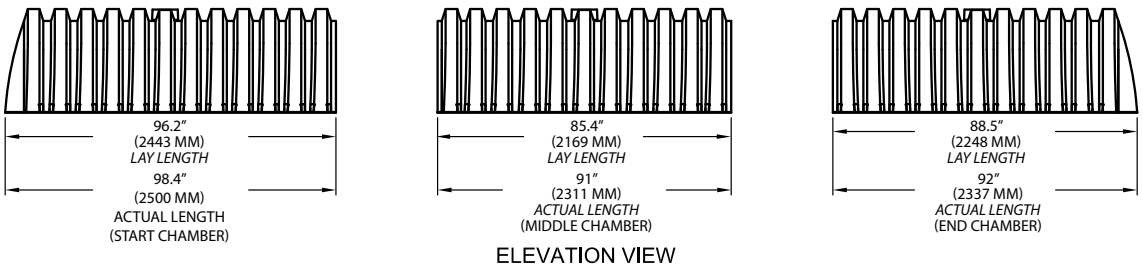
Application-System Configurations

The open-bottom plastic chamber allows infiltration into surrounding soil, effectively achieving runoff reduction objectives often required by an LID design. By utilizing subsurface infiltration, space is preserved for development, runoff is reduced or eliminated and groundwater recharge can occur. The ChamberMaxx is ideal when you need to maximize storage capacity in a shallow footprint.

Subsurface Infiltration

An open bottom plastic chamber the ChamberMaxx allows infiltration into surrounding soils, effectively achieving runoff reduction objectives often required by in an LID (low impact development) design.

Best practice designs for subsurface infiltration include pretreatment to reduce cost and frequency of maintenance while ensuring the infiltration capacity of the facility. Contech has multiple options for pretratment.



ELEVATION VIEW

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Bioretention

ChamberMaxx is designed with a minimum of 6" stone above and below the units. The ChamberMaxx can help make bioretention practical by storing 75.1 CF per unit, including storage in stone, before discharging back into the surrounding soil.



Detention

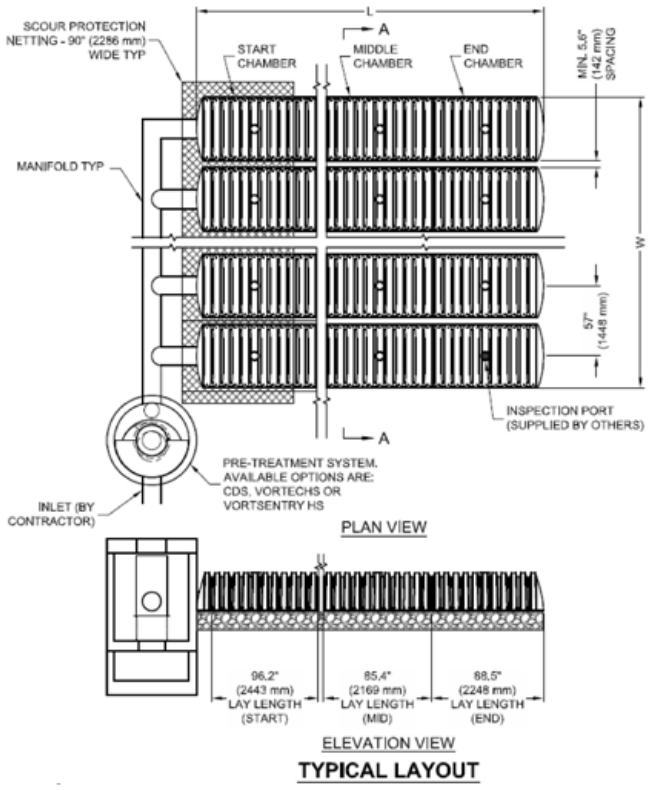
ChamberMaxx systems can also be used for detention applications where infiltraton of stored water is minimized. Minimization of infiltration can be accomplished by wrapping the entire chamber system and stone backfill in an impermeable thermoplastic liner.

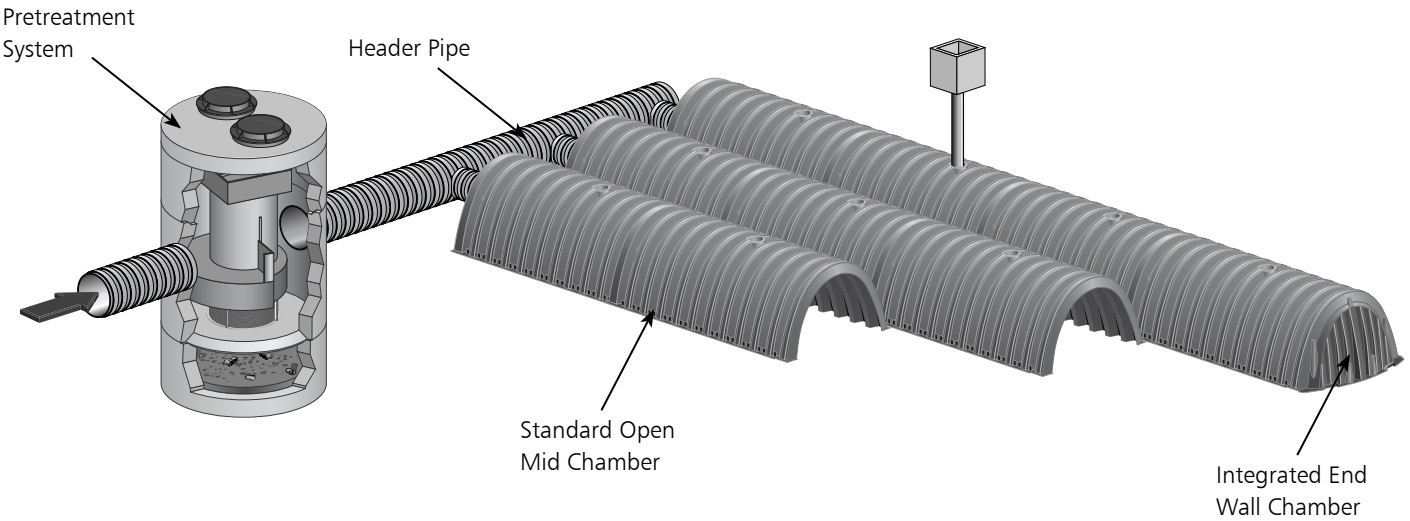
Inlet Congifurations

ChamberMaxx systems are compatible with various inlet configurations. The inlet configuration selected for a design should be based on the site requirements and local regulations. Pretreatment is recommended for all detention/retention systems regardless of type. The initial removal of sediment in a pretreatment device allows easy inspection and unobstructed maintenance. Contech offers standard inlet pretreatment configurations in the form of upstream pretreatment devices or the ChamberMaxx Containment Row.

Pretreatment Devices

In some jurisdictions, it is required to use devices for pretreatment of stormwater prior to entry to stormwater systems. By pretreating the stormwater prior to entry into the ChamberMaxx system, pollutants such as hydrocarbons and sediment may be captured, thereby extending the service life of the chamber system. Pretreatment devices vary in complexity and effectiveness. Several non-proprietary options exist in the form of deep sump manholes, oil grit separators, and bio-swales. Contech offers pretreatment devices such as the CDS and VortSentry HS for designs that require more stringent levels of pollutant removal. See Contech's website to design your own pretreatment device: www.conteches.com/dyohds.





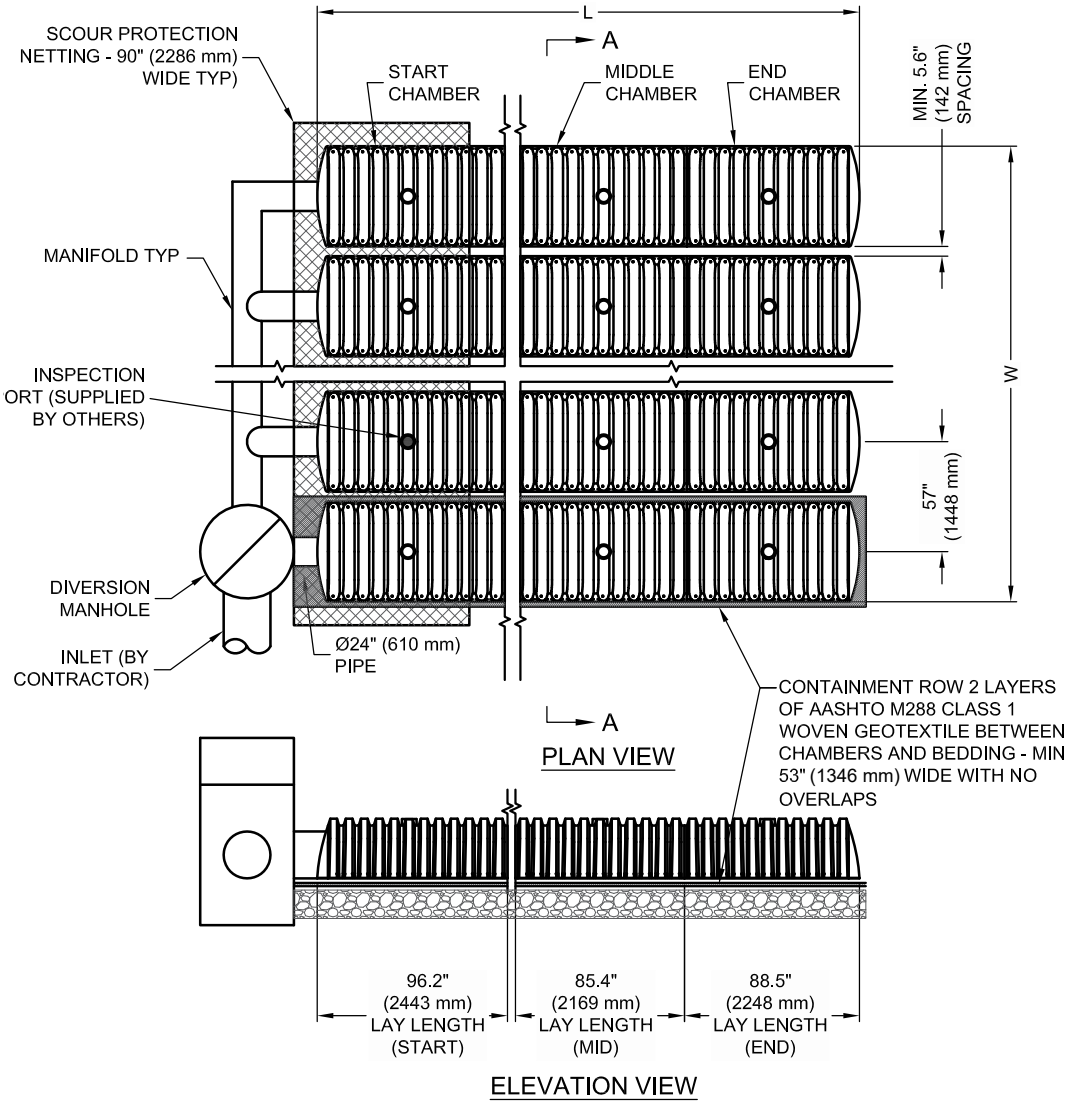
ChamberMaxx Containment Row

Hydrodynamic separators and filtration devices provide the most efficient sediment removal and extended maintenance interval, and are recommended as pretreatment for ChamberMaxx systems. The ChamberMaxx Containment Row should be considered as basic, low cost treatment strategy and should only be considered where sediment loading to the ChamberMaxx system is assumed to be minimal.

The Containment Row is designed to provide TSS removal by direct screening through 2 layers of AASHTO M288 Class 1 Woven Geotextile, located between the containment row chamber and the stone bedding.

The ChamberMaxx Containment Row should be designed with a sumped diversion manhole at the inlet of the Containment Row. The diversion manhole should be designed to allow access for inspection and maintenance of the Containment Row in addition to diverting the required amount of stormwater into the Containment Row for treatment, and a sump for collection of sediment. Once the Containment Row has reached capacity, the overflow should then be distributed to the remainder of the chamber rows by a manifold.

Containment Rows can be sized for water quality volume or water quality flow rate. Contact your local Contech representative at 800-338-1122 for project specific sizing of a Containment Row.



Inlet Manifold Design

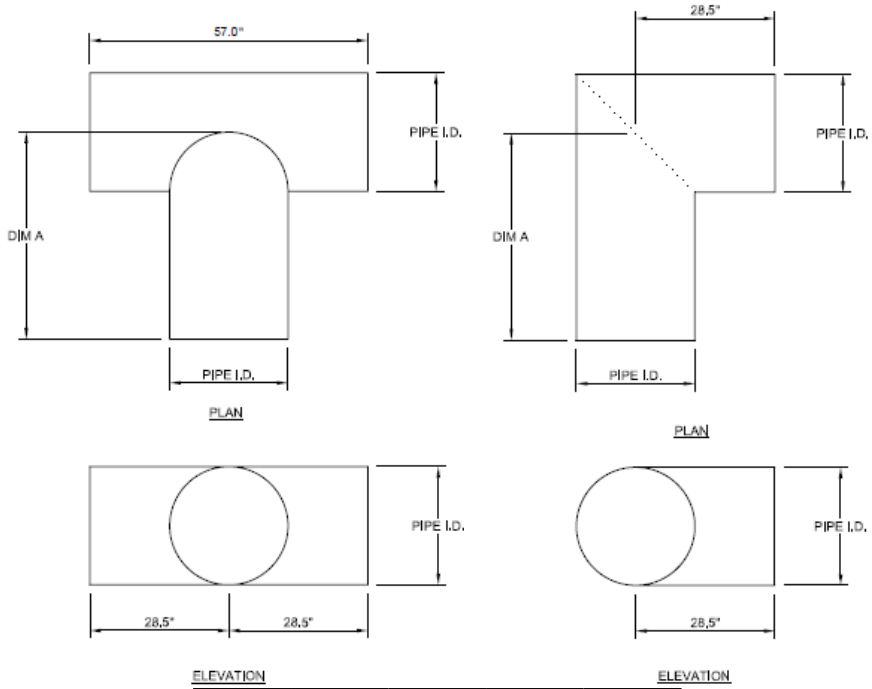
All ChamberMaxx systems require inlet manifolds to ensure that the incoming flow is distributed throughout all chamber rows. The integral end cap of the chamber system can accept up to a 24-inch diameter (0.61m) inlet pipe.

The inlet manifold should be designed to provide ample conveyance of peak flows without creating an unacceptable backwater condition on the upstream structures and piping. To reduce the scour potential of the foundation stone under the chambers from the influent flow, Contech requires the installation of scour protection netting at the manifold entrance to any inlet chamber, extending 1' (0.30 m) beyond the outside edge of the chamber.

When designing an inlet manifold for a ChamberMaxx system, the specifying engineer is responsible for confirmation that the manifold meets the hydraulic needs of the project. The manifold diameter should be equal to or larger than the upstream pipe leading from the site to the chamber system. Contech offers standard high density polyethylene (HDPE) manifold fittings in various sizes to accommodate most project needs.

Contech provides Mar Mac Polyseal couplers to connect manifold fittings, please reference www.MarMac.com for additional information on the provided couplers.

ChamberMaxx cannot accept a pipe directly into the side of the chamber. To accommodate this configuration, the row should be broken up by use of one end chamber and one start chamber to create two separate rows. The inlet pipe should then be joined to a manifold tee that connects into the new start and end chambers. Otherwise, all pipe connections should be made at a manifold or directly stubbed into the end a chamber.



STANDARD MANIFOLD COMPONENTS				
	AVAILABLE DIAMETERS (IN)			
TEE	12	15	18	24
ELBOW	12	15	18	24
DIM A	42	42	48	48

GENERAL NOTES:

1. FITTING MATERIAL TO BE MANUFACTURED FROM CORRUGATED HIGH DENSITY POLYETHYLENE, AASHTO M294 PIPE.
2. FITTINGS TO BE FABRICATED IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO M294.
3. FITTINGS DESIGNED TO PROTRUDE 8" INTO END OF THE INLET CHAMBERS.
4. MANIFOLD TEE AND ELBOW JOINTS TO BE CONNECTED UTILIZING MAR-MAC POLYSEAL COUPLERS. REFERENCE WWW.MARMAC.COM

Outlet Manifold Design

Some ChamberMaxx systems may require an outlet for volumes in excess of the chamber system capacity. An outlet manifold should be designed to ensure that excess volume or peak flows can be conveyed to downstream structures.

In circumstances where infiltration into the surrounding soil is not an option, an underdrain may be used to completely drain the stone bed below the invert of the chamber. The underdrain should connect to the downstream drainage structure and should accommodate free drainage as required.

Other outlet scenarios may include outlet pipes located higher than the invert of the chambers to allow a designed volume to infiltrate through the base stone before exiting the system, or an outlet control structure external to the chamber system to achieve the same effect. These are common scenarios used for recharging groundwater and replicating a site's pre-construction runoff characteristics.

Outlet manifolds should not directly connect to a Containment Row but should be connected to as many standard chamber rows as required to achieve the desired hydraulic conditions. The outlet manifold fittings provided by Contech are the same HDPE fittings used for inlet manifolds and should be installed and connected in the same way.

Foundation Requirements

ChamberMaxx systems require a bedding of at least 6 inches (152.4mm) of crushed stone below the chambers. With a 6 inch (152.4mm) bedding depth a soil bearing capacity of 4 ksf (191.52 kPa) is required for 8 feet of cover over the top of the chambers and a soil bearing capacity of 2ksf (95.76 kPa)is needed for 18 inches (457.2mm) of cover over the top of the chambers. If the soil bearing pressure does not meet the minimum requirements, a geotechnical engineer should evaluate the application and make the appropriate recommendations to improve the bearing capacity to suit the application.

System Sizing

ChamberMaxx systems store water in the chamber itself and also in the void space of the stone backfill. The "Installed Storage Volume" in the table below shows the water storage capacity for the chamber and stone system assuming a 40% stone void ratio.

The ChamberMaxx DYODS (Design Your Own Detention System) is available for online sizing of ChamberMaxx systems. This tool can be found at www.ContechES.com. For assistance sizing a ChamberMaxx system, Contech Design Engineering services can be contacted at 1-800-338-1122 or through your local Contech representative. Modeling for the ChamberMaxx system is also available in HydroCAD®.

Sizing a ChamberMaxx System

The steps outlined below provide the necessary calculations to size a ChamberMaxx System.

1. Determine the Storage Volume (V_s).
   Required Storage Volume should be determined by the design engineer per project requirements.

2. Determine the number of chambers required (C).

Chamber Part	Width		Height		Weight		Actual Length		Installed Length*		Storage Volume		Installed Storage Volume*	
	in	(m)	in	(m)	lbs	(kg)	in	(m)	in	(m)	cf	(m^3)	cf	(m^3)
Start	51.4	(1.31)	30.3	(0.77)	83.0	(37.65)	98.4	(2.50)	96.2	(2.44)	50.2	(1.42)	78.1	(2.21)
Middle	51.4	(1.31)	30.3	(0.77)	73.0	(33.11)	91.0	(2.31)	85.4	(2.17)	47.2	(1.34)	75.1	(2.13)
End	51.4	(1.31)	30.3	(0.77)	76.0	(34.47)	92.0	(2.34)	88.5	(2.25)	46.2	(1.31)	74.1	(2.10)

** 6" (152 mm) of stone above and below chamber, 5.6" (142 mm) chamber spacing and 40% porosity.*

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To calculate the number of chambers needed to store the required volume (Vs), divide the storage volume by the volume of the chamber. For systems with a predetermined number of rows (r), multiply the sum of the start and end chamber volumes by the row count to determine the remainder of middle chambers required.

$$C = C_{start} + C_{mid} + Cend$$

$$C_{start} \& C_{end} = \text{number of rows, r}$$

$$Cmid = Vs / [(Vstart + Vend)*r + Vmid]$$

For systems with an undetermined number of rows, the chamber count can be estimated by using the volume of the middle chamber, ignoring the start and middle chambers.

$$C = Vs / V_{mid}$$

3. Determine the system footprint.
   To determine the system length: Divide the number of middle chambers required (Cmid) by the number of rows (r), rounding up (n). This will be number of middle chambers required in the longest row. Add up the installed lengths of 1 start, 1 end, and the required count of middle chambers. After adding the length of perimeter stone around start and end chambers (minimum 12"or .3048 m), the total length is the system length.

   $$n = C_{mid}/r$$

   $$L = 12" + L_{start} + n*L_{mid} + L_{end} + 12"$$
   $$(.3048m + L_{start} + n*L_{mid} + L_{end} + .3048m)$$

   To determine the system width: Multiply the chamber width (51.4" or 1.31 m) by the number of rows (r). Add the total chamber width plus chamber spacing multiplied by (r-1) and the perimeter stone (minimum 12" or 0.30 mm). Standard spacing between chambers is 5.6"(396.2 mm). The resulting sum is the system width.

   $$W = 12"+ r*51.4" + (r-1)*5.6" + 12"$$
   $$(.3048m + r*1.306m + (r-1)*0.3962m + .3048m)$$

4. Determine the amount of stone (Vst).
   To determine the amount of clean, crushed, angular stone is required for the ChamberMaxx System, multiply the number of start, middle, and end chambers by their respective stone volumes in the table below.

Chamber Type	Amount of stone needed per chamber (cubic feet)	Amount of stone needed per chamber (cubic meters)
Start Chamber	78.69	2.228
Middle Chamber	69.85	1.978
End Chamber	72.36	2.049

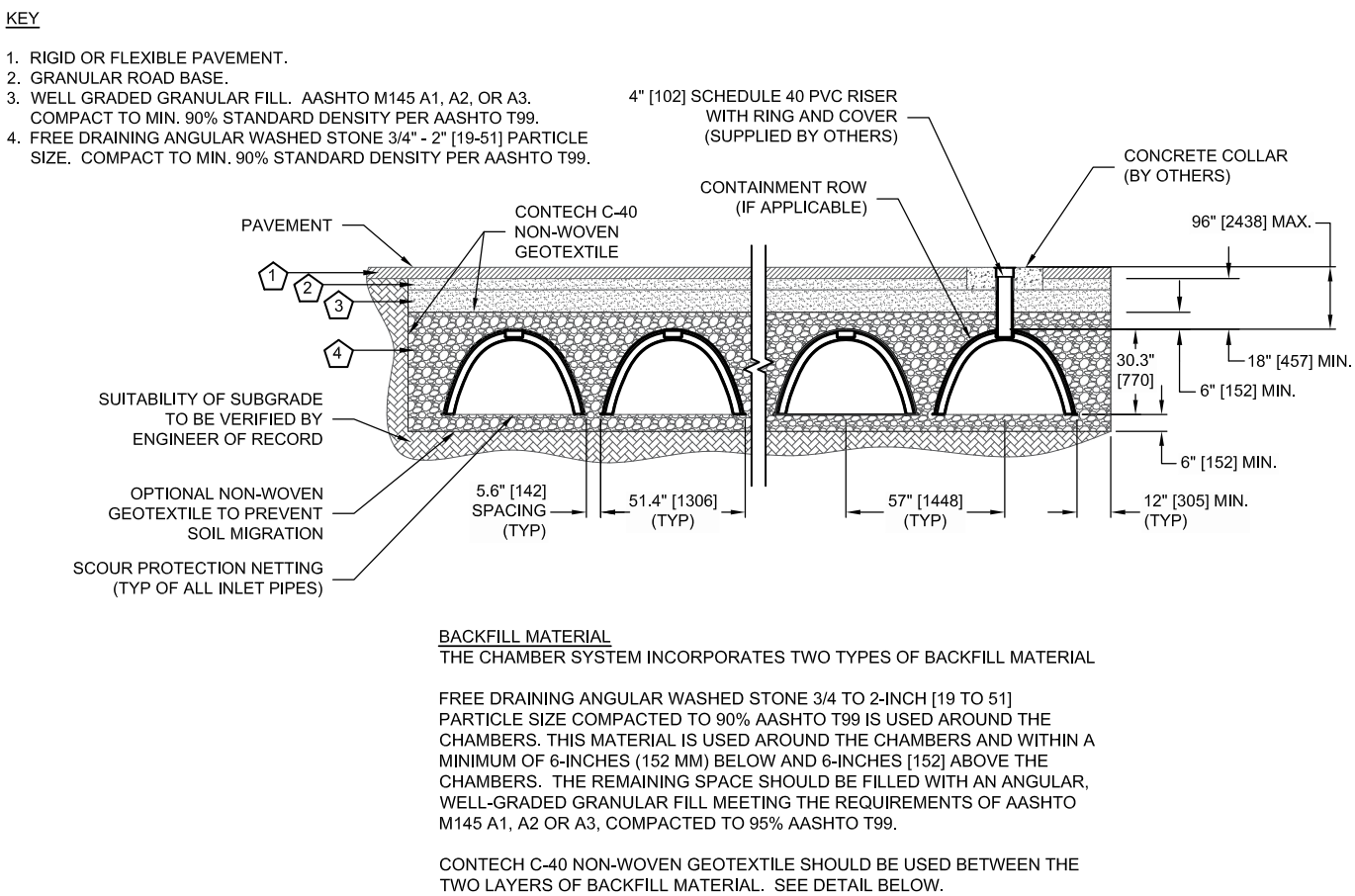
Stage Storage Table

	Elevation		Chamber Storage Volume		Stone Storage Volume		Cumulative Volume Increment		Cumulative Storage Volume	
	(in)	(m)	(cf)	(m^3)	(cf)	(m^3)	(cf)	(m^3)	(cf)	(m^3)
STONE	42.30	1.07	47.20	1.34	27.94	0.79	1.13	0.03	75.14	2.13
	41.30	1.05	47.20	1.34	26.82	0.76	1.13	0.03	74.02	2.09
	40.30	1.02	47.20	1.34	25.69	0.73	1.13	0.03	72.89	2.06
	39.30	1.00	47.20	1.34	24.56	0.70	1.13	0.03	71.76	2.03
	38.30	0.97	47.20	1.34	23.44	0.66	1.13	0.03	70.64	2.00
	37.30	0.95	47.20	1.34	22.31	0.63	1.13	0.03	69.51	1.97
CHAMBERMAXX CHAMBERS	36.30	0.92	47.20	1.34	21.18	0.60	0.62	0.02	68.38	1.94
	35.00	0.89	47.20	1.34	20.56	0.58	1.13	0.03	67.76	1.92
	34.00	0.86	47.20	1.34	19.43	0.55	1.13	0.03	66.63	1.89
	33.00	0.84	47.20	1.34	18.30	0.52	1.13	0.03	65.50	1.85
	32.00	0.81	47.20	1.34	17.18	0.49	1.56	0.04	64.38	1.82
	31.00	0.79	46.48	1.32	16.34	0.46	1.76	0.05	62.82	1.78
	30.00	0.76	45.43	1.29	15.63	0.44	1.83	0.05	61.06	1.73
	29.00	0.74	44.26	1.25	14.98	0.42	1.90	0.05	59.23	1.68
	28.00	0.71	42.97	1.22	14.36	0.41	1.96	0.06	57.33	1.62
	27.00	0.69	41.58	1.18	13.79	0.39	2.02	0.06	55.37	1.57
	26.00	0.66	40.09	1.13	13.26	0.38	2.07	0.06	53.35	1.51
	25.00	0.64	38.53	1.09	12.76	0.36	2.11	0.06	51.29	1.45
	24.00	0.61	36.89	1.04	12.29	0.35	2.15	0.06	49.18	1.39
	23.00	0.58	35.18	1.00	11.84	0.34	2.18	0.06	47.03	1.33
	22.00	0.56	33.42	0.95	11.42	0.32	2.22	0.06	44.84	1.27
	21.00	0.53	31.60	0.89	11.02	0.31	2.24	0.06	42.63	1.21
	20.00	0.51	29.74	0.84	10.64	0.30	2.27	0.06	40.38	1.14
	19.00	0.48	27.84	0.79	10.27	0.29	2.29	0.06	38.11	1.08
	18.00	0.46	25.90	0.73	9.92	0.28	2.31	0.07	35.82	1.01
	17.00	0.43	23.93	0.68	9.59	0.27	2.33	0.07	33.51	0.95
	16.00	0.41	21.92	0.62	9.26	0.26	2.35	0.07	31.18	0.88
	15.00	0.38	19.88	0.56	8.95	0.25	2.37	0.07	28.83	0.82
	14.00	0.36	17.82	0.50	8.65	0.24	2.39	0.07	26.46	0.75
	13.00	0.33	15.72	0.44	8.36	0.24	2.40	0.07	24.08	0.68
	12.00	0.30	13.59	0.38	8.09	0.23	2.42	0.07	21.68	0.61
	11.00	0.28	11.43	0.32	7.82	0.22	2.45	0.07	19.25	0.54
	10.00	0.25	9.23	0.26	7.58	0.21	2.47	0.07	16.81	0.48
	9.00	0.23	6.99	0.20	7.34	0.21	2.50	0.07	14.34	0.41
	8.00	0.20	4.71	0.13	7.13	0.20	2.52	0.07	11.84	0.34
	7.00	0.18	2.38	0.07	6.93	0.20	2.56	0.07	9.32	0.26
STONE	6.00	0.15	0.00	0.00	6.76	0.19	1.13	0.03	6.76	0.19
	5.00	0.13	0.00	0.00	5.63	0.16	1.13	0.03	5.63	0.16
	4.00	0.10	0.00	0.00	4.51	0.13	1.13	0.03	4.51	0.13
	3.00	0.08	0.00	0.00	3.38	0.10	1.13	0.03	3.38	0.10
	2.00	0.05	0.00	0.00	2.25	0.06	1.13	0.03	2.25	0.06
	1.00	0.03	0.00	0.00	1.13	0.03	0.00	0.00	1.13	0.03

ChamberMaxx Flow Routing

Proper design of any detention system typically requires that flow routing be performed. Engineers at Contech can be a valuable resource when designing a ChamberMaxx retention system. Typically, stage- storage curves are utilized in the analysis. A Contech stage-storage calculator is available for download on www.ContechES.com. This information can simply be inserted into common hydrology/ hydraulic software such as HydroCAD, HydroFlow, PondPack or TR20. This makes a flow routing design with ChamberMaxx just as simple as an aboveground pond design.

ChamberMaxx - Backfill Detail



BACKFILL MATERIAL
THE CHAMBER SYSTEM INCORPORATES TWO TYPES OF BACKFILL MATERIAL

FREE DRAINING ANGULAR WASHED STONE 3/4 TO 2-INCH [19 TO 51] PARTICLE SIZE COMPACTED TO 90% AASHTO T99 IS USED AROUND THE CHAMBERS. THIS MATERIAL IS USED AROUND THE CHAMBERS AND WITHIN A MINIMUM OF 6-INCHES (152 MM) BELOW AND 6-INCHES [152] ABOVE THE CHAMBERS. THE REMAINING SPACE SHOULD BE FILLED WITH AN ANGULAR, WELL-GRADED GRANULAR FILL MEETING THE REQUIREMENTS OF AASHTO M145 A1, A2 OR A3, COMPACTED TO 95% AASHTO T99.

CONTECH C-40 NON-WOVEN GEOTEXTILE SHOULD BE USED BETWEEN THE TWO LAYERS OF BACKFILL MATERIAL. SEE DETAIL BELOW.

Inspection And Maintenance

ChamberMaxx Safety

Before entering into any storm sewer or underground retention/ detention system check to make sure all OSHA and local safety regulations and guidelines are observed during the maintenance process. Hard hats, safety glasses, steel-toed boots and any other appropriate personal protective equipment shall be worn at all times.

Inspection Frequency

Inspections are recommended at a minimum annually. The first year of operation may require more frequent inspections. Frequency of inspections will vary significantly on the local site conditions. An individual inspection schedule should be established for each site.

Inspections

Inspection is the key to effective maintenance and is easily performed. Inspections may need to be performed more often in the winter months in climates where sanding operations may lead to rapid sediment accumulations, or in equipment washdown areas. It is very useful to keep a record of each inspection. A sample inspection log is included for your use.

The entire treatment train should be inspected and maintained. The treatment train may consist of an upstream sump manhole, manifold system or pre-treatment HDS device. Inspections should start at the upstream device and continue downstream to the discharge orifice if incorporated into the chamber system.

Pre-Treatment Device Inspection

Inspection and maintenance procedures provided by the manufacturer should be followed for pre-treatment systems such as a CDS®, Vortechs®, VortSentry® or VortSentry® HS. Expected pollutants will be floatable trash, sediment and oil and grease. Pre-treatement devices are recommended for all detention/ retention devices regardless of type.

Containment Row™ Inspection

The optional Containment Row consists of a diversion concrete manhole with a weir, and a row of chambers placed on woven geotextile. The diversion weir directs the first flush flows into the Containment Row of chambers. The majority of sediment will be captured in the Containment Row due to the extended detention time which allows the particles to settle out. Higher flows overtop (bypass) the weir into the manifold system.

The Containment Row will typically be located in the first row of chambers connected to the diversion manhole. Inspection can be done through accessing the diversion manhole and visually inspecting the Containment Row through the inlet pipe. Inspection ports throughout the system can be used for visual observation and measurement of sediment accumulation using a stadia rod. When the depth of sediment accumulates over 4-inch (102 mm), cleanout is recommended.

Manifold System Inspection

The main manifold pipe can be inspected from the diversion manhole upstream. When a quarter of the pipe volume has been filled with sediment the header system should be maintained.

Visual Inspection

Maintenance or further investigation may be required if any of the following conditions exist:

- Evidence of an unusual amount of silt and soil build-up on the surface.
- Clogged outlet drainpipe.
- System does not drain to the elevation of the lowest pipe in dry conditions.
- Evidence of potholes or sinkholes

Maintenance

Underground stormwater retention/detention systems should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities rather than the size or configuration of the system. If accumulated silt is interfering with the operation of the detention system (i.e.: blocking outlet pipes or deposits significantly reduce the storage capacity of the system) it should be removed.

It is easiest to maintain a system when there is no flow entering. For this reason, cleanout should be scheduled during dry weather.

A vacuum truck or other similar devices can be used to remove sediment from the treatment train. Starting upstream, maintain manholes with sumps and any pre-treatment devices (following manufacturer recommended procedures). Once maintenance is complete, replace all caps, lids and covers. It is important to document maintenance events on the Inspection and Maintenance Log.

Header System Maintenance

If maintenance is required, use a high pressure nozzle with rear facing jets to wash the sediments and debris into the diversion manhole. Use the vacuum hose stinger nozzle to remove the washed sediments from the sump of the diversion manhole. It is important to not flush sediments into the chamber system during the maintenance process.

Containment Row™ Maintenance

If maintenance is required, a JetVac truck utilizing a high pressure nozzle (sledge dredging tool) with rear facing jets will be required. Insert the nozzle from the diversion manhole into the Containment Row through the inlet pipe. Turn the water feed hose on and feed the supply hose until the nozzle has reached the end of the Containment Row. Withdraw the nozzle slowly.

The tool will backflush the Containment Row forcing debris into the diversion manhole sump. Use the stringer vacuum hose to remove the sediments and debris from the sump of the diversion manhole. Multiple passes may be required to fully cleanout the Containment Row. Vacuum out the diversion manhole and remove all debris. See Figure 1.



Figure 1. Containment Row shown with high pressure cleaning nozzle.

APPENDIX A: ChamberMaxx Specification with Pretreatment

SPECIFICATION:

ChamberMaxx

Underground Detention and Infiltration Standard Specification with Pretreatment Device

1.0 GENERAL

1.1 This item shall govern the furnishing and installation of ChamberMaxx underground detention and infiltration chamber systems.

1.2 Contractor shall furnish all labor, materials, equipment and incidentals necessary to install the ChamberMaxx system, appurtenances and incidentals in accordance with the Drawings and as specified herein.

1.3 A stormwater treatment device upstream of the ChamberMaxx system is recommended as the appropriate means of pretreating for the purpose of extending the maintenance interval on the ChamberMaxx system and reducing the life cycle cost. Both engineered solutions shall be provided by a single supplier/manufacturer. Filtration by wrapping a chamber row with geotextile is not an acceptable means of pretreatment.

1.4 Applicable provisions of any Division shall govern work in this section.

1.5 Related Standards

1.5.1 ASTM 2418 "Standard Specification for Polypropylene Corrugated Wall Stormwater Collection Chambers"

1.5.2 ASTM F-2787 "Standard Practice for Structural Design of Thermoplastic Corrugated Wall Stormwater Collection Chambers"

1.6 Site layout drawings, product specifications, materials, hydraulic storage data and supported calculations of proposed alternatives shall be submitted to the Engineer of Record (EOR) for review at a minimum of 10 working days prior to bid closing.

1.7 Shop drawings shall be annotated to indicate all materials to be furnished and installed under this section, and all applicable standards for materials, required tests of materials and design assumptions for structural analysis:

1.8 Before installation of the ChamberMaxx system, Contractor shall obtain the written approval of the EOR for the stormwater system and the installation drawings.

1.9 All proposed alternatives to the ChamberMaxx system shall conform to applicable above referenced ASTM specifications.

2.0 MATERIALS

2.1 The chamber shall be constructed of injection molded polypropylene copolymer formulated for high impact and stress cracking resistance and sustained structural performance during high temperatures. The chamber shall be designed and manufactured in accordance to ASTM F-2418 and F-2787.

2.2 The chamber shall be designed to AASHTO LRFD Bridge Design Specifications (Section 12), as applied to material and performance requirements for buried thermoplastic pipes. Design live load shall be the AASHTO HS-20 and HS-25 truck, including multiple lane presence factors, over a minimum cover of 18 inches and chamber row spacing of 5 inches or greater.

2.3 The chamber system shall be comprised of three chamber configurations: The MIDDLE chambers shall be open-ended to allow unobstructed hydraulic flow, inspection, and maintenance. The START and END chambers shall each have an integral end wall designed to resist loading at the start and end of the chamber rows. The chambers within a row shall be installed with overlapping end corrugations.

2.4 The nominal dimensions of the START chamber shall be 51.4 inches wide, 30.3 inches tall, and 98.4 inches long. The nominal dimensions of the MIDDLE chamber shall be 51.4 inches wide, 30.3 inches tall, and 91.0 inches long. The nominal dimensions of the END chamber shall be 51.4 inches wide, 30.3 inches tall, and 92.0 inches long. The nominal storage volume inside the chamber shall be 77 cubic feet when utilizing 6" of stone above and below chamber with 40% stone porosity per ChamberMaxx standard detail.

2.5 The chamber shall have a continuously-curved, arch-shaped section profile.

2.6 The START and END chamber integral end wall shall be structurally suitable for cutting and inserting inlet pipes and shall provide a range of pipe diameter indicants up to 24" diameter as cutting templates.

2.7 The chamber shall be a corrugated, open-bottom design and top vent orifices for hydraulic pressure equalization. Corrugation valleys and crests shall be sub-corrugated to increase stiffness.

2.8 The chamber shall have a circular cut line for an optional reinforced inspection port configured to accept a 4" Schedule 40 pipe.

2.9 The END chambers shall be capable of being cut to shorter lengths to accommodate site specific requirements.

2.10The chamber shall be supported by integral structural

footings comprised of load dispersing toe ribs and longitudinally aligned stiffening ribs.

2.11 The manufacturer of the ChamberMaxx system shall be one that has regularly been engaged in the engineering design and production of these systems for at least eight (8) years and which has a history of successful production, acceptable to the Engineer of Record (EOR). In accordance with the Drawings, the ChamberMaxx system shall be supplied by:

Contech Engineered Solutions
9025 Centre Pointe Drive
West Chester, OH, 45069
Tel: 1 800 338 1122

3.0 PERFORMANCE

3.1 The ChamberMaxx system proposal shall be sized in accordance to the design provided and approved by the Engineer of Record (EOR). Any Contractor deviating from the design shown on the plans, to include: material, footprint, etc., shall provide to the EOR a summary report on stage-storage curves, design calculations, HydroCAD modeling and engineering drawings.

3.2 ChamberMaxx row spacing and stone base thickness cannot be altered with consultation from Contech Engineered Solutions, LLC.

3.3 The ChamberMaxx system shall be designed so as the hydraulic grade line will increase evenly throughout whereas transverse movement from one storage compartment to another shall not be permitted. All storage compartments shall be connected via manifold (or connecting pipe) versus by entirely transporting stormwater through stone.

3.4 A stormwater pretreatment device is recommended upstream of the ChamberMaxx system as follows:

3.4.1 Infiltration: Where feasible, the selected stormwater treatment device upstream of an infiltration system shall be a filter system and have General Use Level Designation (GULD) for Basic Treatment by the Washington State Department of Ecology or demonstrate equivalent performance in independently verified field testing following a peer reviewed testing protocol, and must be sized consistent with the system producing those results.

3.4.2 Detention: Where feasible, the selected Stormwater treatment device upstream of a detention system shall be a separator system and have GULD for Pretreatment by the WADOE or demonstrate equivalent performance in independently verified field testing following a peer reviewed testing protocol, and must be sized consistent with the system producing those results.

3.4.3 Selected pretreatment stormwater device shall incorporate a physical barrier capable of capturing and retaining trash and debris (i.e.: floatable and neutrally buoyant materials) for all flows up to the treatment capacity of the device.

3.4.4 The application of wrapping a system with geotextile of any branding or material type, that allows the passage of stormwater, shall not be regarded as an acceptable treatment or pretreatment device.

3.4.5 The manufacturer of the selected Stormwater treatment device shall have been regularly engaged in the engineering design and production of systems for the physical treatment of Stormwater runoff for 15 years.

3.4.6 In order to not restrict the Owner's ability to maintain the stormwater pretreatment device, the minimum dimension providing access from the ground surface to the sump chamber shall be 20 inches in diameter.

4.0 EXECUTION

4.1 The ChamberMaxx system shall be installed per the Contech "ChamberMaxx Stormwater Retention System Standard Installation Detail", available from local Contech representative or from www.conteches.com.

4.2 For temporary construction vehicle loads, an extra amount of compacted cover may be required over the top of the chambers. The Height-of-Cover shall meet the minimum requirements shown in the Contech "ChamberMaxx Stormwater Retention System Standard Installation Detail". The use of heavy construction equipment necessitates greater protection for the chambers than finished grade cover minimums for normal highway traffic.

4.3 The contractor shall follow Occupational Safety and Health Association (OSHA) guidelines for safe practices in executing the installation process in accordance with the manufacturer/supplier installation recommendations.

4.4 Contractor is required to participate in an on-site preconstruction meeting with the supplier prior to the scheduled delivery date of the ChamberMaxx system.

APPENDIX B: ChamberMaxx Specification with Containment Row

ChamberMaxx

Underground Detention and Infiltration Standard Specification with Containment Row

5.0 GENERAL

5.1 This item shall govern the furnishing and installation of ChamberMaxx underground detention and infiltration chamber systems.

5.2 Contractor shall furnish all labor, materials, equipment and incidentals necessary to install the ChamberMaxx system, appurtenances and incidentals in accordance with the Drawings and as specified herein.

5.3 The containment row of the ChamberMaxx system is recommended as the appropriate means of pretreating for the purpose of extending the maintenance interval on the ChamberMaxx system and reducing the life cycle cost.

5.4 Applicable provisions of any Division shall govern work in this section.

5.5 Related Standards

5.5.1 ASTM 2418 "Standard Specification for Polypropylene Corrugated Wall Stormwater Collection Chambers"

5.5.2 ASTM F-2787 "Standard Practice for Structural Design of Thermoplastic Corrugated Wall Stormwater Collection Chambers"

5.6 Site layout drawings, product specifications, materials, hydraulic storage data and supported calculations of proposed alternatives shall be submitted to the Engineer of Record (EOR) for review at a minimum of 10 working days prior to bid closing.

5.7 Shop drawings shall be annotated to indicate all materials to be furnished and installed under this section, and all applicable standards for materials, required tests of materials and design assumptions for structural analysis:

5.8 Before installation of the ChamberMaxx system, Contractor shall obtain the written approval of the EOR for the stormwater system and the installation drawings.

5.9 All proposed alternatives to the ChamberMaxx system shall conform to applicable above referenced ASTM specifications.

6.0 MATERIALS

6.1 The chamber shall be constructed of injection molded polypropylene copolymer formulated for high impact and stress cracking resistance and sustained structural performance during high temperatures. The chamber shall be designed and manufactured in accordance to ASTM F-2418 and F-2787.

6.2 The chamber shall be designed to AASHTO LRFD Bridge Design Specifications (Section 12), as applied to material and performance requirements for buried thermoplastic pipes. Design live load shall be the AASHTO HS-20 and HS-25 truck, including multiple lane presence factors, over a minimum cover of 18 inches and chamber row spacing of 5 inches or greater.

6.3 The chamber system shall be comprised of three chamber configurations: The MIDDLE chambers shall be open-ended to allow unobstructed hydraulic flow, inspection, and maintenance. The START and END chambers shall each have an integral end wall designed to resist loading at the start and end of the chamber rows. The chambers within a row shall be installed with overlapping end corrugations.

6.4 The nominal dimensions of the START chamber shall be 51.4 inches wide, 30.3 inches tall, and 98.4 inches long. The nominal dimensions of the MIDDLE chamber shall be 51.4 inches wide, 30.3 inches tall, and 91.0 inches long. The nominal dimensions of the END chamber shall be 51.4 inches wide, 30.3 inches tall, and 92.0 inches long. The nominal storage volume inside the chamber shall be 77 cubic feet when utilizing 6" of stone above and below chamber with 40% stone porosity per ChamberMaxx standard detail.

6.5 The chamber shall have a continuously-curved, arch-shaped section profile.

6.6 The START and END chamber integral end wall shall be structurally suitable for cutting and inserting inlet pipes and shall provide a range of pipe diameter indicants up to 24" diameter as cutting templates.

6.7 The chamber shall be a corrugated, open-bottom design and top vent orifices for hydraulic pressure equalization. Corrugation valleys and crests shall be sub-corrugated to increase stiffness.

6.8 The chamber shall have a circular cut line for an optional reinforced inspection port configured to accept a 4" Schedule 40 pipe.

6.9 The END chambers shall be capable of being cut to shorter lengths to accommodate site specific requirements.

6.10The chamber shall be supported by integral structural footings comprised of load dispersing toe ribs and longitudinally aligned stiffening ribs.

6.11The manufacturer of the ChamberMaxx system shall be one that has regularly been engaged in the engineering design and production of these systems for at least eight (8) years and which has a history of successful production, acceptable to the Engineer of Record (EOR). In accordance with the Drawings, the ChamberMaxx system shall be supplied by:

Contech Engineered Solutions
9025 Centre Pointe Drive
West Chester, OH, 45069
Tel: 1 800 338 1122

7.0 PERFORMANCE

7.1 The ChamberMaxx system proposal shall be sized in accordance to the design provided and approved by the Engineer of Record (EOR). Any Contractor deviating from the design shown on the plans, to include: material, footprint, etc., shall provide to the EOR a summary report on stage-storage curves, design calculations, HydroCAD modeling and engineering drawings.

7.2 ChamberMaxx row spacing and stone base thickness cannot be altered with consultation from Contech Engineered Solutions, LLC.

7.3 The ChamberMaxx system shall be designed so as the hydraulic grade line will increase evenly throughout whereas transverse movement from one storage compartment to another shall not be permitted. All storage compartments shall be connected via manifold (or connecting pipe) versus by entirely transporting stormwater through stone.

8.0 EXECUTION

8.1 The ChamberMaxx system shall be installed per the Contech "ChamberMaxx Stormwater Retention System Standard Installation Detail", available from local Contech representative or from www.conteches.com.

8.2 For temporary construction vehicle loads, an extra amount of compacted cover may be required over the top of the chambers. The Height-of-Cover shall meet the minimum requirements shown in the Contech "ChamberMaxx Stormwater Retention System Standard Installation Detail". The use of heavy construction equipment necessitates greater protection for the chambers than finished grade cover minimums for normal highway traffic.

8.3 The contractor shall follow Occupational Safety and Health Association (OSHA) guidelines for safe practices in executing the installation process in accordance with the manufacturer/supplier installation recommendations.

8.4 Contractor is required to participate in an on-site preconstruction meeting with the supplier prior to the scheduled delivery date of the ChamberMaxx system.

END SECTION

NOTES:

NOTES:



RECYCLED PAPER

CONTECH ENGINEERED SOLUTIONS

800-338-1122
www.ContechES.com

Support

- Drawings and specifications are available at contechstormwater.com.
- Site-specific design support is available from our engineers.

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Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech portfolio includes bridges, drainage, sanitary sewer, stormwater and earth stabilization products. For information on other product offerings, visit www.conteches.com or call 800.338.1122

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11/17 PDF CMX Design Guide

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ENGINEERED SOLUTIONS



ChamberMaxx® Retention Installation Guide



CHAMBERMaxx®

ChamberMaxx Retention Installation Guide

The ChamberMaxx system requires adherence to the following installation procedure for the structural integrity of the system to be maintained.

All illustrations and photographs are examples of typical situations. Each individual site will vary, so it is important to follow the engineering project drawings as designed and sealed by a registered Professional Engineer.

Prior to installation of the ChamberMaxx system a pre-construction meeting shall be conducted. Those required to attend are the supplier of the system, the general contractor, sub-contractors and the project Engineer of record.

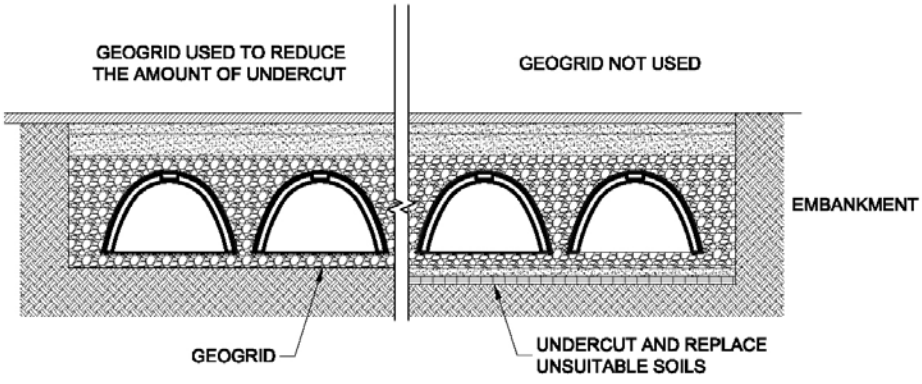


Foundation

Construct a foundation that can support the design loading applied by the chambers and adjacent backfill weight as well as maintain its integrity during construction. A minimum of an extra foot of perimeter excavation is required for proper fit and adequate compaction. Excavation must be free of standing water. Dewater if present.

If soft or unsuitable soils are encountered, remove unsuitable material and bring back to grade with fill material as approved by the Engineer of record. See Detail A. The structural fill material gradation should not allow the migration of fines, which can cause settlement of the chamber system and possibly the above pavement, and occlusion of the void space in the bedding. If the structural fill material is not compatible with the underlying soils a Contech C-40, non-woven 4 oz separation geotextile, should be used as a separator.

Grade the foundation subgrade to a uniform and stable grade. If the subgrade is clay or relatively non-porous and the construction sequence will last for an extended period of time, it is best to slope the grade to one end of the system. This will allow excess water to drain quickly, preventing saturation of the subgrade.



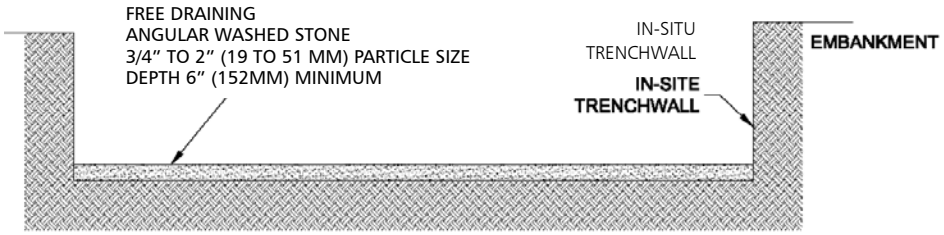
SECTION

DETAIL A

Bedding

A 6-inch (152 mm) minimum thickness, well-graded, free-draining angular washed stone 3/4 to 2-inch (19 to 51 mm) particle size is the required chamber bedding. Refer to project engineering plans for subgrade soil preparation and required stone foundation thickness. If the construction equipment will operate for an extended period of time on the bedding, use an engineering fabric or a geogrid to ensure the base material maintains its integrity. Bedding material is to be compacted to 90% AASHTO T99 standard proctor density. Do not use heavy equipment on bedding material to avoid excessive soil compaction. See Detail B.

Grade the base to a smooth, uniform grade to allow for the proper placement of chambers.



SECTION

DETAIL B

In-Situ Trench Wall

The trench wall must be capable of supporting the load that the chamber sheds as the system is loaded. If soils are not capable of supporting these loads, the integrity of the system can be compromised. Perform a simple soil pressure check using the applied loads to determine the limits of excavation beyond the edge of the outer most row of chambers. Wrap the walls with Contech C-40 non-woven geotextile to help prevent soil migration.

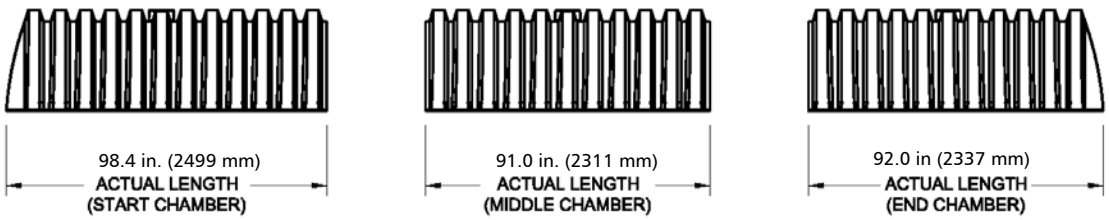
In most cases the requirements for a safe work environment and proper backfill placement and compaction take care of this concern.

ChamberMaxx Units

All systems are comprised of the Start, Mid and End chambers. The Start and End chambers are marked accordingly with a label on each end.

The maximum weight of a single chamber is 83 lbs. (37.65 kg) which allows the chamber to be hand carried. See Detail C.





ELEVATION VIEW

DETAIL C

Layout of the Manifold System

Temporarily layout the manifold system per the project engineering plans. Place the Start chamber of each row in your system. Standard spacing between rows is 5.6", with a minimum of 5" required between each row.. Use a reciprocating saw to cut the inlet pipe diameter hole out from the Start chamber at the correct inlet height. Insert the inlet pipe from the assembled manifold system into each Start chamber. Cover any open void spaces greater than 3/4-inch (19 mm) on the chambers with a non-woven geotextile to prevent infiltration of backfill material.



Layout of the Optional Containment Row

For ease of access during a maintenance operation, ChamberMaxx retention systems may have an optional Containment Row to allow for containment and settlement of sediments and associated pollutants during the initial flows of storm events. This row of chambers is set on top of a 2 layers of AASHTO M288 Class 1 woven geotextile a minimum of 53" wide with no overlaps.

1. Install diversion manhole per site plan.
2. Rollout the 12.5 ft (150 inch) wide woven geotextile and cut to the required length of the containment row while leaving 3-ft (.19m) overlap at each end of the chamber row. Fold the geotextile lengthwise creating 2 layers of 75" wide woven geotextile. Center the 2 layers of geotextile on the location of the containment row. The 75" wide geotextile layers will overlap approximately 1 ft of width on each side of the containment row. It may be necessary to temporarily weigh down the edges of the geotextile material to prevent displacement from wind.
3. Lay chambers for the Containment Row on the 2 layers of woven geotextile per the plans starting at the Start chamber, see Setting Units for installation instructions. It may be necessary to mark position of chambers on geotextile to ensure proper location during placement of chambers.
4. Install inlet connector pipe in Start chamber wall from the diversion manhole per plans.
5. Confirms the width of woven geotextile leaves a minimum of 6" around chamber along the sides. See Detail D.
6. Wrap the sides of the woven geotextile around the sides of the containment row and pin it to ensure that it does not unwrap during backfill
7. Fold overlapping ends of woven geotextile at the ends of the containment row so that they are flat against the end walls and fully wrapped around the inlet pipe of the containment row. Attach with construction tape as needed to keep the geotextile from moving during backfill.
8. Layout remaining chambers of retention system and header manifold per plans. See page 6.

Laying Out Scour Protection Netting

To insure the bedding is not disrupted as flows enter the system, rollout the Scour Protection Netting material perpendicular to the inlet chambers. In the area of the inlet chambers, lay the material with a one foot overlap towards the manifold system and footprint area. Tension material as needed to provide intimate contact with the bedding stone. When the inlet chamber is installed, this will "pin" the netting material in place. Inspect to insure netting is flat with no wrinkles and has intimate contact with the bedding stone. See Detail D.

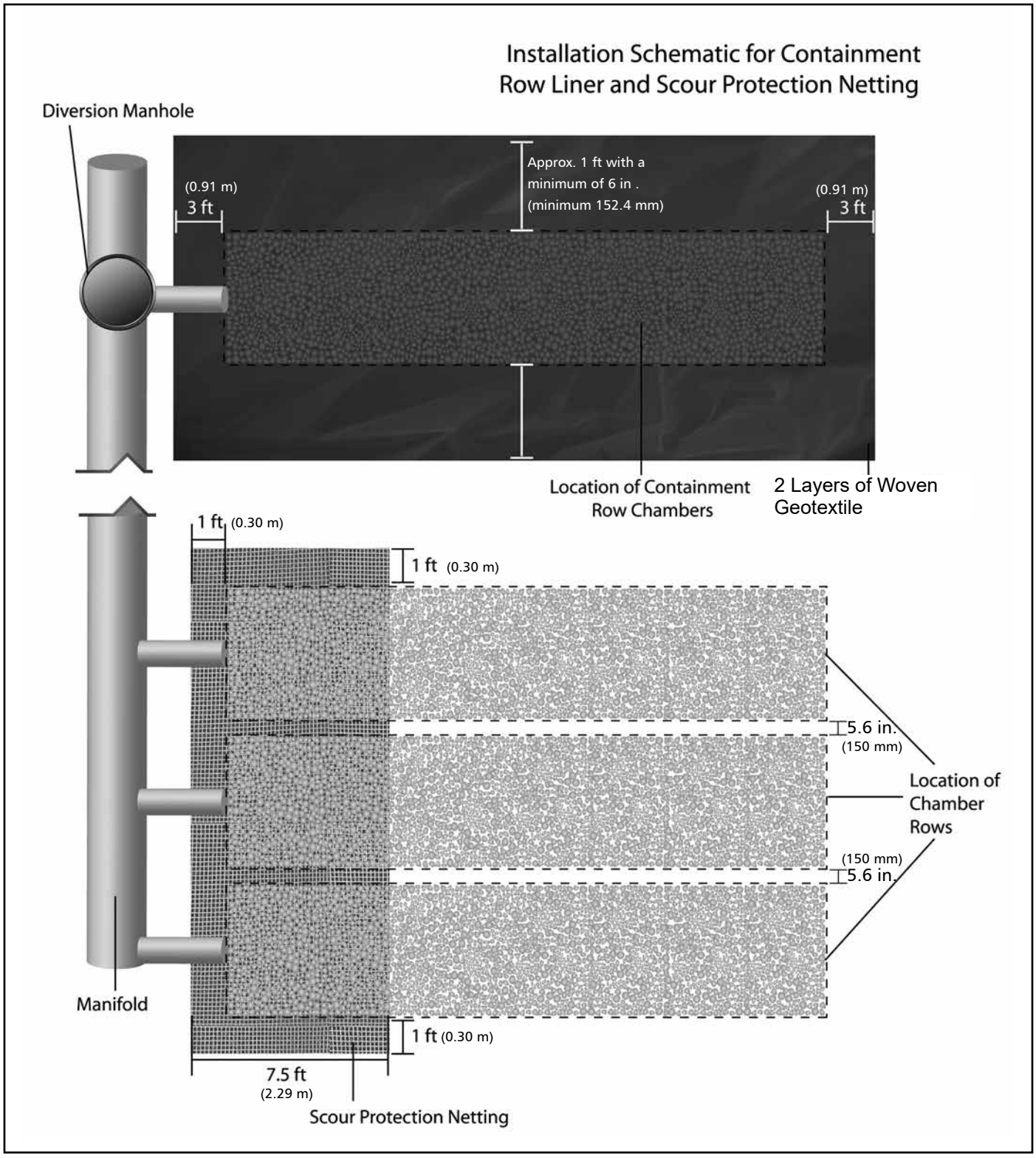


Setting Units

Overlap the Mid chamber corrugation over the end of the Start chamber. Standard spacing between rows is 5.6", with a minimum of 5" required between each row. Always refer to the engineering plans for chamber arrangement. The End chamber will be the final chamber in each row.

Inspection Viewports

Where identified on the engineering project plans cut a 4-inch (102 mm) diameter hole in the reinforced circular port on the top of the chamber. Build an inspection port from PVC Schedule 40 pipe. Cut pipe to an oversized length, screw three small angle irons approximately 1-inch (25 mm) from the end of pipe. Anchor the riser in place on the chamber to keep secured during the backfill process. Install ring and cover on top of the riser pipe. After backfill, place an access casting in a concrete collar. To avoid crushing the inspection port riser, be sure concrete does not attach to riser pipe.


Installation Schematic for Containment
Row Liner and Scour Protection Netting
Diversion Manhole
(0.91 m)
3 ft
Approx. 1 ft with a
minimum of 6 in .
(minimum 152.4 mm)
(0.91 m)
3 ft
Location of Containment
Row Chambers
2 Layers of Woven
Geotextile
1 ft (0.30 m)
1 ft (0.30 m)
5.6 in.
(150 mm)
Location of
Chamber
Rows
(150 mm)
5.6 in.
Manifold
1 ft (0.30 m)
7.5 ft
(2.29 m)
Scour Protection Netting

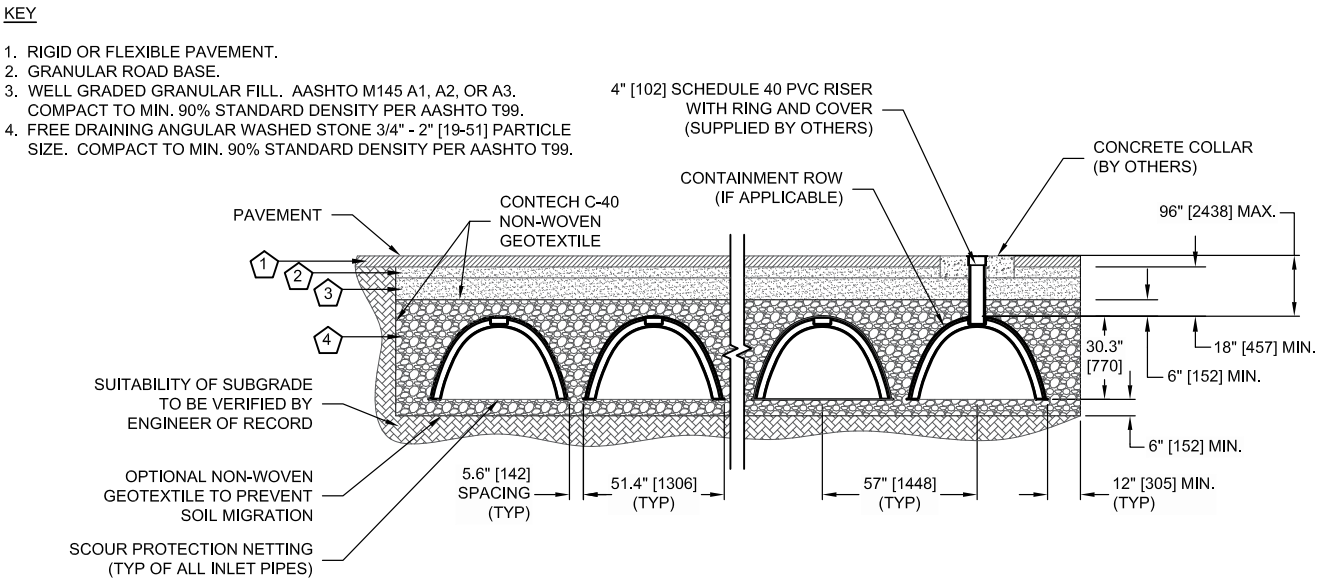
DETAIL D

Backfill Material

The chamber System incorporates two types of backfill material.

Free draining angular washed stone 3/4 to 2-inch (19 to 152 mm) particle size compacted to 90% AASHTO T99 is used around the chambers. This material is used around the chambers and within a minimum of 6-inches (152 mm) below and 6-inches (152 mm) above the chambers. The remaining space should be filled with an angular, well-graded granular fill meeting the requirements of AASHTO M145 A1, A2 or A3, compacted to 90% AASHTO T99.

Contech C-40 Non-Woven Geotextile should be used between the two layers of backfill material. See Detail E.



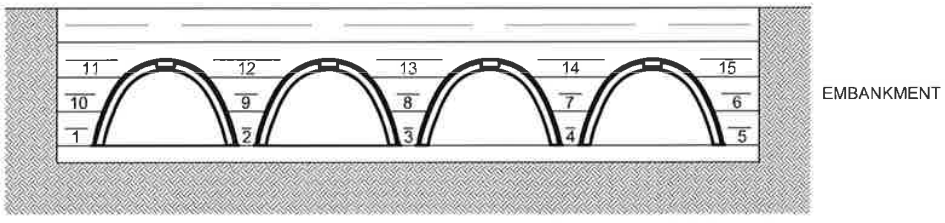
DETAIL E

Backfill Placement

Place backfill material in 6 to 8-inch (152 to 203 mm) loose lifts and compact to 90% AASHTO T99. Use mechanical hand tampers or approved compacting equipment to compact all backfill and embankment immediately adjacent to each side of the installation and over top of the installation to a minimum depth of 18-inches (457 mm). Place backfill so there is no more than a two lift differential between any of the chambers at anytime during the backfilling process. Advance the backfill along the length of the chamber system at the same rate to avoid differential loading on the chambers. Backfilling at differential heights from one side of the chamber to the other in excess of 16-inches (407 mm) can cause chamber distortion or potential collapse. Advance balanced lifts across the width of the system evenly along the length of the chambers as you backfill. See Detail F.

Use only lightweight tracked dozers (D-4 dozer or smaller) not exceeding 1,100 lbs/sf (0.54 kg/cm^2) ground pressure to spread backfill lifts over top of the chamber system. Maintain a minimum of 6-inch (152 mm) cover on top of chambers for the initial lifts.

For large systems use conveyor systems, backhoes with long reaches or draglines with stone buckets may be used to place backfill. Once minimum cover for construction loading across the entire width of the system is reached, advance the equipment to the end of the recently placed fill, and begin the sequence again until the system is completely backfilled. This type of construction sequence provides room for stockpiled backfill directly behind the backhoe, as well as the movement of construction traffic. Material stockpiles on top of the backfilled chamber system should be limited to six feet in total high above the structure and must provide balanced loading across all chambers. To determine the proper cover over the chambers to allow the movement of construction equipment, contact your local Contech Representative.



DETAIL F - TYPICAL BACKFILL SEQUENCE

Construction Loading

Typically, the minimum cover specified for a project assumes HS-20 or HS-25 live load. Because construction loads often exceed design live loads, increased temporary minimum cover requirements are necessary. Since construction equipment varies from job to job, it is best to address equipment specification and minimum cover requirements with our local Contech representative during the pre-construction meeting.

Equipment Restriction	
BACKFILL LEVEL*	ALLOWABLE CONSTRUCTION EQUIPMENT**
4 – Bedding	*No restrictions.*
4 – Back to Top of Chambers	*No equipment js permitted on or nearby the chambers. conveyors or excavators located such that their loads do not influence the chambers should be used to place the backfill stone. Stone should be worked between the chambers by hand.*
4 – Backfill Over the Top of the Chambers	*no wheel loads should be applied over the system. once 6" of stone has been placed over the crown of the chambers, lightweight tracked dozers with a maximum ground pressure of 1,100 psf are permitted over the structure. dozers must spread stone working in a direction parallel with the chamber rows; not working across the chamber rows. also, only small, walk behind compaction equipment can be used over the chambers until a minimum of 12" of cover is over the chambers.*
2 or 3 Select Fill Over the Chambers	*once 18" of compacted material is over the chambers, highway vehicles with axle loads of 32,000 pounds or less can be operated over the structures. front end loaders can be operated over the structures as long as the maximum wheel load does not exceed 16,000 pounds. compaction equipment can be operated over the structures as long as the dynamic force from the drum does not exceed 20,000 pounds and the gross vehicle weight does not exceed 12,000 pounds.*

** Please reference Detail E on page 7.*
*** Contact your local Contech Representative for questions on the use of specific pieces of construction equipment.*

Contractor Tool Checklist

- Wire cutters
- Stone bucket
- Transit or laser level
- Forklift or other type of equipment to unload chambers
- Reciprocating saw or router (to custom cut the end walls and inspection ports)
- Approved compaction equipment
- Excavator to dig trench and place stone and soil backfill
- Stone conveyor/light weight tracked dozer not exceeding 1,100 lbs/sf (0.54 kg/cm^2) to grade backfill

Material Checklist

Start, Mid and End ChamberMaxx chambers	Supplied by Contech
Manifold System	Supplied by Contech
Scour Protection Netting	Supplied by Contech
Contech C-40 Non-woven geotextile	Supplied by Contech
Containment Row Diversion Manhole if required)	Supplied by Contech
Containment Row AASHTO M288 Class 1 Woven Geotextile	Supplied by Contech
Free draining angular washed stone 3/4"-2" (.019 to .05 m) backfill material	Supplied by Contractor
Well graded granular backfill material	Supplied by Contractor
Construction Tape / Adhesive	Supplied by Contractor
Inspection port materials	Supplied by Contractor

ChamberMaxx Pre-Construction Checklist

Contech Field Contact and Phone: _____

Contech Plant Contact and Phone: _____

Contractor Contact and Phone: _____

Project Name: _____

Site Address: _____

Precon Attendees: _____

Topics to Review:

- ☐ Truck access and chamber storage availability/expectation
- ☐ Chamber unloading and handling safety, equipment and procedures
- ☐ System layout and fabrication drawing review
- ☐ Shipping schedule and installation sequence
- ☐ Scour protection netting layout
- ☐ Configuration and assembly
- ☐ Backfill material selection and placement procedure
- ☐ Backfill sequence, lift thickness and balanced loading
- ☐ Compaction requirement (90%) and equipment
- ☐ Additional Containment Row™ construction/liner material layout
- ☐ Inspection port installation

Notes: _____

_____

_____

_____

CHAMBERMaxx™

CONTECH ENGINEERED SOLUTIONS

Support

- Drawings and specifications are available at ContechES.com.
- Site-specific design support is available from Contech Engineered Solutions.

800.338.1122
www.ContechES.com

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