DOCKETED

Docket Number:	16-AFC-01
Project Title:	Stanton Energy Reliability Center
TN #:	223184
Document Title:	Stanton Energy Reliability Center LLC's Water Quality Management Plan
Description:	N/A
Filer:	Patty Paul
Organization:	DayZen LLC
Submitter Role:	Applicant Representative
Submission Date:	4/12/2018 10:10:56 AM
Docketed Date:	4/12/2018

Water Quality Management Plan (WQMP)

Project Name:

Stanton Energy Reliability Center

Prepared for:

Stanton Energy Reliablity Center, LLC

650 Bercut Drive., Suite A

Sacramento, CA 95811

916-492-9486

Prepared by:

WSP USA

862 E. Hospitality Lane

San Bernardino, CA, 92408

909-888-1106

Original: August 2017

Revised: April 2018

Project Owner's Certification			
Permit / Application No.	16-AFC-01	Grading Permit No.	
Tract / Parcel Map No.	126-531-40 & 126-531-43 & 126-553-18	Building Permit No.	
CUP, SUP, and / or APN (Specify Lot Numbers if Portions of Tract)			126-531-40 & 126-531-43 & 126-553-18

This Water Quality Management Plan (WQMP) has been prepared for Stanton Energy Reliability Center, LLC by WSP USA. The WQMP is intended to comply with the requirements of the local NPDES Stormwater Program requiring the preparation of the plan.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current Orange County Drainage Area Management Plan (DAMP) and the intent of the non-point source NPDES Permit for Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the incorporated Cities of Orange County within the Santa Ana Region. In the event the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the WQMP. An appropriate number of approved and signed copies of this document shall be available on the subject site in perpetuity.

Signed: _____

Owner:			
Title	President		
Company	Stanton Energy Reliability Center LLC		
Address	650 Bercut Drive, Suite A		
Email	kmiles@wpowerllc.com (cc: gfranzen@wellhead.com)		
Telephone #	916-492-9486		
I understand my responsibility to implement the provisions of this WQMP including the ongoing operation and maintenance of the best management practices (BMPs) described herein.			
Owner Signature		Date	

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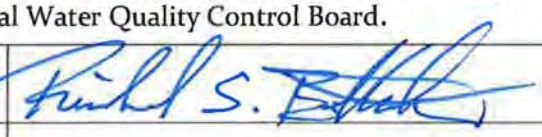
Attachments

Preparer (Engineer):			
Title	Engineering Manager	PE Registration #	47080
Company	WSP USA		
Address	401 B Street, Suite 1650, San Diego, CA 92101		
Email	richard.bottcher@wsp.com		
Telephone #	619-525-8370		

I hereby certify that this Water Quality Management Plan is in compliance with, and meets the requirements set forth in, Order No. R8-2009-0030/NPDES No. CAS618030, of the Santa Ana Regional Water Quality Control Board.

Preparer Signature		Date	4 - 11 - 2018
Place Stamp Here			

Section I Discretionary Permit(s) and Water Quality Conditions

Provide discretionary permit and water quality information. *Refer to Section 2.1 in the Technical Guidance Document (TGD) available from the Orange County Stormwater Program (ocwatersheds.com).*

Project Infomation			
Permit / Application No.		Tract / Parcel Map No.	126-531-40 & 126-531-43 & 126-553-18
Additional Information / Comments:			
Water Quality Conditions			
Water Quality Conditions (list verbatim)	This is a priority development project which is conditioned to prepare a WQMP. The project is also conditioned to preserve existing discharge rates for the 2 year and 100-year storm events.		
Watershed-Based Plan Conditions			
Provide applicable conditions from watershed - based plans including WIHMPs and TMDLS.	Project is located within the Anaheim Bay Subbasin CO2. Project area is identified as susceptible to hydromodification impacts.		

Section II Project Description

II.1 Project Description

Provide a detailed project description including:

- Project areas; The project consists of three parcels 126-553-18, 126-531-40 and 126-531-43 that are segregated by the Stanton Channel. The project area will be further divided into three drainage management areas DMA 1 (APN 126-531-43) and DMA 2 (APN 126-531-40) and DMA 3 (APN 126-553-18).
- Land uses; The project will be an industrial development with infrastructure typical of electrical power projects including multiple storage tanks, transformers, warehouse buildings, switch gear cabinets and control modules (see Foundation Plan). The applicable SIC Code is 4911.
- Land cover; Proposed surface coverage will consist of concrete foundations, DG gravel roads, substation rock and DG granite fill. In total 30% of the site will be covered by impervious surfaces and 70% will be covered by pervious surfaces. Two bridges will also be constructed over the Stanton Channel, one a vehicle bridge and the other a utility bridge. The existing site consists of two separate land covers. Natural mixed grasses cover Parcel 1 (APN 126-531-43). Industrial / commercial surfaces cover Parcel 2 (APN 126-531-40, APN 126-553-18).
- Design elements; The drainage design elements for DMA 1 will include 1047 ft of perforated storm drain underlain by 1ft of gravel substrate. Weirs will be constructed within the inlet structures to cause storm flows to be retained and infiltrated. The furthest downstream inlet will contain a 0.5 ft by 0.2ft orifice to cause detention of flow within the storm drain system. Flows from DMA 1 will ultimately discharge to the Stanton Channel via the existing outlet. DMA 2 will drain to a single low point where flows will be conveyed via a proposed 8" pipe to a stormtech chamber system for retention and subsequent infiltration of stormwater. DMA 3 will also drain to a storm tech chamber system where stormwater will be retained and infiltrated. Onsite inlets will be equipped with fleXstorm filters to provide pretreatment of stormwater. Flows from DMA 2 & 3 will ultimately drain to an existing 36 inch storm drain and discharge to the Stanton Channel via the existing outlet.
- A general description broken down by drainage management areas (DMAs).
    - DMA 1 – 1.75 acres of industrial area will drain from east to west to an underground perforated storm drain and then spill to the existing outlet to the Stanton Channel. 0.75 acres will be impervious. 1.00 acres will be pervious.
    - DMA 2 – 0.80 acres of industrial area will drain inwardly to the center of the parcel to an underground stormtech infiltration chamber system and then spill to an existing storm drain that outlets to the Stanton Channel. A low flow inlet will drain to the storm tech. An overflow inlet will be raised 0.1 ft above the low flow inlet to

allow overflow to drain to the existing storm drain. 0.13 acres will be impervious. 0.67 acres will be pervious.

- DMA 3 - 0.81 acres of industrial area will drain from west to an underground storm tech infiltration chamber system and then spill to an existing storm drain that outlets to the Stanton Channel.

Include attributes relevant to determining applicable source controls. *Refer to Section 2.2 in the TGD for information that must be included in the project description.*

Description of Proposed Project		
Development Category (Verbatim from WQMP):	New development projects that create 10,000 square feet or more of impervious surface. This category includes commercial, industrial, residential housing subdivisions, mixed-use, and public projects on private or public property that falls under the planning and building authority or the Permittees.	
Project Area (ft^2): 146,361	Number of Dwelling Units: 0	SIC Code: 4911
Narrative Project Description:	The Stanton Energy Reliability Center (SERC) will consist of two General Electric (GE) LM6000 based EGT®s. EGT® refers to the LM6000 PC Hybrid EGT® jointly developed by General Electric International, Inc. (GE) and Wellhead Power Solutions. The EGT® combines a combustion gas turbine with an integrated battery storage component operated by a proprietary software system. Each EGT® will consist of a GE LM6000 PC natural gas-fired, simple-cycle combustion turbine and an integrated 10-megawatt (MW) GE Battery Energy Storage System. In total, SERC will provide 98 MW (nominal) of EGT® capacity. The EGT® provides a broad array of unique reliability benefits that neither gas turbines nor batteries can provide on their own. SERC will be a state-of-the-art energy reliability resource. It has been designed to deliver superior reliability services with a minimal carbon footprint and a low emissions profile – all in an aesthetically pleasing design. The project will be one of the first green-field commercial applications of the EGT® technology. Using this technology, SERC is able to combine dispatchable, operationally flexible, and efficient energy generation with state-of-the-art energy storage technology to meet the	

	need for new local capacity and reliability services specifically in the West Los Angeles (LA) Basin local reliability area of Southern California Edison's (SCE's) service territory.			
Project Area	Pervious		Impervious	
	Area (acres or sq ft)	Percentage	Area (acres or sq ft)	Percentage
Pre-Project Conditions	1.75	52%	1.61	48%
Post-Project Conditions	2.34	69%	1.02	31%
Drainage Patterns / Connections	APN 126-531-43 (Parcel 1) drains from east to west as surface flows concentrate at two inlets and then discharge to an existing storm drain that drains west to the Stanton Channel. APN 126-531-40 & 126-553-18 (Parcel 2) drain from west to east. Surface flow is intercepted by one of two existing inlets which drain to the existing 36 inch storm drain and then discharge to the Stanton Channel.			

II.2 Potential Stormwater Pollutants

Determine and list expected stormwater pollutants based on land uses and site activities. *Refer to Section 2.2.2 and Table 2.1 in the TGD for guidance.*

Pollutants of Concern			
Pollutant	Bold One: E=Expected to be of concern N=Not Expected to be of concern		Additional Information and Comments
Suspended-Solid / Sediment	E	N	
Nutrients	E	N	
Heavy Metals	E	N	
Pathogens (Bacteria / Virus)	E	N	No sources of bacteria or viruses anticipated

Pesticides	E	N	No source of pesticides are anticipated
Oil and Grease	E	N	
Toxic Organic Compounds	E	N	
Trash and Debris	E	N	

II.3 Hydrologic Conditions of Concern

Determine if streams located downstream from the project area are determined to be potentially susceptible to hydromodification impacts. *Refer to Section 2.2.3.1 in the TGD for* NOC *or Section 2.2.3.2.*

☐ No – Show map

☒ Yes – Describe applicable hydrologic conditions of concern below. *Refer to Section 2.2.3 in the TGD.*

Per the WIHMP Data the recieving streams are susceptible to hydromodification. The site discharges to the Stanton Channel which is lined at the point of discharge. 500 ft downstream of the site the channel transitions to unlined channel. Hydromodification facilities including an underground storm drain detention facility on Parcel 1 and two Stormtech chamber systems on Parcel 2 will be sized to preserve existing discharges for the 2 year storm event per the WQMP requirements. Orange County Flood Control has also requested existing peaks be preserved for the 100-year storm event. Attachment I presents rational method, Unit Hydrograph and Hydrograph Routing Calculations to demonstrate compliance with these requirements.

II.4 Post Development Drainage Characteristics

Describe post development drainage characteristics. *Refer to Section 2.2.4 in the TGD.*

The following applies to DMA 1: Parcel 1 will drain to a proposed onsite storm drain. The storm drain will be constructed with perforated piping on the bottom side and a 1 ft by 4 ft underlying gravel bed (1675 ft3 storage). 2.25 ft weirs will be provided in each inlet to facilitate retention within the storm drain (5177 ft3) and infiltration into underlying soil. A 0.2 ft by 0.5 ft orifice will be provided within the weir of the most downstream inlet to provide detention for storms up to the 100 year storm event. Retention storage will be provided up to 2.5 ft within the upstream 977 linear feet of storm drain. Storage for detention (7397 ft3 storage) will be provided within the entire 1047 linear feet of storm drain system. Flows discharged from the storm drain will discharge to the Stanton Channel via the existing storm drain outlet.

The following applies to DMA 2: The easterly portion of Parcel 2 will drain to a low flow inlet that conveys flow to an underground storm tech system (4002 ft3 storage). Flows that exceed the stormtech storage capacity will spill to a high flow inlet and then discharge via an 8-inch pipe to the existing 36 inch storm drain and then drain to the Stanton Channel.

The following applies to DMA 3: The westerly portion of Parcel 2 will drain to a low flow inlet that conveys flow to an underground storm tech system (695 ft3 storage). Flows that exceed the stormtech storage capacity will spill to a highflow inlet and then discharge via an 8-inch pipe to the existing 36 inch storm drain and then drain to the Stanton Channel.

II.5 Property Ownership/Management

Describe property ownership/management. *Refer to Section 2.2.5 in the TGD.*

Parcel 1 is owned by Stanton Energy Reliability Center, LLC. Parcel 2 will be leased. Parcel 2 owners are Peter & Genevieve Valov. Maintenance of BMPs will likely be the responsibility of a subcontractor who has not been determined at this time. The site will be automated with regular inspections.

Section III Site Description

III.1 Physical Setting

Fill out table with relevant information. *Refer to Section 2.3.1 in the TGD.*

Planning Area/ Community Name	City of Stanton
Location / Address	10711 Dale Avenue & 8230 Pacific Street
Land Use	Industrial
Zoning	Industrial
Acreage	3.3
Predominant Soil Type	Hydrologic Soil Type B

III.2 Site Characteristics

Fill out table with relevant information and include information regarding BMP sizing, suitability, and feasibility, as applicable. Refer to Section 2.3.2 in the TGD.

Precipitation Zone	*0.85 inch (85th percentile storm)*
Topography	*Site Slopes to the south at approximately 0.5%*
Drainage Patterns/Connections	*Site drains to the south. One existing storm drain system drains parcel 1 and discharges to the Stanton Channel. A seperate storm drain system drains parcel 2 and discharges to Stanton Channel.*
Soil Type, Geology, and Infiltration Properties	*Soils Consist of Hueneme fine sandy loam. Ksat values are approxiamately 2-6 inch/hr. The parent geology is defined by stratified alluvium derived from sedimentary rock.*

Site Characteristics (continued)	
Hydrogeologic (Groundwater) Conditions	*Groundwater depth is anticipated to be approximately 30 feet below the ground surface.*
Geotechnical Conditions (relevant to infiltration)	*Ksat values are approximately 2-6 inch/hr per websoil survey. On site geotechnical investigations recommended a design infiltration rate of 12 inches/hour*
Off-Site Drainage	*1 acre of undeveloped land north of Parcel 1 drains through Parcel 1 to the existing inlet on Parcel 1. This area will be intercepted by proposed drainage improvements and discharged to the Stanton Channel.*
Utility and Infrastructure Information	*An existing Master Planned Drainage Channel (Stanton Channel) drains through the center of the project site. No existing utilities have been identified.*

III.3 Watershed Description

Fill out table with relevant information and include information regarding BMP sizing, suitability, and feasibility, as applicable. *Refer to Section 2.3.3 in the TGD.*

Receiving Waters	Stanton Channel, Anaheim Bay
303(d) Listed Impairments	Pesticides, Organics, Toxicity

Applicable TMDLs	None
Pollutants of Concern for the Project	None
Environmentally Sensitive and Special Biological Significant Areas	None

Section IV Best Management Practices (BMPs)

IV. 1 Project Performance Criteria

Describe project performance criteria. Several steps must be followed in order to determine what performance criteria will apply to a project. These steps include:

- If the project has an approved WIHMP or equivalent, then any watershed specific criteria must be used and the project can evaluate participation in the approved regional or sub-regional opportunities. The local Permittee planning or NPDES staff should be consulted regarding the existence of an approved WIHMP or equivalent.
- Determine applicable hydromodification control performance criteria. *Refer to Section 7.II-2.4.2.2 of the Model WQMP.*
- Determine applicable Low Impact Development (LID) performance criteria. *Refer to Section 7.II-2.4.3 of the Model WQMP.*
- Determine applicable treatment control BMP performance criteria. *Refer to Section 7.II-3.2.2 of the Model WQMP.*
- Calculate the LID design storm capture volume for the project. *Refer to Section 7.II-2.4.3 of the Model WQMP.*

(NOC Permit Area only) Is there an approved WIHMP or equivalent for the project area that includes more stringent LID feasibility criteria or if there are opportunities identified for implementing LID on regional or sub-regional basis?	YES ☐	NO ☒
If yes, describe WIHMP feasibility criteria or regional / sub-regional LID opportunities.		

Project Performance Criteria (continued)

If HCOC exists, list applicable hydromodification control performance criteria (Section 7.II-2.4.2.2 in MWQMP)	HCOCs do exist for this project. Therefore post development runoff volume and Time of Concentration (Tc) for the 2 yr, 24-hr storm will not exceed the predeveloped runoff volume for the 2-yr, 24-hr storm by more than 5%. Please note per the Orange County Technical Guidance Document, it is not physically possible for a project to implement BMPs consistent with LID provisions of the permit without substantially increasing the Tc of the site. The TGD interprets this provision such that increases in Tc would be acceptable and reduction in Tc of more than 5 percent would not be acceptable.
List applicable LID performance criteria (Section 7.II-2.4.3 from MWQMP)	Priority Projects must infiltrate, harvest and use, evapotranspire, or biotreat/biofilter, the 85th percentile, 24-hour storm event (Design Capture Volume).
List applicable treatment control BMP performance criteria (Section 7.II-3.2.2 from MWQMP)	Capture and infiltrate, filter, or treat the runoff from the 24-hour, 85th percentile storm event, as determined from the County of Orange's 85th Percentile Precipitation Isopluvial Map and draw down the stored volume in no more than 48 hours following the end of precipitation,
Calculate LID design storm capture volume for Project.	Water Quality Volume Summary Table

	DMA 1	DMA 2	DMA 3
Runoff Coefficient (unitless)	0.43	0.16	0.17
85% Storm Depth (inch)	0.85	0.85	0.85
Area (acres)	1.75	0.80	0.81
WQV (ft3)	2328.6	394.3	424.0
Retention provided (ft3)	6852	4002	695

WQV = C x d x A x 43560sf/ac x 1/12 in/ft

DMA 1 and 2 systems retention oversized to address hydromodification. DMA 3 system oversized to accommodate potential future development.

IV.2. SITE DESIGN AND DRAINAGE PLAN

Describe site design and drainage plan including

- A narrative of site design practices utilized or rationale for not using practices;
- A narrative of how site is designed to allow BMPs to be incorporated to the MEP
- A table of DMA characteristics and list of LID BMPs proposed in each DMA.
- Reference to the WQMP plot plan.
- Calculation of Design Capture Volume (DCV) for each drainage area.
- A listing of GIS coordinates for LID and Treatment Control BMPs (unless not required by local jurisdiction).

Refer to Section 2.4.2 in the TGD.

Site Design BMPs will include preservation of Stanton Drainage Channel, Minimization of Impervious Area and Disconnection of Impervious Area. The Stanton Channel will be preserved in place and will not be modified other than constructing 2 additional bridges over the channel. Impervious surface will be minimized onsite through the use of Rock, Gravel and Decomposed Granite (DG) instead of concrete. Proposed roads will consist of DG gravel that will allow for infiltration. Impervious surfaces will include roofs and concrete foundations. This minimization strategy will allow for a total of 2.3 acres or 69% of the site to be pervious. Impervious areas will drain and be routed through perforated storm drains on Parcel 1 and storm tech chambers on Parcel 2 prior to discharging to an existing storm drain system there by providing disconnection of the impervious areas. See attached exhibits for more detail.

IV.3 LID BMP SELECTION AND PROJECT CONFORMANCE ANALYSIS

Each sub-section below documents that the proposed design features conform to the applicable project performance criteria via check boxes, tables, calculations, narratives, and/or references to worksheets. *Refer to Section 2.4.2.3 in the TGD for selecting LID BMPs and Section 2.4.3 in the TGD for conducting conformance analysis with project performance criteria.*

IV.3.1 Hydrologic Source Controls

If required HSCs are included, fill out applicable check box forms. If the retention criteria are otherwise met with other LID BMPs, include a statement indicating HSCs not required.

Name	Included?
Localized on-lot infiltration	☒
Impervious area dispersion (e.g. roof top disconnection)	☒
Street trees (canopy interception)	☒
Residential rain barrels (not actively managed)	☐
Green roofs/Brown roofs	☐
Blue roofs	☐
Impervious area reduction (e.g. permeable pavers, site design)	☒
Other: Preservation of Stanton Channel	☒
Other:	☐
Other:	☐
Other:	☐
Other:	☐
Other:	☐
Other:	☐
Other:	☐

IV.3.2 Infiltration BMPs

Identify infiltration BMPs to be used in project. If design volume cannot be met state why BMPs cannot be met

Name	Included?
Bioretention without underdrains	☐
Rain gardens	☐
Porous landscaping	☐
Infiltration planters	☐
Retention swales	☐
Infiltration trenches	☐
Infiltration basins	☐
Drywells	☐
Subsurface infiltration galleries	☒
French drains	☐
Permeable asphalt	☐
Permeable concrete	☐
Permeable concrete pavers	☐
Other: Gravel Surfaces	☒
Other: Substations Rock	☒

Show calculations below to demonstrate if the LID Design Storm Capture Volume can be met with infiltration BMPs. If not document how much can be met with infiltration and document why it is not feasible to meet the full volume with infiltration BMPs.

DMA 1 Storm Drain Infiltration Storage Volume within 2.5 feet of ponding within 977 linear feet of storm drain and within 1047 linear feet of 4ft wide grave bed = 6852 ft3 (for Calculation of storage volume see storage summary table on Inlet/Weir/Orifice Typical Section).

DMA 2 Infiltration System (Storm Tech) Storage Volume = 4002 ft3 (see Stormtech Plan Results in Attachments).

DMA 3 Infiltration System Basin (Storm Tech) Storage Volume =695 ft3 (see Stormtech Plan Results in Attachments).

IV.3.3 Evapotranspiration, Rainwater Harvesting BMPs

If the full Design Storm Capture Volume cannot be met with infiltration BMPs, describe any evapotranspiration, rainwater harvesting BMPs. <Delete or leave blank if not used>

DCV addressed with infiltration BMPs. Therefore section left blank.

Name	Included?
All HSCs; *See Section IV.3.1*	☐
Surface-based infiltration BMPs	☐
Biotreatment BMPs	☐
Above-ground cisterns and basins	☐
Underground detention	☐
Other:	☐
Other:	☐
Other:	☐

Show calculations below to demonstrate if the LID Design Storm Capture Volume can be met with evapotranspiration, rainwater harvesting BMPs in combination with infiltration BMPs. If not document how much can be met with either infiltration BMPs, evapotranspiration, rainwater harvesting BMPs, or a combination, and document why it is not feasible to meet the full volume with either of these BMPs categories.

DCV addressed with infiltration BMPs. Therefore section left blank.

IV.3.4 Biotreatment BMPs

If the full Design Storm Capture Volume cannot be met with infiltration BMPs, and/or evapotranspiration and rainwater harvesting BMPs, describe biotreatment BMPs. Include sections for selection, suitability, sizing, and infeasibility, as applicable. <Delete or leave blank if not used>

DCV addressed with infiltration BMPs. Therefore section left blank.

Name	Included?
Bioretention with underdrains	☐
Stormwater planter boxes with underdrains	☐
Rain gardens with underdrains	☐
Constructed wetlands	☐
Vegetated swales	☐
Vegetated filter strips	☐
Proprietary vegetated biotreatment systems	☐
Wet extended detention basin	☐
Dry extended detention basins	☐
Other:	☐
Other:	☐

Show calculations below to demonstrate if the LID Design Strom Capture Volume can be met with infiltration, evapotranspiration, rainwater harvesting and/or biotreatment BMPs. If not document how much can be met with either infiltration BMPs, evapotranspiration, rainwater harvesting BMPs, or a combination, and document why it is not feasible to meet the full volume with either of these BMPs categories.

DCV addressed with infiltration BMPs. Therefore section left blank.

IV.3.5 Hydromodification Control BMPs

Describe hydromodification control BMPs. See Section 5 TGD. Include sections for selection, suitability, sizing, and infeasibility, as applicable. Detail compliance with Prior Conditions of Approval. <Delete or leave blank if not used>

Hydromodification Control BMPs	
BMP Name	BMP Description
Perforated Storm Drain System	Infiltration storm drain that will discharge to existing storm drain outlet
Storm Tech Chamber DMA 2	Infiltration chamber system that will discharge to existing storm drain system
Strom Tech Chamber DMA 3	Infiltration chamber system that will discharge to existing storm drain system

Hydrologic analysis of infiltration basins to address hydromodification are provided in attachments.

IV.3.6 Regional/Sub-Regional LID BMPs

Describe regional/sub-regional LID BMPs in which the project will participate. *Refer to Section 7.II-2.4.3.2 of the Model WQMP*. <Delete or leave blank if not used>

No regional/sub-regional LID BMP used for this project.

Regional/Sub-Regional LID BMPs
No regional/sub-regional LID BMP used for this project.

IV.3.7 Treatment Control BMPs

Treatment control BMPs can only be considered if the project conformance analysis indicates that it is not feasible to retain the full design capture volume with LID BMPs. Describe treatment control BMPs including sections for selection, sizing, and infeasibility, as applicable. <Delete or leave blank if not used>

DCV addressed with infiltration BMPs. Therefore section left blank.

Treatment Control BMPs	
BMP Name	BMP Description

IV.3.8 Non-structural Source Control BMPs

Fill out non-structural source control check box forms or provide a brief narrative explaining if non-structural source controls were not used.

Non-Structural Source Control BMPs				
Identifier	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
N1	Education for Property Owners, Tenants and Occupants	☒	☐	
N2	Activity Restrictions	☒	☐	
N3	Common Area Landscape Management	☒	☐	
N4	BMP Maintenance	☒	☐	
N5	Title 22 CCR Compliance (How development will comply)	☒	☐	
N6	Local Industrial Permit Compliance	☒	☐	This project will be required to acquire coverage under industrial permit.
N7	Spill Contingency Plan	☒	☐	
N8	Underground Storage Tank Compliance	☐	☒	No underground storage tanks proposed
N9	Hazardous Materials Disclosure Compliance	☒	☐	
N10	Uniform Fire Code Implementation	☒	☐	
N11	Common Area Litter Control	☒	☐	
N12	Employee Training	☒	☐	
N13	Housekeeping of Loading Docks	☒	☐	
N14	Common Area Catch Basin Inspection	☒	☐	
N15	Street Sweeping Private Streets and Parking Lots	☐	☒	Private streets will not be paved and will not be swept
N16	Retail Gasoline Outlets	☐	☒	Not a gasoline outlet

IV.3.9 Structural Source Control BMPs

Fill out structural source control check box forms or provide a brief narrative explaining if Structural source controls were not used.

Structural Source Control BMPs				
Identifier	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
S1	Provide storm drain system stenciling and signage	☒	☐	
S2	Design and construct outdoor material storage areas to reduce pollution introduction	☐	☒	No outdoor storage
S3	Design and construct trash and waste storage areas to reduce pollution introduction	☒	☐	
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	☒	☐	
S5	Protect slopes and channels and provide energy dissipation	☒	☐	
	Incorporate requirements applicable to individual priority project categories (from SDRWQCB NPDES Permit)	☐	☒	SDRWQCB permit does not apply to this site
S6	Dock areas	☐	☒	No dock areas
S7	Maintenance bays	☐	☒	No maintenace bays
S8	Vehicle wash areas	☐	☒	No vehicle wash areas
S9	Outdoor processing areas	☐	☒	No outdoor processing areas
S10	Equipment wash areas	☐	☒	No equipment wash areas
S11	Fueling areas	☐	☒	No fueling areas
S12	Hillside landscaping	☐	☒	No hillside landscaping
S13	Wash water control for food preparation areas	☐	☒	No food preparation areas
S14	Community car wash racks	☐	☒	No community car wash racks

IV.4 ALTERNATIVE COMPLIANCE PLAN (IF APPLICABLE)

IV.4.1 Water Quality Credits

Determine if water quality credits are applicable for the project. *Refer to Section 3.1 of the Model WQMP for description of credits and Appendix VI of the TGD for calculation methods for applying water quality credits.*

<table>
<tr><th colspan="5">Description of Proposed Project</th></tr>
<tr><td colspan="5">Project Types that Qualify for Water Quality Credits (Select all that apply):</td></tr>
<tr><td colspan="2">☐Redevelopment projects that reduce the overall impervious footprint of the project site.</td><td colspan="2">☐Brownfield redevelopment, meaning redevelopment, expansion, or reuse of real property which may be complicated by the presence or potential presence of hazardous substances, pollutants or contaminants, and which have the potential to contribute to adverse ground or surface WQ if not redeveloped.</td><td>☐ Higher density development projects which include two distinct categories (credits can only be taken for one category): those with more than seven units per acre of development (lower credit allowance); vertical density developments, for example, those with a Floor to Area Ratio (FAR) of 2 or those having more than 18 units per acre (greater credit allowance).</td></tr>
<tr><td colspan="2">☐ Mixed use development, such as a combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that can demonstrate environmental benefits that would not be realized through single use projects (e.g. reduced vehicle trip traffic with the potential to reduce sources of water or air pollution).</td><td colspan="2">☐ Transit-oriented developments, such as a mixed use residential or commercial area designed to maximize access to public transportation; similar to above criterion, but where the development center is within one half mile of a mass transit center (e.g. bus, rail, light rail or commuter train station). Such projects would not be able to take credit for both categories, but may have greater credit assigned</td><td>☐ Redevelopment projects in an established historic district, historic preservation area, or similar significant city area including core City Center areas (to be defined through mapping).</td></tr>
<tr><td>☐Developments with dedication of undeveloped portions to parks, preservation areas and other pervious uses.</td><td>☐ Developments in a city center area.</td><td>☐ Developments in historic districts or historic preservation areas.</td><td>☐ Live-work developments, a variety of developments designed to support residential and vocational needs together – similar to criteria to mixed use development; would not be able to take credit for both categories.</td><td>☐In-fill projects, the conversion of empty lots and other underused spaces into more beneficially used spaces, such as residential or commercial areas.</td></tr>
<tr><td>Calculation of Water Quality Credits
(if applicable)</td><td colspan="4">0</td></tr>
</table>

IV.4.2 Alternative Compliance Plan Information

Describe an alternative compliance plan (if applicable). Include alternative compliance obligations (i.e., gallons, pounds) and describe proposed alternative compliance measures. *Refer to Section 7.II 3.0 in the WQMP.*

No Alternative Compliance proposed for this project

Section V Inspection/Maintenance Responsibility for BMPs

Fill out information in table below. Prepare and attach an Operation and Maintenance Plan. Identify the mechanism through which BMPs will be maintained. Inspection and maintenance records must be kept for a minimum of five years for inspection by the regulatory agencies. *Refer to Section 7.II 4.0 in the Model WQMP.*

BMP Inspection/Maintenance			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
Flex Storm Inlet Filters	SERC LLC	Empty sediment bag or vacuum sediment. Spray off fines in container. Replace if tears present.	Inspect after > ½ inch of rain and/or quarterly
Infiltration Perforated Storm Drain System– Underground	SERC LLC	Inspect for Standing Water Remove debris Vaccum Accumulated sediment	bi-annual Before Wet Season As necessary to address standing water
DMA 2 & 3 Storm Tech –Underground Basin	SERC LLC	Inspect Isolator Row JetVac when Sediment accumulation is greater than 3 inches above invert Inspect and clean catch basins upstream	Once/6 Months Once/6 Months

Training/Education	SERC LLC	Staff to be educated annually on Stormwater practices.	annually

Section VI Site Plan and Drainage Plan

VI.1 SITE PLAN AND DRAINAGE PLAN

Include a site plan and drainage plan sheet set containing the following minimum information:

- Project location
- Site boundary
- Land uses and land covers, as applicable
- Suitability / feasibility constraints
- Structural BMP locations
- Drainage delineations and flow information
- Drainage connections
- BMP details

VI.2 ELECTRONIC DATA SUBMITTAL <optional – delete if not used>

The minimum requirement is to provide submittal of PDF exhibits in addition to hard copies. Format must not require specialized software to open.

If the local jurisdiction requires specialized electronic document formats (CAD, GIS) to be submitted, this section will be used to describe the contents (e.g., layering, nomenclature, georeferencing, etc.) of these documents so that they may be interpreted efficiently and accurately.

Section VII Educational Materials

Refer to the Orange County Stormwater Program (ocwatersheds.com) for a library of materials available. For the copy submitted to the Permittee, only attach the educational materials specifically applicable to the project. Other materials specific to the project may be included as well and must be attached.

Education Materials			
Residential Material (http://www.ocwatersheds.com)	Check If Applicable	Business Material (http://www.ocwatersheds.com)	Check If Applicable
The Ocean Begins at Your Front Door	☒	Tips for the Automotive Industry	☐
Tips for Car Wash Fund-raisers	☐	Tips for Using Concrete and Mortar	☐
Tips for the Home Mechanic	☐	Tips for the Food Service Industry	☐
Homeowners Guide for Sustainable Water Use	☐	Proper Maintenance Practices for Your Business	☐
Household Tips	☐	Other Material	Check If Attached
Proper Disposal of Household Hazardous Waste	☐		
Recycle at Your Local Used Oil Collection Center (North County)	☐		☐
Recycle at Your Local Used Oil Collection Center (Central County)	☐		☐
Recycle at Your Local Used Oil Collection Center (South County)	☐		☐
Tips for Maintaining a Septic Tank System	☐		☐
Responsible Pest Control	☐		☐
Sewer Spill	☐		☐
Tips for the Home Improvement Projects	☐		☐
Tips for Horse Care	☐		☐
Tips for Landscaping and Gardening	☐		☐
Tips for Pet Care	☐		☐
Tips for Pool Maintenance	☐		☐
Tips for Residential Pool, Landscape and Hardscape Drains	☐		☐
Tips for Projects Using Paint	☐		☐

ATTACHMENTS

A-WQMP Exhibits

Overall WQMP Exhibit

Concept Drainage Plan

B-Parcel Map

C-Site Map

D-Receiving Waters Exhibit

E-Landuse Map

F-Stormtech and Flex Storm Reference Material

G-BMP Handbook Fact Sheets

H-Educational Materials

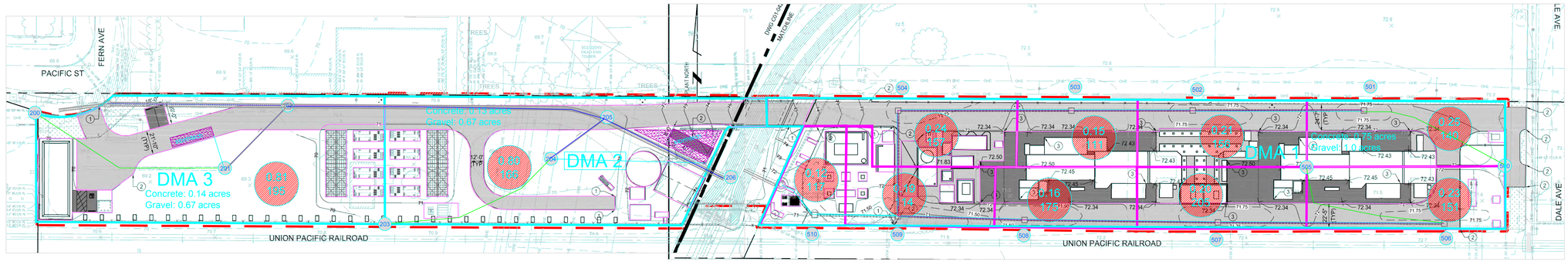
I-Hydromodification

J-Landscape Plan

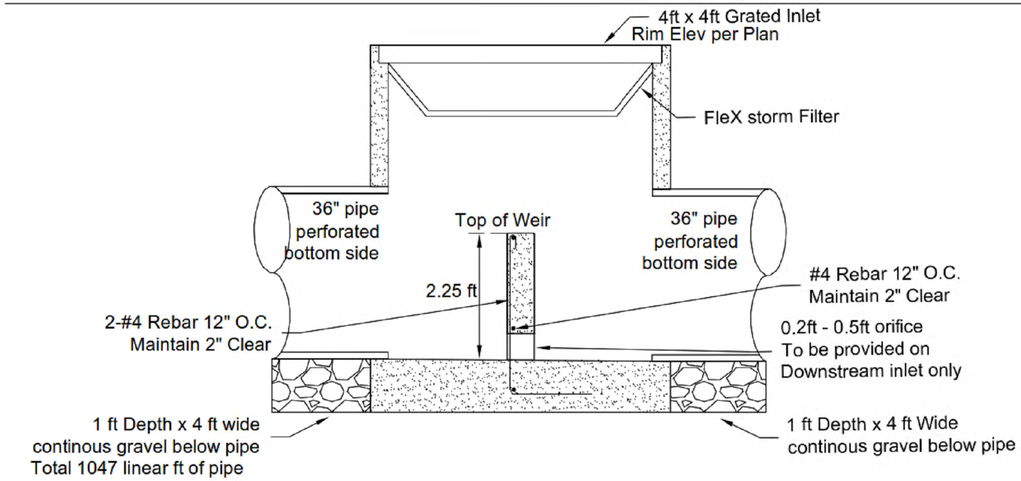
F-Geotechnical Report

Attachment A

WQMP Exhibit



Storm Drain Inlet/Weir/Orifice Typical Section



Water Quality Volume Summary Table

	DMA 1	DMA 2	DMA 3
Runoff Coefficient (unitless)	0.43	0.16	0.17
85% Storm Depth (inch)	0.85	0.85	0.85
Area (acres)	1.75	0.80	0.81
WQV (ft3)	2328.6	394.3	424.0
Retention provided (ft3)	6852	4002	695

WQV = C x d x A x 43560sf/ac x 1/12 in/ft

Perforated Storm Drain Storage Table

Depth (ft)	Storage (ft3)	Storage (ac/ft)
0	0	0.00
1	1675	0.04
1.6	3154	0.07
3.25	7222	0.17
4	9072.055	0.21
Within Gravel Substrate		

Subcatchment Boundaries
Perforated Storm Drain
Existing Storm Drain
Proposed Surface Flowpaths
AES Software Model Node Number
Drainage Management Area Boundary
Subcatchment Area (ac) and Surface Flowpath Length (ft)
Proposed Storm Tech (for Storage See Design Drawings)

0 100 200 Feet

NOTES:

REV	DATE	DESCRIPTION	DRAWN

REV	DATE	DESCRIPTION	DRAWN

Stanton Energy Reliability Center, LLC
650 Bercut Dr, Suite A - Sacramento, CA 95811
Phone: 916-492-9486 Fax: 916-880-5318

DRAWN – DATE –
ENG. APPROVAL – DATE –

DRAWING TITLE: Hydrology Map of Proposed System Figure 2

SIZE D | FSCM NO. | DWG NO. C-201 | REV B
SCALE 1"=50 | PROJECT STANTON | SHEET 1/1

2018-04-11 7:51 PM O:\Common\jarrod\SERC\WQMp exhibit\exhibits\developed-Drainage_Studyrevised04112018.dwg

94 00586

CONCEPTUAL STORM DRAIN EXHIBIT

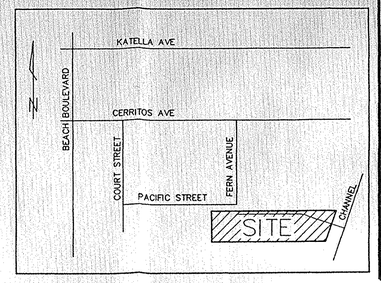
CONSTRUCTION NOTES

1. ---CONSTRUCT 3" AC OVER 7" AB PER RECOMMENDATIONS OF SOILS ENGINEER.
2. ---SAME AS ABOVE. TO BE PAVED IN PHASE II.
3. ---CONSTRUCT 6" PCC CURB PER DETAIL ON SHEET 1.
4. ---CONSTRUCT 12" PCC CURB, VARYING TO 6", PER DETAIL ON SHEET 1.
5. ---CONSTRUCT 24" X 24" DRAIN INLET PER ON SHEET 1.
6. ---CONSTRUCT 24" RCP (D = 3000)
7. ---INSTALL 8" PVC (SCH. 80)
8. ---INSTALL 36" RCP (D=2250).
9. ---CONSTRUCT JUNCTION STRUCTURE NO. I PER O.C.E.M.A. STD. PLAN # 1310.
10. ---CONSTRUCT PCC ENCLOSED HEADWALL PER DETAIL HEREON.
12. ---
13. ---CONSTRUCT 6' CHAIN LINK FENCE PER O.C.E.M.A. STD. PLAN #600-0.
14. ---CONSTRUCT LANDSCAPE AREA PER LANDSCAPING PLAN.
15. ---REMOVE EXISTING IMPROVEMENT
16. ---PROTECT EXISTING IMPROVEMENT IN PLACE
17. ---CONSTRUCT 3' WIDE PCC GUTTER PER DETAIL ON SHEET 1.
18. ---INSTALL STEEL DEBRIS PROTECTOR OVER STORM DRAIN INLET PER L.A. COUNTY F.C.D. STD. #2-DTR 1.1.
19. ---CONSTRUCT JUNCTION STRUCTURE NO. V PER O.C.E.M.A. STD. PLAN # 1314 AND DETAIL BELOW.
20. ---INSTALL 25' WIDE CHAIN LINK GATE.
21. ---INSTALL 8" C.I.P.

SOILS ENGINEER
Montaña Testing & Geotechnical, Inc.
2992 La Palma, Suite A
Anaheim, California 92806
Douglas J. Hitchingham
RCE # 19976

Job No. 9144-001-00
Log No. 4-1216

April 15, 1994



VICINITY MAP

RECEIVED
AUG 16 1994
"PUBLIC PROPERTY PERMITS DIVISION"
ENVIRONMENTAL

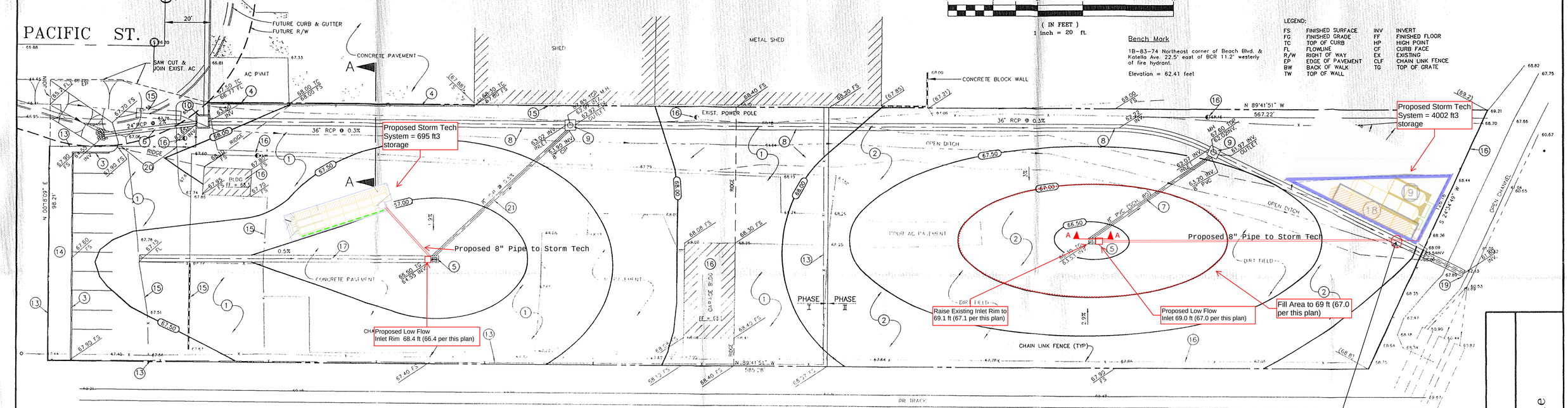
NO.	DESCRIPTION	BY	DATE	CHK'D
X	REVISIONS	XXX	XXXX	XXX

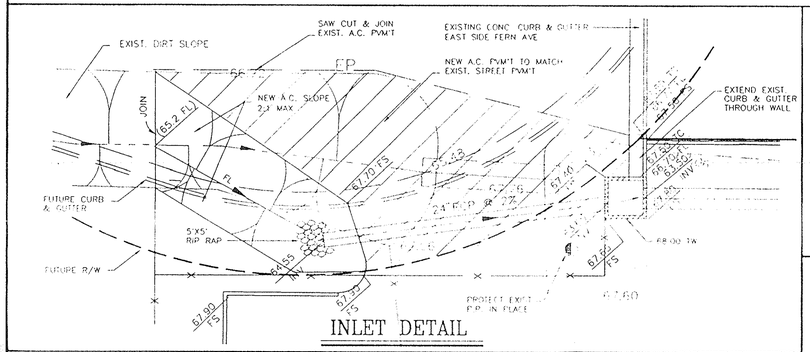
GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

Bench Mark
1B-83-74 Northeast corner of Beach Blvd. & Katella Ave. 22.5' east of BCR 11.2' westerly of fire hydrant.
Elevation = 62.41 feet

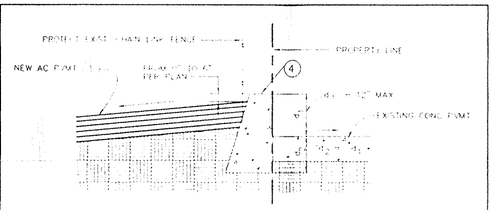
LEGEND:

FS	FINISHED SURFACE	INV	INVERT
FG	FINISHED GRADE	FF	FINISHED FLOOR
TC	TOP OF CURB	HP	HIGH POINT
FL	FLOWLINE	CF	CURB FACE
R/W	RIGHT OF WAY	EX	EXISTING
EP	EDGE OF PAVEMENT	CLF	CHAIN LINK FENCE
BW	BACK OF WALK	TG	TOP OF GRATE
TW	TOP OF WALL		



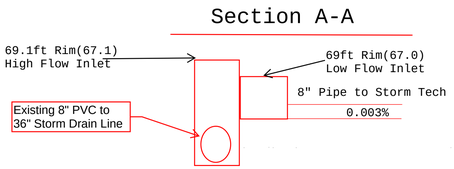


INLET DETAIL

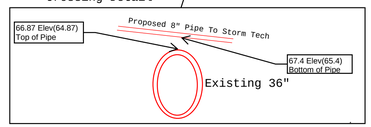


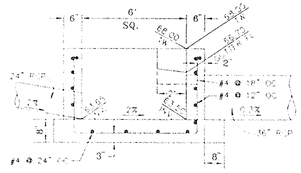
SECTION AA
NO SCALE

Section A-A

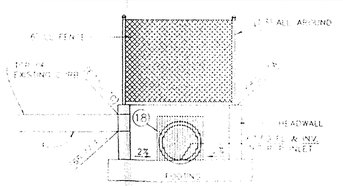


Crossing Detail

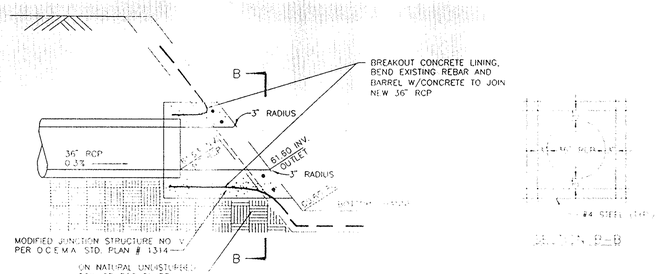




10 ENCLOSED HEADWALL DETAIL
NO SCALE



SECTION AT FACE OF HEADWALL



19 OUTLET DETAIL AT CHANNEL
NO SCALE

COUNTY OF ORANGE
APPROVED FOR PERMITTED USE OF COUNTY AND/OR DISTRICT RIGHT OF WAY
THE GRANTING OF THIS PERMIT SHALL NOT BE CONSTRUED TO BE AN APPROVAL FOR OTHER GOVERNMENTAL AGENCIES NOR ASSURE COMPLIANCE WITH APPLICABLE LAWS, REGULATIONS AND RULES OF OTHER ENTITIES.
94 PERMIT NO. 00086 ISSUED 8/16/94

CITY OF STANTON
APPROVED:
CITY ENGINEER DATE

REGISTERED PROFESSIONAL ENGINEER
LUCIUS J. SMEETS
No. 37221
Exp. 6-19-96
STATE OF CALIFORNIA
CIVIL

team
TEAM FIVE CIVIL ENGINEERS, INC.
ENGINEERING, SURVEYING AND DEVELOPMENT SERVICES
1081 N. PALMER PLACE, SUITE A
ANAHEIM, CA 92806
(714) 630-7557 FAX (714) 630-1184

TITLE GRADING PLAN
PROJECT PETER VALOV
8230 Pacific Avenue
Stanton, California

DRAWN TN 6-29-94
DATE
CHECKED LN 6-29-94
DATE
APP'D BY LJS XX
DATE
JOB No. 385

SHEET 1 OF 1 SHEET

Attachment B

Parcel Map

POR. S 1/2, SW 1/4, SEC. 24, T 4 S, R 11 W

126-53

Site

FERN AVENUE

PACIFIC STREET

59

P.M. 278-36

Parcel 2

40
1.534AC.

Parcel 1

PAR. 1
43
1.764 AC.

PAR. 2
0.482 AC. 44

372-36

497.23'
642.29'
145'
430'
693.73'
707.15'
1260.20'
32.91'
126.16'
25' 25' 1/2
80'
40' 40'
115'

EASEMENT G. D. O. C. F. ROADWAY EASEMENT O.C.F.C.D.

42
3.327AC.

P.M. 278-36

1260.20'

83.23'
151.93'
215.32'
235'
235.90'
222.15'
208.81'
179.55'
158.31'
140.35'
135'
118.07'
57.02'
70'
67.86'
64.82'
64.77'
60.56'
62.79'
46.67'
42.77'
77.11'
60'
38.87'
52.20'
74.46'
95.14'
114.29'
121.22'
53.25'
67.20'
63.91'
62.33'
61.51'
62'
52.61'
9.39'
235.10'
240.97'
197'
182'
274.30'
92.30'
91'
180.30'
94'
151.93'
146.49'
15.62'
16.62'
17.62'
18.62'
19.62'
20.62'
21.62'
22.60.57'

TRACT

SBE 148-30-39-POR. 2

35-40

R.S. 92

O. C. F. C. D.

P.M. 274-40
16
0.85AC.

NO. 3467

P.M. 286-24

13
1.19AC.

531

532

STREET

AVENUE

MONROE

DALE

1" = 100'

55

52

54

MARCH 1960

TR. NO. 3467 M. M. 120-23,24
PARCEL MAP P. M. 278-36, 372-36

NOTE - ASSESSOR'S BLOCK & PARCEL NUMBERS SHOWN IN CIRCLES

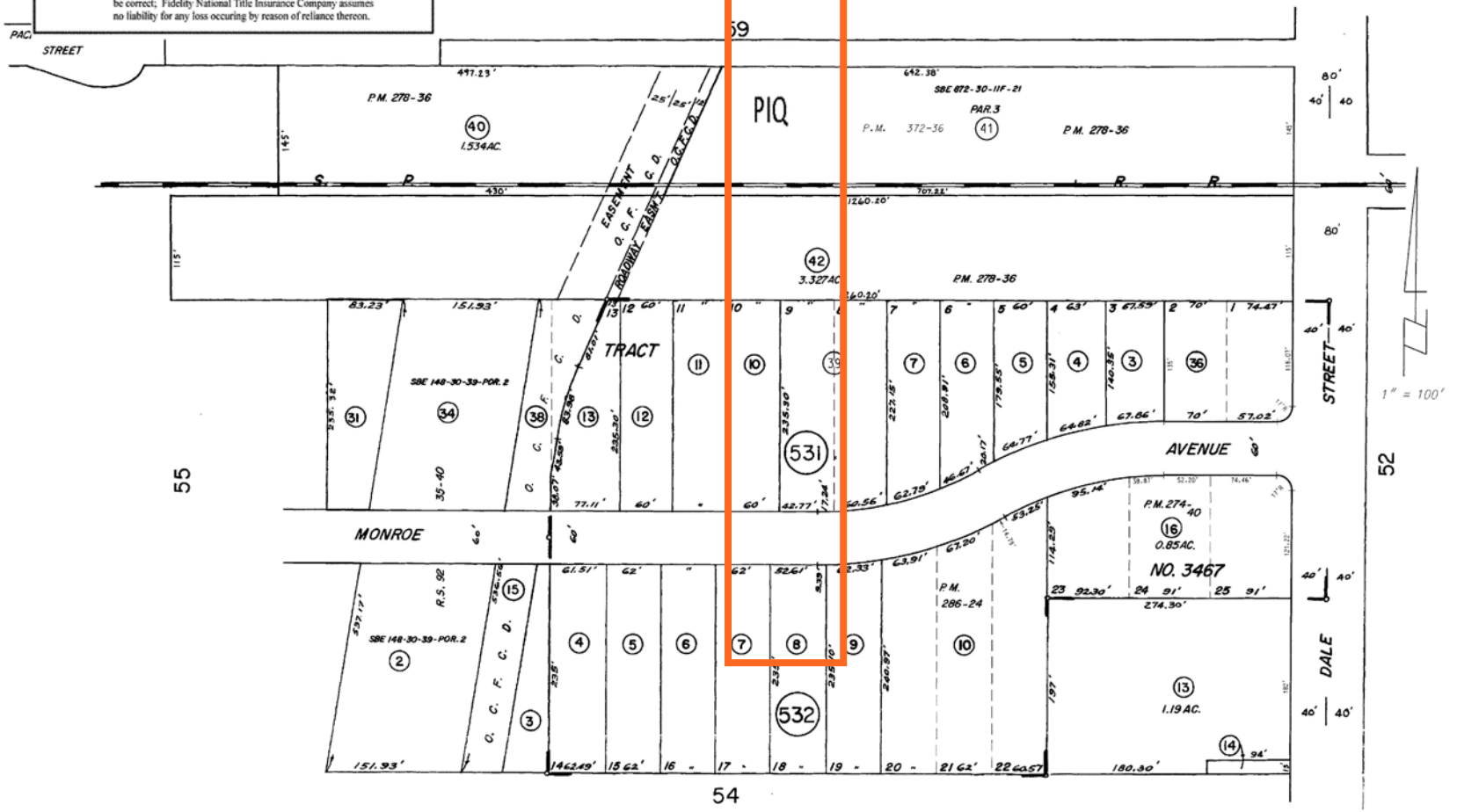
ASSESSOR'S MAP
BOOK 126 PAGE 53
COUNTY OF ORANGE

Fidelity National Title Insurance Company

This plat is for your aid in locating your land with reference to streets and other parcels. Wile this plat is believed to be correct; Fidelity National Title Insurance Company assumes no liability for any loss occuring by reason of reliance thereon.

POR. S 1/2, SW 1/4, SEC. 24, T 4 S, R 11 W

126-53



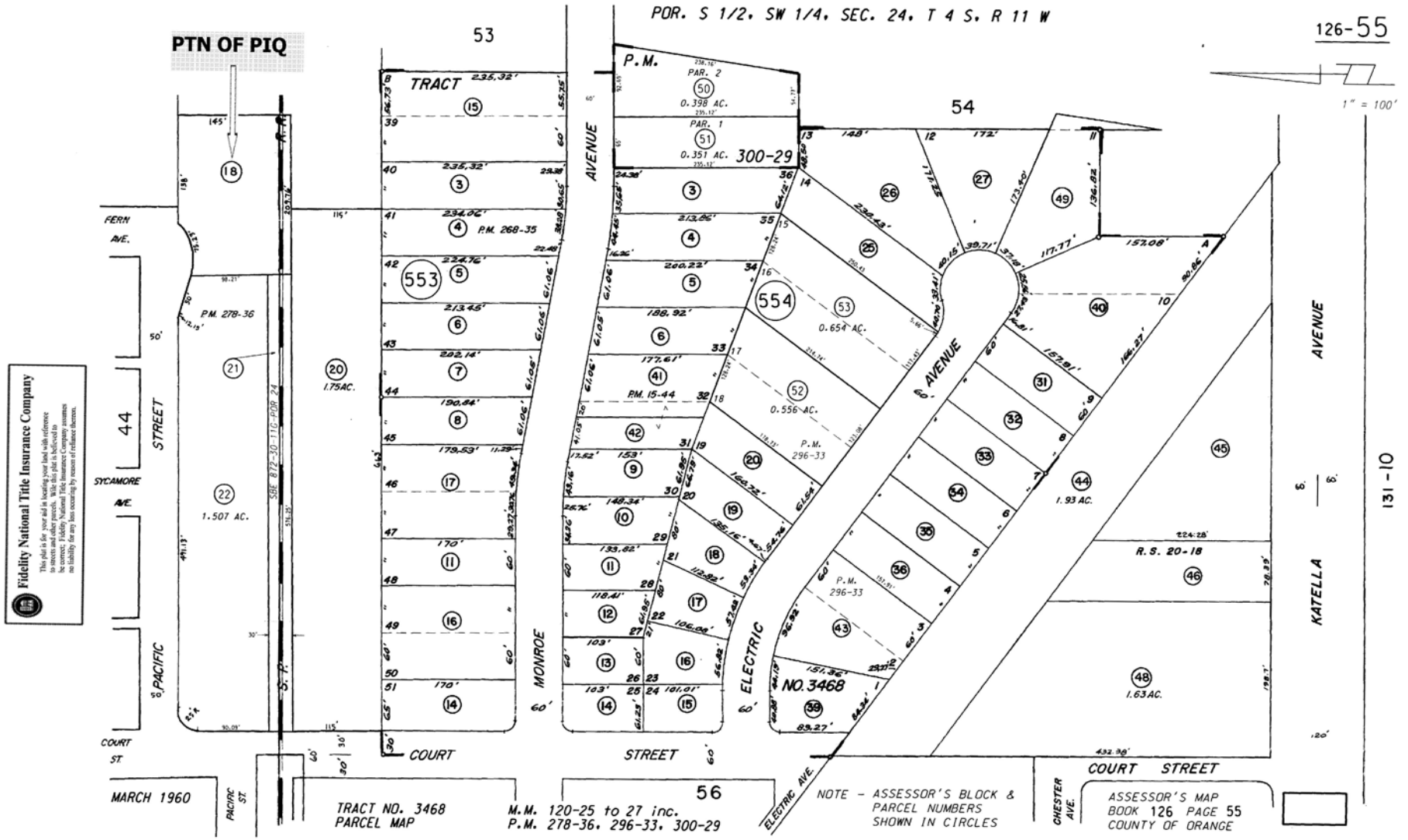
MARCH 1960

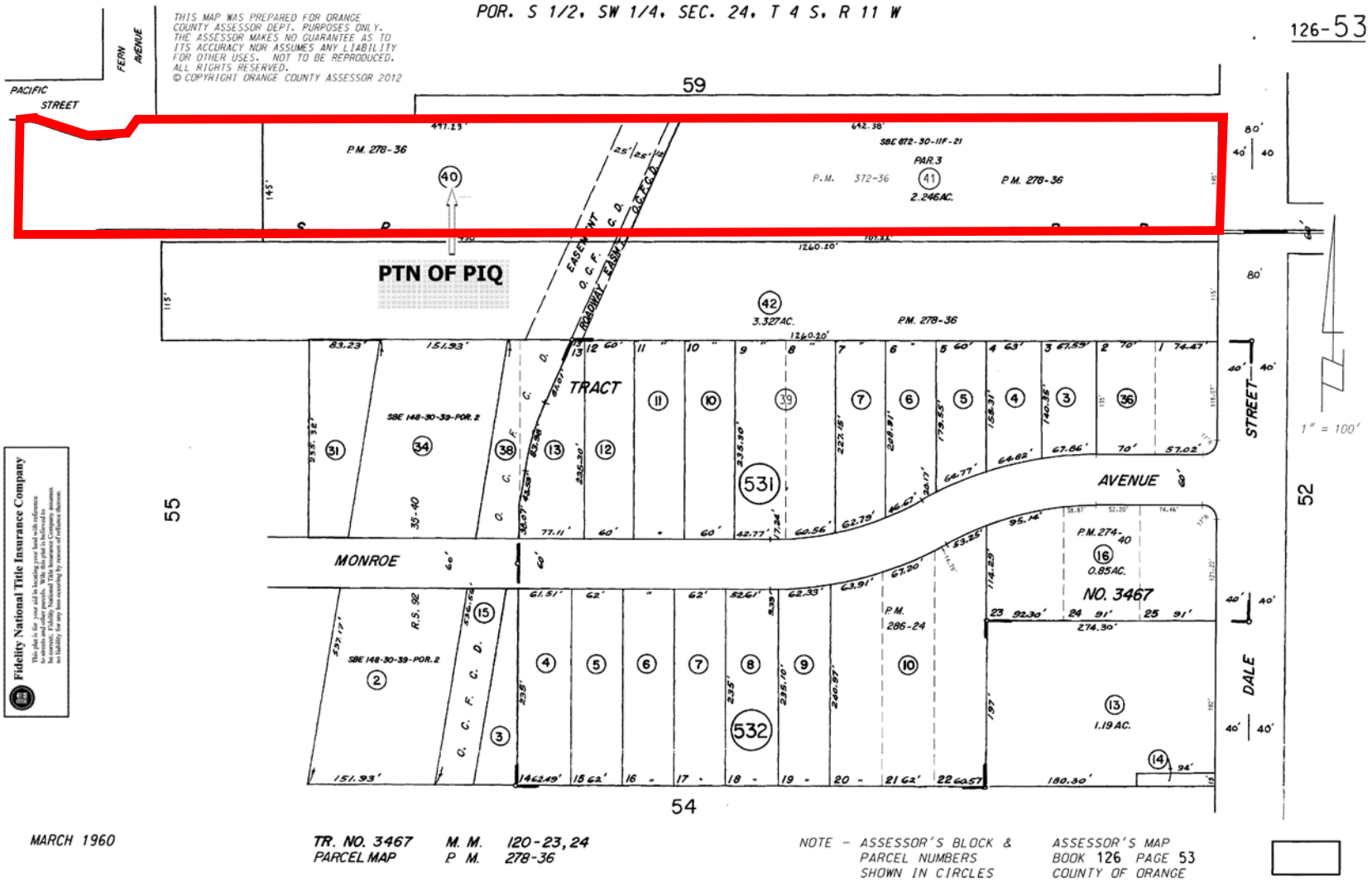
TR. NO. 3467
PARCEL MAP

M. M. 120-23, 24
P. M. 278-36

NOTE - ASSESSOR'S BLOCK & PARCEL NUMBERS SHOWN IN CIRCLES

ASSESSOR'S MAP
BOOK 126 PAGE 53
COUNTY OF ORANGE

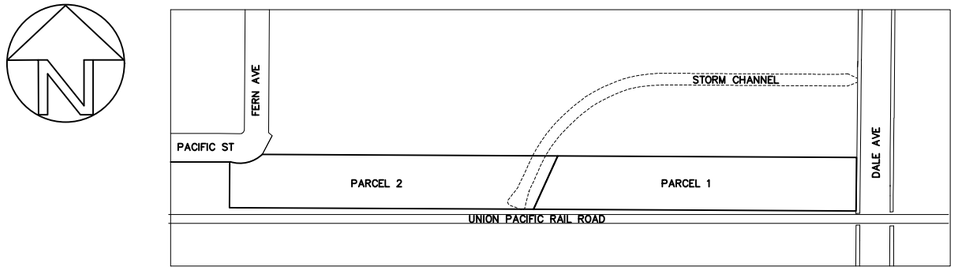

PTN OF PIQ
POR. S 1/2, SW 1/4, SEC. 24, T 4 S, R 11 W
126-55
1" = 100'
131-10
53
54
56
TRACT
P.M.
PAR. 2
0.398 AC.
PAR. 1
0.351 AC.
300-29
P.M. 268-35
P.M. 278-36
1.507 AC.
1.75AC.
0.654 AC.
0.556 AC.
P.M. 15-44
P.M. 296-33
1.93 AC.
1.63AC.
NO. 3468
R.S. 20-18
FERN AVE.
SYCAMORE AVE.
COURT ST.
PACIFIC ST.
MARCH 1960
TRACT NO. 3468
PARCEL MAP
M.M. 120-25 to 27 inc.
P.M. 278-36, 296-33, 300-29
NOTE - ASSESSOR'S BLOCK & PARCEL NUMBERS SHOWN IN CIRCLES
ASSESSOR'S MAP
BOOK 126 PAGE 55
COUNTY OF ORANGE
Fidelity National Title Insurance Company



Fidelity National Title Insurance Company

This plat is for your aid in locating your land with reference to streets and other parcels. While this plat is believed to be correct, the Company assumes no liability for any loss occurring by reason of reliance thereon.

Attachment One (06/03/11)



KEYNOTES:

1. GAS TURBINE/GENERATOR
2. SPRINT SKID
3. FOGGER SKID
4. WATER INJECTION PUMPS
5. CLUTCH LUBE OIL SKID
6. HYDRAULIC START SKID
7. FIN-FAN L.O. COOLER
8. UTILITY BRIDGE
9. PORTABLE HAZMAT STORAGE CART
10. SCR/CO UNIT
11. AMMONIA INJECTION SKID
12. PURGE AIR FANS
13. CEMS ENCLOSURE
14. EXHAUST STACK
15. AMMONIA STORAGE TANK & PUMPS
16. WAREHOUSE
17. STEEL POLE MOUNTED DISCONNECT
18. PORTABLE HAZARDOUS MATERIALS & STORAGE
19. TRASH ENCLOSURE
20. GAS MSA YARD (SCG)
21. FUEL GAS COMPRESSOR (FGC)
22. FGC L.O. FIN-FAN COOLER
23. GAS EMERGENCY SHUT-DOWN VALVE
24. FUEL GAS FILTER SKID
25. PARCEL 1 STORMWATER LIFT STATION
26. INVERTER (PCS)
27. ISOLATION TRANSFORMER
28. GT FACILITY ENCLOSURE
29. BATTERY ENERGY STORAGE SYSTEM
30. BACKFLOW PREVENTER
31. WATER FORWARDING SKID
32. DEMINERALIZED WATER SKID
33. REVERSE OSMOSIS SKID
34. DEMINERALIZED WATER TANK
35. FIRE HYDRANT
36. STORMWATER DETENTION TANK
37. FOGGING WATER DRAIN TANK
38. OILY WATER WASTE TANK
39. PARCEL 2 STORMWATER COLLECTION
40. SWITCHGEAR (15KV)
41. AUX TRANSFORMER (480V)
42. AUX TRANSFORMER (4160V)
43. SWITCHGEAR (4160V)
44. POWER DISTRIBUTION MODULE
45. CONTROL MODULE
46. SWITCHYARD
47. GSU TRANSFORMER
48. SWITCHYARD CONTROL
49. BESS SWITCH GEAR
50. AIR COMPRESSOR SKID
51. FIRE ALARM ANNUNCIATOR PANEL

APN 126-531-43
10711 Dale Avenue
Owner:
Stanton Energy Reliability Center, LLC
650 Bercut Drive, Suite A
Sacramento, CA 95811
(916) 492-9486

DALE AVE

UNION PACIFIC RAILROAD

0 50' 100'

SCALE

PRELIMINARY

NOTES:

REV	DATE	DESCRIPTION	DRAWN
A	07-14-16	PRELIMINARY	BOSSERMAN, J
B	8-03-16	NO GAS CYL, MOVE METER SHACK	BOSSERMAN, J
C	09-07-16	SKIDDED INVERTER DESIGN	BOSSERMAN J
D	09-09-16	GAS COMPRESSOR RE-ARRANGEMENT	BOSSERMAN J
E	09-13-16	STACK SILENCER IMPLEMENTED	BOSSERMAN J

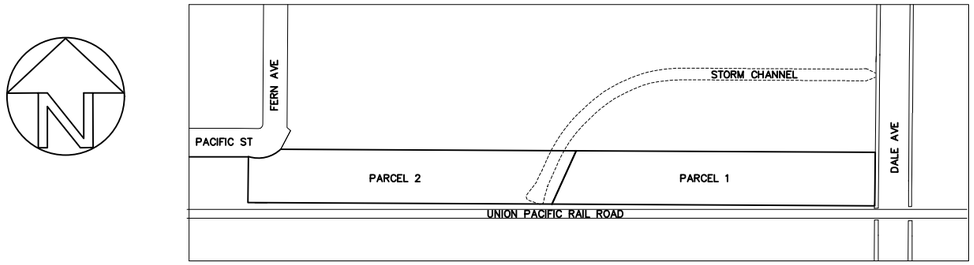
REV	DATE	DESCRIPTION	DRAWN

Stanton Energy Reliability Center, LLC
650 Bercut Dr, Suite A - Sacramento, CA 95811
Phone: 916-492-9486 Fax: 916-880-5318

DRAWN – DATE –
ENG. APPROVAL – DATE –

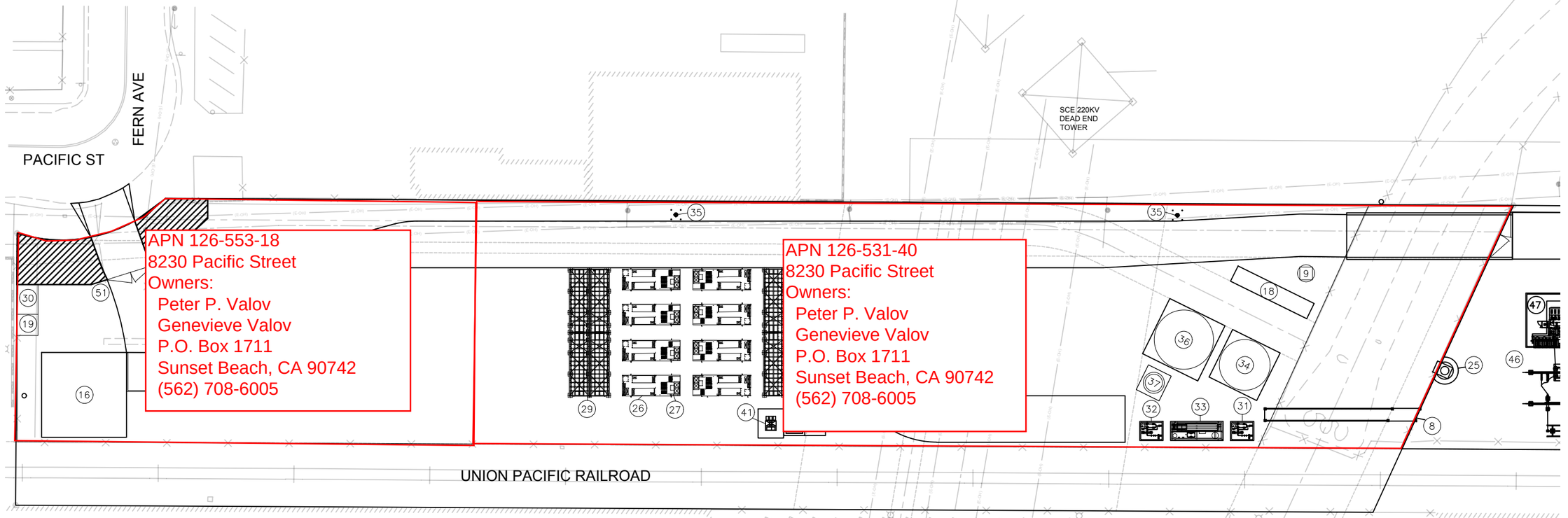
DRAWING TITLE: GENERAL ARANGEMENT – PARCEL 1

SIZE D | FSCM NO. | DWG NO. SERC-C-100 | REV E
SCALE NONE | PROJECT STANTON | SHEET 1/2



KEYNOTES:

1. GAS TURBINE/GENERATOR
2. SPRINT SKID
3. FOGGER SKID
4. WATER INJECTION PUMPS
5. CLUTCH LUBE OIL SKID
6. HYDRAULIC START SKID
7. FIN–FAN L.O. COOLER
8. UTILITY BRIDGE
9. PORTABLE HAZMAT STORAGE CART
10. SCR/CO UNIT
11. AMMONIA INJECTION SKID
12. PURGE AIR FANS
13. CEMS ENCLOSURE
14. EXHAUST STACK
15. AMMONIA STORAGE TANK & PUMPS
16. WAREHOUSE
17. STEEL POLE MOUNTED DISCONNECT
18. PORTABLE HAZARDOUS MATERIALS & STORAGE
19. TRASH ENCLOSURE
20. GAS MSA YARD (SCG)
21. FUEL GAS COMPRESSOR (FGC)
22. FGC L.O. FIN–FAN COOLER
23. GAS EMERGENCY SHUT–DOWN VALVE
24. FUEL GAS FILTER SKID
25. PARCEL 1 STORMWATER LIFT STATION
26. INVERTER (PCS)
27. ISOLATION TRANSFORMER
28. GT FACILITY ENCLOSURE
29. BATTERY ENERGY STORAGE SYSTEM
30. BACKFLOW PREVENTER
31. WATER FORWARDING SKID
32. DEMINERALIZED WATER SKID
33. REVERSE OSMOSIS SKID
34. DEMINERALIZED WATER TANK
35. FIRE HYDRANT
36. STORMWATER DETENTION TANK
37. FOGGING WATER DRAIN TANK
38. OILY WATER WASTE TANK
39. PARCEL 2 STORMWATER COLLECTION
40. SWITCHGEAR (15KV)
41. AUX TRANSFORMER (480V)
42. AUX TRANSFORMER (4160V)
43. SWITCHGEAR (4160V)
44. POWER DISTRIBUTION MODULE
45. CONTROL MODULE
46. SWITCHYARD
47. GSU TRANSFORMER
48. SWITCHYARD CONTROL
49. BESS SWITCH GEAR
50. AIR COMPRESSOR SKID
51. FIRE ALARM ANNUNCIATOR PANEL



PRELIMINARY

NOTES:

REV	DATE	DESCRIPTION	DRAWN
A	07–14–16	PRELIMINARY	BOSSERMAN, J
B	08–03–16	ALTERNATE BATTERY LAYOUT	BOSSERMAN, J
C	09–07–16	SKIDDED INVERTER DESIGN	BOSSERMAN J
D	09–09–16	GAS COMPRESSOR RE–ARRANGEMENT	BOSSERMAN J
E	09–13–16	STACK SILENCER IMPLEMENTED	BOSSERMAN J

Stanton Energy Reliability Center, LLC
650 Bercut Dr, Suite A - Sacramento, CA 95811
Phone: 916-492-9486 Fax: 916-880-5318

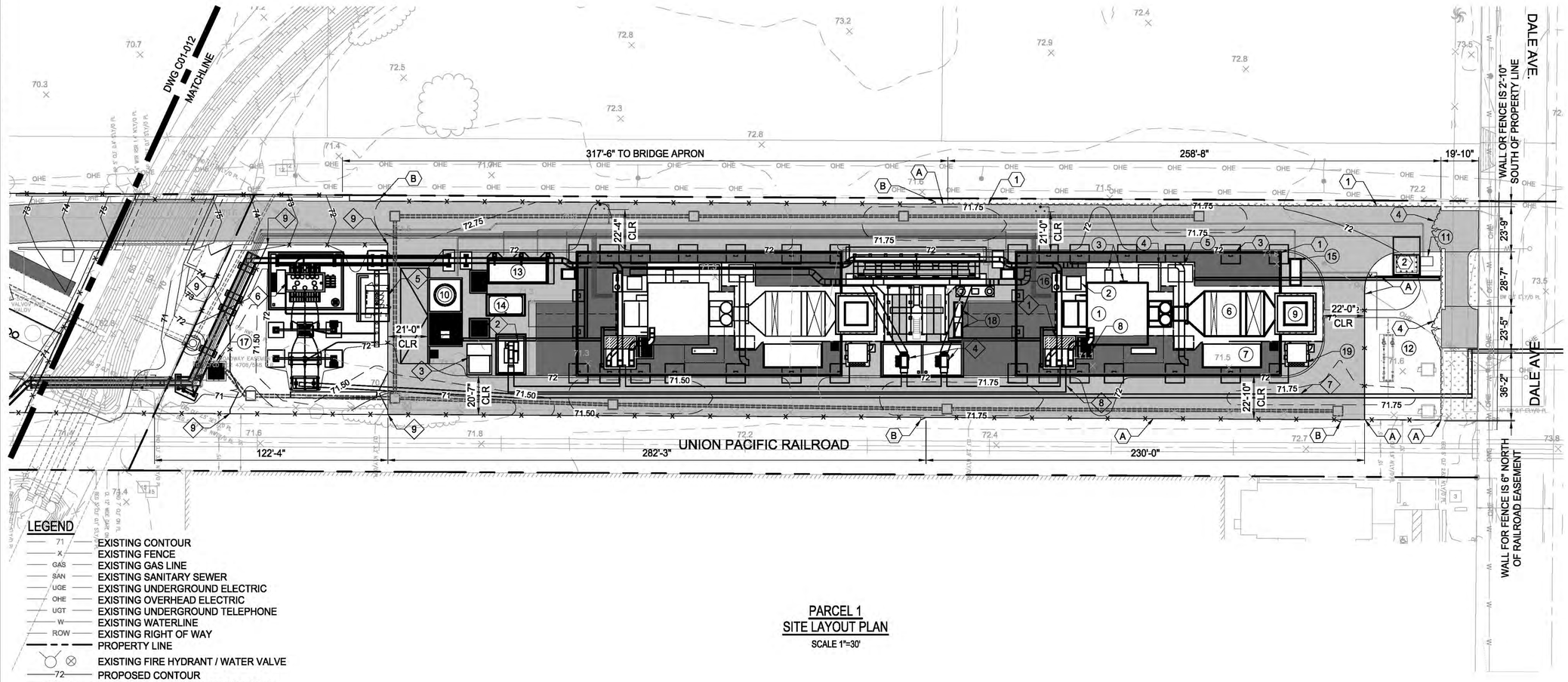
DRAWN: – DATE: –
ENG. APPROVAL: – DATE: –

DRAWING TITLE: GENERAL ARANGEMENT – PARCEL 2

SIZE: D | FSCM NO. | DWG NO.: SERC–C–100 | REV: E
SCALE: NONE | PROJECT: STANTON | SHEET: 2/2

Attachment C

Site Map



PARCEL 1 KEYNOTES

1. COMBUSTION TURBINE GENERATORS
2. FOGGING SKID
3. WATER INJECTION SKID/SPRINT SKID
4. AUXILIARY SKID
5. FIN-FAN LUBE OIL COOLER
6. EMISSIONS REDUCTION UNIT
7. AMMONIA INJECTION SKID
8. OILY WATER WASTE TANK
9. EXHAUST STACK
10. AMMONIA FORWARDING PUMP SKID AND STORAGE TANK
11. BACKFLOW PREVENTER
12. SOCAL GAS MSA YARD
13. FUEL GAS COMPRESSOR
14. FGC LUBE OIL FIN-FAN COOLER
15. FUEL GAS EMERGENCY SHUT-DOWN VALVE SKID
16. FUEL GAS COALESCING FILTER SKID
17. STORMWATER LIFT STATION
18. AIR COMPRESSOR SKID
19. CEMS ENCLOSURE

ENCLOSURE KEYNOTES

1. PERIMETER WALL
2. SOLID WASTE STORAGE
3. POWER BLOCK WALL
4. 20' WIDE PERIMETER WALL GATE
- A. 8' TALL CHAIN LINK FENCE
- B. 3' WIDE CHAIN LINK MAN GATE
- C. 20' WIDE CHAIN LINK SWING GATE

ELECTRICAL KEYNOTES

1. 13.8 KV SWITCHGEAR
2. 4160 V FGC AUXILIARY TRANSFORMER
3. 4160 V FGC SWITCHGEAR
4. 480 V AUXILIARY TRANSFORMER
5. SUBSTATION CONTROL BUILDING
6. GENERATOR STEP-UP TRANSFORMER (GSU)
7. U/G 66 KV
8. U/G 13.8 KV
9. SUBSTATION CHAN LINK FENCE AND 20' GATES

0 15 30 60 90 FEET
1" = 30'

LEGEND

- 71 — EXISTING CONTOUR
- X — EXISTING FENCE
- GAS — EXISTING GAS LINE
- SAN — EXISTING SANITARY SEWER
- UGE — EXISTING UNDERGROUND ELECTRIC
- OHE — EXISTING OVERHEAD ELECTRIC
- UGT — EXISTING UNDERGROUND TELEPHONE
- W — EXISTING WATERLINE
- ROW — EXISTING RIGHT OF WAY
- PROPERTY LINE
- EXISTING FIRE HYDRANT / WATER VALVE
- 72 — PROPOSED CONTOUR
- 72.75 — PROPOSED INTERMEDIATE CONTOUR
- X — PROPOSED FENCE
- GAS — PROPOSED GAS LINE
- SAN — PROPOSED SANITARY SEWER
- PROPOSED PERIMETER WALL
- PROPOSED CONCRETE PAVEMENT
- PROPOSED 8" MINIMUM CRUSHED ROCK PAVEMENT
- LANDSCAPING
- RIDGELINE
- 72.34 — SPOT GRADE

PARCEL 1
SITE LAYOUT PLAN
SCALE 1"=30'

NOTES

1. CHAINLINK FENCE AND GATES SHALL BE SAME SPECIFICATION AS SUBSTATION FENCE AND GATES, BUT 8' TALL WITHOUT BARB WIRED.
2. RAILROAD SHORING WILL BE REQUIRED FOR STORMWATER AND 66-KV UNDERGROUND DUCTBANK. CONTRACTOR IS RESPONSIBLE FOR SUPPLYING THE REQUIRED RAILROAD FLAGMAN IN ACCORDANCE WITH UP RR'S LATEST SHORING REQUIREMENTS.

PRELIMINARY, NOT FOR CONSTRUCTION, RECORDING PURPOSES, OR IMPLEMENTATION

W.H. ROMINES, JR., CIVIL, PE # C73473

PROJECT LOCATION:
10711 DALE AVE
STANTON, ORANGE CO., CA 90680

C01-011.DWG

INTER-DISCIPLINE REVIEW

	DISC	ARCH	CIVIL	ELECT	I&C	MECH	STRUCT
	DATE	*	*	*	*	*	*
	INIT	*	BHR	BMS	*	BSC	SPC

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD
A	ISSUED FOR REVIEW	02-02-2018	BRG	BHR	SPC	JKB

DSGN	BHR	12-04-2017
DRN	BRG	12-04-2017
CKD	SPC	02-02-2018

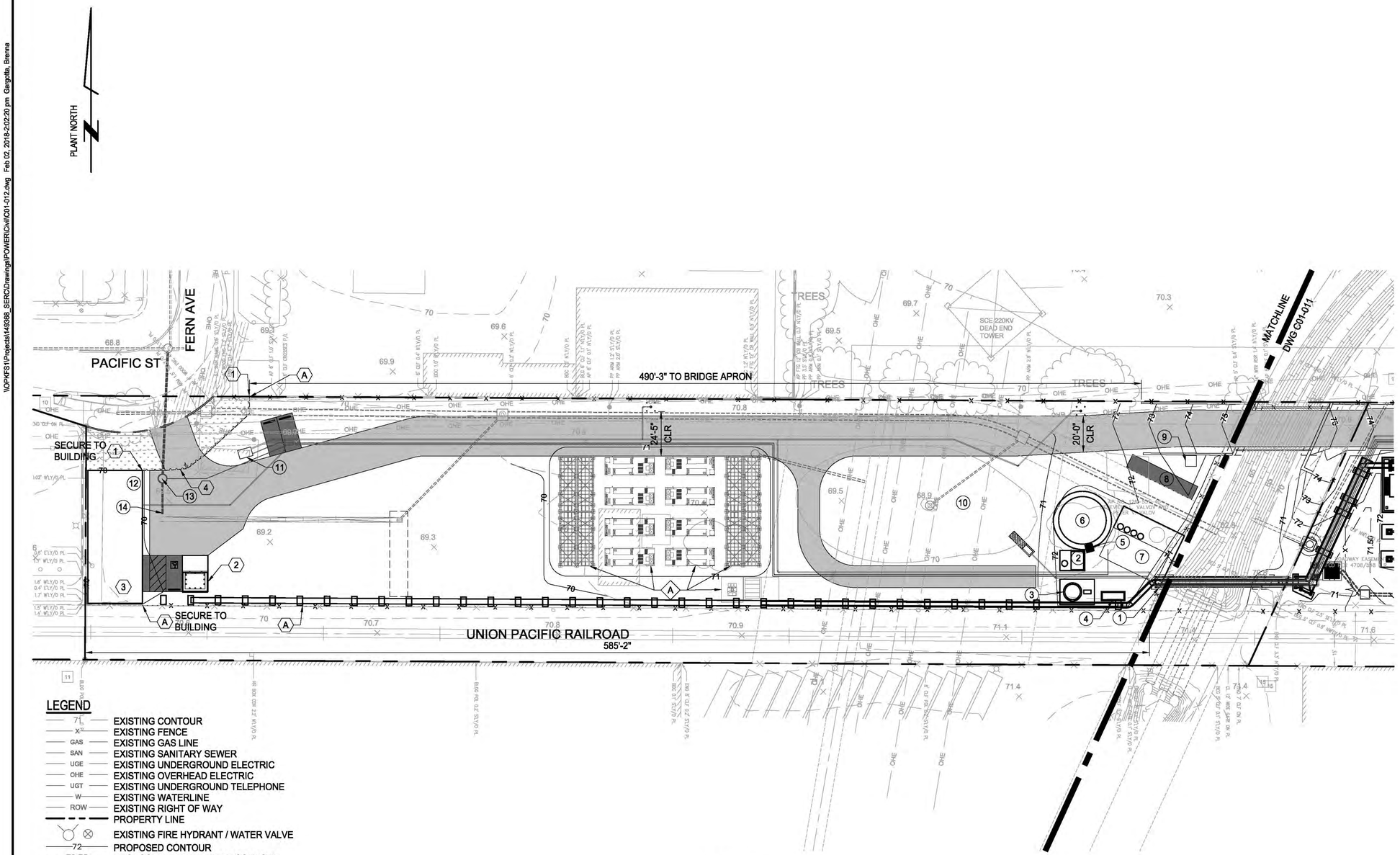
SCALE: AS NOTED
FOR 22x34 DWG ONLY

Stanton Energy Reliability Center, LLC
650 Bercut Dr, Suite A - Sacramento, CA 95811
Phone: 916-492-9486 Fax: 916-880-5318

POWER ENGINEERS
16041 FOSTER, P.O. BOX 1000
OVERLAND PARK, KANSAS 66085-1000
(913) 681-2881 www.powereng.com

STANTON ENERGY RELIABILITY CENTER
OVERALL SITE
PARCEL 1
SITE LAYOUT PLAN

JOB NUMBER 149368
REV A
DRAWING NUMBER C01-011



PARCEL 2 KEYNOTES

1. UTILITY BRIDGE (DESIGNED BY WSP)
2. DEMINERALIZED WATER SKID
3. FOGGING WATER RECYCLE
4. 480 V WATER TREATMENT MCC
5. EYEWASH/SHOWER STATION
6. DEMINERALIZED WATER TANK
7. REVERSE OSMOSIS SKID
8. PORTABLE HAZARDOUS MATERIALS AND STORAGE
9. PORTABLE HAZMAT STORAGE CART
10. STORMWATER COLLECTION (DESIGNED BY WSP)
11. BACKFLOW PREVENTOR
12. FIRE ALARM ANNUNCIATOR PANEL
13. 4' DIAMETER MANHOLE
14. CLEAN OUT

ENCLOSURE KEYNOTES

1. PERIMETER WALL
2. SOLID WASTE STORAGE
3. WAREHOUSE
4. 24' WIDE PERIMETER WALL GATE

A. 8' TALL CHAIN LINK FENCE
B. 3' WIDE CHAIN LINK MAN GATE
C. 20' WIDE CHAIN LINK SWING GATE

BESS KEYNOTES

A. BATTERY ENERGY STORAGE SYSTEM

LEGEND

- EXISTING CONTOUR
- EXISTING FENCE
- EXISTING GAS LINE
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELEPHONE
- EXISTING WATERLINE
- EXISTING RIGHT OF WAY
- PROPERTY LINE
- EXISTING FIRE HYDRANT / WATER VALVE
- PROPOSED CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- PROPOSED FENCE
- PROPOSED GAS LINE
- PROPOSED SANITARY SEWER
- PROPOSED PERIMETER WALL
- PROPOSED CONCRETE PAVEMENT
- PROPOSED 8" MINIMUM CRUSHED ROCK PAVEMENT
- LANDSCAPING
- RIDGELINE
- SPOT GRADE

0 15 30 60 90 FEET
1" = 30'

PARCEL 2
SITE LAYOUT PLAN
SCALE 1"=30'

PRELIMINARY,
NOT FOR CONSTRUCTION,
RECORDING PURPOSES,
OR IMPLEMENTATION

W.H. ROMINES, JR., CIVIL, PE # C73473

PROJECT LOCATION:
10711 DALE AVE
STANTON, ORANGE CO., CA 90680

C01-012.DWG

INTER-DISCIPLINE REVIEW

DISC	ARCH	CIVIL	ELECT	I&C	MECH	STRUCT
DATE	*	*	*	*	*	*
INIT	*	BHR	BMS	*	BSC	SPC

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD
A	ISSUED FOR REVIEW	02-02-2018	BRG	BHR	SPC	JKB

DSGN	BHR	12-04-2017
DRN	BRG	12-04-2017
CKD	SPC	02-02-2018
SCALE:	AS NOTED	

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STANTON ENERGY RELIABILITY CENTER
OVERALL SITE
PARCEL 2
SITE LAYOUT PLAN

JOB NUMBER 149368
REV A
DRAWING NUMBER C01-012

Attachment D

Receiving Waters Exhibit

Susceptibility

Potential Areas of Erosion, Habitat, & Physical Structure Susceptibility

Channel Type

Earth (Unstable)
Earth (Stabilized)
Stabilized

Tidel Influence

<= Mean High Water Line (4.28')

Water Body

Basin
Lake

Federal & Other Lands

Seal Beach National Wildlife Refuge
Airports/Military

San Gabriel-Coyote Creek

Project Location

Los Alamitos Naval Air Station

Seal Beach Naval Weapons Station

Seal Beach National Wildlife Refuge

West Street Retarding Basin

Haster Retarding Basin

Newland Retarding Basin

Receiving Water Anaheim Bay

Lake Huntington

Santa Ana River

Newport Bay

John Wayne Airport

Garden Grove

Westminster Blvd

Bolsa Ave

Edinger Ave

Trask Ave

Orangewood Ave

W Katella Ave

Pacific Ocean

0 6,500 13,000 Feet

TITLE
SUSCEPTIBILITY ANALYIS
ANAHEIM BAY-
HUNTINGTON HARBOR

JOB
ORANGE COUNTY
WATERSHED
MASTER PLANNING
ORANGE CO. CA

SCALE	1" = 6500'
DESIGNED	TH
DRAWING	TH
CHECKED	BMP
DATE	04/22/10
JOB NO.	9526-E

PACE
Advanced Water Engineering

FIGURE
2

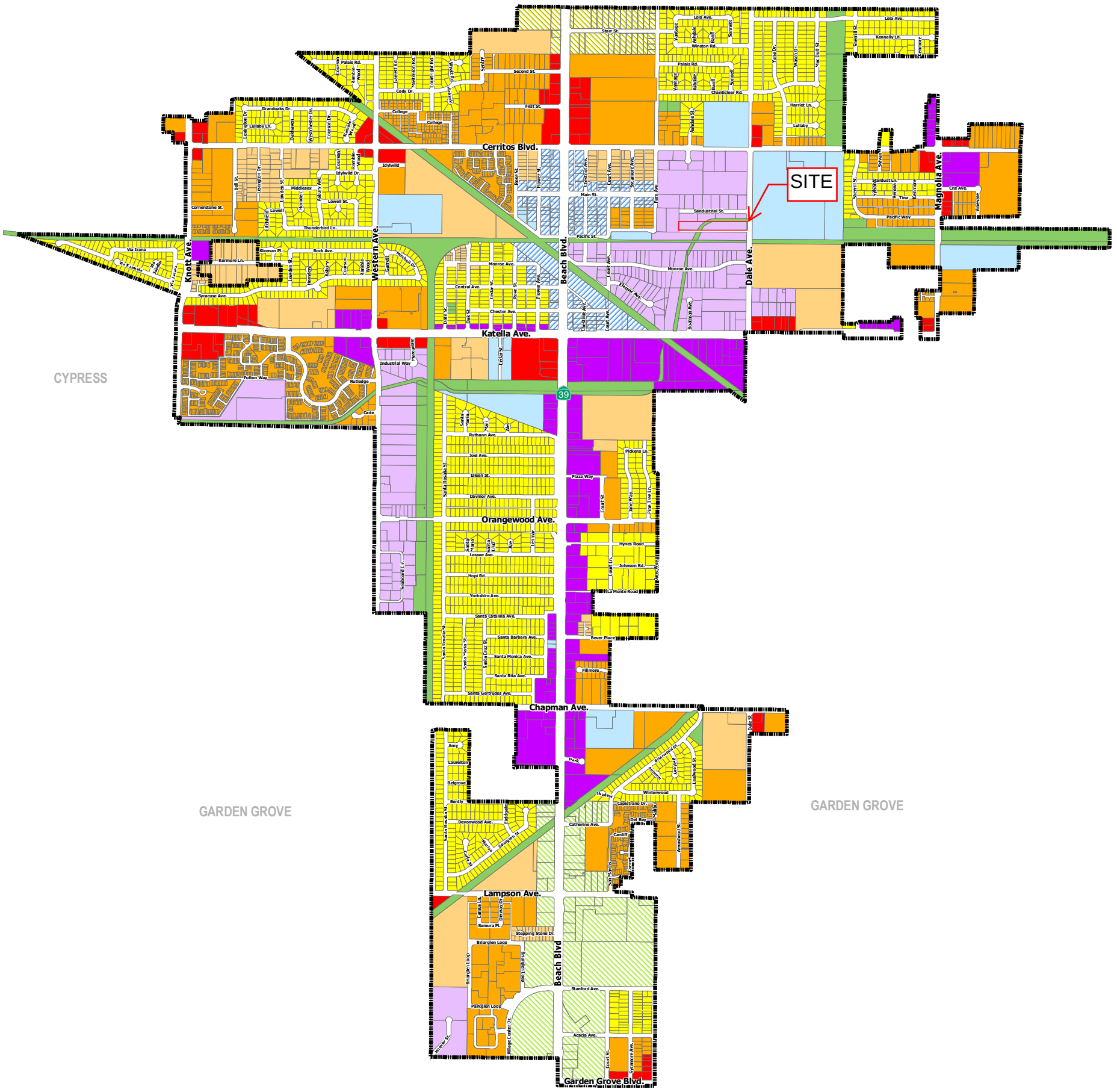
P:\9526E\6-GIS\Mxds\Workspace\SusceptibleAnalysis_20100422\9526E_AnaheimBay_20100331.mxd

Attachment E

Landuse Map

BUENA PARK

ANAHEIM



WESTMINSTER

- Stanton City Boundary
- Low Density Residential
- Medium Density Residential
- High Density Residential
- General Mixed Use
- North Gateway Mixed Use District
- South Gateway Mixed Use District
- Town Center Mixed Use District
- General Commercial
- Industrial
- Public/Institutional
- Open Space

ADOPTED 9/23/08
RESOLUTION NO. 2008-36

RBF CONSULTING GIS

0 375 750 1,500
Feet

M:\Mdata\10103758\GIS\ExistingOnGroundLandUse_24x36.mxd 10/29/2007 -- JM

Stanton General Plan Update

General Plan Land Use Diagram

Attachment F

Stormtech Reference Material

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	TERENCE ZHAO 626-425-2874 TERENCE.ZHAO@ADS-PIPE.COM
ADS SALES REP:	ARNE ERIKSEN 951-796-2048 ARNE.ERIKSEN@ADS-PIPE.COM
PROJECT NO:	S074580

ADVANCED DRAINAGE SYSTEMS, INC.

DMA 2 Stormtech

STANTON ENERGY RELIABILITY CENTER

STANTON, CALIFORNIA

STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500.
2. CHAMBERS SHALL BE MADE FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
10. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
11. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

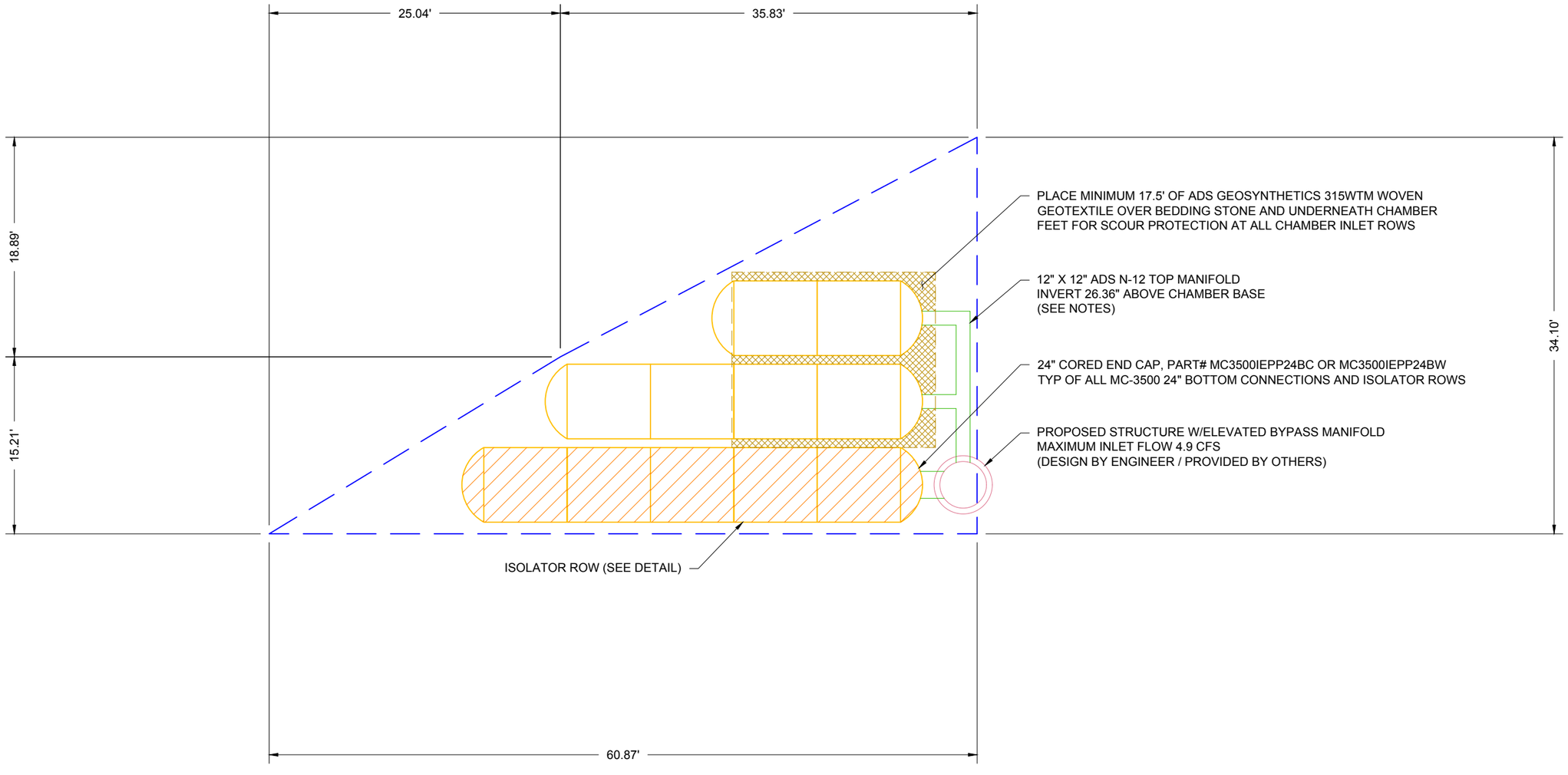
CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

CONCEPTUAL LAYOUT

11	STORMTECH MC-3500 CHAMBERS
6	STORMTECH MC-3500 END CAPS
22	STONE ABOVE (in)
23	STONE BELOW (in)
40	% STONE VOID
4,002	**INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED)**
1,074	SYSTEM AREA (ft²)
164	SYSTEM PERIMETER (ft)

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH SHEET #7 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.



STANTON ENERGY RELIABILITY CENTER
STANTON, CALIFORNIA
DATE: 3-9-18 DRAWN: CTS
PROJECT #: S074580 CHECKED: XXX

REV	DWN	CKD	DESCRIPTION

StormTech
Detention•Retention•Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026

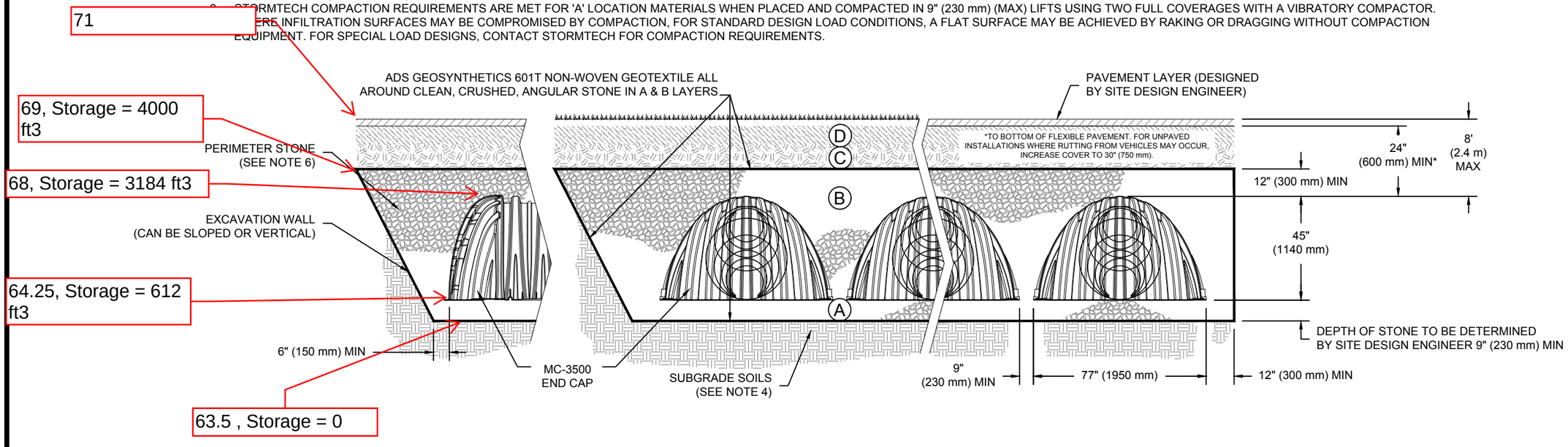
0 10' 20'

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2] [3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

1. MC-3500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
5. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
6. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.

STANTON ENERGY RELIABILITY CENTER
STANTON, CALIFORNIA
DATE: 3-9-18 | DRAWN: CTS | CHECKED: XXX | PROJECT #: S074580

REV | DESCRIPTION | DWN | CKD

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MC-3500 TECHNICAL SPECIFICATION

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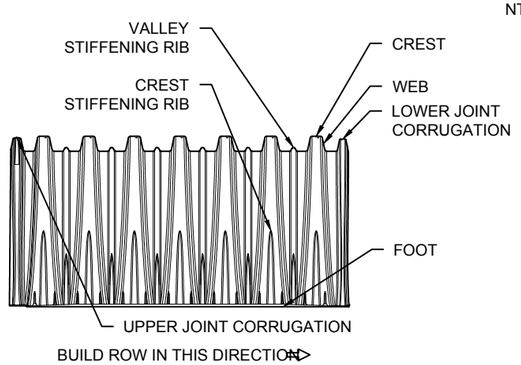

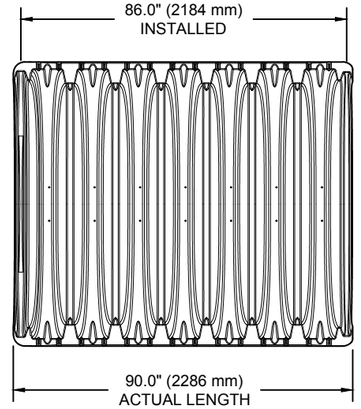

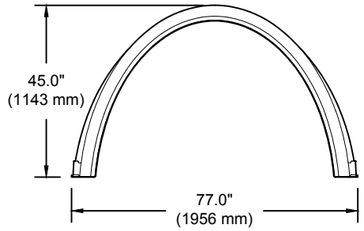

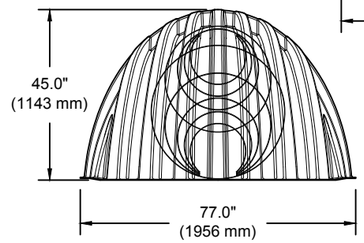

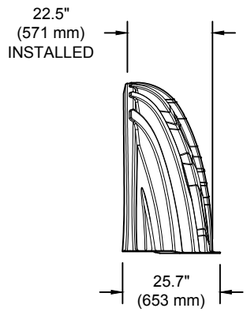

NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 86.0"	(1956 mm X 1143 mm X 2184 mm)
CHAMBER STORAGE	109.9 CUBIC FEET	(3.11 m³)
MINIMUM INSTALLED STORAGE*	178.9 CUBIC FEET	(5.06 m³)
WEIGHT	135.0 lbs.	(61.2 kg)

NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 22.5"	(1956 mm X 1143 mm X 571 mm)
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	46.0 CUBIC FEET	(1.30 m³)
WEIGHT	50.0 lbs.	(22.7 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY

MC-SERIES END CAP INSERTION DETAIL

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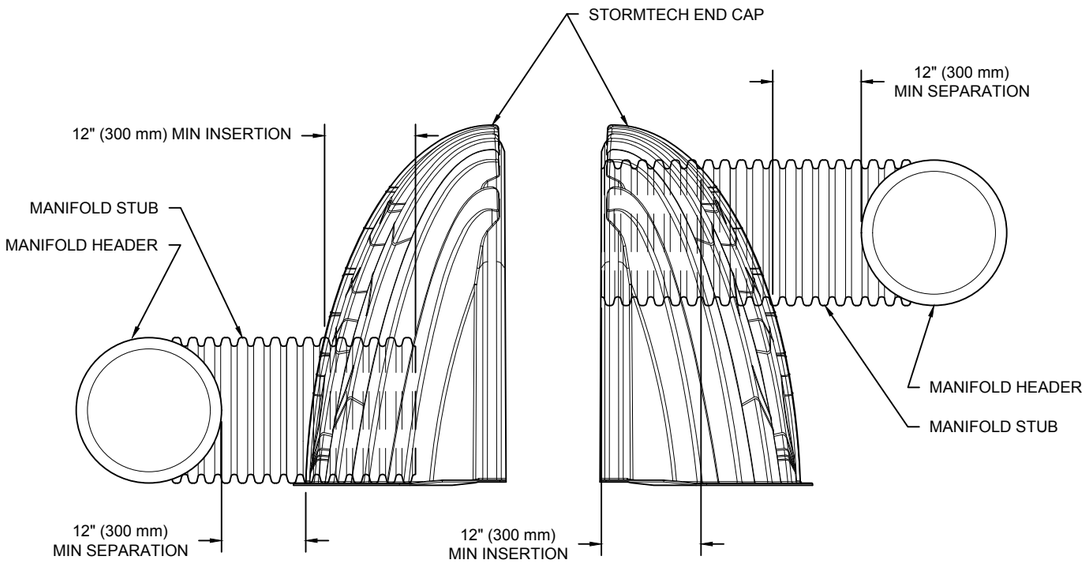
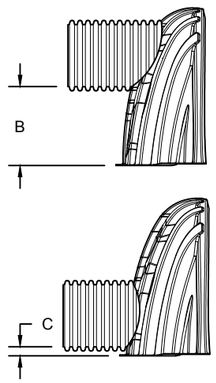


NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A WELDED CROWN PLATE END WITH "C"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B		---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B		---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B		---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B		---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B		---	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	---
MC3500IEPP18TW			
MC3500IEPP18BC		---	1.77" (45 mm)
MC3500IEPP18BW			
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	---
MC3500IEPP24TW			
MC3500IEPP24BC		---	2.06" (52 mm)
MC3500IEPP24BW			
MC3500IEPP30BC	30" (750 mm)	---	2.75" (70 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PRECORED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-3500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

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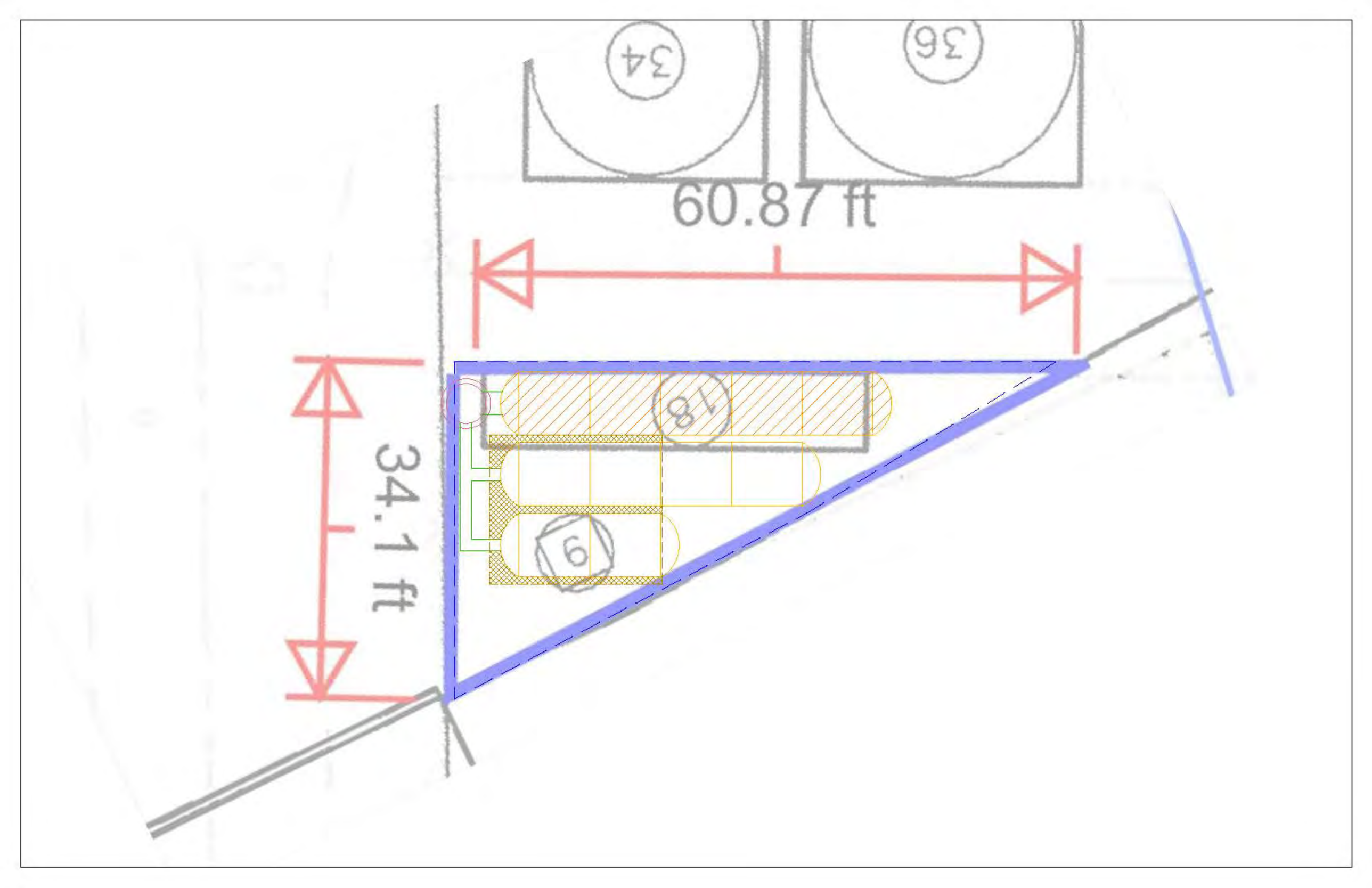

34
36
60.87 ft
34.1 ft
18
9

DMA 3 Stormtech

User Inputs

Chamber Model	SC-310
Outlet Control Structure	Yes (Outlet)
Project Name	SERC
Engineer	WSP
Project Location	Stanton
Project Date	07/03/2017
Measurement Type	Imperial
Required Storage Volume	687 cubic ft.
Stone Porosity	40%
Stone Foundation Depth	6 in.
Stone Above Chambers	6 in.
Average Cover Over Chambers	18 in.
Design Constraint	Width
Design Constraint Dimension	12 ft.

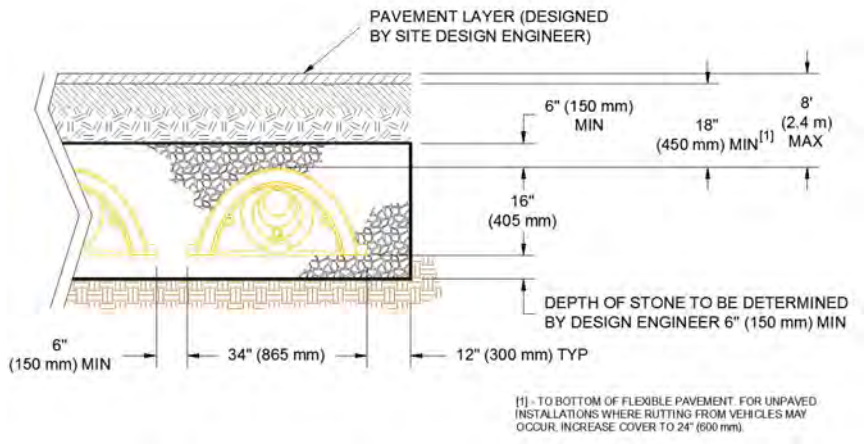
Results

System Volume and Bed Size

Installed Storage Volume	695 cubic ft.
Storage Volume Per Chamber	31.00 cubic ft.
Number Of Chambers Required	17 each
Number Of End Caps Required	6 each
Rows/Chambers	2 row(s) of 6 chamber(s)
Leftover Rows/Chambers	1 row(s) of 5 chamber(s)
Maximum Length	49.37 ft.
Maximum Width	12.10 ft.
Approx. Bed Size Required	584 square ft.

System Components

Amount Of Stone Required	41 cubic yards
Volume Of Excavation (Not Including Fill)	50 cubic yards
Non-woven Filter Fabric Required	160 square yards
Length Of Isolator Row	43.90 ft.
Non-Woven Isolator Row Fabric	24 square yards
Woven Isolator Row Fabric	19 square yards



ADVANCED DRAINAGE SYSTEMS, INC.

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STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-740, SC-310, OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN POLYPROPYLENE OR POLYETHYLENE RESINS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET ASTM F2922 (POLYETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 OR ASTM F2922 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310/SC-740 SYSTEM

1. STORMTECH SC-310 & SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-310 & SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS.

   STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm).
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-310 & SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-310 & SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

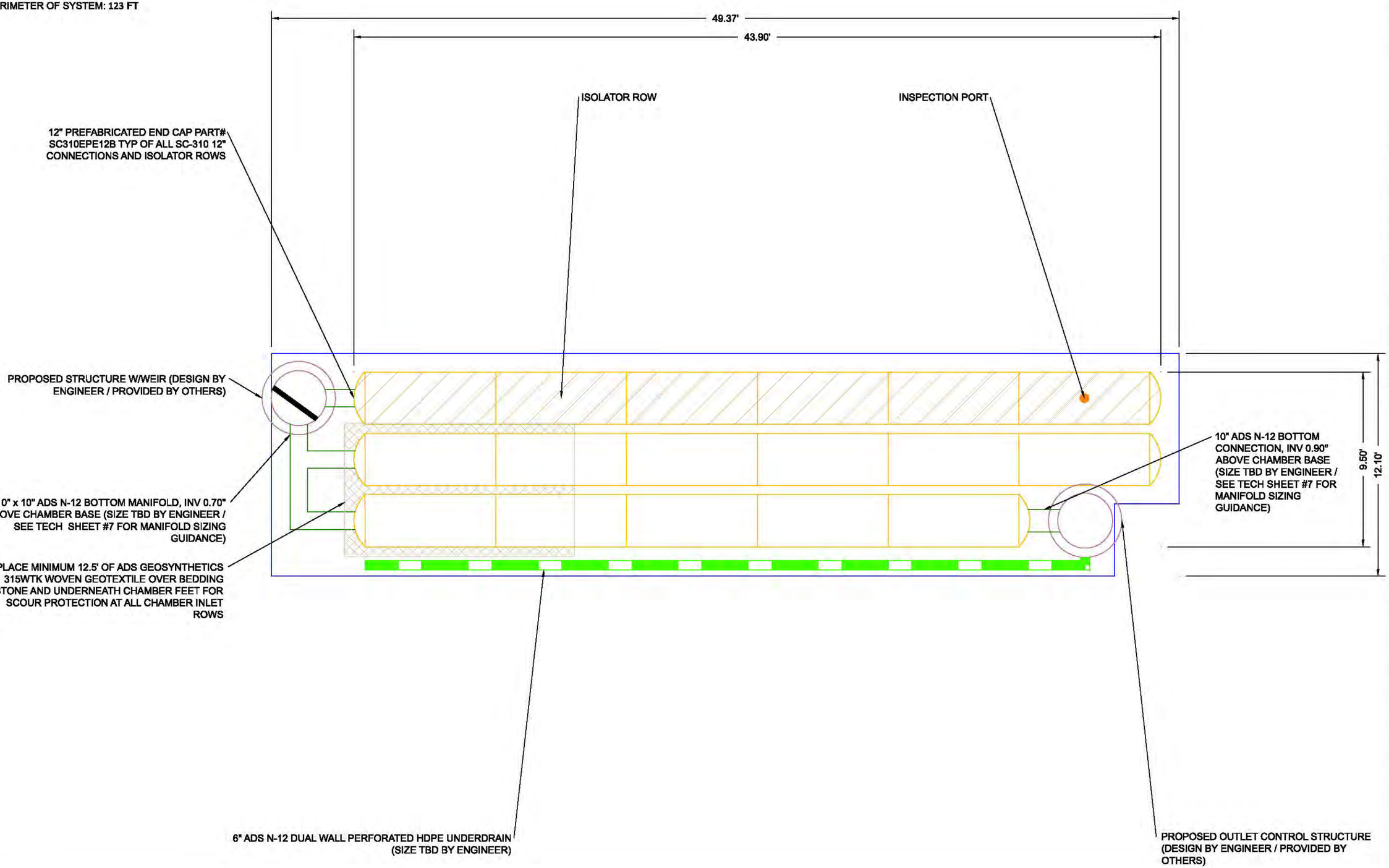
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

CONCEPTUAL LAYOUT

(17) STORMTECH SC-310 CHAMBERS
(6) STORMTECH SC-310 END CAPS
INSTALLED WITH 6 " COVER STONE, 6 " BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 695 CF
AREA OF SYSTEM: 584 FT²
PERIMETER OF SYSTEM: 123 FT

COMPUTER GENERATED CONCEPTUAL LAYOUT - NOT FOR CONSTRUCTION



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DATE: 07/03/2017 | DRAWN: JM | CHECKED: —
PROJECT #: Tool

REV	DRW	CHK	DESCRIPTION

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NOT TO SCALE

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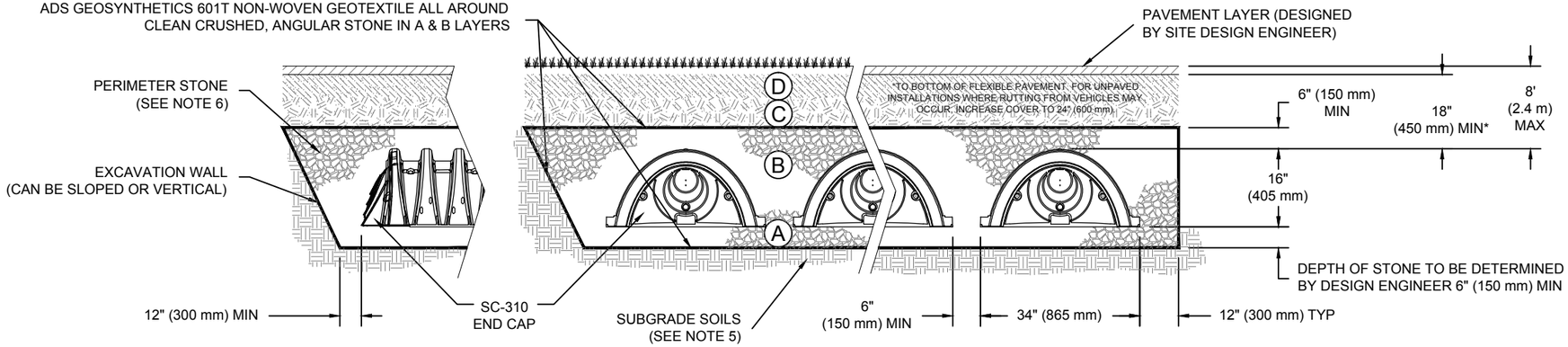
ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2] [3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

1. SC-310 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922
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2. SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
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5. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
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SERC
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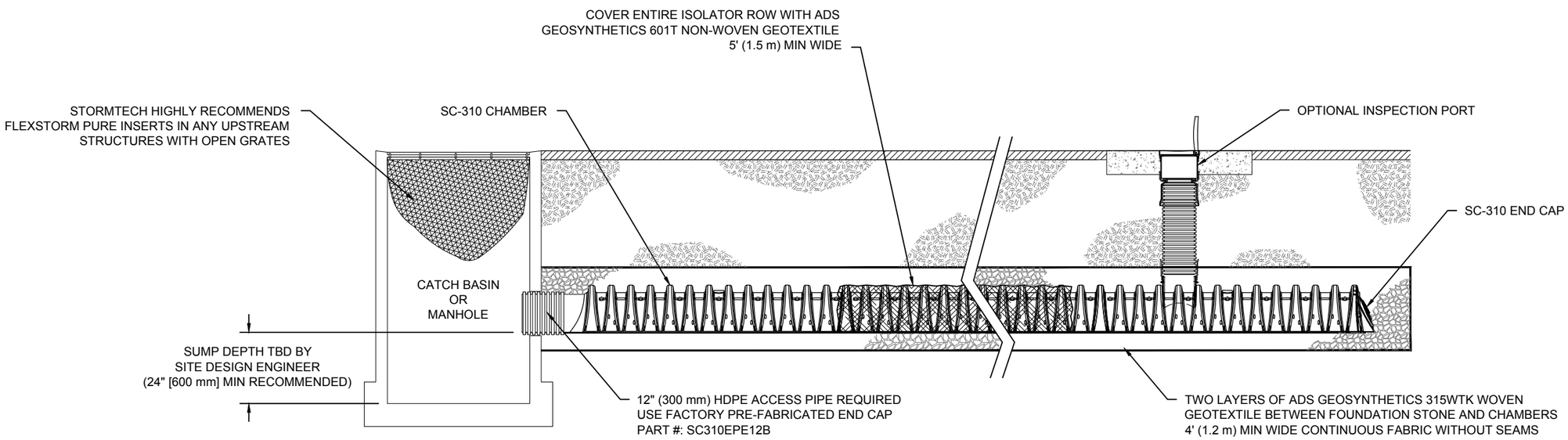


SC-310 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

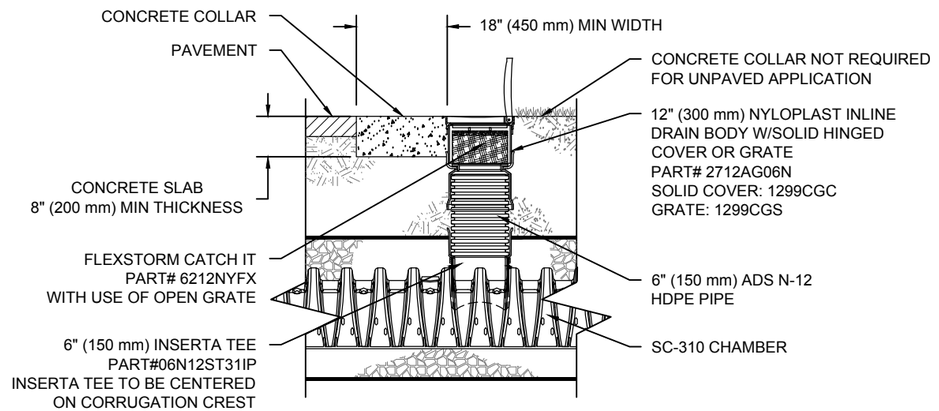
STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



SC-310 6" INSPECTION PORT DETAIL
NTS

SERC
Stanton

DATE: 07/03/2017 | DRAWN: JM | PROJECT #: Tool | CHECKED: ---

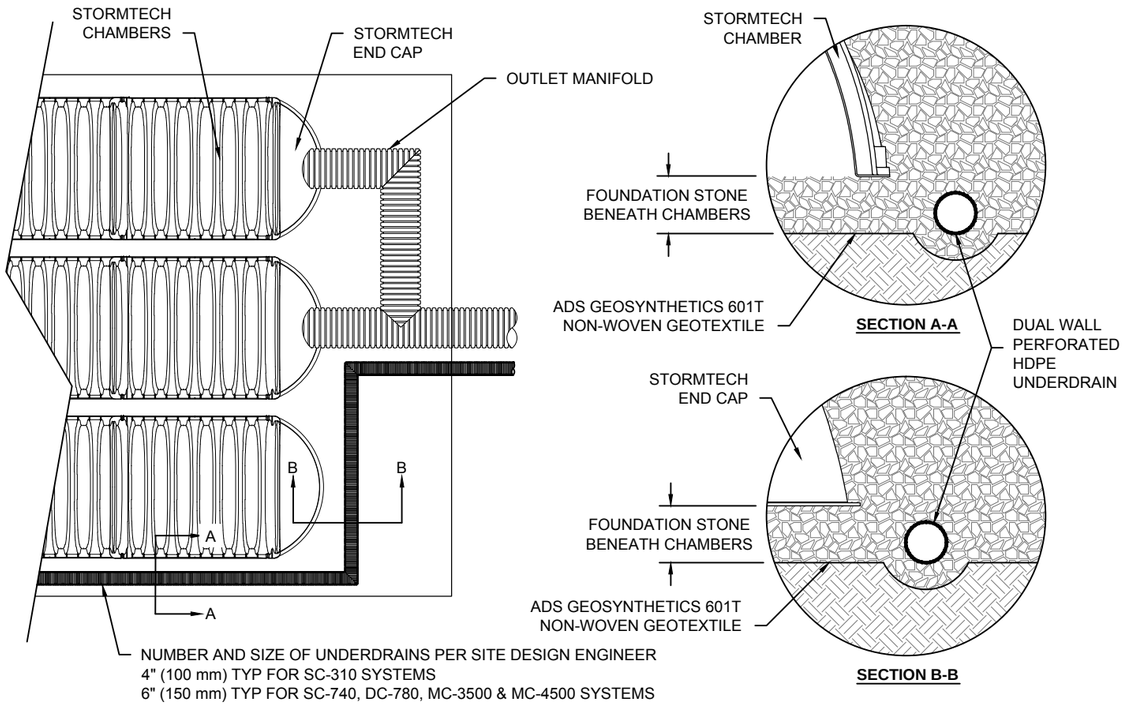
REV	DRW	CHK	DESCRIPTION

StormTech
Detention•Retention •Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

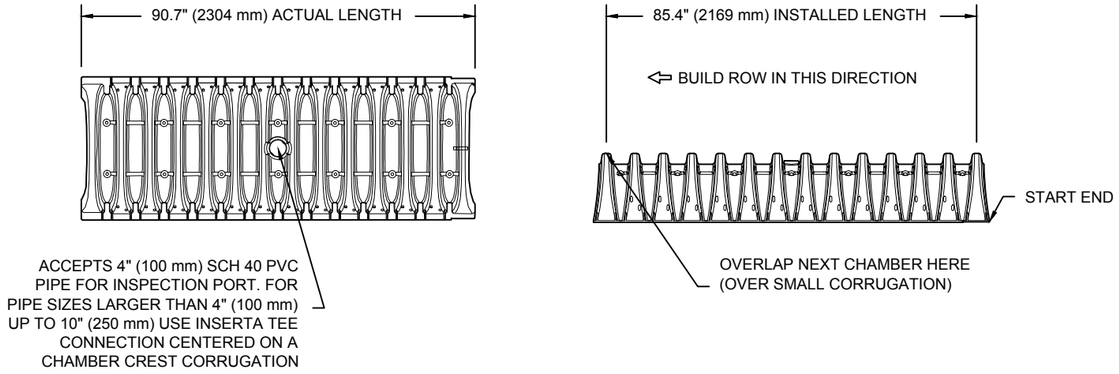
UNDERDRAIN DETAIL

NTS



SC-310 TECHNICAL SPECIFICATION

NTS



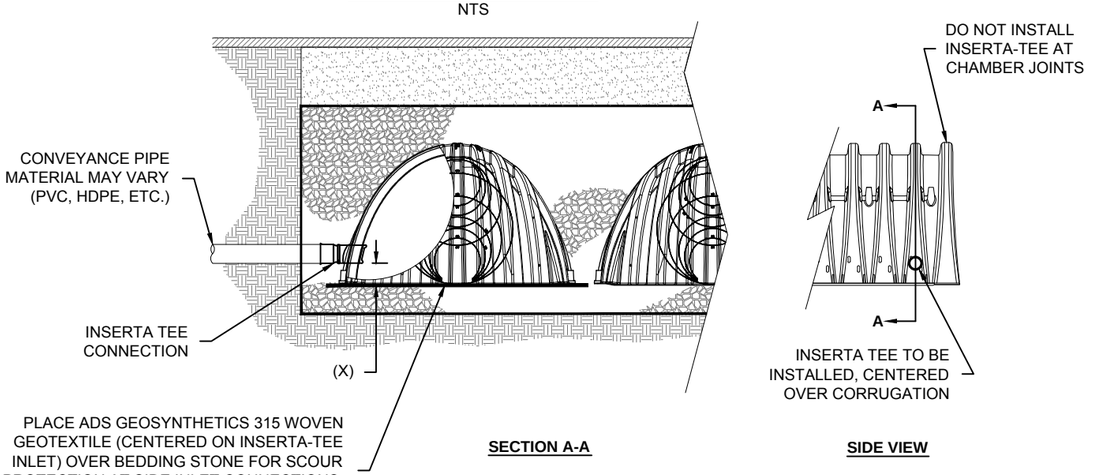
NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	34.0" X 16.0" X 85.4"	(864 mm X 406 mm X 2169 mm)
CHAMBER STORAGE	14.7 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	31.0 CUBIC FEET	(0.88 m³)
WEIGHT	35.0 lbs.	(16.8 kg)

*ASSUMES 6" (152 mm) ABOVE, BELOW, AND BETWEEN CHAMBERS

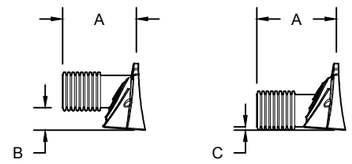
INSERTA TEE DETAIL

NTS



CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
MC-3500	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	8" (200 mm)
INSERTA TEE FITTINGS AVAILABLE FOR SDR 26, SDR 35, SCH 40 IPS GASKETED & SOLVENT WELD, N-12, HP STORM, C-900 OR DUCTILE IRON		

NOTE:
PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS. CONTACT STORMTECH FOR MORE INFORMATION.



STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART #	STUB	A	B	C
SC310EPE06T / SC310EPE06TPC	6" (150 mm)	9.6" (244 mm)	5.8" (147 mm)	---
SC310EPE06B / SC310EPE06BPC			---	0.5" (13 mm)
SC310EPE08T / SC310EPE08TPC	8" (200 mm)	11.9" (302 mm)	3.5" (89 mm)	---
SC310EPE08B / SC310EPE08BPC			---	0.6" (15 mm)
SC310EPE10T / SC310EPE10TPC	10" (250 mm)	12.7" (323 mm)	1.4" (36 mm)	---
SC310EPE10B / SC310EPE10BPC			---	0.7" (18 mm)
SC310EPE12B	12" (300 mm)	13.5" (343 mm)	---	0.9" (23 mm)

ALL STUBS, EXCEPT FOR THE SC310EPE12B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC310EPE12B THE 12" (300 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 0.25" (6 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

SERC Stanton

DATE: 07/03/2017 | DRAWN: JM | PROJECT #: Tool | CHECKED: ---

REV	DRW	CHK	DESCRIPTION

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1-800-733-7473

FLEXSTORM®
INLET FILTERS

FILTER BAG OPTIONS

FLEXSTORM offers seven different filter bag options for any of the framing styles. For complete test results visit www.inletfilters.com

FLEXSTORM FILTER BAGS	STANDARD BAG P/N (22" depth)	SHORT BAG P/N (12" depth)
FX: Standard Woven Bag	FX	FX-S
FX+: Woven w/ MyCelx	FXP	FXP-S
FXO: Woven w/ Oil Boom	FXO	FXO-S
PC: Post Construction Bag	PC	PC-S
PC+: PC Bag w/ MyCelx	PCP	PCP-S
LL: Litter and Leaf Bag	LL	LL-S
IL: IDOT NonWoven Bag	IL	IL-S

FILTER BAG TEST RESULTS

FX FILTRATION EFFICIENCY = 82% †

† Large scale, 3rd party testing per ASTM D 7351, Standard Test Method for Determination of Sediment Retention Device Effectiveness in Sheet Flow Application using 7% USDA Sandy Loam

PC/PC+ TSS = 99% TPH = 97% ‡

‡ Large scale testing at 90 GPM. 3rd party results using US Silica OK-110 sand at 1750 mg/L measuring TSS per SM 2540D. TPH tested at 243 mg/L used motor oil using EPA Method 1664A.

FILTER BAG SPECIFICATIONS & CAPABILITES

Bag Type (P/N)	Clean Water Flow Rate (GPM/SqFt)	Min A.O.S. (US Sieve)
Woven (FX)	200	40
Post Construction (PC)	137	140
NonWoven (IL)	145	70
Litter & Leaf Bag (LL)	High	3.5

Total Bypass Capacity: Bypass capacity will vary with each size drainage structure. Flexstorm designs filter bypass to meet the minimum design flow of the particular drainage structure.

Standard Bag Sizes (match frame sizes) §	Solids Storage Capacity (CuFt)	Filtered Flow Rate at 50% Max (CFS)			Oil Retention (Oz)		
		FX	PC	IL	PC*	PCP**	FX+
Small	1.6	1.2	0.8	0.9	66	155	89
Medium	2.1	1.8	1.2	1.3	96	185	89
Large	3.8	2.2	1.5	1.6	120	209	89
XL	4.2	3.6	2.4	2.6	192	370	178

* PC filter bag at 50% max adsorption capacity

** PC filter bag at 50% capacity and MyCelx skimmer at 100% capacity

§ Bag Sizes match the framing sizes based on clear opening dimensions. Standard bags are 22" in depth. Short bags are 12" in depth, reducing solids storage capacity by approximately 50%.

FLEXSTORM OPERATION AND MAINTENANCE PLAN

FLEXSTORM INLET FILTERS™

OPERATION & MAINTENANCE PLAN

Installation Instructions:

1. Remove grate from the drainage structure
2. Clean stone and dirt from ledge (lip) of drainage structure
3. Drop the FLEXSTORM inlet filter through the clear opening such that the hangers rest firmly on the lip of the structure.
4. Replace the grate and confirm it is not elevated more than 1/8", the thickness of the steel hangers.

Frequency of Inspections:

1. Inspection should occur following any rain event >½".
2. Post construction inspections should occur 4 times per year. In snowfall affected regions additional inspections should take place before and after snowfall season.
3. Industrial application site inspections (loading ramps, wash racks, maintenance facilities) should occur on a regularly scheduled basis no less than 3 times/year.

Maintenance Guidelines:

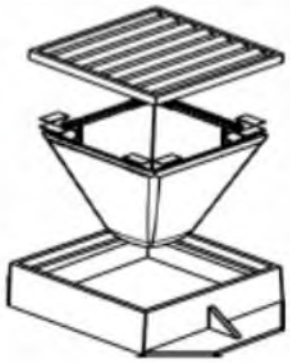
1. Empty the sediment bag if more than half filled with sediment and debris, or as directed.
2. Remove the grate, engage the lifting bars with the FLEXSTORM Removal Tool, and lift from drainage structure.
3. Dispose of sediment or debris as directed by the Engineer or Maintenance contract.
4. An industrial vacuum can be used to collect sediment.
5. Remove caked on silt from sediment bag and flush with Medium spray with optimal filtration.
6. Replace bag if torn or punctured to >½" diameter on lower half of bag.

Post Construction PC Bag Maintenance:

1. At 50% saturation the average 2'x2' Adsorb-it lined PC filter will retain approximately 75 oz (4.2 lbs) of oil and should be serviced. To recover the oils the filter can be centrifuged or passed through a wringer.
2. Oil skimmer pouches start to turn black when saturated, indicating time for replacement. Each ClearTec Rubberizer pouch will absorb ~62oz (4 lbs) of oil before needing replacement.
3. Dispose of all oil contaminated products in accordance with EPA guidelines. ClearTec Rubberizer, since a solidifier, will not leach under pressure and can be disposed of in most landfills, recycled for industrial applications, or burned as fuel.

Sediment Bag Replacement:

1. Remove the bag by loosening or cutting off clamping bag.
2. Take new sediment bag and secure worm drive clamping band to the frame channel.
3. Ensure Bag is secure and there is no slack around perimeter.



STRUCTURE ID#/LOCATION:

DATE	TASK PERFORMED	INSPECTOR

BMP Handbook Fact Sheets

Infiltration Basin TC-11

Design Considerations

- Soil for Infiltration
- Slope
- Aesthetics

Targeted Constituents

☑	Sediment	■
☑	Nutrients	■
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

Description

An infiltration basin is a shallow impoundment that is designed to infiltrate stormwater. Infiltration basins use the natural filtering ability of the soil to remove pollutants in stormwater runoff. Infiltration facilities store runoff until it gradually exfiltrates through the soil and eventually into the water table. This practice has high pollutant removal efficiency and can also help recharge groundwater, thus helping to maintain low flows in stream systems. Infiltration basins can be challenging to apply on many sites, however, because of soils requirements. In addition, some studies have shown relatively high failure rates compared with other management practices.

California Experience

Infiltration basins have a long history of use in California, especially in the Central Valley. Basins located in Fresno were among those initially evaluated in the National Urban Runoff Program and were found to be effective at reducing the volume of runoff, while posing little long-term threat to groundwater quality (EPA, 1983; Schroeder, 1995). Proper siting of these devices is crucial as underscored by the experience of Caltrans in siting two basins in Southern California. The basin with marginal separation from groundwater and soil permeability failed immediately and could never be rehabilitated.

Advantages

- Provides 100% reduction in the load discharged to surface waters.
- The principal benefit of infiltration basins is the approximation of pre-development hydrology during which a

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

significant portion of the average annual rainfall runoff is infiltrated and evaporated rather than flushed directly to creeks.

- If the water quality volume is adequately sized, infiltration basins can be useful for providing control of channel forming (erosion) and high frequency (generally less than the 2-year) flood events.

Limitations

- May not be appropriate for industrial sites or locations where spills may occur.
- Infiltration basins require a minimum soil infiltration rate of 0.5 inches/hour, not appropriate at sites with Hydrologic Soil Types C and D.
- If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully treated prior to infiltration to protect groundwater quality.
- Not suitable on fill sites or steep slopes.
- Risk of groundwater contamination in very coarse soils.
- Upstream drainage area must be completely stabilized before construction.
- Difficult to restore functioning of infiltration basins once clogged.

Design and Sizing Guidelines

- Water quality volume determined by local requirements or sized so that 85% of the annual runoff volume is captured.
- Basin sized so that the entire water quality volume is infiltrated within 48 hours.
- Vegetation establishment on the basin floor may help reduce the clogging rate.

Construction/Inspection Considerations

- Before construction begins, stabilize the entire area draining to the facility. If impossible, place a diversion berm around the perimeter of the infiltration site to prevent sediment entrance during construction or remove the top 2 inches of soil after the site is stabililized. Stabilize the entire contributing drainage area, including the side slopes, before allowing any runoff to enter once construction is complete.
- Place excavated material such that it can not be washed back into the basin if a storm occurs during construction of the facility.
- Build the basin without driving heavy equipment over the infiltration surface. Any equipment driven on the surface should have extra-wide ("low pressure") tires. Prior to any construction, rope off the infiltration area to stop entrance by unwanted equipment.
- After final grading, till the infiltration surface deeply.
- Use appropriate erosion control seed mix for the specific project and location.

Performance

As water migrates through porous soil and rock, pollutant attenuation mechanisms include precipitation, sorption, physical filtration, and bacterial degradation. If functioning properly, this approach is presumed to have high removal efficiencies for particulate pollutants and moderate removal of soluble pollutants. Actual pollutant removal in the subsurface would be expected to vary depending upon site-specific soil types. This technology eliminates discharge to surface waters except for the very largest storms; consequently, complete removal of all stormwater constituents can be assumed.

There remain some concerns about the potential for groundwater contamination despite the findings of the NURP and Nightingale (1975; 1987a,b,c; 1989). For instance, a report by Pitt et al. (1994) highlighted the potential for groundwater contamination from intentional and unintentional stormwater infiltration. That report recommends that infiltration facilities not be sited in areas where high concentrations are present or where there is a potential for spills of toxic material. Conversely, Schroeder (1995) reported that there was no evidence of groundwater impacts from an infiltration basin serving a large industrial catchment in Fresno, CA.

Siting Criteria

The key element in siting infiltration basins is identifying sites with appropriate soil and hydrogeologic properties, which is critical for long term performance. In one study conducted in Prince George's County, Maryland (Galli, 1992), all of the infiltration basins investigated clogged within 2 years. It is believed that these failures were for the most part due to allowing infiltration at sites with rates of less than 0.5 in/hr, basing siting on soil type rather than field infiltration tests, and poor construction practices that resulted in soil compaction of the basin invert.

A study of 23 infiltration basins in the Pacific Northwest showed better long-term performance in an area with highly permeable soils (Hilding, 1996). In this study, few of the infiltration basins had failed after 10 years. Consequently, the following guidelines for identifying appropriate soil and subsurface conditions should be rigorously adhered to.

- Determine soil type (consider RCS soil type 'A, B or C' only) from mapping and consult USDA soil survey tables to review other parameters such as the amount of silt and clay, presence of a restrictive layer or seasonal high water table, and estimated permeability. The soil should not have more than 30% clay or more than 40% of clay and silt combined. Eliminate sites that are clearly unsuitable for infiltration.
- Groundwater separation should be at least 3 m from the basin invert to the measured ground water elevation. There is concern at the state and regional levels of the impact on groundwater quality from infiltrated runoff, especially when the separation between groundwater and the surface is small.
- Location away from buildings, slopes and highway pavement (greater than 6 m) and wells and bridge structures (greater than 30 m). Sites constructed of fill, having a base flow or with a slope greater than 15% should not be considered.
- Ensure that adequate head is available to operate flow splitter structures (to allow the basin to be offline) without ponding in the splitter structure or creating backwater upstream of the splitter.

- Base flow should not be present in the tributary watershed.

Secondary Screening Based on Site Geotechnical Investigation

- At least three in-hole conductivity tests shall be performed using USBR 7300-89 or Bouwer-Rice procedures (the latter if groundwater is encountered within the boring), two tests at different locations within the proposed basin and the third down gradient by no more than approximately 10 m. The tests shall measure permeability in the side slopes and the bed within a depth of 3 m of the invert.

- The minimum acceptable hydraulic conductivity as measured in any of the three required test holes is 13 mm/hr. If any test hole shows less than the minimum value, the site should be disqualified from further consideration.

- Exclude from consideration sites constructed in fill or partially in fill unless no silts or clays are present in the soil boring. Fill tends to be compacted, with clays in a dispersed rather than flocculated state, greatly reducing permeability.

- The geotechnical investigation should be such that a good understanding is gained as to how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water.

Additional Design Guidelines

(1) Basin Sizing - The required water quality volume is determined by local regulations or sufficient to capture 85% of the annual runoff.

(2) Provide pretreatment if sediment loading is a maintenance concern for the basin.

(3) Include energy dissipation in the inlet design for the basins. Avoid designs that include a permanent pool to reduce opportunity for standing water and associated vector problems.

(4) Basin invert area should be determined by the equation:

$$A = \frac{WQV}{kt}$$

where A = Basin invert area (m^2)

WQV = water quality volume (m^3)

k = 0.5 times the lowest field-measured hydraulic conductivity (m/hr)

t = drawdown time (48 hr)

(5) The use of vertical piping, either for distribution or infiltration enhancement shall not be allowed to avoid device classification as a Class V injection well per 40 CFR146.5(e)(4).

Maintenance

Regular maintenance is critical to the successful operation of infiltration basins. Recommended operation and maintenance guidelines include:

- Inspections and maintenance to ensure that water infiltrates into the subsurface completely (recommended infiltration rate of 72 hours or less) and that vegetation is carefully managed to prevent creating mosquito and other vector habitats.
- Observe drain time for the design storm after completion or modification of the facility to confirm that the desired drain time has been obtained.
- Schedule semiannual inspections for beginning and end of the wet season to identify potential problems such as erosion of the basin side slopes and invert, standing water, trash and debris, and sediment accumulation.
- Remove accumulated trash and debris in the basin at the start and end of the wet season.
- Inspect for standing water at the end of the wet season.
- Trim vegetation at the beginning and end of the wet season to prevent establishment of woody vegetation and for aesthetic and vector reasons.
- Remove accumulated sediment and regrade when the accumulated sediment volume exceeds 10% of the basin.
- If erosion is occurring within the basin, revegetate immediately and stabilize with an erosion control mulch or mat until vegetation cover is established.
- To avoid reversing soil development, scarification or other disturbance should only be performed when there are actual signs of clogging, rather than on a routine basis. Always remove deposited sediments before scarification, and use a hand-guided rotary tiller, if possible, or a disc harrow pulled by a very light tractor.

Cost

Infiltration basins are relatively cost-effective practices because little infrastructure is needed when constructing them. One study estimated the total construction cost at about $2 per ft (adjusted for inflation) of storage for a 0.25-acre basin (SWRPC, 1991). As with other BMPs, these published cost estimates may deviate greatly from what might be incurred at a specific site. For instance, Caltrans spent about $18/ft^3 for the two infiltration basins constructed in southern California, each of which had a water quality volume of about 0.34 ac.-ft. Much of the higher cost can be attributed to changes in the storm drain system necessary to route the runoff to the basin locations.

Infiltration basins typically consume about 2 to 3% of the site draining to them, which is relatively small. Additional space may be required for buffer, landscaping, access road, and fencing. Maintenance costs are estimated at 5 to 10% of construction costs.

One cost concern associated with infiltration practices is the maintenance burden and longevity. If improperly maintained, infiltration basins have a high failure rate. Thus, it may be necessary to replace the basin with a different technology after a relatively short period of time.

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Information Resources

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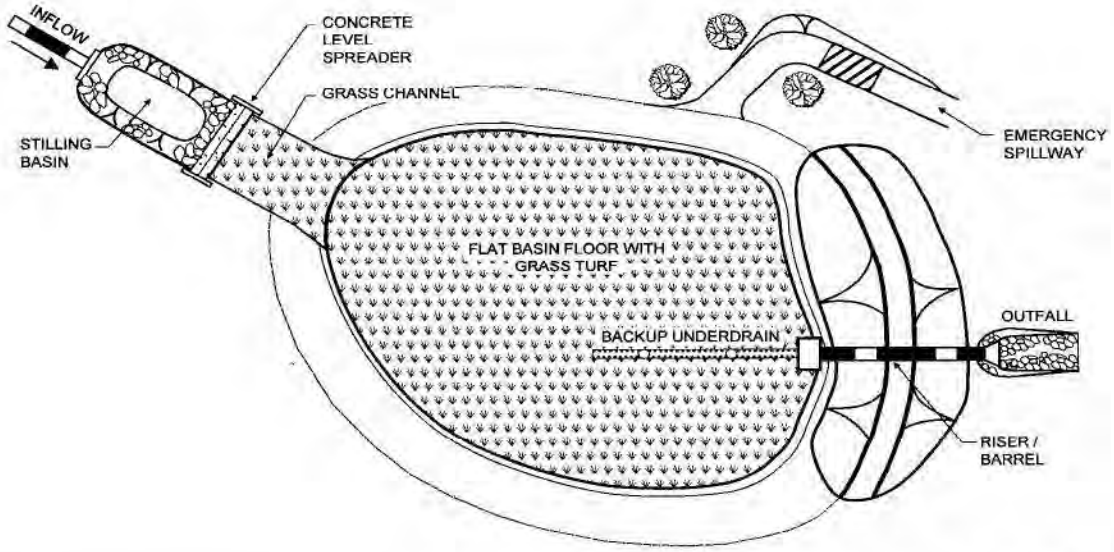
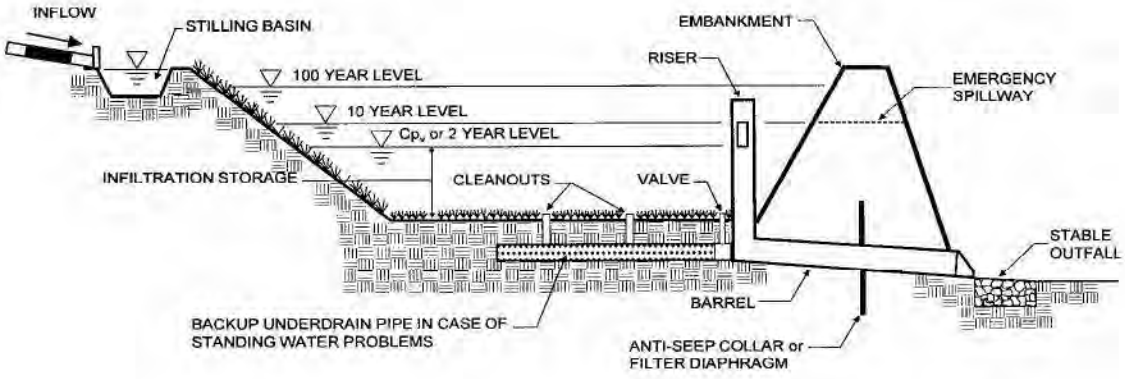


PLAN VIEW



PROFILE

Trash Storage Areas SD-32

Description

Trash storage areas are areas where a trash receptacle (s) are located for use as a repository for solid wastes. Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations that may be sources of stormwater pollution include dumpsters, litter control, and waste piles.

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Approach

This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling. Preventative measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local agency ordinances and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulation.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria in this fact sheet are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler should be contacted prior to the design of your site trash collection areas. Conflicts or issues should be discussed with the local agency.

Designing New Installations

Trash storage areas should be designed to consider the following structural or treatment control BMPs:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater.
- Make sure trash container areas are screened or walled to prevent off-site transport of trash.

- Use lined bins or dumpsters to reduce leaking of liquid waste.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Maintenance Considerations

The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator. Maintenance agreements between the local agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local agency, maintenance agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Efficient Irrigation SD-12

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Attachment H

Educational Materials

Preventing water pollution at your commercial/industrial site

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many landscape and building maintenance activities can lead to water pollution if you're not careful. Paint, chemicals, plant clippings and other materials can be blown or washed into storm drains that flow to the ocean. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never pour soap or fertilizers into the ocean, so why would you let them enter the storm drains? Follow these easy tips to help prevent water pollution.

Some types of industrial facilities are required to obtain coverage under the State General Industrial Permit. For more information visit: **www.swrcb.ca.gov/stormwater/industrial.html**

For more information, please call the **Orange County Stormwater Program** at **1-877-89-SPILL** (1-877-897-7455) or visit **www.ocwatersheds.com**

To report a spill, call the **Orange County 24-Hour Water Pollution Problem Reporting Hotline** at **1-877-89-SPILL** (1-877-897-7455).

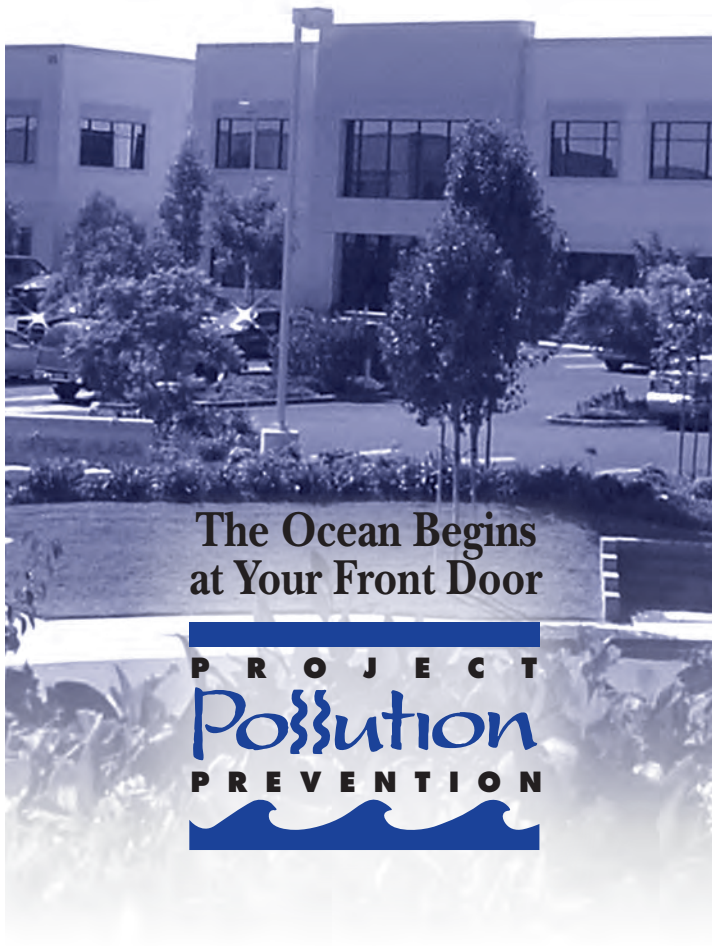
For emergencies, dial 911.

RECYCLE USED OIL

Printed on Recycled Paper

Help Prevent Ocean Pollution:

Proper Maintenance Practices for Your Business



The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

Proper Maintenance Practices for your Business

Landscape Maintenance

- Compost grass clippings, leaves, sticks and other vegetation, or dispose of it at a permitted landfill or in green waste containers. Do not dispose of these materials in the street, gutter or storm drain.
- Irrigate slowly and inspect the system for leaks, overspraying and runoff. Adjust automatic timers to avoid overwatering.
- Follow label directions for the use and disposal of fertilizers and pesticides.
- Do not apply pesticides or fertilizers if rain is expected within 48 hours or if wind speeds are above 5 mph.
- Do not spray pesticides within 100 feet of waterways.
- Fertilizers should be worked into the soil rather than dumped onto the surface.
- If fertilizer is spilled on the pavement or sidewalk, sweep it up immediately and place it back in the container.

Building Maintenance

- Never allow washwater, sweepings or sediment to enter the storm drain.
- Sweep up dry spills and use cat litter, towels or similar materials to absorb wet spills. Dispose of it in the trash.
- If you wash your building, sidewalk or parking lot, you **must** contain the water. Use a shop vac to collect the water and contact your city or sanitation agency for proper disposal information. Do not let water enter the street, gutter or storm drain.
- Use drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of materials in the trash.
- Use a ground cloth or oversized tub for mixing paint and cleaning tools.
- Use a damp mop or broom to clean floors.
- Cover dumpsters to keep insects, animals, rainwater and sand from entering. Keep the area around the dumpster clear of trash and debris. Do not overfill the dumpster.
- Call your trash hauler to replace leaking dumpsters.
- Do not dump any toxic substance or liquid waste on the pavement, the ground, or near a storm drain. Even materials that seem harmless such as latex paint or biodegradable cleaners can damage the environment.

NEVER DISPOSE OF ANYTHING IN THE STORM DRAIN.

- Recycle paints, solvents and other materials. For more information about recycling and collection centers, visit **www.oclandfills.com**.
- Store materials indoors or under cover and away from storm drains.
- Use a construction and demolition recycling company to recycle lumber, paper, cardboard, metals, masonry, carpet, plastic, pipes, drywall, rocks, dirt, and green waste. For a listing of construction and demolition recycling locations in your area, visit **www.ciwmb.ca.gov/recycle.**
- Properly label materials. Familiarize employees with Material Safety Data Sheets.

PROJECT Pollution PREVENTION

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, if we are not careful, our daily activities can lead directly to water pollution problems. Water that drains through your watershed can pick up pollutants which are then transported to our waterways and beautiful ocean.

You can prevent water pollution by taking personal action and by working with members of your watershed community to prevent urban runoff from entering your waterway.

For more information, please call the **Orange County Stormwater Program** at **1.877.89.SPILL** or visit **www.ocwatersheds.com**

To report a spill, call the **Orange County 24-Hour Water Pollution Problem Reporting Hotline** at **1.877.89.SPILL**.

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help protect your watershed. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

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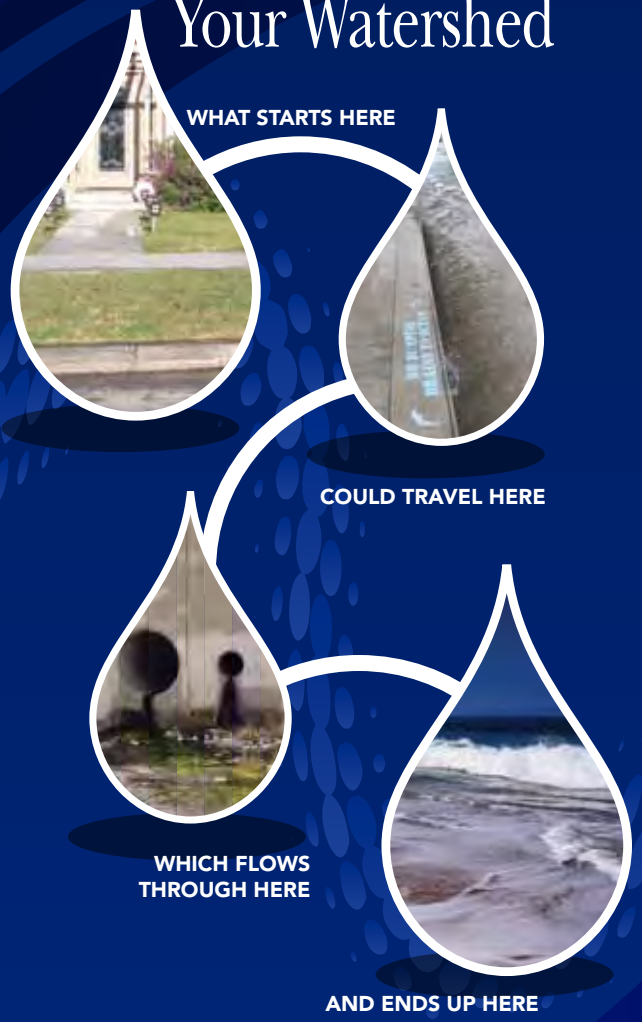
Help Prevent Ocean Pollution: Tips For Protecting Your Watershed



The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

Tips for Protecting Your Watershed

My Watershed. Our Ocean.

Water + shed, *noun: A region of land within which water flows down into a specified water body, such as a river, lake, sea, or ocean; a drainage basin or catchment basin.*

Orange County is comprised of 11 major watersheds into which most of our water flows, connecting all of Orange County to the Pacific Ocean.

As water from rain (stormwater) or sprinklers and hoses (urban runoff) runs down your driveway and into your neighborhood streets, sidewalks and gutters, it flows into storm drains that lead to waterways within your watershed. The waterways from other cities merge as they make their way through our watersheds until all the runoff water in Orange County meets at the Pacific Ocean. The water that reaches our ocean is not pure. As it flows through the watershed, it picks up pollutants such as litter, cigarette butts, fertilizer, pesticides, pet waste, motor oil and lawn clippings. Unlike water that enters the sewer (from sinks and toilets), water that enters the storm drain is not treated before it flows, ultimately, to the ocean.

Water quality can be improved by "Adopting Your Watershed." Through this effort, we are challenging citizens and organizations to join the Orange County Stormwater Program and others who are working to protect and restore our creeks, rivers, bays and ocean.

There are many opportunities to get involved:

- Appreciate your watershed - explore the creeks, trails and ocean and make observations about its conditions. If you see anything abnormal (such as dead fish, oil spills, leaking barrels, and other pollution) contact the Orange County 24-hour water pollution problem reporting hotline at 1.877.89.SPILL to report the problem.
- Research your watershed. Learn about what watershed you live in by visiting www.ocwatersheds.com.
- Find a watershed organization in your community and volunteer to help. If there are no active groups, consider starting your own.
- Visit EPA's Adopt Your Watershed's Catalog of Watershed Groups at www.epa.gov/adopt to locate groups in your community.
- Organize or join in a creek, river, bay or ocean cleanup event such as Coastal & Inner Coastal Cleanup Day that takes place the 3rd Saturday of every September. For more information visit www.coast4u.org.

Follow these simple tips to protect the water quality of your watershed:

- **Sweep up debris and dispose of it in the trash. Do not hose down driveways or sidewalks into the street or gutter.**
- **Use dry cleanup methods such as cat litter to absorb spills and sweep up residue.**
- **Set your irrigation systems to reflect seasonal water needs or use weather-based controllers. Inspect for runoff regularly.**
- **Cover trashcans securely.**
- **Take hazardous waste to a household hazardous waste collection center. (For example, paint, batteries and petroleum products)**
- **Pick up after your pet.**
- **Follow application and disposal directions for pesticides and fertilizers.**
- **If you wash your car at home, wash it on your lawn or divert the runoff onto a landscaped area. Consider taking your car to a commercial car wash, where the water is reclaimed or recycled.**
- **Keep your car well maintained.**
- **Never pour oil or antifreeze in the street, gutter or storm drain.**

Attachment I

Hydro Modification

862 East Hospitality Lane
Suite 350
San Bernardino, CA 92408
Ph: 909-888-1106
Fax: 909-889-1884

April 11, 2018

Hydrologic Conditions of Concern

Stanton Energy Reliability Center

Background

In order to address hydrologic conditions of concern a 2 year storm analysis was applied to the Stanton Energy Reliability Center. The analysis quantified both onsite preconstruction condition and post construction condition flow volumes and times of concentration. The analysis was prepared to comply with the Model WQMP requirements for Hydrologic Conditions of Concern. In the post construction condition a Water Quality Volume was quantified based on the WQMP Guidance Manual and the storage effect on the discharge volume and time of concentration was determined. The purpose of this memo is to summarize the results and provide responses to the following comments.

In addition, Orange County Flood Control has requested the 100 year peak flow rate be preserved so that the post construction condition 100 year peak flow rate does not exceed the preconstruction condition. It should be noted this requirement only pertains to the peak flow and does not include volume or time of concentration.

Comments & Responses

A38 Describe each discrete preconstruction drainage area volume of discharge expected during the design storm and the preconstruction time of concentration for each drainage area.

The existing site was delineated into three drainage management areas (DMA) DMA 1, DMA 2 and DMA 3. DMA 1 is 1.75 acres, DMA 2 is 0.8 acres and DMA 3 is 0.81 acres. The following table identifies the flow volume and Time of Concentration (TOC) for each of the drainage management areas in the preconstruction condition.

Table 1. Preconstruction Condition

	DMA1	DMA 2	DMA 3
Area (ac)	1.75	0.8	0.81
Toc (Minute)	30.77	5.93	7.08
Volume (ft3)	1668	6996	7105

A39 Describe each discrete post-construction drainage area volume of discharge expected during the design storm and the preconstruction time of concentration for each drainage area.

The proposed site was delineated into three drainage management areas (DMA) DMA 1, DMA 2 and DMA 3. DMA 1 is 1.75 acres, DMA 2 is 0.8 acres and DMA 3 is 0.81 acres. DMA 1, DMA 2 and DMA 3 represent the same area in the preconstruction and post construction conditions. The following table identifies the flow volume and Time of Concentration (TOC) for each of the drainage management areas in the post construction condition.

Table 2. Post-Construction Condition

	DMA1	DMA 2	DMA 3
Area (ac)	1.75	0.8	0.81
Toc (Minute)	66.24	9.52	11.08
Volume (ft3)	453	0	1361

A40 Describe how the proposed project would meet the Model WQMP post construction discharge requirements for volume and TOC, including a description of any source controls, hydromodification controls, or treatment controls that could be utilized to achieve that goal storm and the preconstruction time of concentration for each drainage area.

The proposed project will meet Model WQMP post construction discharge requirements for volume and TOC by not exceeding the preconstruction condition Volume and TOC by more than 5% in the post construction condition as indicated by the WQMP Technical Guidance Manual. A WQMP will be developed for the project and submitted to the permittee for approval. Source control BMPs will include reduction of impervious area and impervious area dispersion. Hydromodification controls and treatment controls will consist of an underground perforated storm drain with underlying gravel within DMA 1. DMA 2 and DMA 3 will be managed with underground storm tech infiltration chamber systems within each DMA. The perforated underground storm drain system and storm tech chamber systems will provide retention of the Design Capture Volume to be stored and infiltrated onsite. The storage will be adequate to mitigate for increases in flow volume and reductions in times of concentration as indicated in the Table 1 and Table 2 above.

A41 Describe where these controls would be located on the site and discuss whether they would result in any change of the project layout.

The underground storm drain system will be integrated into the drainage conveyance system within Parcel 1. The storm tech system within DMA2 will be located on Parcel 2 adjacent to the Stanton Storm Drain Channel in the northeast section of the site. The storm tech system in DMA 3 will be located on the north western section of Parcel 2. These infiltration systems will provide disconnection from the inlet by storing the Design Capture Volume prior to discharging to the existing storm drain system. Surface flows from Parcel 1 will be routed through the perforated storm drain system and discharged to the existing outlet to the Stanton Storm Drain Channel. DMA 2 will drain to a proposed low flow inlet where an existing inlet currently resides. Flows will from the low flow inlet will be routed to a stormtech infiltration system. DMA 3 will drain to a low flow inlets where and existing inlet currently resides. Flows will from the low flow inlet will be routed to a stormtech infiltration system. High flows that exceed the storm tech capacity will spill to a high flow inlet and drain to the existing 36-inch storm drain that discharges to the Stanton Channel. The site plan will need to be updated slightly to show the revised locations of the stormtech systems. The site plan currently illustrates the layout for the underground perforated storm drain system.

Attachments

AES Software Output using Rational Method

Unit Hydrographs

Existing Condition Hydrology Exhibit

Proposed Condition Hydrology Exhibit

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
        (c) Copyright 1983-2011 Advanced Engineering Software (aes)
            Ver. 18.0  Release Date: 07/01/2011  License ID 1501

                          Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* Stanton Energy Reliability Center                                       *
* Preconstruction Condition                                                *
* 2 Year Storm Event                                                      *
 *************************************************************************

  FILE NAME: XEAST.DAT
  TIME/DATE OF STUDY: 16:33 04/25/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.5500
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5550

  *ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   341.00
  ELEVATION DATA: UPSTREAM(FEET) =     72.70  DOWNSTREAM(FEET) =     72.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   25.086
```

```
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.897
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "GRASS"                    B        0.88      0.30     1.000    50   25.09
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.47
  TOTAL AREA(ACRES) =      0.88   PEAK FLOW RATE(CFS) =      0.47

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     72.00  DOWNSTREAM(FEET) =     71.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   335.00   CHANNEL SLOPE =  0.0030
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.020   MAXIMUM DEPTH(FEET) =   1.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.802
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "GRASS"                    B        0.85      0.30     1.000    50
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.00
  AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   5.61
  Tc(MIN.) =   30.70
  SUBAREA AREA(ACRES) =     0.85       SUBAREA RUNOFF(CFS) =    0.39
  EFFECTIVE AREA(ACRES) =      1.73     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        1.7         PEAK FLOW RATE(CFS) =       0.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.14   FLOW VELOCITY(FEET/SEC.) =   1.06
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =     676.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    68.50  DOWNSTREAM(FEET) =    64.50
  FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   1.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.59
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.78
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   30.77
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    303.00 =     711.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   30.77
```

```
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.801
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.02      0.30     0.100    36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.02      SUBAREA RUNOFF(CFS) =    0.01
  EFFECTIVE AREA(ACRES) =      1.75   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =        1.7       PEAK FLOW RATE(CFS) =       0.79

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    204.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   160.00
  ELEVATION DATA: UPSTREAM(FEET) =     70.00  DOWNSTREAM(FEET) =     68.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.745
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.017
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.80      0.30     0.100    36    5.74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      1.43
  TOTAL AREA(ACRES) =      0.80   PEAK FLOW RATE(CFS) =      1.43

****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    205.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    65.50  DOWNSTREAM(FEET) =    64.00
  FLOW LENGTH(FEET) =    63.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   8.0 INCH PIPE IS   5.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.63
  GIVEN PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.43
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    5.93
  LONGEST FLOWPATH FROM NODE    203.00 TO NODE    205.00 =     223.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    206.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    64.00  DOWNSTREAM(FEET) =    63.60
  FLOW LENGTH(FEET) =   124.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   4.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.47
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.43
  PIPE TRAVEL TIME(MIN.) =   0.84    Tc(MIN.) =    6.77
  LONGEST FLOWPATH FROM NODE    203.00 TO NODE    206.00 =     347.00 FEET.
```

```
**************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
--------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   195.00
 ELEVATION DATA: UPSTREAM(FEET) =     69.90  DOWNSTREAM(FEET) =     68.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.725
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.850
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        0.81      0.30      0.100    36    6.72
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      1.33
 TOTAL AREA(ACRES) =      0.81   PEAK FLOW RATE(CFS) =      1.33

**************************************************************************
 FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  41
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    66.60  DOWNSTREAM(FEET) =    65.90
 FLOW LENGTH(FEET) =    81.00   MANNING'S N =  0.013
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.80
 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
 GIVEN PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.33
 PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    7.08
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =     276.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE    202.00 TO NODE    206.00 IS CODE =  41
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    65.90  DOWNSTREAM(FEET) =    63.60
 FLOW LENGTH(FEET) =   411.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  36.0 INCH PIPE IS   4.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   2.94
 GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.33
 PIPE TRAVEL TIME(MIN.) =   2.33    Tc(MIN.) =    9.41
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    206.00 =     687.00 FEET.
==========================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =        0.8  TC(MIN.) =      9.41
 EFFECTIVE AREA(ACRES) =      0.81  AREA-AVERAGED Fm(INCH/HR)=  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.100
 PEAK FLOW RATE(CFS)   =       1.33
==========================================================================
==========================================================================
 END OF RATIONAL METHOD ANALYSIS
```

♀

```
****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
        (c) Copyright 1983-2011 Advanced Engineering Software (aes)
            Ver. 18.0  Release Date: 07/01/2011  License ID 1501

                          Analysis prepared by:
```

```
 ************************** DESCRIPTION OF STUDY **************************
* Stanton Energy Reliablity Center                                        *
* Proposed Condition                                                      *
* 2 Year Storm Event                                                      *
 *************************************************************************

  FILE NAME: SERC1.DAT
  TIME/DATE OF STUDY: 15:51 03/30/2018
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.5500
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5550

  *ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    501.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   140.00
  ELEVATION DATA: UPSTREAM(FEET) =     72.50  DOWNSTREAM(FEET) =     71.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.982
```

```
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.812
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.25      0.30     0.350    36    6.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.25   PEAK FLOW RATE(CFS) =      0.38

****************************************************************************
  FLOW PROCESS FROM NODE    501.00 TO NODE    502.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    66.50  DOWNSTREAM(FEET) =    65.25
  FLOW LENGTH(FEET) =   156.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   1.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.74
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.38
  PIPE TRAVEL TIME(MIN.) =   0.95    Tc(MIN.) =    7.93
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    502.00 =     296.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    502.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.93
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.689
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.21      0.30     0.600    36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =    0.21      SUBAREA RUNOFF(CFS) =    0.29
  EFFECTIVE AREA(ACRES) =      0.46   AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.46
  TOTAL AREA(ACRES) =        0.5       PEAK FLOW RATE(CFS) =       0.64

****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    503.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    65.25  DOWNSTREAM(FEET) =    64.48
  FLOW LENGTH(FEET) =   111.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   2.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.06
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.64
  PIPE TRAVEL TIME(MIN.) =   0.60    Tc(MIN.) =    8.53
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    503.00 =     407.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    503.00 TO NODE    503.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
==========================================================================
  MAINLINE Tc(MIN.) =    8.53
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.622
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.15      0.30     0.500    36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA AREA(ACRES) =    0.15      SUBAREA RUNOFF(CFS) =    0.20
  EFFECTIVE AREA(ACRES) =      0.61   AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.47
  TOTAL AREA(ACRES) =        0.6       PEAK FLOW RATE(CFS) =       0.81

**************************************************************************
  FLOW PROCESS FROM NODE    503.00 TO NODE    504.00 IS CODE =  41
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    64.48  DOWNSTREAM(FEET) =    63.37
  FLOW LENGTH(FEET) =   156.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   2.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.29
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.81
  PIPE TRAVEL TIME(MIN.) =   0.79    Tc(MIN.) =    9.32
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    504.00 =     563.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    504.00 TO NODE    504.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =    9.32
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.545
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               B        0.24      0.30     0.350    36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.24      SUBAREA RUNOFF(CFS) =    0.31
  EFFECTIVE AREA(ACRES) =      0.85   AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.44
  TOTAL AREA(ACRES) =        0.9       PEAK FLOW RATE(CFS) =       1.08

**************************************************************************
  FLOW PROCESS FROM NODE    504.00 TO NODE    509.00 IS CODE =  41
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    63.37  DOWNSTREAM(FEET) =    59.50
  FLOW LENGTH(FEET) =    96.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   2.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.61
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.08
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =    9.56
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    509.00 =     659.00 FEET.
```

```
**************************************************************************
 FLOW PROCESS FROM NODE    509.00 TO NODE    509.00 IS CODE =   1
--------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.56
 RAINFALL INTENSITY(INCH/HR) =   1.52
 AREA-AVERAGED Fm(INCH/HR) =  0.13
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.44
 EFFECTIVE STREAM AREA(ACRES) =       0.85
 TOTAL STREAM AREA(ACRES) =       0.85
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.08

**************************************************************************
 FLOW PROCESS FROM NODE    505.00 TO NODE    506.00 IS CODE =  21
--------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   151.00
 ELEVATION DATA: UPSTREAM(FEET) =     73.00  DOWNSTREAM(FEET) =     71.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.999
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.809
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B        0.23      0.30     0.400    36    7.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
 SUBAREA RUNOFF(CFS) =      0.35
 TOTAL AREA(ACRES) =      0.23   PEAK FLOW RATE(CFS) =      0.35

**************************************************************************
 FLOW PROCESS FROM NODE    506.00 TO NODE    507.00 IS CODE =  41
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    66.50  DOWNSTREAM(FEET) =    66.25
 FLOW LENGTH(FEET) =   205.00   MANNING'S N =  0.010
 DEPTH OF FLOW IN  36.0 INCH PIPE IS   2.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   1.39
 GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.35
 PIPE TRAVEL TIME(MIN.) =   2.47    Tc(MIN.) =    9.46
 LONGEST FLOWPATH FROM NODE    505.00 TO NODE    507.00 =     356.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE    507.00 TO NODE    507.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
 MAINLINE Tc(MIN.) =    9.46
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.533
 SUBAREA LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.20      0.30     0.600    36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =    0.20      SUBAREA RUNOFF(CFS) =    0.24
  EFFECTIVE AREA(ACRES) =      0.43   AREA-AVERAGED Fm(INCH/HR) =  0.15
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.49
  TOTAL AREA(ACRES) =        0.4       PEAK FLOW RATE(CFS) =       0.54

****************************************************************************
  FLOW PROCESS FROM NODE    507.00 TO NODE    508.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    66.25  DOWNSTREAM(FEET) =    65.15
  FLOW LENGTH(FEET) =   175.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   2.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.79
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.54
  PIPE TRAVEL TIME(MIN.) =   1.05    Tc(MIN.) =   10.51
  LONGEST FLOWPATH FROM NODE    505.00 TO NODE    508.00 =     531.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    508.00 TO NODE    508.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   10.51
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.447
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.16      0.30     0.600    36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =    0.16      SUBAREA RUNOFF(CFS) =    0.18
  EFFECTIVE AREA(ACRES) =      0.59   AREA-AVERAGED Fm(INCH/HR) =  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.52
  TOTAL AREA(ACRES) =        0.6       PEAK FLOW RATE(CFS) =       0.69

****************************************************************************
  FLOW PROCESS FROM NODE    508.00 TO NODE    509.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    65.15  DOWNSTREAM(FEET) =    59.50
  FLOW LENGTH(FEET) =   114.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   1.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.19
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.69
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =   10.82
  LONGEST FLOWPATH FROM NODE    505.00 TO NODE    509.00 =     645.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    509.00 TO NODE    509.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

```
  MAINLINE Tc(MIN.) =   10.82
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.424
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS              B        0.19      0.30     0.350    36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.19      SUBAREA RUNOFF(CFS) =    0.23
  EFFECTIVE AREA(ACRES) =      0.78   AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.48
  TOTAL AREA(ACRES) =        0.8       PEAK FLOW RATE(CFS) =       0.90

****************************************************************************
  FLOW PROCESS FROM NODE    509.00 TO NODE    509.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.82
  RAINFALL INTENSITY(INCH/HR) =   1.42
  AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.48
  EFFECTIVE STREAM AREA(ACRES) =       0.78
  TOTAL STREAM AREA(ACRES) =       0.78
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.90

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.08    9.56    1.524  0.30( 0.13) 0.44       0.9     500.00
      2        0.90   10.82    1.424  0.30( 0.14) 0.48       0.8     505.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.94    9.56    1.524  0.30( 0.14) 0.46       1.5     500.00
      2        1.90   10.82    1.424  0.30( 0.14) 0.46       1.6     505.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.94    Tc(MIN.) =     9.56
  EFFECTIVE AREA(ACRES) =       1.54   AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.46
  TOTAL AREA(ACRES) =        1.6
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    509.00 =     659.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    509.00 TO NODE    510.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    59.50  DOWNSTREAM(FEET) =    58.50
  FLOW LENGTH(FEET) =   117.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   4.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.58
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
```

```
 PIPE-FLOW(CFS) =       1.94
 PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =    9.99
 LONGEST FLOWPATH FROM NODE    500.00 TO NODE    510.00 =     776.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    510.00 TO NODE    510.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    9.99
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.488
 SUBAREA LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 APARTMENTS                 B        0.12      0.30     0.200    36
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
 SUBAREA AREA(ACRES) =    0.12      SUBAREA RUNOFF(CFS) =    0.15
 EFFECTIVE AREA(ACRES) =      1.66   AREA-AVERAGED Fm(INCH/HR) =  0.13
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.44
 TOTAL AREA(ACRES) =        1.8       PEAK FLOW RATE(CFS) =       2.03

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   195.00
 ELEVATION DATA: UPSTREAM(FEET) =     69.90  DOWNSTREAM(FEET) =     68.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.684
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.434
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 PUBLIC PARK                B        0.81      0.30     0.850    36   10.68
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
 SUBAREA RUNOFF(CFS) =      0.86
 TOTAL AREA(ACRES) =      0.81   PEAK FLOW RATE(CFS) =      0.86

****************************************************************************
 FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    66.60  DOWNSTREAM(FEET) =    65.90
 FLOW LENGTH(FEET) =    81.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN   8.0 INCH PIPE IS   5.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.38
 GIVEN PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.86
 PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =   11.08
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =     276.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    202.00 TO NODE    205.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    65.90  DOWNSTREAM(FEET) =    63.97
  FLOW LENGTH(FEET) =   290.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   3.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.74
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.86
  PIPE TRAVEL TIME(MIN.) =   1.76    Tc(MIN.) =   12.85
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    205.00 =     566.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    205.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.85
  RAINFALL INTENSITY(INCH/HR) =   1.30
  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.85
  EFFECTIVE STREAM AREA(ACRES) =       0.81
  TOTAL STREAM AREA(ACRES) =       0.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.86

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    204.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   166.00
  ELEVATION DATA: UPSTREAM(FEET) =     70.00  DOWNSTREAM(FEET) =     68.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.331
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.545
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK                B        0.80      0.30     0.850    36    9.33
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
  SUBAREA RUNOFF(CFS) =      0.93
  TOTAL AREA(ACRES) =      0.80   PEAK FLOW RATE(CFS) =      0.93

****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    205.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    65.53  DOWNSTREAM(FEET) =    63.97
  FLOW LENGTH(FEET) =    61.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   8.0 INCH PIPE IS   4.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.27
  GIVEN PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.93
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    9.52
  LONGEST FLOWPATH FROM NODE    203.00 TO NODE    205.00 =     227.00 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE    205.00 TO NODE    205.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.52
 RAINFALL INTENSITY(INCH/HR) =   1.53
 AREA-AVERAGED Fm(INCH/HR) =  0.25
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.85
 EFFECTIVE STREAM AREA(ACRES) =       0.80
 TOTAL STREAM AREA(ACRES) =       0.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.93

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        0.86   12.85    1.296  0.30( 0.26) 0.85       0.8     200.00
     2        0.93    9.52    1.527  0.30( 0.25) 0.85       0.8     203.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        1.71    9.52    1.527  0.30( 0.25) 0.85       1.4     203.00
     2        1.62   12.85    1.296  0.30( 0.26) 0.85       1.6     200.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       1.71    Tc(MIN.) =     9.52
 EFFECTIVE AREA(ACRES) =       1.40   AREA-AVERAGED Fm(INCH/HR) =  0.26
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.85
 TOTAL AREA(ACRES) =        1.6
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    205.00 =     566.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =        1.6  TC(MIN.) =      9.52
 EFFECTIVE AREA(ACRES) =      1.40  AREA-AVERAGED Fm(INCH/HR)=  0.26
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.850
 PEAK FLOW RATE(CFS)   =       1.71

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        1.71    9.52    1.527  0.30( 0.25) 0.85       1.4     203.00
     2        1.62   12.85    1.296  0.30( 0.26) 0.85       1.6     200.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

♀

DMA 1 - Parcel 1 - Preconstruciton Condition

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==========================================================================
*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
   AND LOW LOSS FRACTION ESTIMATIONS FOR AMC I:

   TOTAL 24-HOUR DURATION RAINFALL DEPTH =    2.31 (inches)

   SOIL-COVER    AREA     PERCENT OF   SCS CURVE   LOSS RATE
     TYPE     (Acres)  PERVIOUS AREA    NUMBER   Fp(in./hr.)   YIELD
      1        1.75      98.80      69.(AMC II)    0.300      0.015

   TOTAL AREA (Acres) =     1.75

                 _
   AREA-AVERAGED LOSS RATE, Fm (in./hr.) =  0.296

                 _
   AREA-AVERAGED LOW LOSS FRACTION, Y = 0.985
==========================================================================

--------------------------------------------------------------------------


   RATIONAL METHOD CALIBRATION COEFFICIENT = 0.93
   TOTAL CATCHMENT AREA(ACRES) =    1.75
   SOIL-LOSS RATE, Fm,(INCH/HR) =  0.296
   LOW LOSS FRACTION = 0.985
   TIME OF CONCENTRATION(MIN.) = 30.77
   SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
   USER SPECIFIED RAINFALL VALUES ARE USED
   RETURN FREQUENCY(YEARS) =   2
     5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.17
    30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.40
     1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.56
     3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.98
     6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.36
    24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.31

--------------------------------------------------------------------------

   TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    0.04
   TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =    0.30

**************************************************************************
 TIME    VOLUME      Q   0.       2.5      5.0      7.5      10.0
(HOURS)   (AF)     (CFS)
--------------------------------------------------------------------------
 0.10     0.0000     0.00  Q       .        .        .        .
 0.61     0.0000     0.00  Q       .        .        .        .
```

1.13	0.0001	0.00	Q	.	.	.	.	
1.64	0.0001	0.00	Q	.	.	.	.	
2.15	0.0001	0.00	Q	.	.	.	.	
2.67	0.0002	0.00	Q	.	.	.	.	
3.18	0.0002	0.00	Q	.	.	.	.	
3.69	0.0003	0.00	Q	.	.	.	.	
4.20	0.0003	0.00	Q	.	.	.	.	
4.72	0.0004	0.00	Q	.	.	.	.	
5.23	0.0004	0.00	Q	.	.	.	.	
5.74	0.0004	0.00	Q	.	.	.	.	
6.26	0.0005	0.00	Q	.	.	.	.	
6.77	0.0005	0.00	Q	.	.	.	.	
7.28	0.0006	0.00	Q	.	.	.	.	
7.79	0.0007	0.00	Q	.	.	.	.	
8.31	0.0007	0.00	Q	.	.	.	.	
8.82	0.0008	0.00	Q	.	.	.	.	
9.33	0.0008	0.00	Q	.	.	.	.	
9.85	0.0009	0.00	Q	.	.	.	.	
10.36	0.0010	0.00	Q	.	.	.	.	
10.87	0.0010	0.00	Q	.	.	.	.	
11.38	0.0011	0.00	Q	.	.	.	.	
11.90	0.0012	0.00	Q	.	.	.	.	
12.41	0.0013	0.00	Q	.	.	.	.	
12.92	0.0014	0.00	Q	.	.	.	.	
13.44	0.0015	0.00	Q	.	.	.	.	
13.95	0.0017	0.00	Q	.	.	.	.	
14.46	0.0018	0.00	Q	.	.	.	.	
14.97	0.0020	0.00	Q	.	.	.	.	
15.49	0.0022	0.01	Q	.	.	.	.	
16.00	0.0030	0.03	Q	.	.	.	.	
16.51	0.0204	0.79	.	Q	.	.	.	.
17.03	0.0373	0.01	Q	.	.	.	.	
17.54	0.0375	0.00	Q	.	.	.	.	
18.05	0.0376	0.00	Q	.	.	.	.	
18.56	0.0377	0.00	Q	.	.	.	.	
19.08	0.0378	0.00	Q	.	.	.	.	
19.59	0.0378	0.00	Q	.	.	.	.	
20.10	0.0379	0.00	Q	.	.	.	.	
20.62	0.0380	0.00	Q	.	.	.	.	
21.13	0.0380	0.00	Q	.	.	.	.	
21.64	0.0381	0.00	Q	.	.	.	.	
22.15	0.0381	0.00	Q	.	.	.	.	
22.67	0.0382	0.00	Q	.	.	.	.	
23.18	0.0382	0.00	Q	.	.	.	.	
23.69	0.0383	0.00	Q	.	.	.	.	
24.21	0.0383	0.00	Q	.	.	.	.	
24.72	0.0383	0.00	Q	.	.	.	.	0

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1446.2
10%	30.8
20%	30.8
30%	30.8
40%	30.8
50%	30.8
60%	30.8
70%	30.8
80%	30.8
90%	30.8

DMA 2 - Parcel 2 - Preconstruction Condition

```
==========================================================================
*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
   AND LOW LOSS FRACTION ESTIMATIONS FOR AMC I:

   TOTAL 24-HOUR DURATION RAINFALL DEPTH =    2.31 (inches)

   SOIL-COVER    AREA     PERCENT OF   SCS CURVE   LOSS RATE
     TYPE     (Acres)  PERVIOUS AREA    NUMBER   Fp(in./hr.)   YIELD
      1        0.80       0.00      98.(AMC II)    0.010      0.901

   TOTAL AREA (Acres) =     0.80

   AREA-AVERAGED LOSS RATE, Fm (in./hr.) =  0.000

   AREA-AVERAGED LOW LOSS FRACTION, Y = 0.099
==========================================================================

--------------------------------------------------------------------------


   RATIONAL METHOD CALIBRATION COEFFICIENT = 1.05
   TOTAL CATCHMENT AREA(ACRES) =    0.80
   SOIL-LOSS RATE, Fm,(INCH/HR) =  0.000
   LOW LOSS FRACTION = 0.099
   TIME OF CONCENTRATION(MIN.) =  6.77
   SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
   USER SPECIFIED RAINFALL VALUES ARE USED
   RETURN FREQUENCY(YEARS) =   2
     5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.17
    30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.40
     1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.56
     3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.98
     6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.36
    24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.31

--------------------------------------------------------------------------

   TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    0.16
   TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =   -0.01

**************************************************************************
 TIME    VOLUME      Q   0.       2.5      5.0      7.5      10.0
(HOURS)   (AF)     (CFS)
--------------------------------------------------------------------------
 0.09     0.0001     0.03  Q       .        .        .        .
 0.20     0.0004     0.03  Q       .        .        .        .
```

0.32	0.0007	0.03	Q	.	.	.	.
0.43	0.0010	0.03	Q	.	.	.	.
0.54	0.0013	0.03	Q	.	.	.	.
0.65	0.0016	0.03	Q	.	.	.	.
0.77	0.0019	0.03	Q	.	.	.	.
0.88	0.0022	0.03	Q	.	.	.	.
0.99	0.0025	0.03	Q	.	.	.	.
1.11	0.0028	0.03	Q	.	.	.	.
1.22	0.0031	0.03	Q	.	.	.	.
1.33	0.0034	0.03	Q	.	.	.	.
1.44	0.0037	0.03	Q	.	.	.	.
1.56	0.0040	0.03	Q	.	.	.	.
1.67	0.0043	0.03	Q	.	.	.	.
1.78	0.0046	0.03	Q	.	.	.	.
1.90	0.0049	0.03	Q	.	.	.	.
2.01	0.0052	0.03	Q	.	.	.	.
2.12	0.0055	0.03	Q	.	.	.	.
2.23	0.0058	0.03	Q	.	.	.	.
2.35	0.0062	0.03	Q	.	.	.	.
2.46	0.0065	0.03	Q	.	.	.	.
2.57	0.0068	0.03	Q	.	.	.	.
2.69	0.0071	0.03	Q	.	.	.	.
2.80	0.0074	0.03	Q	.	.	.	.
2.91	0.0078	0.03	Q	.	.	.	.
3.02	0.0081	0.04	Q	.	.	.	.
3.14	0.0084	0.04	Q	.	.	.	.
3.25	0.0087	0.04	Q	.	.	.	.
3.36	0.0091	0.04	Q	.	.	.	.
3.48	0.0094	0.04	Q	.	.	.	.
3.59	0.0097	0.04	Q	.	.	.	.
3.70	0.0101	0.04	Q	.	.	.	.
3.81	0.0104	0.04	Q	.	.	.	.
3.93	0.0108	0.04	Q	.	.	.	.
4.04	0.0111	0.04	Q	.	.	.	.
4.15	0.0114	0.04	Q	.	.	.	.
4.27	0.0118	0.04	Q	.	.	.	.
4.38	0.0121	0.04	Q	.	.	.	.
4.49	0.0125	0.04	Q	.	.	.	.
4.60	0.0128	0.04	Q	.	.	.	.
4.72	0.0132	0.04	Q	.	.	.	.
4.83	0.0136	0.04	Q	.	.	.	.
4.94	0.0139	0.04	Q	.	.	.	.
5.06	0.0143	0.04	Q	.	.	.	.
5.17	0.0146	0.04	Q	.	.	.	.
5.28	0.0150	0.04	Q	.	.	.	.
5.39	0.0154	0.04	Q	.	.	.	.
5.51	0.0158	0.04	Q	.	.	.	.

5.62	0.0161	0.04	Q	.	.	.	.
5.73	0.0165	0.04	Q	.	.	.	.
5.85	0.0169	0.04	Q	.	.	.	.
5.96	0.0173	0.04	Q	.	.	.	.
6.07	0.0176	0.04	Q	.	.	.	.
6.18	0.0180	0.04	Q	.	.	.	.
6.30	0.0184	0.04	Q	.	.	.	.
6.41	0.0188	0.04	Q	.	.	.	.
6.52	0.0192	0.04	Q	.	.	.	.
6.63	0.0196	0.04	Q	.	.	.	.
6.75	0.0200	0.04	Q	.	.	.	.
6.86	0.0204	0.04	Q	.	.	.	.
6.97	0.0208	0.04	Q	.	.	.	.
7.09	0.0212	0.04	Q	.	.	.	.
7.20	0.0216	0.04	Q	.	.	.	.
7.31	0.0221	0.04	Q	.	.	.	.
7.42	0.0225	0.05	Q	.	.	.	.
7.54	0.0229	0.05	Q	.	.	.	.
7.65	0.0233	0.05	Q	.	.	.	.
7.76	0.0238	0.05	Q	.	.	.	.
7.88	0.0242	0.05	Q	.	.	.	.
7.99	0.0246	0.05	Q	.	.	.	.
8.10	0.0251	0.05	Q	.	.	.	.
8.21	0.0255	0.05	Q	.	.	.	.
8.33	0.0260	0.05	Q	.	.	.	.
8.44	0.0264	0.05	Q	.	.	.	.
8.55	0.0269	0.05	Q	.	.	.	.
8.67	0.0273	0.05	Q	.	.	.	.
8.78	0.0278	0.05	Q	.	.	.	.
8.89	0.0283	0.05	Q	.	.	.	.
9.00	0.0287	0.05	Q	.	.	.	.
9.12	0.0292	0.05	Q	.	.	.	.
9.23	0.0297	0.05	Q	.	.	.	.
9.34	0.0302	0.05	Q	.	.	.	.
9.46	0.0307	0.05	Q	.	.	.	.
9.57	0.0312	0.05	Q	.	.	.	.
9.68	0.0317	0.05	Q	.	.	.	.
9.79	0.0322	0.06	Q	.	.	.	.
9.91	0.0327	0.06	Q	.	.	.	.
10.02	0.0332	0.06	Q	.	.	.	.
10.13	0.0338	0.06	Q	.	.	.	.
10.25	0.0343	0.06	Q	.	.	.	.
10.36	0.0348	0.06	Q	.	.	.	.
10.47	0.0354	0.06	Q	.	.	.	.
10.58	0.0359	0.06	Q	.	.	.	.
10.70	0.0365	0.06	Q	.	.	.	.
10.81	0.0371	0.06	Q	.	.	.	.

10.92	0.0377	0.06	Q	.	.	.	.
11.04	0.0382	0.06	Q	.	.	.	.
11.15	0.0388	0.06	Q	.	.	.	.
11.26	0.0394	0.06	Q	.	.	.	.
11.37	0.0400	0.07	Q	.	.	.	.
11.49	0.0407	0.07	Q	.	.	.	.
11.60	0.0413	0.07	Q	.	.	.	.
11.71	0.0419	0.07	Q	.	.	.	.
11.83	0.0426	0.07	Q	.	.	.	.
11.94	0.0432	0.07	Q	.	.	.	.
12.05	0.0439	0.08	Q	.	.	.	.
12.16	0.0447	0.09	Q	.	.	.	.
12.28	0.0455	0.09	Q	.	.	.	.
12.39	0.0464	0.09	Q	.	.	.	.
12.50	0.0473	0.10	Q	.	.	.	.
12.62	0.0482	0.10	Q	.	.	.	.
12.73	0.0491	0.10	Q	.	.	.	.
12.84	0.0500	0.10	Q	.	.	.	.
12.95	0.0510	0.10	Q	.	.	.	.
13.07	0.0519	0.10	Q	.	.	.	.
13.18	0.0529	0.11	Q	.	.	.	.
13.29	0.0539	0.11	Q	.	.	.	.
13.40	0.0549	0.11	Q	.	.	.	.
13.52	0.0560	0.11	Q	.	.	.	.
13.63	0.0570	0.12	Q	.	.	.	.
13.74	0.0581	0.12	Q	.	.	.	.
13.86	0.0593	0.12	Q	.	.	.	.
13.97	0.0604	0.12	Q	.	.	.	.
14.08	0.0616	0.14	Q	.	.	.	.
14.19	0.0630	0.15	Q	.	.	.	.
14.31	0.0643	0.15	Q	.	.	.	.
14.42	0.0658	0.15	Q	.	.	.	.
14.53	0.0672	0.16	Q	.	.	.	.
14.65	0.0688	0.17	Q	.	.	.	.
14.76	0.0704	0.17	Q	.	.	.	.
14.87	0.0720	0.18	Q	.	.	.	.
14.98	0.0737	0.19	Q	.	.	.	.
15.10	0.0755	0.20	Q	.	.	.	.
15.21	0.0775	0.21	Q	.	.	.	.
15.32	0.0795	0.22	Q	.	.	.	.
15.44	0.0816	0.23	Q	.	.	.	.
15.55	0.0839	0.25	Q	.	.	.	.
15.66	0.0864	0.29	.Q	.	.	.	.
15.77	0.0892	0.32	.Q	.	.	.	.
15.89	0.0928	0.44	.Q	.	.	.	.
16.00	0.0975	0.57	. Q	.	.	.	.
16.11	0.1068	1.43	. Q	.	.	.	.

16.23	0.1152	0.37	.Q	.	.	.	.
16.34	0.1182	0.27	.Q	.	.	.	.
16.45	0.1205	0.23	Q	.	.	.	.
16.56	0.1226	0.21	Q	.	.	.	.
16.68	0.1244	0.18	Q	.	.	.	.
16.79	0.1260	0.17	Q	.	.	.	.
16.90	0.1276	0.16	Q	.	.	.	.
17.02	0.1290	0.15	Q	.	.	.	.
17.13	0.1303	0.13	Q	.	.	.	.
17.24	0.1314	0.12	Q	.	.	.	.
17.35	0.1325	0.11	Q	.	.	.	.
17.47	0.1336	0.11	Q	.	.	.	.
17.58	0.1346	0.11	Q	.	.	.	.
17.69	0.1355	0.10	Q	.	.	.	.
17.81	0.1365	0.10	Q	.	.	.	.
17.92	0.1374	0.09	Q	.	.	.	.
18.03	0.1382	0.09	Q	.	.	.	.
18.14	0.1390	0.07	Q	.	.	.	.
18.26	0.1397	0.07	Q	.	.	.	.
18.37	0.1403	0.07	Q	.	.	.	.
18.48	0.1409	0.07	Q	.	.	.	.
18.60	0.1415	0.06	Q	.	.	.	.
18.71	0.1421	0.06	Q	.	.	.	.
18.82	0.1427	0.06	Q	.	.	.	.
18.93	0.1432	0.06	Q	.	.	.	.
19.05	0.1438	0.06	Q	.	.	.	.
19.16	0.1443	0.06	Q	.	.	.	.
19.27	0.1448	0.05	Q	.	.	.	.
19.39	0.1453	0.05	Q	.	.	.	.
19.50	0.1458	0.05	Q	.	.	.	.
19.61	0.1463	0.05	Q	.	.	.	.
19.72	0.1468	0.05	Q	.	.	.	.
19.84	0.1472	0.05	Q	.	.	.	.
19.95	0.1477	0.05	Q	.	.	.	.
20.06	0.1481	0.05	Q	.	.	.	.
20.17	0.1486	0.05	Q	.	.	.	.
20.29	0.1490	0.05	Q	.	.	.	.
20.40	0.1494	0.05	Q	.	.	.	.
20.51	0.1499	0.04	Q	.	.	.	.
20.63	0.1503	0.04	Q	.	.	.	.
20.74	0.1507	0.04	Q	.	.	.	.
20.85	0.1511	0.04	Q	.	.	.	.
20.96	0.1515	0.04	Q	.	.	.	.
21.08	0.1519	0.04	Q	.	.	.	.
21.19	0.1522	0.04	Q	.	.	.	.
21.30	0.1526	0.04	Q	.	.	.	.
21.42	0.1530	0.04	Q	.	.	.	.

21.53	0.1534	0.04	Q	.	.	.	.
21.64	0.1537	0.04	Q	.	.	.	.
21.75	0.1541	0.04	Q	.	.	.	.
21.87	0.1544	0.04	Q	.	.	.	.
21.98	0.1548	0.04	Q	.	.	.	.
22.09	0.1551	0.04	Q	.	.	.	.
22.21	0.1555	0.04	Q	.	.	.	.
22.32	0.1558	0.04	Q	.	.	.	.
22.43	0.1562	0.04	Q	.	.	.	.
22.54	0.1565	0.04	Q	.	.	.	.
22.66	0.1568	0.03	Q	.	.	.	.
22.77	0.1571	0.03	Q	.	.	.	.
22.88	0.1575	0.03	Q	.	.	.	.
23.00	0.1578	0.03	Q	.	.	.	.
23.11	0.1581	0.03	Q	.	.	.	.
23.22	0.1584	0.03	Q	.	.	.	.
23.33	0.1587	0.03	Q	.	.	.	.
23.45	0.1590	0.03	Q	.	.	.	.
23.56	0.1593	0.03	Q	.	.	.	.
23.67	0.1596	0.03	Q	.	.	.	.
23.79	0.1599	0.03	Q	.	.	.	.
23.90	0.1602	0.03	Q	.	.	.	.
24.01	0.1605	0.03	Q	.	.	.	.
24.12	0.1606	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1442.0
10%	176.0
20%	40.6
30%	20.3
40%	6.8
50%	6.8
60%	6.8
70%	6.8
80%	6.8
90%	6.8

DMA 3 - Parcel 2 - Preconstruction Condition

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==========================================================================
*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
   AND LOW LOSS FRACTION ESTIMATIONS FOR AMC I:

   TOTAL 24-HOUR DURATION RAINFALL DEPTH =    2.31 (inches)

   SOIL-COVER    AREA     PERCENT OF   SCS CURVE   LOSS RATE
     TYPE     (Acres)  PERVIOUS AREA    NUMBER   Fp(in./hr.)   YIELD
      1        0.81      10.00      98.(AMC II)    0.300      0.888

   TOTAL AREA (Acres) =     0.81

   AREA-AVERAGED LOSS RATE, Fm (in./hr.) =  0.030

   AREA-AVERAGED LOW LOSS FRACTION, Y = 0.112
==========================================================================

--------------------------------------------------------------------------


   RATIONAL METHOD CALIBRATION COEFFICIENT = 1.17
   TOTAL CATCHMENT AREA(ACRES) =    0.81
   SOIL-LOSS RATE, Fm,(INCH/HR) =  0.030
   LOW LOSS FRACTION = 0.112
   TIME OF CONCENTRATION(MIN.) =  9.41
   SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
   USER SPECIFIED RAINFALL VALUES ARE USED
   RETURN FREQUENCY(YEARS) =   2
     5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.17
    30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.40
     1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.56
     3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.98
     6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.36
    24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.31

--------------------------------------------------------------------------

   TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    0.16
   TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =   -0.01

**************************************************************************
 TIME    VOLUME      Q   0.       2.5      5.0      7.5      10.0
(HOURS)   (AF)     (CFS)
--------------------------------------------------------------------------
 0.00     0.0000     0.00  Q       .        .        .        .
 0.16     0.0002     0.03  Q       .        .        .        .
```

0.32	0.0006	0.03	Q	.	.	.	.
0.47	0.0010	0.03	Q	.	.	.	.
0.63	0.0014	0.03	Q	.	.	.	.
0.79	0.0018	0.03	Q	.	.	.	.
0.94	0.0022	0.03	Q	.	.	.	.
1.10	0.0026	0.03	Q	.	.	.	.
1.26	0.0031	0.03	Q	.	.	.	.
1.41	0.0035	0.03	Q	.	.	.	.
1.57	0.0039	0.03	Q	.	.	.	.
1.73	0.0043	0.03	Q	.	.	.	.
1.89	0.0048	0.03	Q	.	.	.	.
2.04	0.0052	0.03	Q	.	.	.	.
2.20	0.0056	0.03	Q	.	.	.	.
2.36	0.0061	0.03	Q	.	.	.	.
2.51	0.0065	0.03	Q	.	.	.	.
2.67	0.0069	0.03	Q	.	.	.	.
2.83	0.0074	0.03	Q	.	.	.	.
2.98	0.0078	0.03	Q	.	.	.	.
3.14	0.0083	0.04	Q	.	.	.	.
3.30	0.0088	0.04	Q	.	.	.	.
3.45	0.0092	0.04	Q	.	.	.	.
3.61	0.0097	0.04	Q	.	.	.	.
3.77	0.0101	0.04	Q	.	.	.	.
3.92	0.0106	0.04	Q	.	.	.	.
4.08	0.0111	0.04	Q	.	.	.	.
4.24	0.0116	0.04	Q	.	.	.	.
4.39	0.0121	0.04	Q	.	.	.	.
4.55	0.0125	0.04	Q	.	.	.	.
4.71	0.0130	0.04	Q	.	.	.	.
4.86	0.0135	0.04	Q	.	.	.	.
5.02	0.0140	0.04	Q	.	.	.	.
5.18	0.0145	0.04	Q	.	.	.	.
5.34	0.0150	0.04	Q	.	.	.	.
5.49	0.0155	0.04	Q	.	.	.	.
5.65	0.0161	0.04	Q	.	.	.	.
5.81	0.0166	0.04	Q	.	.	.	.
5.96	0.0171	0.04	Q	.	.	.	.
6.12	0.0176	0.04	Q	.	.	.	.
6.28	0.0182	0.04	Q	.	.	.	.
6.43	0.0187	0.04	Q	.	.	.	.
6.59	0.0193	0.04	Q	.	.	.	.
6.75	0.0198	0.04	Q	.	.	.	.
6.90	0.0204	0.04	Q	.	.	.	.
7.06	0.0210	0.04	Q	.	.	.	.
7.22	0.0215	0.04	Q	.	.	.	.
7.37	0.0221	0.04	Q	.	.	.	.
7.53	0.0227	0.05	Q	.	.	.	.

7.69	0.0233	0.05	Q	.	.	.	.
7.84	0.0239	0.05	Q	.	.	.	.
8.00	0.0245	0.05	Q	.	.	.	.
8.16	0.0251	0.05	Q	.	.	.	.
8.32	0.0257	0.05	Q	.	.	.	.
8.47	0.0263	0.05	Q	.	.	.	.
8.63	0.0270	0.05	Q	.	.	.	.
8.79	0.0276	0.05	Q	.	.	.	.
8.94	0.0283	0.05	Q	.	.	.	.
9.10	0.0289	0.05	Q	.	.	.	.
9.26	0.0296	0.05	Q	.	.	.	.
9.41	0.0303	0.05	Q	.	.	.	.
9.57	0.0310	0.05	Q	.	.	.	.
9.73	0.0317	0.05	Q	.	.	.	.
9.88	0.0324	0.06	Q	.	.	.	.
10.04	0.0331	0.06	Q	.	.	.	.
10.20	0.0338	0.06	Q	.	.	.	.
10.35	0.0346	0.06	Q	.	.	.	.
10.51	0.0353	0.06	Q	.	.	.	.
10.67	0.0361	0.06	Q	.	.	.	.
10.82	0.0369	0.06	Q	.	.	.	.
10.98	0.0377	0.06	Q	.	.	.	.
11.14	0.0385	0.06	Q	.	.	.	.
11.30	0.0393	0.06	Q	.	.	.	.
11.45	0.0402	0.07	Q	.	.	.	.
11.61	0.0410	0.07	Q	.	.	.	.
11.77	0.0419	0.07	Q	.	.	.	.
11.92	0.0428	0.07	Q	.	.	.	.
12.08	0.0438	0.08	Q	.	.	.	.
12.24	0.0449	0.09	Q	.	.	.	.
12.39	0.0460	0.09	Q	.	.	.	.
12.55	0.0473	0.09	Q	.	.	.	.
12.71	0.0485	0.10	Q	.	.	.	.
12.86	0.0498	0.10	Q	.	.	.	.
13.02	0.0511	0.10	Q	.	.	.	.
13.18	0.0524	0.10	Q	.	.	.	.
13.33	0.0538	0.11	Q	.	.	.	.
13.49	0.0553	0.11	Q	.	.	.	.
13.65	0.0567	0.12	Q	.	.	.	.
13.80	0.0582	0.12	Q	.	.	.	.
13.96	0.0598	0.12	Q	.	.	.	.
14.12	0.0615	0.13	Q	.	.	.	.
14.27	0.0633	0.15	Q	.	.	.	.
14.43	0.0652	0.15	Q	.	.	.	.
14.59	0.0673	0.16	Q	.	.	.	.
14.75	0.0694	0.17	Q	.	.	.	.
14.90	0.0717	0.18	Q	.	.	.	.

15.06	0.0741	0.19	Q	.	.	.	.
15.22	0.0767	0.21	Q	.	.	.	.
15.37	0.0795	0.22	Q	.	.	.	.
15.53	0.0825	0.25	Q	.	.	.	.
15.69	0.0860	0.28	.Q	.	.	.	.
15.84	0.0902	0.39	.Q	.	.	.	.
16.00	0.0961	0.52	. Q	.	.	.	.
16.16	0.1080	1.33	. Q	.	.	.	.
16.31	0.1187	0.32	.Q	.	.	.	.
16.47	0.1223	0.24	Q	.	.	.	.
16.63	0.1252	0.20	Q	.	.	.	.
16.78	0.1276	0.17	Q	.	.	.	.
16.94	0.1297	0.16	Q	.	.	.	.
17.10	0.1317	0.14	Q	.	.	.	.
17.25	0.1334	0.12	Q	.	.	.	.
17.41	0.1349	0.11	Q	.	.	.	.
17.57	0.1364	0.11	Q	.	.	.	.
17.73	0.1377	0.10	Q	.	.	.	.
17.88	0.1390	0.10	Q	.	.	.	.
18.04	0.1402	0.09	Q	.	.	.	.
18.20	0.1413	0.07	Q	.	.	.	.
18.35	0.1422	0.07	Q	.	.	.	.
18.51	0.1430	0.07	Q	.	.	.	.
18.67	0.1439	0.06	Q	.	.	.	.
18.82	0.1447	0.06	Q	.	.	.	.
18.98	0.1454	0.06	Q	.	.	.	.
19.14	0.1462	0.06	Q	.	.	.	.
19.29	0.1469	0.05	Q	.	.	.	.
19.45	0.1476	0.05	Q	.	.	.	.
19.61	0.1483	0.05	Q	.	.	.	.
19.76	0.1489	0.05	Q	.	.	.	.
19.92	0.1496	0.05	Q	.	.	.	.
20.08	0.1502	0.05	Q	.	.	.	.
20.23	0.1508	0.05	Q	.	.	.	.
20.39	0.1514	0.05	Q	.	.	.	.
20.55	0.1520	0.04	Q	.	.	.	.
20.70	0.1526	0.04	Q	.	.	.	.
20.86	0.1531	0.04	Q	.	.	.	.
21.02	0.1537	0.04	Q	.	.	.	.
21.18	0.1542	0.04	Q	.	.	.	.
21.33	0.1547	0.04	Q	.	.	.	.
21.49	0.1553	0.04	Q	.	.	.	.
21.65	0.1558	0.04	Q	.	.	.	.
21.80	0.1563	0.04	Q	.	.	.	.
21.96	0.1568	0.04	Q	.	.	.	.
22.12	0.1572	0.04	Q	.	.	.	.
22.27	0.1577	0.04	Q	.	.	.	.

22.43	0.1582	0.04	Q	.	.	.	.
22.59	0.1586	0.04	Q	.	.	.	.
22.74	0.1591	0.03	Q	.	.	.	.
22.90	0.1595	0.03	Q	.	.	.	.
23.06	0.1600	0.03	Q	.	.	.	.
23.21	0.1604	0.03	Q	.	.	.	.
23.37	0.1608	0.03	Q	.	.	.	.
23.53	0.1613	0.03	Q	.	.	.	.
23.68	0.1617	0.03	Q	.	.	.	.
23.84	0.1621	0.03	Q	.	.	.	.
24.00	0.1625	0.03	Q	.	.	.	.
24.16	0.1629	0.03	Q	.	.	.	.
24.31	0.1631	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1449.1
10%	178.8
20%	47.0
30%	18.8
40%	9.4
50%	9.4
60%	9.4
70%	9.4
80%	9.4
90%	9.4

DMA 1 - Parcel 1 - Post Construction Hydrograph

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*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
   AND LOW LOSS FRACTION ESTIMATIONS FOR AMC I:

   TOTAL 24-HOUR DURATION RAINFALL DEPTH =     2.31 (inches)

   SOIL-COVER     AREA      PERCENT OF    SCS CURVE    LOSS RATE
     TYPE      (Acres)   PERVIOUS AREA     NUMBER    Fp(in./hr.)    YIELD
      1         0.75        0.00       98.(AMC II)     0.000       0.901
      2         1.00      100.00        72.(AMC II)     0.768       0.013

   TOTAL AREA (Acres) =      1.75

                 _
   AREA-AVERAGED LOSS RATE, Fm (in./hr.) =  0.439

                 _
   AREA-AVERAGED LOW LOSS FRACTION, Y = 0.606
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   RATIONAL METHOD CALIBRATION COEFFICIENT = 1.18
   TOTAL CATCHMENT AREA(ACRES) =    1.75
   SOIL-LOSS RATE, Fm,(INCH/HR) =  0.439
   LOW LOSS FRACTION = 0.606
   TIME OF CONCENTRATION(MIN.) =  9.99
   SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
   USER SPECIFIED RAINFALL VALUES ARE USED
   RETURN FREQUENCY(YEARS) =   2
     5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.17
    30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.40
     1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.56
     3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.98
     6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.36
    24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.31

------------------------------------------------------------------------------

   TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.17
   TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     0.17

**************************************************************
 TIME    VOLUME      Q   0.       2.5       5.0       7.5      10.0
(HOURS)   (AF)     (CFS)
------------------------------------------------------------------------------
```

0.02	0.0000	0.00	Q	.	.	.	.
0.18	0.0002	0.03	Q	.	.	.	.
0.35	0.0006	0.03	Q	.	.	.	.
0.52	0.0010	0.03	Q	.	.	.	.
0.68	0.0015	0.03	Q	.	.	.	.
0.85	0.0019	0.03	Q	.	.	.	.
1.02	0.0023	0.03	Q	.	.	.	.
1.18	0.0027	0.03	Q	.	.	.	.
1.35	0.0032	0.03	Q	.	.	.	.
1.51	0.0036	0.03	Q	.	.	.	.
1.68	0.0040	0.03	Q	.	.	.	.
1.85	0.0045	0.03	Q	.	.	.	.
2.01	0.0049	0.03	Q	.	.	.	.
2.18	0.0054	0.03	Q	.	.	.	.
2.35	0.0058	0.03	Q	.	.	.	.
2.51	0.0063	0.03	Q	.	.	.	.
2.68	0.0067	0.03	Q	.	.	.	.
2.85	0.0072	0.03	Q	.	.	.	.
3.01	0.0076	0.03	Q	.	.	.	.
3.18	0.0081	0.03	Q	.	.	.	.
3.35	0.0086	0.03	Q	.	.	.	.
3.51	0.0091	0.03	Q	.	.	.	.
3.68	0.0095	0.03	Q	.	.	.	.
3.85	0.0100	0.04	Q	.	.	.	.
4.01	0.0105	0.04	Q	.	.	.	.
4.18	0.0110	0.04	Q	.	.	.	.
4.35	0.0115	0.04	Q	.	.	.	.
4.51	0.0120	0.04	Q	.	.	.	.
4.68	0.0125	0.04	Q	.	.	.	.
4.84	0.0130	0.04	Q	.	.	.	.
5.01	0.0135	0.04	Q	.	.	.	.
5.18	0.0140	0.04	Q	.	.	.	.
5.34	0.0146	0.04	Q	.	.	.	.
5.51	0.0151	0.04	Q	.	.	.	.
5.68	0.0156	0.04	Q	.	.	.	.
5.84	0.0162	0.04	Q	.	.	.	.
6.01	0.0167	0.04	Q	.	.	.	.
6.18	0.0173	0.04	Q	.	.	.	.
6.34	0.0178	0.04	Q	.	.	.	.
6.51	0.0184	0.04	Q	.	.	.	.
6.68	0.0189	0.04	Q	.	.	.	.
6.84	0.0195	0.04	Q	.	.	.	.
7.01	0.0201	0.04	Q	.	.	.	.
7.18	0.0207	0.04	Q	.	.	.	.
7.34	0.0213	0.04	Q	.	.	.	.
7.51	0.0219	0.04	Q	.	.	.	.
7.68	0.0225	0.04	Q	.	.	.	.

7.84	0.0231	0.05	Q	.	.	.	.
8.01	0.0237	0.05	Q	.	.	.	.
8.17	0.0243	0.05	Q	.	.	.	.
8.34	0.0250	0.05	Q	.	.	.	.
8.51	0.0256	0.05	Q	.	.	.	.
8.67	0.0263	0.05	Q	.	.	.	.
8.84	0.0269	0.05	Q	.	.	.	.
9.01	0.0276	0.05	Q	.	.	.	.
9.17	0.0283	0.05	Q	.	.	.	.
9.34	0.0290	0.05	Q	.	.	.	.
9.51	0.0297	0.05	Q	.	.	.	.
9.67	0.0304	0.05	Q	.	.	.	.
9.84	0.0311	0.05	Q	.	.	.	.
10.01	0.0319	0.05	Q	.	.	.	.
10.17	0.0326	0.06	Q	.	.	.	.
10.34	0.0334	0.06	Q	.	.	.	.
10.51	0.0342	0.06	Q	.	.	.	.
10.67	0.0350	0.06	Q	.	.	.	.
10.84	0.0358	0.06	Q	.	.	.	.
11.01	0.0366	0.06	Q	.	.	.	.
11.17	0.0374	0.06	Q	.	.	.	.
11.34	0.0383	0.06	Q	.	.	.	.
11.50	0.0392	0.06	Q	.	.	.	.
11.67	0.0401	0.07	Q	.	.	.	.
11.84	0.0410	0.07	Q	.	.	.	.
12.00	0.0419	0.07	Q	.	.	.	.
12.17	0.0430	0.09	Q	.	.	.	.
12.34	0.0442	0.09	Q	.	.	.	.
12.50	0.0455	0.09	Q	.	.	.	.
12.67	0.0467	0.09	Q	.	.	.	.
12.84	0.0480	0.10	Q	.	.	.	.
13.00	0.0494	0.10	Q	.	.	.	.
13.17	0.0508	0.10	Q	.	.	.	.
13.34	0.0522	0.10	Q	.	.	.	.
13.50	0.0537	0.11	Q	.	.	.	.
13.67	0.0552	0.11	Q	.	.	.	.
13.84	0.0568	0.12	Q	.	.	.	.
14.00	0.0584	0.12	Q	.	.	.	.
14.17	0.0602	0.14	Q	.	.	.	.
14.34	0.0621	0.14	Q	.	.	.	.
14.50	0.0641	0.15	Q	.	.	.	.
14.67	0.0662	0.16	Q	.	.	.	.
14.83	0.0685	0.17	Q	.	.	.	.
15.00	0.0708	0.18	Q	.	.	.	.
15.17	0.0734	0.20	Q	.	.	.	.
15.33	0.0762	0.21	Q	.	.	.	.
15.50	0.0792	0.23	Q	.	.	.	.

15.67	0.0826	0.26	.Q	.	.	.	.
15.83	0.0867	0.34	.Q	.	.	.	.
16.00	0.0922	0.45	.Q	.	.	.	.
16.17	0.1093	2.03	.	Q	.	.	.
16.33	0.1252	0.29	.Q	.	.	.	.
16.50	0.1288	0.22	Q	.	.	.	.
16.67	0.1316	0.19	Q	.	.	.	.
16.83	0.1340	0.16	Q	.	.	.	.
17.00	0.1361	0.15	Q	.	.	.	.
17.17	0.1380	0.12	Q	.	.	.	.
17.33	0.1396	0.11	Q	.	.	.	.
17.50	0.1411	0.11	Q	.	.	.	.
17.67	0.1426	0.10	Q	.	.	.	.
17.83	0.1439	0.10	Q	.	.	.	.
18.00	0.1452	0.09	Q	.	.	.	.
18.16	0.1463	0.07	Q	.	.	.	.
18.33	0.1472	0.07	Q	.	.	.	.
18.50	0.1481	0.06	Q	.	.	.	.
18.66	0.1490	0.06	Q	.	.	.	.
18.83	0.1498	0.06	Q	.	.	.	.
19.00	0.1506	0.06	Q	.	.	.	.
19.16	0.1514	0.05	Q	.	.	.	.
19.33	0.1521	0.05	Q	.	.	.	.
19.50	0.1528	0.05	Q	.	.	.	.
19.66	0.1535	0.05	Q	.	.	.	.
19.83	0.1542	0.05	Q	.	.	.	.
20.00	0.1548	0.05	Q	.	.	.	.
20.16	0.1555	0.05	Q	.	.	.	.
20.33	0.1561	0.04	Q	.	.	.	.
20.50	0.1567	0.04	Q	.	.	.	.
20.66	0.1573	0.04	Q	.	.	.	.
20.83	0.1579	0.04	Q	.	.	.	.
20.99	0.1585	0.04	Q	.	.	.	.
21.16	0.1590	0.04	Q	.	.	.	.
21.33	0.1596	0.04	Q	.	.	.	.
21.49	0.1601	0.04	Q	.	.	.	.
21.66	0.1606	0.04	Q	.	.	.	.
21.83	0.1611	0.04	Q	.	.	.	.
21.99	0.1616	0.04	Q	.	.	.	.
22.16	0.1621	0.04	Q	.	.	.	.
22.33	0.1626	0.04	Q	.	.	.	.
22.49	0.1631	0.03	Q	.	.	.	.
22.66	0.1636	0.03	Q	.	.	.	.
22.83	0.1640	0.03	Q	.	.	.	.
22.99	0.1645	0.03	Q	.	.	.	.
23.16	0.1649	0.03	Q	.	.	.	.
23.33	0.1654	0.03	Q	.	.	.	.

23.49	0.1658	0.03	Q	.	.	.	.
23.66	0.1662	0.03	Q	.	.	.	.
23.83	0.1667	0.03	Q	.	.	.	.
23.99	0.1671	0.03	Q	.	.	.	.
24.16	0.1675	0.03	Q	.	.	.	.
24.33	0.1677	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1448.5
10%	79.9
20%	20.0
30%	10.0
40%	10.0
50%	10.0
60%	10.0
70%	10.0
80%	10.0
90%	10.0

DMA 2 - Parcel 2 - Post Construction Hydrograph

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==========================================================================
 *** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
    AND LOW LOSS FRACTION ESTIMATIONS FOR AMC I:

    TOTAL 24-HOUR DURATION RAINFALL DEPTH =     2.31 (inches)

    SOIL-COVER     AREA      PERCENT OF    SCS CURVE    LOSS RATE
      TYPE      (Acres)   PERVIOUS AREA     NUMBER    Fp(in./hr.)    YIELD
       1         0.13        0.00       98.(AMC II)     0.000       0.901
       2         0.67      100.00       72.(AMC II)     0.768       0.013

    TOTAL AREA (Acres) =      0.80

                  _
    AREA-AVERAGED LOSS RATE, Fm (in./hr.) =  0.643

                  _
    AREA-AVERAGED LOW LOSS FRACTION, Y = 0.842
==========================================================================

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    RATIONAL METHOD CALIBRATION COEFFICIENT = 1.40
    TOTAL CATCHMENT AREA(ACRES) =    0.80
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.643
    LOW LOSS FRACTION = 0.842
    TIME OF CONCENTRATION(MIN.) =  9.33
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
      5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.17
     30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.40
      1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.56
      3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.98
      6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.36
     24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.31

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    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.04
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     0.11

**************************************************************************
  TIME    VOLUME      Q   0.       2.5       5.0       7.5      10.0
 (HOURS)   (AF)     (CFS)
--------------------------------------------------------------------------
```

0.14	0.0000	0.01	Q	.	.	.	.
0.29	0.0001	0.01	Q	.	.	.	.
0.45	0.0002	0.01	Q	.	.	.	.
0.61	0.0003	0.01	Q	.	.	.	.
0.76	0.0004	0.01	Q	.	.	.	.
0.92	0.0005	0.01	Q	.	.	.	.
1.07	0.0006	0.01	Q	.	.	.	.
1.23	0.0006	0.01	Q	.	.	.	.
1.38	0.0007	0.01	Q	.	.	.	.
1.54	0.0008	0.01	Q	.	.	.	.
1.69	0.0009	0.01	Q	.	.	.	.
1.85	0.0010	0.01	Q	.	.	.	.
2.01	0.0011	0.01	Q	.	.	.	.
2.16	0.0012	0.01	Q	.	.	.	.
2.32	0.0013	0.01	Q	.	.	.	.
2.47	0.0014	0.01	Q	.	.	.	.
2.63	0.0015	0.01	Q	.	.	.	.
2.78	0.0015	0.01	Q	.	.	.	.
2.94	0.0016	0.01	Q	.	.	.	.
3.09	0.0017	0.01	Q	.	.	.	.
3.25	0.0018	0.01	Q	.	.	.	.
3.40	0.0019	0.01	Q	.	.	.	.
3.56	0.0020	0.01	Q	.	.	.	.
3.72	0.0021	0.01	Q	.	.	.	.
3.87	0.0022	0.01	Q	.	.	.	.
4.03	0.0023	0.01	Q	.	.	.	.
4.18	0.0024	0.01	Q	.	.	.	.
4.34	0.0025	0.01	Q	.	.	.	.
4.49	0.0026	0.01	Q	.	.	.	.
4.65	0.0027	0.01	Q	.	.	.	.
4.80	0.0028	0.01	Q	.	.	.	.
4.96	0.0029	0.01	Q	.	.	.	.
5.11	0.0030	0.01	Q	.	.	.	.
5.27	0.0031	0.01	Q	.	.	.	.
5.43	0.0032	0.01	Q	.	.	.	.
5.58	0.0034	0.01	Q	.	.	.	.
5.74	0.0035	0.01	Q	.	.	.	.
5.89	0.0036	0.01	Q	.	.	.	.
6.05	0.0037	0.01	Q	.	.	.	.
6.20	0.0038	0.01	Q	.	.	.	.
6.36	0.0039	0.01	Q	.	.	.	.
6.51	0.0040	0.01	Q	.	.	.	.
6.67	0.0041	0.01	Q	.	.	.	.
6.83	0.0043	0.01	Q	.	.	.	.
6.98	0.0044	0.01	Q	.	.	.	.
7.14	0.0045	0.01	Q	.	.	.	.
7.29	0.0046	0.01	Q	.	.	.	.

7.45	0.0047	0.01	Q	.	.	.	.
7.60	0.0049	0.01	Q	.	.	.	.
7.76	0.0050	0.01	Q	.	.	.	.
7.91	0.0051	0.01	Q	.	.	.	.
8.07	0.0052	0.01	Q	.	.	.	.
8.23	0.0054	0.01	Q	.	.	.	.
8.38	0.0055	0.01	Q	.	.	.	.
8.54	0.0056	0.01	Q	.	.	.	.
8.69	0.0058	0.01	Q	.	.	.	.
8.85	0.0059	0.01	Q	.	.	.	.
9.00	0.0060	0.01	Q	.	.	.	.
9.16	0.0062	0.01	Q	.	.	.	.
9.31	0.0063	0.01	Q	.	.	.	.
9.47	0.0064	0.01	Q	.	.	.	.
9.62	0.0066	0.01	Q	.	.	.	.
9.78	0.0067	0.01	Q	.	.	.	.
9.94	0.0069	0.01	Q	.	.	.	.
10.09	0.0070	0.01	Q	.	.	.	.
10.25	0.0072	0.01	Q	.	.	.	.
10.40	0.0073	0.01	Q	.	.	.	.
10.56	0.0075	0.01	Q	.	.	.	.
10.71	0.0077	0.01	Q	.	.	.	.
10.87	0.0078	0.01	Q	.	.	.	.
11.02	0.0080	0.01	Q	.	.	.	.
11.18	0.0082	0.01	Q	.	.	.	.
11.34	0.0083	0.01	Q	.	.	.	.
11.49	0.0085	0.01	Q	.	.	.	.
11.65	0.0087	0.01	Q	.	.	.	.
11.80	0.0089	0.01	Q	.	.	.	.
11.96	0.0091	0.01	Q	.	.	.	.
12.11	0.0093	0.02	Q	.	.	.	.
12.27	0.0095	0.02	Q	.	.	.	.
12.42	0.0098	0.02	Q	.	.	.	.
12.58	0.0100	0.02	Q	.	.	.	.
12.73	0.0103	0.02	Q	.	.	.	.
12.89	0.0106	0.02	Q	.	.	.	.
13.05	0.0108	0.02	Q	.	.	.	.
13.20	0.0111	0.02	Q	.	.	.	.
13.36	0.0114	0.02	Q	.	.	.	.
13.51	0.0117	0.02	Q	.	.	.	.
13.67	0.0120	0.02	Q	.	.	.	.
13.82	0.0123	0.03	Q	.	.	.	.
13.98	0.0127	0.03	Q	.	.	.	.
14.13	0.0130	0.03	Q	.	.	.	.
14.29	0.0134	0.03	Q	.	.	.	.
14.45	0.0138	0.03	Q	.	.	.	.
14.60	0.0142	0.03	Q	.	.	.	.

14.76	0.0147	0.04	Q	.	.	.	.
14.91	0.0151	0.04	Q	.	.	.	.
15.07	0.0156	0.04	Q	.	.	.	.
15.22	0.0162	0.04	Q	.	.	.	.
15.38	0.0168	0.05	Q	.	.	.	.
15.53	0.0174	0.05	Q	.	.	.	.
15.69	0.0181	0.06	Q	.	.	.	.
15.84	0.0190	0.08	Q	.	.	.	.
16.00	0.0201	0.10	Q	.	.	.	.
16.16	0.0268	0.93	. Q	.	.	.	.
16.31	0.0332	0.07	Q	.	.	.	.
16.47	0.0339	0.05	Q	.	.	.	.
16.62	0.0345	0.04	Q	.	.	.	.
16.78	0.0350	0.04	Q	.	.	.	.
16.93	0.0354	0.03	Q	.	.	.	.
17.09	0.0358	0.03	Q	.	.	.	.
17.24	0.0362	0.03	Q	.	.	.	.
17.40	0.0365	0.02	Q	.	.	.	.
17.56	0.0368	0.02	Q	.	.	.	.
17.71	0.0371	0.02	Q	.	.	.	.
17.87	0.0374	0.02	Q	.	.	.	.
18.02	0.0376	0.02	Q	.	.	.	.
18.18	0.0378	0.02	Q	.	.	.	.
18.33	0.0380	0.01	Q	.	.	.	.
18.49	0.0382	0.01	Q	.	.	.	.
18.64	0.0384	0.01	Q	.	.	.	.
18.80	0.0386	0.01	Q	.	.	.	.
18.95	0.0387	0.01	Q	.	.	.	.
19.11	0.0389	0.01	Q	.	.	.	.
19.27	0.0390	0.01	Q	.	.	.	.
19.42	0.0392	0.01	Q	.	.	.	.
19.58	0.0393	0.01	Q	.	.	.	.
19.73	0.0395	0.01	Q	.	.	.	.
19.89	0.0396	0.01	Q	.	.	.	.
20.04	0.0397	0.01	Q	.	.	.	.
20.20	0.0398	0.01	Q	.	.	.	.
20.35	0.0400	0.01	Q	.	.	.	.
20.51	0.0401	0.01	Q	.	.	.	.
20.67	0.0402	0.01	Q	.	.	.	.
20.82	0.0403	0.01	Q	.	.	.	.
20.98	0.0404	0.01	Q	.	.	.	.
21.13	0.0406	0.01	Q	.	.	.	.
21.29	0.0407	0.01	Q	.	.	.	.
21.44	0.0408	0.01	Q	.	.	.	.
21.60	0.0409	0.01	Q	.	.	.	.
21.75	0.0410	0.01	Q	.	.	.	.
21.91	0.0411	0.01	Q	.	.	.	.

22.06	0.0412	0.01	Q	.	.	.	.
22.22	0.0413	0.01	Q	.	.	.	.
22.38	0.0414	0.01	Q	.	.	.	.
22.53	0.0415	0.01	Q	.	.	.	.
22.69	0.0416	0.01	Q	.	.	.	.
22.84	0.0417	0.01	Q	.	.	.	.
23.00	0.0418	0.01	Q	.	.	.	.
23.15	0.0419	0.01	Q	.	.	.	.
23.31	0.0420	0.01	Q	.	.	.	.
23.46	0.0420	0.01	Q	.	.	.	.
23.62	0.0421	0.01	Q	.	.	.	.
23.77	0.0422	0.01	Q	.	.	.	.
23.93	0.0423	0.01	Q	.	.	.	.
24.09	0.0424	0.01	Q	.	.	.	.
24.24	0.0424	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1446.2
10%	18.7
20%	9.3
30%	9.3
40%	9.3
50%	9.3
60%	9.3
70%	9.3
80%	9.3
90%	9.3

DMA 3 - Parcel 2 - Post Construction Hydrograph

```
============================================================
*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
   AND LOW LOSS FRACTION ESTIMATIONS FOR AMC I:

   TOTAL 24-HOUR DURATION RAINFALL DEPTH =     2.31 (inches)

   SOIL-COVER     AREA      PERCENT OF    SCS CURVE    LOSS RATE
     TYPE      (Acres)   PERVIOUS AREA     NUMBER    Fp(in./hr.)    YIELD
      1         0.14        0.00       98.(AMC II)     0.000       0.901
      2         0.67      100.00       72.(AMC II)     0.768       0.013

   TOTAL AREA (Acres) =      0.81

                 _
   AREA-AVERAGED LOSS RATE, Fm (in./hr.) =  0.635

                 _
   AREA-AVERAGED LOW LOSS FRACTION, Y = 0.833
============================================================

------------------------------------------------------------------------------


   RATIONAL METHOD CALIBRATION COEFFICIENT = 1.48
   TOTAL CATCHMENT AREA(ACRES) =    0.81
   SOIL-LOSS RATE, Fm,(INCH/HR) =  0.635
   LOW LOSS FRACTION = 0.833
   TIME OF CONCENTRATION(MIN.) = 11.08
   SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
   USER SPECIFIED RAINFALL VALUES ARE USED
   RETURN FREQUENCY(YEARS) =   2
     5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.17
    30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.40
     1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.56
     3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.98
     6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.36
    24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.31

------------------------------------------------------------------------------

   TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.05
   TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     0.11

**************************************************************
 TIME    VOLUME      Q   0.       2.5       5.0       7.5      10.0
(HOURS)   (AF)     (CFS)
------------------------------------------------------------------------------
```

0.12	0.0000	0.00	Q	.	.	.	.
0.30	0.0001	0.01	Q	.	.	.	.
0.49	0.0002	0.01	Q	.	.	.	.
0.67	0.0003	0.01	Q	.	.	.	.
0.86	0.0004	0.01	Q	.	.	.	.
1.04	0.0005	0.01	Q	.	.	.	.
1.23	0.0006	0.01	Q	.	.	.	.
1.41	0.0008	0.01	Q	.	.	.	.
1.60	0.0009	0.01	Q	.	.	.	.
1.78	0.0010	0.01	Q	.	.	.	.
1.97	0.0011	0.01	Q	.	.	.	.
2.15	0.0012	0.01	Q	.	.	.	.
2.33	0.0014	0.01	Q	.	.	.	.
2.52	0.0015	0.01	Q	.	.	.	.
2.70	0.0016	0.01	Q	.	.	.	.
2.89	0.0017	0.01	Q	.	.	.	.
3.07	0.0019	0.01	Q	.	.	.	.
3.26	0.0020	0.01	Q	.	.	.	.
3.44	0.0021	0.01	Q	.	.	.	.
3.63	0.0022	0.01	Q	.	.	.	.
3.81	0.0024	0.01	Q	.	.	.	.
4.00	0.0025	0.01	Q	.	.	.	.
4.18	0.0026	0.01	Q	.	.	.	.
4.37	0.0028	0.01	Q	.	.	.	.
4.55	0.0029	0.01	Q	.	.	.	.
4.74	0.0031	0.01	Q	.	.	.	.
4.92	0.0032	0.01	Q	.	.	.	.
5.10	0.0033	0.01	Q	.	.	.	.
5.29	0.0035	0.01	Q	.	.	.	.
5.47	0.0036	0.01	Q	.	.	.	.
5.66	0.0038	0.01	Q	.	.	.	.
5.84	0.0039	0.01	Q	.	.	.	.
6.03	0.0041	0.01	Q	.	.	.	.
6.21	0.0042	0.01	Q	.	.	.	.
6.40	0.0044	0.01	Q	.	.	.	.
6.58	0.0045	0.01	Q	.	.	.	.
6.77	0.0047	0.01	Q	.	.	.	.
6.95	0.0048	0.01	Q	.	.	.	.
7.14	0.0050	0.01	Q	.	.	.	.
7.32	0.0051	0.01	Q	.	.	.	.
7.51	0.0053	0.01	Q	.	.	.	.
7.69	0.0055	0.01	Q	.	.	.	.
7.87	0.0056	0.01	Q	.	.	.	.
8.06	0.0058	0.01	Q	.	.	.	.
8.24	0.0060	0.01	Q	.	.	.	.
8.43	0.0062	0.01	Q	.	.	.	.
8.61	0.0063	0.01	Q	.	.	.	.

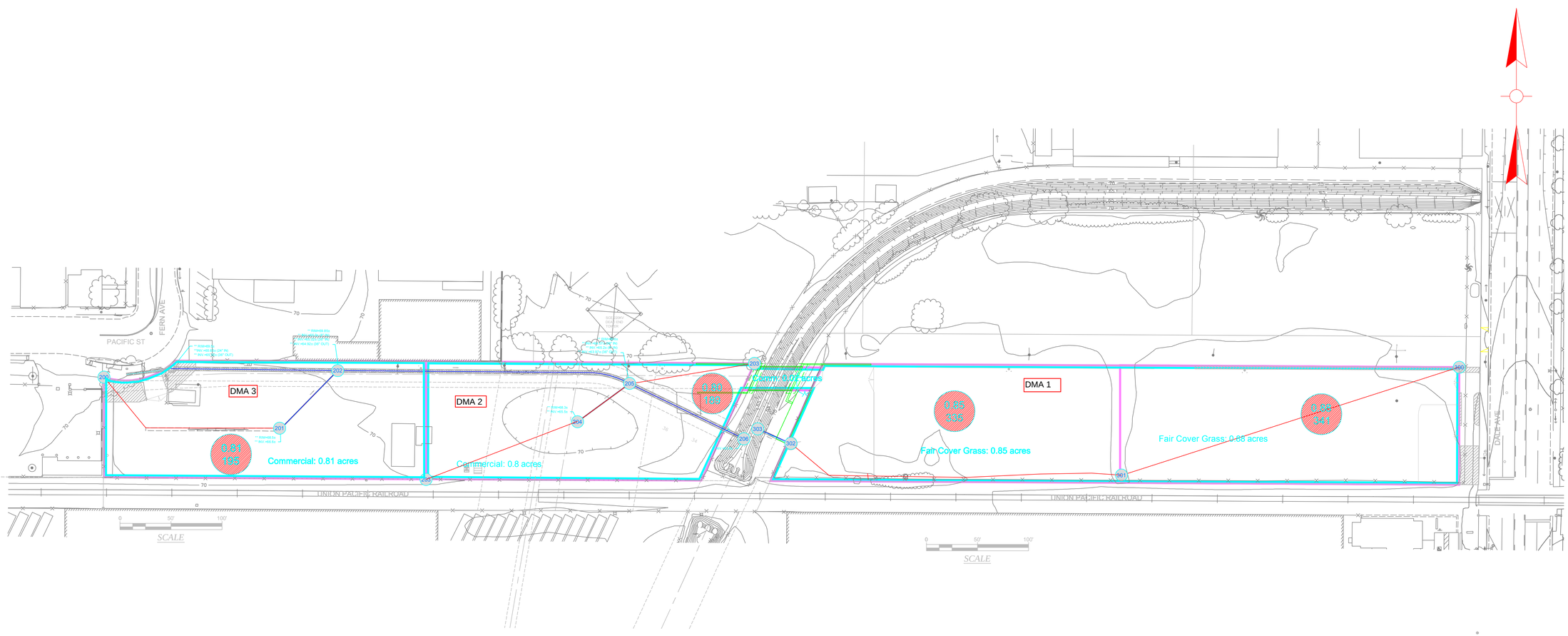
8.80	0.0065	0.01	Q	.	.	.	.
8.98	0.0067	0.01	Q	.	.	.	.
9.17	0.0069	0.01	Q	.	.	.	.
9.35	0.0071	0.01	Q	.	.	.	.
9.54	0.0073	0.01	Q	.	.	.	.
9.72	0.0075	0.01	Q	.	.	.	.
9.91	0.0077	0.01	Q	.	.	.	.
10.09	0.0079	0.01	Q	.	.	.	.
10.28	0.0081	0.01	Q	.	.	.	.
10.46	0.0083	0.01	Q	.	.	.	.
10.64	0.0085	0.01	Q	.	.	.	.
10.83	0.0087	0.01	Q	.	.	.	.
11.01	0.0090	0.01	Q	.	.	.	.
11.20	0.0092	0.02	Q	.	.	.	.
11.38	0.0094	0.02	Q	.	.	.	.
11.57	0.0097	0.02	Q	.	.	.	.
11.75	0.0099	0.02	Q	.	.	.	.
11.94	0.0102	0.02	Q	.	.	.	.
12.12	0.0104	0.02	Q	.	.	.	.
12.31	0.0107	0.02	Q	.	.	.	.
12.49	0.0111	0.02	Q	.	.	.	.
12.68	0.0114	0.02	Q	.	.	.	.
12.86	0.0118	0.02	Q	.	.	.	.
13.05	0.0122	0.02	Q	.	.	.	.
13.23	0.0125	0.03	Q	.	.	.	.
13.41	0.0129	0.03	Q	.	.	.	.
13.60	0.0133	0.03	Q	.	.	.	.
13.78	0.0138	0.03	Q	.	.	.	.
13.97	0.0142	0.03	Q	.	.	.	.
14.15	0.0147	0.03	Q	.	.	.	.
14.34	0.0152	0.04	Q	.	.	.	.
14.52	0.0157	0.04	Q	.	.	.	.
14.71	0.0163	0.04	Q	.	.	.	.
14.89	0.0169	0.04	Q	.	.	.	.
15.08	0.0176	0.05	Q	.	.	.	.
15.26	0.0183	0.05	Q	.	.	.	.
15.45	0.0191	0.06	Q	.	.	.	.
15.63	0.0200	0.06	Q	.	.	.	.
15.82	0.0211	0.08	Q	.	.	.	.
16.00	0.0225	0.11	Q	.	.	.	.
16.18	0.0298	0.86	. Q	.	.	.	.
16.37	0.0369	0.07	Q	.	.	.	.
16.55	0.0378	0.05	Q	.	.	.	.
16.74	0.0385	0.04	Q	.	.	.	.
16.92	0.0391	0.04	Q	.	.	.	.
17.11	0.0397	0.03	Q	.	.	.	.
17.29	0.0402	0.03	Q	.	.	.	.

17.48	0.0406	0.03	Q	.	.	.	.
17.66	0.0410	0.02	Q	.	.	.	.
17.85	0.0414	0.02	Q	.	.	.	.
18.03	0.0417	0.02	Q	.	.	.	.
18.22	0.0420	0.02	Q	.	.	.	.
18.40	0.0423	0.02	Q	.	.	.	.
18.59	0.0425	0.02	Q	.	.	.	.
18.77	0.0427	0.01	Q	.	.	.	.
18.95	0.0430	0.01	Q	.	.	.	.
19.14	0.0432	0.01	Q	.	.	.	.
19.32	0.0434	0.01	Q	.	.	.	.
19.51	0.0436	0.01	Q	.	.	.	.
19.69	0.0438	0.01	Q	.	.	.	.
19.88	0.0439	0.01	Q	.	.	.	.
20.06	0.0441	0.01	Q	.	.	.	.
20.25	0.0443	0.01	Q	.	.	.	.
20.43	0.0445	0.01	Q	.	.	.	.
20.62	0.0446	0.01	Q	.	.	.	.
20.80	0.0448	0.01	Q	.	.	.	.
20.99	0.0449	0.01	Q	.	.	.	.
21.17	0.0451	0.01	Q	.	.	.	.
21.36	0.0452	0.01	Q	.	.	.	.
21.54	0.0454	0.01	Q	.	.	.	.
21.72	0.0455	0.01	Q	.	.	.	.
21.91	0.0457	0.01	Q	.	.	.	.
22.09	0.0458	0.01	Q	.	.	.	.
22.28	0.0459	0.01	Q	.	.	.	.
22.46	0.0461	0.01	Q	.	.	.	.
22.65	0.0462	0.01	Q	.	.	.	.
22.83	0.0463	0.01	Q	.	.	.	.
23.02	0.0464	0.01	Q	.	.	.	.
23.20	0.0466	0.01	Q	.	.	.	.
23.39	0.0467	0.01	Q	.	.	.	.
23.57	0.0468	0.01	Q	.	.	.	.
23.76	0.0469	0.01	Q	.	.	.	.
23.94	0.0470	0.01	Q	.	.	.	.
24.13	0.0472	0.01	Q	.	.	.	.
24.31	0.0472	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
==========	=========

0%	1440.4
10%	22.2
20%	11.1
30%	11.1
40%	11.1
50%	11.1
60%	11.1
70%	11.1
80%	11.1
90%	11.1



0 100' 200'

SCALE

Subcatchment Boundaries

Existing Drainage Pipe Flowpaths

Drainage Management Area Boundary

Surface Flowpaths

AES Software Model Node Number

Subcatchment Area (ac) and Surface Flowpath Length (ft)

0 100 200 Feet

WSP | PARSONS BRINCKERHOFF

NOTES:

REV	DATE	DESCRIPTION	DRAWN

REV	DATE	DESCRIPTION	DRAWN

Stanton Energy Reliability Center, LLC
650 Bercut Dr, Suite A - Sacramento, CA 95811
Phone: 916-492-9486 Fax: 916-880-5318

DRAWN — DATE —

ENG. APPROVAL — DATE —

DRAWING TITLE
Hydrology Map of Existing System
Figure 1

SIZE D | FSCM NO. | DWG NO. C-201 | REV B

SCALE 1"=50 | PROJECT STANTON | SHEET 1/1

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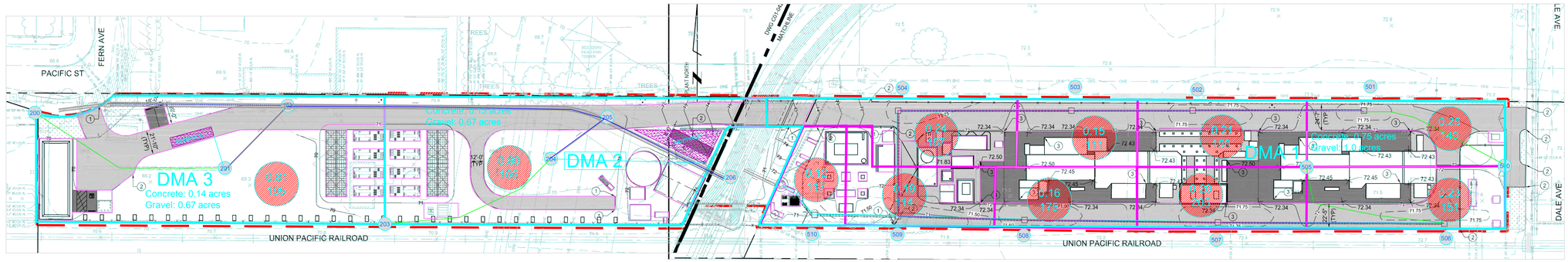
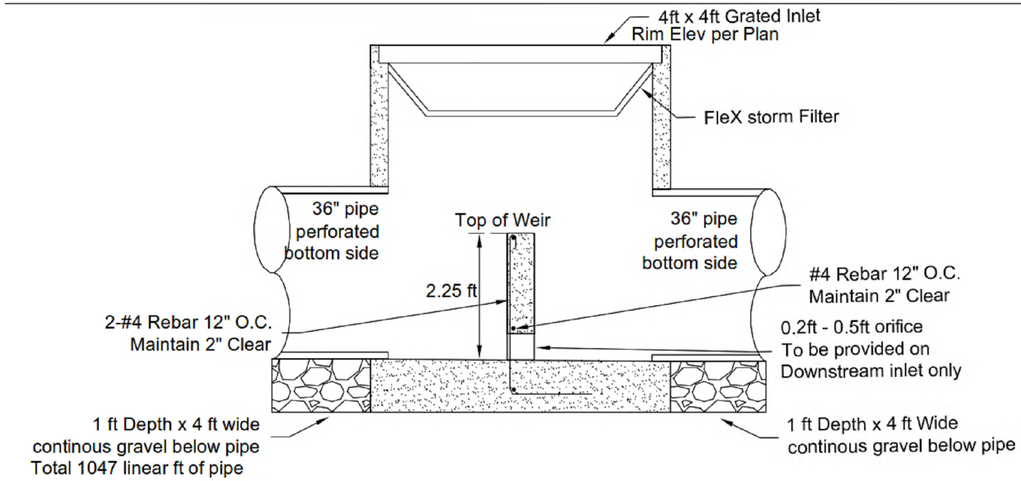


Storm Drain Inlet/Weir/Orifice Typical Section



Water Quality Volume Summary Table

	DMA 1	DMA 2	DMA 3
Runoff Coefficient (unitless)	0.43	0.16	0.17
85% Storm Depth (inch)	0.85	0.85	0.85
Area (acres)	1.75	0.80	0.81
WQV (ft3)	2328.6	394.3	424.0
Retention provided (ft3)	6852	4002	695

WQV = C x d x A x 43560sf/ac x 1/12 in/ft

Perforated Storm Drain Storage Table

Depth (ft)	Storage (ft3)	Storage (ac/ft)
0	0	0.00
1	1675	0.04
1.6	3154	0.07
3.25	7222	0.17
4	9072.055	0.21
Within Gravel Substrate		

Subcatchment Boundaries
Perforated Storm Drain
Existing Storm Drain
Proposed Surface Flowpaths
AES Software Model Node Number
Drainage Management Area Boundary
Subcatchment Area (ac) and Surface Flowpath Length (ft)
Proposed Storm Tech (for Storage See Design Drawings)

0 100 200 Feet

NOTES:

REV	DATE	DESCRIPTION	DRAWN

REV	DATE	DESCRIPTION	DRAWN

Stanton Energy Reliability Center, LLC
650 Bercut Dr, Suite A - Sacramento, CA 95811
Phone: 916-492-9486 Fax: 916-880-5318

DRAWN – DATE –
ENG. APPROVAL – DATE –

DRAWING TITLE: Hydrology Map of Proposed System Figure 2

SIZE D | FSCM NO. | DWG NO. C-201 | REV B
SCALE 1"=50 | PROJECT STANTON | SHEET 1/1

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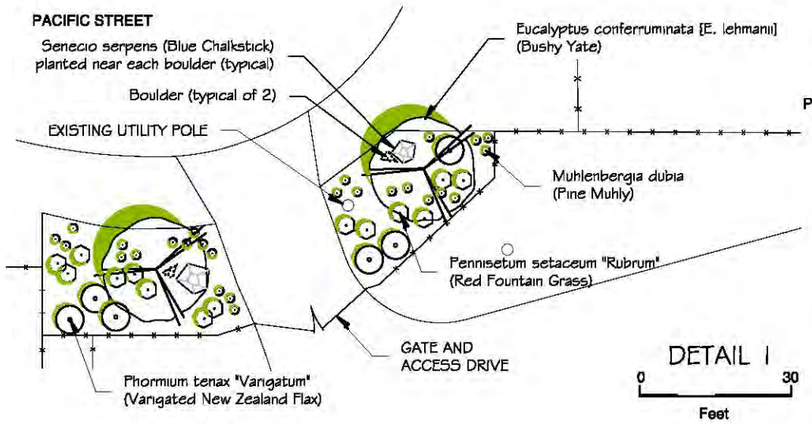
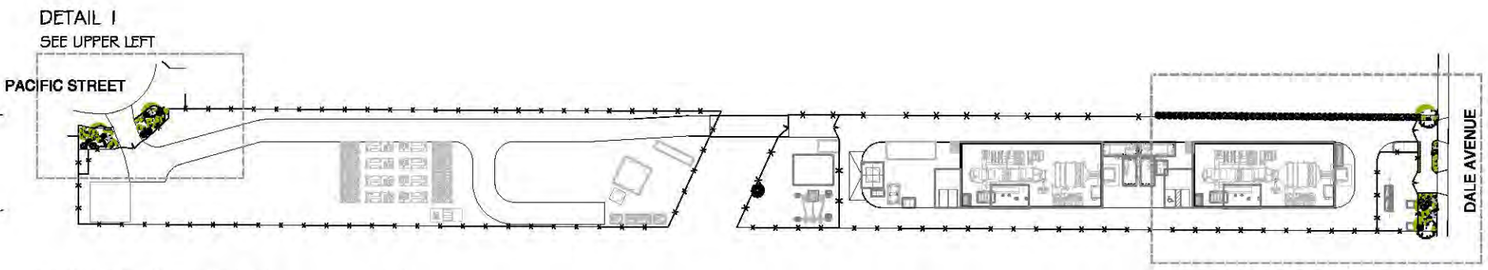
Attachment J

Landscape Plan

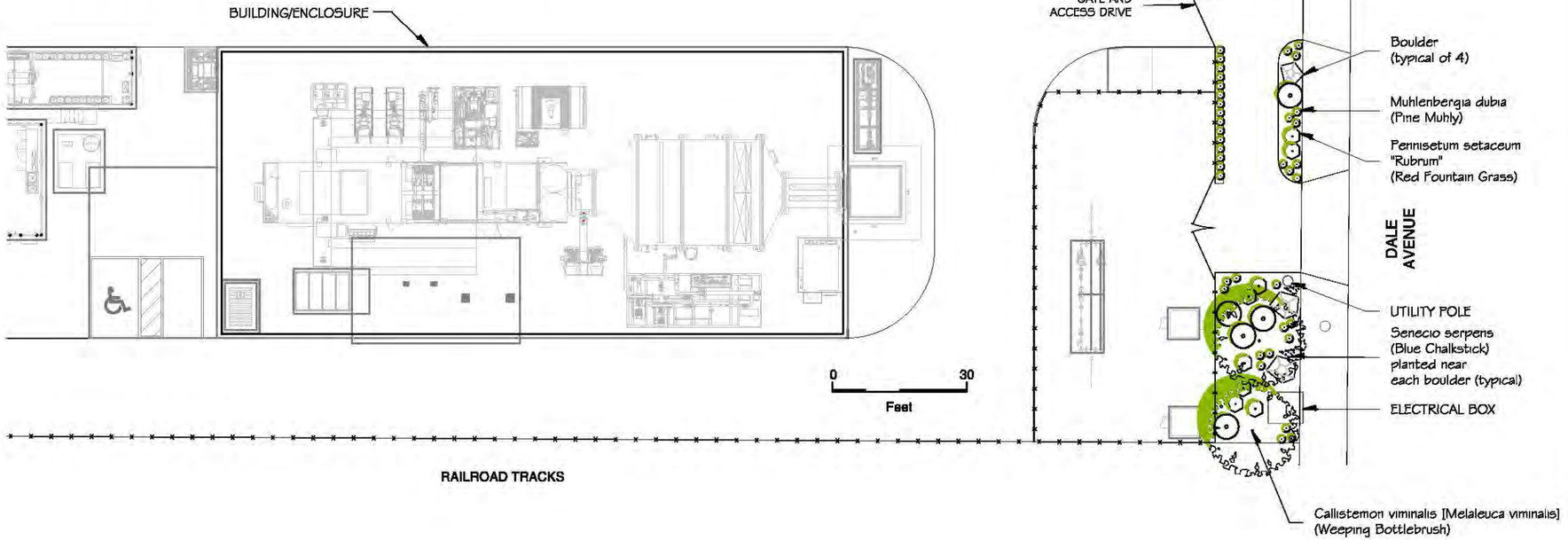




PLAN OVERVIEW (Not to scale)

PLANT PALETTE LEGEND

SYMBOL	TYPE AND SPECIES
	EVERGREEN CANOPY TREE - Dale Avenue Callistemon viminalis [Melaleuca viminalis] (Weeping Bottlebrush) or Eriobotrya deflexa (Bronze Loquat)
	EVERGREEN CANOPY TREE - Pacific Street Eucalyptus conferruminata [E. lehmanii] (Bushy Yate) or Photinia x fraseri (Fraser Photinia)
	MEDIUM HEIGHT EVERGREEN SHRUB Phormium tenax "Atropurpureum" (Purple New Zealand Flax)
	Phormium tenax "Variegatum" (Variegated New Zealand Flax)
	ORNAMENTAL GRASSES Pennisetum setaceum "Rubrum" (Red Fountain Grass)
	Muhlenbergia dubia (Pine Muhly)
	SUCCULENT GROUNDCOVER Senecio serpens (Blue Chalksticks)



North

ENVIRONMENTAL VISION
10-10-2016

APPENDIX 5.13B
Conceptual Landscape Plan
SHEET 1 of 2
Stanton Energy Reliability Center

LANDSCAPE CONCEPT

The landscape concept for the Stanton Energy Reliability Center incorporates a combination of evergreen trees, medium size shrubs, and ornamental grasses. The landscape plan calls for medium-height evergreen canopy trees along the Dale Avenue and Pacific Street frontages, within the area located between the sidewalk and the perimeter fence. Within this landscaped area, there will also be a limited number of shrubs, clustered informally with small and medium height ornamental grasses. To add visual interest, boulders accented by succulent groundcover will also be placed in the landscaped areas. In addition, a row of distinctive, medium height evergreen shrubs will be planted along the northern edge of the site, near Dale Avenue. The landscaping will enhance the site's appearance and partially screen new fencing and structures.
The suggested plant palette includes drought tolerant species that are appropriate to the regional setting and local site conditions.

NOTES:

1. Landscape layout is preliminary and subject to change based on final engineering and other factors.
2. A drip irrigation system will be installed to provide regular watering of new landscaping.
3. Decomposed granite to a depth of 3 to 4 inches will be applied within the planting strip for water conservation and weed suppression.
4. All planting shall meet SERC safety, operations, and maintenance requirements, including clearance requirements for underground and overhead conductors.
5. All landscaping and irrigation shall conform to applicable landscape related City and Regional Standards.

EVERGREEN CANOPY TREE - Dale Street

Eriobotrya deflexa (Bronze Loquat)
Photo source: California Polytechnic State University / Selectree 2016

Callistemon viminalis [Melaleuca viminalis]
Photo source: Treenames.net / Sheridan Landscaping LLC. 2016

EVERGREEN CANOPY TREE - Pacific Street

Eucalyptus conferruminata [E. lehmanii] (Bushy Yate)
Photo source:
California Polytechnic State University / Selectree 2016

Photinia x fraseri (Fraser Photinia)
Photo source:
City of Los Angeles,
Street Tree Selection Guide 2016

PLANT SIZE AND QUANTITY ESTIMATE

TYPE AND SPECIES	ESTIMATED QUANTITY	CONTAINER SIZE	GROWTH RATE	APPROXIMATE HEIGHT AT 5 YEARS	APPROXIMATE MATURE HEIGHT / WIDTH	APPROXIMATE TIME TO MATURITY
EVERGREEN CANOPY TREE - Dale Avenue						
Callistemon viminalis [Melaleuca viminalis] (Weeping Bottlebrush)	3	15 Gallon or 24" Box	2' / year	16'	20'-35' / 20'-30'	10 - 15 years
or						
Eriobotrya deflexa (Bronze Loquat)		15 Gallon or 24" Box	3' / year	20'	15'-25' / 15'-25'	5 - 8 years
EVERGREEN CANOPY TREE - Pacific Street						
Eucalyptus conferruminata [E. lehmanii] (Bushy Yate)	2	15 Gallon or 24" Box	2'-3' / year	18'	12'-25' / 10'-25'	10 years
or						
Photinia x fraseri (Fraser Photinia)		15 Gallon or 24" Box	2'-3' / year	18'	12'-20' / 8'-12'	5 - 8 years
MEDIUM HEIGHT EVERGREEN SHRUB						
Phormium tenax "Variegatum" (Variegated New Zealand Flax)	28	1 Gallon or 5 Gallon	-	6'	6' / 6'	
Phormium tenax "Atropurpureum" (Purple New Zealand Flax)	31	1 Gallon or 5 Gallon	-	6'	6' / 6'	
ORNAMENTAL GRASSES						
Pennisetum setaceum "Rubrum" (Red Fountain Grass)	22	1 Gallon	-	4'-5'	4'-5' / 4'-5'	
Muhlenbergia dubia (Pine Muhly)	70	1 Gallon	-	1'-3'	1'-3' / 2'-3'	
SUCCULENT GROUNDCOVER						
Senecio serpens (Blue Chalksticks)	18	4" or 1 Gallon	-	1'	1' / 2'-3'	

Tree growth and size estimates based on information contained in: Reimer, Jeffrey L. and W. Mark. "SelecTree: A Tree Selection Guide." http://selectree.calpoly.edu/ (site visited August 16, 2016.)
Shrub size estimates based on information contained in: Brenzel, Kathleen Norris. Sunset Western Garden Book. Menlo Park, CA: Sunset Publishing Corporation, 2001.
and
San Marcos Growers. http://www.smgrowers.com/ (site visited August 16, 2016.)

MEDIUM HEIGHT EVERGREEN SHRUB

Phormium tenax (New Zealand Flax)
Photo source: Environmental Vision 2005

ORNAMENTAL GRASSES

Pennisetum setaceum "Rubrum"
(Red Fountain Grass)
Photo source: Environmental Vision 2016

Muhlenbergia dubia (Pine Muhly)
Photo source: UC Master Gardeners 2016

SUCCULENT GROUNDCOVER

Senecio serpens (Blue Chalksticks)
Photo source: Monrovia 2016

ENVIRONMENTAL VISION
10-10-2016

APPENDIX 5.13B
Conceptual Landscape Plan
SHEET 2 of 2
Stanton Energy Reliability Center

Attachment K

Geotechnical Report

ENVIRONMENTAL
GEOTECHNICAL / CONSTRUCTION MATERIALS TESTING
INFRASTRUCTURE ENGINEERING
MUNICIPAL SERVICES
ASSET MANAGEMENT / CERTIFICATION

PRELIMINARY GEOTECHNICAL INVESTIGATION
STANTON ENERGY RELIABILITY CENTER
STANTON, CALIFORNIA




October 27, 2016

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A NV5 Company – Offices Nationwide

Stanton Energy Reliability Center, LLC
650 Bercut Drive, Suite A
Sacramento, California 95811

October 27, 2016
Project No.: 113815-00763.00

Attention: Mr. Paul Cummins

Subject: Preliminary Geotechnical Investigation

Project: Proposed Stanton Energy Reliability Center
West of Dale Street
Stanton, California

Dear Mr. Cummins:

As requested, NV5 West, Inc. (NV5) is pleased to submit the results of our preliminary geotechnical investigation for the subject project. The purpose of this investigation was to evaluate the subsurface conditions at the proposed Stanton Energy Reliability Center site located on the west side of Dale Street in Stanton, California. The results of the geotechnical field exploration, laboratory tests, and preliminary geotechnical engineering recommendations and conclusions are presented herewith.

Based on the subsurface exploration, subsequent testing of the subsurface soils, and engineering analyses it was concluded that the construction of the proposed project is geotechnically feasible. The geotechnical information presented herein is intended to assist the project design team in their understanding of the geotechnical factors affecting the proposed project, and the preliminary recommendations, should be incorporated into the project design and implemented construction.

It is recommended that the forthcoming project specifications, in particular the earthwork/compaction sections, be reviewed by NV5 for consistency with our report prior to the bid process in order to avoid possible conflicts, misinterpretations, and inadvertent omissions, etc. It should also be noted that the applicability and final evaluation of recommendations presented herein are contingent upon construction phase field monitoring by NV5 in light of the widely acknowledged importance of geotechnical consultant continuity through the various design, planning and construction stages of a project.

NV5 appreciates the opportunity to provide this geotechnical engineering service for this project and looks forward to continuing our role as your geotechnical engineering consultant.

Respectfully submitted,

NV5 West, Inc.

Gene Custenborder, CEG 1319
Senior Engineering Geologist

Sam Koohi, PhD., PE 85010
Engineering Manager

Reviewed by:

Guillaume Gau, GE 2986
Senior Vice President

GC/SK/GG:ma

Distribution: (3) Addressee, (1) via email
Stanton Energy Reliability Center Geotechnical Report.doc

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1.0 INTRODUCTION

This report presents the results of NV5's preliminary geotechnical investigation for the proposed Stanton Energy Reliability Center site (SERC) in Stanton, California. The approximate location of the project area is shown on *Figure 1, Site Location Map*. The purpose of this study was to evaluate the subsurface conditions and to provide preliminary geotechnical recommendations for the design and construction of the proposed development. From information presented on a preliminary site plans and our discussions with you, it is understood that the proposed development will include gas turbine generators, gas compressors, gas metering station, switchyard, and associated equipment. This report summarizes the data collected and presents our findings, conclusions, and preliminary recommendations.

This report has been prepared for the exclusive use of the client and their consultants to describe the geotechnical factors at the project site which should be considered in the design and construction of the proposed project. In particular, it should be noted that this report has not been prepared from the perspective of a construction bid preparation instrument and should be considered by prospective bidders only as a source of general information subject to interpretation and refinement by their own expertise and experience, particularly with regard to construction feasibility. Contract requirements as set forth by the project plans and specifications will supersede any general observations and specific recommendations presented in this report.

2.0 SCOPE OF SERVICES

The scope of services for this project consisted of the following tasks:

- Review of a preliminary site plan.
- Review of readily available background data, including Client provided geotechnical data, geotechnical literature, geologic maps, topographic maps, seismic hazard maps, and literature relevant to the subject site.
- A site reconnaissance to observe the general surficial site conditions and to select boring locations.
- Preparation of an Orange County Health Care Agency, Environmental Health Division, geotechnical boring construction permit.
- A subsurface investigation, including the excavating, logging, and sampling of six exploratory borings located within the project area to depths of approximately 51.5 feet below the existing ground surface. Soil samples obtained from the borings were transported to NV5's in-house laboratory for observation and testing.
- Field percolation testing to evaluate the infiltration characteristics of the onsite soils.
- Laboratory testing of selected soil samples to evaluate their pertinent geotechnical engineering properties.
- An assessment of faulting, seismicity, liquefaction, and other geologic hazards affecting the area and possible impacts on the subject project.

- Engineering evaluation of the geotechnical data collected to develop geotechnical recommendations for the design and construction of the proposed project.

- Preparation of this report, including reference maps and graphics, summarizing the data collected and presenting our findings, conclusions, and geotechnical recommendations for the design and construction of the proposed project.

3.0 SITE AND PROJECT DESCRIPTION

The proposed SERC site is located in the southern portion of the vacant parcel located west of Dale Avenue, south of Standustrial Street and north of a railroad right-of way in Stanton, California. The property is relatively level at an elevation of approximately 68 feet above mean sea level. A southerly flowing, concrete-lined drainage channel crosses the western portion of the site. (refer to *Figure 2, Geotechnical Map*). The property is currently undeveloped, has a perimeter chain-link fence, and is sparsely vegetated weeds. Overhead electrical transmission lines are located immediately to the north and east sides of the site, and two electrical transmission line towers exist immediately to the northwest of the site.

Based on preliminary information it is understood that the proposed construction includes a gas turbine generator, electrical enclosure, switchgear, demineralized water tank, RO skid, gas metering station, gas compressor, switchyard, ammonia tank, fin-fan cooler, CEMS building, 480 V auxiliary transformer, air compressor skid and tempering air fan access road, and other miscellaneous structures and equipment.

4.0 FIELD EXPLORATION

Before starting the field exploration program, a field reconnaissance was conducted to observe site conditions and check locations for the planned subsurface explorations. NV5 obtained a DEH geotechnical boring construction permit (LMWP-002408). As required by law, Underground Service Alert was notified of the locations of the exploratory borings prior to drilling.

The subsurface conditions were explored by drilling, logging, and sampling six exploratory borings located within the project area to a maximum depth of approximately 51.5 feet below ground surface (bgs). The borings were drilled using a truck-mounted hollow-stem auger drill rig. The drilling services were provided by J.&H. Drilling Company of Buena Park, California. The approximate locations of the exploratory borings are presented on *Figure 2, Geotechnical Map,* and on the project General Arrangement drawings. Details of the subsurface exploration and logs of the exploratory borings are presented in *Appendix A*. Subsequent to logging and sampling, the borings were backfilled in accordance with the permit requirements.

5.0 PERCOLATION TESTING

Field percolation testing was performed to evaluate the infiltration characteristics of the onsite soils to obtain information regarding the feasibility of storm water runoff infiltration. Percolation tests were performed in four borings. Two of the tests were in borings that were drilled to approximately 5 feet bgs and two were in borings that were drilled approximately 10 feet bgs. The borings were 4 inches in diameter and a 2-inch diameter PVC casing was installed in the borehole prior to testing. The approximate locations of the percolation tests are presented on *Figure 2*.

Prior to conducting the percolation tests, each test hole was filled with clear water and allowed to presoak overnight to simulate actual operating conditions. The following day, the boring was refilled with water. Water level measurements were taken from the top of the test hole to the water level in the pipes at various time increments. Due to the relatively high percolation rates, a minimum of four cycles of filling and measuring the water levels were performed in each of the borings. The results of the percolation tests are presented in the following Table 1.

Table 1
Percolation Test Results

Test Number	Depth Below Ground)	Soil Description	Infiltration Rate (minutes per inch)	Infiltration Rate (inches per hour)
P-1	5.3 feet	Light brown silty sand (SM)	0.80	75
P-2	10.1 feet	Gray-brown silty sand (SM)	1.06	57
P-3	5.3 feet	Brown silty sand (SM)	1.57	38
P-4	10.1 feet	Gray-brown silty sand (SM)	0.60	99

As indicated in the above table, the percolation rate was variable across the site, but in general the near-surface soils (upper 10 feet) exhibit high percolation characteristics.

The in-situ infiltration characteristics of the subsurface materials are primarily a function of the amount of fines (i.e., silt and clay size), the relative density, and other anomalies associated with the placement or natural depositional/weathering processes (e.g., compaction/lamination, smearing, cementation). As a result of the heterogeneous nature inherent with the site subsurface materials, the in-situ infiltration characteristics are variable. If the on-site soils will be used to infiltrate storm water runoff, then it is recommended that an infiltration rate of 12 inches per hour should be used in the design. The recommended infiltration rate includes a safety factor of 3.

6.0 LABORATORY TESTING

Laboratory testing was performed on selected representative bulk and relatively undisturbed soil samples obtained from the exploratory borings to aid in the soil classification and to evaluate the engineering properties of the soil materials encountered. The following tests were performed:

- In-situ moisture content (ASTM D2216)
- Sieve analyses (ASTM D422)
- Atterberg Limits (ASTM D4318)
- Expansion Index (ASTM D4829)
- R-Value (ASTM D2844)
- Corrosivity series including sulfate content, chloride content, pH-value, and resistivity (California Test Methods 417, 422, and 532/643)
- Direct shear (ASTM D3080)

Testing was performed in general accordance with applicable ASTM standards or California Test Methods. The laboratory test results and details of the laboratory-testing program are presented in *Appendix B*.

7.0 GEOLOGY

Geologic Setting - The site area is located in the south-central part of the Los Angeles physiographic basin between the Transverse Ranges physiographic Basin on the north and the Peninsular Ranges province on the south. The Los Angeles Basin is a relatively flat, low-lying coastal plain surrounded by mountains on the north east and south. The western margin of the basin is open to the sea except at the Palos Verdes hills. Major rivers and drainages throughout the basin have been modified by agricultural, urban and commercial development and are now largely confined within lined channels. Regional geological maps of Orange County (Morton and Miller, 1981; California Geological Survey, 1997) indicate the surface of the site is occupied by Holocene-age alluvium. Regional geological studies indicate that Holocene-age flood-plain sediments extend up to a depth of about 75 feet. These are primarily silts, sands, and gravels deposited by the rivers meandering across the floor of the Los Angeles Basin when they flowed under their natural regime. These units are underlain by non-indurated to poorly indurated, marine and non-marine, Pleistocene-age sediments of the Lakewood and San Pedro formations. These Pleistocene units extend to depths on the order of several hundred feet (~500 to 1,000 feet). The depth to the top of Tertiary-age sedimentary rock is more than 1000 feet deep, and crystalline basement rock is about 24,000 feet deep in the site region.

Geologic Materials - Geologic materials encountered during the subsurface explorations include Quaternary-aged alluvial deposits. Minor surficial deposits of fill and topsoil may also present locally. *Figure 3, General Geologic Map* presents the general distribution of geologic units in the site area. Detailed descriptions of the earth materials encountered are presented on the boring logs in *Appendix A*. A description of the geologic materials encountered are provided below:

- Alluvium – Quaternary-aged alluvium was encountered in all of the exploratory borings. Alluvium was encountered to the total depth explored (maximum of approximately 51.5 feet). As encountered these materials generally consisted of light brown to dark gray, moist, medium dense, micaceous, silty to clayey sands and soft to firm sandy to clayey silts.

Groundwater - Groundwater was encountered in all six of the exploratory borings at a depth of approximately 20 feet bgs. Groundwater levels may vary due to seasonal fluctuations and factors such as a substantial increase in surface water infiltration from landscape irrigation, agricultural activity, storage facility leaks or unusually heavy precipitation.

8.0 FAULTING, SEISMICITY AND OTHER GEOLOGIC HAZARDS

The principal seismic considerations for most facilities in Southern California are damage caused by surface rupturing of fault traces, ground shaking, seismically-induced ground settlement and liquefaction. Potential impacts to the project due to faulting, seismicity and other geologic hazards are discussed in the following sections.

Faulting - The numerous faults in southern California include active, potentially active, and inactive faults. As used in this report, the definitions of fault terms are based on those developed for the Alquist-Priolo Special Studies Zones Act (AP) of 1972 and published by the California Division of Mines and

Geology (Hart and Bryant, 2007). Active faults are defined as those that have experienced surface displacement within Holocene time (approximately the last 11,000 years) and/or have been included within any of the state-designated Earthquake Fault Zones (previously known as Alquist-Priolo Special Studies Zones). Faults are considered potentially active if they exhibit evidence of surface displacement since the beginning of Quaternary time (approximately two million years ago) but not since the beginning of Holocene time. Inactive faults are those that have not had surface movement since the beginning of Quaternary time.

Review of geologic maps and literature pertaining to the general site area indicates that the site is not located within a state-designated Earthquake Fault Zone. In addition, there are no known major or active faults mapped on the project site. Evidence for active faulting at the site was not observed during the subsurface investigation. The relative location of the site to known active faults in the region is depicted on *Figure 4, Regional Fault Map*. The distance from the site to the projection of traces of surface rupture along major active earthquake fault zones, that could affect the site are listed in the following Table 2.

Table 2
Distance from the Site to Major Active Faults

Fault	Distance From Site
Puente Hills (Coyote Hills)	4.7 miles
Newport-Inglewood	7.2 miles
San Joaquin Hills	8.2 miles
Elsinore fault (Whittier section)	10.5 miles
Palos Verdes	16.0 miles
San Jose fault	17.1 miles
Elysian Park	19.2 miles
Chino fault	19.3 miles
Sierra Madre fault	23.8 miles
San Gabriel	39.0 miles
Coronado Bank fault	36.5 miles
San Jacinto fault	41.2 miles
Northridge fault	41.3 miles
San Andreas fault	42.6 miles

Seismic Shaking - The project site is located in southern California which is considered a seismically active area, and as such, the seismic hazard most likely to impact the site is ground shaking resulting from an earthquake along one of the known active faults in the region. The seismic design of the project may be performed using seismic design recommendations in accordance with the 2013 California Building Code (CBC). Recommended seismic design parameters are presented in *Section 10.4* of this report.

Fault Rupture - The project site is not located within an Earthquake Fault Zone delineated by the State of California for the hazard of fault surface rupture. The surface traces of known active or potentially active faults are not known to pass directly through, or to project toward the site. Therefore, the potential for damage due to surface rupture of faults at the project site is considered low.

Liquefaction and Seismically-Induced Settlement – Liquefaction and dynamic settlement of soils can be caused by ground shaking during earthquakes. Research and historical data indicate that loose, relatively clean granular soils are susceptible to liquefaction and dynamic settlement, whereas the stability of the majority of clayey silts, silty clays and clays is not adversely affected by ground shaking. Liquefaction is generally known to occur in saturated loose cohesionless soils at depths shallower than

approximately 50 feet. The potential for liquefaction under the same conditions of ground shaking intensity and duration will decrease for sands that are more well graded, more irregular and gritty, coarser and denser. Also, a pronounced decrease in liquefaction potential will occur with the increase in fine-grained (i.e., silt and clay) content. Seed and others have suggested that a non-liquefiable classification be assigned if the clay faction is 15 percent or greater (Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117, CDMG, Ch. 6, 1997). Dynamic settlement due to earthquake shaking can occur in both dry and saturated sands. The potential consequences of liquefaction to engineered structures include loss of bearing capacity, buoyancy forces on underground structures (including pipelines), increased lateral earth pressures on retaining walls, and lateral spreading.

The project site is underlain by poorly to moderately consolidated alluvial materials. The subsurface exploration program encountered poorly to moderately consolidated alluvial silt and sand with varying contents of clay, along with a relatively shallow ground water table. The State of California Seismic Hazard Zones, Anaheim Quadrangle Map (California Department of Conservation, 1998) the site is located within a zone mapped as having potential for earthquake-induced soil liquefaction (refer to *Figure 5, Liquefaction Susceptibility Map*).

Liquefaction analyses were performed using the Civiltech software program LiquefyPro – Version 5.8. The Seed method was used, which consists of comparing a Cyclic Stress Ratio (CSR, earthquake "load") to the Cyclic Resistance Ratio (CRR, soil "strength") of the soil. The CRR calculations were based upon input data obtained from the test borings. All of the potential liquefaction induced settlements were performed utilizing the Tokimatsu & Seed method. Detailed information regarding liquefaction analysis is presented in a published National Center for Earthquake Engineering Research (NCEER) document referenced in *Section 13.0: References*.

Liquefaction analyses were performed utilizing the field and laboratory test data. A peak ground acceleration (PGA) value of 0.5g and an earthquake moment magnitude of Mw=6.9, as estimated for the Newport-Inglewood fault were used in the analyses. The ground water level (GWL) utilized in the analyses was 15 feet below existing ground surface. *Appendix C, Liquefaction Analysis*, contains the input data file and a graphical output identifying the potentially liquefiable zones. The magnitude of liquefaction-induced settlement ranged from 4 to 6 inches. In accordance with industry standards, the accuracy of the above settlements ranges from approximately ± 0.5-inches to ± 1.0-inches. The analysis indicates that the liquefaction-induced settlements would occur within the loose to medium dense sand layers.

Based on our analysis, it is estimated that up to 6 inches of total seismic settlement could occur within the footprint of proposed structures for the design-event earthquake. In addition, differential settlements could be expected. In summary, the analyses indicate that there is a potential for liquefaction, seismically-induced settlement and associated ground damage for the design-event earthquake. Methods to mitigate liquefaction potential are discussed in *Section 10.2*.

Landslides and Slope Instability - There are no high or steep slopes on or in close proximity to the project site. Based on the investigation, there appears to be no indications of landslides or deep-seated instability at the site.

Subsidence - The site is not located in an area of known ground subsidence due to the withdrawal of subsurface fluids. Accordingly, the potential for subsidence occurring at the site due to the withdrawal of oil, gas, or water is considered low.

Tsunamis Inundation Seiches, and Flooding – The site and surrounding areas are at an approximate elevation of 60 feet above mean sea level, the site is approximately 7 miles from the Pacific Ocean. Therefore, tsunamis (seismic sea waves) are not considered a hazard at the site.

The site is not located near to or downslope of, any large body of water that could affect the site in the event of an earthquake-induced failure or seiche (oscillation in a body of water due to earthquake shaking). Whelan Lake and the three small relatively shallow unlined ponds adjacent to the west of the site are not considered a hazard to the site in terms of a seismically-induced seiche.

The Stanton Storm Channel, a concrete lined drainage course, crosses the western portion of the site. The potential for flooding should be addressed by the project Civil Engineer.

9.0 CONCLUSIONS

Based on the data obtained from the subsurface exploration, the associated laboratory test results, engineering analyses, and experience with similar site conditions, it is NV5's opinion that construction of the proposed project and associated improvements is feasible from a geotechnical standpoint.

- Poorly to moderately consolidated alluvial materials consisting of silts and sands that are susceptible to liquefaction were encountered underlying the proposed project site. Measurable seismically induced settlement is likely to occur at the site as a result of the design level seismic event. Ground improvement should be incorporated into the project to mitigate potential liquefaction.

- The near-surface materials are considered compressible and not capable of reliably supporting the proposed recycled water reservoir and associated improvements in their present condition. Overexcavation and recompaction of these materials are recommended for the proposed structure and fill loads.

- The near-surface soils were found to have "low" expansion potential.

- Considering the relatively high rate percolation characteristics of the onsite soils, it is our opinion that Low Impact Development (LID) surface runoff infiltration systems are feasible. Infiltration should not have any adverse effects on the regional groundwater table or cause soil instability. It is recommended that a vertical clearance of 10 feet be maintained between the bottom of infiltration basins and the groundwater table.

10.0 RECOMMENDATIONS

The following preliminary recommendations are provided so that the project design team is aware of the geotechnical factors that should be incorporated into the project design and implemented construction.

10.1 Earthwork

Site grading should be performed in accordance with the following recommendations and the *Typical Earthwork Guidelines* provided in *Appendix D*. In the event of conflict, the recommendations presented herein supersede those of *Appendix D*.

- Clearing and Grubbing - Prior to grading, the project area should be cleared of all significant surface vegetation, demolition rubble, pond liners, trash, debris, etc. Any buried organic debris or other unsuitable contaminated material encountered during subsequent excavation and grading work should also be removed. Removed material and debris should be properly disposed of offsite. Holes resulting from removal of buried obstruction which extend below finished site grades should be filled with properly compacted soils. Any utilities within the footprint of planned structural improvements should be appropriately abandoned.

    - Excavation and Building Pad Preparation – Proposed structures should be founded entirely on properly compacted fill. In order to mitigate undesirable surface settlements and improve shallow foundations lateral support, we recommend to over-excavate a minimum thickness of approximately 3 feet below the bottom of the foundations and replace with compacted granular non-expansive or very low expansive fill. The excavation should extend laterally a distance of at least 5 feet beyond the perimeter of the footprint of proposed structures.

      For heavily-loaded and settlement-sensitive structures, however, we recommend to over-excavate a minimum thickness of approximately 5 feet below the bottom of the foundations and replace with compacted granular non-expansive or very low expansive fill, reinforced with three layers of geosynthetic materials (e.g., geogrids), This geogrid-reinforced provide additional benefits for long-term performance of the foundation system by minimizing damage due to the potential hydrocompression and long-term settlements.

      For the above geogrid-reinforced engineered fill, we recommend that three layers of geogrid (Tensar TX140 or equivalent) be placed within the fill. The individual geogrid sheets should overlap at least 12 inches and should extend at least five feet beyond the edge of the foundation. We recommend that the geogrid layers be placed at approximately 12 inches, 36 inches and 60 inches below the bottom of foundations.

      Prior to placing the engineered fill, the soils exposed in the bottom of the excavation should be moisture conditioned and uniformly recompacted to at least 95 percent of the soils maximum density (based on ASTM D1557).

- Excavatability – Based on our subsurface exploration, it is anticipated that the on-site soils can be excavated by modern conventional heavy-duty excavating equipment in good operating conditions.

- Structural Fill Placement - Areas to receive fill and/or surface improvements should be scarified to a minimum depth of 6 inches, brought to near-optimum moisture conditions, and compacted to at least 95 percent relative compaction, based on laboratory standard ASTM D1557. Fill soils should be brought to near-optimum moisture conditions and compacted in uniform lifts to at least 95 percent relative compaction (ASTM D1557). Rocks with a maximum dimension greater than 4 inches should not be placed in the upper 3 feet of pad grade. The optimum lift thickness to produce a uniformly compacted fill will depend on the size and type of construction equipment used. In general, fill should be placed in uniform lifts not exceeding 8 inches in loose thickness. Placement and compaction of fill should be observed and tested by the geotechnical consultant.

- Paved Areas, Flatwork: - Excavate to a depth of at least 1.0 feet below the proposed or existing subgrade elevation, whichever is greater and replace with non-expansive fill (Expansion Index

not exceeding 20) compacted to at least 95 percent relative compaction, based on laboratory standard ASTM D1557. These excavations should extend a horizontal distance of at least 2.0 feet beyond the outside perimeter.

- Graded Slopes - Graded slopes, if planned, should be constructed at a gradient of 2 to 1 (horizontal to vertical) or flatter. To reduce the potential for surface runoff over slope faces, cut slopes should be provided with brow ditches and berms should be constructed at the top of fill slopes.

- Import Soils - If import soils are needed, proposed import should be sampled and tested for suitability by NV5 prior to delivery to the site. Imported fill materials should consist of clean granular soils free from vegetation, debris, or rocks larger than 3 inches in maximum dimension. The Expansion Index value should not exceed a maximum of 20 (i.e., essentially non-expansive).

10.2 Liquefaction Potential

Based on our liquefaction analysis, it is estimated that up to 6 inches of total seismic settlement could occur within the footprint of proposed structures for the design-event earthquake. In addition, potential differential settlement on the order of 2/3 of the total settlement over a horizontal span of 40 feet should be assumed. Seismically-induced settlement and associated ground damage for the design-event earthquake could result in unacceptable foundation movement and structural damage. Ground improvement should be incorporated into the project to mitigate potential liquefaction. Ground improvement provides mitigation of the liquefaction hazard by improving the strength, density and drainage characteristics of the soil. This can be done using variety of soil improvement techniques. Some methods are discussed in more detail below:

- **Compaction Grouting** - Also known as Low Mobility Grouting, is a grouting technique that displaces and densifies loose granular soils and reinforces fine grained soils by the staged injection of low-slump, low mobility aggregate grout. Typically, an injection pipe is first advanced to the maximum treatment depth. The low mobility grout is then injected as the pipe is slowly extracted in lifts, creating a column of overlapping grout bulbs. The expansion of the low mobility grout bulbs displaces surrounding soils. When performed in granular soil, compaction grouting increases the surrounding soils density, friction angle and stiffness. In all soils, the high modulus grout column reinforces the soils within the treatment zone. By sequencing the compaction grouting work from primary to secondary to tertiary locations, the densification process can be performed to achieve significant improvement. Compaction is achieved above and below the water table. This method permits the use of economical continuous and spread footings. Seismic settlement and liquefaction potential are reduced.

- **Vibro Replacement** - Vibro replacement is a ground improvement technique that constructs dense aggregate columns (stone columns) by means of a crane-suspended downhole vibrator, to reinforce all soils and densify granular soils. Vibro replacement stone columns are constructed with either the wet top feed process, or the dry bottom feed process. In the wet top feed process, the vibrator penetrates to the design depth by means of the vibrator's weight and vibrations, as well as water jets located in the vibrator's tip. The crushed stone is then introduced at the ground surface to the annular space around the vibrator created by the jetting water. The stone falls through the annular space to the vibrator tip, and fills the void created as the vibrator is lifted several feet. The vibrator is lowered, densifying and displacing the underlying stone. The vibro replacement process is repeated until a dense stone column is constructed to the ground surface.

The dry bottom feed process is similar except that no water jets are used and the stone is fed to the vibrator tip through a feed pipe attached to the vibrator. Predrilling of dense strata at the column location may be required for the vibrator to penetrate to the design depth. Both methods of construction create a high modulus stone column that reinforces the treatment zone and densifies surrounding granular soils. This method permits the use of economical continuous and spread footings. Seismic settlement and liquefaction potential are reduced.

- **Dry Soil Mixing** - Dry soil mixing is a technique that improves the characteristics of soft, high moisture content clays, peats, and other weak soils, by mechanically mixing them with dry cementitious binder to create soilcrete. To construct columns, a high speed drill rig advances a drill steel with radial mixing paddles located near the bottom of the drill string. During penetration, the tool shears the soils preparing them for mixing. After the tool reaches the design depth, the binder is pumped pneumatically through the drill steel to the tool where it is mixed with the soil as the tool is withdrawn. The dry soil mixing process constructs individual soilcrete columns, rows of overlapping columns or 100% mass stabilization, all with a designed strength and stiffness. This method permits the use of economical continuous and spread footings. Seismic settlement and liquefaction potential are reduced. Dry soil mixing is low vibration, quiet, and clean, and uses readily available materials. The process is often used in high ground water conditions and has the advantage of producing practically no spoil for disposal.

The typical liquefaction mitigation methods discussed above are generally considered the most cost-effective. It is our recommendation that a contractor specializing in soil improvement be contacted to determine the most appropriate method. Other methods aimed at decreasing potential distress resulting from liquefaction can be considered on a case-by-case basis if the specifications of the proposed facility allow it.

10.3 Foundations

Subsequent to implementation of the selected ground improvement, the proposed foundations should be founded entirely in compacted fill prepared in accordance with *Section 10.1*. Recommendations for the design and construction of foundation system are presented below.

10.3.1 Design Parameters

Foundations should be designed using the geotechnical design parameters presented in the following Table 4. Footings should be designed and reinforced in accordance with the recommendations of the structural engineer and should conform to the latest edition of the California Building Code.

Table 4
Geotechnical Design Parameters For Foundations*

Foundation Dimensions	Continuous or spread foundations at least 12 inches in width and at least 15 inches below the lowest adjacent grade. Concrete mat slabs should be founded a minimum of 8 inches below the lowest adjacent grade.

Allowable Bearing Capacity (dead-plus-live load)	Compacted Fill: 1,500 pounds per square foot (psf). May be increased 300 psf for each additional foot of depth and 100 psf for each additional foot of width to a maximum of 3,000 psf. A one-third increase is allowed for transient live loads from wind or seismic forces.
Reinforcement	Reinforce in accordance with requirements as provided by the project Structural Engineer.
Allowable Coefficient of Friction	0.30 0.10 in the event a vapor barrier is used.
Allowable Lateral Passive Resistance (Equivalent Fluid Pressure)	250 pounds per cubic foot (pcf) per foot of depth to a maximum of 2,500 psf. One third increase in passive value may be used for wind and seismic loads. The total allowable lateral resistance may be taken as the sum of the frictional resistance and the passive resistance, provided that the passive bearing resistance does not exceed two-thirds of the total allowable resistance.

* The above parameters assume level ground (sloping no steeper than 5 horizontal to 1 vertical).

10.3.2 Settlement

Estimated settlements will depend on the foundation size and depth, and the loads imposed and the allowable bearing values used for design. For preliminary design purposes, the total static settlement for continuous or mat foundations loaded to accordance with the allowable bearing capacities recommended above is estimated to be less than 1 inch. Based on our knowledge of the project, differential static settlements are anticipated to be 0.5 inch or less.

10.3.3 Foundation Observation

To verify the presence of satisfactory materials at design elevations, footing excavations should be observed to be clean of loosened soil and debris before placing steel or concrete and probed for soft areas.

10.4 Seismic Design Parameters

Preliminary seismic design parameters for the project site were developed as per the guidelines outlined in the 2012 IBC (2008 USGS hazard data) and 2010 ASCE 7-10 Standard (with errata as of April 2013). **NV5 should be contacted to provide revisions to these parameters if other codes are specified.** The seismic design parameters for Site Class "D" were developed using a JAVA ™ application, Java Ground Motion Parameter Calculator available on the USGS website (http://earthquake.usgs.gov). The preliminary seismic design parameters for the project site are presented in Table 5 below.

Table 5
2012 IBC Seismic Design Parameters
And ASCE 7-10 Standard

Parameter	Value
Site Class; (Section 11.4.2)	D
Mapped Spectral Accelerations for short periods, S_S ; (Section 11.4.1)	1.492g
Mapped Spectral Accelerations for 1-sec period, S_1 ; (Section 11.4.1)	0.543g
Site Coefficient, F_a; (Table 11.4-1)	1.000
Site Coefficient, F_v; (Table 11.4-2)	1.500
Maximum considered earthquake spectral response acceleration for short periods, S_{MS} adjusted for Site Class (Equation 11.4-1)	1.492g
Maximum considered earthquake spectral response acceleration at 1-sec period, S_{M1} adjusted for Site Class (Equation 11.4-2)	0.814g
Five-percent damped design spectral response acceleration at short periods, S_{DS}; (Equation 11.4-3)	0.995g
Five-percent damped design spectral response acceleration at 1-sec period, S_{D1}; (Equation 11.4-4)	0.543g

10.5 Utility Trenching and Temporary Excavations

Excavation of the on-site soils may be achieved with conventional heavy-duty grading equipment. Temporary, unsurcharged, excavation walls may be sloped back at an inclination of 1:1(H:V) within fill and natural materials. Utility trench excavations should be shored in accordance with guidelines and regulations set forth by CalOSHA. For planning purposes, the alluvial soils may be considered a Type C soil, as defined by the current CalOSHA soil classification. Stockpiled (excavated) materials should be placed no closer to the edge of a trench excavation than a distance defined by a line drawn upward from the bottom of the trench at an inclination of 1:1(H:V), but no closer than 4 feet. All trench excavations should be made in accordance with CalOSHA requirements.

Temporary, shallow excavations with vertical side slopes less than 4 feet high will generally be stable, although due to the low density of the alluvium, there is a potential for localized sloughing. Vertical excavations greater than 4 feet high should not be attempted without proper shoring to prevent local instabilities. For vertical excavations less than about 15 feet in height, cantilevered shoring may be used. Cantilevered shoring may also be used for deeper excavations; however, the total deflection at the top of the wall should not exceed one inch. Therefore, shoring of excavations deeper than about 15 feet may need to be accomplished with the aid of tied back earth anchors.

The actual shoring design should be provided by a registered civil engineer in the State of California experienced in the design and construction of shoring under similar conditions. Once the final excavation and shoring plans are complete, the plans and the design should be reviewed by NV5 for conformance with the design intent and geotechnical recommendations. The shoring system should further satisfy requirements of CalOSHA. Shoring may be accomplished with hydraulic shores and trench plates, and/or trench boxes, soldier piles and lagging. The actual method of a shoring system should be provided and designed by a contractor experienced in installing temporary shoring under

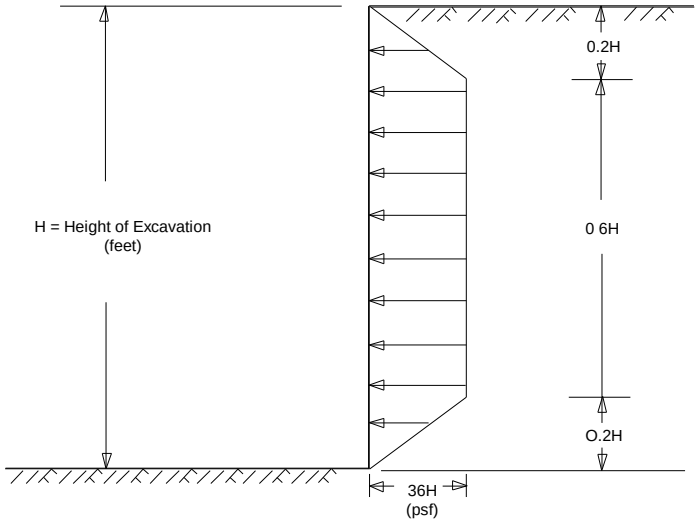
similar soil conditions. If soldier piles and lagging are to be used, we should be contacted for additional recommendations.

For major excavation or where restrictions do not permit back-sloping, shoring should be utilized in accordance with recommendations for shoring as presented in *Section 10.5.1*. Personnel from NV5 should observe the excavation so that any necessary modifications based on variations in the encountered soil conditions can be made. All applicable safety requirements and regulations, including CalOSHA requirements, should be met.

Where sloped excavations are used, the tops of the slopes should be barricaded so that vehicles and storage loads are not located within 10 feet of the tops of excavated slopes. A greater setback may be necessary when considering heavy vehicles, such as concrete trucks and cranes. NV5 should be advised of such heavy loadings so that specific setback requirements may be established. If the temporary construction slopes are to be maintained during the rainy season, berms are recommended along the tops of the slopes, to prevent runoff water from entering the excavation and eroding the slope faces.

10.5.1 Lateral Pressures

For design of cantilevered shoring, a triangular distribution of lateral earth pressure may be used. It may be assumed that the drained soils, with a level surface behind the cantilevered shoring, will exert an equivalent fluid pressure of 30 pcf. Tied-back or braced shoring should be designed to resist a trapezoidal distribution of lateral earth pressure. The recommended pressure distribution, for the case where the grade is level behind the shoring, is illustrated in the following diagram with the maximum pressure equal to 36H in psf, where H is the height of the shored wall in feet.



Any surcharge (live, including traffic, or dead load) located within a 1:1 (H:V) plane drawn upward from the base of the shored excavation should be added to the lateral earth pressures. Lateral load contributions of surcharges can be provided once the load configurations and layouts are known. As a minimum, a 2-foot equivalent soil surcharge is recommended to account for nominal construction loads.

10.6 Dewatering

Groundwater was encountered at a depth of approximately 20 feet below the existing ground surface. Dewatering is not generally anticipated during the proposed construction. However, any cases of localized seepage or heavy precipitation should be monitored during construction. If necessary, dewatering may be achieved by means of excavating a series of shallow trenches directed by gradient (i.e., gravity) to sumps with pumps. In any case, the actual means and methods of any dewatering scheme should be established by a contractor with local experience. It is important to note that temporary dewatering, if necessary, will require a permit and plan that complies with RWQCB regulations. If excessive water is encountered, NV5 should be contacted to provide additional recommendations for temporary construction dewatering. Based on the subsurface exploration and onsite percolation testing, the onsite soils maybe considered to be relatively permeable.

10.7 Trench Bottom Stability

The bottom of onsite excavations will likely expose medium dense to dense sands to firm clayey silt. These soils should provide a suitable base for construction of pipelines. For the design of flexible conduits, a modulus of soil reaction (E'), of 2,000 pounds per square inch is recommended.

While groundwater is not anticipated to be encountered, if these soils become wet or saturated they may be prone to settlement due to construction activities such as placement and compaction of backfill soils. Buried improvements underlain by these soils could also be damaged or subjected to unacceptable settlement due to subsidence of these soils. If wet or unusually soft conditions are encountered in the trench bottom, the bottom of the excavations will need to be stabilized. A typical stabilization method includes overexcavation of the soft or saturated soil and replacement with properly compacted fill, gravel or lean concrete to form a "mat" or stable working surface in the bottom of the excavation. There are other acceptable methods that can be implemented to mitigate the presence of compressible soils or unstable trench bottom conditions, and specific recommendations for a particular alternative can be discussed based on the actual construction techniques and conditions encountered.

10.8 Pipe Bedding

It is recommended that pipe bedding materials be placed in the trench to provide uniform support and protection for the pipe. Bedding is defined as that material supporting, surrounding and extending to one foot above the top of the pipe. A cement slurry may not be used as bedding. The bedding materials should be approved by the geotechnical consultant prior to hauling on site. A minimum six-inch layer of pipe bedding should be placed beneath the pipe consisting of sand or other granular material and shall have a minimum sand equivalent of 30. This zone shall be compacted to a minimum of 90 percent relative compaction. Care should be taken by the contractor during placement of the pipe bedding so that uniform contact between the bedding and pipe is attained. There should be sufficient clearance along the side of the utility pipe or line to allow for compaction equipment. The pipe bedding and cover shall be compacted under the haunches and alongside the pipe. Mechanical compaction and hand tamping near the pipe zone should be performed carefully as to not damage the pipe.

10.9 Backfill Placement and Compaction

The majority of the on-site soils should generally be suitable for use as backfill material. Backfill should be placed in loose lifts not exceeding 8 inches in thickness and compacted to at least

90 percent (95 percent beneath or within the footprint of proposed structures) of the maximum dry density as evaluated by the latest version of ASTM D1557. Water jetting should not be used for compaction. Imported backfill should consist of granular, non-expansive soil with an Expansion Index of 20 or less and should not contain any contaminated soil, expansive soil, debris, organic matter, or other deleterious materials. The sand equivalent of the imported material shall be 20 or greater. Import material should be evaluated for suitability by the geotechnical consultant prior to transport to the site.

The upper 12 inches of subgrade soil and all rock base should be compacted to at least 95 percent. The moisture content of the backfill should be maintained within 2 percent of optimum moisture content during compaction. All backfill should be mechanically compacted. Flooding or jetting is not recommended and should not be allowed.

10.10 Pavement Sections

The following sections present recommendations for pavement of parking lots and driveways within the proposed development. For pavement within the City of Stanton or County of Orange right-of-way, the recommendations should be reviewed for compliance with the appropriate agency's ordinance.

10.10.1. Flexural Asphalt Concrete (AC) Pavement

To determine the minimum structural section an R-Value test was performed on a near surface soil sample. The test results provided an R-Value of 60; however, we assumed an R-Value of 50 for the recommended pavement sections. Pavement evaluation and design was performed in accordance with the Caltrans' "Highway Design Manual", Chapter 630 for Flexible Pavements.

The table below presents the structural sections for the assumed traffic conditions for parking areas and heavy trucks driveways (i.e. delivery trucks and garbage service trucks).

Table 7
Flexible Asphalt Pavement Sections

Pavement Area	*Traffic Index (TI)*	*Pavement Section*	
		AC(1) (inches)	*AB(2) (inches)*
Parking areas	5.0	3.0	4.0
Heavy Trucks Driveways	7.0	4.0	5.0

(1) Asphalt Concrete;
(2) Crushed Miscellaneous Base (CMB), in accordance with section 200-2.4 of the Greenbook, current edition; compacted to at least 95% relative compaction (ASTM D-1557);

Note: The upper 12-inches of subgrade soils should be compacted to at least 95% relative compaction (ASTM D 1557).

Crushed Miscellaneous Base (CMB) shall consist of broken and crushed asphalt concrete, Portland cement concrete and may contain crushed aggregate base or other rock materials. It should be uniformly mixed, moistened and compacted to 95% relative compaction (ASTM D-1557). CMB shall be in accordance with section 200-2.4 of the current edition of the Standard Specifications for Public Works Construction (Greenbook).

The asphalt concrete pavement should be compacted to 95% of the unit weight as tested in accordance with the Hveem procedure. The asphalt concrete material shall conform to Type III, Class C2 or C3, latest edition of the Greenbook Standard Specifications for Public Works Construction. An approved mix design should be submitted 30 days prior to placement. The mix design should include proportions of materials, maximum density and required lay-down temperature range. Field testing should be used to verify oil content, aggregate gradation, compaction, compacted thickness, and lay-down temperature.

The performance of pavements is highly dependent upon providing positive surface drainage away from the edge of the pavement. The ponding of water on or adjacent to pavement areas will likely cause failure of the subgrade and resultant pavement distress. Where planters are proposed, the perimeter curb should extend at least 6 inches below the subgrade elevation of the adjacent pavement. In addition, our experience indicates that even with these provisions, a saturated subgrade condition can develop as a result of increased irrigation, landscaping and surface runoff.

10.11 Soil Corrosion

Laboratory testing was performed on a representative sample of the on-site soils to evaluate pH, minimum resistivity, and chloride and soluble sulfate content. Table 9 presents the results of the corrosivity testing.

Table 9
Corrosivity Test Results

Test Location	Exploratory Boring B-5
Depth (feet)	0 – 5
pH	8.0
Resistivity (ohm-cm)	1000
Chloride Content (ppm)	43
Soluble Sulfate Content (ppm)	120

Based on our experience and various publications including the Caltrans Corrosion Guidelines dated November 2012, the site would be considered “not corrosive” due to the chloride and sulfate concentrations. It is recommended that a corrosion specialist be contacted to determine if measures are necessary.

11.0 CONSTRUCTION OBSERVATION AND TESTING

Observation and testing of the placement and compaction of backfill, subgrade and base will be important to the performance of the proposed project. Site preparation, removal of unsuitable soils, assessment of imported fill materials, backfill placement, and other earthwork operations should be observed and tested.

The substrata exposed during the construction may differ from that encountered in the exploratory borings. Continuous observation by a representative of NV5 during construction allows for evaluation of the soil conditions as they are encountered, and allows the opportunity to recommend appropriate revisions where necessary.

12.0 LIMITATIONS

The recommendations and opinions expressed in this report are based on NV5's review of background documents and on information obtained from field explorations. It should be noted that this study did not evaluate the possible presence of hazardous materials on any portion of the site.

Due to the limited nature of the field explorations, conditions not observed and described in this report may be present on the site. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation and laboratory testing can be performed upon request. It should be understood that conditions different from those anticipated in this report may be encountered during construction, and that additional effort may be required to mitigate them.

Site conditions, including groundwater elevation, can change with time as a result of natural processes or the activities of man at the subject site or at nearby sites. Changes to the applicable laws, regulations, codes, and standards of practice may occur as a result of government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which NV5 has no control.

NV5's recommendations for this site are, to a high degree, dependent upon appropriate quality control of construction operations, placement and compaction of backfill, subgrade preparation, etc. Accordingly, the recommendations are made contingent upon the opportunity for NV5 to observe the earthwork operations for the proposed construction. If parties other than NV5 are engaged to provide such services, such parties must be notified that they will be required to assume complete responsibility as the geotechnical engineer of record for the geotechnical phase of the project by concurring with the recommendations in this report and/or by providing alternative recommendations.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. NV5 should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

NV5 has endeavored to perform this geotechnical evaluation using the degree of care and skill ordinarily exercised under similar circumstances by reputable geotechnical professionals with experience in this area in similar soil conditions.

13.0 REFERENCES

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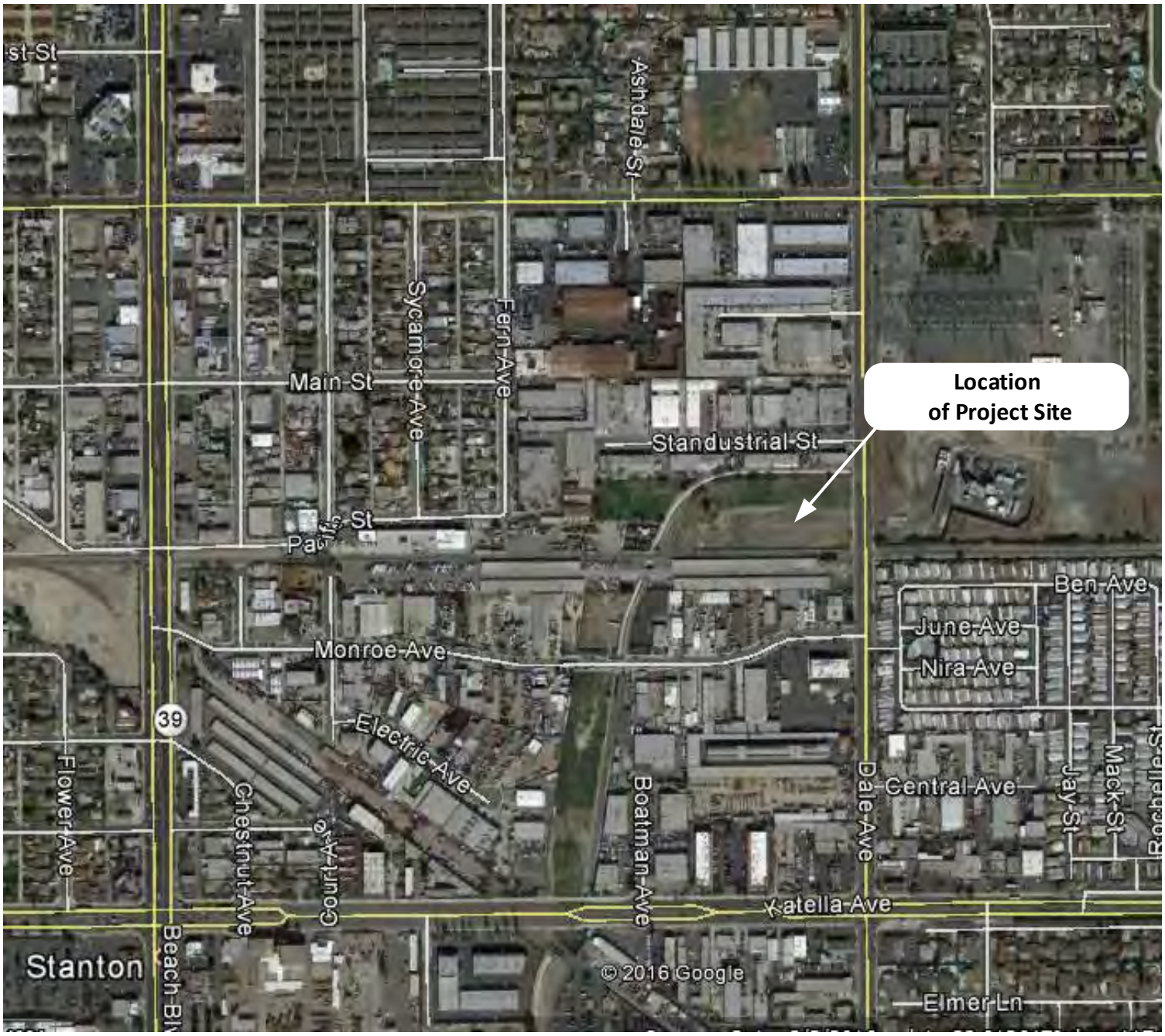
Youd, T.L. and Idriss, I.M., 2001, Liquefaction Resistance of Soils: Summary report of NCEER 1996 and 1998 NCEER/SF Workshops on Evaluation of Liquefaction Resistance of Soils: Journal of Geotechnical and Geoenvironmental Engineering, dated April, pp. 297-313.

Figures



Reference: Google Maps 2016

N

No Scale

Not a Construction Drawing

NV5
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10592 Avenue of Science, Suite 200
San Diego, CA
Tel: (858) 715-5800, Fax: (858) 715-5810

Project No: **113815-00763**
Drawn: **SR**
Date: **August 2016**

Site Location Map
Stanton Energy Reliability Center
Stanton, California

Figure No. 1

N

MAP SYMBOLS

Approximate scale in feet

0 40 80 120 160 200

Approximate location of geotechnical boring **B-1**

Approximate location of percolation test boring **P-1**

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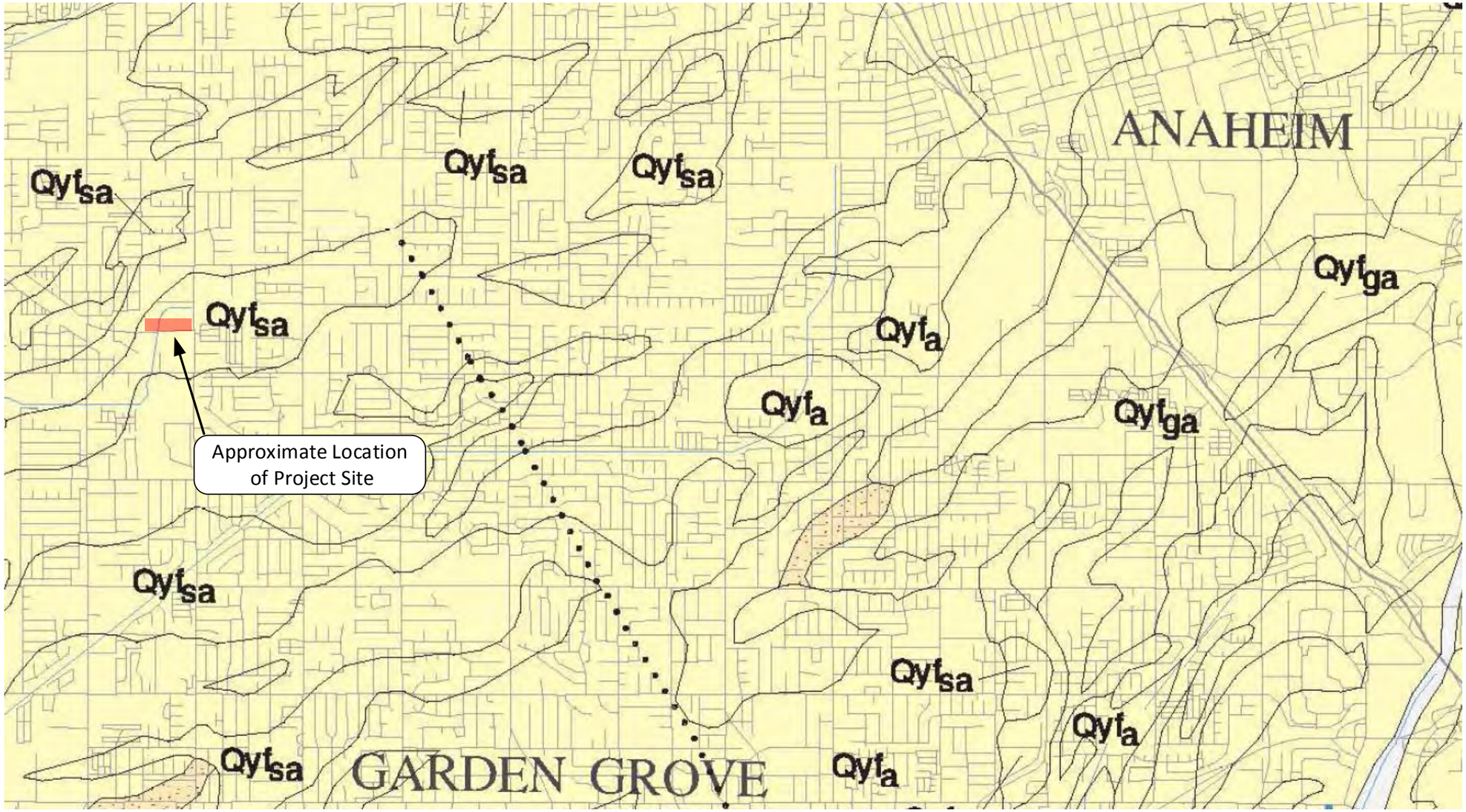
Geotechnical Map
Stanton Energy Reliability Center
Stanton, California

Figure No. 2



DESCRIPTION OF MAP UNITS

Qyf	Quaternary alluvial flood-plain deposits

Not a Construction Drawing

Reference: *Geologic Map of the San Bernardino and Santa Ana 30' x 60' Quadrangles, California*. Compiled by Morton Douglas M. and Miller, Fred K., 2006, United States Geological Survey.

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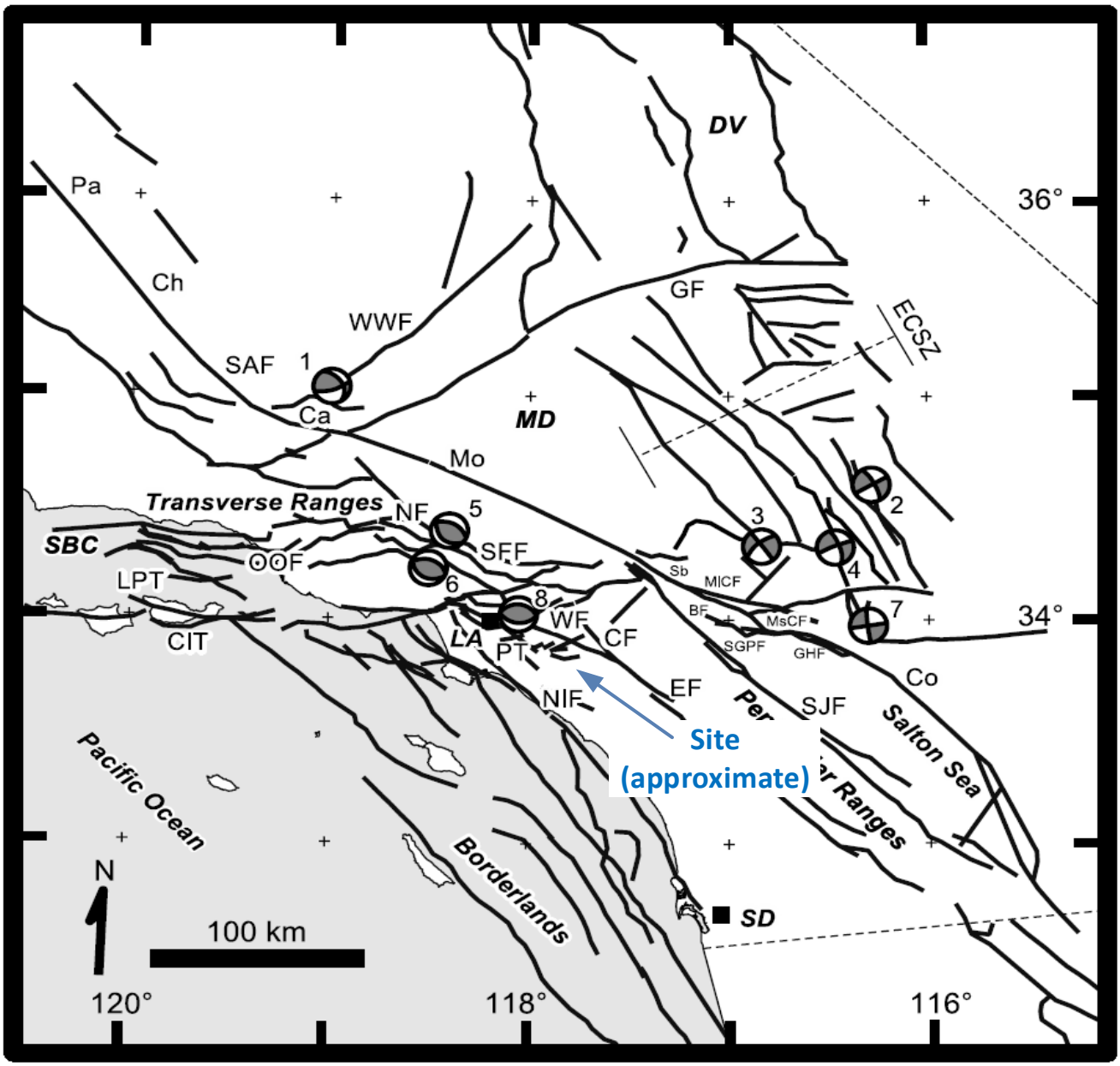
Project No: **113815-00763**
Drawn: **GC**
Date: **September 2016**

Regional Geologic Map
Stanton Energy Reliability Center
Stanton, California
Figure No. 3



Map of southern California showing the geographic regions, faults and focal mechanisms of the more significant earthquakes. **Regions:** Death Valley, DV; Mojave Desert MD; Los Angeles, LA; Santa Barbara Channel, SBC; and San Diego, SD. **Indicated Faults:** Banning fault, BF; Channel Island thrust, CIT; Chino fault, CF; Eastern California Shear Zone, ECSZ; Elsinore fault, EF; Garlock fault, GF; Garnet Hill fault, GHF; Lower Pitas Point thrust, LPT; Mill Creek fault, MICF; Mission Creek fault, MsCF; Northridge fault, NF; Newport Inglewood fault, NIF; offshore Oak Ridge fault, OOF; Puente Hills thrust, PT; San Andreas fault (sections: Parkfield, Pa; Cholame, Ch; Carrizo; Ca; Mojave, Mo; San Bernardino, Sb; and Coachella, Co); San Fernando fault, SFF; San Gorgonio Pass fault, SGPF; San Jacinto fault, SJF; Whittier fault, WF; and White Wolf fault, WWF. **Earthquake Focal Mechanisms:** 1952 Kern County, 1; 1999 Hector Mine, 2; 1992 Big Bear, 3; 1992 Landers, 4; 1971 San Fernando, 5; 1994 Northridge, 6; 1992 Joshua Tree, 7; and 1987 Whittier Narrows, 8.

For Schematic Use Only-Not a Construction Drawing

NV5

Regional Fault Map

Stanton Energy Reliability Center
Stanton, California

Drawn: GC	Contract No.: 113815-00763
Date: September 2016	Figure No.: 4

Reference: Plesch, Anndreas et. al., 2007, Community Fault Model (CFM) for Southern California; in the *Bulletin of the Seismological Society of America*, Vol. 97, No. 6. pp. 1793-1802, dated December.

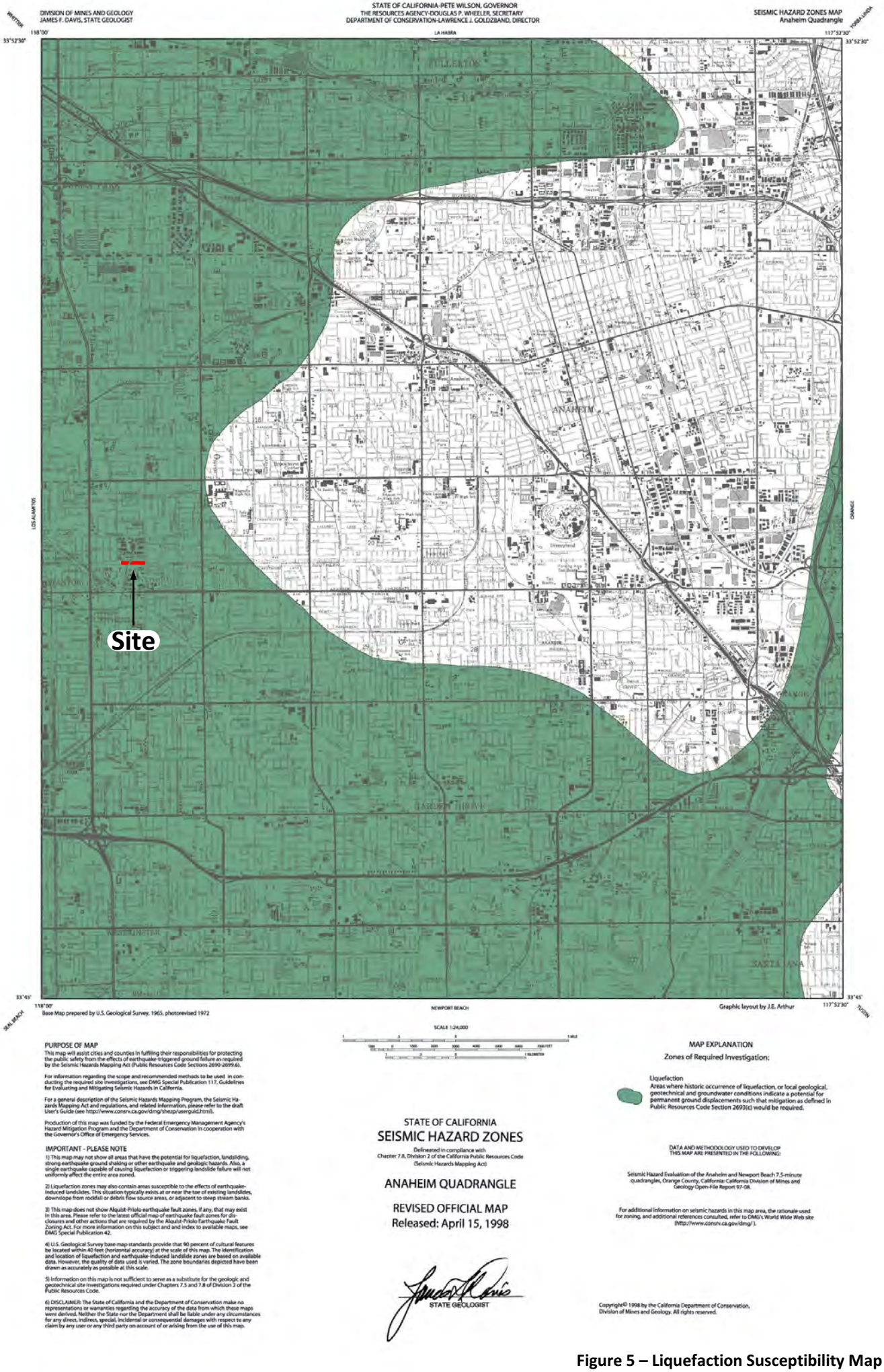
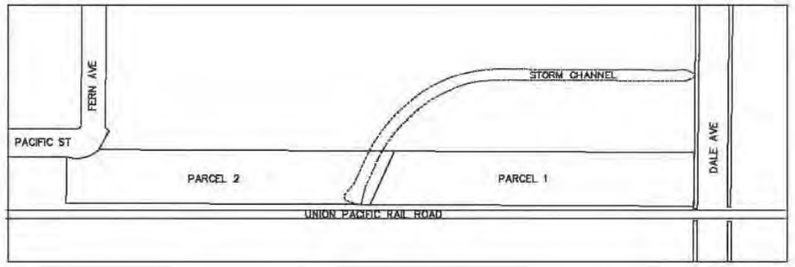


Figure 5 – Liquefaction Susceptibility Map

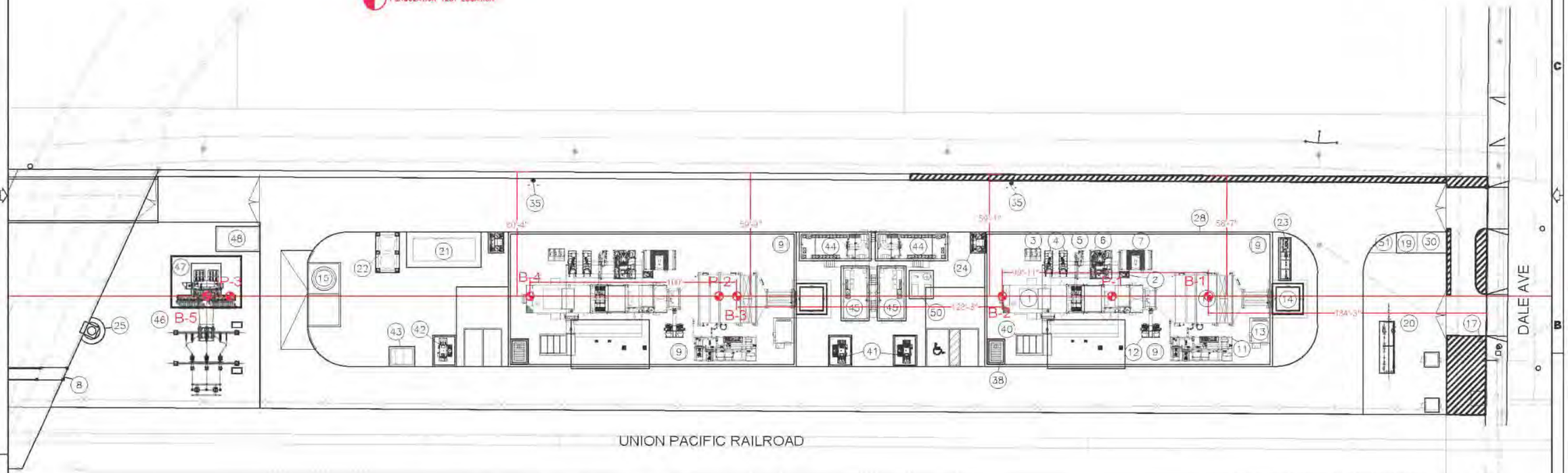


GEOTECH BORE LOCATION

PERCOLATION TEST LOCATION

KEYNOTES:

1. GAS TURBINE/GENERATOR
2. SPRINT SKID
3. FOGGER SKID
4. WATER INJECTION PUMPS
5. CLUTCH LUBE OIL SKID
6. HYDRAULIC START SKID
7. FIN-FAN L.O. COOLER
8. UTILITY BRIDGE
9. PORTABLE HAZMAT STORAGE CART
10. SCR/CO UNIT
11. AMMONIA INJECTION SKID
12. PURGE AIR FANS
13. CEMS ENCLOSURE
14. EXHAUST STACK
15. AMMONIA STORAGE TANK & PUMPS
16. WAREHOUSE
17. STEEL POLE MOUNTED DISCONNECT
18. PORTABLE HAZARDOUS MATERIALS & STORAGE
19. TRASH ENCLOSURE
20. GAS MSA YARD (SCG)
21. FUEL GAS COMPRESSOR (FGC)
22. FGC L.O. FIN-FAN COOLER
23. GAS EMERGENCY SHUT-DOWN VALVE
24. FUEL GAS FILTER SKID
25. PARCEL 1 STORMWATER LIFT STATION
26. INVERTER (PCS)
27. ISOLATION TRANSFORMER
28. GT FACILITY ENCLOSURE
29. BATTERY ENERGY STORAGE SYSTEM
30. BACKFLOW PREVENTER
31. WATER FORWARDING SKID
32. DEMINERALIZED WATER SKID
33. REVERSE OSMOSIS SKID
34. DEMINERALIZED WATER TANK
35. FIRE HYDRANT
36. STORMWATER DETENTION TANK
37. FOGGING WATER DRAIN TANK
38. OILY WATER WASTE TANK
39. PARCEL 2 STORMWATER COLLECTION
40. SWITCHGEAR (15KV)
41. AUX TRANSFORMER (480V)
42. AUX TRANSFORMER (4160V)
43. SWITCHGEAR (4160V)
44. POWER DISTRIBUTION MODULE
45. CONTROL MODULE
46. SWITCHYARD
47. GSU TRANSFORMER
48. SWITCHYARD CONTROL
49. BESS SWITCH GEAR
50. AIR COMPRESSOR SKID
51. FIRE ALARM ANNUNCIATOR PANEL



0 50' 100'

SCALE

PRELIMINARY

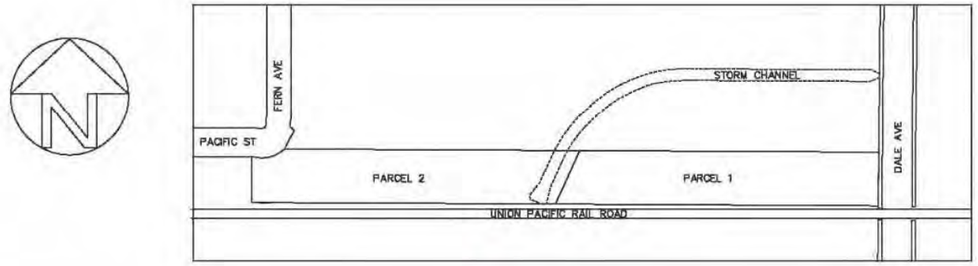
REV	DATE	DESCRIPTION	DRAWN
A	10-12-16	PRELIMINARY	BOSSERMAN, J

Stanton Energy Reliability Center, LLC
650 Bercut Dr, Suite A - Sacramento, CA 95811
Phone: 916-492-9456 Fax: 916-880-5318

DRAWING TITLE: GEOTECHNICAL LOCATIONS – PARCEL 1

DRAWN: – DATE: –
ENG. APPROVAL: – DATE: –

SIZE: D | FSCM NO. | DWG NO.: SERC-C-100 | REV: A
SCALE: NONE | PROJECT STANTON | SHEET 1/2



GEOTECH BORE LOCATION

PERCOLATION TEST LOCATION

KEYNOTES:

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8. UTILITY BRIDGE
9. PORTABLE HAZMAT STORAGE CART
10. SCR/CO UNIT
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12. PURGE AIR FANS
13. CEMS ENCLOSURE
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15. AMMONIA STORAGE TANK & PUMPS
16. WAREHOUSE
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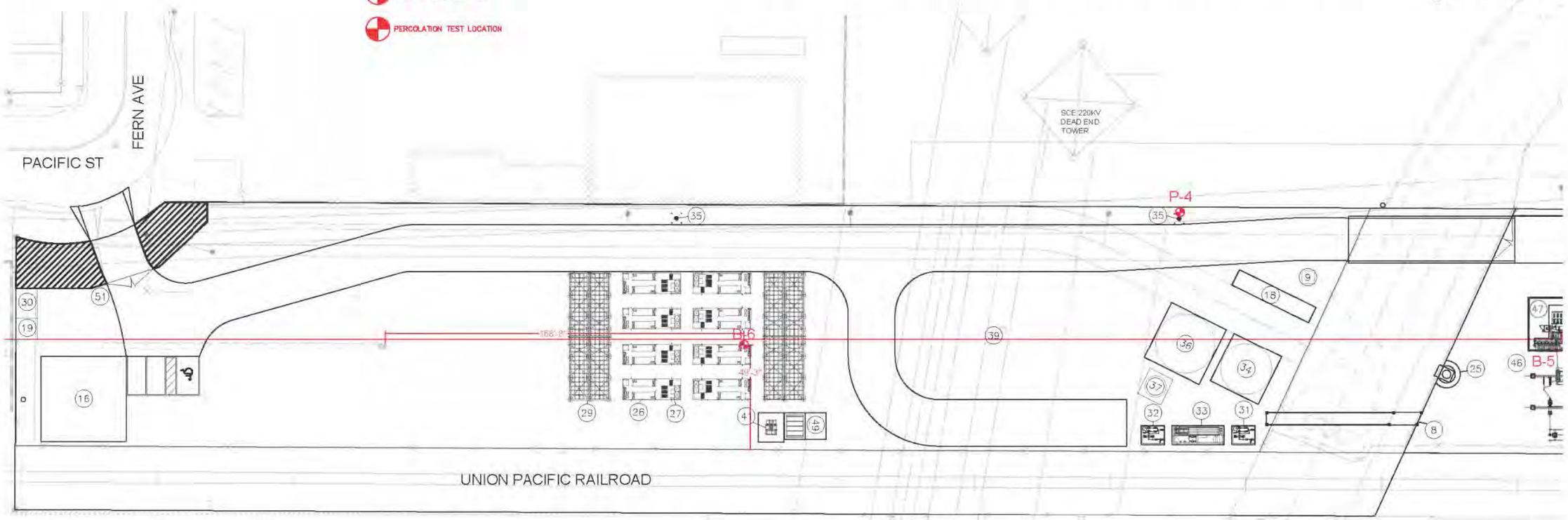
38. OILY WATER WASTE TANK
39. PARCEL 2 STORMWATER COLLECTION
40. SWITCHGEAR (15KV)
41. AUX TRANSFORMER (480V)
42. AUX TRANSFORMER (4160V)
43. SWITCHGEAR (4160V)
44. POWER DISTRIBUTION MODULE
45. CONTROL MODULE
46. SWITCHYARD
47. GSU TRANSFORMER
48. SWITCHYARD CONTROL
49. BESS SWITCH GEAR
50. AIR COMPRESSOR SKID
51. FIRE ALARM ANNUNCIATOR PANEL



PRELIMINARY

NOTES:

REV	DATE	DESCRIPTION	DRAWN
A	10-12-16	PRELIMINARY	BOSSERMAN, J

Stanton Energy Reliability Center, LLC
650 Bercut Dr, Suite A - Sacramento, CA 95811
Phone 916-492-9486 Fax 916-880-5318

DRAWN — DATE —
ENG. APPROVAL — DATE —

DRAWING TITLE: GEOTECHNICAL LOCATIONS – PARCEL 2

SIZE D | PSCM NO. | DWG NO. SERC-C-103 | REV A
SCALE NONE | PROJECT STANTON | SHEET 2/2

Appendix A

Exploratory Boring Logs

Logs of Exploratory Borings

Bulk and relatively undisturbed drive samples were obtained in the field during our subsurface evaluation. The samples were tagged in the field and transported to our laboratory for observation and testing. The drive samples were obtained using the Standard Penetration Test (SPT) samplers as described below.

California Modified Split Spoon Sampler

The split barrel drive sampler is driven with a 140-pound hammer allowed to drop freely 30 inches in general accordance with ASTM D1587. The number of blows per foot recorded during sampling is presented in the logs of exploratory borings. The sampler has external and internal diameters of approximately 3.0 and 2.4 inches, respectively, and the inside of the sampler is lined with 1-inch-long brass rings. The relatively undisturbed soil sample within the rings is removed, sealed, and transported to the laboratory for observation and testing.

Standard Penetration Test (SPT) Sampler

The split barrel sampler is driven with a 140-pound hammer allowed to drop freely 30 inches in general accordance with ASTM D1586. The number of blows per foot recorded during sampling is presented in the logs of exploratory borings. The sampler has external and internal diameters of 2.0 and 1.5 inches, respectively. The soil sample obtained in the interior of the barrel is measured, removed, sealed and transported to the laboratory for observation and testing.

LOG SYMBOLS:

Bulk/Bag sample

California sampler
(2-1/2 inch outside diameter)

Modified California sampler
(3 inch outside diameter)

Standard penetration
Split spoon sampler
(2 inch outside diameter)

NX size core barrel
(2-5/8 inch outside diameter)

Shelby tube

Water level
(level after completion)

Water level
(level where first encountered)

Abbreviations:

SA - Sieve Analysis
P200 - Percent passing #200 sieve
AL - Atterberg Limits
LL - Liquid limit
DS - Direct shear test
'R' - R-value test
CS - Corrosivity test
EI - UBC expansion index
MD - Laboratory compaction test
CN - Consolidation test

General Notes:

1. Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual.
2. No warranty is provided as to the continuity of soil conditions between individual sample locations.
3. Logs represent general soil conditions observed at the point of exploration on the date indicated.
4. In general, unified soil classification designations presented on the logs were evaluated by visual methods only. Therefore, actual designations (based on laboratory tests) may vary.

Consistency criteria based on field tests

Relative density	SPT* (# blows/ft)	Relative density (%)
Very Loose	<4	0 - 15
Loose	4 - 10	15 - 35
Medium Dense	10 - 30	35 - 65
Dense	30 - 50	65 - 85
Very dense	>50	85 - 100

		Torvane	Pocket** penetrometer
Consistency	SPT (# blows/ft)	Undrained shear strength (tsf)	Unconfined compressive strength
Very soft	<2	<0.13	<0.25
Soft	2 - 4	0.13 - 0.25	0.25 - 0.5
Medium stiff	4 - 8	0.25 - 0.5	0.5 - 1.0
Stiff	8 - 15	0.5 - 1.0	1.0 - 2.0
Very stiff	15 - 30	1.0 - 2.0	2.0 - 4.0
Hard	>30	>2.0	>4.0

* Number of blows of 140 pounds hammer falling 30 inches to drive a 2 inch C.D. (1 3/8" I.D.) split barrel samler (ASTM - 1386 standard penetration test)

** Unconfined compressive strength in Tons/ft^2. Read from pocket penetrometer

Moisture content

Description	Field test
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

Cementation

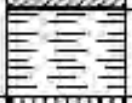
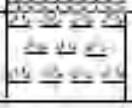
Description	Field test
Weakly	Crumbles or breaks with handling or slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

NV5 West, Inc.
15092 Avenue of Science, Suire 200,
San Diego, CA 92128
Tel: (858) 715-5800, Fax: (858) 715-5810

Project No: 113815-00763
Drawn: GC
Date: September 2016

Title: Log Legend
Project: Stanton Energy Reliability Center
Stanton, California

Soil Classification Chart

Major Divisions			Symbols: Graph	Symbols: Letter	Typical Descriptions
Coarse Grained Soils: More than 50% of material is larger than No. 200 sieve size	Gravel and Gravelly soils: more than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels (Little or no fines)		GW	Well-Graded Gravel, Gravel - SAND mixtures, little or no fines
				GP	Poorly-Graded Gravels, Gravel - SAND mixtures, little or no fines
		Gravels with fines (Appreciable amount of fines)		GM	Silty Gravels, Gravel- SAND-Silt mixture
				GC	Clayey Gravels, Gravel - SAND - Clay mixtures
	Sand and Sandy Soils: More than 50% of coarse fraction passing on No.4 sieve	Clean SANDS (Little or no fines)		SW	Well-Graded SANDS, Gravelly SANDS, little or no fines
				SP	Poorly - Graded SANDS, Gravelly SAND, little or no fines
		Sands with Fines (Appreciable amount of fines)		SM	Silty SANDS, SAND-Silt mixtures
				SC	Clayey SANDS, SAND - Clay mixtures
Fine grained soils: More than 50% of material is smaller than No. 200 sieve size	Silts and Clays: Liquid Limit less than 50			ML	Inorganic Silts and very fine SANDS, rock flour, Silty or Clayey fine SANDS or clayey Silts with slight Plasticity
				CL	Inorganic Clays of low to medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
				OL	Organic Silts and organic Silty Clays of low Plasticity
	Silts and Clays: Liquid Limit Greater than 50			MH	Inorganic Silts, micaceous or diatomaceous fine SAND or Silty Soils
				CH	Inorganic Clays of high Plasticity
				OH	Organic Clays of medium to high Plasticity, organic Silts
Highly organic soils				PT	Peat, Humus, Swamp soils with High organic contents

NOTE: Dual symbols are used to indicate borderline soil classifications

NV5 West, Inc.
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San Diego, CA 92128
Tel: (858) 715-5800, Fax: (858) 715-5810

Project No: **113815-00763**
Drawn: **GC**
Date: **September 2016**

Title: **Log Legend**
Project: **Stanton Energy Reliability Center**
Stanton, California

Chart No. 2

NV5 BEYOND ENGINEERING

Project: **Stanton Energy Reliability Center**
Project Location: Stanton, CA
Project Number: 113815-00763.00

Boring B1

Sheet 1 of 2

Date(s) Drilled	August 8, 2016	Logged By	S. Roy	Checked By	G. Custenborder
Drilling Method	Hollow Stem Auger	Boring Diameter	8-inch	Approximate Surface Elevation	68 feet
Drilling Contractor	J&H Drilling	Sampling Method	Cal-Mod./SPT	Hammer Data	140 pound, auto chain
Drill Rig Type:	CME-75	Location:		Lat. - Long.:	33.806836,-117.985106 (WGS84)

MATERIAL DESCRIPTION

This log is an integral part of the accompanying report and must be used together with the report for relevant interpretation. The descriptions contained hereon apply only at this boring location and at the time of excavation. Subsurface data are a simplified summary of actual conditions encountered and may vary at other locations and with the passage of time.

Depth (ft)	Sample Type	Blows / 6 in. (N)	Sample ID	USCS Class.	Material Description	Moisture Content %	Dry Weight (pcf)	Other Tests and Remarks
0					Alluvium:			
3				SM	SILTY SAND: medium dense, light brown, dry, micaceous, fine grained			
4			Bag 1					
5		7				2.7		
		7	SPT1	SM	SAME:			
		8						
			Bag 2					
10		4				16.5	105	
		5	Cal 1	ML	SANDY SILT: stiff, dark brown, moist, micaceous, fine grained.			
		7						
			Bag 3					
15		5				5.2		
		7	SPT2	SP	Poorly Graded SAND: Medium dense, light brown, moist, micaceous, fine grained			
		10						
			Bag 4					
20		5				22.8	105	Wet at 20' bgs
		6	Cal 2					
		6		SC-SM	SILTY CLAYEY SAND: Medium dense, dark brown, wet, micaceous, fine grained.			
25		4				21.4		
		5	SPT3	SP	Poorly Graded SAND: Medium dense, light brown, wet, micaceous, fine grained			
		7						
30								

Sample Type: Cal. Mod. | SPT | Bulk | Other | No Recovery

NV5 BEYOND ENGINEERING

Project: **Stanton Energy Reliability Center**
Project Location: Stanton, CA
Project Number: 113815-00763.00

Boring B1

Sheet 2 of 2

Date(s) Drilled	August 8, 2016	Logged By	Sean Roy	Checked By	G. Custenborder
Drilling Method	Hollow Stem Auger	Boring Diameter	8-inch	Approximate Surface Elevation	68 feet
Drilling Contractor	J&H Drilling	Sampling Method	Cal-Mod./SPT	Hammer Data	140 pound, auto chain
Drill Rig Type:	CME-75	Location:		Lat. - Long.:	33.806836,-117.985106 (WGS84)

Depth (ft)	Sample Type	Blows / 6 in. (N)	Sample ID	USCS Class.	MATERIAL DESCRIPTION	Moisture Content %	Dry Weight (pcf)	Other Tests and Remarks
					This log is an integral part of the accompanying report and must be used together with the report for relevant interpretation. The descriptions contained hereon apply only at this boring location and at the time of excavation. Subsurface data are a simplified summary of actual conditions encountered and may vary at other locations and with the passage of time.			
30		10 22 28	Cal 3	SP	Poorly Graded SAND: Dense, light brown, wet, micaceous, fine grained	23.0	104	
35		10 12 14	SPT4	SP	Poorly Graded SAND: Medium dense, light brown, wet, micaceous, fine grained	19.8		
40		12 18 21	Cal 4	SP	Poorly Graded SAND: Dense, light brown, wet, micaceous, fine grained	20.8	105	
45		5 6 7	SPT5	SP	Poorly Graded SAND: Medium dense, light brown, wet, micaceous, fine grained	18.8		
50		6 8 12	SPT6	SP	Poorly Graded SAND: Medium dense, light brown, wet, micaceous, fine grained	16.0		
55					Totoal Depth 51.5' bgs ground water encountered at 20' bgs backfilled with bentonite grout 20% solids approximately 125 gallons, from 5'-51.5' bgs 100 lbs medium bentonite chips, hydrated, from 1' - 5' Soil cuttings 0' - 1' bgs			
60								

Sample Type: Cal. Mod. | SPT | Bulk | Other | No Recovery

NV5 BEYOND ENGINEERING

Project: **Stanton Energy Reliability Center**
Project Location: Stanton, CA
Project Number: 113815-00763.00

Boring B2

Sheet 1 of 2

Date(s) Drilled	August 8, 2016	Logged By	S. Roy	Checked By	G. Custenborder
Drilling Method	Hollow Stem Auger	Boring Diameter	8-inch	Approximate Surface Elevation	68 feet
Drilling Contractor	J&H Drilling	Sampling Method	Cal-Mod./SPT	Hammer Data	140 pound, auto chain
Drill Rig Type:	CME-75	Location:		Lat. - Long.:	33.806832,-117.985439 (WGS84)

MATERIAL DESCRIPTION

This log is an integral part of the accompanying report and must be used together with the report for relevant interpretation. The descriptions contained hereon apply only at this boring location and at the time of excavation. Subsurface data are a simplified summary of actual conditions encountered and may vary at other locations and with the passage of time.

Depth (ft)	Sample Type	Blows / 6 in. (N)	Sample ID	USCS Class.	Material Description	Moisture Content %	Dry Weight (pcf)	Other Tests and Remarks
0					Alluvium:			
1				ML	SANDY SILT: hard, grayish brown, dry, micaceous, fine grained.			
2								
3		14				3.1		
		20	SPT1					
4		12						
			Bag 1					
5		10				2.6	100	
		14	Cal 1	SM	SILTY SAND: medium dense, grayish brown, dry, micaceous, fine grained			
		16						
						21.8		
		1						
		2	SPT2	SC	Silty CLAYEY SAND: Loose, dark grayish brown, moist, micaceous, fine grained.			
		3						
			Bag 2					
10		4		SC	Same: Medium dense.	21.3	103	
		6	Cal 2					
		7						
		3						
		4	SPT3	SM	SILTY SAND: loose, dark grayish brown, moist, micaceous, fine grained			
		5						
			Bag 3					
15		9				11.3	102	
		12	Cal 3	SP	Poorly Graded SAND: Medium dense, light brown, moist, micaceous, fine grained			
		14						
			Bag 4					
20		4		SP	Poorly Graded SAND: Medium dense, light brown, wet, micaceous, fine grained			▼ Wet at 20' bgs
		5	SPT4					
		6						
25		2				17.2		
		3	SPT5	SC	Silty CLAYEY SAND: Loose, grayish brown, wet, micaceous, fine grained.			
		4						
30				SP	Poorly Graded SAND: Medium dense, light brown, wet, micaceous, fine-medium grained.			

Sample Type: Cal. Mod. | SPT | Bulk | Other | No Recovery

NV5 BEYOND ENGINEERING

Project: **Stanton Energy Reliability Center**
Project Location: Stanton, CA
Project Number: 113815-00763.00

Boring B2

Sheet 2 of 2

Date(s) Drilled	August 8, 2016	Logged By	Sean Roy	Checked By	G. Custenborder
Drilling Method	Hollow Stem Auger	Boring Diameter	8-inch	Approximate Surface Elevation	68 feet
Drilling Contractor	J&H Drilling	Sampling Method	Cal-Mod./SPT	Hammer Data	140 pound, auto chain
Drill Rig Type:	CME-75	Location:		Lat. - Long.:	33.806832,-117.985439 (WGS84)

Depth (ft)	Sample Type	Blows / 6 in. (N)	Sample ID	USCS Class.	MATERIAL DESCRIPTION	Moisture Content %	Dry Weight (pcf)	Other Tests and Remarks
					This log is an integral part of the accompanying report and must be used together with the report for relevant interpretation. The descriptions contained hereon apply only at this boring location and at the time of excavation. Subsurface data are a simplified summary of actual conditions encountered and may vary at other locations and with the passage of time.			
30								
	X	4 6 9	SPT6	SP	Poorly Graded SAND: Medium dense, light brown, wet, micaceous, fine-medium grained.			
35	X	6 12 18	SPT7	SP	SAME			
					SAME: fine grained			
40	X	4 5 6	SPT8	SC	Silty CLAYEY SAND: Medium dense, grayish brown, wet, micaceous, fine grained.	20.9		
					downward fining, increasing silt, decreasing sand			
45	X	6 6 9	SPT9	CL	SILTY CLAY: Stiff, grayish brown, wet			
				SM	SILTY SAND: Medium dense, grayish brown, wet, micaceous, fine grained			
50	X	6 10 12	SPT10					
					Totoal Depth 51.5' bgs ground water encountered at 20' bgs backfilled with bentonite grout 20% solids, approximately 125 gallons, from 5'-51.5' bgs 100 lbs medium bentonite chips, hydrated, from 1' - 5' bgs Soil cuttings 0' - 1' bgs			
55								
60								

Sample Type: Cal. Mod. | SPT | Bulk | Other | No Recovery

NV5 BEYOND ENGINEERING

Project: **Stanton Energy Reliability Center**
Project Location: Stanton, CA
Project Number: 113815-00763.00

Boring B3

Sheet 1 of 2

Date(s) Drilled	August 1, 2016	Logged By	S. Roy	Checked By	G. Custenborder
Drilling Method	Hollow Stem Auger	Boring Diameter	8-inch	Approximate Surface Elevation	68 feet
Drilling Contractor	J&H Drilling	Sampling Method	Cal-Mod./SPT	Hammer Data	140 pound, auto chain
Drill Rig Type:	CME-75	Location:		Lat. - Long.:	33.806828,-117.985862 (WGS84)

MATERIAL DESCRIPTION

This log is an integral part of the accompanying report and must be used together with the report for relevant interpretation. The descriptions contained hereon apply only at this boring location and at the time of excavation. Subsurface data are a simplified summary of actual conditions encountered and may vary at other locations and with the passage of time.

Depth (ft)	Sample Type	Blows / 6 in. (N)	Sample ID	USCS Class.	Material Description	Moisture Content %	Dry Weight (pcf)	Other Tests and Remarks
0					3-inch gravel			
					Alluvium:			
1				SM	SILTY SAND: Dense grayish brown, dry, micaceous, fine grained			
2								
3								
4			Bag 1					
5		13		SM	Silty SAND: Very dense, grayish brown, moist, micaceous, fine grained	2.4	99	
		23						
		29	Cal 1					
			Bag 2		Increasing clay content	17.8		
10		3		SC	Silty CLAYEY SAND: Loose, mottled dark gray to brown, moist, micaceous,			
		4	SPT1		fine grained			
		5						
			Bag 3					
15		9		SM	SILTY SAND: Medium dense, light brown, moist, micaceous, fine grained	15.4	106	
		12						
		16	Cal 2					
			Bag 4					
20		4		SM	SILTY SAND: Loose, grayish brown, wet, micaceous, fine grained			▼ Wet at 20' bgs
		4						
		6	SPT2					
25		12			Decreasing silt from 25-26, fine-medium grained sand	21.7	106	
		14	Cal 3	SM				
		19			SILTY SAND: Dense, gray, wet, micaceous, fine grained			
30								

Sample Type: Cal. Mod. | SPT | Bulk | Other | No Recovery

NV5 BEYOND ENGINEERING

Project: **Stanton Energy Reliability Center**
Project Location: Stanton, CA
Project Number: 113815-00763.00

Boring B3

Sheet 2 of 2

Date(s) Drilled	August 1, 2016	Logged By	Sean Roy	Checked By	G. Custenborder
Drilling Method	Hollow Stem Auger	Boring Diameter	8-inch	Approximate Surface Elevation	68 feet
Drilling Contractor	J&H Drilling	Sampling Method	Cal-Mod./SPT	Hammer Data	140 pound, auto chain
Drill Rig Type:	CME-75	Location:		Lat. - Long.:	33.806828,-117.985862 (WGS84)

MATERIAL DESCRIPTION

This log is an integral part of the accompanying report and must be used together with the report for relevant interpretation. The descriptions contained hereon apply only at this boring location and at the time of excavation. Subsurface data are a simplified summary of actual conditions encountered and may vary at other locations and with the passage of time.

Depth (ft)	Sample Type	Blows / 6 in. (N)	Sample ID	USCS Class.	Material Description	Moisture Content %	Dry Weight (pcf)	Other Tests and Remarks
30		10 13 16	SPT3	SP	Poorly Graded SAND: Medium dense, light brown, wet, micaceous, fine grained	22.1		
					Downward coarsening 35'- 36.5' increasing grain size (fine - medium grained)			
35		14 14 23	Cal 4	SM	SILTY SAND: Dense, grayish brown, wet, micaceous, fine grained	20.3	104	
					Downward coarsening Increasing grain size, (fine - medium grained)			
40		7 11 14	SPT4	ML	SANDY SILT: Very stiff, dark grey, moist wet, micaceous, fine grained	27.6		
45		8 12 15	Cal 5	ML	Same:	30.0	91	
50		7 11 35	SPT5	ML	50.5' - 51' (fine-medium grained sand) SANDY SILT: Hard, dark gray, wet, micaceous, fine grained.			
					Totoal Depth 51.5' bgs ground water encountered at 20' bgs backfilled with bentonite grout 20% solids approximately 125 gallons, from 5'-51.5' bgs 200lbs medium bentonite chips, hydrated, from 1' - 5' bgs Soil cuttings 0' - 1' bgs			
55								
60								

Sample Type: Cal. Mod. | SPT | Bulk | Other | No Recovery

NV5 BEYOND ENGINEERING

Project: **Stanton Energy Reliability Center**
Project Location: Stanton, CA
Project Number: 113815-00763.00

Boring B4

Sheet 1 of 2

Date(s) Drilled	August 1, 2016	Logged By	S. Roy	Checked By	G. Custenborder
Drilling Method	Hollow Stem Auger	Boring Diameter	8-inch	Approximate Surface Elevation	68 feet
Drilling Contractor	J&H Drilling	Sampling Method	Cal-Mod./SPT	Hammer Data	140 pound, auto chain
Drill Rig Type:	CME-75	Location:		Lat. - Long.:	33.806826,-117.986189 (WGS84)

Depth (ft)	Sample Type	Blows / 6 in. (N)	Sample ID	USCS Class.	MATERIAL DESCRIPTION	Moisture Content %	Dry Weight (pcf)	Other Tests and Remarks
					This log is an integral part of the accompanying report and must be used together with the report for relevant interpretation. The descriptions contained hereon apply only at this boring location and at the time of excavation. Subsurface data are a simplified summary of actual conditions encountered and may vary at other locations and with the passage of time.			
0					Alluvium:	2.5		
1				SM	SILTY SAND: Loose, yelowish brown, dry, fine grained			
2								
3								
4			Bag 1					
5		11 13 13	SPT1	SP	Poorly graded SAND: Medium dense, light brown, dry, micaceous, fine-medium grained			
			Bag 2					
10		4 12 16	Cal 1	SP	Poorly graded SAND: Medium dense, grayish brown, moist, micaceous, fine-medium, grained			
			Bag 3					
15		11 14 17	SPT2	SW	Well graded SAND: Dense, light brown, moist, fine-coarse grained	2.1		
			Bag 4					
20		8 14 17	Cal 2	SP	SILTY SAND: Dense, dary gray, wet, micaceous, fine grained	19.5	104	▼ Wet at 20' bgs
				ML	SANDY SILT: Very stiff, dark gray, wet, micaceous			
25		4 7 11	SPT3	SP	Poorly graded SAND: Medium dense, dark gray, wet, micaceous, fine grained	22.4		
30								

Sample Type: Cal. Mod. | SPT | Bulk | Other | No Recovery

NV5 BEYOND ENGINEERING

Project: **Stanton Energy Reliability Center**
Project Location: Stanton, CA
Project Number: 113815-00763.00

Boring B4

Sheet 2 of 2

Date(s) Drilled	August 1, 2016	Logged By	Sean Roy	Checked By	G. Custenborder
Drilling Method	Hollow Stem Auger	Boring Diameter	8-inch	Approximate Surface Elevation	68 feet
Drilling Contractor	J&H Drilling	Sampling Method	Cal-Mod./SPT	Hammer Data	140 pound, auto chain
Drill Rig Type:	CME-75	Location:		Lat. - Long.:	33.806826,-117.986189 (WGS84)

Depth (ft)	Sample Type	Blows / 6 in. (N)	Sample ID	USCS Class.	MATERIAL DESCRIPTION	Moisture Content %	Dry Weight (pcf)	Other Tests and Remarks
					This log is an integral part of the accompanying report and must be used together with the report for relevant interpretation. The descriptions contained hereon apply only at this boring location and at the time of excavation. Subsurface data are a simplified summary of actual conditions encountered and may vary at other locations and with the passage of time.			
30		7				18.9	105	
		19	Cal 3	SP	Poorly graded SAND: Dense, dark gray, wet, micaceous, fine-medium grained			
		31						
35		4		ML	Increase in silt content 35.5' - 36'	20.1		
		9	SPT4	SP	Poorly graded SAND: Medium dense, dark grey, wet, micaceous, fine grained			
		13						
40		9		ML	CLAYEY SILT: Hard, mottled dark gray, wet, micaceous	31.9	87	
		17	Cal 4					
		24						
					Decresing silt, increasing sand			
45		6		SP	Poorly graded SAND: Dense, dark gray, wet, micaceous, fine grained	28.5		
		16	SPT5					
		19		ML	CLAYEY SILT: Hard, mottled dark gray, moist, micaceous.			
				SP	Poorly graded SAND: Dense, dark gray, wet, micaceous, fine grained.			
50		10				34.8	81	
		13	Cal 5					
		26						
					Total Dep h 51.5' bgs ground water encountered at 20' bgs backfilled with bentonite grout 20% solids approximately 125 gallons, from 5'-51.5' bgs 100 lbs medium bentonite chips, hydrated, from 1' - 5' bgs, soil cuttings from 0' - 1' bgs			
55								
60								

Sample Type: Cal. Mod. | SPT | Bulk | Other | No Recovery

NV5 BEYOND ENGINEERING

Project: **Stanton Energy Reliability Center**
Project Location: Stanton, CA
Project Number: 113815-00763.00

Boring B5

Sheet 1 of 2

Date(s) Drilled	August 1, 2016	Logged By	S. Roy	Checked By	G. Custenborder
Drilling Method	Hollow Stem Auger	Boring Diameter	8-inch	Approximate Surface Elevation	68 feet
Drilling Contractor	J&H Drilling	Sampling Method	Cal-Mod./SPT	Hammer Data	140 pound, auto chain
Drill Rig Type:	CME-75	Location:		Lat. - Long.:	33.806824,-117.986706 (WGS84)

MATERIAL DESCRIPTION

This log is an integral part of the accompanying report and must be used together with the report for relevant interpretation. The descriptions contained hereon apply only at this boring location and at the time of excavation. Subsurface data are a simplified summary of actual conditions encountered and may vary at other locations and with the passage of time.

Depth (ft)	Sample Type	Blows / 6 in. (N)	Sample ID	USCS Class.	Material Description	Moisture Content %	Dry Weight (pcf)	Other Tests and Remarks
0					Alluvium:			
1				SM	SILTY SAND: Medium dense, brown, dry, fine grained, with asphalt fragments.			
2								
3								
4			Bag 1					
5		7 15 16	Cal 1	SP	Poorly graded SAND: Dense, light brown, moist, micaceous, fine grained.			
			Bag 2					
10		4 7 10	SPT1	ML	SANDY SILT:			
			Bag 3					
15		6 8 13	Cal 2	ML	SAME: Increasing sand			
			Bag 4					
20		3 4 7	SPT2	ML	SILTY SAND: Stiff, gray, wet, micaceous, fine grained.	21.1		▼ Wet at 20' bgs
25		6 15 22	Cal 3		Same	17.8	114	
				SP	Poorly graded SAND: Dense, gray, wet, micaceous, fine-medium grained			
30								

Sample Type: Cal. Mod. | SPT | Bulk | Other | No Recovery

NV5 BEYOND ENGINEERING

Project: **Stanton Energy Reliability Center**
Project Location: Stanton, CA
Project Number: 113815-00763.00

Boring B5

Sheet 2 of 2

Date(s) Drilled	August 1, 2016	Logged By	Sean Roy	Checked By	G. Custenborder
Drilling Method	Hollow Stem Auger	Boring Diameter	8-inch	Approximate Surface Elevation	68 feet
Drilling Contractor	J&H Drilling	Sampling Method	Cal-Mod./SPT	Hammer Data	140 pound, auto chain
Drill Rig Type:	CME-75	Location:		Lat. - Long.:	33.806824,-117.986706 (WGS84)

MATERIAL DESCRIPTION

This log is an integral part of the accompanying report and must be used together with the report for relevant interpretation. The descriptions contained hereon apply only at this boring location and at the time of excavation. Subsurface data are a simplified summary of actual conditions encountered and may vary at other locations and with the passage of time.

Depth (ft)	Sample Type	Blows / 6 in. (N)	Sample ID	USCS Class.	Material Description	Moisture Content %	Dry Weight (pcf)	Other Tests and Remarks
30		6 16 21	SPT3	SP	Poorly Graded SAND: Dense, gray, wet, micaceous, fine grained.	25.6		
35		7 16 22	Cal 4	SP	Same:	18.3	107	
40		4 7 11	SPT4	SP	Same:			
45		9 16 18	Cal 5	ML	CLAYEY SILT: Hard, dark gray, wet, micaceous.	30.1	95	
50		4 7 11	SPT5	ML	Increase in fine sand from 50' - 50.5' bgs CLAYEY SILT: Very stiff, dark gray, wet, micaceous	34.0		
55					Total Dep h 51.5' bgs ground water encountered at 20' bgs backfilled with bentonite grout, 20% solids approximately 125 gallons, from 5'-51.5' bgs 250 lbs medium bentonite chips, hydrated, from 1' - 5' bgs, soil cuttings from 0' - 1' bgs			
60								

Sample Type: Cal. Mod. | SPT | Bulk | Other | No Recovery

NV5 BEYOND ENGINEERING

Project: **Stanton Energy Reliability Center**
Project Location: Stanton, CA
Project Number: 113815-00763.00

Boring B6

Sheet 1 of 2

Date(s) Drilled	August 8, 2016	Logged By	S. Roy	Checked By	G. Custenborder
Drilling Method	Hollow Stem Auger	Boring Diameter	8-inch	Approximate Surface Elevation	72 feet
Drilling Contractor	J&H Drilling	Sampling Method	Cal-Mod./SPT	Hammer Data	140 pound, auto chain
Drill Rig Type:	CME-75	Location:		Lat. - Long.:	33.806791,-117.987933 (WGS84)

MATERIAL DESCRIPTION

This log is an integral part of the accompanying report and must be used together with the report for relevant interpretation. The descriptions contained hereon apply only at this boring location and at the time of excavation. Subsurface data are a simplified summary of actual conditions encountered and may vary at other locations and with the passage of time.

Depth (ft)	Sample Type	Blows / 6 in. (N)	Sample ID	USCS Class.	Material Description	Moisture Content %	Dry Weight (pcf)	Other Tests and Remarks
0				SM	Asphalt 3-inches thick. Fill (0'-2' bgs): SILTY SAND: Mediume dense, grayish brown, dry, micaceous, fine grained			
1								
2				SM	Alluvium: SILTY SAND: Medium dense, grayish brown, dry, micaceous, fine grained.			
3								
4			Bag 1					
5		5 8 9	Cal 1	SP	Poorly graded SAND: Medium dense, light brown, dry, micaceous, fine grained.			
10		2 3 3	Bag 2 SPT1	ML	Sandy SILT: Medium stiff, dark brown, moist, micaceous, with fine grained sand.	16.9		
15		5 9 12	Bag 3 Cal 2	SM	SILTY SAND: Medium dense, brown, moist, micaceous, fine grained, downward fining, with increasing silt and clay.	25.6	98	
20		5 5 6	Bag 4 SPT2	SM	SILTY SAND: Medium dense, dark brown, wet, micaceous, fine grained,	20.5		Wet at 20' bgs
25		3 5 7	Cal 3	ML	Sandy clayey SILT: Stiff, dark brown, wet, micaceous, with fine grained sand and clay.	23.0	105	
30				SP	See next page for description.			

Sample Type: Cal. Mod. | SPT | Bulk | Other | No Recovery

NV5 BEYOND ENGINEERING

Project: **Stanton Energy Reliability Center**
Project Location: Stanton, CA
Project Number: 113815-00763.00

Boring B6

Sheet 2 of 2

Date(s) Drilled	August 8, 2016	Logged By	Sean Roy	Checked By	G. Custenborder
Drilling Method	Hollow Stem Auger	Boring Diameter	8-inch	Approximate Surface Elevation	72 feet
Drilling Contractor	J&H Drilling	Sampling Method	Cal-Mod./SPT	Hammer Data	140 pound, auto chain
Drill Rig Type:	CME-75	Location:		Lat. - Long.:	33.806791,-117.987933 (WGS84)

Depth (ft)	Sample Type	Blows / 6 in. (N)	Sample ID	USCS Class.	MATERIAL DESCRIPTION	Moisture Content %	Dry Weight (pcf)	Other Tests and Remarks
					This log is an integral part of the accompanying report and must be used together with the report for relevant interpretation. The descriptions contained hereon apply only at this boring location and at the time of excavation. Subsurface data are a simplified summary of actual conditions encountered and may vary at other locations and with the passage of time.			
30	X	6 10 15	SPT3	SP	Poorly Graded SAND: Medium dense, grayish brown, wet, micaceous, fine grained, with occasional silt laminae.	25.2		
35	▨	11 14 18	Cal 4	SP	Poorly Graded SAND: Dense, grayish brown, wet, micaceous, fine grained, slight increase in silt.	22.5	106	
40	X	5 12 12	SPT4	ML	CLAYEY SILT: Very stiff, olive gray with orange mottling, wet.			
45	▨	6 8 10	Cal 5	CL	SILTY CLAY: Very stiff, olive gray, wet.	40.1	82	
50	X	7 18 26	SPT5	SC	Increasing sand content CLAYEY SAND: Dense, dark gray, wet, micaceous, fine grained.	24.5		
55					Total Dep h 51.5' bgs, ground water encountered at 20' bgs, back fill with bentonite grout, 20% solids, approximately 125 gallons, from 5'-51.5' bgs, 100 lbs medium bentonite chips, hydrated, from 1' - 5' bgs, soil cuttings from 0' - 1' bgs			
60								

Sample Type: ▨ Cal. Mod. X SPT ▨ Bulk ◥ Other ● No Recovery

Appendix B

Laboratory Test Results

SUMMARY OF LABORATORY TEST RESULTS

In-situ Moisture and Density Tests

The in-situ moisture contents and dry densities of selected samples obtained from the test borings were evaluated in general accordance with the latest version of D-2216 and D2937 laboratory test methods. The method involves obtaining the moist weight of the sample and then drying the sample to obtain is dry weight. The moisture content is calculated by taking the difference between the wet and dry weights, dividing it by the dry weight of the sample and expressing the result as a percentage. The results of the in-situ moisture content and density tests are presented in the following table.

RESULTS OF MOISTURE CONTENT AND DENSITY TESTS
(ASTM D2216)

Sample Location	Moisture Content (percent)	Dry Density (pounds per cubic foot)
Boring 1 @ 5-5.6 feet	2.7	-
Boring 1 @ 10-11.5 feet	16.5	105
Boring 1 @ 15-16.5 feet	5.2	-
Boring 1 @ 20-21.5 feet	22.8	105
Boring 1 @ 25-26.5 feet	21.4	-
Boring 1 @ 30-31.5 feet	23.0	104
Boring 1 @ 35-36.5 feet	19.8	-
Boring 1 @ 40-41.5 feet	20.8	105
Boring 1 @ 45-46.5 feet	18.8	-
Boring 1 @ 50-51.5 feet	16.0	-
Boring 2 @ 2.5-4 feet	3.1	-
Boring 2 @ 5-6.5 feet	2.6	100
Boring 2 @ 7.5-9 feet	21.8	
Boring 2 @ 10-11.5 feet	21.3	103
Boring 2 @ 15-16.5 feet	11.3	102
Boring 2 @ 25-26.5 feet	17.2	-
Boring 2 @ 40-41.5 feet	20.9	-
Boring 3 @ 5-6.5 feet	2.4	99
Boring 3 @ 10-11.5 feet	17.8	-
Boring 3 @ 15-16.5 feet	15.4	106

Sample Location	Moisture Content (percent)	Dry Density (pounds per cubic foot)
Boring 3 @ 25-26.5 feet	21.7	106
Boring 3 @ 30-31.5 feet	22.1	-
Boring 3 @ 35-36.5 feet	20.3	104
Boring 3 @ 40-41.5 feet	27.6	-
Boring 3 @ 45-46.5 feet	30.0	91
Boring 4 @ 5-6.5 feet	2.5	-
Boring 4 @ 15-16.5 feet	2.1	-
Boring 4 @ 20-21.5 feet	19.5	104
Boring 4 @ 25-26.5 feet	22.4	-
Boring 4 @ 30-31.5 feet	18.9	105
Boring 4 @ 35-36.5 feet	20.1	-
Boring 4 @ 40-41.5 feet	31.9	87
Boring 4 @ 45-46.5 feet	28.5	-
Boring 4 @ 50-51.5 feet	34.8	81
Boring 5 @ 20-21.5 feet	21.1	-
Boring 5 @ 25-26.5 feet	17.8	114
Boring 5 @ 30-31.5 feet	25.6	-
Boring 5 @ 35-36.5 feet	18.3	107
Boring 5 @ 45-46.5 feet	30.1	95
Boring 5 @ 50-51.5 feet	34.0	-
Boring 6 @ 10-11.5 feet	16.9	-
Boring 6 @ 15-16.5 feet	25.6	98
Boring 6 @ 20-21.5 feet	20.5	-
Boring 6 @ 25-26.5 feet	23.0	105
Boring 6 @ 30-31.5 feet	25.2	-
Boring 6 @ 35-36.5 feet	22.5	106
Boring 6 @ 45-46.5 feet	40.1	82
Boring 6 @ 50-51.5 feet	24.5	-

Classification

Soils were visually and texturally classified in accordance with the Unified Soil Classification System. Soil classifications are indicated on the logs of the exploratory borings in Appendix A.

Particle-size Distribution Tests

An evaluation of the grain-size distribution of selected soil samples was performed in general accordance with the latest version of ASTM D-422 (including –200 wash). These test results were utilized in evaluating the soil classifications in accordance with the Unified Soil Classification System. Particle size distribution test results are presented on the laboratory test sheets attached in this appendix.

Material Finer Than 75-µm (No.200)

Material Finer Than 75-µm (No.200) test was performed in accordance with ASTM D1140. This test was useful in classification of the soil. Test results are attached in this appendix.

Sample Location	B2 @ 5-6.5ft	B2 @ 7.5-9ft	B2 @ 12.5-14ft	B2 @ 45-46.5ft
% Finer Than 75-µm	15.5	75.9	51.1	97.5

Sample Location	B3 @ 40-41.5ft	B3 @ 50-51.5ft	B5 @ 50-51.5 ft
% Finer Than 75-µm	78.3	79.6	91.7

Atterberg Limits

Atterberg limits test was performed in accordance with ASTM D4318. This test was useful in classification of the soil. Test results are attached in this appendix.

Expansion Index

Expansion index test was performed in accordance with ASTM D4829. This test was useful in evaluating the potential expansion of the soil. Test results are attached in this appendix.

Sample Location	B3 @ 0-5ft	B3 @ 5-10ft
Expansion Index	7.0	0

Maximum Density

Maximum density test was performed in accordance with ASTM D1557. This test was useful in evaluating the compaction of the soil in the field. Test results are attached in this appendix.

Sample Location	B4 @ 0-5ft
Maximum Dry Density	125
Optimum Moisture	10

R Value

R Value test was performed in accordance with ASTM D2844. This test was useful in evaluating the response of the compacted soil. Test results are attached in this appendix.

Sample Location	B3 @ 0-5ft
R-Value Equilibrium	60

Soil Corrosivity Tests

Soluble sulfate, chloride, resistively and pH tests were performed in accordance with California Test Methods 643, 417 and 422 to assess the degree of corrosivity of the subgrade soils with regard to concrete and normal grade steel. The results of the test are presented in the following table and attached in this appendix.

RESULTS OF CORROSIVITY TESTS
(CTM 417, CTM 422)

Location	pH	Resistivity (ohm-cm)	Sulfate (ppm)	Chloride (ppm)
B5 @ 0-5ft	8.0	1000	120	43

Direct shear

A direct shear test was performed on a representative undisturbed sample in accordance with ASTM D3080 to evaluate the shear strength characteristics of the on-site materials. The test method consists of placing the soil sample in the direct shear device, applying a series of normal stresses, and then shearing the sample at the constant rate of shearing deformation. The shearing force and horizontal displacements are measured and recorded as the soil specimen is sheared. The shearing is continued well beyond the point of maximum stress until the stress reaches a constant or residual value. The results of the tests are presented in the following table and attached in this appendix.

RESULTS OF DIRECT SHEAR TEST
(ASTM D3080)

Location	Peak Angle of Internal Friction (degrees)	Peak Cohesion Intercept (psf)	Notes
B5, 15-16.5ft	33	208	-
B4, 10-11.5ft	36	220	-

Natural Moisture Report

(ASTM 2216,2937)

Date:	August 22, 2016	Job Number:	113815-00763
Client:	Stanton Energy Reliability Center, LLC	Report Number:	4531
Address:	650 Bercut Drive, Ste A	Lab Number:	113243-113271
	Sacramento, CA		
Project:	Stanton Energy Reliability Center		
Project Add:	West of Dale Street, Stanton, CA		
Sampled By:	Sean Roy		
Date Rcvd:	8/8/16		

Lab Number	113243	113244	113245	112346	113247
Exploration No.	B1-SPT1	B1-D1	B1-SPT2	B1-D2	B1-SPT3
Depth, feet	5-5.6	10-11.5	15-16.5	20-21.5	25-26.5
Moisture Content, %	2.7	16.5	5.2	22.8	21.4
Dry Density, pcf.	-	104.5	-	105.0	-

Lab Number	113248	113249	113250	113251	113252
Exploration No.	B1-D3	B1-SPT4	B1-D4	B1-SPT5	B1-SPT6
Depth, feet	30-31.5	35-36.5	40-41.5	45-46.5	50-51.5
Moisture Content, %	23.0	19.8	20.8	18.8	16.0
Dry Density, pcf.	103.6	-	104.8	-	-

Lab Number	113253	113254	113255	113256	113258
Exploration No.	B2-SPT1	B2-D1	B2-SPT2	B2-D2	B2-D3
Depth, feet	2.5-4	5-6.5	7.5-9	10-11.5	15-16.5
Moisture Content, %	3.1	2.6	21.8	21.3	11.3
Dry Density, pcf.	-	100.0	-	102.5	102.2

Lab Number	113260	113261	113264	113265	113266
Exploration No.	B2-SPT5	B2-SPT8	B6-SPT1	B6-D1	B6-SPT2
Depth, feet	25-26.5	40-41.5	10-11.5	15-16.5	20-21.5
Moisture Content, %	17.2	20.9	16.9	25.6	20.5
Dry Density, pcf.	-	-	-	97.5	-

Natural Moisture Report

(ASTM 2216,2937)

Job No: 113815-00763.00
Job Name: Stanton Energy Reliability Center
Client: Stanton Energy Reliability Center, LLC
Report No: 4531

Lab Number	113267	113268	113269	113270	113271
Exploration No.	B6-D3	B6-SPT3	B6-D4	B6-5	B6-SPT5
Depth, feet	25-26.5	30-31.5	35-36.5	45-46.5	50-51.5
Moisture Content, %	23.0	25.2	22.5	40.1	24.5
Dry Density, pcf.	105.4	-	106.1	81.6	-

Respectfully Submitted,
NV5 West, Inc.

Sam Koohi, PE
Engineering Manager

Natural Moisture Report

(ASTM 2216,2937)

Date:	August 25, 2016	Job Number:	113815-00763
Client:	Stanton Energy Reliability Center, LLC	Report Number:	4513
Address:	650 Bercut Drive, Ste A	Lab Number:	113194-113219
	Sacramento, CA		
Project:	Stanton Energy Reliability Center		
Project Add:	West of Dale Street, Stanton, CA		
Sampled By:	Sean Roy		
Date Rcvd:	8/8/16		

Lab Number	113194	113195	113196	113197	113198
Exploration No.	B3-D1	B3-SPT1	B3-D2	B3-D3	B3-SPT3
Depth, feet	5-6.5	10-11.5	15-16.5	25-26.5	30-31.5
Moisture Content, %	2.4	17.8	15.4	21.7	22.1
Dry Density, pcf.	98.5	-	105.6	106.3	-

Lab Number	113199	113200	113201	113203	113205
Exploration No.	B3-D4	B3-SPT4	B3-D5	B4-SPT1	B4-SPT2
Depth, feet	35-36.5	40-41.5	45-46.5	5-6.5	15-16.5
Moisture Content, %	20.3	27.6	30.0	2.5	2.1
Dry Density, pcf.	105.3	-	91.4	-	-

Lab Number	113206	113207	113208	113209	113210
Exploration No.	B4-D2	B4-SPT3	B4-D3	B4-SPT4	B4-D4
Depth, feet	20-21.5	25-26.5	30-31.5	35-36.5	40-41.5
Moisture Content, %	19.5	22.4	18.9	20.1	31.9
Dry Density, pcf.	103.7	-	105.1	-	87.0

Lab Number	113211	113212	113214	113215	113216
Exploration No.	B4-SPT5	B4-D5	B5-SPT2	B5-D3	B5-SPT3
Depth, feet	45-46.5	50-51.5	20-21.5	25-26.5	30-31.5
Moisture Content, %	28.5	34.8	21.1	17.8	25.6
Dry Density, pcf.	-	80.5	-	113.7	-

Natural Moisture Report

(ASTM 2216,2937)

Job No: 113815-00763.00
Job Name: Stanton Energy Reliability Center
Client: Stanton Energy Reliability Center, LLC
Report No: 4513

Lab Number	113217	113218	113219
Exploration No.	B5-D4	B5-D5	B5-SPT5
Depth, feet	35-36.5	45-46.5	50-51.5
Moisture Content, %	18.3	30.1	34.0
Dry Density, pcf.	106.5	94.5	-

Respectfully Submitted,
NV5 West, Inc.

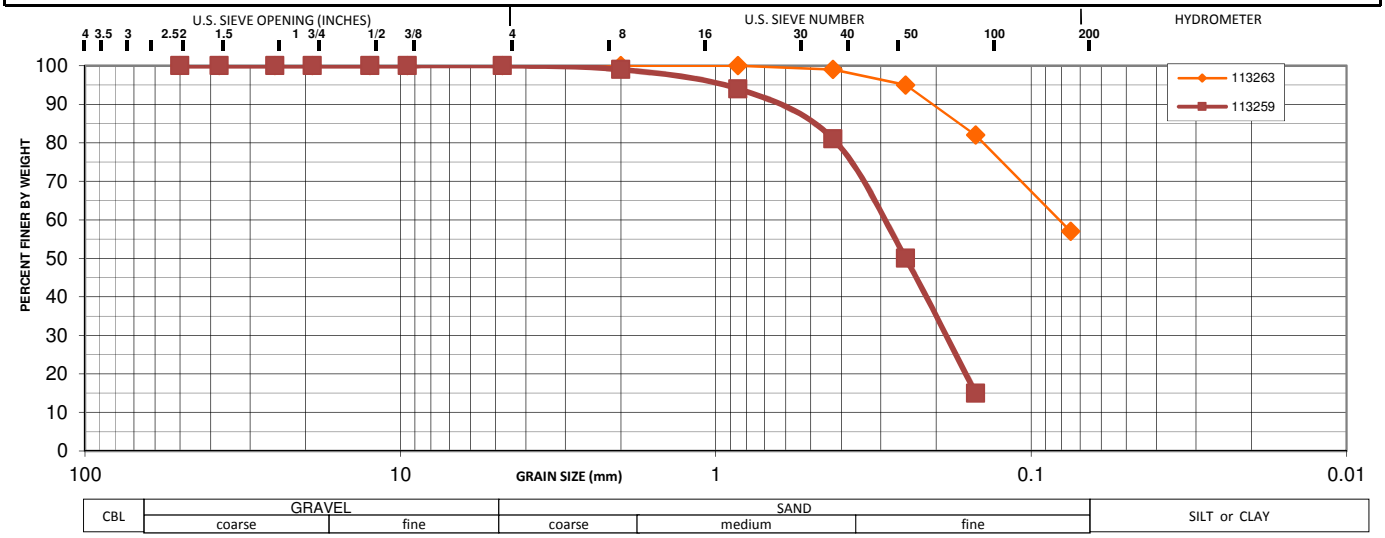
Sam Koohi, PE
Engineering Manager

REPORT OF SIEVE ANALYSIS TEST

ASTM D422 - Soil

Date: August 22, 2016 Job Number: 113815-00763.00
Client: Stanton Energy Reliability Center, LLC Report Number: 4531
Address: 650 Bercut Drive, Ste A Lab Number: 112845
Sacramento, CA
Project : Stanton Energy Reliability Center
Project Address: West of Dale Street, Stanton, CA

Material	Clayey SILT	Silty Sand				
Color	Grey	Brown				
Sample Location	B2-SPT10 50-51.5'	B2-SPT4 20-21.5'				
Date Sampled	8/8/2016	42590				
Sampled By	S.Roy	S.Roy				
Date Tested	8/19/2016	42598				
Tested By	C.Padhiar	C.Padhiar				



Sample ID:	113263	113259				
Sieve Size	% Passing					
63mm (2 1/2")						
50mm (2")						
37 5mm (1 1/2")	100	100				
25mm (1")	100	100				
19mm (3/4")	100	100				
12 5mm (1/2")	100	100				
9.5mm (3/8")	100	100				
4.75mm (#4)	100	100				
2mm (#10)	100	100				
850µm (#20)	100	99				
425µm (#40)	99	94				
250µm (#60)	95	81				
150 µm (#100)	82	50				
75 um (#200) washµ	57	15.0				
Fineness Modulus	0.2	0.6				
Shape (sand & gravel)	N.R.	N.R.				
Hardness (sand & gravel)	N.R.	H&D				
Specific Gravity	2.65	2.65				
Coef. of Curvature (C_C)	0.4	6.6				
Coef. of Uniformity (C_U)	255.1	22.7				
% Gravel	0	0				
% Sand	43	85				
% Fines	57.0	15.0				
USCS Class:	ML	SM				

Notes: *Hardness: H&D = Hard & Durable; W&F = Weathered & Friable*
N.R.: Not Recorded; N/A: Not Available.

Respectfully Submitted,
NV5 West, Inc.

Sam Koohi, PE
Engineering Manager

REPORT OF SIEVE ANALYSIS TEST

ASTM D422 - Soil

Date: August 25, 2016 Job Number: 113815-00763.00

Client: Stanton Energy Reliability Center, LLC Report Number: 4513

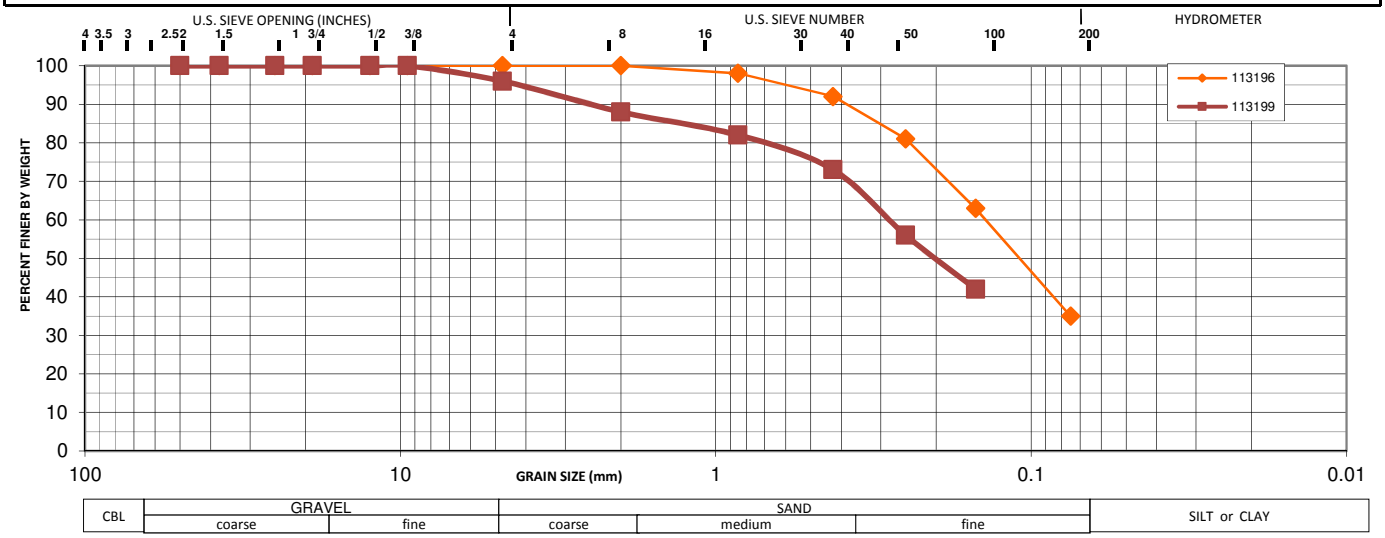
Address: 650 Bercut Drive, Ste A Lab Number: 113196, 113199

Sacramento, CA

Project : Stanton Energy Reliability Center

Project Address: West of Dale Street, Stanton, CA

Material	Silty SAND (SM)	Silty SAND				
Color	NR	NR				
Sample Location	B3-D3 @ 15-16.5"	B3-D4 @ 35-36.5'				
Date Sampled	8/1/2016	42583				
Sampled By	S.Roy	S.Roy				
Date Tested	8/9/2016	42591				
Tested By	D. Delgado	D. Delgado				



Sample ID:	113196	113199				
Sieve Size	% Passing					
63mm (2 1/2")						
50mm (2")						
37 5mm (1 1/2")	100	100				
25mm (1")	100	100				
19mm (3/4")	100	100				
12 5mm (1/2")	100	100				
9.5mm (3/8")	100	100				
4.75mm (#4)	100	100				
2mm (#10)	100	96				
850µm (#20)	98	88				
425µm (#40)	92	82				
250µm (#60)	81	73				
150 µm (#100)	63	56				
75 um (#200) washµ	35	42.0				
Fineness Modulus	0.5	0.8				
Shape (sand & gravel)	N.R.	N.R.				
Hardness (sand & gravel)	N.R.	H&D				
Specific Gravity	2.65	2.65				
Coef. of Curvature (C_c)	9.2	1.5				
Coef. of Uniformity (C_u)	210.1	365.1				
% Gravel	0	0				
% Sand	65	58				
% Fines	35.0	42.0				
USCS Class:	SW-SM	SM				

Notes: *Hardness: H&D = Hard & Durable; W&F = Weathered & Friable*
N.R.: Not Recorded; N/A: Not Available.

Respectfully Submitted,
NV5 West, Inc.

Sam Koohi, PE
Engineering Manager

Material Finer Than 75-µm (No.200) Sieve in Soils by Washing

(ASTM 1140)

Date:	August 22, 2016	Job Number:	113815-00763
Client:	Stanton Energy Reliability Center, LLC	Report Number:	4531
Address:	650 Bercut Drive, Ste A	Lab Number:	113254-113262
	Sacramento, CA		
Project:	Stanton Energy Reliability Center		
Project Add:	West of Dale Street, Stanton, CA		
Sampled By:	Sean Roy		
Date Rcvd:	8/8/16		

Lab Number	113254	113255	113257	1132652
Exploration No.	B2-D1	B2-SPT2	B2-SPT3	B2-SPT9
Depth, Ft.	5-6.5	7.5-9	12.5-14	45-46.5
% Finer Than 75-µm	15.5	75.9	51.1	97.5

Respectfully Submitted,
NV5 West, Inc.

Sam Koohi, PE
Engineering Manager

Material Finer Than 75-µm (No.200) Sieve in Soils by Washing

(ASTM 1140)

Date:	August 25, 2016	Job Number:	113815-00763
Client:	Stanton Energy Reliability Center, LLC	Report Number:	4513
Address:	650 Bercut Drive, Ste A	Lab Number:	113200-113202-113219
	Sacramento, CA		
Project:	Stanton Energy Reliability Center		
Project Add:	West of Dale Street, Stanton, CA		
Sampled By:	Sean Roy		
Date Rcvd:	8/2/16		

Lab Number	113200	113202	113219
Exploration No.	B3-SPT4	B3-SPT5	B5-SPT5
Depth, Ft.	40-41.5	50-51.5	50-51.5
% Finer Than 75-µm	78.3	79.6	91.7

Respectfully Submitted,
NV5 West, Inc.

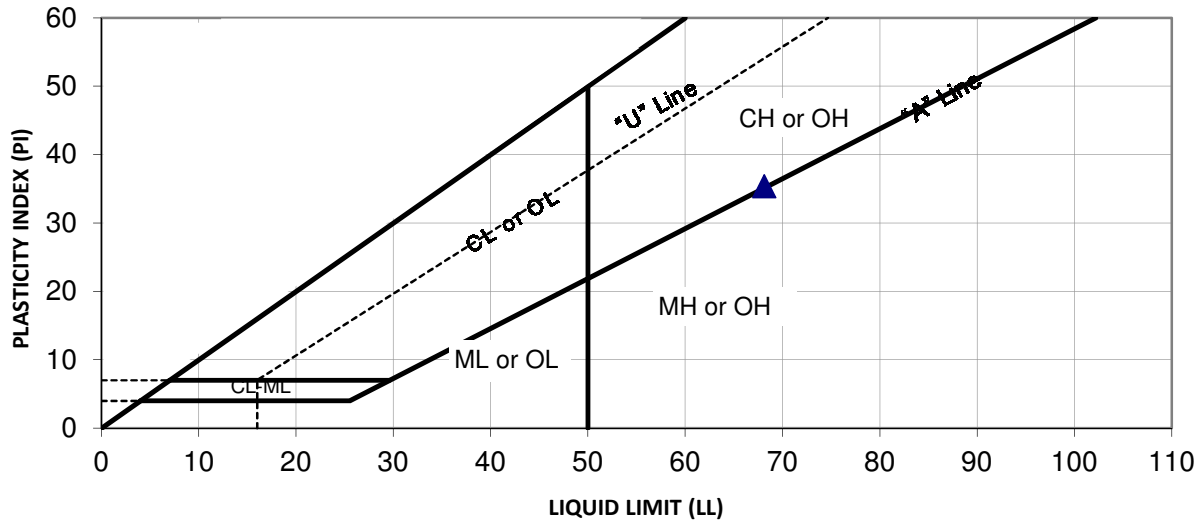
Sam Koohi, PE
Engineering Manager

REPORT OF LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX TESTS

(ASTM 4318)

Date:	August 18, 2016	Job Number:	763
Client:	Stanton Energy Reliability Center, LLC	Report Number:	4531
Address:	650 Bercut Drive, Ste A Sacramento, CA	Lab Number:	113270

Project:	Stanton Energy Reliability Center
Project Address:	West of Dale Street, Stanton, CA
Material:	Light Gray CLAY (CH)
Location:	B6-D5
Date Sampled:	8/8/16
Sampled By:	S.Roy
Date Tested:	8/17/2016



SUMMARY OF TEST RESULTS

SAMPLE ID	SOURCE / LOCATION	DEPTH/ ELEV.	%>#40	TEST RESULT			USCS	
				LL	PL	PI	Class	Group Name
113270	B6-D5	45'-46.5'		**68**	**33**	**35**	CH	fat CLAY

Reviewed By: _____

Sam Koohi. PE
Engineering Manager

Expansion Index Test REPORT

(ASTM D4829)

Date:	August 25, 2016	Job Number:	113815-00763
Client:	Stanton Energy Reliability Center, LLC	Report Number:	4513
Address:	650 Bercut Drive, Ste A	Lab Number:	113190, 113191
	Sacramento, CA		
Project:	Stanton Energy Reliability Center		
Project Add:	West of Dale Street, Stanton, CA		

Date Sampled:	8/1/16	By:	SR
Type of Material:	Silty SAND (SM)		
Date Submitted:	8/2/16	By:	SR
Source of Material:	On-Site		

Lab Number	113190	113191
Location	B3 @ 0-5’	B3 @ 5-10’
Sample No.	1	2
Initial Moisture Content, %	10.0	8.2
Final Moisture Content, %	19.8	16.0
Dry Density, pcf	109.8	109.6
Saturation, %	50.5	50.8
Expansion Index	**7.0**	**0**
Potential Expansion	**VERY LOW**	**VERY LOW**

Respectfully Submitted,
NV5 West, Inc.

Sam Koohi, PE
Engineering Manager

REPORT OF MOISTURE/DENSITY RELATIONSHIP TEST

(ASTM D1557/D698)

Date: August 25, 2016
Client: Stanton Energy Reliability Center, LLC
Address: 650 Bercut Drive, Ste A
Sacramento, CA

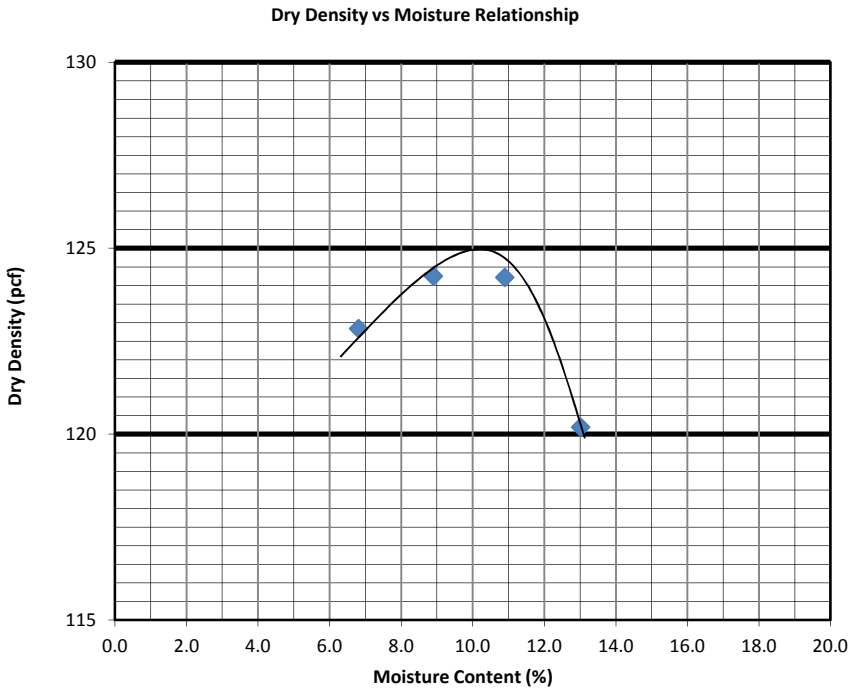
Job Number: 113815-00763.00
Report Number: 4513
Lab Number: 113192

Project: Stanton Energy Reliability Center
Project Address: West of Dale Street, Stanton, CA
Material: Silty SAND (SM)
Location: B4 @ 0-5'
Date Sampled: 8/1/16
Sampled By: S.Roy

Mold Size: 4 inch
ASTM D1557 A

Maximum Dry Density = 125.0 pcf

Optimum Moisture = 10.0%



Distribution
Client
File

Reviewed By: _____
Sam Koohi, PE
Engineering Manager

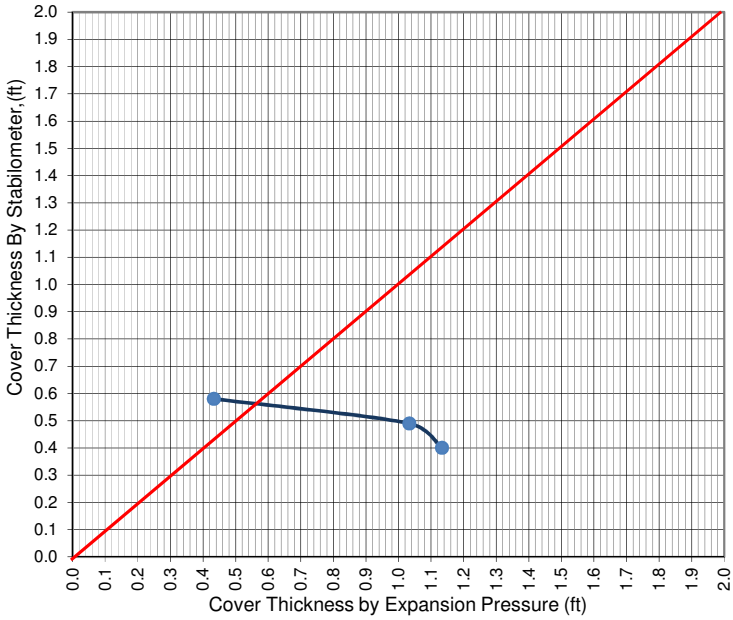
RESISTANCE "R" VALUE TEST

(CTM301 Caltrans / ASTM D2844)

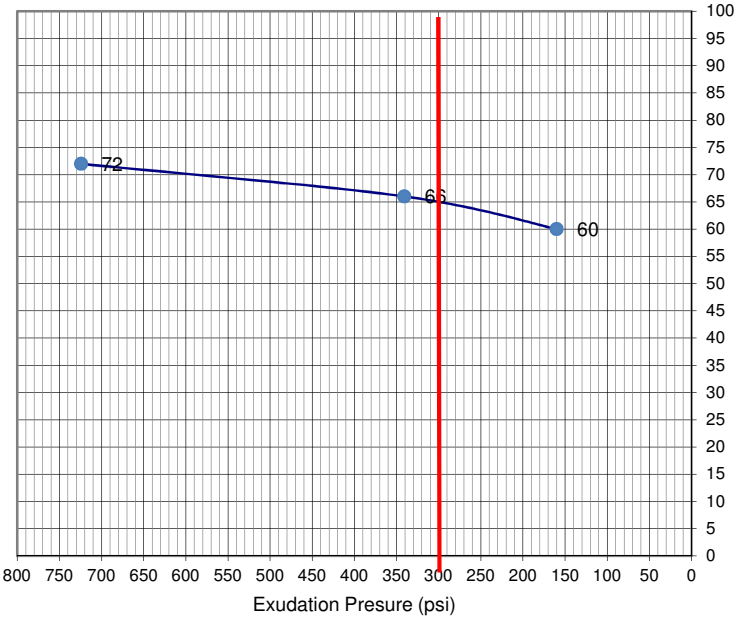
Date:	8/25/2016	Job Number:	113815-00763
Client:	Stanton Energy Reliability Center, LLC	Report Number:	4513
Address:	P.O. Box 129007 Sacramento, CA	Lab Number:	113190
Project :	Stanton Energy Reliability Center		
Project Address:	West of Dale Street, Stanton, CA		

Material:	Grayish Brown Silt
Location:	B3 @ 0-5'
Samples By:	S.Roy
Date Recived:	8/2/16

EXPANSION PRESSURE CHART



EXUDATION PRESSURE CHART



TEST SPECIMEN	A	B	C	D
COMP. FOOT PRESSURE, psi	350	350	350	
INITIAL MOISTURE %	2.8	2.8	2.8	
MOISTURE @ COMPACTION %	10.1	10.5	11.4	
DRY DENSITY, pcf	120.2	120.8	119.1	
EXUDATION PRESSURE, psi	725	341	160	
STABILOMETER VALUE 'R'	72	66	60	

R-VALUE BY EXUDATION	65
R-VALUE BY EXPANSION	60
R-VALUE AT EQUILIBRIUM	**60**

Respectfully Submitted,

NV5 West, Inc.

Sam Koohi, PE
Engineering Manager

L A B O R A T O R Y R E P O R T

Telephone (619) 425-1993 Fax 425-7917 Established 1928

C L A R K S O N L A B O R A T O R Y A N D S U P P L Y I N C.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
A N A L Y T I C A L A N D C O N S U L T I N G C H E M I S T S

Date: August 10, 2016
Purchase Order Number: 16-0376
Sales Order Number: 32360
Account Number: NV5.SD

To:

NV5 West Inc
15092 Avenue of Science #200
San Diego, CA 92128
Attention: Michelle Albrecht

Laboratory Number: SO6110 Customers Phone: 858-715-5800
Fax: 858-715-5810
Sample Designation:

One soil sample received on 08/09/16 at 12:10pm,
taken from Stanton Energy Reliability Center
Job#113815-00763 marked as B-5 @ 0-5' (Bulk Sample).

Analysis By California Test 643, 1999, Department of Transportation
Division of Construction, Method for Estimating the Service Life of
Steel Culverts.

pH 8.0

Water Added (ml)	Resistivity (ohm-cm)
10	3300
5	2000
5	1300
5	1100
5	1000
5	1200
5	1300

31 years to perforation for a 16 gauge metal culvert.
40 years to perforation for a 14 gauge metal culvert.
55 years to perforation for a 12 gauge metal culvert.
70 years to perforation for a 10 gauge metal culvert.
86 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417 0.012% (120ppm)

Water Soluble Chloride Calif. Test 422 0.004% (43ppm)

Laura Torres
LT/ilv

DIRECT SHEAR TEST (ASTM D3080)

Project No. **113815-00763.00**
Client: **Stanton Energy Reliability Center, LLC**
Proj. Name: **Stanton Energy Reliability Center**
Location: **West of Dale Street, Stanton, CA**
Sample date: **8/1/2016** Sample Location: **15'-16'.5"** Boring No: **B5-D2**

Report No.: **4513**
Lab No.: **113213**
Test Date: **8/15/2016**

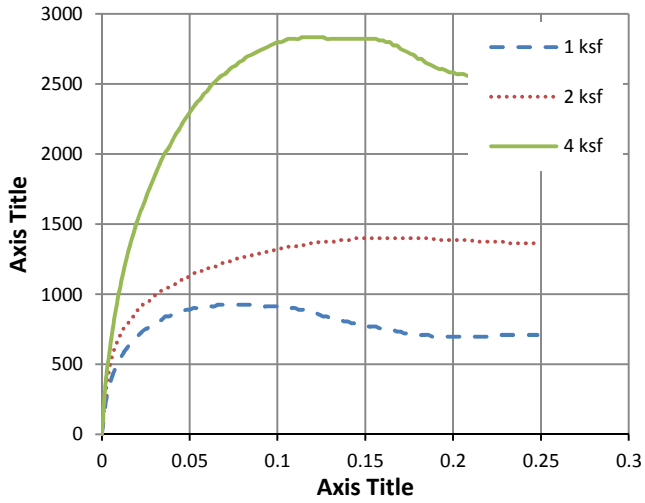
TEST DATA:

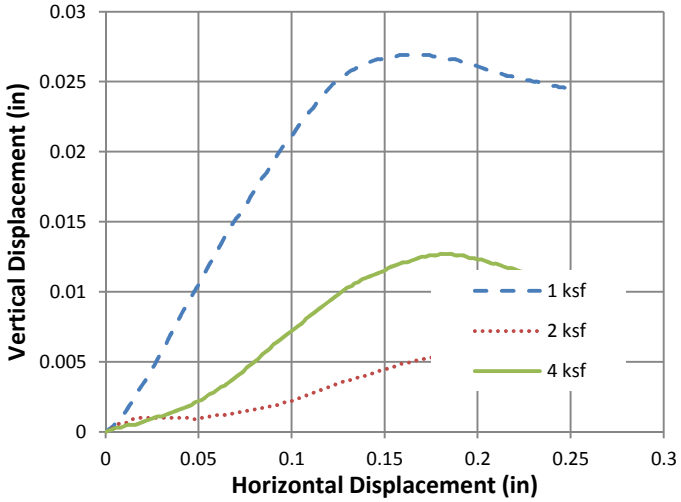
	Sample ID:	1 ksf	2 ksf	4 ksf
Initial	Water Content (%)	14.3	13.2	14.2
	Dry Density	101.4	95.1	98.0
	Saturation (%)	61.9	48.5	56.3
Final	Water Content (%)	25.4	28.5	24.8
	Dry Density	101.4	95.1	98.0
	Saturation (%)	110.4	105.1	98.4
Normal Stress (psf)		1000	2000	4000
Ultimate Shear Stress (psf)		721	1363	2571
Peak Shear Stress (psf)		925	1399	2834

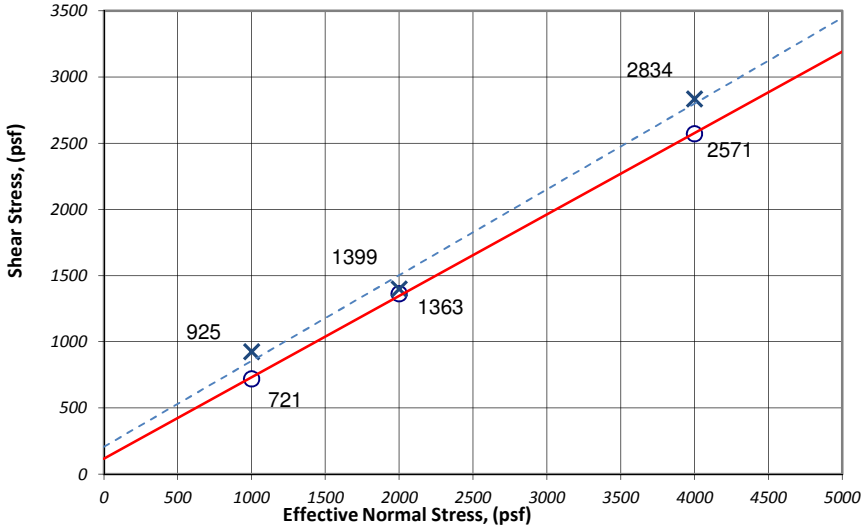
Sample Type: Undistrubed

Description: Sandy/Silty CLAY (ML)

Color: Olive Gray







Linear (Ultimate Strength Envelope)

Linear (Peak Strength Envelope)

Peak y = 0.6479x + 207.5

Ultimate y = 0.6149x + 117

Peak Cohesion, C'(psf): **208**
Peak Friction,Φ' (deg): **33**

Ultimate Cohesion, C'(psf): **117**
Ultimate Friction,Φ' (deg): **32**

Respectfully Submitted,
NV5 West, Inc.

NV5
15092 Avenue of Science, Ste 200
San Diego CA 92128
p. 858 385 0500 f. 858 715 5810

Sam Koohi, PE
Engineering Manager

DIRECT SHEAR TEST (ASTM D3080)

Project No. **113815-00763.00**
Client: **Stanton Energy Reliability Center, LLC**
Proj. Name: **Stanton Energy Reliability Center**
Location: **West of Dale Street, Stanton, CA**
Sample date: **8/1/2016** Sample Location: **10'-11'.5"** Boring No: **B4-D1**

Report No.: **4513**
Lab No.: **113204**
Test Date: **8/22/2016**

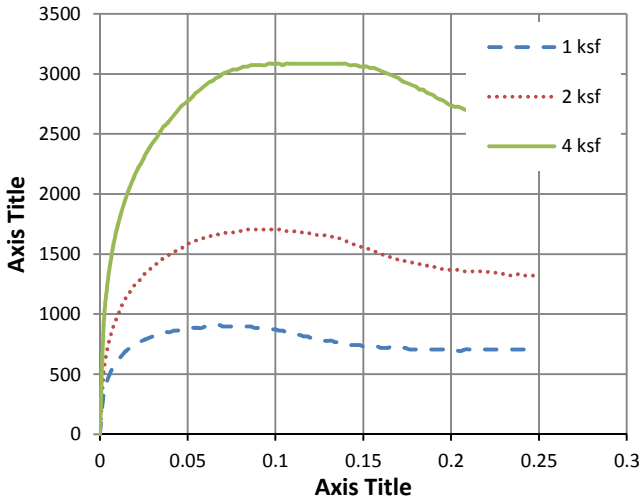
TEST DATA:

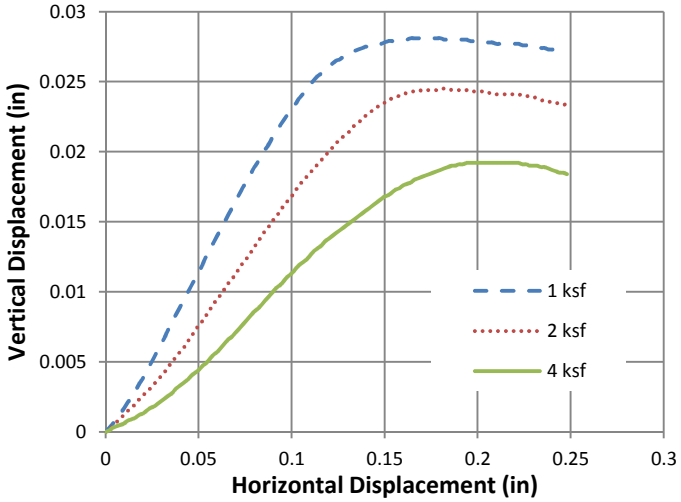
	Sample ID:	1 ksf	2 ksf	4 ksf
Initial	Water Content (%)	5.3	5.5	10.4
	Dry Density	105.0	103.3	100.4
	Saturation (%)	25.3	25.2	44.0
Final	Water Content (%)	20.5	20.9	21.0
	Dry Density	105.0	103.3	100.4
	Saturation (%)	98.0	95.4	88.8
Normal Stress (psf)		1000	2000	4000
Ultimate Shear Stress (psf)		707	1321	2583
Peak Shear Stress (psf)		910	1705	3086

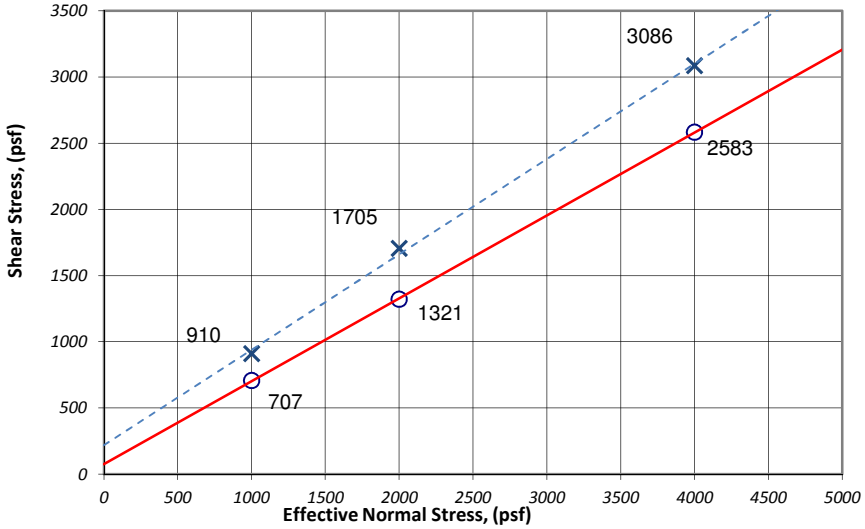
Sample Type: Undistrubed

Description: SAND (SP)

Color: Gray Brown







Linear (Ultimate Strength Envelope)

Linear (Peak Strength Envelope)

Peak y = 0.7204x + 219.5

Ultimate y = 0.6261x + 76

Peak Cohesion, C'(psf): **220**
Peak Friction,Φ' (deg): **36**

Ultimate Cohesion, C'(psf): **76**
Ultimate Friction,Φ' (deg): **32**

Respectfully Submitted,
NV5 West, Inc.

NV5
15092 Avenue of Science, Ste 200
San Diego CA 92128
p. 858 385 0500 f. 858 715 5810

Sam Koohi, PE
Engineering Manager

Appendix C

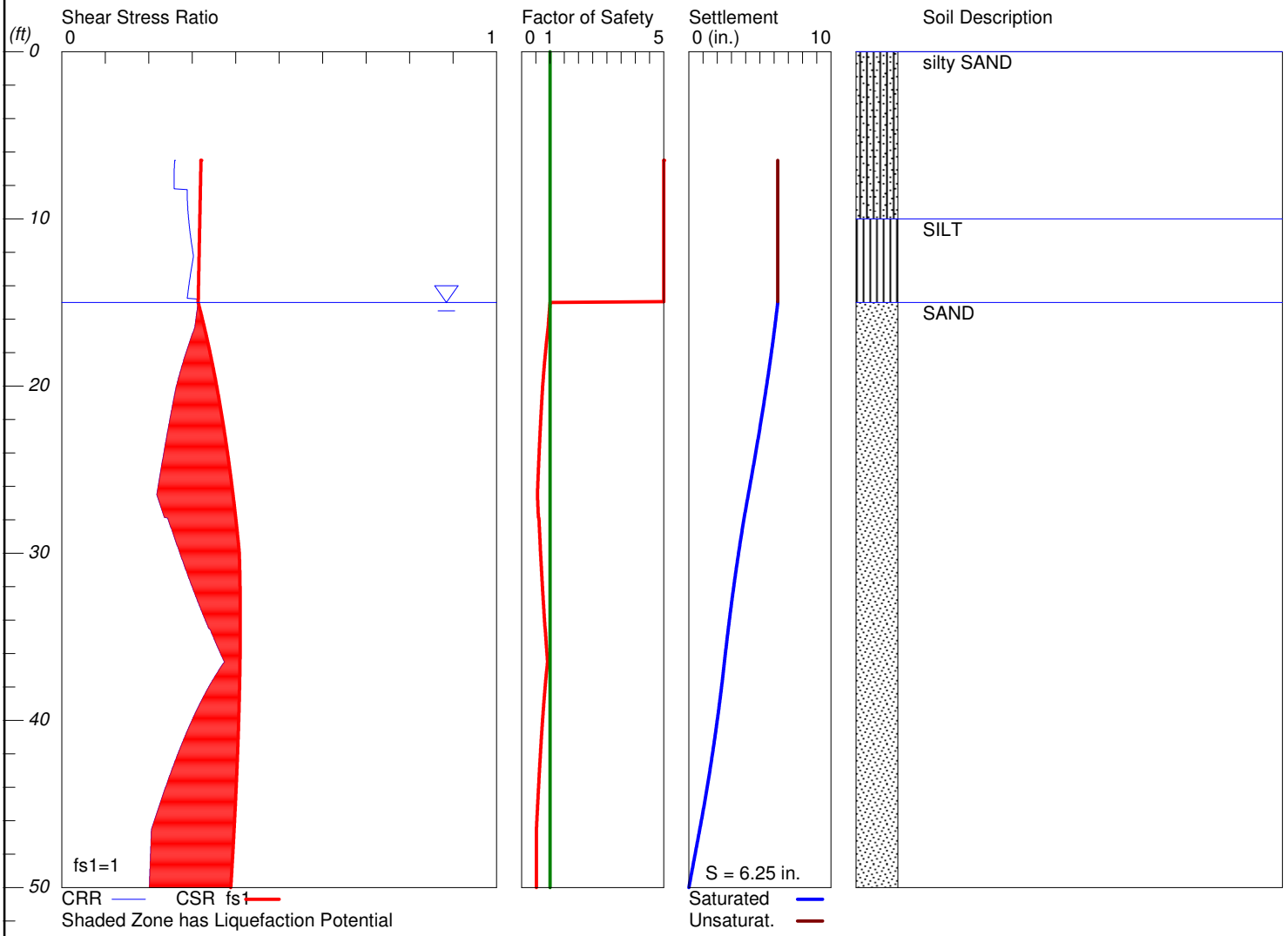
Liquefaction Analysis

LIQUEFACTION ANALYSIS

Stanton Energy Reliability Center-B1

Hole No.=B1 Water Depth=15 ft Surface Elev.=68

Magnitude=6.9
Acceleration=0.5g

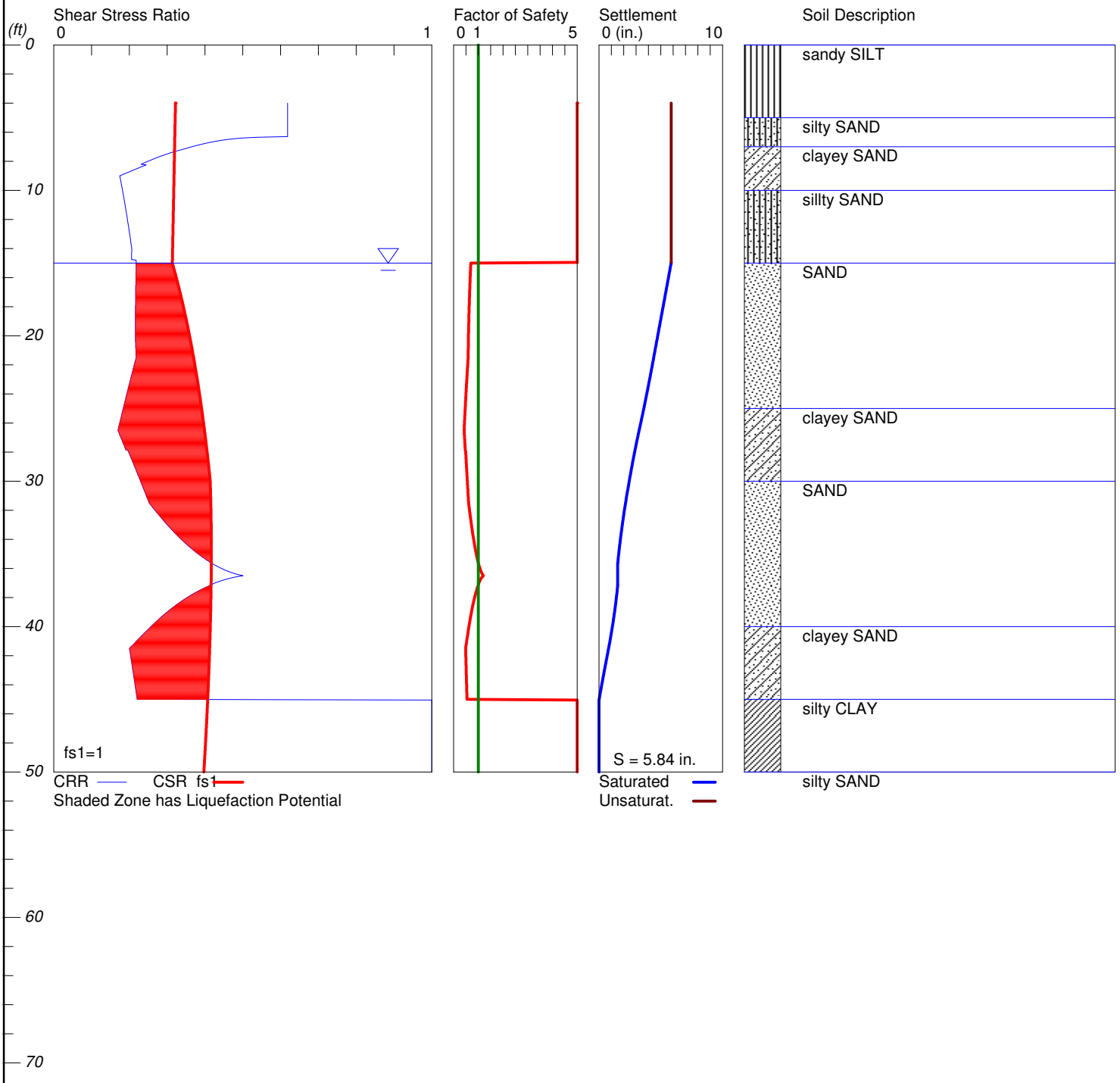


LIQUEFACTION ANALYSIS

Stanton Energy Reliability Center-B2

Hole No.=B2 Water Depth=15 ft Surface Elev.=68

Magnitude=6.9
Acceleration=0.5g

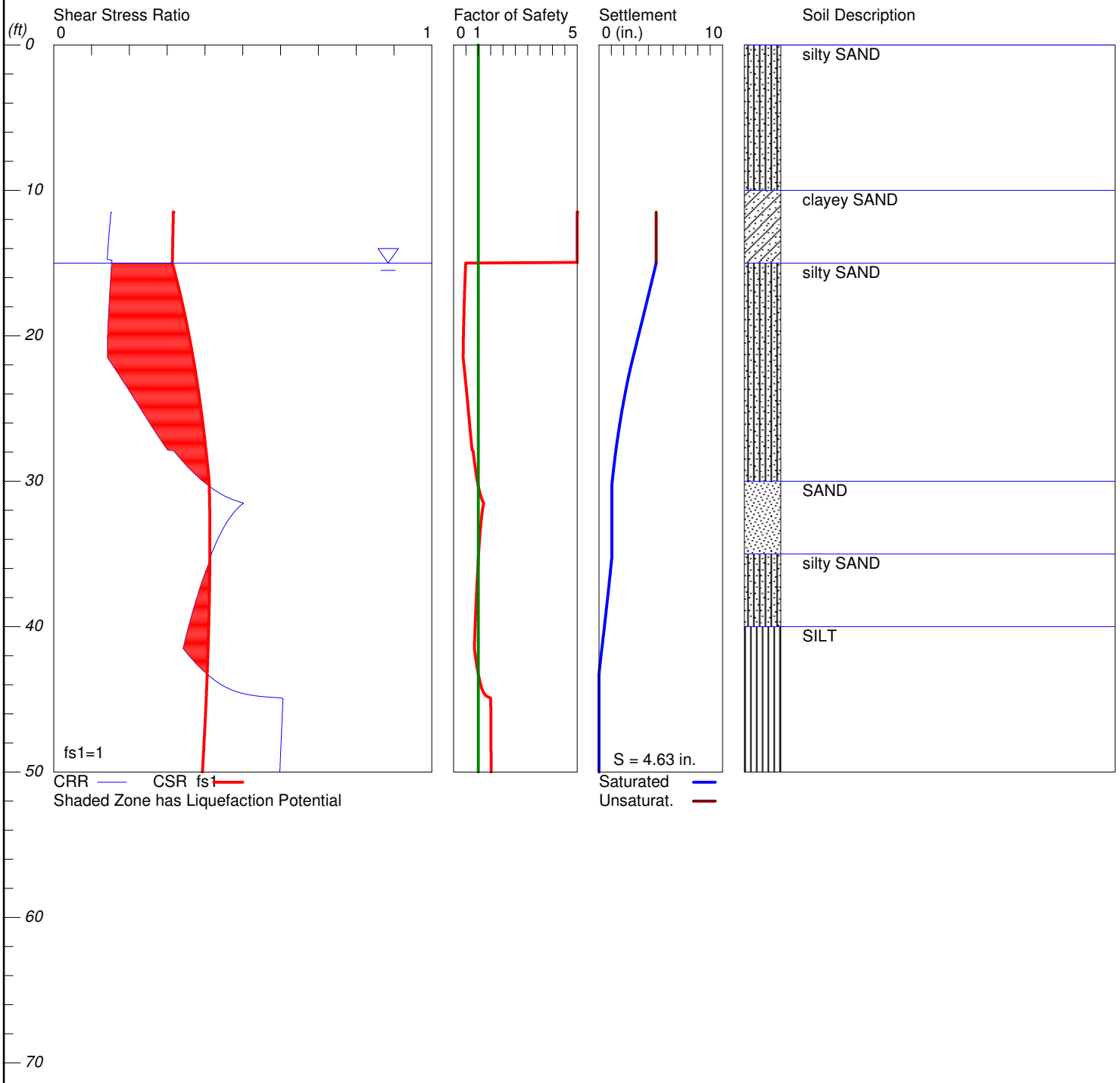


LIQUEFACTION ANALYSIS

Stanton Energy Reliability Center-B3

Hole No.=B3 Water Depth=15 ft Surface Elev.=68

Magnitude=6.9
Acceleration=0.5g

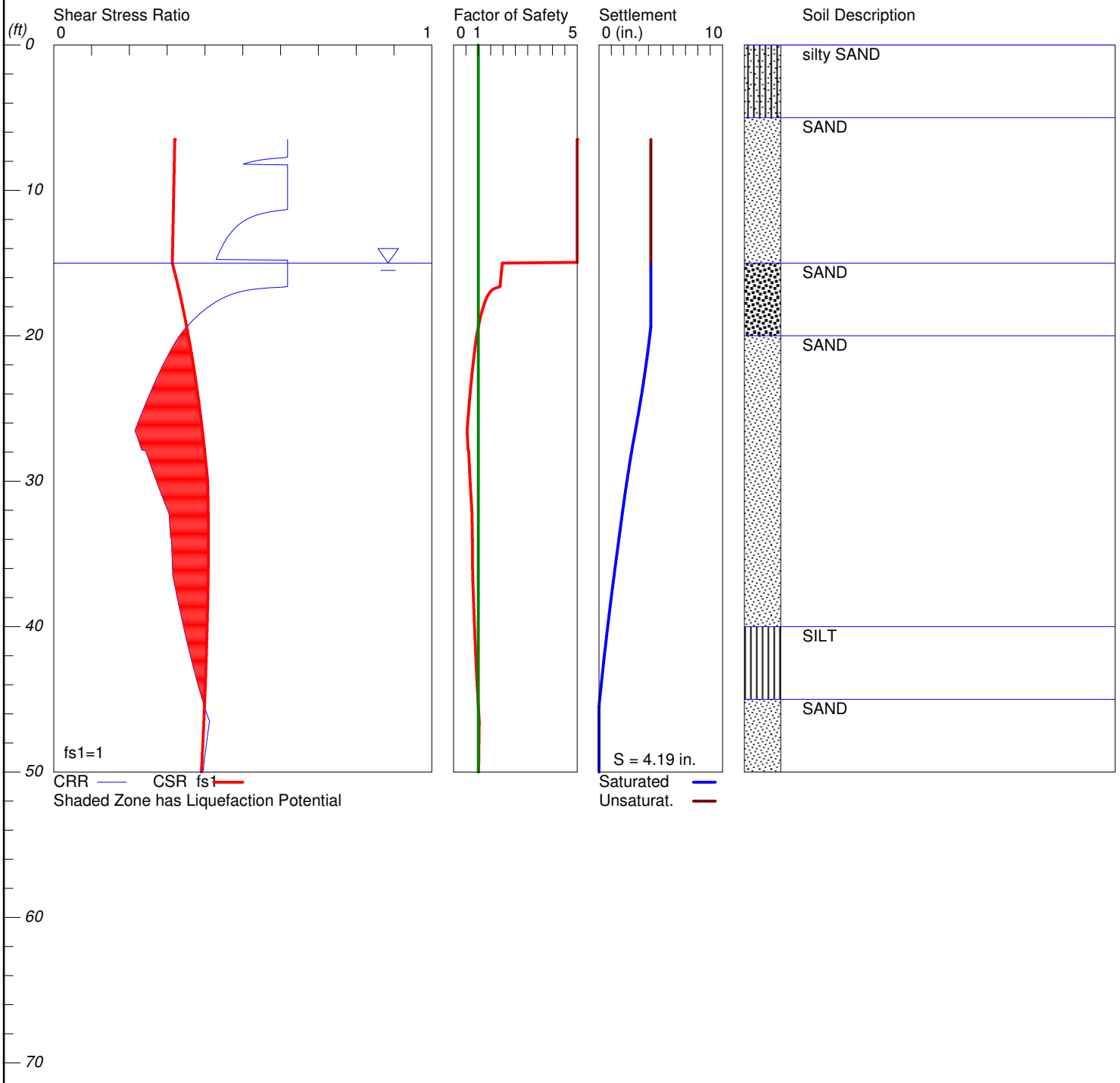


LIQUEFACTION ANALYSIS

Stanton Energy Reliability Center-B4

Hole No.=B4 Water Depth=15 ft Surface Elev.=68

Magnitude=6.9
Acceleration=0.5g

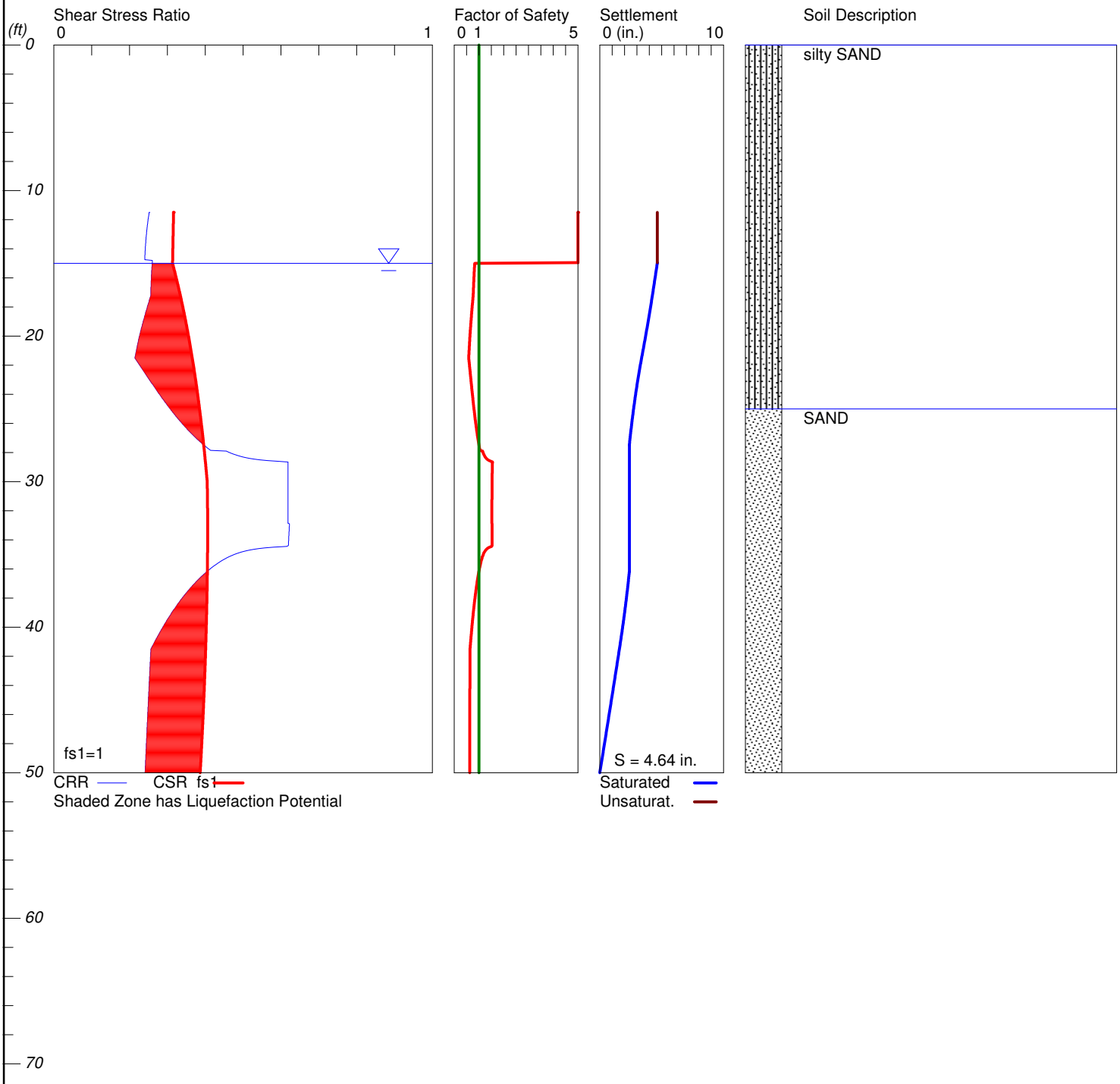


LIQUEFACTION ANALYSIS

Stanton Energy Reliability Center-B5

Hole No.=B5 Water Depth=15 ft Surface Elev.=68

Magnitude=6.9
Acceleration=0.5g

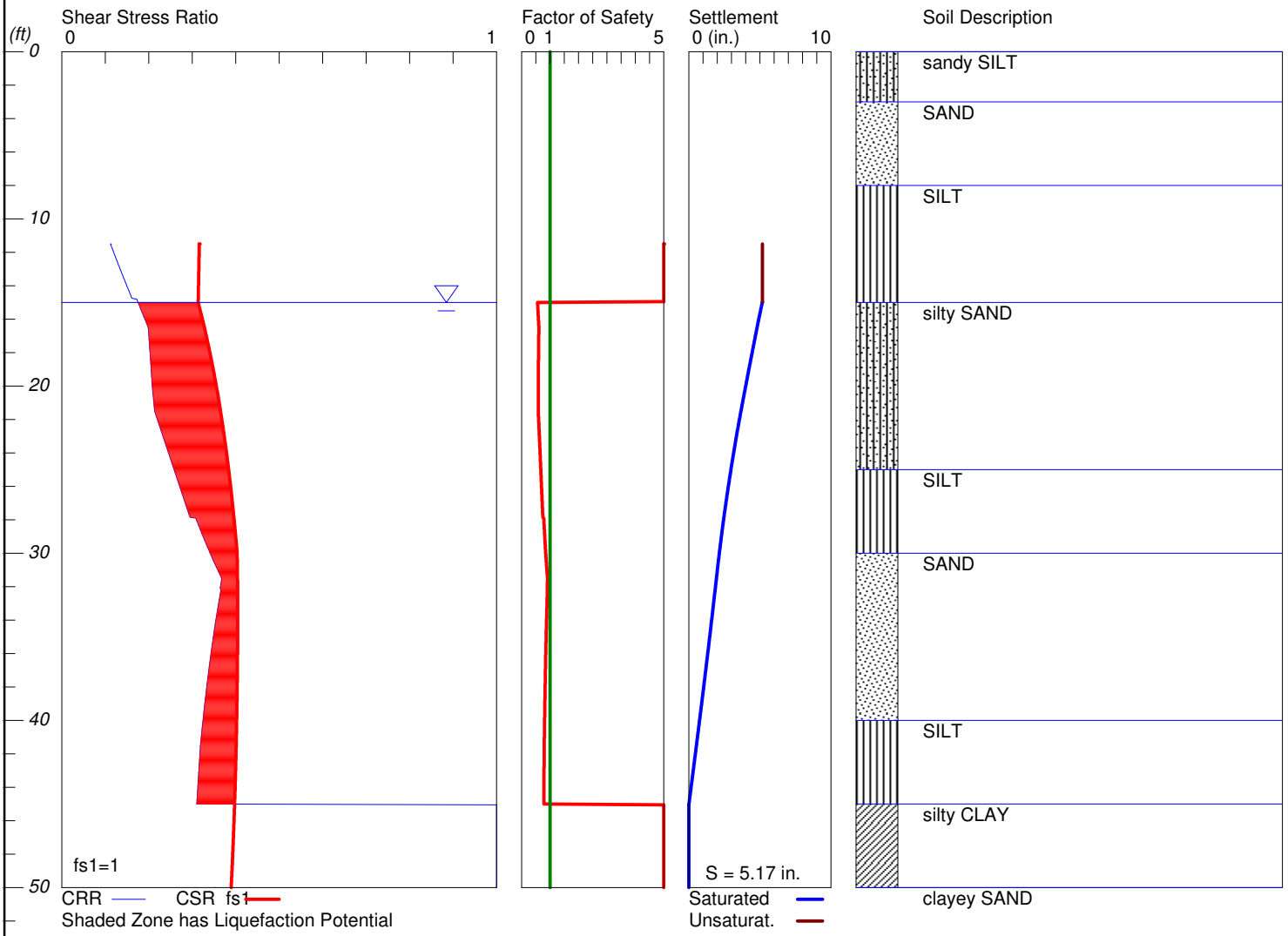


LIQUEFACTION ANALYSIS

Stanton Energy Reliability Center-B6

Hole No.=B6 Water Depth=15 ft Surface Elev.=68

Magnitude=6.9
Acceleration=0.5g



****

LIQUEFACTION ANALYSIS SUMMARY

****

Font: Courier New, Regular, Size 8 is recommended for this report.
Licensed to , 8/25/2016 4:03:57 PM

Input File Name: C:\Users\koohi\Desktop\Stanton\B1.liq
Title: Stanton Energy Reliability Center-B1
Subtitle: Stanton, CA

Surface Elev.=68
Hole No.=B1
Depth of Hole= 50.00 ft
Water Table during Earthquake= 15.00 ft
Water Table during In-Situ Testing= 20.00 ft
Max. Acceleration= 0.5 g
Earthquake Magnitude= 6.90

Input Data:
Surface Elev.=68
Hole No.=B1
Depth of Hole=50.00 ft
Water Table during Earthquake= 15.00 ft
Water Table during In-Situ Testing= 20.00 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=6.90
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Tokimatsu/Seed
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: Liq. zone only
6. Hammer Energy Ratio, Ce = 0.8
7. Borehole Diameter, Cb= 1.15
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 %
6.50	15.00	120.00	15.00
16.50	17.00	120.00	50.00
26.50	12.00	120.00	45.00
36.50	26.00	125.00	45.00
46.50	13.00	125.00	45.00

Output Results:
Settlement of Saturated Sands=6.25 in.
Settlement of Unsaturated Sands=0.00 in.
Total Settlement of Saturated and Unsaturated Sands=6.25 in.

Differential Settlement=3.125 to 4.126 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
6.50	0.26	0.32	5.00	6.25	0.00	6.25
6.55	0.26	0.32	5.00	6.25	0.00	6.25
6.60	0.26	0.32	5.00	6.25	0.00	6.25
6.65	0.26	0.32	5.00	6.25	0.00	6.25
6.70	0.26	0.32	5.00	6.25	0.00	6.25
6.75	0.26	0.32	5.00	6.25	0.00	6.25
6.80	0.26	0.32	5.00	6.25	0.00	6.25
6.85	0.26	0.32	5.00	6.25	0.00	6.25
6.90	0.26	0.32	5.00	6.25	0.00	6.25
6.95	0.26	0.32	5.00	6.25	0.00	6.25
7.00	0.26	0.32	5.00	6.25	0.00	6.25
7.05	0.26	0.32	5.00	6.25	0.00	6.25
7.10	0.26	0.32	5.00	6.25	0.00	6.25
7.15	0.26	0.32	5.00	6.25	0.00	6.25
7.20	0.26	0.32	5.00	6.25	0.00	6.25
7.25	0.26	0.32	5.00	6.25	0.00	6.25
7.30	0.26	0.32	5.00	6.25	0.00	6.25
7.35	0.26	0.32	5.00	6.25	0.00	6.25
7.40	0.26	0.32	5.00	6.25	0.00	6.25
7.45	0.26	0.32	5.00	6.25	0.00	6.25
7.50	0.26	0.32	5.00	6.25	0.00	6.25
7.55	0.26	0.32	5.00	6.25	0.00	6.25
7.60	0.26	0.32	5.00	6.25	0.00	6.25
7.65	0.26	0.32	5.00	6.25	0.00	6.25
7.70	0.26	0.32	5.00	6.25	0.00	6.25
7.75	0.26	0.32	5.00	6.25	0.00	6.25
7.80	0.26	0.32	5.00	6.25	0.00	6.25
7.85	0.26	0.32	5.00	6.25	0.00	6.25
7.90	0.26	0.32	5.00	6.25	0.00	6.25
7.95	0.26	0.32	5.00	6.25	0.00	6.25
8.00	0.26	0.32	5.00	6.25	0.00	6.25
8.05	0.26	0.32	5.00	6.25	0.00	6.25
8.10	0.26	0.32	5.00	6.25	0.00	6.25
8.15	0.26	0.32	5.00	6.25	0.00	6.25
8.20	0.26	0.32	5.00	6.25	0.00	6.25
8.25	0.29	0.32	5.00	6.25	0.00	6.25
8.30	0.29	0.32	5.00	6.25	0.00	6.25
8.35	0.29	0.32	5.00	6.25	0.00	6.25
8.40	0.29	0.32	5.00	6.25	0.00	6.25
8.45	0.29	0.32	5.00	6.25	0.00	6.25
8.50	0.29	0.32	5.00	6.25	0.00	6.25
8.55	0.29	0.32	5.00	6.25	0.00	6.25
8.60	0.29	0.32	5.00	6.25	0.00	6.25
8.65	0.29	0.32	5.00	6.25	0.00	6.25
8.70	0.29	0.32	5.00	6.25	0.00	6.25
8.75	0.29	0.32	5.00	6.25	0.00	6.25
8.80	0.29	0.32	5.00	6.25	0.00	6.25
8.85	0.29	0.32	5.00	6.25	0.00	6.25
8.90	0.29	0.32	5.00	6.25	0.00	6.25
8.95	0.29	0.32	5.00	6.25	0.00	6.25
9.00	0.29	0.32	5.00	6.25	0.00	6.25
9.05	0.29	0.32	5.00	6.25	0.00	6.25
9.10	0.29	0.32	5.00	6.25	0.00	6.25
9.15	0.29	0.32	5.00	6.25	0.00	6.25
9.20	0.29	0.32	5.00	6.25	0.00	6.25
9.25	0.29	0.32	5.00	6.25	0.00	6.25
9.30	0.29	0.32	5.00	6.25	0.00	6.25
9.35	0.29	0.32	5.00	6.25	0.00	6.25

9.40	0.29	0.32	5.00	6.25	0.00	6.25
9.45	0.29	0.32	5.00	6.25	0.00	6.25
9.50	0.29	0.32	5.00	6.25	0.00	6.25
9.55	0.29	0.32	5.00	6.25	0.00	6.25
9.60	0.29	0.32	5.00	6.25	0.00	6.25
9.65	0.29	0.32	5.00	6.25	0.00	6.25
9.70	0.29	0.32	5.00	6.25	0.00	6.25
9.75	0.29	0.32	5.00	6.25	0.00	6.25
9.80	0.29	0.32	5.00	6.25	0.00	6.25
9.85	0.29	0.32	5.00	6.25	0.00	6.25
9.90	0.29	0.32	5.00	6.25	0.00	6.25
9.95	0.29	0.32	5.00	6.25	0.00	6.25
10.00	0.29	0.32	5.00	6.25	0.00	6.25
10.05	0.29	0.32	5.00	6.25	0.00	6.25
10.10	0.29	0.32	5.00	6.25	0.00	6.25
10.15	0.29	0.32	5.00	6.25	0.00	6.25
10.20	0.29	0.32	5.00	6.25	0.00	6.25
10.25	0.29	0.32	5.00	6.25	0.00	6.25
10.30	0.29	0.32	5.00	6.25	0.00	6.25
10.35	0.29	0.32	5.00	6.25	0.00	6.25
10.40	0.29	0.32	5.00	6.25	0.00	6.25
10.45	0.29	0.32	5.00	6.25	0.00	6.25
10.50	0.29	0.32	5.00	6.25	0.00	6.25
10.55	0.29	0.32	5.00	6.25	0.00	6.25
10.60	0.29	0.32	5.00	6.25	0.00	6.25
10.65	0.29	0.32	5.00	6.25	0.00	6.25
10.70	0.29	0.32	5.00	6.25	0.00	6.25
10.75	0.29	0.32	5.00	6.25	0.00	6.25
10.80	0.29	0.32	5.00	6.25	0.00	6.25
10.85	0.30	0.32	5.00	6.25	0.00	6.25
10.90	0.30	0.32	5.00	6.25	0.00	6.25
10.95	0.30	0.32	5.00	6.25	0.00	6.25
11.00	0.30	0.32	5.00	6.25	0.00	6.25
11.05	0.30	0.32	5.00	6.25	0.00	6.25
11.10	0.30	0.32	5.00	6.25	0.00	6.25
11.15	0.30	0.32	5.00	6.25	0.00	6.25
11.20	0.30	0.32	5.00	6.25	0.00	6.25
11.25	0.30	0.32	5.00	6.25	0.00	6.25
11.30	0.30	0.32	5.00	6.25	0.00	6.25
11.35	0.30	0.32	5.00	6.25	0.00	6.25
11.40	0.30	0.32	5.00	6.25	0.00	6.25
11.45	0.30	0.32	5.00	6.25	0.00	6.25
11.50	0.30	0.32	5.00	6.25	0.00	6.25
11.55	0.30	0.32	5.00	6.25	0.00	6.25
11.60	0.30	0.32	5.00	6.25	0.00	6.25
11.65	0.30	0.32	5.00	6.25	0.00	6.25
11.70	0.30	0.32	5.00	6.25	0.00	6.25
11.75	0.30	0.32	5.00	6.25	0.00	6.25
11.80	0.30	0.32	5.00	6.25	0.00	6.25
11.85	0.30	0.32	5.00	6.25	0.00	6.25
11.90	0.30	0.32	5.00	6.25	0.00	6.25
11.95	0.30	0.32	5.00	6.25	0.00	6.25
12.00	0.30	0.32	5.00	6.25	0.00	6.25
12.05	0.30	0.32	5.00	6.25	0.00	6.25
12.10	0.30	0.32	5.00	6.25	0.00	6.25
12.15	0.30	0.32	5.00	6.25	0.00	6.25
12.20	0.30	0.32	5.00	6.25	0.00	6.25
12.25	0.30	0.32	5.00	6.25	0.00	6.25
12.30	0.30	0.32	5.00	6.25	0.00	6.25
12.35	0.30	0.32	5.00	6.25	0.00	6.25
12.40	0.30	0.32	5.00	6.25	0.00	6.25
12.45	0.30	0.32	5.00	6.25	0.00	6.25
12.50	0.30	0.32	5.00	6.25	0.00	6.25

12.55	0.30	0.32	5.00	6.25	0.00	6.25
12.60	0.30	0.32	5.00	6.25	0.00	6.25
12.65	0.30	0.32	5.00	6.25	0.00	6.25
12.70	0.30	0.32	5.00	6.25	0.00	6.25
12.75	0.30	0.32	5.00	6.25	0.00	6.25
12.80	0.30	0.32	5.00	6.25	0.00	6.25
12.85	0.30	0.32	5.00	6.25	0.00	6.25
12.90	0.30	0.32	5.00	6.25	0.00	6.25
12.95	0.30	0.32	5.00	6.25	0.00	6.25
13.00	0.30	0.32	5.00	6.25	0.00	6.25
13.05	0.30	0.32	5.00	6.25	0.00	6.25
13.10	0.30	0.32	5.00	6.25	0.00	6.25
13.15	0.30	0.32	5.00	6.25	0.00	6.25
13.20	0.30	0.31	5.00	6.25	0.00	6.25
13.25	0.30	0.31	5.00	6.25	0.00	6.25
13.30	0.30	0.31	5.00	6.25	0.00	6.25
13.35	0.30	0.31	5.00	6.25	0.00	6.25
13.40	0.30	0.31	5.00	6.25	0.00	6.25
13.45	0.30	0.31	5.00	6.25	0.00	6.25
13.50	0.29	0.31	5.00	6.25	0.00	6.25
13.55	0.29	0.31	5.00	6.25	0.00	6.25
13.60	0.29	0.31	5.00	6.25	0.00	6.25
13.65	0.29	0.31	5.00	6.25	0.00	6.25
13.70	0.29	0.31	5.00	6.25	0.00	6.25
13.75	0.29	0.31	5.00	6.25	0.00	6.25
13.80	0.29	0.31	5.00	6.25	0.00	6.25
13.85	0.29	0.31	5.00	6.25	0.00	6.25
13.90	0.29	0.31	5.00	6.25	0.00	6.25
13.95	0.29	0.31	5.00	6.25	0.00	6.25
14.00	0.29	0.31	5.00	6.25	0.00	6.25
14.05	0.29	0.31	5.00	6.25	0.00	6.25
14.10	0.29	0.31	5.00	6.25	0.00	6.25
14.15	0.29	0.31	5.00	6.25	0.00	6.25
14.20	0.29	0.31	5.00	6.25	0.00	6.25
14.25	0.29	0.31	5.00	6.25	0.00	6.25
14.30	0.29	0.31	5.00	6.25	0.00	6.25
14.35	0.29	0.31	5.00	6.25	0.00	6.25
14.40	0.29	0.31	5.00	6.25	0.00	6.25
14.45	0.29	0.31	5.00	6.25	0.00	6.25
14.50	0.29	0.31	5.00	6.25	0.00	6.25
14.55	0.29	0.31	5.00	6.25	0.00	6.25
14.60	0.29	0.31	5.00	6.25	0.00	6.25
14.65	0.29	0.31	5.00	6.25	0.00	6.25
14.70	0.29	0.31	5.00	6.25	0.00	6.25
14.75	0.29	0.31	5.00	6.25	0.00	6.25
14.80	0.31	0.31	5.00	6.25	0.00	6.25
14.85	0.31	0.31	5.00	6.25	0.00	6.25
14.90	0.31	0.31	5.00	6.25	0.00	6.25
14.95	0.31	0.31	5.00	6.25	0.00	6.25
15.00	0.31	0.31	1.00	6.25	0.00	6.25
15.05	0.31	0.31	1.00*	6.25	0.00	6.25
15.10	0.31	0.31	1.00*	6.24	0.00	6.24
15.15	0.31	0.32	0.99*	6.24	0.00	6.24
15.20	0.31	0.32	0.99*	6.23	0.00	6.23
15.25	0.31	0.32	0.99*	6.22	0.00	6.22
15.30	0.31	0.32	0.99*	6.22	0.00	6.22
15.35	0.31	0.32	0.98*	6.21	0.00	6.21
15.40	0.31	0.32	0.98*	6.20	0.00	6.20
15.45	0.31	0.32	0.98*	6.19	0.00	6.19
15.50	0.31	0.32	0.98*	6.19	0.00	6.19
15.55	0.31	0.32	0.97*	6.18	0.00	6.18
15.60	0.31	0.32	0.97*	6.17	0.00	6.17
15.65	0.31	0.32	0.97*	6.17	0.00	6.17

15.70	0.31	0.32	0.97*	6.16	0.00	6.16
15.75	0.31	0.32	0.96*	6.15	0.00	6.15
15.80	0.31	0.32	0.96*	6.14	0.00	6.14
15.85	0.31	0.32	0.96*	6.14	0.00	6.14
15.90	0.31	0.32	0.96*	6.13	0.00	6.13
15.95	0.31	0.32	0.96*	6.12	0.00	6.12
16.00	0.31	0.32	0.95*	6.12	0.00	6.12
16.05	0.31	0.32	0.95*	6.11	0.00	6.11
16.10	0.31	0.32	0.95*	6.10	0.00	6.10
16.15	0.31	0.32	0.95*	6.09	0.00	6.09
16.20	0.31	0.33	0.95*	6.09	0.00	6.09
16.25	0.31	0.33	0.94*	6.08	0.00	6.08
16.30	0.31	0.33	0.94*	6.07	0.00	6.07
16.35	0.31	0.33	0.94*	6.06	0.00	6.06
16.40	0.31	0.33	0.94*	6.06	0.00	6.06
16.45	0.31	0.33	0.93*	6.05	0.00	6.05
16.50	0.31	0.33	0.93*	6.04	0.00	6.04
16.55	0.31	0.33	0.93*	6.03	0.00	6.03
16.60	0.30	0.33	0.93*	6.03	0.00	6.03
16.65	0.30	0.33	0.92*	6.02	0.00	6.02
16.70	0.30	0.33	0.92*	6.01	0.00	6.01
16.75	0.30	0.33	0.92*	6.00	0.00	6.00
16.80	0.30	0.33	0.91*	6.00	0.00	6.00
16.85	0.30	0.33	0.91*	5.99	0.00	5.99
16.90	0.30	0.33	0.91*	5.98	0.00	5.98
16.95	0.30	0.33	0.90*	5.97	0.00	5.97
17.00	0.30	0.33	0.90*	5.97	0.00	5.97
17.05	0.30	0.33	0.90*	5.96	0.00	5.96
17.10	0.30	0.33	0.89*	5.95	0.00	5.95
17.15	0.30	0.33	0.89*	5.94	0.00	5.94
17.20	0.30	0.33	0.89*	5.94	0.00	5.94
17.25	0.30	0.33	0.88*	5.93	0.00	5.93
17.30	0.29	0.34	0.88*	5.92	0.00	5.92
17.35	0.29	0.34	0.88*	5.91	0.00	5.91
17.40	0.29	0.34	0.87*	5.90	0.00	5.90
17.45	0.29	0.34	0.87*	5.90	0.00	5.90
17.50	0.29	0.34	0.87*	5.89	0.00	5.89
17.55	0.29	0.34	0.86*	5.88	0.00	5.88
17.60	0.29	0.34	0.86*	5.87	0.00	5.87
17.65	0.29	0.34	0.86*	5.86	0.00	5.86
17.70	0.29	0.34	0.86*	5.86	0.00	5.86
17.75	0.29	0.34	0.85*	5.85	0.00	5.85
17.80	0.29	0.34	0.85*	5.84	0.00	5.84
17.85	0.29	0.34	0.85*	5.83	0.00	5.83
17.90	0.29	0.34	0.84*	5.82	0.00	5.82
17.95	0.29	0.34	0.84*	5.82	0.00	5.82
18.00	0.29	0.34	0.84*	5.81	0.00	5.81
18.05	0.29	0.34	0.84*	5.80	0.00	5.80
18.10	0.28	0.34	0.83*	5.79	0.00	5.79
18.15	0.28	0.34	0.83*	5.78	0.00	5.78
18.20	0.28	0.34	0.83*	5.78	0.00	5.78
18.25	0.28	0.34	0.82*	5.77	0.00	5.77
18.30	0.28	0.34	0.82*	5.76	0.00	5.76
18.35	0.28	0.34	0.82*	5.75	0.00	5.75
18.40	0.28	0.34	0.82*	5.74	0.00	5.74
18.45	0.28	0.34	0.81*	5.73	0.00	5.73
18.50	0.28	0.34	0.81*	5.73	0.00	5.73
18.55	0.28	0.35	0.81*	5.72	0.00	5.72
18.60	0.28	0.35	0.81*	5.71	0.00	5.71
18.65	0.28	0.35	0.80*	5.70	0.00	5.70
18.70	0.28	0.35	0.80*	5.69	0.00	5.69
18.75	0.28	0.35	0.80*	5.68	0.00	5.68
18.80	0.28	0.35	0.80*	5.68	0.00	5.68

18.85	0.28	0.35	0.79*	5.67	0.00	5.67
18.90	0.28	0.35	0.79*	5.66	0.00	5.66
18.95	0.27	0.35	0.79*	5.65	0.00	5.65
19.00	0.27	0.35	0.79*	5.64	0.00	5.64
19.05	0.27	0.35	0.78*	5.63	0.00	5.63
19.10	0.27	0.35	0.78*	5.62	0.00	5.62
19.15	0.27	0.35	0.78*	5.62	0.00	5.62
19.20	0.27	0.35	0.78*	5.61	0.00	5.61
19.25	0.27	0.35	0.77*	5.60	0.00	5.60
19.30	0.27	0.35	0.77*	5.59	0.00	5.59
19.35	0.27	0.35	0.77*	5.58	0.00	5.58
19.40	0.27	0.35	0.77*	5.57	0.00	5.57
19.45	0.27	0.35	0.76*	5.56	0.00	5.56
19.50	0.27	0.35	0.76*	5.55	0.00	5.55
19.55	0.27	0.35	0.76*	5.55	0.00	5.55
19.60	0.27	0.35	0.76*	5.54	0.00	5.54
19.65	0.27	0.35	0.76*	5.53	0.00	5.53
19.70	0.27	0.35	0.75*	5.52	0.00	5.52
19.75	0.27	0.35	0.75*	5.51	0.00	5.51
19.80	0.27	0.35	0.75*	5.50	0.00	5.50
19.85	0.27	0.36	0.75*	5.49	0.00	5.49
19.90	0.26	0.36	0.74*	5.48	0.00	5.48
19.95	0.26	0.36	0.74*	5.48	0.00	5.48
20.00	0.26	0.36	0.74*	5.47	0.00	5.47
20.05	0.26	0.36	0.74*	5.46	0.00	5.46
20.10	0.26	0.36	0.74*	5.45	0.00	5.45
20.15	0.26	0.36	0.73*	5.44	0.00	5.44
20.20	0.26	0.36	0.73*	5.43	0.00	5.43
20.25	0.26	0.36	0.73*	5.42	0.00	5.42
20.30	0.26	0.36	0.73*	5.41	0.00	5.41
20.35	0.26	0.36	0.73*	5.40	0.00	5.40
20.40	0.26	0.36	0.73*	5.39	0.00	5.39
20.45	0.26	0.36	0.72*	5.39	0.00	5.39
20.50	0.26	0.36	0.72*	5.38	0.00	5.38
20.55	0.26	0.36	0.72*	5.37	0.00	5.37
20.60	0.26	0.36	0.72*	5.36	0.00	5.36
20.65	0.26	0.36	0.72*	5.35	0.00	5.35
20.70	0.26	0.36	0.71*	5.34	0.00	5.34
20.75	0.26	0.36	0.71*	5.33	0.00	5.33
20.80	0.26	0.36	0.71*	5.32	0.00	5.32
20.85	0.26	0.36	0.71*	5.31	0.00	5.31
20.90	0.26	0.36	0.71*	5.30	0.00	5.30
20.95	0.26	0.36	0.71*	5.29	0.00	5.29
21.00	0.26	0.36	0.70*	5.28	0.00	5.28
21.05	0.26	0.36	0.70*	5.28	0.00	5.28
21.10	0.26	0.36	0.70*	5.27	0.00	5.27
21.15	0.25	0.36	0.70*	5.26	0.00	5.26
21.20	0.25	0.36	0.70*	5.25	0.00	5.25
21.25	0.25	0.36	0.70*	5.24	0.00	5.24
21.30	0.25	0.36	0.69*	5.23	0.00	5.23
21.35	0.25	0.37	0.69*	5.22	0.00	5.22
21.40	0.25	0.37	0.69*	5.21	0.00	5.21
21.45	0.25	0.37	0.69*	5.20	0.00	5.20
21.50	0.25	0.37	0.69*	5.19	0.00	5.19
21.55	0.25	0.37	0.69*	5.18	0.00	5.18
21.60	0.25	0.37	0.69*	5.17	0.00	5.17
21.65	0.25	0.37	0.68*	5.16	0.00	5.16
21.70	0.25	0.37	0.68*	5.15	0.00	5.15
21.75	0.25	0.37	0.68*	5.14	0.00	5.14
21.80	0.25	0.37	0.68*	5.13	0.00	5.13
21.85	0.25	0.37	0.68*	5.12	0.00	5.12
21.90	0.25	0.37	0.68*	5.12	0.00	5.12
21.95	0.25	0.37	0.67*	5.11	0.00	5.11

22.00	0.25	0.37	0.67*	5.10	0.00	5.10
22.05	0.25	0.37	0.67*	5.09	0.00	5.09
22.10	0.25	0.37	0.67*	5.08	0.00	5.08
22.15	0.25	0.37	0.67*	5.07	0.00	5.07
22.20	0.25	0.37	0.67*	5.06	0.00	5.06
22.25	0.25	0.37	0.67*	5.05	0.00	5.05
22.30	0.25	0.37	0.66*	5.04	0.00	5.04
22.35	0.25	0.37	0.66*	5.03	0.00	5.03
22.40	0.25	0.37	0.66*	5.02	0.00	5.02
22.45	0.25	0.37	0.66*	5.01	0.00	5.01
22.50	0.25	0.37	0.66*	5.00	0.00	5.00
22.55	0.24	0.37	0.66*	4.99	0.00	4.99
22.60	0.24	0.37	0.65*	4.98	0.00	4.98
22.65	0.24	0.37	0.65*	4.97	0.00	4.97
22.70	0.24	0.37	0.65*	4.96	0.00	4.96
22.75	0.24	0.37	0.65*	4.95	0.00	4.95
22.80	0.24	0.37	0.65*	4.94	0.00	4.94
22.85	0.24	0.37	0.65*	4.93	0.00	4.93
22.90	0.24	0.37	0.65*	4.92	0.00	4.92
22.95	0.24	0.38	0.64*	4.91	0.00	4.91
23.00	0.24	0.38	0.64*	4.90	0.00	4.90
23.05	0.24	0.38	0.64*	4.89	0.00	4.89
23.10	0.24	0.38	0.64*	4.88	0.00	4.88
23.15	0.24	0.38	0.64*	4.87	0.00	4.87
23.20	0.24	0.38	0.64*	4.86	0.00	4.86
23.25	0.24	0.38	0.64*	4.85	0.00	4.85
23.30	0.24	0.38	0.63*	4.84	0.00	4.84
23.35	0.24	0.38	0.63*	4.83	0.00	4.83
23.40	0.24	0.38	0.63*	4.82	0.00	4.82
23.45	0.24	0.38	0.63*	4.81	0.00	4.81
23.50	0.24	0.38	0.63*	4.80	0.00	4.80
23.55	0.24	0.38	0.63*	4.79	0.00	4.79
23.60	0.24	0.38	0.63*	4.78	0.00	4.78
23.65	0.24	0.38	0.63*	4.77	0.00	4.77
23.70	0.24	0.38	0.62*	4.76	0.00	4.76
23.75	0.24	0.38	0.62*	4.75	0.00	4.75
23.80	0.24	0.38	0.62*	4.74	0.00	4.74
23.85	0.24	0.38	0.62*	4.73	0.00	4.73
23.90	0.24	0.38	0.62*	4.72	0.00	4.72
23.95	0.24	0.38	0.62*	4.71	0.00	4.71
24.00	0.23	0.38	0.62*	4.70	0.00	4.70
24.05	0.23	0.38	0.61*	4.69	0.00	4.69
24.10	0.23	0.38	0.61*	4.68	0.00	4.68
24.15	0.23	0.38	0.61*	4.67	0.00	4.67
24.20	0.23	0.38	0.61*	4.66	0.00	4.66
24.25	0.23	0.38	0.61*	4.65	0.00	4.65
24.30	0.23	0.38	0.61*	4.64	0.00	4.64
24.35	0.23	0.38	0.61*	4.63	0.00	4.63
24.40	0.23	0.38	0.61*	4.62	0.00	4.62
24.45	0.23	0.38	0.60*	4.61	0.00	4.61
24.50	0.23	0.38	0.60*	4.60	0.00	4.60
24.55	0.23	0.38	0.60*	4.59	0.00	4.59
24.60	0.23	0.38	0.60*	4.58	0.00	4.58
24.65	0.23	0.38	0.60*	4.57	0.00	4.57
24.70	0.23	0.38	0.60*	4.56	0.00	4.56
24.75	0.23	0.39	0.60*	4.55	0.00	4.55
24.80	0.23	0.39	0.60*	4.54	0.00	4.54
24.85	0.23	0.39	0.59*	4.53	0.00	4.53
24.90	0.23	0.39	0.59*	4.52	0.00	4.52
24.95	0.23	0.39	0.59*	4.51	0.00	4.51
25.00	0.23	0.39	0.59*	4.50	0.00	4.50
25.05	0.23	0.39	0.59*	4.49	0.00	4.49
25.10	0.23	0.39	0.59*	4.48	0.00	4.48

25.15	0.23	0.39	0.59*	4.47	0.00	4.47
25.20	0.23	0.39	0.59*	4.46	0.00	4.46
25.25	0.23	0.39	0.58*	4.45	0.00	4.45
25.30	0.23	0.39	0.58*	4.44	0.00	4.44
25.35	0.23	0.39	0.58*	4.42	0.00	4.42
25.40	0.23	0.39	0.58*	4.41	0.00	4.41
25.45	0.23	0.39	0.58*	4.40	0.00	4.40
25.50	0.22	0.39	0.58*	4.39	0.00	4.39
25.55	0.22	0.39	0.58*	4.38	0.00	4.38
25.60	0.22	0.39	0.58*	4.37	0.00	4.37
25.65	0.22	0.39	0.57*	4.36	0.00	4.36
25.70	0.22	0.39	0.57*	4.35	0.00	4.35
25.75	0.22	0.39	0.57*	4.34	0.00	4.34
25.80	0.22	0.39	0.57*	4.33	0.00	4.33
25.85	0.22	0.39	0.57*	4.32	0.00	4.32
25.90	0.22	0.39	0.57*	4.31	0.00	4.31
25.95	0.22	0.39	0.57*	4.30	0.00	4.30
26.00	0.22	0.39	0.57*	4.29	0.00	4.29
26.05	0.22	0.39	0.57*	4.28	0.00	4.28
26.10	0.22	0.39	0.56*	4.27	0.00	4.27
26.15	0.22	0.39	0.56*	4.26	0.00	4.26
26.20	0.22	0.39	0.56*	4.25	0.00	4.25
26.25	0.22	0.39	0.56*	4.23	0.00	4.23
26.30	0.22	0.39	0.56*	4.22	0.00	4.22
26.35	0.22	0.39	0.56*	4.21	0.00	4.21
26.40	0.22	0.39	0.56*	4.20	0.00	4.20
26.45	0.22	0.39	0.56*	4.19	0.00	4.19
26.50	0.22	0.39	0.56*	4.18	0.00	4.18
26.55	0.22	0.39	0.56*	4.17	0.00	4.17
26.60	0.22	0.39	0.56*	4.16	0.00	4.16
26.65	0.22	0.39	0.56*	4.15	0.00	4.15
26.70	0.22	0.39	0.56*	4.14	0.00	4.14
26.75	0.22	0.39	0.56*	4.13	0.00	4.13
26.80	0.22	0.40	0.56*	4.12	0.00	4.12
26.85	0.22	0.40	0.56*	4.11	0.00	4.11
26.90	0.22	0.40	0.57*	4.10	0.00	4.10
26.95	0.22	0.40	0.57*	4.09	0.00	4.09
27.00	0.22	0.40	0.57*	4.07	0.00	4.07
27.05	0.23	0.40	0.57*	4.06	0.00	4.06
27.10	0.23	0.40	0.57*	4.05	0.00	4.05
27.15	0.23	0.40	0.57*	4.04	0.00	4.04
27.20	0.23	0.40	0.57*	4.03	0.00	4.03
27.25	0.23	0.40	0.57*	4.02	0.00	4.02
27.30	0.23	0.40	0.58*	4.01	0.00	4.01
27.35	0.23	0.40	0.58*	4.00	0.00	4.00
27.40	0.23	0.40	0.58*	3.99	0.00	3.99
27.45	0.23	0.40	0.58*	3.98	0.00	3.98
27.50	0.23	0.40	0.58*	3.97	0.00	3.97
27.55	0.23	0.40	0.58*	3.96	0.00	3.96
27.60	0.23	0.40	0.58*	3.95	0.00	3.95
27.65	0.23	0.40	0.58*	3.94	0.00	3.94
27.70	0.23	0.40	0.59*	3.93	0.00	3.93
27.75	0.23	0.40	0.59*	3.92	0.00	3.92
27.80	0.24	0.40	0.59*	3.91	0.00	3.91
27.85	0.24	0.40	0.59*	3.90	0.00	3.90
27.90	0.24	0.40	0.61*	3.89	0.00	3.89
27.95	0.24	0.40	0.61*	3.88	0.00	3.88
28.00	0.24	0.40	0.61*	3.87	0.00	3.87
28.05	0.25	0.40	0.61*	3.86	0.00	3.86
28.10	0.25	0.40	0.61*	3.85	0.00	3.85
28.15	0.25	0.40	0.62*	3.84	0.00	3.84
28.20	0.25	0.40	0.62*	3.83	0.00	3.83
28.25	0.25	0.40	0.62*	3.82	0.00	3.82

28.30	0.25	0.40	0.62*	3.81	0.00	3.81
28.35	0.25	0.40	0.62*	3.80	0.00	3.80
28.40	0.25	0.40	0.62*	3.79	0.00	3.79
28.45	0.25	0.40	0.62*	3.78	0.00	3.78
28.50	0.25	0.40	0.63*	3.77	0.00	3.77
28.55	0.25	0.40	0.63*	3.76	0.00	3.76
28.60	0.25	0.40	0.63*	3.75	0.00	3.75
28.65	0.25	0.40	0.63*	3.74	0.00	3.74
28.70	0.25	0.40	0.63*	3.74	0.00	3.74
28.75	0.25	0.40	0.63*	3.73	0.00	3.73
28.80	0.26	0.40	0.63*	3.72	0.00	3.72
28.85	0.26	0.40	0.63*	3.71	0.00	3.71
28.90	0.26	0.40	0.64*	3.70	0.00	3.70
28.95	0.26	0.40	0.64*	3.69	0.00	3.69
29.00	0.26	0.40	0.64*	3.68	0.00	3.68
29.05	0.26	0.40	0.64*	3.67	0.00	3.67
29.10	0.26	0.40	0.64*	3.66	0.00	3.66
29.15	0.26	0.41	0.64*	3.65	0.00	3.65
29.20	0.26	0.41	0.64*	3.64	0.00	3.64
29.25	0.26	0.41	0.65*	3.63	0.00	3.63
29.30	0.26	0.41	0.65*	3.62	0.00	3.62
29.35	0.26	0.41	0.65*	3.62	0.00	3.62
29.40	0.26	0.41	0.65*	3.61	0.00	3.61
29.45	0.26	0.41	0.65*	3.60	0.00	3.60
29.50	0.27	0.41	0.65*	3.59	0.00	3.59
29.55	0.27	0.41	0.65*	3.58	0.00	3.58
29.60	0.27	0.41	0.65*	3.57	0.00	3.57
29.65	0.27	0.41	0.66*	3.56	0.00	3.56
29.70	0.27	0.41	0.66*	3.55	0.00	3.55
29.75	0.27	0.41	0.66*	3.54	0.00	3.54
29.80	0.27	0.41	0.66*	3.53	0.00	3.53
29.85	0.27	0.41	0.66*	3.53	0.00	3.53
29.90	0.27	0.41	0.66*	3.52	0.00	3.52
29.95	0.27	0.41	0.66*	3.51	0.00	3.51
30.00	0.27	0.41	0.67*	3.50	0.00	3.50
30.05	0.27	0.41	0.67*	3.49	0.00	3.49
30.10	0.27	0.41	0.67*	3.48	0.00	3.48
30.15	0.27	0.41	0.67*	3.47	0.00	3.47
30.20	0.27	0.41	0.67*	3.46	0.00	3.46
30.25	0.28	0.41	0.67*	3.45	0.00	3.45
30.30	0.28	0.41	0.68*	3.45	0.00	3.45
30.35	0.28	0.41	0.68*	3.44	0.00	3.44
30.40	0.28	0.41	0.68*	3.43	0.00	3.43
30.45	0.28	0.41	0.68*	3.42	0.00	3.42
30.50	0.28	0.41	0.68*	3.41	0.00	3.41
30.55	0.28	0.41	0.68*	3.40	0.00	3.40
30.60	0.28	0.41	0.68*	3.39	0.00	3.39
30.65	0.28	0.41	0.69*	3.39	0.00	3.39
30.70	0.28	0.41	0.69*	3.38	0.00	3.38
30.75	0.28	0.41	0.69*	3.37	0.00	3.37
30.80	0.28	0.41	0.69*	3.36	0.00	3.36
30.85	0.28	0.41	0.69*	3.35	0.00	3.35
30.90	0.28	0.41	0.69*	3.34	0.00	3.34
30.95	0.28	0.41	0.70*	3.33	0.00	3.33
31.00	0.29	0.41	0.70*	3.33	0.00	3.33
31.05	0.29	0.41	0.70*	3.32	0.00	3.32
31.10	0.29	0.41	0.70*	3.31	0.00	3.31
31.15	0.29	0.41	0.70*	3.30	0.00	3.30
31.20	0.29	0.41	0.70*	3.29	0.00	3.29
31.25	0.29	0.41	0.71*	3.28	0.00	3.28
31.30	0.29	0.41	0.71*	3.27	0.00	3.27
31.35	0.29	0.41	0.71*	3.27	0.00	3.27
31.40	0.29	0.41	0.71*	3.26	0.00	3.26

31.45	0.29	0.41	0.71*	3.25	0.00	3.25
31.50	0.29	0.41	0.71*	3.24	0.00	3.24
31.55	0.29	0.41	0.72*	3.23	0.00	3.23
31.60	0.29	0.41	0.72*	3.23	0.00	3.23
31.65	0.29	0.41	0.72*	3.22	0.00	3.22
31.70	0.30	0.41	0.72*	3.21	0.00	3.21
31.75	0.30	0.41	0.72*	3.20	0.00	3.20
31.80	0.30	0.41	0.72*	3.19	0.00	3.19
31.85	0.30	0.41	0.73*	3.18	0.00	3.18
31.90	0.30	0.41	0.73*	3.18	0.00	3.18
31.95	0.30	0.41	0.73*	3.17	0.00	3.17
32.00	0.30	0.41	0.73*	3.16	0.00	3.16
32.05	0.30	0.41	0.73*	3.15	0.00	3.15
32.10	0.30	0.41	0.73*	3.14	0.00	3.14
32.15	0.30	0.41	0.74*	3.14	0.00	3.14
32.20	0.30	0.41	0.74*	3.13	0.00	3.13
32.25	0.30	0.41	0.74*	3.12	0.00	3.12
32.30	0.30	0.41	0.74*	3.11	0.00	3.11
32.35	0.30	0.41	0.74*	3.10	0.00	3.10
32.40	0.31	0.41	0.75*	3.10	0.00	3.10
32.45	0.31	0.41	0.75*	3.09	0.00	3.09
32.50	0.31	0.41	0.75*	3.08	0.00	3.08
32.55	0.31	0.41	0.75*	3.07	0.00	3.07
32.60	0.31	0.41	0.75*	3.06	0.00	3.06
32.65	0.31	0.41	0.75*	3.06	0.00	3.06
32.70	0.31	0.41	0.76*	3.05	0.00	3.05
32.75	0.31	0.41	0.76*	3.04	0.00	3.04
32.80	0.31	0.41	0.76*	3.03	0.00	3.03
32.85	0.31	0.41	0.76*	3.03	0.00	3.03
32.90	0.31	0.41	0.76*	3.02	0.00	3.02
32.95	0.31	0.41	0.76*	3.01	0.00	3.01
33.00	0.31	0.41	0.77*	3.00	0.00	3.00
33.05	0.32	0.41	0.77*	2.99	0.00	2.99
33.10	0.32	0.41	0.77*	2.99	0.00	2.99
33.15	0.32	0.41	0.77*	2.98	0.00	2.98
33.20	0.32	0.41	0.77*	2.97	0.00	2.97
33.25	0.32	0.41	0.78*	2.96	0.00	2.96
33.30	0.32	0.41	0.78*	2.96	0.00	2.96
33.35	0.32	0.41	0.78*	2.95	0.00	2.95
33.40	0.32	0.41	0.78*	2.94	0.00	2.94
33.45	0.32	0.41	0.78*	2.93	0.00	2.93
33.50	0.32	0.41	0.79*	2.93	0.00	2.93
33.55	0.32	0.41	0.79*	2.92	0.00	2.92
33.60	0.32	0.41	0.79*	2.91	0.00	2.91
33.65	0.32	0.41	0.79*	2.90	0.00	2.90
33.70	0.33	0.41	0.79*	2.90	0.00	2.90
33.75	0.33	0.41	0.79*	2.89	0.00	2.89
33.80	0.33	0.41	0.80*	2.88	0.00	2.88
33.85	0.33	0.41	0.80*	2.87	0.00	2.87
33.90	0.33	0.41	0.80*	2.87	0.00	2.87
33.95	0.33	0.41	0.80*	2.86	0.00	2.86
34.00	0.33	0.41	0.80*	2.85	0.00	2.85
34.05	0.33	0.41	0.81*	2.84	0.00	2.84
34.10	0.33	0.41	0.81*	2.84	0.00	2.84
34.15	0.33	0.41	0.81*	2.83	0.00	2.83
34.20	0.33	0.41	0.81*	2.82	0.00	2.82
34.25	0.33	0.41	0.81*	2.81	0.00	2.81
34.30	0.34	0.41	0.82*	2.81	0.00	2.81
34.35	0.34	0.41	0.82*	2.80	0.00	2.80
34.40	0.34	0.41	0.82*	2.79	0.00	2.79
34.45	0.34	0.41	0.82*	2.79	0.00	2.79
34.50	0.34	0.41	0.82*	2.78	0.00	2.78
34.55	0.34	0.41	0.83*	2.77	0.00	2.77

34.60	0.34	0.41	0.83*	2.76	0.00	2.76
34.65	0.34	0.41	0.84*	2.76	0.00	2.76
34.70	0.34	0.41	0.84*	2.75	0.00	2.75
34.75	0.34	0.41	0.84*	2.74	0.00	2.74
34.80	0.35	0.41	0.84*	2.74	0.00	2.74
34.85	0.35	0.41	0.84*	2.73	0.00	2.73
34.90	0.35	0.41	0.84*	2.72	0.00	2.72
34.95	0.35	0.41	0.85*	2.71	0.00	2.71
35.00	0.35	0.41	0.85*	2.71	0.00	2.71
35.05	0.35	0.41	0.85*	2.70	0.00	2.70
35.10	0.35	0.41	0.85*	2.69	0.00	2.69
35.15	0.35	0.41	0.85*	2.69	0.00	2.69
35.20	0.35	0.41	0.86*	2.68	0.00	2.68
35.25	0.35	0.41	0.86*	2.67	0.00	2.67
35.30	0.35	0.41	0.86*	2.67	0.00	2.67
35.35	0.35	0.41	0.86*	2.66	0.00	2.66
35.40	0.35	0.41	0.87*	2.65	0.00	2.65
35.45	0.36	0.41	0.87*	2.64	0.00	2.64
35.50	0.36	0.41	0.87*	2.64	0.00	2.64
35.55	0.36	0.41	0.87*	2.63	0.00	2.63
35.60	0.36	0.41	0.87*	2.62	0.00	2.62
35.65	0.36	0.41	0.88*	2.62	0.00	2.62
35.70	0.36	0.41	0.88*	2.61	0.00	2.61
35.75	0.36	0.41	0.88*	2.60	0.00	2.60
35.80	0.36	0.41	0.88*	2.60	0.00	2.60
35.85	0.36	0.41	0.88*	2.59	0.00	2.59
35.90	0.36	0.41	0.89*	2.58	0.00	2.58
35.95	0.36	0.41	0.89*	2.58	0.00	2.58
36.00	0.37	0.41	0.89*	2.57	0.00	2.57
36.05	0.37	0.41	0.89*	2.56	0.00	2.56
36.10	0.37	0.41	0.89*	2.56	0.00	2.56
36.15	0.37	0.41	0.90*	2.55	0.00	2.55
36.20	0.37	0.41	0.90*	2.54	0.00	2.54
36.25	0.37	0.41	0.90*	2.54	0.00	2.54
36.30	0.37	0.41	0.90*	2.53	0.00	2.53
36.35	0.37	0.41	0.91*	2.52	0.00	2.52
36.40	0.37	0.41	0.91*	2.52	0.00	2.52
36.45	0.37	0.41	0.91*	2.51	0.00	2.51
36.50	0.37	0.41	0.91*	2.50	0.00	2.50
36.55	0.37	0.41	0.91*	2.50	0.00	2.50
36.60	0.37	0.41	0.91*	2.49	0.00	2.49
36.65	0.37	0.41	0.90*	2.49	0.00	2.49
36.70	0.37	0.41	0.90*	2.48	0.00	2.48
36.75	0.37	0.41	0.90*	2.47	0.00	2.47
36.80	0.37	0.41	0.89*	2.47	0.00	2.47
36.85	0.36	0.41	0.89*	2.46	0.00	2.46
36.90	0.36	0.41	0.89*	2.45	0.00	2.45
36.95	0.36	0.41	0.88*	2.45	0.00	2.45
37.00	0.36	0.41	0.88*	2.44	0.00	2.44
37.05	0.36	0.41	0.88*	2.43	0.00	2.43
37.10	0.36	0.41	0.88*	2.43	0.00	2.43
37.15	0.36	0.41	0.87*	2.42	0.00	2.42
37.20	0.36	0.41	0.87*	2.41	0.00	2.41
37.25	0.36	0.41	0.87*	2.41	0.00	2.41
37.30	0.35	0.41	0.86*	2.40	0.00	2.40
37.35	0.35	0.41	0.86*	2.39	0.00	2.39
37.40	0.35	0.41	0.86*	2.38	0.00	2.38
37.45	0.35	0.41	0.86*	2.38	0.00	2.38
37.50	0.35	0.41	0.85*	2.37	0.00	2.37
37.55	0.35	0.41	0.85*	2.36	0.00	2.36
37.60	0.35	0.41	0.85*	2.36	0.00	2.36
37.65	0.35	0.41	0.85*	2.35	0.00	2.35
37.70	0.34	0.41	0.84*	2.34	0.00	2.34

37.75	0.34	0.41	0.84*	2.34	0.00	2.34
37.80	0.34	0.41	0.84*	2.33	0.00	2.33
37.85	0.34	0.41	0.83*	2.32	0.00	2.32
37.90	0.34	0.41	0.83*	2.32	0.00	2.32
37.95	0.34	0.41	0.83*	2.31	0.00	2.31
38.00	0.34	0.41	0.83*	2.30	0.00	2.30
38.05	0.34	0.41	0.82*	2.29	0.00	2.29
38.10	0.34	0.41	0.82*	2.29	0.00	2.29
38.15	0.33	0.41	0.82*	2.28	0.00	2.28
38.20	0.33	0.41	0.82*	2.27	0.00	2.27
38.25	0.33	0.41	0.81*	2.26	0.00	2.26
38.30	0.33	0.41	0.81*	2.26	0.00	2.26
38.35	0.33	0.41	0.81*	2.25	0.00	2.25
38.40	0.33	0.41	0.81*	2.24	0.00	2.24
38.45	0.33	0.41	0.80*	2.24	0.00	2.24
38.50	0.33	0.41	0.80*	2.23	0.00	2.23
38.55	0.33	0.41	0.80*	2.22	0.00	2.22
38.60	0.33	0.41	0.80*	2.21	0.00	2.21
38.65	0.32	0.41	0.79*	2.21	0.00	2.21
38.70	0.32	0.41	0.79*	2.20	0.00	2.20
38.75	0.32	0.41	0.79*	2.19	0.00	2.19
38.80	0.32	0.41	0.79*	2.18	0.00	2.18
38.85	0.32	0.41	0.79*	2.18	0.00	2.18
38.90	0.32	0.41	0.78*	2.17	0.00	2.17
38.95	0.32	0.41	0.78*	2.16	0.00	2.16
39.00	0.32	0.41	0.78*	2.15	0.00	2.15
39.05	0.32	0.41	0.78*	2.15	0.00	2.15
39.10	0.32	0.41	0.77*	2.14	0.00	2.14
39.15	0.31	0.41	0.77*	2.13	0.00	2.13
39.20	0.31	0.41	0.77*	2.12	0.00	2.12
39.25	0.31	0.41	0.77*	2.12	0.00	2.12
39.30	0.31	0.41	0.77*	2.11	0.00	2.11
39.35	0.31	0.41	0.76*	2.10	0.00	2.10
39.40	0.31	0.41	0.76*	2.09	0.00	2.09
39.45	0.31	0.41	0.76*	2.08	0.00	2.08
39.50	0.31	0.41	0.76*	2.08	0.00	2.08
39.55	0.31	0.41	0.75*	2.07	0.00	2.07
39.60	0.31	0.41	0.75*	2.06	0.00	2.06
39.65	0.31	0.41	0.75*	2.05	0.00	2.05
39.70	0.30	0.41	0.75*	2.05	0.00	2.05
39.75	0.30	0.41	0.75*	2.04	0.00	2.04
39.80	0.30	0.41	0.74*	2.03	0.00	2.03
39.85	0.30	0.41	0.74*	2.02	0.00	2.02
39.90	0.30	0.41	0.74*	2.01	0.00	2.01
39.95	0.30	0.41	0.74*	2.01	0.00	2.01
40.00	0.30	0.41	0.74*	2.00	0.00	2.00
40.05	0.30	0.41	0.73*	1.99	0.00	1.99
40.10	0.30	0.41	0.73*	1.98	0.00	1.98
40.15	0.30	0.41	0.73*	1.97	0.00	1.97
40.20	0.30	0.41	0.73*	1.97	0.00	1.97
40.25	0.29	0.41	0.73*	1.96	0.00	1.96
40.30	0.29	0.41	0.72*	1.95	0.00	1.95
40.35	0.29	0.41	0.72*	1.94	0.00	1.94
40.40	0.29	0.41	0.72*	1.93	0.00	1.93
40.45	0.29	0.41	0.72*	1.93	0.00	1.93
40.50	0.29	0.41	0.72*	1.92	0.00	1.92
40.55	0.29	0.41	0.71*	1.91	0.00	1.91
40.60	0.29	0.41	0.71*	1.90	0.00	1.90
40.65	0.29	0.41	0.71*	1.89	0.00	1.89
40.70	0.29	0.41	0.71*	1.88	0.00	1.88
40.75	0.29	0.41	0.71*	1.88	0.00	1.88
40.80	0.29	0.41	0.70*	1.87	0.00	1.87
40.85	0.28	0.41	0.70*	1.86	0.00	1.86

40.90	0.28	0.41	0.70*	1.85	0.00	1.85
40.95	0.28	0.41	0.70*	1.84	0.00	1.84
41.00	0.28	0.41	0.70*	1.83	0.00	1.83
41.05	0.28	0.41	0.69*	1.83	0.00	1.83
41.10	0.28	0.41	0.69*	1.82	0.00	1.82
41.15	0.28	0.41	0.69*	1.81	0.00	1.81
41.20	0.28	0.41	0.69*	1.80	0.00	1.80
41.25	0.28	0.41	0.69*	1.79	0.00	1.79
41.30	0.28	0.41	0.69*	1.78	0.00	1.78
41.35	0.28	0.41	0.68*	1.77	0.00	1.77
41.40	0.28	0.41	0.68*	1.77	0.00	1.77
41.45	0.28	0.40	0.68*	1.76	0.00	1.76
41.50	0.27	0.40	0.68*	1.75	0.00	1.75
41.55	0.27	0.40	0.68*	1.74	0.00	1.74
41.60	0.27	0.40	0.67*	1.73	0.00	1.73
41.65	0.27	0.40	0.67*	1.72	0.00	1.72
41.70	0.27	0.40	0.67*	1.71	0.00	1.71
41.75	0.27	0.40	0.67*	1.71	0.00	1.71
41.80	0.27	0.40	0.67*	1.70	0.00	1.70
41.85	0.27	0.40	0.67*	1.69	0.00	1.69
41.90	0.27	0.40	0.66*	1.68	0.00	1.68
41.95	0.27	0.40	0.66*	1.67	0.00	1.67
42.00	0.27	0.40	0.66*	1.66	0.00	1.66
42.05	0.27	0.40	0.66*	1.65	0.00	1.65
42.10	0.27	0.40	0.66*	1.64	0.00	1.64
42.15	0.26	0.40	0.66*	1.64	0.00	1.64
42.20	0.26	0.40	0.65*	1.63	0.00	1.63
42.25	0.26	0.40	0.65*	1.62	0.00	1.62
42.30	0.26	0.40	0.65*	1.61	0.00	1.61
42.35	0.26	0.40	0.65*	1.60	0.00	1.60
42.40	0.26	0.40	0.65*	1.59	0.00	1.59
42.45	0.26	0.40	0.65*	1.58	0.00	1.58
42.50	0.26	0.40	0.64*	1.57	0.00	1.57
42.55	0.26	0.40	0.64*	1.56	0.00	1.56
42.60	0.26	0.40	0.64*	1.55	0.00	1.55
42.65	0.26	0.40	0.64*	1.55	0.00	1.55
42.70	0.26	0.40	0.64*	1.54	0.00	1.54
42.75	0.26	0.40	0.64*	1.53	0.00	1.53
42.80	0.26	0.40	0.63*	1.52	0.00	1.52
42.85	0.25	0.40	0.63*	1.51	0.00	1.51
42.90	0.25	0.40	0.63*	1.50	0.00	1.50
42.95	0.25	0.40	0.63*	1.49	0.00	1.49
43.00	0.25	0.40	0.63*	1.48	0.00	1.48
43.05	0.25	0.40	0.63*	1.47	0.00	1.47
43.10	0.25	0.40	0.62*	1.46	0.00	1.46
43.15	0.25	0.40	0.62*	1.45	0.00	1.45
43.20	0.25	0.40	0.62*	1.44	0.00	1.44
43.25	0.25	0.40	0.62*	1.43	0.00	1.43
43.30	0.25	0.40	0.62*	1.42	0.00	1.42
43.35	0.25	0.40	0.62*	1.42	0.00	1.42
43.40	0.25	0.40	0.61*	1.41	0.00	1.41
43.45	0.25	0.40	0.61*	1.40	0.00	1.40
43.50	0.25	0.40	0.61*	1.39	0.00	1.39
43.55	0.24	0.40	0.61*	1.38	0.00	1.38
43.60	0.24	0.40	0.61*	1.37	0.00	1.37
43.65	0.24	0.40	0.61*	1.36	0.00	1.36
43.70	0.24	0.40	0.60*	1.35	0.00	1.35
43.75	0.24	0.40	0.60*	1.34	0.00	1.34
43.80	0.24	0.40	0.60*	1.33	0.00	1.33
43.85	0.24	0.40	0.60*	1.32	0.00	1.32
43.90	0.24	0.40	0.60*	1.31	0.00	1.31
43.95	0.24	0.40	0.60*	1.30	0.00	1.30
44.00	0.24	0.40	0.60*	1.29	0.00	1.29

44.05	0.24	0.40	0.59*	1.28	0.00	1.28
44.10	0.24	0.40	0.59*	1.27	0.00	1.27
44.15	0.24	0.40	0.59*	1.26	0.00	1.26
44.20	0.24	0.40	0.59*	1.25	0.00	1.25
44.25	0.24	0.40	0.59*	1.24	0.00	1.24
44.30	0.23	0.40	0.59*	1.23	0.00	1.23
44.35	0.23	0.40	0.58*	1.22	0.00	1.22
44.40	0.23	0.40	0.58*	1.21	0.00	1.21
44.45	0.23	0.40	0.58*	1.20	0.00	1.20
44.50	0.23	0.40	0.58*	1.19	0.00	1.19
44.55	0.23	0.40	0.58*	1.18	0.00	1.18
44.60	0.23	0.40	0.58*	1.17	0.00	1.17
44.65	0.23	0.40	0.58*	1.16	0.00	1.16
44.70	0.23	0.40	0.57*	1.15	0.00	1.15
44.75	0.23	0.40	0.57*	1.14	0.00	1.14
44.80	0.23	0.40	0.57*	1.13	0.00	1.13
44.85	0.23	0.40	0.57*	1.12	0.00	1.12
44.90	0.23	0.40	0.57*	1.11	0.00	1.11
44.95	0.23	0.40	0.57*	1.10	0.00	1.10
45.00	0.23	0.40	0.56*	1.09	0.00	1.09
45.05	0.22	0.40	0.56*	1.08	0.00	1.08
45.10	0.22	0.40	0.56*	1.07	0.00	1.07
45.15	0.22	0.40	0.56*	1.06	0.00	1.06
45.20	0.22	0.40	0.56*	1.05	0.00	1.05
45.25	0.22	0.40	0.56*	1.04	0.00	1.04
45.30	0.22	0.40	0.56*	1.03	0.00	1.03
45.35	0.22	0.40	0.55*	1.02	0.00	1.02
45.40	0.22	0.40	0.55*	1.01	0.00	1.01
45.45	0.22	0.40	0.55*	1.00	0.00	1.00
45.50	0.22	0.40	0.55*	0.99	0.00	0.99
45.55	0.22	0.40	0.55*	0.98	0.00	0.98
45.60	0.22	0.40	0.55*	0.97	0.00	0.97
45.65	0.22	0.40	0.55*	0.96	0.00	0.96
45.70	0.22	0.40	0.54*	0.94	0.00	0.94
45.75	0.22	0.40	0.54*	0.93	0.00	0.93
45.80	0.22	0.40	0.54*	0.92	0.00	0.92
45.85	0.21	0.40	0.54*	0.91	0.00	0.91
45.90	0.21	0.40	0.54*	0.90	0.00	0.90
45.95	0.21	0.40	0.54*	0.89	0.00	0.89
46.00	0.21	0.40	0.54*	0.88	0.00	0.88
46.05	0.21	0.40	0.53*	0.87	0.00	0.87
46.10	0.21	0.40	0.53*	0.86	0.00	0.86
46.15	0.21	0.40	0.53*	0.85	0.00	0.85
46.20	0.21	0.40	0.53*	0.84	0.00	0.84
46.25	0.21	0.40	0.53*	0.83	0.00	0.83
46.30	0.21	0.40	0.53*	0.82	0.00	0.82
46.35	0.21	0.40	0.52*	0.80	0.00	0.80
46.40	0.21	0.40	0.52*	0.79	0.00	0.79
46.45	0.21	0.40	0.52*	0.78	0.00	0.78
46.50	0.21	0.40	0.52*	0.77	0.00	0.77
46.55	0.21	0.40	0.52*	0.76	0.00	0.76
46.60	0.21	0.40	0.52*	0.75	0.00	0.75
46.65	0.21	0.40	0.52*	0.74	0.00	0.74
46.70	0.21	0.40	0.52*	0.73	0.00	0.73
46.75	0.21	0.40	0.52*	0.72	0.00	0.72
46.80	0.21	0.40	0.52*	0.71	0.00	0.71
46.85	0.21	0.40	0.52*	0.70	0.00	0.70
46.90	0.21	0.40	0.52*	0.68	0.00	0.68
46.95	0.21	0.40	0.52*	0.67	0.00	0.67
47.00	0.21	0.40	0.52*	0.66	0.00	0.66
47.05	0.21	0.40	0.52*	0.65	0.00	0.65
47.10	0.21	0.40	0.52*	0.64	0.00	0.64
47.15	0.21	0.39	0.52*	0.63	0.00	0.63

47.20	0.21	0.39	0.52*	0.62	0.00	0.62
47.25	0.21	0.39	0.52*	0.61	0.00	0.61
47.30	0.21	0.39	0.52*	0.60	0.00	0.60
47.35	0.21	0.39	0.52*	0.59	0.00	0.59
47.40	0.20	0.39	0.52*	0.57	0.00	0.57
47.45	0.20	0.39	0.52*	0.56	0.00	0.56
47.50	0.20	0.39	0.52*	0.55	0.00	0.55
47.55	0.20	0.39	0.52*	0.54	0.00	0.54
47.60	0.20	0.39	0.52*	0.53	0.00	0.53
47.65	0.20	0.39	0.52*	0.52	0.00	0.52
47.70	0.20	0.39	0.52*	0.51	0.00	0.51
47.75	0.20	0.39	0.52*	0.50	0.00	0.50
47.80	0.20	0.39	0.52*	0.49	0.00	0.49
47.85	0.20	0.39	0.52*	0.48	0.00	0.48
47.90	0.20	0.39	0.52*	0.46	0.00	0.46
47.95	0.20	0.39	0.52*	0.45	0.00	0.45
48.00	0.20	0.39	0.52*	0.44	0.00	0.44
48.05	0.20	0.39	0.52*	0.43	0.00	0.43
48.10	0.20	0.39	0.52*	0.42	0.00	0.42
48.15	0.20	0.39	0.52*	0.41	0.00	0.41
48.20	0.20	0.39	0.52*	0.40	0.00	0.40
48.25	0.20	0.39	0.52*	0.39	0.00	0.39
48.30	0.20	0.39	0.52*	0.38	0.00	0.38
48.35	0.20	0.39	0.52*	0.37	0.00	0.37
48.40	0.20	0.39	0.52*	0.35	0.00	0.35
48.45	0.20	0.39	0.52*	0.34	0.00	0.34
48.50	0.20	0.39	0.52*	0.33	0.00	0.33
48.55	0.20	0.39	0.52*	0.32	0.00	0.32
48.60	0.20	0.39	0.52*	0.31	0.00	0.31
48.65	0.20	0.39	0.52*	0.30	0.00	0.30
48.70	0.20	0.39	0.52*	0.29	0.00	0.29
48.75	0.20	0.39	0.52*	0.28	0.00	0.28
48.80	0.20	0.39	0.52*	0.27	0.00	0.27
48.85	0.20	0.39	0.52*	0.25	0.00	0.25
48.90	0.20	0.39	0.52*	0.24	0.00	0.24
48.95	0.20	0.39	0.52*	0.23	0.00	0.23
49.00	0.20	0.39	0.52*	0.22	0.00	0.22
49.05	0.20	0.39	0.52*	0.21	0.00	0.21
49.10	0.20	0.39	0.52*	0.20	0.00	0.20
49.15	0.20	0.39	0.52*	0.19	0.00	0.19
49.20	0.20	0.39	0.52*	0.18	0.00	0.18
49.25	0.20	0.39	0.52*	0.17	0.00	0.17
49.30	0.20	0.39	0.52*	0.16	0.00	0.16
49.35	0.20	0.39	0.52*	0.14	0.00	0.14
49.40	0.20	0.39	0.52*	0.13	0.00	0.13
49.45	0.20	0.39	0.52*	0.12	0.00	0.12
49.50	0.20	0.39	0.52*	0.11	0.00	0.11
49.55	0.20	0.39	0.52*	0.10	0.00	0.10
49.60	0.20	0.39	0.52*	0.09	0.00	0.09
49.65	0.20	0.39	0.52*	0.08	0.00	0.08
49.70	0.20	0.39	0.52*	0.07	0.00	0.07
49.75	0.20	0.39	0.52*	0.06	0.00	0.06
49.80	0.20	0.39	0.52*	0.04	0.00	0.04
49.85	0.20	0.39	0.52*	0.03	0.00	0.03
49.90	0.20	0.39	0.52*	0.02	0.00	0.02
49.95	0.20	0.39	0.52*	0.01	0.00	0.01
50.00	0.20	0.39	0.52*	0.00	0.00	0.00

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

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm Cyclic resistance ratio from soils
CSRsf Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat Settlement from saturated sands
S_dry Settlement from Unsaturated Sands
S_all Total Settlement from Saturated and Unsaturated Sands
NoLiq No-Liquefy Soils

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LIQUEFACTION ANALYSIS SUMMARY

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Input File Name: C:\Users\koohi\Desktop\Stanton\B2.liq
Title: Stanton Energy Reliability Center-B2
Subtitle: Stanton, CA

Surface Elev.=68
Hole No.=B2
Depth of Hole= 50.00 ft
Water Table during Earthquake= 15.00 ft
Water Table during In-Situ Testing= 20.00 ft
Max. Acceleration= 0.5 g
Earthquake Magnitude= 6.90

Input Data:
Surface Elev.=68
Hole No.=B2
Depth of Hole=50.00 ft
Water Table during Earthquake= 15.00 ft
Water Table during In-Situ Testing= 20.00 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=6.90
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Tokimatsu/Seed
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: Liq. zone only
6. Hammer Energy Ratio, Ce = 0.8
7. Borehole Diameter, Cb= 1.15
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 %
4.00	32.00	100.00	15.00
9.00	5.00	120.00	76.00
14.00	9.00	120.00	50.00
21.50	11.00	120.00	50.00
26.50	7.00	120.00	50.00
31.50	15.00	120.00	50.00
36.50	30.00	120.00	50.00
41.50	11.00	120.00	50.00
46.50	15.00	120.00	NoLiq

Output Results:

Settlement of Saturated Sands=5.84 in.
Settlement of Unsaturated Sands=0.00 in.
Total Settlement of Saturated and Unsaturated Sands=5.84 in.
Differential Settlement=2.918 to 3.852 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
4.00	0.62	0.32	5.00	5.84	0.00	5.84
4.05	0.62	0.32	5.00	5.84	0.00	5.84
4.10	0.62	0.32	5.00	5.84	0.00	5.84
4.15	0.62	0.32	5.00	5.84	0.00	5.84
4.20	0.62	0.32	5.00	5.84	0.00	5.84
4.25	0.62	0.32	5.00	5.84	0.00	5.84
4.30	0.62	0.32	5.00	5.84	0.00	5.84
4.35	0.62	0.32	5.00	5.84	0.00	5.84
4.40	0.62	0.32	5.00	5.84	0.00	5.84
4.45	0.62	0.32	5.00	5.84	0.00	5.84
4.50	0.62	0.32	5.00	5.84	0.00	5.84
4.55	0.62	0.32	5.00	5.84	0.00	5.84
4.60	0.62	0.32	5.00	5.84	0.00	5.84
4.65	0.62	0.32	5.00	5.84	0.00	5.84
4.70	0.62	0.32	5.00	5.84	0.00	5.84
4.75	0.62	0.32	5.00	5.84	0.00	5.84
4.80	0.62	0.32	5.00	5.84	0.00	5.84
4.85	0.62	0.32	5.00	5.84	0.00	5.84
4.90	0.62	0.32	5.00	5.84	0.00	5.84
4.95	0.62	0.32	5.00	5.84	0.00	5.84
5.00	0.62	0.32	5.00	5.84	0.00	5.84
5.05	0.62	0.32	5.00	5.84	0.00	5.84
5.10	0.62	0.32	5.00	5.84	0.00	5.84
5.15	0.62	0.32	5.00	5.84	0.00	5.84
5.20	0.62	0.32	5.00	5.84	0.00	5.84
5.25	0.62	0.32	5.00	5.84	0.00	5.84
5.30	0.62	0.32	5.00	5.84	0.00	5.84
5.35	0.62	0.32	5.00	5.84	0.00	5.84
5.40	0.62	0.32	5.00	5.84	0.00	5.84
5.45	0.62	0.32	5.00	5.84	0.00	5.84
5.50	0.62	0.32	5.00	5.84	0.00	5.84
5.55	0.62	0.32	5.00	5.84	0.00	5.84
5.60	0.62	0.32	5.00	5.84	0.00	5.84
5.65	0.62	0.32	5.00	5.84	0.00	5.84
5.70	0.62	0.32	5.00	5.84	0.00	5.84
5.75	0.62	0.32	5.00	5.84	0.00	5.84
5.80	0.62	0.32	5.00	5.84	0.00	5.84
5.85	0.62	0.32	5.00	5.84	0.00	5.84
5.90	0.62	0.32	5.00	5.84	0.00	5.84
5.95	0.62	0.32	5.00	5.84	0.00	5.84
6.00	0.62	0.32	5.00	5.84	0.00	5.84
6.05	0.62	0.32	5.00	5.84	0.00	5.84
6.10	0.62	0.32	5.00	5.84	0.00	5.84
6.15	0.62	0.32	5.00	5.84	0.00	5.84
6.20	0.62	0.32	5.00	5.84	0.00	5.84
6.25	0.62	0.32	5.00	5.84	0.00	5.84
6.30	0.62	0.32	5.00	5.84	0.00	5.84
6.35	0.54	0.32	5.00	5.84	0.00	5.84
6.40	0.50	0.32	5.00	5.84	0.00	5.84
6.45	0.48	0.32	5.00	5.84	0.00	5.84
6.50	0.46	0.32	5.00	5.84	0.00	5.84
6.55	0.45	0.32	5.00	5.84	0.00	5.84
6.60	0.43	0.32	5.00	5.84	0.00	5.84
6.65	0.42	0.32	5.00	5.84	0.00	5.84

6.70	0.41	0.32	5.00	5.84	0.00	5.84
6.75	0.40	0.32	5.00	5.84	0.00	5.84
6.80	0.40	0.32	5.00	5.84	0.00	5.84
6.85	0.39	0.32	5.00	5.84	0.00	5.84
6.90	0.38	0.32	5.00	5.84	0.00	5.84
6.95	0.37	0.32	5.00	5.84	0.00	5.84
7.00	0.37	0.32	5.00	5.84	0.00	5.84
7.05	0.36	0.32	5.00	5.84	0.00	5.84
7.10	0.35	0.32	5.00	5.84	0.00	5.84
7.15	0.34	0.32	5.00	5.84	0.00	5.84
7.20	0.34	0.32	5.00	5.84	0.00	5.84
7.25	0.33	0.32	5.00	5.84	0.00	5.84
7.30	0.32	0.32	5.00	5.84	0.00	5.84
7.35	0.32	0.32	5.00	5.84	0.00	5.84
7.40	0.31	0.32	5.00	5.84	0.00	5.84
7.45	0.31	0.32	5.00	5.84	0.00	5.84
7.50	0.30	0.32	5.00	5.84	0.00	5.84
7.55	0.29	0.32	5.00	5.84	0.00	5.84
7.60	0.29	0.32	5.00	5.84	0.00	5.84
7.65	0.28	0.32	5.00	5.84	0.00	5.84
7.70	0.28	0.32	5.00	5.84	0.00	5.84
7.75	0.27	0.32	5.00	5.84	0.00	5.84
7.80	0.27	0.32	5.00	5.84	0.00	5.84
7.85	0.26	0.32	5.00	5.84	0.00	5.84
7.90	0.26	0.32	5.00	5.84	0.00	5.84
7.95	0.25	0.32	5.00	5.84	0.00	5.84
8.00	0.25	0.32	5.00	5.84	0.00	5.84
8.05	0.24	0.32	5.00	5.84	0.00	5.84
8.10	0.24	0.32	5.00	5.84	0.00	5.84
8.15	0.24	0.32	5.00	5.84	0.00	5.84
8.20	0.23	0.32	5.00	5.84	0.00	5.84
8.25	0.24	0.32	5.00	5.84	0.00	5.84
8.30	0.24	0.32	5.00	5.84	0.00	5.84
8.35	0.23	0.32	5.00	5.84	0.00	5.84
8.40	0.23	0.32	5.00	5.84	0.00	5.84
8.45	0.22	0.32	5.00	5.84	0.00	5.84
8.50	0.22	0.32	5.00	5.84	0.00	5.84
8.55	0.22	0.32	5.00	5.84	0.00	5.84
8.60	0.21	0.32	5.00	5.84	0.00	5.84
8.65	0.21	0.32	5.00	5.84	0.00	5.84
8.70	0.20	0.32	5.00	5.84	0.00	5.84
8.75	0.20	0.32	5.00	5.84	0.00	5.84
8.80	0.19	0.32	5.00	5.84	0.00	5.84
8.85	0.19	0.32	5.00	5.84	0.00	5.84
8.90	0.18	0.32	5.00	5.84	0.00	5.84
8.95	0.18	0.32	5.00	5.84	0.00	5.84
9.00	0.17	0.32	5.00	5.84	0.00	5.84
9.05	0.18	0.32	5.00	5.84	0.00	5.84
9.10	0.18	0.32	5.00	5.84	0.00	5.84
9.15	0.18	0.32	5.00	5.84	0.00	5.84
9.20	0.18	0.32	5.00	5.84	0.00	5.84
9.25	0.18	0.32	5.00	5.84	0.00	5.84
9.30	0.18	0.32	5.00	5.84	0.00	5.84
9.35	0.18	0.32	5.00	5.84	0.00	5.84
9.40	0.18	0.32	5.00	5.84	0.00	5.84
9.45	0.18	0.32	5.00	5.84	0.00	5.84
9.50	0.18	0.32	5.00	5.84	0.00	5.84
9.55	0.18	0.32	5.00	5.84	0.00	5.84
9.60	0.18	0.32	5.00	5.84	0.00	5.84
9.65	0.18	0.32	5.00	5.84	0.00	5.84
9.70	0.18	0.32	5.00	5.84	0.00	5.84
9.75	0.18	0.32	5.00	5.84	0.00	5.84
9.80	0.18	0.32	5.00	5.84	0.00	5.84

9.85	0.18	0.32	5.00	5.84	0.00	5.84
9.90	0.18	0.32	5.00	5.84	0.00	5.84
9.95	0.18	0.32	5.00	5.84	0.00	5.84
10.00	0.18	0.32	5.00	5.84	0.00	5.84
10.05	0.18	0.32	5.00	5.84	0.00	5.84
10.10	0.18	0.32	5.00	5.84	0.00	5.84
10.15	0.18	0.32	5.00	5.84	0.00	5.84
10.20	0.18	0.32	5.00	5.84	0.00	5.84
10.25	0.18	0.32	5.00	5.84	0.00	5.84
10.30	0.18	0.32	5.00	5.84	0.00	5.84
10.35	0.18	0.32	5.00	5.84	0.00	5.84
10.40	0.18	0.32	5.00	5.84	0.00	5.84
10.45	0.18	0.32	5.00	5.84	0.00	5.84
10.50	0.19	0.32	5.00	5.84	0.00	5.84
10.55	0.19	0.32	5.00	5.84	0.00	5.84
10.60	0.19	0.32	5.00	5.84	0.00	5.84
10.65	0.19	0.32	5.00	5.84	0.00	5.84
10.70	0.19	0.32	5.00	5.84	0.00	5.84
10.75	0.19	0.32	5.00	5.84	0.00	5.84
10.80	0.19	0.32	5.00	5.84	0.00	5.84
10.85	0.19	0.32	5.00	5.84	0.00	5.84
10.90	0.19	0.32	5.00	5.84	0.00	5.84
10.95	0.19	0.32	5.00	5.84	0.00	5.84
11.00	0.19	0.32	5.00	5.84	0.00	5.84
11.05	0.19	0.32	5.00	5.84	0.00	5.84
11.10	0.19	0.32	5.00	5.84	0.00	5.84
11.15	0.19	0.32	5.00	5.84	0.00	5.84
11.20	0.19	0.32	5.00	5.84	0.00	5.84
11.25	0.19	0.32	5.00	5.84	0.00	5.84
11.30	0.19	0.32	5.00	5.84	0.00	5.84
11.35	0.19	0.32	5.00	5.84	0.00	5.84
11.40	0.19	0.32	5.00	5.84	0.00	5.84
11.45	0.19	0.32	5.00	5.84	0.00	5.84
11.50	0.19	0.32	5.00	5.84	0.00	5.84
11.55	0.19	0.32	5.00	5.84	0.00	5.84
11.60	0.19	0.32	5.00	5.84	0.00	5.84
11.65	0.19	0.32	5.00	5.84	0.00	5.84
11.70	0.19	0.32	5.00	5.84	0.00	5.84
11.75	0.19	0.32	5.00	5.84	0.00	5.84
11.80	0.19	0.32	5.00	5.84	0.00	5.84
11.85	0.19	0.32	5.00	5.84	0.00	5.84
11.90	0.19	0.32	5.00	5.84	0.00	5.84
11.95	0.19	0.32	5.00	5.84	0.00	5.84
12.00	0.19	0.32	5.00	5.84	0.00	5.84
12.05	0.20	0.32	5.00	5.84	0.00	5.84
12.10	0.20	0.32	5.00	5.84	0.00	5.84
12.15	0.20	0.32	5.00	5.84	0.00	5.84
12.20	0.20	0.32	5.00	5.84	0.00	5.84
12.25	0.20	0.32	5.00	5.84	0.00	5.84
12.30	0.20	0.32	5.00	5.84	0.00	5.84
12.35	0.20	0.32	5.00	5.84	0.00	5.84
12.40	0.20	0.32	5.00	5.84	0.00	5.84
12.45	0.20	0.32	5.00	5.84	0.00	5.84
12.50	0.20	0.32	5.00	5.84	0.00	5.84
12.55	0.20	0.32	5.00	5.84	0.00	5.84
12.60	0.20	0.32	5.00	5.84	0.00	5.84
12.65	0.20	0.32	5.00	5.84	0.00	5.84
12.70	0.20	0.32	5.00	5.84	0.00	5.84
12.75	0.20	0.32	5.00	5.84	0.00	5.84
12.80	0.20	0.32	5.00	5.84	0.00	5.84
12.85	0.20	0.32	5.00	5.84	0.00	5.84
12.90	0.20	0.32	5.00	5.84	0.00	5.84
12.95	0.20	0.32	5.00	5.84	0.00	5.84

13.00	0.20	0.32	5.00	5.84	0.00	5.84
13.05	0.20	0.32	5.00	5.84	0.00	5.84
13.10	0.20	0.32	5.00	5.84	0.00	5.84
13.15	0.20	0.32	5.00	5.84	0.00	5.84
13.20	0.20	0.31	5.00	5.84	0.00	5.84
13.25	0.20	0.31	5.00	5.84	0.00	5.84
13.30	0.20	0.31	5.00	5.84	0.00	5.84
13.35	0.20	0.31	5.00	5.84	0.00	5.84
13.40	0.20	0.31	5.00	5.84	0.00	5.84
13.45	0.20	0.31	5.00	5.84	0.00	5.84
13.50	0.20	0.31	5.00	5.84	0.00	5.84
13.55	0.20	0.31	5.00	5.84	0.00	5.84
13.60	0.20	0.31	5.00	5.84	0.00	5.84
13.65	0.20	0.31	5.00	5.84	0.00	5.84
13.70	0.20	0.31	5.00	5.84	0.00	5.84
13.75	0.20	0.31	5.00	5.84	0.00	5.84
13.80	0.21	0.31	5.00	5.84	0.00	5.84
13.85	0.21	0.31	5.00	5.84	0.00	5.84
13.90	0.21	0.31	5.00	5.84	0.00	5.84
13.95	0.21	0.31	5.00	5.84	0.00	5.84
14.00	0.21	0.31	5.00	5.84	0.00	5.84
14.05	0.21	0.31	5.00	5.84	0.00	5.84
14.10	0.21	0.31	5.00	5.84	0.00	5.84
14.15	0.21	0.31	5.00	5.84	0.00	5.84
14.20	0.21	0.31	5.00	5.84	0.00	5.84
14.25	0.21	0.31	5.00	5.84	0.00	5.84
14.30	0.21	0.31	5.00	5.84	0.00	5.84
14.35	0.21	0.31	5.00	5.84	0.00	5.84
14.40	0.21	0.31	5.00	5.84	0.00	5.84
14.45	0.21	0.31	5.00	5.84	0.00	5.84
14.50	0.21	0.31	5.00	5.84	0.00	5.84
14.55	0.21	0.31	5.00	5.84	0.00	5.84
14.60	0.21	0.31	5.00	5.84	0.00	5.84
14.65	0.21	0.31	5.00	5.84	0.00	5.84
14.70	0.21	0.31	5.00	5.84	0.00	5.84
14.75	0.21	0.31	5.00	5.84	0.00	5.84
14.80	0.22	0.31	5.00	5.84	0.00	5.84
14.85	0.22	0.31	5.00	5.84	0.00	5.84
14.90	0.22	0.31	5.00	5.84	0.00	5.84
14.95	0.22	0.31	5.00	5.84	0.00	5.84
15.00	0.22	0.31	0.70*	5.84	0.00	5.84
15.05	0.22	0.31	0.69*	5.83	0.00	5.83
15.10	0.22	0.31	0.69*	5.81	0.00	5.81
15.15	0.22	0.32	0.69*	5.80	0.00	5.80
15.20	0.22	0.32	0.69*	5.79	0.00	5.79
15.25	0.22	0.32	0.69*	5.78	0.00	5.78
15.30	0.22	0.32	0.69*	5.77	0.00	5.77
15.35	0.22	0.32	0.69*	5.76	0.00	5.76
15.40	0.22	0.32	0.68*	5.75	0.00	5.75
15.45	0.22	0.32	0.68*	5.74	0.00	5.74
15.50	0.22	0.32	0.68*	5.73	0.00	5.73
15.55	0.22	0.32	0.68*	5.72	0.00	5.72
15.60	0.22	0.32	0.68*	5.71	0.00	5.71
15.65	0.22	0.32	0.68*	5.70	0.00	5.70
15.70	0.22	0.32	0.68*	5.69	0.00	5.69
15.75	0.22	0.32	0.68*	5.67	0.00	5.67
15.80	0.22	0.32	0.68*	5.66	0.00	5.66
15.85	0.22	0.32	0.67*	5.65	0.00	5.65
15.90	0.22	0.32	0.67*	5.64	0.00	5.64
15.95	0.22	0.32	0.67*	5.63	0.00	5.63
16.00	0.22	0.32	0.67*	5.62	0.00	5.62
16.05	0.22	0.32	0.67*	5.61	0.00	5.61
16.10	0.22	0.33	0.67*	5.60	0.00	5.60

16.15	0.22	0.33	0.67*	5.59	0.00	5.59
16.20	0.22	0.33	0.67*	5.58	0.00	5.58
16.25	0.22	0.33	0.66*	5.57	0.00	5.57
16.30	0.22	0.33	0.66*	5.56	0.00	5.56
16.35	0.22	0.33	0.66*	5.54	0.00	5.54
16.40	0.22	0.33	0.66*	5.53	0.00	5.53
16.45	0.22	0.33	0.66*	5.52	0.00	5.52
16.50	0.22	0.33	0.66*	5.51	0.00	5.51
16.55	0.22	0.33	0.66*	5.50	0.00	5.50
16.60	0.22	0.33	0.66*	5.49	0.00	5.49
16.65	0.22	0.33	0.66*	5.48	0.00	5.48
16.70	0.22	0.33	0.66*	5.47	0.00	5.47
16.75	0.22	0.33	0.65*	5.46	0.00	5.46
16.80	0.22	0.33	0.65*	5.45	0.00	5.45
16.85	0.22	0.33	0.65*	5.44	0.00	5.44
16.90	0.22	0.33	0.65*	5.43	0.00	5.43
16.95	0.22	0.33	0.65*	5.41	0.00	5.41
17.00	0.22	0.33	0.65*	5.40	0.00	5.40
17.05	0.22	0.33	0.65*	5.39	0.00	5.39
17.10	0.22	0.33	0.65*	5.38	0.00	5.38
17.15	0.22	0.34	0.65*	5.37	0.00	5.37
17.20	0.22	0.34	0.65*	5.36	0.00	5.36
17.25	0.22	0.34	0.64*	5.35	0.00	5.35
17.30	0.22	0.34	0.64*	5.34	0.00	5.34
17.35	0.22	0.34	0.64*	5.33	0.00	5.33
17.40	0.22	0.34	0.64*	5.32	0.00	5.32
17.45	0.22	0.34	0.64*	5.31	0.00	5.31
17.50	0.22	0.34	0.64*	5.30	0.00	5.30
17.55	0.22	0.34	0.64*	5.28	0.00	5.28
17.60	0.22	0.34	0.64*	5.27	0.00	5.27
17.65	0.22	0.34	0.64*	5.26	0.00	5.26
17.70	0.22	0.34	0.64*	5.25	0.00	5.25
17.75	0.22	0.34	0.64*	5.24	0.00	5.24
17.80	0.22	0.34	0.63*	5.23	0.00	5.23
17.85	0.22	0.34	0.63*	5.22	0.00	5.22
17.90	0.22	0.34	0.63*	5.21	0.00	5.21
17.95	0.22	0.34	0.63*	5.20	0.00	5.20
18.00	0.22	0.34	0.63*	5.19	0.00	5.19
18.05	0.22	0.34	0.63*	5.18	0.00	5.18
18.10	0.22	0.34	0.63*	5.16	0.00	5.16
18.15	0.22	0.34	0.63*	5.15	0.00	5.15
18.20	0.22	0.34	0.63*	5.14	0.00	5.14
18.25	0.22	0.35	0.63*	5.13	0.00	5.13
18.30	0.22	0.35	0.63*	5.12	0.00	5.12
18.35	0.22	0.35	0.62*	5.11	0.00	5.11
18.40	0.22	0.35	0.62*	5.10	0.00	5.10
18.45	0.22	0.35	0.62*	5.09	0.00	5.09
18.50	0.22	0.35	0.62*	5.08	0.00	5.08
18.55	0.22	0.35	0.62*	5.07	0.00	5.07
18.60	0.22	0.35	0.62*	5.06	0.00	5.06
18.65	0.22	0.35	0.62*	5.05	0.00	5.05
18.70	0.22	0.35	0.62*	5.03	0.00	5.03
18.75	0.22	0.35	0.62*	5.02	0.00	5.02
18.80	0.22	0.35	0.62*	5.01	0.00	5.01
18.85	0.22	0.35	0.62*	5.00	0.00	5.00
18.90	0.22	0.35	0.62*	4.99	0.00	4.99
18.95	0.22	0.35	0.62*	4.98	0.00	4.98
19.00	0.22	0.35	0.61*	4.97	0.00	4.97
19.05	0.22	0.35	0.61*	4.96	0.00	4.96
19.10	0.22	0.35	0.61*	4.95	0.00	4.95
19.15	0.22	0.35	0.61*	4.94	0.00	4.94
19.20	0.22	0.35	0.61*	4.93	0.00	4.93
19.25	0.22	0.35	0.61*	4.91	0.00	4.91

19.30	0.22	0.35	0.61*	4.90	0.00	4.90
19.35	0.22	0.35	0.61*	4.89	0.00	4.89
19.40	0.22	0.35	0.61*	4.88	0.00	4.88
19.45	0.22	0.35	0.61*	4.87	0.00	4.87
19.50	0.22	0.36	0.61*	4.86	0.00	4.86
19.55	0.22	0.36	0.61*	4.85	0.00	4.85
19.60	0.22	0.36	0.61*	4.84	0.00	4.84
19.65	0.22	0.36	0.61*	4.83	0.00	4.83
19.70	0.22	0.36	0.60*	4.82	0.00	4.82
19.75	0.22	0.36	0.60*	4.81	0.00	4.81
19.80	0.22	0.36	0.60*	4.79	0.00	4.79
19.85	0.22	0.36	0.60*	4.78	0.00	4.78
19.90	0.22	0.36	0.60*	4.77	0.00	4.77
19.95	0.22	0.36	0.60*	4.76	0.00	4.76
20.00	0.22	0.36	0.60*	4.75	0.00	4.75
20.05	0.22	0.36	0.60*	4.74	0.00	4.74
20.10	0.22	0.36	0.60*	4.73	0.00	4.73
20.15	0.22	0.36	0.60*	4.72	0.00	4.72
20.20	0.22	0.36	0.60*	4.71	0.00	4.71
20.25	0.22	0.36	0.60*	4.70	0.00	4.70
20.30	0.22	0.36	0.60*	4.69	0.00	4.69
20.35	0.22	0.36	0.60*	4.68	0.00	4.68
20.40	0.22	0.36	0.60*	4.66	0.00	4.66
20.45	0.22	0.36	0.60*	4.65	0.00	4.65
20.50	0.22	0.36	0.60*	4.64	0.00	4.64
20.55	0.22	0.36	0.60*	4.63	0.00	4.63
20.60	0.22	0.36	0.60*	4.62	0.00	4.62
20.65	0.22	0.36	0.60*	4.61	0.00	4.61
20.70	0.22	0.36	0.59*	4.60	0.00	4.60
20.75	0.22	0.36	0.59*	4.59	0.00	4.59
20.80	0.22	0.37	0.59*	4.58	0.00	4.58
20.85	0.22	0.37	0.59*	4.57	0.00	4.57
20.90	0.22	0.37	0.59*	4.56	0.00	4.56
20.95	0.22	0.37	0.59*	4.55	0.00	4.55
21.00	0.22	0.37	0.59*	4.53	0.00	4.53
21.05	0.22	0.37	0.59*	4.52	0.00	4.52
21.10	0.22	0.37	0.59*	4.51	0.00	4.51
21.15	0.22	0.37	0.59*	4.50	0.00	4.50
21.20	0.22	0.37	0.59*	4.49	0.00	4.49
21.25	0.22	0.37	0.59*	4.48	0.00	4.48
21.30	0.22	0.37	0.59*	4.47	0.00	4.47
21.35	0.22	0.37	0.59*	4.46	0.00	4.46
21.40	0.22	0.37	0.59*	4.45	0.00	4.45
21.45	0.22	0.37	0.59*	4.44	0.00	4.44
21.50	0.22	0.37	0.59*	4.43	0.00	4.43
21.55	0.22	0.37	0.59*	4.42	0.00	4.42
21.60	0.22	0.37	0.59*	4.40	0.00	4.40
21.65	0.22	0.37	0.58*	4.39	0.00	4.39
21.70	0.22	0.37	0.58*	4.38	0.00	4.38
21.75	0.22	0.37	0.58*	4.37	0.00	4.37
21.80	0.21	0.37	0.58*	4.36	0.00	4.36
21.85	0.21	0.37	0.58*	4.35	0.00	4.35
21.90	0.21	0.37	0.57*	4.34	0.00	4.34
21.95	0.21	0.37	0.57*	4.33	0.00	4.33
22.00	0.21	0.37	0.57*	4.32	0.00	4.32
22.05	0.21	0.37	0.57*	4.31	0.00	4.31
22.10	0.21	0.37	0.57*	4.30	0.00	4.30
22.15	0.21	0.37	0.56*	4.28	0.00	4.28
22.20	0.21	0.37	0.56*	4.27	0.00	4.27
22.25	0.21	0.37	0.56*	4.26	0.00	4.26
22.30	0.21	0.38	0.56*	4.25	0.00	4.25
22.35	0.21	0.38	0.56*	4.24	0.00	4.24
22.40	0.21	0.38	0.56*	4.23	0.00	4.23

22.45	0.21	0.38	0.55*	4.22	0.00	4.22
22.50	0.21	0.38	0.55*	4.21	0.00	4.21
22.55	0.21	0.38	0.55*	4.20	0.00	4.20
22.60	0.21	0.38	0.55*	4.18	0.00	4.18
22.65	0.21	0.38	0.55*	4.17	0.00	4.17
22.70	0.21	0.38	0.55*	4.16	0.00	4.16
22.75	0.21	0.38	0.54*	4.15	0.00	4.15
22.80	0.20	0.38	0.54*	4.14	0.00	4.14
22.85	0.20	0.38	0.54*	4.13	0.00	4.13
22.90	0.20	0.38	0.54*	4.12	0.00	4.12
22.95	0.20	0.38	0.54*	4.11	0.00	4.11
23.00	0.20	0.38	0.53*	4.09	0.00	4.09
23.05	0.20	0.38	0.53*	4.08	0.00	4.08
23.10	0.20	0.38	0.53*	4.07	0.00	4.07
23.15	0.20	0.38	0.53*	4.06	0.00	4.06
23.20	0.20	0.38	0.53*	4.05	0.00	4.05
23.25	0.20	0.38	0.53*	4.04	0.00	4.04
23.30	0.20	0.38	0.52*	4.03	0.00	4.03
23.35	0.20	0.38	0.52*	4.01	0.00	4.01
23.40	0.20	0.38	0.52*	4.00	0.00	4.00
23.45	0.20	0.38	0.52*	3.99	0.00	3.99
23.50	0.20	0.38	0.52*	3.98	0.00	3.98
23.55	0.20	0.38	0.52*	3.97	0.00	3.97
23.60	0.20	0.38	0.51*	3.96	0.00	3.96
23.65	0.20	0.38	0.51*	3.94	0.00	3.94
23.70	0.20	0.38	0.51*	3.93	0.00	3.93
23.75	0.20	0.38	0.51*	3.92	0.00	3.92
23.80	0.20	0.38	0.51*	3.91	0.00	3.91
23.85	0.19	0.38	0.51*	3.90	0.00	3.90
23.90	0.19	0.38	0.50*	3.89	0.00	3.89
23.95	0.19	0.39	0.50*	3.87	0.00	3.87
24.00	0.19	0.39	0.50*	3.86	0.00	3.86
24.05	0.19	0.39	0.50*	3.85	0.00	3.85
24.10	0.19	0.39	0.50*	3.84	0.00	3.84
24.15	0.19	0.39	0.50*	3.83	0.00	3.83
24.20	0.19	0.39	0.49*	3.82	0.00	3.82
24.25	0.19	0.39	0.49*	3.80	0.00	3.80
24.30	0.19	0.39	0.49*	3.79	0.00	3.79
24.35	0.19	0.39	0.49*	3.78	0.00	3.78
24.40	0.19	0.39	0.49*	3.77	0.00	3.77
24.45	0.19	0.39	0.49*	3.76	0.00	3.76
24.50	0.19	0.39	0.49*	3.75	0.00	3.75
24.55	0.19	0.39	0.48*	3.73	0.00	3.73
24.60	0.19	0.39	0.48*	3.72	0.00	3.72
24.65	0.19	0.39	0.48*	3.71	0.00	3.71
24.70	0.19	0.39	0.48*	3.70	0.00	3.70
24.75	0.19	0.39	0.48*	3.69	0.00	3.69
24.80	0.19	0.39	0.48*	3.67	0.00	3.67
24.85	0.19	0.39	0.47*	3.66	0.00	3.66
24.90	0.18	0.39	0.47*	3.65	0.00	3.65
24.95	0.18	0.39	0.47*	3.64	0.00	3.64
25.00	0.18	0.39	0.47*	3.63	0.00	3.63
25.05	0.18	0.39	0.47*	3.61	0.00	3.61
25.10	0.18	0.39	0.47*	3.60	0.00	3.60
25.15	0.18	0.39	0.47*	3.59	0.00	3.59
25.20	0.18	0.39	0.46*	3.58	0.00	3.58
25.25	0.18	0.39	0.46*	3.56	0.00	3.56
25.30	0.18	0.39	0.46*	3.55	0.00	3.55
25.35	0.18	0.39	0.46*	3.54	0.00	3.54
25.40	0.18	0.39	0.46*	3.53	0.00	3.53
25.45	0.18	0.39	0.46*	3.52	0.00	3.52
25.50	0.18	0.39	0.45*	3.50	0.00	3.50
25.55	0.18	0.39	0.45*	3.49	0.00	3.49

25.60	0.18	0.39	0.45*	3.48	0.00	3.48
25.65	0.18	0.39	0.45*	3.47	0.00	3.47
25.70	0.18	0.39	0.45*	3.45	0.00	3.45
25.75	0.18	0.40	0.45*	3.44	0.00	3.44
25.80	0.18	0.40	0.45*	3.43	0.00	3.43
25.85	0.18	0.40	0.44*	3.42	0.00	3.42
25.90	0.18	0.40	0.44*	3.40	0.00	3.40
25.95	0.17	0.40	0.44*	3.39	0.00	3.39
26.00	0.17	0.40	0.44*	3.38	0.00	3.38
26.05	0.17	0.40	0.44*	3.36	0.00	3.36
26.10	0.17	0.40	0.44*	3.35	0.00	3.35
26.15	0.17	0.40	0.44*	3.34	0.00	3.34
26.20	0.17	0.40	0.43*	3.33	0.00	3.33
26.25	0.17	0.40	0.43*	3.31	0.00	3.31
26.30	0.17	0.40	0.43*	3.30	0.00	3.30
26.35	0.17	0.40	0.43*	3.29	0.00	3.29
26.40	0.17	0.40	0.43*	3.28	0.00	3.28
26.45	0.17	0.40	0.43*	3.26	0.00	3.26
26.50	0.17	0.40	0.43*	3.25	0.00	3.25
26.55	0.17	0.40	0.43*	3.24	0.00	3.24
26.60	0.17	0.40	0.43*	3.22	0.00	3.22
26.65	0.17	0.40	0.43*	3.21	0.00	3.21
26.70	0.17	0.40	0.43*	3.20	0.00	3.20
26.75	0.17	0.40	0.43*	3.19	0.00	3.19
26.80	0.17	0.40	0.44*	3.17	0.00	3.17
26.85	0.18	0.40	0.44*	3.16	0.00	3.16
26.90	0.18	0.40	0.44*	3.15	0.00	3.15
26.95	0.18	0.40	0.44*	3.13	0.00	3.13
27.00	0.18	0.40	0.44*	3.12	0.00	3.12
27.05	0.18	0.40	0.44*	3.11	0.00	3.11
27.10	0.18	0.40	0.45*	3.10	0.00	3.10
27.15	0.18	0.40	0.45*	3.08	0.00	3.08
27.20	0.18	0.40	0.45*	3.07	0.00	3.07
27.25	0.18	0.40	0.45*	3.06	0.00	3.06
27.30	0.18	0.40	0.45*	3.05	0.00	3.05
27.35	0.18	0.40	0.45*	3.04	0.00	3.04
27.40	0.18	0.40	0.46*	3.02	0.00	3.02
27.45	0.18	0.40	0.46*	3.01	0.00	3.01
27.50	0.19	0.40	0.46*	3.00	0.00	3.00
27.55	0.19	0.40	0.46*	2.99	0.00	2.99
27.60	0.19	0.40	0.46*	2.98	0.00	2.98
27.65	0.19	0.40	0.46*	2.96	0.00	2.96
27.70	0.19	0.40	0.47*	2.95	0.00	2.95
27.75	0.19	0.40	0.47*	2.94	0.00	2.94
27.80	0.19	0.40	0.47*	2.93	0.00	2.93
27.85	0.19	0.41	0.47*	2.92	0.00	2.92
27.90	0.20	0.41	0.49*	2.90	0.00	2.90
27.95	0.20	0.41	0.49*	2.89	0.00	2.89
28.00	0.20	0.41	0.49*	2.88	0.00	2.88
28.05	0.20	0.41	0.49*	2.87	0.00	2.87
28.10	0.20	0.41	0.49*	2.86	0.00	2.86
28.15	0.20	0.41	0.49*	2.85	0.00	2.85
28.20	0.20	0.41	0.50*	2.84	0.00	2.84
28.25	0.20	0.41	0.50*	2.82	0.00	2.82
28.30	0.20	0.41	0.50*	2.81	0.00	2.81
28.35	0.20	0.41	0.50*	2.80	0.00	2.80
28.40	0.20	0.41	0.50*	2.79	0.00	2.79
28.45	0.21	0.41	0.50*	2.78	0.00	2.78
28.50	0.21	0.41	0.51*	2.77	0.00	2.77
28.55	0.21	0.41	0.51*	2.76	0.00	2.76
28.60	0.21	0.41	0.51*	2.75	0.00	2.75
28.65	0.21	0.41	0.51*	2.73	0.00	2.73
28.70	0.21	0.41	0.51*	2.72	0.00	2.72

28.75	0.21	0.41	0.51*	2.71	0.00	2.71
28.80	0.21	0.41	0.52*	2.70	0.00	2.70
28.85	0.21	0.41	0.52*	2.69	0.00	2.69
28.90	0.21	0.41	0.52*	2.68	0.00	2.68
28.95	0.21	0.41	0.52*	2.67	0.00	2.67
29.00	0.21	0.41	0.52*	2.66	0.00	2.66
29.05	0.21	0.41	0.52*	2.65	0.00	2.65
29.10	0.22	0.41	0.53*	2.64	0.00	2.64
29.15	0.22	0.41	0.53*	2.63	0.00	2.63
29.20	0.22	0.41	0.53*	2.61	0.00	2.61
29.25	0.22	0.41	0.53*	2.60	0.00	2.60
29.30	0.22	0.41	0.53*	2.59	0.00	2.59
29.35	0.22	0.41	0.53*	2.58	0.00	2.58
29.40	0.22	0.41	0.54*	2.57	0.00	2.57
29.45	0.22	0.41	0.54*	2.56	0.00	2.56
29.50	0.22	0.41	0.54*	2.55	0.00	2.55
29.55	0.22	0.41	0.54*	2.54	0.00	2.54
29.60	0.22	0.41	0.54*	2.53	0.00	2.53
29.65	0.22	0.41	0.54*	2.52	0.00	2.52
29.70	0.22	0.41	0.54*	2.51	0.00	2.51
29.75	0.23	0.41	0.55*	2.50	0.00	2.50
29.80	0.23	0.41	0.55*	2.49	0.00	2.49
29.85	0.23	0.41	0.55*	2.48	0.00	2.48
29.90	0.23	0.41	0.55*	2.47	0.00	2.47
29.95	0.23	0.41	0.55*	2.46	0.00	2.46
30.00	0.23	0.41	0.55*	2.45	0.00	2.45
30.05	0.23	0.41	0.56*	2.44	0.00	2.44
30.10	0.23	0.41	0.56*	2.42	0.00	2.42
30.15	0.23	0.41	0.56*	2.41	0.00	2.41
30.20	0.23	0.41	0.56*	2.40	0.00	2.40
30.25	0.23	0.41	0.56*	2.39	0.00	2.39
30.30	0.23	0.41	0.57*	2.38	0.00	2.38
30.35	0.23	0.41	0.57*	2.37	0.00	2.37
30.40	0.24	0.41	0.57*	2.36	0.00	2.36
30.45	0.24	0.41	0.57*	2.35	0.00	2.35
30.50	0.24	0.41	0.57*	2.34	0.00	2.34
30.55	0.24	0.41	0.57*	2.33	0.00	2.33
30.60	0.24	0.41	0.58*	2.32	0.00	2.32
30.65	0.24	0.41	0.58*	2.31	0.00	2.31
30.70	0.24	0.41	0.58*	2.30	0.00	2.30
30.75	0.24	0.41	0.58*	2.29	0.00	2.29
30.80	0.24	0.41	0.58*	2.28	0.00	2.28
30.85	0.24	0.41	0.58*	2.27	0.00	2.27
30.90	0.24	0.41	0.59*	2.26	0.00	2.26
30.95	0.24	0.41	0.59*	2.25	0.00	2.25
31.00	0.24	0.41	0.59*	2.24	0.00	2.24
31.05	0.25	0.42	0.59*	2.23	0.00	2.23
31.10	0.25	0.42	0.59*	2.23	0.00	2.23
31.15	0.25	0.42	0.60*	2.22	0.00	2.22
31.20	0.25	0.42	0.60*	2.21	0.00	2.21
31.25	0.25	0.42	0.60*	2.20	0.00	2.20
31.30	0.25	0.42	0.60*	2.19	0.00	2.19
31.35	0.25	0.42	0.60*	2.18	0.00	2.18
31.40	0.25	0.42	0.60*	2.17	0.00	2.17
31.45	0.25	0.42	0.61*	2.16	0.00	2.16
31.50	0.25	0.42	0.61*	2.15	0.00	2.15
31.55	0.25	0.42	0.61*	2.14	0.00	2.14
31.60	0.26	0.42	0.62*	2.13	0.00	2.13
31.65	0.26	0.42	0.62*	2.12	0.00	2.12
31.70	0.26	0.42	0.62*	2.11	0.00	2.11
31.75	0.26	0.42	0.63*	2.10	0.00	2.10
31.80	0.26	0.42	0.63*	2.09	0.00	2.09
31.85	0.26	0.42	0.63*	2.08	0.00	2.08

31.90	0.26	0.42	0.64*	2.07	0.00	2.07
31.95	0.27	0.42	0.64*	2.06	0.00	2.06
32.00	0.27	0.42	0.64*	2.06	0.00	2.06
32.05	0.27	0.42	0.65*	2.05	0.00	2.05
32.10	0.27	0.42	0.65*	2.04	0.00	2.04
32.15	0.27	0.42	0.66*	2.03	0.00	2.03
32.20	0.27	0.42	0.66*	2.02	0.00	2.02
32.25	0.28	0.42	0.66*	2.01	0.00	2.01
32.30	0.28	0.42	0.67*	2.00	0.00	2.00
32.35	0.28	0.42	0.67*	1.99	0.00	1.99
32.40	0.28	0.42	0.67*	1.99	0.00	1.99
32.45	0.28	0.42	0.68*	1.98	0.00	1.98
32.50	0.28	0.42	0.68*	1.97	0.00	1.97
32.55	0.29	0.42	0.69*	1.96	0.00	1.96
32.60	0.29	0.42	0.69*	1.95	0.00	1.95
32.65	0.29	0.42	0.69*	1.94	0.00	1.94
32.70	0.29	0.42	0.70*	1.93	0.00	1.93
32.75	0.29	0.42	0.70*	1.93	0.00	1.93
32.80	0.29	0.42	0.71*	1.92	0.00	1.92
32.85	0.30	0.42	0.71*	1.91	0.00	1.91
32.90	0.30	0.42	0.71*	1.90	0.00	1.90
32.95	0.30	0.42	0.72*	1.89	0.00	1.89
33.00	0.30	0.42	0.72*	1.89	0.00	1.89
33.05	0.30	0.42	0.73*	1.88	0.00	1.88
33.10	0.30	0.42	0.73*	1.87	0.00	1.87
33.15	0.31	0.42	0.73*	1.86	0.00	1.86
33.20	0.31	0.42	0.74*	1.85	0.00	1.85
33.25	0.31	0.42	0.74*	1.85	0.00	1.85
33.30	0.31	0.42	0.75*	1.84	0.00	1.84
33.35	0.31	0.42	0.75*	1.83	0.00	1.83
33.40	0.31	0.42	0.76*	1.82	0.00	1.82
33.45	0.32	0.42	0.76*	1.81	0.00	1.81
33.50	0.32	0.42	0.76*	1.81	0.00	1.81
33.55	0.32	0.42	0.77*	1.80	0.00	1.80
33.60	0.32	0.42	0.77*	1.79	0.00	1.79
33.65	0.32	0.42	0.78*	1.78	0.00	1.78
33.70	0.33	0.42	0.78*	1.78	0.00	1.78
33.75	0.33	0.42	0.79*	1.77	0.00	1.77
33.80	0.33	0.42	0.79*	1.76	0.00	1.76
33.85	0.33	0.42	0.80*	1.75	0.00	1.75
33.90	0.33	0.42	0.80*	1.75	0.00	1.75
33.95	0.34	0.42	0.80*	1.74	0.00	1.74
34.00	0.34	0.42	0.81*	1.73	0.00	1.73
34.05	0.34	0.42	0.81*	1.72	0.00	1.72
34.10	0.34	0.42	0.82*	1.72	0.00	1.72
34.15	0.34	0.42	0.82*	1.71	0.00	1.71
34.20	0.35	0.42	0.83*	1.70	0.00	1.70
34.25	0.35	0.42	0.83*	1.70	0.00	1.70
34.30	0.35	0.42	0.84*	1.69	0.00	1.69
34.35	0.35	0.42	0.84*	1.68	0.00	1.68
34.40	0.35	0.42	0.85*	1.68	0.00	1.68
34.45	0.36	0.42	0.85*	1.67	0.00	1.67
34.50	0.36	0.42	0.86*	1.66	0.00	1.66
34.55	0.36	0.42	0.87*	1.65	0.00	1.65
34.60	0.36	0.42	0.87*	1.65	0.00	1.65
34.65	0.37	0.42	0.88*	1.64	0.00	1.64
34.70	0.37	0.42	0.88*	1.63	0.00	1.63
34.75	0.37	0.42	0.89*	1.63	0.00	1.63
34.80	0.37	0.42	0.89*	1.62	0.00	1.62
34.85	0.37	0.42	0.90*	1.61	0.00	1.61
34.90	0.38	0.42	0.90*	1.61	0.00	1.61
34.95	0.38	0.42	0.91*	1.60	0.00	1.60
35.00	0.38	0.42	0.92*	1.60	0.00	1.60

35.05	0.38	0.42	0.92*	1.59	0.00	1.59
35.10	0.39	0.42	0.93*	1.58	0.00	1.58
35.15	0.39	0.42	0.94*	1.58	0.00	1.58
35.20	0.39	0.42	0.94*	1.57	0.00	1.57
35.25	0.40	0.42	0.95*	1.56	0.00	1.56
35.30	0.40	0.42	0.95*	1.56	0.00	1.56
35.35	0.40	0.42	0.96*	1.55	0.00	1.55
35.40	0.40	0.42	0.97*	1.55	0.00	1.55
35.45	0.41	0.42	0.98*	1.54	0.00	1.54
35.50	0.41	0.42	0.98*	1.53	0.00	1.53
35.55	0.41	0.42	0.99*	1.53	0.00	1.53
35.60	0.42	0.42	1.00*	1.52	0.00	1.52
35.65	0.42	0.42	1.00	1.52	0.00	1.52
35.70	0.42	0.42	1.01	1.52	0.00	1.52
35.75	0.43	0.42	1.02	1.52	0.00	1.52
35.80	0.43	0.42	1.03	1.52	0.00	1.52
35.85	0.43	0.42	1.04	1.52	0.00	1.52
35.90	0.44	0.42	1.05	1.52	0.00	1.52
35.95	0.44	0.42	1.06	1.52	0.00	1.52
36.00	0.44	0.42	1.06	1.52	0.00	1.52
36.05	0.45	0.42	1.07	1.52	0.00	1.52
36.10	0.45	0.42	1.09	1.52	0.00	1.52
36.15	0.46	0.42	1.10	1.52	0.00	1.52
36.20	0.46	0.42	1.11	1.52	0.00	1.52
36.25	0.47	0.42	1.12	1.52	0.00	1.52
36.30	0.47	0.42	1.13	1.52	0.00	1.52
36.35	0.48	0.42	1.15	1.52	0.00	1.52
36.40	0.48	0.42	1.16	1.52	0.00	1.52
36.45	0.49	0.42	1.18	1.52	0.00	1.52
36.50	0.50	0.42	1.20	1.52	0.00	1.52
36.55	0.49	0.42	1.17	1.52	0.00	1.52
36.60	0.48	0.42	1.15	1.52	0.00	1.52
36.65	0.47	0.42	1.13	1.52	0.00	1.52
36.70	0.46	0.42	1.11	1.52	0.00	1.52
36.75	0.45	0.42	1.09	1.52	0.00	1.52
36.80	0.45	0.42	1.08	1.52	0.00	1.52
36.85	0.44	0.42	1.06	1.52	0.00	1.52
36.90	0.44	0.42	1.05	1.52	0.00	1.52
36.95	0.43	0.42	1.04	1.52	0.00	1.52
37.00	0.43	0.42	1.02	1.52	0.00	1.52
37.05	0.42	0.42	1.01	1.52	0.00	1.52
37.10	0.42	0.42	1.01	1.52	0.00	1.52
37.15	0.41	0.42	1.00*	1.52	0.00	1.52
37.20	0.41	0.42	0.99*	1.51	0.00	1.51
37.25	0.41	0.42	0.98*	1.50	0.00	1.50
37.30	0.40	0.42	0.97*	1.50	0.00	1.50
37.35	0.40	0.42	0.96*	1.49	0.00	1.49
37.40	0.39	0.42	0.95*	1.49	0.00	1.49
37.45	0.39	0.42	0.94*	1.48	0.00	1.48
37.50	0.39	0.42	0.93*	1.47	0.00	1.47
37.55	0.38	0.42	0.92*	1.47	0.00	1.47
37.60	0.38	0.42	0.91*	1.46	0.00	1.46
37.65	0.38	0.42	0.90*	1.45	0.00	1.45
37.70	0.37	0.42	0.89*	1.45	0.00	1.45
37.75	0.37	0.42	0.89*	1.44	0.00	1.44
37.80	0.37	0.42	0.88*	1.43	0.00	1.43
37.85	0.36	0.42	0.87*	1.43	0.00	1.43
37.90	0.36	0.42	0.86*	1.42	0.00	1.42
37.95	0.36	0.42	0.86*	1.41	0.00	1.41
38.00	0.35	0.42	0.85*	1.41	0.00	1.41
38.05	0.35	0.42	0.84*	1.40	0.00	1.40
38.10	0.35	0.42	0.83*	1.39	0.00	1.39
38.15	0.34	0.42	0.83*	1.39	0.00	1.39

38.20	0.34	0.42	0.82*	1.38	0.00	1.38
38.25	0.34	0.42	0.81*	1.37	0.00	1.37
38.30	0.34	0.42	0.81*	1.37	0.00	1.37
38.35	0.33	0.42	0.80*	1.36	0.00	1.36
38.40	0.33	0.42	0.79*	1.35	0.00	1.35
38.45	0.33	0.42	0.79*	1.34	0.00	1.34
38.50	0.32	0.42	0.78*	1.34	0.00	1.34
38.55	0.32	0.42	0.77*	1.33	0.00	1.33
38.60	0.32	0.42	0.77*	1.32	0.00	1.32
38.65	0.32	0.42	0.76*	1.31	0.00	1.31
38.70	0.31	0.42	0.76*	1.31	0.00	1.31
38.75	0.31	0.42	0.75*	1.30	0.00	1.30
38.80	0.31	0.42	0.74*	1.29	0.00	1.29
38.85	0.31	0.42	0.74*	1.28	0.00	1.28
38.90	0.30	0.42	0.73*	1.27	0.00	1.27
38.95	0.30	0.42	0.73*	1.27	0.00	1.27
39.00	0.30	0.42	0.72*	1.26	0.00	1.26
39.05	0.30	0.41	0.72*	1.25	0.00	1.25
39.10	0.30	0.41	0.71*	1.24	0.00	1.24
39.15	0.29	0.41	0.71*	1.23	0.00	1.23
39.20	0.29	0.41	0.70*	1.23	0.00	1.23
39.25	0.29	0.41	0.70*	1.22	0.00	1.22
39.30	0.29	0.41	0.69*	1.21	0.00	1.21
39.35	0.28	0.41	0.68*	1.20	0.00	1.20
39.40	0.28	0.41	0.68*	1.19	0.00	1.19
39.45	0.28	0.41	0.67*	1.18	0.00	1.18
39.50	0.28	0.41	0.67*	1.17	0.00	1.17
39.55	0.28	0.41	0.66*	1.17	0.00	1.17
39.60	0.27	0.41	0.66*	1.16	0.00	1.16
39.65	0.27	0.41	0.65*	1.15	0.00	1.15
39.70	0.27	0.41	0.65*	1.14	0.00	1.14
39.75	0.27	0.41	0.64*	1.13	0.00	1.13
39.80	0.27	0.41	0.64*	1.12	0.00	1.12
39.85	0.26	0.41	0.64*	1.11	0.00	1.11
39.90	0.26	0.41	0.63*	1.10	0.00	1.10
39.95	0.26	0.41	0.63*	1.09	0.00	1.09
40.00	0.26	0.41	0.62*	1.09	0.00	1.09
40.05	0.26	0.41	0.62*	1.08	0.00	1.08
40.10	0.25	0.41	0.61*	1.07	0.00	1.07
40.15	0.25	0.41	0.61*	1.06	0.00	1.06
40.20	0.25	0.41	0.60*	1.05	0.00	1.05
40.25	0.25	0.41	0.60*	1.04	0.00	1.04
40.30	0.25	0.41	0.59*	1.03	0.00	1.03
40.35	0.24	0.41	0.59*	1.02	0.00	1.02
40.40	0.24	0.41	0.58*	1.01	0.00	1.01
40.45	0.24	0.41	0.58*	1.00	0.00	1.00
40.50	0.24	0.41	0.57*	0.99	0.00	0.99
40.55	0.24	0.41	0.57*	0.98	0.00	0.98
40.60	0.23	0.41	0.57*	0.97	0.00	0.97
40.65	0.23	0.41	0.56*	0.96	0.00	0.96
40.70	0.23	0.41	0.56*	0.95	0.00	0.95
40.75	0.23	0.41	0.55*	0.94	0.00	0.94
40.80	0.23	0.41	0.55*	0.93	0.00	0.93
40.85	0.22	0.41	0.54*	0.92	0.00	0.92
40.90	0.22	0.41	0.54*	0.91	0.00	0.91
40.95	0.22	0.41	0.53*	0.90	0.00	0.90
41.00	0.22	0.41	0.53*	0.89	0.00	0.89
41.05	0.22	0.41	0.53*	0.88	0.00	0.88
41.10	0.22	0.41	0.52*	0.86	0.00	0.86
41.15	0.21	0.41	0.52*	0.85	0.00	0.85
41.20	0.21	0.41	0.51*	0.84	0.00	0.84
41.25	0.21	0.41	0.51*	0.83	0.00	0.83
41.30	0.21	0.41	0.50*	0.82	0.00	0.82

41.35	0.21	0.41	0.50*	0.81	0.00	0.81
41.40	0.20	0.41	0.49*	0.80	0.00	0.80
41.45	0.20	0.41	0.49*	0.79	0.00	0.79
41.50	0.20	0.41	0.49*	0.78	0.00	0.78
41.55	0.20	0.41	0.49*	0.76	0.00	0.76
41.60	0.20	0.41	0.49*	0.75	0.00	0.75
41.65	0.20	0.41	0.49*	0.74	0.00	0.74
41.70	0.20	0.41	0.49*	0.73	0.00	0.73
41.75	0.20	0.41	0.49*	0.72	0.00	0.72
41.80	0.20	0.41	0.49*	0.71	0.00	0.71
41.85	0.20	0.41	0.49*	0.70	0.00	0.70
41.90	0.20	0.41	0.49*	0.69	0.00	0.69
41.95	0.20	0.41	0.49*	0.67	0.00	0.67
42.00	0.20	0.41	0.49*	0.66	0.00	0.66
42.05	0.20	0.41	0.49*	0.65	0.00	0.65
42.10	0.20	0.41	0.50*	0.64	0.00	0.64
42.15	0.20	0.41	0.50*	0.63	0.00	0.63
42.20	0.20	0.41	0.50*	0.62	0.00	0.62
42.25	0.20	0.41	0.50*	0.61	0.00	0.61
42.30	0.21	0.41	0.50*	0.60	0.00	0.60
42.35	0.21	0.41	0.50*	0.58	0.00	0.58
42.40	0.21	0.41	0.50*	0.57	0.00	0.57
42.45	0.21	0.41	0.50*	0.56	0.00	0.56
42.50	0.21	0.41	0.50*	0.55	0.00	0.55
42.55	0.21	0.41	0.50*	0.54	0.00	0.54
42.60	0.21	0.41	0.50*	0.53	0.00	0.53
42.65	0.21	0.41	0.50*	0.52	0.00	0.52
42.70	0.21	0.41	0.50*	0.51	0.00	0.51
42.75	0.21	0.41	0.51*	0.50	0.00	0.50
42.80	0.21	0.41	0.51*	0.48	0.00	0.48
42.85	0.21	0.41	0.51*	0.47	0.00	0.47
42.90	0.21	0.41	0.51*	0.46	0.00	0.46
42.95	0.21	0.41	0.51*	0.45	0.00	0.45
43.00	0.21	0.41	0.51*	0.44	0.00	0.44
43.05	0.21	0.41	0.51*	0.43	0.00	0.43
43.10	0.21	0.41	0.51*	0.42	0.00	0.42
43.15	0.21	0.41	0.51*	0.41	0.00	0.41
43.20	0.21	0.41	0.51*	0.40	0.00	0.40
43.25	0.21	0.41	0.51*	0.39	0.00	0.39
43.30	0.21	0.41	0.51*	0.38	0.00	0.38
43.35	0.21	0.41	0.52*	0.36	0.00	0.36
43.40	0.21	0.41	0.52*	0.35	0.00	0.35
43.45	0.21	0.41	0.52*	0.34	0.00	0.34
43.50	0.21	0.41	0.52*	0.33	0.00	0.33
43.55	0.21	0.41	0.52*	0.32	0.00	0.32
43.60	0.21	0.41	0.52*	0.31	0.00	0.31
43.65	0.21	0.41	0.52*	0.30	0.00	0.30
43.70	0.21	0.41	0.52*	0.29	0.00	0.29
43.75	0.21	0.41	0.52*	0.28	0.00	0.28
43.80	0.21	0.41	0.52*	0.27	0.00	0.27
43.85	0.21	0.41	0.52*	0.26	0.00	0.26
43.90	0.21	0.41	0.52*	0.24	0.00	0.24
43.95	0.21	0.41	0.53*	0.23	0.00	0.23
44.00	0.22	0.41	0.53*	0.22	0.00	0.22
44.05	0.22	0.41	0.53*	0.21	0.00	0.21
44.10	0.22	0.41	0.53*	0.20	0.00	0.20
44.15	0.22	0.41	0.53*	0.19	0.00	0.19
44.20	0.22	0.41	0.53*	0.18	0.00	0.18
44.25	0.22	0.41	0.53*	0.17	0.00	0.17
44.30	0.22	0.41	0.53*	0.16	0.00	0.16
44.35	0.22	0.41	0.53*	0.15	0.00	0.15
44.40	0.22	0.41	0.53*	0.14	0.00	0.14
44.45	0.22	0.41	0.53*	0.13	0.00	0.13

44.50	0.22	0.41	0.53*	0.12	0.00	0.12
44.55	0.22	0.41	0.53*	0.11	0.00	0.11
44.60	0.22	0.41	0.54*	0.10	0.00	0.10
44.65	0.22	0.41	0.54*	0.08	0.00	0.08
44.70	0.22	0.41	0.54*	0.07	0.00	0.07
44.75	0.22	0.41	0.54*	0.06	0.00	0.06
44.80	0.22	0.41	0.54*	0.05	0.00	0.05
44.85	0.22	0.41	0.54*	0.04	0.00	0.04
44.90	0.22	0.41	0.54*	0.03	0.00	0.03
44.95	0.22	0.41	0.54*	0.02	0.00	0.02
45.00	0.22	0.41	0.54*	0.01	0.00	0.01
45.05	2.00	0.41	5.00	0.00	0.00	0.00
45.10	2.00	0.41	5.00	0.00	0.00	0.00
45.15	2.00	0.41	5.00	0.00	0.00	0.00
45.20	2.00	0.41	5.00	0.00	0.00	0.00
45.25	2.00	0.41	5.00	0.00	0.00	0.00
45.30	2.00	0.41	5.00	0.00	0.00	0.00
45.35	2.00	0.41	5.00	0.00	0.00	0.00
45.40	2.00	0.41	5.00	0.00	0.00	0.00
45.45	2.00	0.41	5.00	0.00	0.00	0.00
45.50	2.00	0.41	5.00	0.00	0.00	0.00
45.55	2.00	0.41	5.00	0.00	0.00	0.00
45.60	2.00	0.41	5.00	0.00	0.00	0.00
45.65	2.00	0.41	5.00	0.00	0.00	0.00
45.70	2.00	0.41	5.00	0.00	0.00	0.00
45.75	2.00	0.41	5.00	0.00	0.00	0.00
45.80	2.00	0.41	5.00	0.00	0.00	0.00
45.85	2.00	0.41	5.00	0.00	0.00	0.00
45.90	2.00	0.41	5.00	0.00	0.00	0.00
45.95	2.00	0.41	5.00	0.00	0.00	0.00
46.00	2.00	0.41	5.00	0.00	0.00	0.00
46.05	2.00	0.41	5.00	0.00	0.00	0.00
46.10	2.00	0.41	5.00	0.00	0.00	0.00
46.15	2.00	0.41	5.00	0.00	0.00	0.00
46.20	2.00	0.41	5.00	0.00	0.00	0.00
46.25	2.00	0.40	5.00	0.00	0.00	0.00
46.30	2.00	0.40	5.00	0.00	0.00	0.00
46.35	2.00	0.40	5.00	0.00	0.00	0.00
46.40	2.00	0.40	5.00	0.00	0.00	0.00
46.45	2.00	0.40	5.00	0.00	0.00	0.00
46.50	2.00	0.40	5.00	0.00	0.00	0.00
46.55	2.00	0.40	5.00	0.00	0.00	0.00
46.60	2.00	0.40	5.00	0.00	0.00	0.00
46.65	2.00	0.40	5.00	0.00	0.00	0.00
46.70	2.00	0.40	5.00	0.00	0.00	0.00
46.75	2.00	0.40	5.00	0.00	0.00	0.00
46.80	2.00	0.40	5.00	0.00	0.00	0.00
46.85	2.00	0.40	5.00	0.00	0.00	0.00
46.90	2.00	0.40	5.00	0.00	0.00	0.00
46.95	2.00	0.40	5.00	0.00	0.00	0.00
47.00	2.00	0.40	5.00	0.00	0.00	0.00
47.05	2.00	0.40	5.00	0.00	0.00	0.00
47.10	2.00	0.40	5.00	0.00	0.00	0.00
47.15	2.00	0.40	5.00	0.00	0.00	0.00
47.20	2.00	0.40	5.00	0.00	0.00	0.00
47.25	2.00	0.40	5.00	0.00	0.00	0.00
47.30	2.00	0.40	5.00	0.00	0.00	0.00
47.35	2.00	0.40	5.00	0.00	0.00	0.00
47.40	2.00	0.40	5.00	0.00	0.00	0.00
47.45	2.00	0.40	5.00	0.00	0.00	0.00
47.50	2.00	0.40	5.00	0.00	0.00	0.00
47.55	2.00	0.40	5.00	0.00	0.00	0.00
47.60	2.00	0.40	5.00	0.00	0.00	0.00

47.65	2.00	0.40	5.00	0.00	0.00	0.00
47.70	2.00	0.40	5.00	0.00	0.00	0.00
47.75	2.00	0.40	5.00	0.00	0.00	0.00
47.80	2.00	0.40	5.00	0.00	0.00	0.00
47.85	2.00	0.40	5.00	0.00	0.00	0.00
47.90	2.00	0.40	5.00	0.00	0.00	0.00
47.95	2.00	0.40	5.00	0.00	0.00	0.00
48.00	2.00	0.40	5.00	0.00	0.00	0.00
48.05	2.00	0.40	5.00	0.00	0.00	0.00
48.10	2.00	0.40	5.00	0.00	0.00	0.00
48.15	2.00	0.40	5.00	0.00	0.00	0.00
48.20	2.00	0.40	5.00	0.00	0.00	0.00
48.25	2.00	0.40	5.00	0.00	0.00	0.00
48.30	2.00	0.40	5.00	0.00	0.00	0.00
48.35	2.00	0.40	5.00	0.00	0.00	0.00
48.40	2.00	0.40	5.00	0.00	0.00	0.00
48.45	2.00	0.40	5.00	0.00	0.00	0.00
48.50	2.00	0.40	5.00	0.00	0.00	0.00
48.55	2.00	0.40	5.00	0.00	0.00	0.00
48.60	2.00	0.40	5.00	0.00	0.00	0.00
48.65	2.00	0.40	5.00	0.00	0.00	0.00
48.70	2.00	0.40	5.00	0.00	0.00	0.00
48.75	2.00	0.40	5.00	0.00	0.00	0.00
48.80	2.00	0.40	5.00	0.00	0.00	0.00
48.85	2.00	0.40	5.00	0.00	0.00	0.00
48.90	2.00	0.40	5.00	0.00	0.00	0.00
48.95	2.00	0.40	5.00	0.00	0.00	0.00
49.00	2.00	0.40	5.00	0.00	0.00	0.00
49.05	2.00	0.40	5.00	0.00	0.00	0.00
49.10	2.00	0.40	5.00	0.00	0.00	0.00
49.15	2.00	0.40	5.00	0.00	0.00	0.00
49.20	2.00	0.40	5.00	0.00	0.00	0.00
49.25	2.00	0.40	5.00	0.00	0.00	0.00
49.30	2.00	0.40	5.00	0.00	0.00	0.00
49.35	2.00	0.40	5.00	0.00	0.00	0.00
49.40	2.00	0.40	5.00	0.00	0.00	0.00
49.45	2.00	0.40	5.00	0.00	0.00	0.00
49.50	2.00	0.40	5.00	0.00	0.00	0.00
49.55	2.00	0.40	5.00	0.00	0.00	0.00
49.60	2.00	0.40	5.00	0.00	0.00	0.00
49.65	2.00	0.40	5.00	0.00	0.00	0.00
49.70	2.00	0.40	5.00	0.00	0.00	0.00
49.75	2.00	0.40	5.00	0.00	0.00	0.00
49.80	2.00	0.40	5.00	0.00	0.00	0.00
49.85	2.00	0.40	5.00	0.00	0.00	0.00
49.90	2.00	0.40	5.00	0.00	0.00	0.00
49.95	2.00	0.40	5.00	0.00	0.00	0.00
50.00	2.00	0.40	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: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

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1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm Cyclic resistance ratio from soils
CSRsf Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat Settlement from saturated sands
S_dry Settlement from Unsaturated Sands

S_all	Total Settlement from Saturated and Unsaturated Sands
NoLiq	No-Liquefy Soils

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LIQUEFACTION ANALYSIS SUMMARY

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Input File Name: C:\Users\koohi\Desktop\Stanton\B3.liq
Title: Stanton Energy Reliability Center-B3
Subtitle: Stanton, CA

Surface Elev.=68
Hole No.=B3
Depth of Hole= 50.00 ft
Water Table during Earthquake= 15.00 ft
Water Table during In-Situ Testing= 20.00 ft
Max. Acceleration= 0.5 g
Earthquake Magnitude= 6.90

Input Data:
Surface Elev.=68
Hole No.=B3
Depth of Hole=50.00 ft
Water Table during Earthquake= 15.00 ft
Water Table during In-Situ Testing= 20.00 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=6.90
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Tokimatsu/Seed
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: Liq. zone only
6. Hammer Energy Ratio, Ce = 0.8
7. Borehole Diameter, Cb= 1.15
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 %
11.50	9.00	115.00	15.00
21.50	10.00	120.00	15.00
31.50	29.00	125.00	35.00
41.50	25.00	120.00	78.00
50.00	46.00	120.00	78.00

Output Results:
Settlement of Saturated Sands=4.63 in.
Settlement of Unsaturated Sands=0.00 in.
Total Settlement of Saturated and Unsaturated Sands=4.63 in.

Differential Settlement=2.315 to 3.055 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
11.50	0.15	0.32	5.00	4.63	0.00	4.63
11.55	0.15	0.32	5.00	4.63	0.00	4.63
11.60	0.15	0.32	5.00	4.63	0.00	4.63
11.65	0.15	0.32	5.00	4.63	0.00	4.63
11.70	0.15	0.32	5.00	4.63	0.00	4.63
11.75	0.15	0.32	5.00	4.63	0.00	4.63
11.80	0.15	0.32	5.00	4.63	0.00	4.63
11.85	0.15	0.32	5.00	4.63	0.00	4.63
11.90	0.15	0.32	5.00	4.63	0.00	4.63
11.95	0.15	0.32	5.00	4.63	0.00	4.63
12.00	0.15	0.32	5.00	4.63	0.00	4.63
12.05	0.15	0.32	5.00	4.63	0.00	4.63
12.10	0.15	0.32	5.00	4.63	0.00	4.63
12.15	0.15	0.32	5.00	4.63	0.00	4.63
12.20	0.15	0.32	5.00	4.63	0.00	4.63
12.25	0.15	0.32	5.00	4.63	0.00	4.63
12.30	0.15	0.32	5.00	4.63	0.00	4.63
12.35	0.15	0.32	5.00	4.63	0.00	4.63
12.40	0.15	0.32	5.00	4.63	0.00	4.63
12.45	0.15	0.32	5.00	4.63	0.00	4.63
12.50	0.15	0.32	5.00	4.63	0.00	4.63
12.55	0.15	0.32	5.00	4.63	0.00	4.63
12.60	0.15	0.32	5.00	4.63	0.00	4.63
12.65	0.15	0.32	5.00	4.63	0.00	4.63
12.70	0.15	0.32	5.00	4.63	0.00	4.63
12.75	0.15	0.32	5.00	4.63	0.00	4.63
12.80	0.15	0.32	5.00	4.63	0.00	4.63
12.85	0.15	0.32	5.00	4.63	0.00	4.63
12.90	0.15	0.32	5.00	4.63	0.00	4.63
12.95	0.15	0.32	5.00	4.63	0.00	4.63
13.00	0.15	0.32	5.00	4.63	0.00	4.63
13.05	0.15	0.32	5.00	4.63	0.00	4.63
13.10	0.15	0.32	5.00	4.63	0.00	4.63
13.15	0.15	0.32	5.00	4.63	0.00	4.63
13.20	0.15	0.31	5.00	4.63	0.00	4.63
13.25	0.15	0.31	5.00	4.63	0.00	4.63
13.30	0.15	0.31	5.00	4.63	0.00	4.63
13.35	0.15	0.31	5.00	4.63	0.00	4.63
13.40	0.15	0.31	5.00	4.63	0.00	4.63
13.45	0.14	0.31	5.00	4.63	0.00	4.63
13.50	0.14	0.31	5.00	4.63	0.00	4.63
13.55	0.14	0.31	5.00	4.63	0.00	4.63
13.60	0.14	0.31	5.00	4.63	0.00	4.63
13.65	0.14	0.31	5.00	4.63	0.00	4.63
13.70	0.14	0.31	5.00	4.63	0.00	4.63
13.75	0.14	0.31	5.00	4.63	0.00	4.63
13.80	0.14	0.31	5.00	4.63	0.00	4.63
13.85	0.14	0.31	5.00	4.63	0.00	4.63
13.90	0.14	0.31	5.00	4.63	0.00	4.63
13.95	0.14	0.31	5.00	4.63	0.00	4.63
14.00	0.14	0.31	5.00	4.63	0.00	4.63
14.05	0.14	0.31	5.00	4.63	0.00	4.63
14.10	0.14	0.31	5.00	4.63	0.00	4.63
14.15	0.14	0.31	5.00	4.63	0.00	4.63
14.20	0.14	0.31	5.00	4.63	0.00	4.63
14.25	0.14	0.31	5.00	4.63	0.00	4.63
14.30	0.14	0.31	5.00	4.63	0.00	4.63
14.35	0.14	0.31	5.00	4.63	0.00	4.63

14.40	0.14	0.31	5.00	4.63	0.00	4.63
14.45	0.14	0.31	5.00	4.63	0.00	4.63
14.50	0.14	0.31	5.00	4.63	0.00	4.63
14.55	0.14	0.31	5.00	4.63	0.00	4.63
14.60	0.14	0.31	5.00	4.63	0.00	4.63
14.65	0.14	0.31	5.00	4.63	0.00	4.63
14.70	0.14	0.31	5.00	4.63	0.00	4.63
14.75	0.14	0.31	5.00	4.63	0.00	4.63
14.80	0.15	0.31	5.00	4.63	0.00	4.63
14.85	0.15	0.31	5.00	4.63	0.00	4.63
14.90	0.15	0.31	5.00	4.63	0.00	4.63
14.95	0.15	0.31	5.00	4.63	0.00	4.63
15.00	0.15	0.31	0.49*	4.63	0.00	4.63
15.05	0.15	0.31	0.49*	4.62	0.00	4.62
15.10	0.15	0.31	0.49*	4.60	0.00	4.60
15.15	0.15	0.32	0.49*	4.59	0.00	4.59
15.20	0.15	0.32	0.48*	4.57	0.00	4.57
15.25	0.15	0.32	0.48*	4.56	0.00	4.56
15.30	0.15	0.32	0.48*	4.54	0.00	4.54
15.35	0.15	0.32	0.48*	4.53	0.00	4.53
15.40	0.15	0.32	0.48*	4.52	0.00	4.52
15.45	0.15	0.32	0.48*	4.50	0.00	4.50
15.50	0.15	0.32	0.48*	4.49	0.00	4.49
15.55	0.15	0.32	0.48*	4.47	0.00	4.47
15.60	0.15	0.32	0.47*	4.46	0.00	4.46
15.65	0.15	0.32	0.47*	4.45	0.00	4.45
15.70	0.15	0.32	0.47*	4.43	0.00	4.43
15.75	0.15	0.32	0.47*	4.42	0.00	4.42
15.80	0.15	0.32	0.47*	4.40	0.00	4.40
15.85	0.15	0.32	0.47*	4.39	0.00	4.39
15.90	0.15	0.32	0.47*	4.37	0.00	4.37
15.95	0.15	0.32	0.47*	4.36	0.00	4.36
16.00	0.15	0.32	0.47*	4.35	0.00	4.35
16.05	0.15	0.32	0.46*	4.33	0.00	4.33
16.10	0.15	0.32	0.46*	4.32	0.00	4.32
16.15	0.15	0.33	0.46*	4.30	0.00	4.30
16.20	0.15	0.33	0.46*	4.29	0.00	4.29
16.25	0.15	0.33	0.46*	4.27	0.00	4.27
16.30	0.15	0.33	0.46*	4.26	0.00	4.26
16.35	0.15	0.33	0.46*	4.25	0.00	4.25
16.40	0.15	0.33	0.46*	4.23	0.00	4.23
16.45	0.15	0.33	0.46*	4.22	0.00	4.22
16.50	0.15	0.33	0.45*	4.20	0.00	4.20
16.55	0.15	0.33	0.45*	4.19	0.00	4.19
16.60	0.15	0.33	0.45*	4.17	0.00	4.17
16.65	0.15	0.33	0.45*	4.16	0.00	4.16
16.70	0.15	0.33	0.45*	4.15	0.00	4.15
16.75	0.15	0.33	0.45*	4.13	0.00	4.13
16.80	0.15	0.33	0.45*	4.12	0.00	4.12
16.85	0.15	0.33	0.45*	4.10	0.00	4.10
16.90	0.15	0.33	0.45*	4.09	0.00	4.09
16.95	0.15	0.33	0.45*	4.07	0.00	4.07
17.00	0.15	0.33	0.45*	4.06	0.00	4.06
17.05	0.15	0.33	0.44*	4.05	0.00	4.05
17.10	0.15	0.33	0.44*	4.03	0.00	4.03
17.15	0.15	0.33	0.44*	4.02	0.00	4.02
17.20	0.15	0.34	0.44*	4.00	0.00	4.00
17.25	0.15	0.34	0.44*	3.99	0.00	3.99
17.30	0.15	0.34	0.44*	3.97	0.00	3.97
17.35	0.15	0.34	0.44*	3.96	0.00	3.96
17.40	0.15	0.34	0.44*	3.95	0.00	3.95
17.45	0.15	0.34	0.44*	3.93	0.00	3.93
17.50	0.15	0.34	0.44*	3.92	0.00	3.92

17.55	0.15	0.34	0.43*	3.90	0.00	3.90
17.60	0.15	0.34	0.43*	3.89	0.00	3.89
17.65	0.15	0.34	0.43*	3.87	0.00	3.87
17.70	0.15	0.34	0.43*	3.86	0.00	3.86
17.75	0.15	0.34	0.43*	3.84	0.00	3.84
17.80	0.15	0.34	0.43*	3.83	0.00	3.83
17.85	0.15	0.34	0.43*	3.82	0.00	3.82
17.90	0.15	0.34	0.43*	3.80	0.00	3.80
17.95	0.15	0.34	0.43*	3.79	0.00	3.79
18.00	0.15	0.34	0.43*	3.77	0.00	3.77
18.05	0.15	0.34	0.43*	3.76	0.00	3.76
18.10	0.15	0.34	0.43*	3.74	0.00	3.74
18.15	0.15	0.34	0.42*	3.73	0.00	3.73
18.20	0.15	0.34	0.42*	3.71	0.00	3.71
18.25	0.15	0.34	0.42*	3.70	0.00	3.70
18.30	0.15	0.34	0.42*	3.69	0.00	3.69
18.35	0.15	0.35	0.42*	3.67	0.00	3.67
18.40	0.15	0.35	0.42*	3.66	0.00	3.66
18.45	0.15	0.35	0.42*	3.64	0.00	3.64
18.50	0.15	0.35	0.42*	3.63	0.00	3.63
18.55	0.15	0.35	0.42*	3.61	0.00	3.61
18.60	0.15	0.35	0.42*	3.60	0.00	3.60
18.65	0.14	0.35	0.42*	3.58	0.00	3.58
18.70	0.14	0.35	0.42*	3.57	0.00	3.57
18.75	0.14	0.35	0.42*	3.56	0.00	3.56
18.80	0.14	0.35	0.41*	3.54	0.00	3.54
18.85	0.14	0.35	0.41*	3.53	0.00	3.53
18.90	0.14	0.35	0.41*	3.51	0.00	3.51
18.95	0.14	0.35	0.41*	3.50	0.00	3.50
19.00	0.14	0.35	0.41*	3.48	0.00	3.48
19.05	0.14	0.35	0.41*	3.47	0.00	3.47
19.10	0.14	0.35	0.41*	3.45	0.00	3.45
19.15	0.14	0.35	0.41*	3.44	0.00	3.44
19.20	0.14	0.35	0.41*	3.42	0.00	3.42
19.25	0.14	0.35	0.41*	3.41	0.00	3.41
19.30	0.14	0.35	0.41*	3.40	0.00	3.40
19.35	0.14	0.35	0.41*	3.38	0.00	3.38
19.40	0.14	0.35	0.41*	3.37	0.00	3.37
19.45	0.14	0.35	0.41*	3.35	0.00	3.35
19.50	0.14	0.35	0.40*	3.34	0.00	3.34
19.55	0.14	0.35	0.40*	3.32	0.00	3.32
19.60	0.14	0.36	0.40*	3.31	0.00	3.31
19.65	0.14	0.36	0.40*	3.29	0.00	3.29
19.70	0.14	0.36	0.40*	3.28	0.00	3.28
19.75	0.14	0.36	0.40*	3.26	0.00	3.26
19.80	0.14	0.36	0.40*	3.25	0.00	3.25
19.85	0.14	0.36	0.40*	3.23	0.00	3.23
19.90	0.14	0.36	0.40*	3.22	0.00	3.22
19.95	0.14	0.36	0.40*	3.21	0.00	3.21
20.00	0.14	0.36	0.40*	3.19	0.00	3.19
20.05	0.14	0.36	0.40*	3.18	0.00	3.18
20.10	0.14	0.36	0.40*	3.16	0.00	3.16
20.15	0.14	0.36	0.40*	3.15	0.00	3.15
20.20	0.14	0.36	0.40*	3.13	0.00	3.13
20.25	0.14	0.36	0.40*	3.12	0.00	3.12
20.30	0.14	0.36	0.40*	3.10	0.00	3.10
20.35	0.14	0.36	0.39*	3.09	0.00	3.09
20.40	0.14	0.36	0.39*	3.07	0.00	3.07
20.45	0.14	0.36	0.39*	3.06	0.00	3.06
20.50	0.14	0.36	0.39*	3.04	0.00	3.04
20.55	0.14	0.36	0.39*	3.03	0.00	3.03
20.60	0.14	0.36	0.39*	3.01	0.00	3.01
20.65	0.14	0.36	0.39*	3.00	0.00	3.00

20.70	0.14	0.36	0.39*	2.99	0.00	2.99
20.75	0.14	0.36	0.39*	2.97	0.00	2.97
20.80	0.14	0.36	0.39*	2.96	0.00	2.96
20.85	0.14	0.36	0.39*	2.94	0.00	2.94
20.90	0.14	0.36	0.39*	2.93	0.00	2.93
20.95	0.14	0.36	0.39*	2.91	0.00	2.91
21.00	0.14	0.37	0.39*	2.90	0.00	2.90
21.05	0.14	0.37	0.39*	2.88	0.00	2.88
21.10	0.14	0.37	0.39*	2.87	0.00	2.87
21.15	0.14	0.37	0.39*	2.85	0.00	2.85
21.20	0.14	0.37	0.39*	2.84	0.00	2.84
21.25	0.14	0.37	0.39*	2.82	0.00	2.82
21.30	0.14	0.37	0.39*	2.81	0.00	2.81
21.35	0.14	0.37	0.39*	2.80	0.00	2.80
21.40	0.14	0.37	0.39*	2.78	0.00	2.78
21.45	0.14	0.37	0.39*	2.77	0.00	2.77
21.50	0.14	0.37	0.39*	2.75	0.00	2.75
21.55	0.14	0.37	0.39*	2.74	0.00	2.74
21.60	0.14	0.37	0.39*	2.72	0.00	2.72
21.65	0.15	0.37	0.39*	2.71	0.00	2.71
21.70	0.15	0.37	0.40*	2.69	0.00	2.69
21.75	0.15	0.37	0.40*	2.68	0.00	2.68
21.80	0.15	0.37	0.40*	2.66	0.00	2.66
21.85	0.15	0.37	0.41*	2.65	0.00	2.65
21.90	0.15	0.37	0.41*	2.64	0.00	2.64
21.95	0.15	0.37	0.41*	2.62	0.00	2.62
22.00	0.15	0.37	0.42*	2.61	0.00	2.61
22.05	0.16	0.37	0.42*	2.59	0.00	2.59
22.10	0.16	0.37	0.42*	2.58	0.00	2.58
22.15	0.16	0.37	0.43*	2.57	0.00	2.57
22.20	0.16	0.37	0.43*	2.55	0.00	2.55
22.25	0.16	0.37	0.43*	2.54	0.00	2.54
22.30	0.16	0.37	0.44*	2.53	0.00	2.53
22.35	0.16	0.37	0.44*	2.51	0.00	2.51
22.40	0.17	0.37	0.44*	2.50	0.00	2.50
22.45	0.17	0.37	0.44*	2.49	0.00	2.49
22.50	0.17	0.37	0.45*	2.47	0.00	2.47
22.55	0.17	0.38	0.45*	2.46	0.00	2.46
22.60	0.17	0.38	0.45*	2.45	0.00	2.45
22.65	0.17	0.38	0.46*	2.43	0.00	2.43
22.70	0.17	0.38	0.46*	2.42	0.00	2.42
22.75	0.17	0.38	0.46*	2.41	0.00	2.41
22.80	0.18	0.38	0.47*	2.39	0.00	2.39
22.85	0.18	0.38	0.47*	2.38	0.00	2.38
22.90	0.18	0.38	0.47*	2.37	0.00	2.37
22.95	0.18	0.38	0.47*	2.36	0.00	2.36
23.00	0.18	0.38	0.48*	2.34	0.00	2.34
23.05	0.18	0.38	0.48*	2.33	0.00	2.33
23.10	0.18	0.38	0.48*	2.32	0.00	2.32
23.15	0.18	0.38	0.49*	2.31	0.00	2.31
23.20	0.19	0.38	0.49*	2.29	0.00	2.29
23.25	0.19	0.38	0.49*	2.28	0.00	2.28
23.30	0.19	0.38	0.49*	2.27	0.00	2.27
23.35	0.19	0.38	0.50*	2.26	0.00	2.26
23.40	0.19	0.38	0.50*	2.25	0.00	2.25
23.45	0.19	0.38	0.50*	2.24	0.00	2.24
23.50	0.19	0.38	0.51*	2.22	0.00	2.22
23.55	0.19	0.38	0.51*	2.21	0.00	2.21
23.60	0.20	0.38	0.51*	2.20	0.00	2.20
23.65	0.20	0.38	0.51*	2.19	0.00	2.19
23.70	0.20	0.38	0.52*	2.18	0.00	2.18
23.75	0.20	0.38	0.52*	2.17	0.00	2.17
23.80	0.20	0.38	0.52*	2.15	0.00	2.15

23.85	0.20	0.38	0.53*	2.14	0.00	2.14
23.90	0.20	0.38	0.53*	2.13	0.00	2.13
23.95	0.20	0.38	0.53*	2.12	0.00	2.12
24.00	0.21	0.38	0.53*	2.11	0.00	2.11
24.05	0.21	0.38	0.54*	2.10	0.00	2.10
24.10	0.21	0.38	0.54*	2.09	0.00	2.09
24.15	0.21	0.38	0.54*	2.07	0.00	2.07
24.20	0.21	0.38	0.55*	2.06	0.00	2.06
24.25	0.21	0.39	0.55*	2.05	0.00	2.05
24.30	0.21	0.39	0.55*	2.04	0.00	2.04
24.35	0.21	0.39	0.55*	2.03	0.00	2.03
24.40	0.21	0.39	0.56*	2.02	0.00	2.02
24.45	0.22	0.39	0.56*	2.01	0.00	2.01
24.50	0.22	0.39	0.56*	2.00	0.00	2.00
24.55	0.22	0.39	0.56*	1.99	0.00	1.99
24.60	0.22	0.39	0.57*	1.98	0.00	1.98
24.65	0.22	0.39	0.57*	1.97	0.00	1.97
24.70	0.22	0.39	0.57*	1.95	0.00	1.95
24.75	0.22	0.39	0.58*	1.94	0.00	1.94
24.80	0.22	0.39	0.58*	1.93	0.00	1.93
24.85	0.23	0.39	0.58*	1.92	0.00	1.92
24.90	0.23	0.39	0.58*	1.91	0.00	1.91
24.95	0.23	0.39	0.59*	1.90	0.00	1.90
25.00	0.23	0.39	0.59*	1.89	0.00	1.89
25.05	0.23	0.39	0.59*	1.88	0.00	1.88
25.10	0.23	0.39	0.59*	1.87	0.00	1.87
25.15	0.23	0.39	0.60*	1.86	0.00	1.86
25.20	0.23	0.39	0.60*	1.85	0.00	1.85
25.25	0.24	0.39	0.60*	1.84	0.00	1.84
25.30	0.24	0.39	0.61*	1.83	0.00	1.83
25.35	0.24	0.39	0.61*	1.82	0.00	1.82
25.40	0.24	0.39	0.61*	1.81	0.00	1.81
25.45	0.24	0.39	0.61*	1.80	0.00	1.80
25.50	0.24	0.39	0.62*	1.79	0.00	1.79
25.55	0.24	0.39	0.62*	1.78	0.00	1.78
25.60	0.24	0.39	0.62*	1.77	0.00	1.77
25.65	0.25	0.39	0.62*	1.76	0.00	1.76
25.70	0.25	0.39	0.63*	1.75	0.00	1.75
25.75	0.25	0.39	0.63*	1.74	0.00	1.74
25.80	0.25	0.39	0.63*	1.73	0.00	1.73
25.85	0.25	0.39	0.64*	1.72	0.00	1.72
25.90	0.25	0.39	0.64*	1.71	0.00	1.71
25.95	0.25	0.39	0.64*	1.70	0.00	1.70
26.00	0.25	0.39	0.64*	1.69	0.00	1.69
26.05	0.25	0.39	0.65*	1.68	0.00	1.68
26.10	0.26	0.39	0.65*	1.67	0.00	1.67
26.15	0.26	0.39	0.65*	1.67	0.00	1.67
26.20	0.26	0.40	0.65*	1.66	0.00	1.66
26.25	0.26	0.40	0.66*	1.65	0.00	1.65
26.30	0.26	0.40	0.66*	1.64	0.00	1.64
26.35	0.26	0.40	0.66*	1.63	0.00	1.63
26.40	0.26	0.40	0.67*	1.62	0.00	1.62
26.45	0.26	0.40	0.67*	1.61	0.00	1.61
26.50	0.27	0.40	0.67*	1.60	0.00	1.60
26.55	0.27	0.40	0.67*	1.59	0.00	1.59
26.60	0.27	0.40	0.68*	1.58	0.00	1.58
26.65	0.27	0.40	0.68*	1.57	0.00	1.57
26.70	0.27	0.40	0.68*	1.57	0.00	1.57
26.75	0.27	0.40	0.68*	1.56	0.00	1.56
26.80	0.27	0.40	0.69*	1.55	0.00	1.55
26.85	0.27	0.40	0.69*	1.54	0.00	1.54
26.90	0.28	0.40	0.69*	1.53	0.00	1.53
26.95	0.28	0.40	0.70*	1.52	0.00	1.52

27.00	0.28	0.40	0.70*	1.51	0.00	1.51
27.05	0.28	0.40	0.70*	1.50	0.00	1.50
27.10	0.28	0.40	0.70*	1.50	0.00	1.50
27.15	0.28	0.40	0.71*	1.49	0.00	1.49
27.20	0.28	0.40	0.71*	1.48	0.00	1.48
27.25	0.29	0.40	0.71*	1.47	0.00	1.47
27.30	0.29	0.40	0.72*	1.46	0.00	1.46
27.35	0.29	0.40	0.72*	1.45	0.00	1.45
27.40	0.29	0.40	0.72*	1.45	0.00	1.45
27.45	0.29	0.40	0.72*	1.44	0.00	1.44
27.50	0.29	0.40	0.73*	1.43	0.00	1.43
27.55	0.29	0.40	0.73*	1.42	0.00	1.42
27.60	0.29	0.40	0.73*	1.41	0.00	1.41
27.65	0.30	0.40	0.74*	1.40	0.00	1.40
27.70	0.30	0.40	0.74*	1.40	0.00	1.40
27.75	0.30	0.40	0.74*	1.39	0.00	1.39
27.80	0.30	0.40	0.75*	1.38	0.00	1.38
27.85	0.30	0.40	0.75*	1.37	0.00	1.37
27.90	0.32	0.40	0.79*	1.36	0.00	1.36
27.95	0.32	0.40	0.79*	1.36	0.00	1.36
28.00	0.32	0.40	0.79*	1.35	0.00	1.35
28.05	0.32	0.40	0.80*	1.34	0.00	1.34
28.10	0.32	0.40	0.80*	1.33	0.00	1.33
28.15	0.33	0.40	0.81*	1.33	0.00	1.33
28.20	0.33	0.40	0.81*	1.32	0.00	1.32
28.25	0.33	0.40	0.81*	1.31	0.00	1.31
28.30	0.33	0.40	0.82*	1.30	0.00	1.30
28.35	0.33	0.40	0.82*	1.30	0.00	1.30
28.40	0.33	0.40	0.82*	1.29	0.00	1.29
28.45	0.33	0.41	0.83*	1.28	0.00	1.28
28.50	0.34	0.41	0.83*	1.27	0.00	1.27
28.55	0.34	0.41	0.83*	1.27	0.00	1.27
28.60	0.34	0.41	0.84*	1.26	0.00	1.26
28.65	0.34	0.41	0.84*	1.25	0.00	1.25
28.70	0.34	0.41	0.85*	1.25	0.00	1.25
28.75	0.35	0.41	0.85*	1.24	0.00	1.24
28.80	0.35	0.41	0.85*	1.23	0.00	1.23
28.85	0.35	0.41	0.86*	1.22	0.00	1.22
28.90	0.35	0.41	0.86*	1.22	0.00	1.22
28.95	0.35	0.41	0.87*	1.21	0.00	1.21
29.00	0.35	0.41	0.87*	1.20	0.00	1.20
29.05	0.36	0.41	0.87*	1.20	0.00	1.20
29.10	0.36	0.41	0.88*	1.19	0.00	1.19
29.15	0.36	0.41	0.88*	1.18	0.00	1.18
29.20	0.36	0.41	0.89*	1.18	0.00	1.18
29.25	0.36	0.41	0.89*	1.17	0.00	1.17
29.30	0.37	0.41	0.89*	1.16	0.00	1.16
29.35	0.37	0.41	0.90*	1.16	0.00	1.16
29.40	0.37	0.41	0.90*	1.15	0.00	1.15
29.45	0.37	0.41	0.91*	1.14	0.00	1.14
29.50	0.37	0.41	0.91*	1.14	0.00	1.14
29.55	0.38	0.41	0.92*	1.13	0.00	1.13
29.60	0.38	0.41	0.92*	1.12	0.00	1.12
29.65	0.38	0.41	0.93*	1.12	0.00	1.12
29.70	0.38	0.41	0.93*	1.11	0.00	1.11
29.75	0.38	0.41	0.94*	1.10	0.00	1.10
29.80	0.39	0.41	0.94*	1.10	0.00	1.10
29.85	0.39	0.41	0.95*	1.09	0.00	1.09
29.90	0.39	0.41	0.95*	1.09	0.00	1.09
29.95	0.39	0.41	0.96*	1.08	0.00	1.08
30.00	0.39	0.41	0.96*	1.07	0.00	1.07
30.05	0.40	0.41	0.97*	1.07	0.00	1.07
30.10	0.40	0.41	0.97*	1.06	0.00	1.06

30.15	0.40	0.41	0.98*	1.06	0.00	1.06
30.20	0.40	0.41	0.98*	1.05	0.00	1.05
30.25	0.41	0.41	0.99*	1.04	0.00	1.04
30.30	0.41	0.41	0.99*	1.04	0.00	1.04
30.35	0.41	0.41	1.00	1.03	0.00	1.03
30.40	0.41	0.41	1.01	1.03	0.00	1.03
30.45	0.42	0.41	1.01	1.03	0.00	1.03
30.50	0.42	0.41	1.02	1.03	0.00	1.03
30.55	0.42	0.41	1.03	1.03	0.00	1.03
30.60	0.43	0.41	1.03	1.03	0.00	1.03
30.65	0.43	0.41	1.04	1.03	0.00	1.03
30.70	0.43	0.41	1.05	1.03	0.00	1.03
30.75	0.43	0.41	1.05	1.03	0.00	1.03
30.80	0.44	0.41	1.06	1.03	0.00	1.03
30.85	0.44	0.41	1.07	1.03	0.00	1.03
30.90	0.44	0.41	1.08	1.03	0.00	1.03
30.95	0.45	0.41	1.09	1.03	0.00	1.03
31.00	0.45	0.41	1.09	1.03	0.00	1.03
31.05	0.45	0.41	1.10	1.03	0.00	1.03
31.10	0.46	0.41	1.11	1.03	0.00	1.03
31.15	0.46	0.41	1.12	1.03	0.00	1.03
31.20	0.47	0.41	1.13	1.03	0.00	1.03
31.25	0.47	0.41	1.14	1.03	0.00	1.03
31.30	0.48	0.41	1.16	1.03	0.00	1.03
31.35	0.48	0.41	1.17	1.03	0.00	1.03
31.40	0.49	0.41	1.18	1.03	0.00	1.03
31.45	0.49	0.41	1.20	1.03	0.00	1.03
31.50	0.50	0.41	1.22	1.03	0.00	1.03
31.55	0.50	0.41	1.21	1.03	0.00	1.03
31.60	0.50	0.41	1.21	1.03	0.00	1.03
31.65	0.50	0.41	1.20	1.03	0.00	1.03
31.70	0.49	0.41	1.20	1.03	0.00	1.03
31.75	0.49	0.41	1.19	1.03	0.00	1.03
31.80	0.49	0.41	1.19	1.03	0.00	1.03
31.85	0.49	0.41	1.18	1.03	0.00	1.03
31.90	0.49	0.41	1.18	1.03	0.00	1.03
31.95	0.48	0.41	1.17	1.03	0.00	1.03
32.00	0.48	0.41	1.17	1.03	0.00	1.03
32.05	0.48	0.41	1.16	1.03	0.00	1.03
32.10	0.48	0.41	1.16	1.03	0.00	1.03
32.15	0.48	0.41	1.15	1.03	0.00	1.03
32.20	0.47	0.41	1.15	1.03	0.00	1.03
32.25	0.47	0.41	1.15	1.03	0.00	1.03
32.30	0.47	0.41	1.14	1.03	0.00	1.03
32.35	0.47	0.41	1.14	1.03	0.00	1.03
32.40	0.47	0.41	1.14	1.03	0.00	1.03
32.45	0.47	0.41	1.13	1.03	0.00	1.03
32.50	0.47	0.41	1.13	1.03	0.00	1.03
32.55	0.46	0.41	1.13	1.03	0.00	1.03
32.60	0.46	0.41	1.12	1.03	0.00	1.03
32.65	0.46	0.41	1.12	1.03	0.00	1.03
32.70	0.46	0.41	1.12	1.03	0.00	1.03
32.75	0.46	0.41	1.11	1.03	0.00	1.03
32.80	0.46	0.41	1.11	1.03	0.00	1.03
32.85	0.46	0.41	1.11	1.03	0.00	1.03
32.90	0.46	0.41	1.10	1.03	0.00	1.03
32.95	0.45	0.41	1.10	1.03	0.00	1.03
33.00	0.45	0.41	1.10	1.03	0.00	1.03
33.05	0.45	0.41	1.10	1.03	0.00	1.03
33.10	0.45	0.41	1.09	1.03	0.00	1.03
33.15	0.45	0.41	1.09	1.03	0.00	1.03
33.20	0.45	0.41	1.09	1.03	0.00	1.03
33.25	0.45	0.41	1.09	1.03	0.00	1.03

33.30	0.45	0.41	1.08	1.03	0.00	1.03
33.35	0.45	0.41	1.08	1.03	0.00	1.03
33.40	0.45	0.41	1.08	1.03	0.00	1.03
33.45	0.44	0.41	1.08	1.03	0.00	1.03
33.50	0.44	0.41	1.07	1.03	0.00	1.03
33.55	0.44	0.41	1.07	1.03	0.00	1.03
33.60	0.44	0.41	1.07	1.03	0.00	1.03
33.65	0.44	0.41	1.07	1.03	0.00	1.03
33.70	0.44	0.41	1.06	1.03	0.00	1.03
33.75	0.44	0.41	1.06	1.03	0.00	1.03
33.80	0.44	0.41	1.06	1.03	0.00	1.03
33.85	0.44	0.41	1.06	1.03	0.00	1.03
33.90	0.44	0.41	1.05	1.03	0.00	1.03
33.95	0.43	0.41	1.05	1.03	0.00	1.03
34.00	0.43	0.41	1.05	1.03	0.00	1.03
34.05	0.43	0.41	1.05	1.03	0.00	1.03
34.10	0.43	0.41	1.05	1.03	0.00	1.03
34.15	0.43	0.41	1.04	1.03	0.00	1.03
34.20	0.43	0.41	1.04	1.03	0.00	1.03
34.25	0.43	0.41	1.04	1.03	0.00	1.03
34.30	0.43	0.41	1.04	1.03	0.00	1.03
34.35	0.43	0.41	1.04	1.03	0.00	1.03
34.40	0.43	0.41	1.03	1.03	0.00	1.03
34.45	0.43	0.41	1.03	1.03	0.00	1.03
34.50	0.43	0.41	1.03	1.03	0.00	1.03
34.55	0.42	0.41	1.03	1.03	0.00	1.03
34.60	0.42	0.41	1.03	1.03	0.00	1.03
34.65	0.42	0.41	1.02	1.03	0.00	1.03
34.70	0.42	0.41	1.02	1.03	0.00	1.03
34.75	0.42	0.41	1.02	1.03	0.00	1.03
34.80	0.42	0.41	1.02	1.03	0.00	1.03
34.85	0.42	0.41	1.02	1.03	0.00	1.03
34.90	0.42	0.41	1.01	1.03	0.00	1.03
34.95	0.42	0.41	1.01	1.03	0.00	1.03
35.00	0.42	0.41	1.01	1.03	0.00	1.03
35.05	0.42	0.41	1.01	1.03	0.00	1.03
35.10	0.42	0.41	1.01	1.03	0.00	1.03
35.15	0.41	0.41	1.00	1.03	0.00	1.03
35.20	0.41	0.41	1.00	1.03	0.00	1.03
35.25	0.41	0.41	1.00	1.03	0.00	1.03
35.30	0.41	0.41	1.00*	1.03	0.00	1.03
35.35	0.41	0.41	1.00*	1.03	0.00	1.03
35.40	0.41	0.41	1.00*	1.02	0.00	1.02
35.45	0.41	0.41	0.99*	1.01	0.00	1.01
35.50	0.41	0.41	0.99*	1.01	0.00	1.01
35.55	0.41	0.41	1.00*	1.00	0.00	1.00
35.60	0.41	0.41	1.00*	1.00	0.00	1.00
35.65	0.41	0.41	0.99*	0.99	0.00	0.99
35.70	0.41	0.41	0.99*	0.98	0.00	0.98
35.75	0.41	0.41	0.99*	0.98	0.00	0.98
35.80	0.41	0.41	0.99*	0.97	0.00	0.97
35.85	0.41	0.41	0.99*	0.97	0.00	0.97
35.90	0.41	0.41	0.98*	0.96	0.00	0.96
35.95	0.41	0.41	0.98*	0.96	0.00	0.96
36.00	0.41	0.41	0.98*	0.95	0.00	0.95
36.05	0.40	0.41	0.98*	0.94	0.00	0.94
36.10	0.40	0.41	0.98*	0.94	0.00	0.94
36.15	0.40	0.41	0.98*	0.93	0.00	0.93
36.20	0.40	0.41	0.97*	0.92	0.00	0.92
36.25	0.40	0.41	0.97*	0.92	0.00	0.92
36.30	0.40	0.41	0.97*	0.91	0.00	0.91
36.35	0.40	0.41	0.97*	0.91	0.00	0.91
36.40	0.40	0.41	0.97*	0.90	0.00	0.90

36.45	0.40	0.41	0.97*	0.89	0.00	0.89
36.50	0.40	0.41	0.96*	0.89	0.00	0.89
36.55	0.40	0.41	0.96*	0.88	0.00	0.88
36.60	0.40	0.41	0.96*	0.88	0.00	0.88
36.65	0.40	0.41	0.96*	0.87	0.00	0.87
36.70	0.40	0.41	0.96*	0.86	0.00	0.86
36.75	0.39	0.41	0.96*	0.86	0.00	0.86
36.80	0.39	0.41	0.96*	0.85	0.00	0.85
36.85	0.39	0.41	0.95*	0.85	0.00	0.85
36.90	0.39	0.41	0.95*	0.84	0.00	0.84
36.95	0.39	0.41	0.95*	0.83	0.00	0.83
37.00	0.39	0.41	0.95*	0.83	0.00	0.83
37.05	0.39	0.41	0.95*	0.82	0.00	0.82
37.10	0.39	0.41	0.95*	0.81	0.00	0.81
37.15	0.39	0.41	0.94*	0.81	0.00	0.81
37.20	0.39	0.41	0.94*	0.80	0.00	0.80
37.25	0.39	0.41	0.94*	0.80	0.00	0.80
37.30	0.39	0.41	0.94*	0.79	0.00	0.79
37.35	0.39	0.41	0.94*	0.78	0.00	0.78
37.40	0.39	0.41	0.94*	0.78	0.00	0.78
37.45	0.39	0.41	0.94*	0.77	0.00	0.77
37.50	0.38	0.41	0.93*	0.76	0.00	0.76
37.55	0.38	0.41	0.93*	0.76	0.00	0.76
37.60	0.38	0.41	0.93*	0.75	0.00	0.75
37.65	0.38	0.41	0.93*	0.75	0.00	0.75
37.70	0.38	0.41	0.93*	0.74	0.00	0.74
37.75	0.38	0.41	0.93*	0.73	0.00	0.73
37.80	0.38	0.41	0.93*	0.73	0.00	0.73
37.85	0.38	0.41	0.92*	0.72	0.00	0.72
37.90	0.38	0.41	0.92*	0.71	0.00	0.71
37.95	0.38	0.41	0.92*	0.71	0.00	0.71
38.00	0.38	0.41	0.92*	0.70	0.00	0.70
38.05	0.38	0.41	0.92*	0.69	0.00	0.69
38.10	0.38	0.41	0.92*	0.69	0.00	0.69
38.15	0.38	0.41	0.92*	0.68	0.00	0.68
38.20	0.38	0.41	0.91*	0.67	0.00	0.67
38.25	0.38	0.41	0.91*	0.67	0.00	0.67
38.30	0.38	0.41	0.91*	0.66	0.00	0.66
38.35	0.37	0.41	0.91*	0.66	0.00	0.66
38.40	0.37	0.41	0.91*	0.65	0.00	0.65
38.45	0.37	0.41	0.91*	0.64	0.00	0.64
38.50	0.37	0.41	0.91*	0.64	0.00	0.64
38.55	0.37	0.41	0.91*	0.63	0.00	0.63
38.60	0.37	0.41	0.90*	0.62	0.00	0.62
38.65	0.37	0.41	0.90*	0.62	0.00	0.62
38.70	0.37	0.41	0.90*	0.61	0.00	0.61
38.75	0.37	0.41	0.90*	0.60	0.00	0.60
38.80	0.37	0.41	0.90*	0.60	0.00	0.60
38.85	0.37	0.41	0.90*	0.59	0.00	0.59
38.90	0.37	0.41	0.90*	0.58	0.00	0.58
38.95	0.37	0.41	0.90*	0.58	0.00	0.58
39.00	0.37	0.41	0.89*	0.57	0.00	0.57
39.05	0.37	0.41	0.89*	0.56	0.00	0.56
39.10	0.37	0.41	0.89*	0.56	0.00	0.56
39.15	0.37	0.41	0.89*	0.55	0.00	0.55
39.20	0.37	0.41	0.89*	0.54	0.00	0.54
39.25	0.36	0.41	0.89*	0.54	0.00	0.54
39.30	0.36	0.41	0.89*	0.53	0.00	0.53
39.35	0.36	0.41	0.89*	0.52	0.00	0.52
39.40	0.36	0.41	0.88*	0.52	0.00	0.52
39.45	0.36	0.41	0.88*	0.51	0.00	0.51
39.50	0.36	0.41	0.88*	0.50	0.00	0.50
39.55	0.36	0.41	0.88*	0.50	0.00	0.50

39.60	0.36	0.41	0.88*	0.49	0.00	0.49
39.65	0.36	0.41	0.88*	0.48	0.00	0.48
39.70	0.36	0.41	0.88*	0.48	0.00	0.48
39.75	0.36	0.41	0.88*	0.47	0.00	0.47
39.80	0.36	0.41	0.87*	0.46	0.00	0.46
39.85	0.36	0.41	0.87*	0.46	0.00	0.46
39.90	0.36	0.41	0.87*	0.45	0.00	0.45
39.95	0.36	0.41	0.87*	0.44	0.00	0.44
40.00	0.36	0.41	0.87*	0.44	0.00	0.44
40.05	0.36	0.41	0.87*	0.43	0.00	0.43
40.10	0.36	0.41	0.87*	0.42	0.00	0.42
40.15	0.36	0.41	0.87*	0.42	0.00	0.42
40.20	0.35	0.41	0.87*	0.41	0.00	0.41
40.25	0.35	0.41	0.86*	0.40	0.00	0.40
40.30	0.35	0.41	0.86*	0.40	0.00	0.40
40.35	0.35	0.41	0.86*	0.39	0.00	0.39
40.40	0.35	0.41	0.86*	0.38	0.00	0.38
40.45	0.35	0.41	0.86*	0.38	0.00	0.38
40.50	0.35	0.41	0.86*	0.37	0.00	0.37
40.55	0.35	0.41	0.86*	0.36	0.00	0.36
40.60	0.35	0.41	0.86*	0.36	0.00	0.36
40.65	0.35	0.41	0.86*	0.35	0.00	0.35
40.70	0.35	0.41	0.85*	0.34	0.00	0.34
40.75	0.35	0.41	0.85*	0.34	0.00	0.34
40.80	0.35	0.41	0.85*	0.33	0.00	0.33
40.85	0.35	0.41	0.85*	0.32	0.00	0.32
40.90	0.35	0.41	0.85*	0.31	0.00	0.31
40.95	0.35	0.41	0.85*	0.31	0.00	0.31
41.00	0.35	0.41	0.85*	0.30	0.00	0.30
41.05	0.35	0.41	0.85*	0.29	0.00	0.29
41.10	0.35	0.41	0.85*	0.29	0.00	0.29
41.15	0.35	0.41	0.85*	0.28	0.00	0.28
41.20	0.35	0.41	0.84*	0.27	0.00	0.27
41.25	0.34	0.41	0.84*	0.27	0.00	0.27
41.30	0.34	0.41	0.84*	0.26	0.00	0.26
41.35	0.34	0.41	0.84*	0.25	0.00	0.25
41.40	0.34	0.41	0.84*	0.25	0.00	0.25
41.45	0.34	0.41	0.84*	0.24	0.00	0.24
41.50	0.34	0.41	0.84*	0.23	0.00	0.23
41.55	0.34	0.41	0.84*	0.22	0.00	0.22
41.60	0.35	0.41	0.85*	0.22	0.00	0.22
41.65	0.35	0.41	0.85*	0.21	0.00	0.21
41.70	0.35	0.41	0.85*	0.20	0.00	0.20
41.75	0.35	0.41	0.86*	0.20	0.00	0.20
41.80	0.35	0.41	0.86*	0.19	0.00	0.19
41.85	0.35	0.41	0.87*	0.18	0.00	0.18
41.90	0.35	0.41	0.87*	0.18	0.00	0.18
41.95	0.36	0.41	0.87*	0.17	0.00	0.17
42.00	0.36	0.41	0.88*	0.16	0.00	0.16
42.05	0.36	0.41	0.88*	0.16	0.00	0.16
42.10	0.36	0.41	0.89*	0.15	0.00	0.15
42.15	0.36	0.41	0.89*	0.14	0.00	0.14
42.20	0.36	0.41	0.90*	0.14	0.00	0.14
42.25	0.37	0.41	0.90*	0.13	0.00	0.13
42.30	0.37	0.41	0.90*	0.12	0.00	0.12
42.35	0.37	0.41	0.91*	0.12	0.00	0.12
42.40	0.37	0.41	0.91*	0.11	0.00	0.11
42.45	0.37	0.41	0.92*	0.10	0.00	0.10
42.50	0.38	0.41	0.92*	0.10	0.00	0.10
42.55	0.38	0.41	0.93*	0.09	0.00	0.09
42.60	0.38	0.41	0.93*	0.08	0.00	0.08
42.65	0.38	0.41	0.94*	0.08	0.00	0.08
42.70	0.38	0.41	0.94*	0.07	0.00	0.07

42.75	0.38	0.41	0.95*	0.07	0.00	0.07
42.80	0.39	0.41	0.95*	0.06	0.00	0.06
42.85	0.39	0.41	0.96*	0.05	0.00	0.05
42.90	0.39	0.41	0.96*	0.05	0.00	0.05
42.95	0.39	0.41	0.97*	0.04	0.00	0.04
43.00	0.39	0.41	0.97*	0.04	0.00	0.04
43.05	0.40	0.41	0.98*	0.03	0.00	0.03
43.10	0.40	0.41	0.98*	0.02	0.00	0.02
43.15	0.40	0.41	0.99*	0.02	0.00	0.02
43.20	0.40	0.41	0.99*	0.01	0.00	0.01
43.25	0.40	0.41	1.00*	0.01	0.00	0.01
43.30	0.41	0.41	1.00	0.00	0.00	0.00
43.35	0.41	0.41	1.01	0.00	0.00	0.00
43.40	0.41	0.41	1.01	0.00	0.00	0.00
43.45	0.41	0.41	1.02	0.00	0.00	0.00
43.50	0.42	0.41	1.03	0.00	0.00	0.00
43.55	0.42	0.41	1.03	0.00	0.00	0.00
43.60	0.42	0.41	1.04	0.00	0.00	0.00
43.65	0.42	0.41	1.05	0.00	0.00	0.00
43.70	0.43	0.41	1.05	0.00	0.00	0.00
43.75	0.43	0.41	1.06	0.00	0.00	0.00
43.80	0.43	0.41	1.07	0.00	0.00	0.00
43.85	0.43	0.41	1.07	0.00	0.00	0.00
43.90	0.44	0.40	1.08	0.00	0.00	0.00
43.95	0.44	0.40	1.09	0.00	0.00	0.00
44.00	0.44	0.40	1.10	0.00	0.00	0.00
44.05	0.45	0.40	1.10	0.00	0.00	0.00
44.10	0.45	0.40	1.11	0.00	0.00	0.00
44.15	0.45	0.40	1.12	0.00	0.00	0.00
44.20	0.46	0.40	1.13	0.00	0.00	0.00
44.25	0.46	0.40	1.14	0.00	0.00	0.00
44.30	0.47	0.40	1.15	0.00	0.00	0.00
44.35	0.47	0.40	1.16	0.00	0.00	0.00
44.40	0.48	0.40	1.18	0.00	0.00	0.00
44.45	0.48	0.40	1.19	0.00	0.00	0.00
44.50	0.49	0.40	1.20	0.00	0.00	0.00
44.55	0.49	0.40	1.22	0.00	0.00	0.00
44.60	0.50	0.40	1.24	0.00	0.00	0.00
44.65	0.51	0.40	1.26	0.00	0.00	0.00
44.70	0.52	0.40	1.29	0.00	0.00	0.00
44.75	0.53	0.40	1.32	0.00	0.00	0.00
44.80	0.55	0.40	1.36	0.00	0.00	0.00
44.85	0.57	0.40	1.41	0.00	0.00	0.00
44.90	0.60	0.40	1.49	0.00	0.00	0.00
44.95	0.61	0.40	1.50	0.00	0.00	0.00
45.00	0.61	0.40	1.50	0.00	0.00	0.00
45.05	0.61	0.40	1.50	0.00	0.00	0.00
45.10	0.61	0.40	1.50	0.00	0.00	0.00
45.15	0.61	0.40	1.50	0.00	0.00	0.00
45.20	0.61	0.40	1.50	0.00	0.00	0.00
45.25	0.61	0.40	1.50	0.00	0.00	0.00
45.30	0.61	0.40	1.50	0.00	0.00	0.00
45.35	0.61	0.40	1.50	0.00	0.00	0.00
45.40	0.61	0.40	1.50	0.00	0.00	0.00
45.45	0.61	0.40	1.50	0.00	0.00	0.00
45.50	0.61	0.40	1.50	0.00	0.00	0.00
45.55	0.61	0.40	1.50	0.00	0.00	0.00
45.60	0.61	0.40	1.51	0.00	0.00	0.00
45.65	0.61	0.40	1.51	0.00	0.00	0.00
45.70	0.61	0.40	1.51	0.00	0.00	0.00
45.75	0.60	0.40	1.51	0.00	0.00	0.00
45.80	0.60	0.40	1.51	0.00	0.00	0.00
45.85	0.60	0.40	1.51	0.00	0.00	0.00

45.90	0.60	0.40	1.51	0.00	0.00	0.00
45.95	0.60	0.40	1.51	0.00	0.00	0.00
46.00	0.60	0.40	1.51	0.00	0.00	0.00
46.05	0.60	0.40	1.51	0.00	0.00	0.00
46.10	0.60	0.40	1.51	0.00	0.00	0.00
46.15	0.60	0.40	1.51	0.00	0.00	0.00
46.20	0.60	0.40	1.51	0.00	0.00	0.00
46.25	0.60	0.40	1.51	0.00	0.00	0.00
46.30	0.60	0.40	1.51	0.00	0.00	0.00
46.35	0.60	0.40	1.51	0.00	0.00	0.00
46.40	0.60	0.40	1.51	0.00	0.00	0.00
46.45	0.60	0.40	1.51	0.00	0.00	0.00
46.50	0.60	0.40	1.51	0.00	0.00	0.00
46.55	0.60	0.40	1.51	0.00	0.00	0.00
46.60	0.60	0.40	1.51	0.00	0.00	0.00
46.65	0.60	0.40	1.51	0.00	0.00	0.00
46.70	0.60	0.40	1.51	0.00	0.00	0.00
46.75	0.60	0.40	1.51	0.00	0.00	0.00
46.80	0.60	0.40	1.51	0.00	0.00	0.00
46.85	0.60	0.40	1.51	0.00	0.00	0.00
46.90	0.60	0.40	1.51	0.00	0.00	0.00
46.95	0.60	0.40	1.51	0.00	0.00	0.00
47.00	0.60	0.40	1.51	0.00	0.00	0.00
47.05	0.60	0.40	1.51	0.00	0.00	0.00
47.10	0.60	0.40	1.51	0.00	0.00	0.00
47.15	0.60	0.40	1.51	0.00	0.00	0.00
47.20	0.60	0.40	1.51	0.00	0.00	0.00
47.25	0.60	0.40	1.51	0.00	0.00	0.00
47.30	0.60	0.40	1.51	0.00	0.00	0.00
47.35	0.60	0.40	1.51	0.00	0.00	0.00
47.40	0.60	0.40	1.51	0.00	0.00	0.00
47.45	0.60	0.40	1.51	0.00	0.00	0.00
47.50	0.60	0.40	1.51	0.00	0.00	0.00
47.55	0.60	0.40	1.51	0.00	0.00	0.00
47.60	0.60	0.40	1.51	0.00	0.00	0.00
47.65	0.60	0.40	1.51	0.00	0.00	0.00
47.70	0.60	0.40	1.51	0.00	0.00	0.00
47.75	0.60	0.40	1.51	0.00	0.00	0.00
47.80	0.60	0.40	1.51	0.00	0.00	0.00
47.85	0.60	0.40	1.51	0.00	0.00	0.00
47.90	0.60	0.40	1.51	0.00	0.00	0.00
47.95	0.60	0.40	1.51	0.00	0.00	0.00
48.00	0.60	0.40	1.51	0.00	0.00	0.00
48.05	0.60	0.40	1.51	0.00	0.00	0.00
48.10	0.60	0.40	1.51	0.00	0.00	0.00
48.15	0.60	0.40	1.51	0.00	0.00	0.00
48.20	0.60	0.40	1.51	0.00	0.00	0.00
48.25	0.60	0.40	1.51	0.00	0.00	0.00
48.30	0.60	0.40	1.51	0.00	0.00	0.00
48.35	0.60	0.40	1.51	0.00	0.00	0.00
48.40	0.60	0.40	1.51	0.00	0.00	0.00
48.45	0.60	0.40	1.51	0.00	0.00	0.00
48.50	0.60	0.40	1.51	0.00	0.00	0.00
48.55	0.60	0.40	1.51	0.00	0.00	0.00
48.60	0.60	0.40	1.51	0.00	0.00	0.00
48.65	0.60	0.40	1.52	0.00	0.00	0.00
48.70	0.60	0.40	1.52	0.00	0.00	0.00
48.75	0.60	0.40	1.52	0.00	0.00	0.00
48.80	0.60	0.40	1.52	0.00	0.00	0.00
48.85	0.60	0.40	1.52	0.00	0.00	0.00
48.90	0.60	0.40	1.52	0.00	0.00	0.00
48.95	0.60	0.40	1.52	0.00	0.00	0.00
49.00	0.60	0.40	1.52	0.00	0.00	0.00

49.05	0.60	0.40	1.52	0.00	0.00	0.00
49.10	0.60	0.40	1.52	0.00	0.00	0.00
49.15	0.60	0.40	1.52	0.00	0.00	0.00
49.20	0.60	0.40	1.52	0.00	0.00	0.00
49.25	0.60	0.39	1.52	0.00	0.00	0.00
49.30	0.60	0.39	1.52	0.00	0.00	0.00
49.35	0.60	0.39	1.52	0.00	0.00	0.00
49.40	0.60	0.39	1.52	0.00	0.00	0.00
49.45	0.60	0.39	1.52	0.00	0.00	0.00
49.50	0.60	0.39	1.52	0.00	0.00	0.00
49.55	0.60	0.39	1.52	0.00	0.00	0.00
49.60	0.60	0.39	1.52	0.00	0.00	0.00
49.65	0.60	0.39	1.52	0.00	0.00	0.00
49.70	0.60	0.39	1.52	0.00	0.00	0.00
49.75	0.60	0.39	1.52	0.00	0.00	0.00
49.80	0.60	0.39	1.52	0.00	0.00	0.00
49.85	0.60	0.39	1.52	0.00	0.00	0.00
49.90	0.60	0.39	1.52	0.00	0.00	0.00
49.95	0.60	0.39	1.52	0.00	0.00	0.00
50.00	0.60	0.39	1.52	0.00	0.00	0.00

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

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

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1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm Cyclic resistance ratio from soils
CSRsf Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat Settlement from saturated sands
S_dry Settlement from Unsaturated Sands
S_all Total Settlement from Saturated and Unsaturated Sands
NoLiq No-Liquefy Soils

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LIQUEFACTION ANALYSIS SUMMARY

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Font: Courier New, Regular, Size 8 is recommended for this report.
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Input File Name: C:\Users\koohi\Desktop\Stanton\B4.liq
Title: Stanton Energy Reliability Center-B4
Subtitle: Stanton, CA

Surface Elev.=68
Hole No.=B4
Depth of Hole= 50.00 ft
Water Table during Earthquake= 15.00 ft
Water Table during In-Situ Testing= 20.00 ft
Max. Acceleration= 0.5 g
Earthquake Magnitude= 6.90

Input Data:
Surface Elev.=68
Hole No.=B4
Depth of Hole=50.00 ft
Water Table during Earthquake= 15.00 ft
Water Table during In-Situ Testing= 20.00 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=6.90
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Tokimatsu/Seed
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: Liq. zone only
6. Hammer Energy Ratio, Ce = 0.8
7. Borehole Diameter, Cb= 1.15
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 %
6.50	26.00	120.00	15.00
16.50	31.00	120.00	15.00
26.50	18.00	124.00	15.00
36.50	22.00	124.00	50.00
46.50	31.00	115.00	50.00

Output Results:
Settlement of Saturated Sands=4.19 in.
Settlement of Unsaturated Sands=0.00 in.
Total Settlement of Saturated and Unsaturated Sands=4.19 in.

Differential Settlement=2.095 to 2.765 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
6.50	0.62	0.32	5.00	4.19	0.00	4.19
6.55	0.62	0.32	5.00	4.19	0.00	4.19
6.60	0.62	0.32	5.00	4.19	0.00	4.19
6.65	0.62	0.32	5.00	4.19	0.00	4.19
6.70	0.62	0.32	5.00	4.19	0.00	4.19
6.75	0.62	0.32	5.00	4.19	0.00	4.19
6.80	0.62	0.32	5.00	4.19	0.00	4.19
6.85	0.62	0.32	5.00	4.19	0.00	4.19
6.90	0.62	0.32	5.00	4.19	0.00	4.19
6.95	0.62	0.32	5.00	4.19	0.00	4.19
7.00	0.62	0.32	5.00	4.19	0.00	4.19
7.05	0.62	0.32	5.00	4.19	0.00	4.19
7.10	0.62	0.32	5.00	4.19	0.00	4.19
7.15	0.62	0.32	5.00	4.19	0.00	4.19
7.20	0.62	0.32	5.00	4.19	0.00	4.19
7.25	0.62	0.32	5.00	4.19	0.00	4.19
7.30	0.62	0.32	5.00	4.19	0.00	4.19
7.35	0.62	0.32	5.00	4.19	0.00	4.19
7.40	0.62	0.32	5.00	4.19	0.00	4.19
7.45	0.62	0.32	5.00	4.19	0.00	4.19
7.50	0.62	0.32	5.00	4.19	0.00	4.19
7.55	0.62	0.32	5.00	4.19	0.00	4.19
7.60	0.62	0.32	5.00	4.19	0.00	4.19
7.65	0.62	0.32	5.00	4.19	0.00	4.19
7.70	0.62	0.32	5.00	4.19	0.00	4.19
7.75	0.61	0.32	5.00	4.19	0.00	4.19
7.80	0.58	0.32	5.00	4.19	0.00	4.19
7.85	0.56	0.32	5.00	4.19	0.00	4.19
7.90	0.55	0.32	5.00	4.19	0.00	4.19
7.95	0.54	0.32	5.00	4.19	0.00	4.19
8.00	0.53	0.32	5.00	4.19	0.00	4.19
8.05	0.52	0.32	5.00	4.19	0.00	4.19
8.10	0.51	0.32	5.00	4.19	0.00	4.19
8.15	0.51	0.32	5.00	4.19	0.00	4.19
8.20	0.50	0.32	5.00	4.19	0.00	4.19
8.25	0.62	0.32	5.00	4.19	0.00	4.19
8.30	0.62	0.32	5.00	4.19	0.00	4.19
8.35	0.62	0.32	5.00	4.19	0.00	4.19
8.40	0.62	0.32	5.00	4.19	0.00	4.19
8.45	0.62	0.32	5.00	4.19	0.00	4.19
8.50	0.62	0.32	5.00	4.19	0.00	4.19
8.55	0.62	0.32	5.00	4.19	0.00	4.19
8.60	0.62	0.32	5.00	4.19	0.00	4.19
8.65	0.62	0.32	5.00	4.19	0.00	4.19
8.70	0.62	0.32	5.00	4.19	0.00	4.19
8.75	0.62	0.32	5.00	4.19	0.00	4.19
8.80	0.62	0.32	5.00	4.19	0.00	4.19
8.85	0.62	0.32	5.00	4.19	0.00	4.19
8.90	0.62	0.32	5.00	4.19	0.00	4.19
8.95	0.62	0.32	5.00	4.19	0.00	4.19
9.00	0.62	0.32	5.00	4.19	0.00	4.19
9.05	0.62	0.32	5.00	4.19	0.00	4.19
9.10	0.62	0.32	5.00	4.19	0.00	4.19
9.15	0.62	0.32	5.00	4.19	0.00	4.19
9.20	0.62	0.32	5.00	4.19	0.00	4.19
9.25	0.62	0.32	5.00	4.19	0.00	4.19
9.30	0.62	0.32	5.00	4.19	0.00	4.19
9.35	0.62	0.32	5.00	4.19	0.00	4.19

9.40	0.62	0.32	5.00	4.19	0.00	4.19
9.45	0.62	0.32	5.00	4.19	0.00	4.19
9.50	0.62	0.32	5.00	4.19	0.00	4.19
9.55	0.62	0.32	5.00	4.19	0.00	4.19
9.60	0.62	0.32	5.00	4.19	0.00	4.19
9.65	0.62	0.32	5.00	4.19	0.00	4.19
9.70	0.62	0.32	5.00	4.19	0.00	4.19
9.75	0.62	0.32	5.00	4.19	0.00	4.19
9.80	0.62	0.32	5.00	4.19	0.00	4.19
9.85	0.62	0.32	5.00	4.19	0.00	4.19
9.90	0.62	0.32	5.00	4.19	0.00	4.19
9.95	0.62	0.32	5.00	4.19	0.00	4.19
10.00	0.62	0.32	5.00	4.19	0.00	4.19
10.05	0.62	0.32	5.00	4.19	0.00	4.19
10.10	0.62	0.32	5.00	4.19	0.00	4.19
10.15	0.62	0.32	5.00	4.19	0.00	4.19
10.20	0.62	0.32	5.00	4.19	0.00	4.19
10.25	0.62	0.32	5.00	4.19	0.00	4.19
10.30	0.62	0.32	5.00	4.19	0.00	4.19
10.35	0.62	0.32	5.00	4.19	0.00	4.19
10.40	0.62	0.32	5.00	4.19	0.00	4.19
10.45	0.62	0.32	5.00	4.19	0.00	4.19
10.50	0.62	0.32	5.00	4.19	0.00	4.19
10.55	0.62	0.32	5.00	4.19	0.00	4.19
10.60	0.62	0.32	5.00	4.19	0.00	4.19
10.65	0.62	0.32	5.00	4.19	0.00	4.19
10.70	0.62	0.32	5.00	4.19	0.00	4.19
10.75	0.62	0.32	5.00	4.19	0.00	4.19
10.80	0.62	0.32	5.00	4.19	0.00	4.19
10.85	0.62	0.32	5.00	4.19	0.00	4.19
10.90	0.62	0.32	5.00	4.19	0.00	4.19
10.95	0.62	0.32	5.00	4.19	0.00	4.19
11.00	0.62	0.32	5.00	4.19	0.00	4.19
11.05	0.62	0.32	5.00	4.19	0.00	4.19
11.10	0.62	0.32	5.00	4.19	0.00	4.19
11.15	0.62	0.32	5.00	4.19	0.00	4.19
11.20	0.62	0.32	5.00	4.19	0.00	4.19
11.25	0.62	0.32	5.00	4.19	0.00	4.19
11.30	0.62	0.32	5.00	4.19	0.00	4.19
11.35	0.61	0.32	5.00	4.19	0.00	4.19
11.40	0.59	0.32	5.00	4.19	0.00	4.19
11.45	0.58	0.32	5.00	4.19	0.00	4.19
11.50	0.57	0.32	5.00	4.19	0.00	4.19
11.55	0.56	0.32	5.00	4.19	0.00	4.19
11.60	0.55	0.32	5.00	4.19	0.00	4.19
11.65	0.54	0.32	5.00	4.19	0.00	4.19
11.70	0.54	0.32	5.00	4.19	0.00	4.19
11.75	0.53	0.32	5.00	4.19	0.00	4.19
11.80	0.53	0.32	5.00	4.19	0.00	4.19
11.85	0.52	0.32	5.00	4.19	0.00	4.19
11.90	0.52	0.32	5.00	4.19	0.00	4.19
11.95	0.51	0.32	5.00	4.19	0.00	4.19
12.00	0.51	0.32	5.00	4.19	0.00	4.19
12.05	0.51	0.32	5.00	4.19	0.00	4.19
12.10	0.50	0.32	5.00	4.19	0.00	4.19
12.15	0.50	0.32	5.00	4.19	0.00	4.19
12.20	0.50	0.32	5.00	4.19	0.00	4.19
12.25	0.49	0.32	5.00	4.19	0.00	4.19
12.30	0.49	0.32	5.00	4.19	0.00	4.19
12.35	0.49	0.32	5.00	4.19	0.00	4.19
12.40	0.49	0.32	5.00	4.19	0.00	4.19
12.45	0.49	0.32	5.00	4.19	0.00	4.19
12.50	0.48	0.32	5.00	4.19	0.00	4.19

12.55	0.48	0.32	5.00	4.19	0.00	4.19
12.60	0.48	0.32	5.00	4.19	0.00	4.19
12.65	0.48	0.32	5.00	4.19	0.00	4.19
12.70	0.48	0.32	5.00	4.19	0.00	4.19
12.75	0.47	0.32	5.00	4.19	0.00	4.19
12.80	0.47	0.32	5.00	4.19	0.00	4.19
12.85	0.47	0.32	5.00	4.19	0.00	4.19
12.90	0.47	0.32	5.00	4.19	0.00	4.19
12.95	0.47	0.32	5.00	4.19	0.00	4.19
13.00	0.47	0.32	5.00	4.19	0.00	4.19
13.05	0.46	0.32	5.00	4.19	0.00	4.19
13.10	0.46	0.32	5.00	4.19	0.00	4.19
13.15	0.46	0.32	5.00	4.19	0.00	4.19
13.20	0.46	0.31	5.00	4.19	0.00	4.19
13.25	0.46	0.31	5.00	4.19	0.00	4.19
13.30	0.46	0.31	5.00	4.19	0.00	4.19
13.35	0.46	0.31	5.00	4.19	0.00	4.19
13.40	0.46	0.31	5.00	4.19	0.00	4.19
13.45	0.45	0.31	5.00	4.19	0.00	4.19
13.50	0.45	0.31	5.00	4.19	0.00	4.19
13.55	0.45	0.31	5.00	4.19	0.00	4.19
13.60	0.45	0.31	5.00	4.19	0.00	4.19
13.65	0.45	0.31	5.00	4.19	0.00	4.19
13.70	0.45	0.31	5.00	4.19	0.00	4.19
13.75	0.45	0.31	5.00	4.19	0.00	4.19
13.80	0.45	0.31	5.00	4.19	0.00	4.19
13.85	0.45	0.31	5.00	4.19	0.00	4.19
13.90	0.44	0.31	5.00	4.19	0.00	4.19
13.95	0.44	0.31	5.00	4.19	0.00	4.19
14.00	0.44	0.31	5.00	4.19	0.00	4.19
14.05	0.44	0.31	5.00	4.19	0.00	4.19
14.10	0.44	0.31	5.00	4.19	0.00	4.19
14.15	0.44	0.31	5.00	4.19	0.00	4.19
14.20	0.44	0.31	5.00	4.19	0.00	4.19
14.25	0.44	0.31	5.00	4.19	0.00	4.19
14.30	0.44	0.31	5.00	4.19	0.00	4.19
14.35	0.44	0.31	5.00	4.19	0.00	4.19
14.40	0.44	0.31	5.00	4.19	0.00	4.19
14.45	0.43	0.31	5.00	4.19	0.00	4.19
14.50	0.43	0.31	5.00	4.19	0.00	4.19
14.55	0.43	0.31	5.00	4.19	0.00	4.19
14.60	0.43	0.31	5.00	4.19	0.00	4.19
14.65	0.43	0.31	5.00	4.19	0.00	4.19
14.70	0.43	0.31	5.00	4.19	0.00	4.19
14.75	0.43	0.31	5.00	4.19	0.00	4.19
14.80	0.62	0.31	5.00	4.19	0.00	4.19
14.85	0.62	0.31	5.00	4.19	0.00	4.19
14.90	0.62	0.31	5.00	4.19	0.00	4.19
14.95	0.62	0.31	5.00	4.19	0.00	4.19
15.00	0.62	0.31	1.97	4.19	0.00	4.19
15.05	0.62	0.31	1.97	4.19	0.00	4.19
15.10	0.62	0.31	1.97	4.19	0.00	4.19
15.15	0.62	0.32	1.96	4.19	0.00	4.19
15.20	0.62	0.32	1.96	4.19	0.00	4.19
15.25	0.62	0.32	1.96	4.19	0.00	4.19
15.30	0.62	0.32	1.95	4.19	0.00	4.19
15.35	0.62	0.32	1.95	4.19	0.00	4.19
15.40	0.62	0.32	1.95	4.19	0.00	4.19
15.45	0.62	0.32	1.95	4.19	0.00	4.19
15.50	0.62	0.32	1.94	4.19	0.00	4.19
15.55	0.62	0.32	1.94	4.19	0.00	4.19
15.60	0.62	0.32	1.94	4.19	0.00	4.19
15.65	0.62	0.32	1.93	4.19	0.00	4.19

15.70	0.62	0.32	1.93	4.19	0.00	4.19
15.75	0.62	0.32	1.93	4.19	0.00	4.19
15.80	0.62	0.32	1.92	4.19	0.00	4.19
15.85	0.62	0.32	1.92	4.19	0.00	4.19
15.90	0.62	0.32	1.92	4.19	0.00	4.19
15.95	0.62	0.32	1.92	4.19	0.00	4.19
16.00	0.62	0.32	1.91	4.19	0.00	4.19
16.05	0.62	0.32	1.91	4.19	0.00	4.19
16.10	0.62	0.32	1.91	4.19	0.00	4.19
16.15	0.62	0.32	1.91	4.19	0.00	4.19
16.20	0.62	0.33	1.90	4.19	0.00	4.19
16.25	0.62	0.33	1.90	4.19	0.00	4.19
16.30	0.62	0.33	1.90	4.19	0.00	4.19
16.35	0.62	0.33	1.89	4.19	0.00	4.19
16.40	0.62	0.33	1.89	4.19	0.00	4.19
16.45	0.62	0.33	1.89	4.19	0.00	4.19
16.50	0.62	0.33	1.89	4.19	0.00	4.19
16.55	0.62	0.33	1.88	4.19	0.00	4.19
16.60	0.62	0.33	1.88	4.19	0.00	4.19
16.65	0.61	0.33	1.85	4.19	0.00	4.19
16.70	0.57	0.33	1.73	4.19	0.00	4.19
16.75	0.55	0.33	1.65	4.19	0.00	4.19
16.80	0.53	0.33	1.60	4.19	0.00	4.19
16.85	0.52	0.33	1.56	4.19	0.00	4.19
16.90	0.51	0.33	1.52	4.19	0.00	4.19
16.95	0.50	0.33	1.50	4.19	0.00	4.19
17.00	0.49	0.33	1.47	4.19	0.00	4.19
17.05	0.48	0.33	1.45	4.19	0.00	4.19
17.10	0.48	0.33	1.43	4.19	0.00	4.19
17.15	0.47	0.33	1.41	4.19	0.00	4.19
17.20	0.47	0.33	1.39	4.19	0.00	4.19
17.25	0.46	0.33	1.38	4.19	0.00	4.19
17.30	0.46	0.34	1.36	4.19	0.00	4.19
17.35	0.45	0.34	1.35	4.19	0.00	4.19
17.40	0.45	0.34	1.33	4.19	0.00	4.19
17.45	0.44	0.34	1.32	4.19	0.00	4.19
17.50	0.44	0.34	1.31	4.19	0.00	4.19
17.55	0.44	0.34	1.30	4.19	0.00	4.19
17.60	0.43	0.34	1.28	4.19	0.00	4.19
17.65	0.43	0.34	1.27	4.19	0.00	4.19
17.70	0.43	0.34	1.26	4.19	0.00	4.19
17.75	0.42	0.34	1.25	4.19	0.00	4.19
17.80	0.42	0.34	1.24	4.19	0.00	4.19
17.85	0.42	0.34	1.23	4.19	0.00	4.19
17.90	0.42	0.34	1.22	4.19	0.00	4.19
17.95	0.41	0.34	1.21	4.19	0.00	4.19
18.00	0.41	0.34	1.20	4.19	0.00	4.19
18.05	0.41	0.34	1.19	4.19	0.00	4.19
18.10	0.40	0.34	1.18	4.19	0.00	4.19
18.15	0.40	0.34	1.18	4.19	0.00	4.19
18.20	0.40	0.34	1.17	4.19	0.00	4.19
18.25	0.40	0.34	1.16	4.19	0.00	4.19
18.30	0.39	0.34	1.15	4.19	0.00	4.19
18.35	0.39	0.34	1.14	4.19	0.00	4.19
18.40	0.39	0.34	1.13	4.19	0.00	4.19
18.45	0.39	0.34	1.13	4.19	0.00	4.19
18.50	0.39	0.34	1.12	4.19	0.00	4.19
18.55	0.38	0.35	1.11	4.19	0.00	4.19
18.60	0.38	0.35	1.10	4.19	0.00	4.19
18.65	0.38	0.35	1.10	4.19	0.00	4.19
18.70	0.38	0.35	1.09	4.19	0.00	4.19
18.75	0.38	0.35	1.08	4.19	0.00	4.19
18.80	0.37	0.35	1.08	4.19	0.00	4.19

18.85	0.37	0.35	1.07	4.19	0.00	4.19
18.90	0.37	0.35	1.06	4.19	0.00	4.19
18.95	0.37	0.35	1.06	4.19	0.00	4.19
19.00	0.37	0.35	1.05	4.19	0.00	4.19
19.05	0.36	0.35	1.04	4.19	0.00	4.19
19.10	0.36	0.35	1.04	4.19	0.00	4.19
19.15	0.36	0.35	1.03	4.19	0.00	4.19
19.20	0.36	0.35	1.02	4.19	0.00	4.19
19.25	0.36	0.35	1.02	4.19	0.00	4.19
19.30	0.35	0.35	1.01	4.19	0.00	4.19
19.35	0.35	0.35	1.01	4.19	0.00	4.19
19.40	0.35	0.35	1.00*	4.19	0.00	4.19
19.45	0.35	0.35	0.99*	4.18	0.00	4.18
19.50	0.35	0.35	0.99*	4.18	0.00	4.18
19.55	0.35	0.35	0.98*	4.17	0.00	4.17
19.60	0.34	0.35	0.98*	4.16	0.00	4.16
19.65	0.34	0.35	0.97*	4.16	0.00	4.16
19.70	0.34	0.35	0.97*	4.15	0.00	4.15
19.75	0.34	0.35	0.96*	4.14	0.00	4.14
19.80	0.34	0.35	0.95*	4.14	0.00	4.14
19.85	0.34	0.36	0.95*	4.13	0.00	4.13
19.90	0.34	0.36	0.94*	4.12	0.00	4.12
19.95	0.33	0.36	0.94*	4.12	0.00	4.12
20.00	0.33	0.36	0.93*	4.11	0.00	4.11
20.05	0.33	0.36	0.93*	4.10	0.00	4.10
20.10	0.33	0.36	0.92*	4.09	0.00	4.09
20.15	0.33	0.36	0.92*	4.09	0.00	4.09
20.20	0.33	0.36	0.92*	4.08	0.00	4.08
20.25	0.33	0.36	0.91*	4.07	0.00	4.07
20.30	0.33	0.36	0.91*	4.07	0.00	4.07
20.35	0.32	0.36	0.90*	4.06	0.00	4.06
20.40	0.32	0.36	0.90*	4.05	0.00	4.05
20.45	0.32	0.36	0.90*	4.04	0.00	4.04
20.50	0.32	0.36	0.89*	4.04	0.00	4.04
20.55	0.32	0.36	0.89*	4.03	0.00	4.03
20.60	0.32	0.36	0.88*	4.02	0.00	4.02
20.65	0.32	0.36	0.88*	4.02	0.00	4.02
20.70	0.32	0.36	0.88*	4.01	0.00	4.01
20.75	0.31	0.36	0.87*	4.00	0.00	4.00
20.80	0.31	0.36	0.87*	3.99	0.00	3.99
20.85	0.31	0.36	0.86*	3.99	0.00	3.99
20.90	0.31	0.36	0.86*	3.98	0.00	3.98
20.95	0.31	0.36	0.86*	3.97	0.00	3.97
21.00	0.31	0.36	0.85*	3.96	0.00	3.96
21.05	0.31	0.36	0.85*	3.95	0.00	3.95
21.10	0.31	0.36	0.85*	3.95	0.00	3.95
21.15	0.31	0.36	0.84*	3.94	0.00	3.94
21.20	0.31	0.36	0.84*	3.93	0.00	3.93
21.25	0.30	0.36	0.83*	3.92	0.00	3.92
21.30	0.30	0.36	0.83*	3.92	0.00	3.92
21.35	0.30	0.37	0.83*	3.91	0.00	3.91
21.40	0.30	0.37	0.82*	3.90	0.00	3.90
21.45	0.30	0.37	0.82*	3.89	0.00	3.89
21.50	0.30	0.37	0.82*	3.88	0.00	3.88
21.55	0.30	0.37	0.81*	3.88	0.00	3.88
21.60	0.30	0.37	0.81*	3.87	0.00	3.87
21.65	0.30	0.37	0.81*	3.86	0.00	3.86
21.70	0.30	0.37	0.80*	3.85	0.00	3.85
21.75	0.29	0.37	0.80*	3.84	0.00	3.84
21.80	0.29	0.37	0.80*	3.84	0.00	3.84
21.85	0.29	0.37	0.79*	3.83	0.00	3.83
21.90	0.29	0.37	0.79*	3.82	0.00	3.82
21.95	0.29	0.37	0.79*	3.81	0.00	3.81

22.00	0.29	0.37	0.78*	3.80	0.00	3.80
22.05	0.29	0.37	0.78*	3.80	0.00	3.80
22.10	0.29	0.37	0.78*	3.79	0.00	3.79
22.15	0.29	0.37	0.77*	3.78	0.00	3.78
22.20	0.29	0.37	0.77*	3.77	0.00	3.77
22.25	0.28	0.37	0.77*	3.76	0.00	3.76
22.30	0.28	0.37	0.76*	3.75	0.00	3.75
22.35	0.28	0.37	0.76*	3.75	0.00	3.75
22.40	0.28	0.37	0.76*	3.74	0.00	3.74
22.45	0.28	0.37	0.75*	3.73	0.00	3.73
22.50	0.28	0.37	0.75*	3.72	0.00	3.72
22.55	0.28	0.37	0.75*	3.71	0.00	3.71
22.60	0.28	0.37	0.75*	3.70	0.00	3.70
22.65	0.28	0.37	0.74*	3.69	0.00	3.69
22.70	0.28	0.37	0.74*	3.69	0.00	3.69
22.75	0.28	0.37	0.74*	3.68	0.00	3.68
22.80	0.27	0.37	0.73*	3.67	0.00	3.67
22.85	0.27	0.37	0.73*	3.66	0.00	3.66
22.90	0.27	0.37	0.73*	3.65	0.00	3.65
22.95	0.27	0.37	0.72*	3.64	0.00	3.64
23.00	0.27	0.38	0.72*	3.63	0.00	3.63
23.05	0.27	0.38	0.72*	3.63	0.00	3.63
23.10	0.27	0.38	0.72*	3.62	0.00	3.62
23.15	0.27	0.38	0.71*	3.61	0.00	3.61
23.20	0.27	0.38	0.71*	3.60	0.00	3.60
23.25	0.27	0.38	0.71*	3.59	0.00	3.59
23.30	0.27	0.38	0.70*	3.58	0.00	3.58
23.35	0.26	0.38	0.70*	3.57	0.00	3.57
23.40	0.26	0.38	0.70*	3.56	0.00	3.56
23.45	0.26	0.38	0.70*	3.55	0.00	3.55
23.50	0.26	0.38	0.69*	3.55	0.00	3.55
23.55	0.26	0.38	0.69*	3.54	0.00	3.54
23.60	0.26	0.38	0.69*	3.53	0.00	3.53
23.65	0.26	0.38	0.69*	3.52	0.00	3.52
23.70	0.26	0.38	0.68*	3.51	0.00	3.51
23.75	0.26	0.38	0.68*	3.50	0.00	3.50
23.80	0.26	0.38	0.68*	3.49	0.00	3.49
23.85	0.26	0.38	0.67*	3.48	0.00	3.48
23.90	0.26	0.38	0.67*	3.47	0.00	3.47
23.95	0.25	0.38	0.67*	3.46	0.00	3.46
24.00	0.25	0.38	0.67*	3.45	0.00	3.45
24.05	0.25	0.38	0.66*	3.44	0.00	3.44
24.10	0.25	0.38	0.66*	3.43	0.00	3.43
24.15	0.25	0.38	0.66*	3.42	0.00	3.42
24.20	0.25	0.38	0.66*	3.42	0.00	3.42
24.25	0.25	0.38	0.65*	3.41	0.00	3.41
24.30	0.25	0.38	0.65*	3.40	0.00	3.40
24.35	0.25	0.38	0.65*	3.39	0.00	3.39
24.40	0.25	0.38	0.65*	3.38	0.00	3.38
24.45	0.25	0.38	0.64*	3.37	0.00	3.37
24.50	0.25	0.38	0.64*	3.36	0.00	3.36
24.55	0.25	0.38	0.64*	3.35	0.00	3.35
24.60	0.24	0.38	0.64*	3.34	0.00	3.34
24.65	0.24	0.38	0.63*	3.33	0.00	3.33
24.70	0.24	0.38	0.63*	3.32	0.00	3.32
24.75	0.24	0.38	0.63*	3.31	0.00	3.31
24.80	0.24	0.38	0.63*	3.30	0.00	3.30
24.85	0.24	0.39	0.62*	3.29	0.00	3.29
24.90	0.24	0.39	0.62*	3.28	0.00	3.28
24.95	0.24	0.39	0.62*	3.27	0.00	3.27
25.00	0.24	0.39	0.62*	3.26	0.00	3.26
25.05	0.24	0.39	0.61*	3.25	0.00	3.25
25.10	0.24	0.39	0.61*	3.24	0.00	3.24

25.15	0.24	0.39	0.61*	3.23	0.00	3.23
25.20	0.23	0.39	0.61*	3.22	0.00	3.22
25.25	0.23	0.39	0.60*	3.21	0.00	3.21
25.30	0.23	0.39	0.60*	3.20	0.00	3.20
25.35	0.23	0.39	0.60*	3.19	0.00	3.19
25.40	0.23	0.39	0.60*	3.18	0.00	3.18
25.45	0.23	0.39	0.59*	3.17	0.00	3.17
25.50	0.23	0.39	0.59*	3.16	0.00	3.16
25.55	0.23	0.39	0.59*	3.15	0.00	3.15
25.60	0.23	0.39	0.59*	3.14	0.00	3.14
25.65	0.23	0.39	0.59*	3.13	0.00	3.13
25.70	0.23	0.39	0.58*	3.12	0.00	3.12
25.75	0.23	0.39	0.58*	3.11	0.00	3.11
25.80	0.23	0.39	0.58*	3.10	0.00	3.10
25.85	0.22	0.39	0.58*	3.09	0.00	3.09
25.90	0.22	0.39	0.57*	3.07	0.00	3.07
25.95	0.22	0.39	0.57*	3.06	0.00	3.06
26.00	0.22	0.39	0.57*	3.05	0.00	3.05
26.05	0.22	0.39	0.57*	3.04	0.00	3.04
26.10	0.22	0.39	0.56*	3.03	0.00	3.03
26.15	0.22	0.39	0.56*	3.02	0.00	3.02
26.20	0.22	0.39	0.56*	3.01	0.00	3.01
26.25	0.22	0.39	0.56*	3.00	0.00	3.00
26.30	0.22	0.39	0.56*	2.99	0.00	2.99
26.35	0.22	0.39	0.55*	2.98	0.00	2.98
26.40	0.22	0.39	0.55*	2.97	0.00	2.97
26.45	0.22	0.39	0.55*	2.96	0.00	2.96
26.50	0.21	0.39	0.55*	2.95	0.00	2.95
26.55	0.22	0.39	0.55*	2.94	0.00	2.94
26.60	0.22	0.39	0.55*	2.92	0.00	2.92
26.65	0.22	0.39	0.55*	2.91	0.00	2.91
26.70	0.22	0.39	0.55*	2.90	0.00	2.90
26.75	0.22	0.39	0.55*	2.89	0.00	2.89
26.80	0.22	0.39	0.56*	2.88	0.00	2.88
26.85	0.22	0.39	0.56*	2.87	0.00	2.87
26.90	0.22	0.39	0.56*	2.86	0.00	2.86
26.95	0.22	0.40	0.56*	2.85	0.00	2.85
27.00	0.22	0.40	0.56*	2.84	0.00	2.84
27.05	0.22	0.40	0.56*	2.83	0.00	2.83
27.10	0.22	0.40	0.56*	2.82	0.00	2.82
27.15	0.22	0.40	0.56*	2.81	0.00	2.81
27.20	0.22	0.40	0.57*	2.80	0.00	2.80
27.25	0.22	0.40	0.57*	2.79	0.00	2.79
27.30	0.23	0.40	0.57*	2.78	0.00	2.78
27.35	0.23	0.40	0.57*	2.76	0.00	2.76
27.40	0.23	0.40	0.57*	2.75	0.00	2.75
27.45	0.23	0.40	0.57*	2.74	0.00	2.74
27.50	0.23	0.40	0.57*	2.73	0.00	2.73
27.55	0.23	0.40	0.58*	2.72	0.00	2.72
27.60	0.23	0.40	0.58*	2.71	0.00	2.71
27.65	0.23	0.40	0.58*	2.70	0.00	2.70
27.70	0.23	0.40	0.58*	2.69	0.00	2.69
27.75	0.23	0.40	0.58*	2.68	0.00	2.68
27.80	0.23	0.40	0.58*	2.67	0.00	2.67
27.85	0.23	0.40	0.58*	2.66	0.00	2.66
27.90	0.24	0.40	0.61*	2.65	0.00	2.65
27.95	0.24	0.40	0.61*	2.64	0.00	2.64
28.00	0.24	0.40	0.61*	2.63	0.00	2.63
28.05	0.25	0.40	0.61*	2.62	0.00	2.62
28.10	0.25	0.40	0.61*	2.61	0.00	2.61
28.15	0.25	0.40	0.62*	2.60	0.00	2.60
28.20	0.25	0.40	0.62*	2.59	0.00	2.59
28.25	0.25	0.40	0.62*	2.58	0.00	2.58

28.30	0.25	0.40	0.62*	2.57	0.00	2.57
28.35	0.25	0.40	0.62*	2.56	0.00	2.56
28.40	0.25	0.40	0.62*	2.55	0.00	2.55
28.45	0.25	0.40	0.62*	2.54	0.00	2.54
28.50	0.25	0.40	0.63*	2.54	0.00	2.54
28.55	0.25	0.40	0.63*	2.53	0.00	2.53
28.60	0.25	0.40	0.63*	2.52	0.00	2.52
28.65	0.25	0.40	0.63*	2.51	0.00	2.51
28.70	0.25	0.40	0.63*	2.50	0.00	2.50
28.75	0.25	0.40	0.63*	2.49	0.00	2.49
28.80	0.26	0.40	0.63*	2.48	0.00	2.48
28.85	0.26	0.40	0.63*	2.47	0.00	2.47
28.90	0.26	0.40	0.64*	2.46	0.00	2.46
28.95	0.26	0.40	0.64*	2.45	0.00	2.45
29.00	0.26	0.40	0.64*	2.44	0.00	2.44
29.05	0.26	0.40	0.64*	2.43	0.00	2.43
29.10	0.26	0.40	0.64*	2.42	0.00	2.42
29.15	0.26	0.40	0.64*	2.41	0.00	2.41
29.20	0.26	0.40	0.64*	2.40	0.00	2.40
29.25	0.26	0.40	0.65*	2.39	0.00	2.39
29.30	0.26	0.40	0.65*	2.39	0.00	2.39
29.35	0.26	0.40	0.65*	2.38	0.00	2.38
29.40	0.26	0.40	0.65*	2.37	0.00	2.37
29.45	0.26	0.41	0.65*	2.36	0.00	2.36
29.50	0.26	0.41	0.65*	2.35	0.00	2.35
29.55	0.27	0.41	0.65*	2.34	0.00	2.34
29.60	0.27	0.41	0.66*	2.33	0.00	2.33
29.65	0.27	0.41	0.66*	2.32	0.00	2.32
29.70	0.27	0.41	0.66*	2.31	0.00	2.31
29.75	0.27	0.41	0.66*	2.30	0.00	2.30
29.80	0.27	0.41	0.66*	2.30	0.00	2.30
29.85	0.27	0.41	0.66*	2.29	0.00	2.29
29.90	0.27	0.41	0.66*	2.28	0.00	2.28
29.95	0.27	0.41	0.67*	2.27	0.00	2.27
30.00	0.27	0.41	0.67*	2.26	0.00	2.26
30.05	0.27	0.41	0.67*	2.25	0.00	2.25
30.10	0.27	0.41	0.67*	2.24	0.00	2.24
30.15	0.27	0.41	0.67*	2.23	0.00	2.23
30.20	0.27	0.41	0.67*	2.22	0.00	2.22
30.25	0.28	0.41	0.68*	2.22	0.00	2.22
30.30	0.28	0.41	0.68*	2.21	0.00	2.21
30.35	0.28	0.41	0.68*	2.20	0.00	2.20
30.40	0.28	0.41	0.68*	2.19	0.00	2.19
30.45	0.28	0.41	0.68*	2.18	0.00	2.18
30.50	0.28	0.41	0.68*	2.17	0.00	2.17
30.55	0.28	0.41	0.69*	2.16	0.00	2.16
30.60	0.28	0.41	0.69*	2.16	0.00	2.16
30.65	0.28	0.41	0.69*	2.15	0.00	2.15
30.70	0.28	0.41	0.69*	2.14	0.00	2.14
30.75	0.28	0.41	0.69*	2.13	0.00	2.13
30.80	0.28	0.41	0.69*	2.12	0.00	2.12
30.85	0.28	0.41	0.70*	2.11	0.00	2.11
30.90	0.28	0.41	0.70*	2.10	0.00	2.10
30.95	0.29	0.41	0.70*	2.10	0.00	2.10
31.00	0.29	0.41	0.70*	2.09	0.00	2.09
31.05	0.29	0.41	0.70*	2.08	0.00	2.08
31.10	0.29	0.41	0.71*	2.07	0.00	2.07
31.15	0.29	0.41	0.71*	2.06	0.00	2.06
31.20	0.29	0.41	0.71*	2.05	0.00	2.05
31.25	0.29	0.41	0.71*	2.05	0.00	2.05
31.30	0.29	0.41	0.71*	2.04	0.00	2.04
31.35	0.29	0.41	0.71*	2.03	0.00	2.03
31.40	0.29	0.41	0.72*	2.02	0.00	2.02

31.45	0.29	0.41	0.72*	2.01	0.00	2.01
31.50	0.29	0.41	0.72*	2.00	0.00	2.00
31.55	0.29	0.41	0.72*	2.00	0.00	2.00
31.60	0.30	0.41	0.72*	1.99	0.00	1.99
31.65	0.30	0.41	0.73*	1.98	0.00	1.98
31.70	0.30	0.41	0.73*	1.97	0.00	1.97
31.75	0.30	0.41	0.73*	1.96	0.00	1.96
31.80	0.30	0.41	0.73*	1.95	0.00	1.95
31.85	0.30	0.41	0.73*	1.95	0.00	1.95
31.90	0.30	0.41	0.73*	1.94	0.00	1.94
31.95	0.30	0.41	0.74*	1.93	0.00	1.93
32.00	0.30	0.41	0.74*	1.92	0.00	1.92
32.05	0.30	0.41	0.74*	1.91	0.00	1.91
32.10	0.30	0.41	0.74*	1.91	0.00	1.91
32.15	0.30	0.41	0.74*	1.90	0.00	1.90
32.20	0.30	0.41	0.75*	1.89	0.00	1.89
32.25	0.31	0.41	0.75*	1.88	0.00	1.88
32.30	0.31	0.41	0.75*	1.87	0.00	1.87
32.35	0.31	0.41	0.75*	1.87	0.00	1.87
32.40	0.31	0.41	0.75*	1.86	0.00	1.86
32.45	0.31	0.41	0.75*	1.85	0.00	1.85
32.50	0.31	0.41	0.75*	1.84	0.00	1.84
32.55	0.31	0.41	0.75*	1.83	0.00	1.83
32.60	0.31	0.41	0.75*	1.83	0.00	1.83
32.65	0.31	0.41	0.75*	1.82	0.00	1.82
32.70	0.31	0.41	0.75*	1.81	0.00	1.81
32.75	0.31	0.41	0.75*	1.80	0.00	1.80
32.80	0.31	0.41	0.75*	1.80	0.00	1.80
32.85	0.31	0.41	0.75*	1.79	0.00	1.79
32.90	0.31	0.41	0.75*	1.78	0.00	1.78
32.95	0.31	0.41	0.75*	1.77	0.00	1.77
33.00	0.31	0.41	0.75*	1.76	0.00	1.76
33.05	0.31	0.41	0.75*	1.76	0.00	1.76
33.10	0.31	0.41	0.75*	1.75	0.00	1.75
33.15	0.31	0.41	0.75*	1.74	0.00	1.74
33.20	0.31	0.41	0.75*	1.73	0.00	1.73
33.25	0.31	0.41	0.75*	1.72	0.00	1.72
33.30	0.31	0.41	0.75*	1.72	0.00	1.72
33.35	0.31	0.41	0.75*	1.71	0.00	1.71
33.40	0.31	0.41	0.75*	1.70	0.00	1.70
33.45	0.31	0.41	0.75*	1.69	0.00	1.69
33.50	0.31	0.41	0.75*	1.68	0.00	1.68
33.55	0.31	0.41	0.75*	1.68	0.00	1.68
33.60	0.31	0.41	0.75*	1.67	0.00	1.67
33.65	0.31	0.41	0.75*	1.66	0.00	1.66
33.70	0.31	0.41	0.75*	1.65	0.00	1.65
33.75	0.31	0.41	0.75*	1.65	0.00	1.65
33.80	0.31	0.41	0.76*	1.64	0.00	1.64
33.85	0.31	0.41	0.76*	1.63	0.00	1.63
33.90	0.31	0.41	0.76*	1.62	0.00	1.62
33.95	0.31	0.41	0.76*	1.61	0.00	1.61
34.00	0.31	0.41	0.76*	1.61	0.00	1.61
34.05	0.31	0.41	0.76*	1.60	0.00	1.60
34.10	0.31	0.41	0.76*	1.59	0.00	1.59
34.15	0.31	0.41	0.76*	1.58	0.00	1.58
34.20	0.31	0.41	0.76*	1.57	0.00	1.57
34.25	0.31	0.41	0.76*	1.57	0.00	1.57
34.30	0.31	0.41	0.76*	1.56	0.00	1.56
34.35	0.31	0.41	0.76*	1.55	0.00	1.55
34.40	0.31	0.41	0.76*	1.54	0.00	1.54
34.45	0.31	0.41	0.76*	1.54	0.00	1.54
34.50	0.31	0.41	0.76*	1.53	0.00	1.53
34.55	0.31	0.41	0.76*	1.52	0.00	1.52

34.60	0.31	0.41	0.76*	1.51	0.00	1.51
34.65	0.31	0.41	0.76*	1.50	0.00	1.50
34.70	0.31	0.41	0.76*	1.50	0.00	1.50
34.75	0.31	0.41	0.76*	1.49	0.00	1.49
34.80	0.31	0.41	0.76*	1.48	0.00	1.48
34.85	0.31	0.41	0.76*	1.47	0.00	1.47
34.90	0.31	0.41	0.76*	1.47	0.00	1.47
34.95	0.31	0.41	0.76*	1.46	0.00	1.46
35.00	0.31	0.41	0.76*	1.45	0.00	1.45
35.05	0.31	0.41	0.77*	1.44	0.00	1.44
35.10	0.31	0.41	0.77*	1.43	0.00	1.43
35.15	0.31	0.41	0.77*	1.43	0.00	1.43
35.20	0.31	0.41	0.77*	1.42	0.00	1.42
35.25	0.31	0.41	0.77*	1.41	0.00	1.41
35.30	0.31	0.41	0.77*	1.40	0.00	1.40
35.35	0.31	0.41	0.77*	1.40	0.00	1.40
35.40	0.31	0.41	0.77*	1.39	0.00	1.39
35.45	0.31	0.41	0.77*	1.38	0.00	1.38
35.50	0.31	0.41	0.77*	1.37	0.00	1.37
35.55	0.31	0.41	0.77*	1.36	0.00	1.36
35.60	0.31	0.41	0.77*	1.36	0.00	1.36
35.65	0.31	0.41	0.77*	1.35	0.00	1.35
35.70	0.31	0.41	0.77*	1.34	0.00	1.34
35.75	0.31	0.41	0.77*	1.33	0.00	1.33
35.80	0.31	0.41	0.77*	1.33	0.00	1.33
35.85	0.31	0.41	0.77*	1.32	0.00	1.32
35.90	0.31	0.41	0.77*	1.31	0.00	1.31
35.95	0.31	0.41	0.77*	1.30	0.00	1.30
36.00	0.31	0.41	0.77*	1.30	0.00	1.30
36.05	0.31	0.41	0.77*	1.29	0.00	1.29
36.10	0.31	0.41	0.77*	1.28	0.00	1.28
36.15	0.31	0.41	0.77*	1.27	0.00	1.27
36.20	0.31	0.41	0.77*	1.26	0.00	1.26
36.25	0.31	0.41	0.77*	1.26	0.00	1.26
36.30	0.31	0.41	0.77*	1.25	0.00	1.25
36.35	0.31	0.41	0.77*	1.24	0.00	1.24
36.40	0.31	0.41	0.77*	1.23	0.00	1.23
36.45	0.32	0.41	0.77*	1.23	0.00	1.23
36.50	0.32	0.41	0.77*	1.22	0.00	1.22
36.55	0.32	0.41	0.77*	1.21	0.00	1.21
36.60	0.32	0.41	0.77*	1.20	0.00	1.20
36.65	0.32	0.41	0.77*	1.20	0.00	1.20
36.70	0.32	0.41	0.78*	1.19	0.00	1.19
36.75	0.32	0.41	0.78*	1.18	0.00	1.18
36.80	0.32	0.41	0.78*	1.17	0.00	1.17
36.85	0.32	0.41	0.78*	1.16	0.00	1.16
36.90	0.32	0.41	0.78*	1.16	0.00	1.16
36.95	0.32	0.41	0.78*	1.15	0.00	1.15
37.00	0.32	0.41	0.78*	1.14	0.00	1.14
37.05	0.32	0.41	0.78*	1.13	0.00	1.13
37.10	0.32	0.41	0.78*	1.13	0.00	1.13
37.15	0.32	0.41	0.78*	1.12	0.00	1.12
37.20	0.32	0.41	0.79*	1.11	0.00	1.11
37.25	0.32	0.41	0.79*	1.10	0.00	1.10
37.30	0.32	0.41	0.79*	1.10	0.00	1.10
37.35	0.32	0.41	0.79*	1.09	0.00	1.09
37.40	0.32	0.41	0.79*	1.08	0.00	1.08
37.45	0.32	0.41	0.79*	1.07	0.00	1.07
37.50	0.32	0.41	0.79*	1.07	0.00	1.07
37.55	0.32	0.41	0.79*	1.06	0.00	1.06
37.60	0.32	0.41	0.79*	1.05	0.00	1.05
37.65	0.32	0.41	0.79*	1.04	0.00	1.04
37.70	0.32	0.41	0.80*	1.04	0.00	1.04

37.75	0.32	0.41	0.80*	1.03	0.00	1.03
37.80	0.33	0.41	0.80*	1.02	0.00	1.02
37.85	0.33	0.41	0.80*	1.01	0.00	1.01
37.90	0.33	0.41	0.80*	1.01	0.00	1.01
37.95	0.33	0.41	0.80*	1.00	0.00	1.00
38.00	0.33	0.41	0.80*	0.99	0.00	0.99
38.05	0.33	0.41	0.80*	0.98	0.00	0.98
38.10	0.33	0.41	0.80*	0.98	0.00	0.98
38.15	0.33	0.41	0.81*	0.97	0.00	0.97
38.20	0.33	0.41	0.81*	0.96	0.00	0.96
38.25	0.33	0.41	0.81*	0.96	0.00	0.96
38.30	0.33	0.41	0.81*	0.95	0.00	0.95
38.35	0.33	0.41	0.81*	0.94	0.00	0.94
38.40	0.33	0.41	0.81*	0.93	0.00	0.93
38.45	0.33	0.41	0.81*	0.93	0.00	0.93
38.50	0.33	0.41	0.81*	0.92	0.00	0.92
38.55	0.33	0.41	0.81*	0.91	0.00	0.91
38.60	0.33	0.41	0.81*	0.90	0.00	0.90
38.65	0.33	0.41	0.82*	0.90	0.00	0.90
38.70	0.33	0.41	0.82*	0.89	0.00	0.89
38.75	0.33	0.41	0.82*	0.88	0.00	0.88
38.80	0.33	0.41	0.82*	0.88	0.00	0.88
38.85	0.33	0.41	0.82*	0.87	0.00	0.87
38.90	0.33	0.41	0.82*	0.86	0.00	0.86
38.95	0.33	0.41	0.82*	0.85	0.00	0.85
39.00	0.33	0.41	0.82*	0.85	0.00	0.85
39.05	0.34	0.41	0.82*	0.84	0.00	0.84
39.10	0.34	0.41	0.83*	0.83	0.00	0.83
39.15	0.34	0.41	0.83*	0.83	0.00	0.83
39.20	0.34	0.41	0.83*	0.82	0.00	0.82
39.25	0.34	0.41	0.83*	0.81	0.00	0.81
39.30	0.34	0.41	0.83*	0.80	0.00	0.80
39.35	0.34	0.41	0.83*	0.80	0.00	0.80
39.40	0.34	0.41	0.83*	0.79	0.00	0.79
39.45	0.34	0.41	0.83*	0.78	0.00	0.78
39.50	0.34	0.41	0.83*	0.78	0.00	0.78
39.55	0.34	0.41	0.84*	0.77	0.00	0.77
39.60	0.34	0.41	0.84*	0.76	0.00	0.76
39.65	0.34	0.41	0.84*	0.75	0.00	0.75
39.70	0.34	0.41	0.84*	0.75	0.00	0.75
39.75	0.34	0.41	0.84*	0.74	0.00	0.74
39.80	0.34	0.41	0.84*	0.73	0.00	0.73
39.85	0.34	0.41	0.84*	0.73	0.00	0.73
39.90	0.34	0.41	0.84*	0.72	0.00	0.72
39.95	0.34	0.41	0.85*	0.71	0.00	0.71
40.00	0.34	0.41	0.85*	0.71	0.00	0.71
40.05	0.34	0.41	0.85*	0.70	0.00	0.70
40.10	0.34	0.41	0.85*	0.69	0.00	0.69
40.15	0.34	0.41	0.85*	0.68	0.00	0.68
40.20	0.35	0.41	0.85*	0.68	0.00	0.68
40.25	0.35	0.41	0.85*	0.67	0.00	0.67
40.30	0.35	0.41	0.85*	0.66	0.00	0.66
40.35	0.35	0.41	0.85*	0.66	0.00	0.66
40.40	0.35	0.41	0.86*	0.65	0.00	0.65
40.45	0.35	0.41	0.86*	0.64	0.00	0.64
40.50	0.35	0.41	0.86*	0.64	0.00	0.64
40.55	0.35	0.41	0.86*	0.63	0.00	0.63
40.60	0.35	0.41	0.86*	0.62	0.00	0.62
40.65	0.35	0.41	0.86*	0.62	0.00	0.62
40.70	0.35	0.41	0.86*	0.61	0.00	0.61
40.75	0.35	0.41	0.86*	0.60	0.00	0.60
40.80	0.35	0.40	0.87*	0.59	0.00	0.59
40.85	0.35	0.40	0.87*	0.59	0.00	0.59

40.90	0.35	0.40	0.87*	0.58	0.00	0.58
40.95	0.35	0.40	0.87*	0.57	0.00	0.57
41.00	0.35	0.40	0.87*	0.57	0.00	0.57
41.05	0.35	0.40	0.87*	0.56	0.00	0.56
41.10	0.35	0.40	0.87*	0.55	0.00	0.55
41.15	0.35	0.40	0.87*	0.55	0.00	0.55
41.20	0.35	0.40	0.88*	0.54	0.00	0.54
41.25	0.35	0.40	0.88*	0.53	0.00	0.53
41.30	0.35	0.40	0.88*	0.53	0.00	0.53
41.35	0.36	0.40	0.88*	0.52	0.00	0.52
41.40	0.36	0.40	0.88*	0.51	0.00	0.51
41.45	0.36	0.40	0.88*	0.51	0.00	0.51
41.50	0.36	0.40	0.88*	0.50	0.00	0.50
41.55	0.36	0.40	0.88*	0.49	0.00	0.49
41.60	0.36	0.40	0.89*	0.49	0.00	0.49
41.65	0.36	0.40	0.89*	0.48	0.00	0.48
41.70	0.36	0.40	0.89*	0.47	0.00	0.47
41.75	0.36	0.40	0.89*	0.47	0.00	0.47
41.80	0.36	0.40	0.89*	0.46	0.00	0.46
41.85	0.36	0.40	0.89*	0.45	0.00	0.45
41.90	0.36	0.40	0.89*	0.45	0.00	0.45
41.95	0.36	0.40	0.89*	0.44	0.00	0.44
42.00	0.36	0.40	0.90*	0.43	0.00	0.43
42.05	0.36	0.40	0.90*	0.43	0.00	0.43
42.10	0.36	0.40	0.90*	0.42	0.00	0.42
42.15	0.36	0.40	0.90*	0.41	0.00	0.41
42.20	0.36	0.40	0.90*	0.41	0.00	0.41
42.25	0.36	0.40	0.90*	0.40	0.00	0.40
42.30	0.36	0.40	0.90*	0.39	0.00	0.39
42.35	0.36	0.40	0.91*	0.39	0.00	0.39
42.40	0.37	0.40	0.91*	0.38	0.00	0.38
42.45	0.37	0.40	0.91*	0.38	0.00	0.38
42.50	0.37	0.40	0.91*	0.37	0.00	0.37
42.55	0.37	0.40	0.91*	0.36	0.00	0.36
42.60	0.37	0.40	0.91*	0.36	0.00	0.36
42.65	0.37	0.40	0.91*	0.35	0.00	0.35
42.70	0.37	0.40	0.91*	0.34	0.00	0.34
42.75	0.37	0.40	0.92*	0.34	0.00	0.34
42.80	0.37	0.40	0.92*	0.33	0.00	0.33
42.85	0.37	0.40	0.92*	0.32	0.00	0.32
42.90	0.37	0.40	0.92*	0.32	0.00	0.32
42.95	0.37	0.40	0.92*	0.31	0.00	0.31
43.00	0.37	0.40	0.92*	0.30	0.00	0.30
43.05	0.37	0.40	0.92*	0.30	0.00	0.30
43.10	0.37	0.40	0.93*	0.29	0.00	0.29
43.15	0.37	0.40	0.93*	0.29	0.00	0.29
43.20	0.37	0.40	0.93*	0.28	0.00	0.28
43.25	0.37	0.40	0.93*	0.27	0.00	0.27
43.30	0.37	0.40	0.93*	0.27	0.00	0.27
43.35	0.37	0.40	0.93*	0.26	0.00	0.26
43.40	0.38	0.40	0.93*	0.25	0.00	0.25
43.45	0.38	0.40	0.94*	0.25	0.00	0.25
43.50	0.38	0.40	0.94*	0.24	0.00	0.24
43.55	0.38	0.40	0.94*	0.24	0.00	0.24
43.60	0.38	0.40	0.94*	0.23	0.00	0.23
43.65	0.38	0.40	0.94*	0.22	0.00	0.22
43.70	0.38	0.40	0.94*	0.22	0.00	0.22
43.75	0.38	0.40	0.94*	0.21	0.00	0.21
43.80	0.38	0.40	0.95*	0.20	0.00	0.20
43.85	0.38	0.40	0.95*	0.20	0.00	0.20
43.90	0.38	0.40	0.95*	0.19	0.00	0.19
43.95	0.38	0.40	0.95*	0.19	0.00	0.19
44.00	0.38	0.40	0.95*	0.18	0.00	0.18

44.05	0.38	0.40	0.95*	0.17	0.00	0.17
44.10	0.38	0.40	0.96*	0.17	0.00	0.17
44.15	0.38	0.40	0.96*	0.16	0.00	0.16
44.20	0.38	0.40	0.96*	0.15	0.00	0.15
44.25	0.38	0.40	0.96*	0.15	0.00	0.15
44.30	0.39	0.40	0.96*	0.14	0.00	0.14
44.35	0.39	0.40	0.96*	0.14	0.00	0.14
44.40	0.39	0.40	0.96*	0.13	0.00	0.13
44.45	0.39	0.40	0.97*	0.12	0.00	0.12
44.50	0.39	0.40	0.97*	0.12	0.00	0.12
44.55	0.39	0.40	0.97*	0.11	0.00	0.11
44.60	0.39	0.40	0.97*	0.11	0.00	0.11
44.65	0.39	0.40	0.97*	0.10	0.00	0.10
44.70	0.39	0.40	0.97*	0.09	0.00	0.09
44.75	0.39	0.40	0.98*	0.09	0.00	0.09
44.80	0.39	0.40	0.98*	0.08	0.00	0.08
44.85	0.39	0.40	0.98*	0.08	0.00	0.08
44.90	0.39	0.40	0.98*	0.07	0.00	0.07
44.95	0.39	0.40	0.98*	0.06	0.00	0.06
45.00	0.39	0.40	0.98*	0.06	0.00	0.06
45.05	0.39	0.40	0.99*	0.05	0.00	0.05
45.10	0.39	0.40	0.99*	0.05	0.00	0.05
45.15	0.39	0.40	0.99*	0.04	0.00	0.04
45.20	0.40	0.40	0.99*	0.03	0.00	0.03
45.25	0.40	0.40	0.99*	0.03	0.00	0.03
45.30	0.40	0.40	0.99*	0.02	0.00	0.02
45.35	0.40	0.40	1.00*	0.02	0.00	0.02
45.40	0.40	0.40	1.00*	0.01	0.00	0.01
45.45	0.40	0.40	1.00*	0.01	0.00	0.01
45.50	0.40	0.40	1.00	0.00	0.00	0.00
45.55	0.40	0.40	1.00	0.00	0.00	0.00
45.60	0.40	0.40	1.00	0.00	0.00	0.00
45.65	0.40	0.40	1.01	0.00	0.00	0.00
45.70	0.40	0.40	1.01	0.00	0.00	0.00
45.75	0.40	0.40	1.01	0.00	0.00	0.00
45.80	0.40	0.40	1.01	0.00	0.00	0.00
45.85	0.40	0.40	1.01	0.00	0.00	0.00
45.90	0.40	0.40	1.01	0.00	0.00	0.00
45.95	0.40	0.40	1.02	0.00	0.00	0.00
46.00	0.41	0.40	1.02	0.00	0.00	0.00
46.05	0.41	0.40	1.02	0.00	0.00	0.00
46.10	0.41	0.40	1.02	0.00	0.00	0.00
46.15	0.41	0.40	1.02	0.00	0.00	0.00
46.20	0.41	0.40	1.03	0.00	0.00	0.00
46.25	0.41	0.40	1.03	0.00	0.00	0.00
46.30	0.41	0.40	1.03	0.00	0.00	0.00
46.35	0.41	0.40	1.03	0.00	0.00	0.00
46.40	0.41	0.40	1.03	0.00	0.00	0.00
46.45	0.41	0.40	1.04	0.00	0.00	0.00
46.50	0.41	0.40	1.04	0.00	0.00	0.00
46.55	0.41	0.40	1.04	0.00	0.00	0.00
46.60	0.41	0.40	1.04	0.00	0.00	0.00
46.65	0.41	0.40	1.04	0.00	0.00	0.00
46.70	0.41	0.40	1.04	0.00	0.00	0.00
46.75	0.41	0.40	1.04	0.00	0.00	0.00
46.80	0.41	0.40	1.03	0.00	0.00	0.00
46.85	0.41	0.40	1.03	0.00	0.00	0.00
46.90	0.41	0.40	1.03	0.00	0.00	0.00
46.95	0.41	0.40	1.03	0.00	0.00	0.00
47.00	0.41	0.40	1.03	0.00	0.00	0.00
47.05	0.41	0.40	1.03	0.00	0.00	0.00
47.10	0.41	0.40	1.03	0.00	0.00	0.00
47.15	0.41	0.40	1.03	0.00	0.00	0.00

47.20	0.41	0.40	1.03	0.00	0.00	0.00
47.25	0.41	0.40	1.03	0.00	0.00	0.00
47.30	0.41	0.40	1.03	0.00	0.00	0.00
47.35	0.41	0.40	1.03	0.00	0.00	0.00
47.40	0.41	0.40	1.03	0.00	0.00	0.00
47.45	0.41	0.40	1.03	0.00	0.00	0.00
47.50	0.41	0.40	1.03	0.00	0.00	0.00
47.55	0.41	0.40	1.03	0.00	0.00	0.00
47.60	0.41	0.40	1.03	0.00	0.00	0.00
47.65	0.41	0.40	1.03	0.00	0.00	0.00
47.70	0.41	0.40	1.03	0.00	0.00	0.00
47.75	0.41	0.39	1.03	0.00	0.00	0.00
47.80	0.41	0.39	1.03	0.00	0.00	0.00
47.85	0.40	0.39	1.03	0.00	0.00	0.00
47.90	0.40	0.39	1.03	0.00	0.00	0.00
47.95	0.40	0.39	1.03	0.00	0.00	0.00
48.00	0.40	0.39	1.02	0.00	0.00	0.00
48.05	0.40	0.39	1.02	0.00	0.00	0.00
48.10	0.40	0.39	1.02	0.00	0.00	0.00
48.15	0.40	0.39	1.02	0.00	0.00	0.00
48.20	0.40	0.39	1.02	0.00	0.00	0.00
48.25	0.40	0.39	1.02	0.00	0.00	0.00
48.30	0.40	0.39	1.02	0.00	0.00	0.00
48.35	0.40	0.39	1.02	0.00	0.00	0.00
48.40	0.40	0.39	1.02	0.00	0.00	0.00
48.45	0.40	0.39	1.02	0.00	0.00	0.00
48.50	0.40	0.39	1.02	0.00	0.00	0.00
48.55	0.40	0.39	1.02	0.00	0.00	0.00
48.60	0.40	0.39	1.02	0.00	0.00	0.00
48.65	0.40	0.39	1.02	0.00	0.00	0.00
48.70	0.40	0.39	1.02	0.00	0.00	0.00
48.75	0.40	0.39	1.02	0.00	0.00	0.00
48.80	0.40	0.39	1.02	0.00	0.00	0.00
48.85	0.40	0.39	1.02	0.00	0.00	0.00
48.90	0.40	0.39	1.02	0.00	0.00	0.00
48.95	0.40	0.39	1.02	0.00	0.00	0.00
49.00	0.40	0.39	1.02	0.00	0.00	0.00
49.05	0.40	0.39	1.02	0.00	0.00	0.00
49.10	0.40	0.39	1.02	0.00	0.00	0.00
49.15	0.40	0.39	1.02	0.00	0.00	0.00
49.20	0.40	0.39	1.02	0.00	0.00	0.00
49.25	0.40	0.39	1.02	0.00	0.00	0.00
49.30	0.40	0.39	1.02	0.00	0.00	0.00
49.35	0.40	0.39	1.01	0.00	0.00	0.00
49.40	0.40	0.39	1.01	0.00	0.00	0.00
49.45	0.40	0.39	1.01	0.00	0.00	0.00
49.50	0.40	0.39	1.01	0.00	0.00	0.00
49.55	0.40	0.39	1.01	0.00	0.00	0.00
49.60	0.40	0.39	1.01	0.00	0.00	0.00
49.65	0.40	0.39	1.01	0.00	0.00	0.00
49.70	0.40	0.39	1.01	0.00	0.00	0.00
49.75	0.40	0.39	1.01	0.00	0.00	0.00
49.80	0.40	0.39	1.01	0.00	0.00	0.00
49.85	0.40	0.39	1.01	0.00	0.00	0.00
49.90	0.40	0.39	1.01	0.00	0.00	0.00
49.95	0.39	0.39	1.01	0.00	0.00	0.00
50.00	0.39	0.39	1.01	0.00	0.00	0.00

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

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm Cyclic resistance ratio from soils
CSRsf Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat Settlement from saturated sands
S_dry Settlement from Unsaturated Sands
S_all Total Settlement from Saturated and Unsaturated Sands
NoLiq No-Liquefy Soils

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LIQUEFACTION ANALYSIS SUMMARY

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Input File Name: C:\Users\koohi\Desktop\Stanton\B5.liq
Title: Stanton Energy Reliability Center-B5
Subtitle: Stanton, CA

Surface Elev.=68
Hole No.=B5
Depth of Hole= 50.00 ft
Water Table during Earthquake= 15.00 ft
Water Table during In-Situ Testing= 20.00 ft
Max. Acceleration= 0.5 g
Earthquake Magnitude= 6.90

Input Data:
Surface Elev.=68
Hole No.=B5
Depth of Hole=50.00 ft
Water Table during Earthquake= 15.00 ft
Water Table during In-Situ Testing= 20.00 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=6.90
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Tokimatsu/Seed
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: Liq. zone only
6. Hammer Energy Ratio, Ce = 0.8
7. Borehole Diameter, Cb= 1.15
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 %
11.50	17.00	120.00	15.00
21.50	11.00	125.00	50.00
31.50	37.00	130.00	50.00
41.50	18.00	120.00	50.00

Output Results:
Settlement of Saturated Sands=4.64 in.
Settlement of Unsaturated Sands=0.00 in.
Total Settlement of Saturated and Unsaturated Sands=4.64 in.
Differential Settlement=2.322 to 3.065 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
11.50	0.25	0.32	5.00	4.64	0.00	4.64
11.55	0.25	0.32	5.00	4.64	0.00	4.64
11.60	0.25	0.32	5.00	4.64	0.00	4.64
11.65	0.25	0.32	5.00	4.64	0.00	4.64
11.70	0.25	0.32	5.00	4.64	0.00	4.64
11.75	0.25	0.32	5.00	4.64	0.00	4.64
11.80	0.25	0.32	5.00	4.64	0.00	4.64
11.85	0.25	0.32	5.00	4.64	0.00	4.64
11.90	0.25	0.32	5.00	4.64	0.00	4.64
11.95	0.25	0.32	5.00	4.64	0.00	4.64
12.00	0.25	0.32	5.00	4.64	0.00	4.64
12.05	0.25	0.32	5.00	4.64	0.00	4.64
12.10	0.25	0.32	5.00	4.64	0.00	4.64
12.15	0.25	0.32	5.00	4.64	0.00	4.64
12.20	0.25	0.32	5.00	4.64	0.00	4.64
12.25	0.25	0.32	5.00	4.64	0.00	4.64
12.30	0.25	0.32	5.00	4.64	0.00	4.64
12.35	0.25	0.32	5.00	4.64	0.00	4.64
12.40	0.25	0.32	5.00	4.64	0.00	4.64
12.45	0.25	0.32	5.00	4.64	0.00	4.64
12.50	0.25	0.32	5.00	4.64	0.00	4.64
12.55	0.25	0.32	5.00	4.64	0.00	4.64
12.60	0.25	0.32	5.00	4.64	0.00	4.64
12.65	0.25	0.32	5.00	4.64	0.00	4.64
12.70	0.25	0.32	5.00	4.64	0.00	4.64
12.75	0.25	0.32	5.00	4.64	0.00	4.64
12.80	0.25	0.32	5.00	4.64	0.00	4.64
12.85	0.25	0.32	5.00	4.64	0.00	4.64
12.90	0.24	0.32	5.00	4.64	0.00	4.64
12.95	0.24	0.32	5.00	4.64	0.00	4.64
13.00	0.24	0.32	5.00	4.64	0.00	4.64
13.05	0.24	0.32	5.00	4.64	0.00	4.64
13.10	0.24	0.32	5.00	4.64	0.00	4.64
13.15	0.24	0.32	5.00	4.64	0.00	4.64
13.20	0.24	0.31	5.00	4.64	0.00	4.64
13.25	0.24	0.31	5.00	4.64	0.00	4.64
13.30	0.24	0.31	5.00	4.64	0.00	4.64
13.35	0.24	0.31	5.00	4.64	0.00	4.64
13.40	0.24	0.31	5.00	4.64	0.00	4.64
13.45	0.24	0.31	5.00	4.64	0.00	4.64
13.50	0.24	0.31	5.00	4.64	0.00	4.64
13.55	0.24	0.31	5.00	4.64	0.00	4.64
13.60	0.24	0.31	5.00	4.64	0.00	4.64
13.65	0.24	0.31	5.00	4.64	0.00	4.64
13.70	0.24	0.31	5.00	4.64	0.00	4.64
13.75	0.24	0.31	5.00	4.64	0.00	4.64
13.80	0.24	0.31	5.00	4.64	0.00	4.64
13.85	0.24	0.31	5.00	4.64	0.00	4.64
13.90	0.24	0.31	5.00	4.64	0.00	4.64
13.95	0.24	0.31	5.00	4.64	0.00	4.64
14.00	0.24	0.31	5.00	4.64	0.00	4.64
14.05	0.24	0.31	5.00	4.64	0.00	4.64
14.10	0.24	0.31	5.00	4.64	0.00	4.64
14.15	0.24	0.31	5.00	4.64	0.00	4.64
14.20	0.24	0.31	5.00	4.64	0.00	4.64
14.25	0.24	0.31	5.00	4.64	0.00	4.64
14.30	0.24	0.31	5.00	4.64	0.00	4.64
14.35	0.24	0.31	5.00	4.64	0.00	4.64
14.40	0.24	0.31	5.00	4.64	0.00	4.64

14.45	0.24	0.31	5.00	4.64	0.00	4.64
14.50	0.24	0.31	5.00	4.64	0.00	4.64
14.55	0.24	0.31	5.00	4.64	0.00	4.64
14.60	0.24	0.31	5.00	4.64	0.00	4.64
14.65	0.24	0.31	5.00	4.64	0.00	4.64
14.70	0.24	0.31	5.00	4.64	0.00	4.64
14.75	0.24	0.31	5.00	4.64	0.00	4.64
14.80	0.26	0.31	5.00	4.64	0.00	4.64
14.85	0.26	0.31	5.00	4.64	0.00	4.64
14.90	0.26	0.31	5.00	4.64	0.00	4.64
14.95	0.26	0.31	5.00	4.64	0.00	4.64
15.00	0.26	0.31	0.83*	4.64	0.00	4.64
15.05	0.26	0.31	0.83*	4.63	0.00	4.63
15.10	0.26	0.31	0.83*	4.63	0.00	4.63
15.15	0.26	0.32	0.82*	4.62	0.00	4.62
15.20	0.26	0.32	0.82*	4.61	0.00	4.61
15.25	0.26	0.32	0.82*	4.60	0.00	4.60
15.30	0.26	0.32	0.82*	4.59	0.00	4.59
15.35	0.26	0.32	0.82*	4.58	0.00	4.58
15.40	0.26	0.32	0.82*	4.57	0.00	4.57
15.45	0.26	0.32	0.81*	4.56	0.00	4.56
15.50	0.26	0.32	0.81*	4.55	0.00	4.55
15.55	0.26	0.32	0.81*	4.55	0.00	4.55
15.60	0.26	0.32	0.81*	4.54	0.00	4.54
15.65	0.26	0.32	0.81*	4.53	0.00	4.53
15.70	0.26	0.32	0.81*	4.52	0.00	4.52
15.75	0.26	0.32	0.80*	4.51	0.00	4.51
15.80	0.26	0.32	0.80*	4.50	0.00	4.50
15.85	0.26	0.32	0.80*	4.49	0.00	4.49
15.90	0.26	0.32	0.80*	4.48	0.00	4.48
15.95	0.26	0.32	0.80*	4.47	0.00	4.47
16.00	0.26	0.32	0.80*	4.47	0.00	4.47
16.05	0.26	0.32	0.80*	4.46	0.00	4.46
16.10	0.26	0.32	0.79*	4.45	0.00	4.45
16.15	0.26	0.32	0.79*	4.44	0.00	4.44
16.20	0.26	0.33	0.79*	4.43	0.00	4.43
16.25	0.26	0.33	0.79*	4.42	0.00	4.42
16.30	0.26	0.33	0.79*	4.41	0.00	4.41
16.35	0.26	0.33	0.79*	4.40	0.00	4.40
16.40	0.26	0.33	0.79*	4.39	0.00	4.39
16.45	0.26	0.33	0.78*	4.39	0.00	4.39
16.50	0.26	0.33	0.78*	4.38	0.00	4.38
16.55	0.26	0.33	0.78*	4.37	0.00	4.37
16.60	0.26	0.33	0.78*	4.36	0.00	4.36
16.65	0.26	0.33	0.78*	4.35	0.00	4.35
16.70	0.26	0.33	0.78*	4.34	0.00	4.34
16.75	0.26	0.33	0.78*	4.33	0.00	4.33
16.80	0.26	0.33	0.78*	4.32	0.00	4.32
16.85	0.26	0.33	0.77*	4.31	0.00	4.31
16.90	0.26	0.33	0.77*	4.30	0.00	4.30
16.95	0.26	0.33	0.77*	4.29	0.00	4.29
17.00	0.26	0.33	0.77*	4.29	0.00	4.29
17.05	0.26	0.33	0.77*	4.28	0.00	4.28
17.10	0.26	0.33	0.77*	4.27	0.00	4.27
17.15	0.26	0.33	0.77*	4.26	0.00	4.26
17.20	0.26	0.33	0.77*	4.25	0.00	4.25
17.25	0.26	0.33	0.76*	4.24	0.00	4.24
17.30	0.26	0.33	0.76*	4.23	0.00	4.23
17.35	0.25	0.34	0.76*	4.22	0.00	4.22
17.40	0.25	0.34	0.76*	4.21	0.00	4.21
17.45	0.25	0.34	0.75*	4.20	0.00	4.20
17.50	0.25	0.34	0.75*	4.19	0.00	4.19
17.55	0.25	0.34	0.75*	4.19	0.00	4.19

17.60	0.25	0.34	0.75*	4.18	0.00	4.18
17.65	0.25	0.34	0.74*	4.17	0.00	4.17
17.70	0.25	0.34	0.74*	4.16	0.00	4.16
17.75	0.25	0.34	0.74*	4.15	0.00	4.15
17.80	0.25	0.34	0.74*	4.14	0.00	4.14
17.85	0.25	0.34	0.73*	4.13	0.00	4.13
17.90	0.25	0.34	0.73*	4.12	0.00	4.12
17.95	0.25	0.34	0.73*	4.11	0.00	4.11
18.00	0.25	0.34	0.73*	4.10	0.00	4.10
18.05	0.25	0.34	0.72*	4.09	0.00	4.09
18.10	0.25	0.34	0.72*	4.08	0.00	4.08
18.15	0.25	0.34	0.72*	4.07	0.00	4.07
18.20	0.24	0.34	0.72*	4.06	0.00	4.06
18.25	0.24	0.34	0.71*	4.05	0.00	4.05
18.30	0.24	0.34	0.71*	4.04	0.00	4.04
18.35	0.24	0.34	0.71*	4.03	0.00	4.03
18.40	0.24	0.34	0.71*	4.02	0.00	4.02
18.45	0.24	0.34	0.70*	4.01	0.00	4.01
18.50	0.24	0.34	0.70*	4.00	0.00	4.00
18.55	0.24	0.35	0.70*	3.99	0.00	3.99
18.60	0.24	0.35	0.70*	3.98	0.00	3.98
18.65	0.24	0.35	0.69*	3.98	0.00	3.98
18.70	0.24	0.35	0.69*	3.97	0.00	3.97
18.75	0.24	0.35	0.69*	3.96	0.00	3.96
18.80	0.24	0.35	0.69*	3.95	0.00	3.95
18.85	0.24	0.35	0.68*	3.94	0.00	3.94
18.90	0.24	0.35	0.68*	3.93	0.00	3.93
18.95	0.24	0.35	0.68*	3.92	0.00	3.92
19.00	0.24	0.35	0.68*	3.91	0.00	3.91
19.05	0.24	0.35	0.68*	3.90	0.00	3.90
19.10	0.24	0.35	0.67*	3.89	0.00	3.89
19.15	0.23	0.35	0.67*	3.88	0.00	3.88
19.20	0.23	0.35	0.67*	3.87	0.00	3.87
19.25	0.23	0.35	0.67*	3.86	0.00	3.86
19.30	0.23	0.35	0.66*	3.85	0.00	3.85
19.35	0.23	0.35	0.66*	3.83	0.00	3.83
19.40	0.23	0.35	0.66*	3.82	0.00	3.82
19.45	0.23	0.35	0.66*	3.81	0.00	3.81
19.50	0.23	0.35	0.66*	3.80	0.00	3.80
19.55	0.23	0.35	0.65*	3.79	0.00	3.79
19.60	0.23	0.35	0.65*	3.78	0.00	3.78
19.65	0.23	0.35	0.65*	3.77	0.00	3.77
19.70	0.23	0.35	0.65*	3.76	0.00	3.76
19.75	0.23	0.35	0.65*	3.75	0.00	3.75
19.80	0.23	0.35	0.64*	3.74	0.00	3.74
19.85	0.23	0.35	0.64*	3.73	0.00	3.73
19.90	0.23	0.36	0.64*	3.72	0.00	3.72
19.95	0.23	0.36	0.64*	3.71	0.00	3.71
20.00	0.23	0.36	0.64*	3.70	0.00	3.70
20.05	0.23	0.36	0.63*	3.69	0.00	3.69
20.10	0.23	0.36	0.63*	3.68	0.00	3.68
20.15	0.22	0.36	0.63*	3.67	0.00	3.67
20.20	0.22	0.36	0.63*	3.66	0.00	3.66
20.25	0.22	0.36	0.63*	3.65	0.00	3.65
20.30	0.22	0.36	0.62*	3.64	0.00	3.64
20.35	0.22	0.36	0.62*	3.63	0.00	3.63
20.40	0.22	0.36	0.62*	3.62	0.00	3.62
20.45	0.22	0.36	0.62*	3.61	0.00	3.61
20.50	0.22	0.36	0.62*	3.60	0.00	3.60
20.55	0.22	0.36	0.62*	3.58	0.00	3.58
20.60	0.22	0.36	0.61*	3.57	0.00	3.57
20.65	0.22	0.36	0.61*	3.56	0.00	3.56
20.70	0.22	0.36	0.61*	3.55	0.00	3.55

20.75	0.22	0.36	0.61*	3.54	0.00	3.54
20.80	0.22	0.36	0.61*	3.53	0.00	3.53
20.85	0.22	0.36	0.61*	3.52	0.00	3.52
20.90	0.22	0.36	0.60*	3.51	0.00	3.51
20.95	0.22	0.36	0.60*	3.50	0.00	3.50
21.00	0.22	0.36	0.60*	3.49	0.00	3.49
21.05	0.22	0.36	0.60*	3.48	0.00	3.48
21.10	0.22	0.36	0.60*	3.47	0.00	3.47
21.15	0.22	0.36	0.60*	3.46	0.00	3.46
21.20	0.22	0.36	0.60*	3.45	0.00	3.45
21.25	0.22	0.36	0.59*	3.43	0.00	3.43
21.30	0.22	0.36	0.59*	3.42	0.00	3.42
21.35	0.22	0.36	0.59*	3.41	0.00	3.41
21.40	0.21	0.37	0.59*	3.40	0.00	3.40
21.45	0.21	0.37	0.59*	3.39	0.00	3.39
21.50	0.21	0.37	0.59*	3.38	0.00	3.38
21.55	0.22	0.37	0.59*	3.37	0.00	3.37
21.60	0.22	0.37	0.59*	3.36	0.00	3.36
21.65	0.22	0.37	0.59*	3.35	0.00	3.35
21.70	0.22	0.37	0.60*	3.34	0.00	3.34
21.75	0.22	0.37	0.60*	3.33	0.00	3.33
21.80	0.22	0.37	0.60*	3.32	0.00	3.32
21.85	0.22	0.37	0.61*	3.30	0.00	3.30
21.90	0.22	0.37	0.61*	3.29	0.00	3.29
21.95	0.23	0.37	0.61*	3.28	0.00	3.28
22.00	0.23	0.37	0.62*	3.27	0.00	3.27
22.05	0.23	0.37	0.62*	3.26	0.00	3.26
22.10	0.23	0.37	0.62*	3.25	0.00	3.25
22.15	0.23	0.37	0.62*	3.24	0.00	3.24
22.20	0.23	0.37	0.63*	3.23	0.00	3.23
22.25	0.23	0.37	0.63*	3.22	0.00	3.22
22.30	0.23	0.37	0.63*	3.21	0.00	3.21
22.35	0.24	0.37	0.64*	3.20	0.00	3.20
22.40	0.24	0.37	0.64*	3.19	0.00	3.19
22.45	0.24	0.37	0.64*	3.18	0.00	3.18
22.50	0.24	0.37	0.65*	3.17	0.00	3.17
22.55	0.24	0.37	0.65*	3.16	0.00	3.16
22.60	0.24	0.37	0.65*	3.15	0.00	3.15
22.65	0.24	0.37	0.65*	3.14	0.00	3.14
22.70	0.25	0.37	0.66*	3.13	0.00	3.13
22.75	0.25	0.37	0.66*	3.12	0.00	3.12
22.80	0.25	0.37	0.66*	3.11	0.00	3.11
22.85	0.25	0.37	0.67*	3.10	0.00	3.10
22.90	0.25	0.37	0.67*	3.09	0.00	3.09
22.95	0.25	0.37	0.67*	3.08	0.00	3.08
23.00	0.25	0.37	0.67*	3.07	0.00	3.07
23.05	0.25	0.37	0.68*	3.06	0.00	3.06
23.10	0.26	0.38	0.68*	3.06	0.00	3.06
23.15	0.26	0.38	0.68*	3.05	0.00	3.05
23.20	0.26	0.38	0.69*	3.04	0.00	3.04
23.25	0.26	0.38	0.69*	3.03	0.00	3.03
23.30	0.26	0.38	0.69*	3.02	0.00	3.02
23.35	0.26	0.38	0.70*	3.01	0.00	3.01
23.40	0.26	0.38	0.70*	3.00	0.00	3.00
23.45	0.26	0.38	0.70*	2.99	0.00	2.99
23.50	0.27	0.38	0.70*	2.98	0.00	2.98
23.55	0.27	0.38	0.71*	2.97	0.00	2.97
23.60	0.27	0.38	0.71*	2.96	0.00	2.96
23.65	0.27	0.38	0.71*	2.96	0.00	2.96
23.70	0.27	0.38	0.72*	2.95	0.00	2.95
23.75	0.27	0.38	0.72*	2.94	0.00	2.94
23.80	0.27	0.38	0.72*	2.93	0.00	2.93
23.85	0.28	0.38	0.73*	2.92	0.00	2.92

23.90	0.28	0.38	0.73*	2.91	0.00	2.91
23.95	0.28	0.38	0.73*	2.90	0.00	2.90
24.00	0.28	0.38	0.73*	2.89	0.00	2.89
24.05	0.28	0.38	0.74*	2.89	0.00	2.89
24.10	0.28	0.38	0.74*	2.88	0.00	2.88
24.15	0.28	0.38	0.74*	2.87	0.00	2.87
24.20	0.28	0.38	0.75*	2.86	0.00	2.86
24.25	0.29	0.38	0.75*	2.85	0.00	2.85
24.30	0.29	0.38	0.75*	2.84	0.00	2.84
24.35	0.29	0.38	0.76*	2.84	0.00	2.84
24.40	0.29	0.38	0.76*	2.83	0.00	2.83
24.45	0.29	0.38	0.76*	2.82	0.00	2.82
24.50	0.29	0.38	0.77*	2.81	0.00	2.81
24.55	0.29	0.38	0.77*	2.80	0.00	2.80
24.60	0.30	0.38	0.77*	2.79	0.00	2.79
24.65	0.30	0.38	0.78*	2.79	0.00	2.79
24.70	0.30	0.38	0.78*	2.78	0.00	2.78
24.75	0.30	0.38	0.78*	2.77	0.00	2.77
24.80	0.30	0.38	0.79*	2.76	0.00	2.76
24.85	0.30	0.38	0.79*	2.75	0.00	2.75
24.90	0.30	0.38	0.79*	2.75	0.00	2.75
24.95	0.31	0.38	0.80*	2.74	0.00	2.74
25.00	0.31	0.38	0.80*	2.73	0.00	2.73
25.05	0.31	0.39	0.80*	2.72	0.00	2.72
25.10	0.31	0.39	0.81*	2.71	0.00	2.71
25.15	0.31	0.39	0.81*	2.71	0.00	2.71
25.20	0.31	0.39	0.81*	2.70	0.00	2.70
25.25	0.31	0.39	0.82*	2.69	0.00	2.69
25.30	0.32	0.39	0.82*	2.68	0.00	2.68
25.35	0.32	0.39	0.82*	2.68	0.00	2.68
25.40	0.32	0.39	0.83*	2.67	0.00	2.67
25.45	0.32	0.39	0.83*	2.66	0.00	2.66
25.50	0.32	0.39	0.83*	2.65	0.00	2.65
25.55	0.32	0.39	0.84*	2.65	0.00	2.65
25.60	0.33	0.39	0.84*	2.64	0.00	2.64
25.65	0.33	0.39	0.84*	2.63	0.00	2.63
25.70	0.33	0.39	0.85*	2.62	0.00	2.62
25.75	0.33	0.39	0.85*	2.62	0.00	2.62
25.80	0.33	0.39	0.85*	2.61	0.00	2.61
25.85	0.33	0.39	0.86*	2.60	0.00	2.60
25.90	0.34	0.39	0.86*	2.60	0.00	2.60
25.95	0.34	0.39	0.87*	2.59	0.00	2.59
26.00	0.34	0.39	0.87*	2.58	0.00	2.58
26.05	0.34	0.39	0.87*	2.57	0.00	2.57
26.10	0.34	0.39	0.88*	2.57	0.00	2.57
26.15	0.34	0.39	0.88*	2.56	0.00	2.56
26.20	0.35	0.39	0.89*	2.55	0.00	2.55
26.25	0.35	0.39	0.89*	2.55	0.00	2.55
26.30	0.35	0.39	0.89*	2.54	0.00	2.54
26.35	0.35	0.39	0.90*	2.53	0.00	2.53
26.40	0.35	0.39	0.90*	2.53	0.00	2.53
26.45	0.35	0.39	0.91*	2.52	0.00	2.52
26.50	0.36	0.39	0.91*	2.51	0.00	2.51
26.55	0.36	0.39	0.91*	2.51	0.00	2.51
26.60	0.36	0.39	0.92*	2.50	0.00	2.50
26.65	0.36	0.39	0.92*	2.49	0.00	2.49
26.70	0.36	0.39	0.93*	2.49	0.00	2.49
26.75	0.37	0.39	0.93*	2.48	0.00	2.48
26.80	0.37	0.39	0.94*	2.47	0.00	2.47
26.85	0.37	0.39	0.94*	2.47	0.00	2.47
26.90	0.37	0.39	0.94*	2.46	0.00	2.46
26.95	0.37	0.39	0.95*	2.45	0.00	2.45
27.00	0.38	0.39	0.95*	2.45	0.00	2.45

27.05	0.38	0.39	0.96*	2.44	0.00	2.44
27.10	0.38	0.39	0.96*	2.43	0.00	2.43
27.15	0.38	0.39	0.97*	2.43	0.00	2.43
27.20	0.38	0.39	0.97*	2.42	0.00	2.42
27.25	0.39	0.39	0.98*	2.41	0.00	2.41
27.30	0.39	0.40	0.98*	2.41	0.00	2.41
27.35	0.39	0.40	0.99*	2.40	0.00	2.40
27.40	0.39	0.40	0.99*	2.40	0.00	2.40
27.45	0.39	0.40	1.00*	2.39	0.00	2.39
27.50	0.40	0.40	1.00	2.38	0.00	2.38
27.55	0.40	0.40	1.01	2.38	0.00	2.38
27.60	0.40	0.40	1.01	2.38	0.00	2.38
27.65	0.40	0.40	1.02	2.38	0.00	2.38
27.70	0.41	0.40	1.02	2.38	0.00	2.38
27.75	0.41	0.40	1.03	2.38	0.00	2.38
27.80	0.41	0.40	1.04	2.38	0.00	2.38
27.85	0.41	0.40	1.04	2.38	0.00	2.38
27.90	0.46	0.40	1.15	2.38	0.00	2.38
27.95	0.46	0.40	1.16	2.38	0.00	2.38
28.00	0.46	0.40	1.17	2.38	0.00	2.38
28.05	0.47	0.40	1.18	2.38	0.00	2.38
28.10	0.47	0.40	1.19	2.38	0.00	2.38
28.15	0.48	0.40	1.20	2.38	0.00	2.38
28.20	0.49	0.40	1.22	2.38	0.00	2.38
28.25	0.49	0.40	1.23	2.38	0.00	2.38
28.30	0.50	0.40	1.25	2.38	0.00	2.38
28.35	0.51	0.40	1.27	2.38	0.00	2.38
28.40	0.52	0.40	1.29	2.38	0.00	2.38
28.45	0.53	0.40	1.32	2.38	0.00	2.38
28.50	0.54	0.40	1.36	2.38	0.00	2.38
28.55	0.56	0.40	1.41	2.38	0.00	2.38
28.60	0.59	0.40	1.48	2.38	0.00	2.38
28.65	0.62	0.40	1.55	2.38	0.00	2.38
28.70	0.62	0.40	1.54	2.38	0.00	2.38
28.75	0.62	0.40	1.54	2.38	0.00	2.38
28.80	0.62	0.40	1.54	2.38	0.00	2.38
28.85	0.62	0.40	1.54	2.38	0.00	2.38
28.90	0.62	0.40	1.54	2.38	0.00	2.38
28.95	0.62	0.40	1.54	2.38	0.00	2.38
29.00	0.62	0.40	1.54	2.38	0.00	2.38
29.05	0.62	0.40	1.54	2.38	0.00	2.38
29.10	0.62	0.40	1.54	2.38	0.00	2.38
29.15	0.62	0.40	1.54	2.38	0.00	2.38
29.20	0.62	0.40	1.54	2.38	0.00	2.38
29.25	0.62	0.40	1.54	2.38	0.00	2.38
29.30	0.62	0.40	1.54	2.38	0.00	2.38
29.35	0.62	0.40	1.54	2.38	0.00	2.38
29.40	0.62	0.40	1.53	2.38	0.00	2.38
29.45	0.62	0.40	1.53	2.38	0.00	2.38
29.50	0.62	0.40	1.53	2.38	0.00	2.38
29.55	0.62	0.40	1.53	2.38	0.00	2.38
29.60	0.62	0.40	1.53	2.38	0.00	2.38
29.65	0.62	0.40	1.53	2.38	0.00	2.38
29.70	0.62	0.40	1.53	2.38	0.00	2.38
29.75	0.62	0.40	1.53	2.38	0.00	2.38
29.80	0.62	0.40	1.53	2.38	0.00	2.38
29.85	0.62	0.40	1.53	2.38	0.00	2.38
29.90	0.62	0.40	1.53	2.38	0.00	2.38
29.95	0.62	0.41	1.53	2.38	0.00	2.38
30.00	0.62	0.41	1.53	2.38	0.00	2.38
30.05	0.62	0.41	1.53	2.38	0.00	2.38
30.10	0.62	0.41	1.53	2.38	0.00	2.38
30.15	0.62	0.41	1.53	2.38	0.00	2.38

30.20	0.62	0.41	1.53	2.38	0.00	2.38
30.25	0.62	0.41	1.53	2.38	0.00	2.38
30.30	0.62	0.41	1.53	2.38	0.00	2.38
30.35	0.62	0.41	1.53	2.38	0.00	2.38
30.40	0.62	0.41	1.53	2.38	0.00	2.38
30.45	0.62	0.41	1.53	2.38	0.00	2.38
30.50	0.62	0.41	1.53	2.38	0.00	2.38
30.55	0.62	0.41	1.53	2.38	0.00	2.38
30.60	0.62	0.41	1.53	2.38	0.00	2.38
30.65	0.62	0.41	1.53	2.38	0.00	2.38
30.70	0.62	0.41	1.53	2.38	0.00	2.38
30.75	0.62	0.41	1.53	2.38	0.00	2.38
30.80	0.62	0.41	1.53	2.38	0.00	2.38
30.85	0.62	0.41	1.53	2.38	0.00	2.38
30.90	0.62	0.41	1.53	2.38	0.00	2.38
30.95	0.62	0.41	1.53	2.38	0.00	2.38
31.00	0.62	0.41	1.52	2.38	0.00	2.38
31.05	0.62	0.41	1.52	2.38	0.00	2.38
31.10	0.62	0.41	1.52	2.38	0.00	2.38
31.15	0.62	0.41	1.52	2.38	0.00	2.38
31.20	0.62	0.41	1.52	2.38	0.00	2.38
31.25	0.62	0.41	1.52	2.38	0.00	2.38
31.30	0.62	0.41	1.52	2.38	0.00	2.38
31.35	0.62	0.41	1.52	2.38	0.00	2.38
31.40	0.62	0.41	1.52	2.38	0.00	2.38
31.45	0.62	0.41	1.52	2.38	0.00	2.38
31.50	0.62	0.41	1.52	2.38	0.00	2.38
31.55	0.62	0.41	1.52	2.38	0.00	2.38
31.60	0.62	0.41	1.52	2.38	0.00	2.38
31.65	0.62	0.41	1.52	2.38	0.00	2.38
31.70	0.62	0.41	1.52	2.38	0.00	2.38
31.75	0.62	0.41	1.52	2.38	0.00	2.38
31.80	0.62	0.41	1.52	2.38	0.00	2.38
31.85	0.62	0.41	1.52	2.38	0.00	2.38
31.90	0.62	0.41	1.52	2.38	0.00	2.38
31.95	0.62	0.41	1.52	2.38	0.00	2.38
32.00	0.62	0.41	1.52	2.38	0.00	2.38
32.05	0.62	0.41	1.52	2.38	0.00	2.38
32.10	0.62	0.41	1.52	2.38	0.00	2.38
32.15	0.62	0.41	1.52	2.38	0.00	2.38
32.20	0.62	0.41	1.52	2.38	0.00	2.38
32.25	0.62	0.41	1.52	2.38	0.00	2.38
32.30	0.62	0.41	1.52	2.38	0.00	2.38
32.35	0.62	0.41	1.52	2.38	0.00	2.38
32.40	0.62	0.41	1.52	2.38	0.00	2.38
32.45	0.62	0.41	1.52	2.38	0.00	2.38
32.50	0.62	0.41	1.52	2.38	0.00	2.38
32.55	0.62	0.41	1.52	2.38	0.00	2.38
32.60	0.62	0.41	1.52	2.38	0.00	2.38
32.65	0.62	0.41	1.52	2.38	0.00	2.38
32.70	0.62	0.41	1.52	2.38	0.00	2.38
32.75	0.62	0.41	1.52	2.38	0.00	2.38
32.80	0.62	0.41	1.52	2.38	0.00	2.38
32.85	0.62	0.41	1.52	2.38	0.00	2.38
32.90	0.62	0.41	1.53	2.38	0.00	2.38
32.95	0.62	0.41	1.53	2.38	0.00	2.38
33.00	0.62	0.41	1.53	2.38	0.00	2.38
33.05	0.62	0.41	1.53	2.38	0.00	2.38
33.10	0.62	0.41	1.53	2.38	0.00	2.38
33.15	0.62	0.41	1.53	2.38	0.00	2.38
33.20	0.62	0.41	1.53	2.38	0.00	2.38
33.25	0.62	0.41	1.53	2.38	0.00	2.38
33.30	0.62	0.41	1.53	2.38	0.00	2.38

33.35	0.62	0.41	1.53	2.38	0.00	2.38
33.40	0.62	0.41	1.53	2.38	0.00	2.38
33.45	0.62	0.41	1.53	2.38	0.00	2.38
33.50	0.62	0.41	1.53	2.38	0.00	2.38
33.55	0.62	0.41	1.53	2.38	0.00	2.38
33.60	0.62	0.41	1.53	2.38	0.00	2.38
33.65	0.62	0.41	1.53	2.38	0.00	2.38
33.70	0.62	0.41	1.53	2.38	0.00	2.38
33.75	0.62	0.41	1.53	2.38	0.00	2.38
33.80	0.62	0.41	1.53	2.38	0.00	2.38
33.85	0.62	0.41	1.53	2.38	0.00	2.38
33.90	0.62	0.41	1.53	2.38	0.00	2.38
33.95	0.62	0.41	1.53	2.38	0.00	2.38
34.00	0.62	0.41	1.53	2.38	0.00	2.38
34.05	0.62	0.41	1.53	2.38	0.00	2.38
34.10	0.62	0.41	1.53	2.38	0.00	2.38
34.15	0.62	0.41	1.53	2.38	0.00	2.38
34.20	0.62	0.41	1.53	2.38	0.00	2.38
34.25	0.62	0.41	1.53	2.38	0.00	2.38
34.30	0.62	0.41	1.53	2.38	0.00	2.38
34.35	0.62	0.41	1.53	2.38	0.00	2.38
34.40	0.62	0.41	1.53	2.38	0.00	2.38
34.45	0.61	0.41	1.51	2.38	0.00	2.38
34.50	0.58	0.41	1.43	2.38	0.00	2.38
34.55	0.56	0.41	1.37	2.38	0.00	2.38
34.60	0.54	0.41	1.33	2.38	0.00	2.38
34.65	0.53	0.41	1.30	2.38	0.00	2.38
34.70	0.52	0.41	1.27	2.38	0.00	2.38
34.75	0.51	0.41	1.25	2.38	0.00	2.38
34.80	0.50	0.41	1.23	2.38	0.00	2.38
34.85	0.49	0.41	1.22	2.38	0.00	2.38
34.90	0.49	0.41	1.20	2.38	0.00	2.38
34.95	0.48	0.41	1.19	2.38	0.00	2.38
35.00	0.48	0.41	1.17	2.38	0.00	2.38
35.05	0.47	0.41	1.16	2.38	0.00	2.38
35.10	0.47	0.41	1.15	2.38	0.00	2.38
35.15	0.46	0.41	1.14	2.38	0.00	2.38
35.20	0.46	0.41	1.13	2.38	0.00	2.38
35.25	0.46	0.41	1.12	2.38	0.00	2.38
35.30	0.45	0.41	1.11	2.38	0.00	2.38
35.35	0.45	0.41	1.11	2.38	0.00	2.38
35.40	0.45	0.41	1.10	2.38	0.00	2.38
35.45	0.44	0.41	1.09	2.38	0.00	2.38
35.50	0.44	0.41	1.08	2.38	0.00	2.38
35.55	0.44	0.41	1.08	2.38	0.00	2.38
35.60	0.43	0.41	1.07	2.38	0.00	2.38
35.65	0.43	0.41	1.06	2.38	0.00	2.38
35.70	0.43	0.41	1.05	2.38	0.00	2.38
35.75	0.43	0.41	1.05	2.38	0.00	2.38
35.80	0.42	0.41	1.04	2.38	0.00	2.38
35.85	0.42	0.41	1.04	2.38	0.00	2.38
35.90	0.42	0.41	1.03	2.38	0.00	2.38
35.95	0.42	0.41	1.02	2.38	0.00	2.38
36.00	0.41	0.41	1.02	2.38	0.00	2.38
36.05	0.41	0.41	1.01	2.38	0.00	2.38
36.10	0.41	0.41	1.01	2.38	0.00	2.38
36.15	0.41	0.41	1.00	2.38	0.00	2.38
36.20	0.40	0.41	0.99*	2.38	0.00	2.38
36.25	0.40	0.41	0.99*	2.38	0.00	2.38
36.30	0.40	0.41	0.98*	2.37	0.00	2.37
36.35	0.40	0.41	0.98*	2.37	0.00	2.37
36.40	0.39	0.41	0.97*	2.36	0.00	2.36
36.45	0.39	0.41	0.97*	2.35	0.00	2.35

36.50	0.39	0.41	0.96*	2.35	0.00	2.35
36.55	0.39	0.41	0.96*	2.34	0.00	2.34
36.60	0.39	0.41	0.95*	2.34	0.00	2.34
36.65	0.38	0.41	0.95*	2.33	0.00	2.33
36.70	0.38	0.41	0.94*	2.32	0.00	2.32
36.75	0.38	0.41	0.94*	2.32	0.00	2.32
36.80	0.38	0.41	0.94*	2.31	0.00	2.31
36.85	0.38	0.41	0.93*	2.30	0.00	2.30
36.90	0.38	0.41	0.93*	2.30	0.00	2.30
36.95	0.37	0.41	0.92*	2.29	0.00	2.29
37.00	0.37	0.41	0.92*	2.29	0.00	2.29
37.05	0.37	0.41	0.91*	2.28	0.00	2.28
37.10	0.37	0.41	0.91*	2.27	0.00	2.27
37.15	0.37	0.41	0.90*	2.27	0.00	2.27
37.20	0.36	0.41	0.90*	2.26	0.00	2.26
37.25	0.36	0.40	0.90*	2.25	0.00	2.25
37.30	0.36	0.40	0.89*	2.25	0.00	2.25
37.35	0.36	0.40	0.89*	2.24	0.00	2.24
37.40	0.36	0.40	0.88*	2.23	0.00	2.23
37.45	0.36	0.40	0.88*	2.23	0.00	2.23
37.50	0.35	0.40	0.88*	2.22	0.00	2.22
37.55	0.35	0.40	0.87*	2.21	0.00	2.21
37.60	0.35	0.40	0.87*	2.21	0.00	2.21
37.65	0.35	0.40	0.86*	2.20	0.00	2.20
37.70	0.35	0.40	0.86*	2.19	0.00	2.19
37.75	0.35	0.40	0.86*	2.19	0.00	2.19
37.80	0.35	0.40	0.85*	2.18	0.00	2.18
37.85	0.34	0.40	0.85*	2.17	0.00	2.17
37.90	0.34	0.40	0.85*	2.16	0.00	2.16
37.95	0.34	0.40	0.84*	2.16	0.00	2.16
38.00	0.34	0.40	0.84*	2.15	0.00	2.15
38.05	0.34	0.40	0.83*	2.14	0.00	2.14
38.10	0.34	0.40	0.83*	2.14	0.00	2.14
38.15	0.33	0.40	0.83*	2.13	0.00	2.13
38.20	0.33	0.40	0.82*	2.12	0.00	2.12
38.25	0.33	0.40	0.82*	2.11	0.00	2.11
38.30	0.33	0.40	0.82*	2.11	0.00	2.11
38.35	0.33	0.40	0.81*	2.10	0.00	2.10
38.40	0.33	0.40	0.81*	2.09	0.00	2.09
38.45	0.33	0.40	0.81*	2.09	0.00	2.09
38.50	0.32	0.40	0.80*	2.08	0.00	2.08
38.55	0.32	0.40	0.80*	2.07	0.00	2.07
38.60	0.32	0.40	0.80*	2.06	0.00	2.06
38.65	0.32	0.40	0.79*	2.06	0.00	2.06
38.70	0.32	0.40	0.79*	2.05	0.00	2.05
38.75	0.32	0.40	0.79*	2.04	0.00	2.04
38.80	0.32	0.40	0.78*	2.03	0.00	2.03
38.85	0.32	0.40	0.78*	2.03	0.00	2.03
38.90	0.31	0.40	0.78*	2.02	0.00	2.02
38.95	0.31	0.40	0.78*	2.01	0.00	2.01
39.00	0.31	0.40	0.77*	2.00	0.00	2.00
39.05	0.31	0.40	0.77*	2.00	0.00	2.00
39.10	0.31	0.40	0.77*	1.99	0.00	1.99
39.15	0.31	0.40	0.76*	1.98	0.00	1.98
39.20	0.31	0.40	0.76*	1.97	0.00	1.97
39.25	0.31	0.40	0.76*	1.96	0.00	1.96
39.30	0.30	0.40	0.75*	1.96	0.00	1.96
39.35	0.30	0.40	0.75*	1.95	0.00	1.95
39.40	0.30	0.40	0.75*	1.94	0.00	1.94
39.45	0.30	0.40	0.75*	1.93	0.00	1.93
39.50	0.30	0.40	0.74*	1.93	0.00	1.93
39.55	0.30	0.40	0.74*	1.92	0.00	1.92
39.60	0.30	0.40	0.74*	1.91	0.00	1.91

39.65	0.30	0.40	0.73*	1.90	0.00	1.90
39.70	0.29	0.40	0.73*	1.89	0.00	1.89
39.75	0.29	0.40	0.73*	1.89	0.00	1.89
39.80	0.29	0.40	0.73*	1.88	0.00	1.88
39.85	0.29	0.40	0.72*	1.87	0.00	1.87
39.90	0.29	0.40	0.72*	1.86	0.00	1.86
39.95	0.29	0.40	0.72*	1.85	0.00	1.85
40.00	0.29	0.40	0.72*	1.84	0.00	1.84
40.05	0.29	0.40	0.71*	1.84	0.00	1.84
40.10	0.29	0.40	0.71*	1.83	0.00	1.83
40.15	0.28	0.40	0.71*	1.82	0.00	1.82
40.20	0.28	0.40	0.70*	1.81	0.00	1.81
40.25	0.28	0.40	0.70*	1.80	0.00	1.80
40.30	0.28	0.40	0.70*	1.79	0.00	1.79
40.35	0.28	0.40	0.70*	1.79	0.00	1.79
40.40	0.28	0.40	0.69*	1.78	0.00	1.78
40.45	0.28	0.40	0.69*	1.77	0.00	1.77
40.50	0.28	0.40	0.69*	1.76	0.00	1.76
40.55	0.28	0.40	0.69*	1.75	0.00	1.75
40.60	0.27	0.40	0.68*	1.74	0.00	1.74
40.65	0.27	0.40	0.68*	1.73	0.00	1.73
40.70	0.27	0.40	0.68*	1.73	0.00	1.73
40.75	0.27	0.40	0.68*	1.72	0.00	1.72
40.80	0.27	0.40	0.67*	1.71	0.00	1.71
40.85	0.27	0.40	0.67*	1.70	0.00	1.70
40.90	0.27	0.40	0.67*	1.69	0.00	1.69
40.95	0.27	0.40	0.67*	1.68	0.00	1.68
41.00	0.27	0.40	0.66*	1.67	0.00	1.67
41.05	0.27	0.40	0.66*	1.66	0.00	1.66
41.10	0.26	0.40	0.66*	1.66	0.00	1.66
41.15	0.26	0.40	0.66*	1.65	0.00	1.65
41.20	0.26	0.40	0.65*	1.64	0.00	1.64
41.25	0.26	0.40	0.65*	1.63	0.00	1.63
41.30	0.26	0.40	0.65*	1.62	0.00	1.62
41.35	0.26	0.40	0.65*	1.61	0.00	1.61
41.40	0.26	0.40	0.64*	1.60	0.00	1.60
41.45	0.26	0.40	0.64*	1.59	0.00	1.59
41.50	0.26	0.40	0.64*	1.58	0.00	1.58
41.55	0.26	0.40	0.64*	1.57	0.00	1.57
41.60	0.26	0.40	0.64*	1.57	0.00	1.57
41.65	0.26	0.40	0.64*	1.56	0.00	1.56
41.70	0.26	0.40	0.64*	1.55	0.00	1.55
41.75	0.26	0.40	0.64*	1.54	0.00	1.54
41.80	0.26	0.40	0.64*	1.53	0.00	1.53
41.85	0.26	0.40	0.64*	1.52	0.00	1.52
41.90	0.26	0.40	0.64*	1.51	0.00	1.51
41.95	0.26	0.40	0.64*	1.50	0.00	1.50
42.00	0.26	0.40	0.64*	1.49	0.00	1.49
42.05	0.26	0.40	0.64*	1.48	0.00	1.48
42.10	0.26	0.40	0.64*	1.47	0.00	1.47
42.15	0.26	0.40	0.64*	1.47	0.00	1.47
42.20	0.26	0.40	0.64*	1.46	0.00	1.46
42.25	0.26	0.40	0.64*	1.45	0.00	1.45
42.30	0.25	0.40	0.64*	1.44	0.00	1.44
42.35	0.25	0.40	0.64*	1.43	0.00	1.43
42.40	0.25	0.40	0.64*	1.42	0.00	1.42
42.45	0.25	0.40	0.64*	1.41	0.00	1.41
42.50	0.25	0.40	0.64*	1.40	0.00	1.40
42.55	0.25	0.40	0.64*	1.39	0.00	1.39
42.60	0.25	0.40	0.64*	1.38	0.00	1.38
42.65	0.25	0.40	0.64*	1.37	0.00	1.37
42.70	0.25	0.40	0.64*	1.36	0.00	1.36
42.75	0.25	0.40	0.64*	1.35	0.00	1.35

42.80	0.25	0.40	0.64*	1.35	0.00	1.35
42.85	0.25	0.40	0.64*	1.34	0.00	1.34
42.90	0.25	0.40	0.64*	1.33	0.00	1.33
42.95	0.25	0.40	0.64*	1.32	0.00	1.32
43.00	0.25	0.40	0.64*	1.31	0.00	1.31
43.05	0.25	0.40	0.64*	1.30	0.00	1.30
43.10	0.25	0.40	0.64*	1.29	0.00	1.29
43.15	0.25	0.40	0.63*	1.28	0.00	1.28
43.20	0.25	0.40	0.63*	1.27	0.00	1.27
43.25	0.25	0.40	0.63*	1.26	0.00	1.26
43.30	0.25	0.40	0.63*	1.25	0.00	1.25
43.35	0.25	0.40	0.63*	1.24	0.00	1.24
43.40	0.25	0.40	0.63*	1.24	0.00	1.24
43.45	0.25	0.40	0.63*	1.23	0.00	1.23
43.50	0.25	0.40	0.63*	1.22	0.00	1.22
43.55	0.25	0.40	0.63*	1.21	0.00	1.21
43.60	0.25	0.40	0.63*	1.20	0.00	1.20
43.65	0.25	0.40	0.63*	1.19	0.00	1.19
43.70	0.25	0.40	0.63*	1.18	0.00	1.18
43.75	0.25	0.40	0.63*	1.17	0.00	1.17
43.80	0.25	0.40	0.63*	1.16	0.00	1.16
43.85	0.25	0.40	0.63*	1.15	0.00	1.15
43.90	0.25	0.40	0.63*	1.14	0.00	1.14
43.95	0.25	0.40	0.63*	1.13	0.00	1.13
44.00	0.25	0.40	0.63*	1.12	0.00	1.12
44.05	0.25	0.40	0.63*	1.12	0.00	1.12
44.10	0.25	0.40	0.63*	1.11	0.00	1.11
44.15	0.25	0.40	0.63*	1.10	0.00	1.10
44.20	0.25	0.40	0.63*	1.09	0.00	1.09
44.25	0.25	0.40	0.63*	1.08	0.00	1.08
44.30	0.25	0.40	0.63*	1.07	0.00	1.07
44.35	0.25	0.40	0.63*	1.06	0.00	1.06
44.40	0.25	0.40	0.63*	1.05	0.00	1.05
44.45	0.25	0.40	0.63*	1.04	0.00	1.04
44.50	0.25	0.40	0.63*	1.03	0.00	1.03
44.55	0.25	0.40	0.63*	1.02	0.00	1.02
44.60	0.25	0.40	0.63*	1.01	0.00	1.01
44.65	0.25	0.40	0.63*	1.00	0.00	1.00
44.70	0.25	0.40	0.63*	0.99	0.00	0.99
44.75	0.25	0.40	0.63*	0.99	0.00	0.99
44.80	0.25	0.40	0.63*	0.98	0.00	0.98
44.85	0.25	0.40	0.63*	0.97	0.00	0.97
44.90	0.25	0.40	0.63*	0.96	0.00	0.96
44.95	0.25	0.40	0.63*	0.95	0.00	0.95
45.00	0.25	0.40	0.63*	0.94	0.00	0.94
45.05	0.25	0.40	0.63*	0.93	0.00	0.93
45.10	0.25	0.40	0.63*	0.92	0.00	0.92
45.15	0.25	0.40	0.63*	0.91	0.00	0.91
45.20	0.25	0.40	0.63*	0.90	0.00	0.90
45.25	0.25	0.40	0.63*	0.89	0.00	0.89
45.30	0.25	0.40	0.63*	0.88	0.00	0.88
45.35	0.25	0.40	0.63*	0.87	0.00	0.87
45.40	0.25	0.40	0.63*	0.86	0.00	0.86
45.45	0.25	0.40	0.63*	0.86	0.00	0.86
45.50	0.25	0.40	0.63*	0.85	0.00	0.85
45.55	0.25	0.40	0.63*	0.84	0.00	0.84
45.60	0.25	0.40	0.63*	0.83	0.00	0.83
45.65	0.25	0.40	0.63*	0.82	0.00	0.82
45.70	0.25	0.39	0.63*	0.81	0.00	0.81
45.75	0.25	0.39	0.63*	0.80	0.00	0.80
45.80	0.25	0.39	0.63*	0.79	0.00	0.79
45.85	0.25	0.39	0.63*	0.78	0.00	0.78
45.90	0.25	0.39	0.63*	0.77	0.00	0.77

45.95	0.25	0.39	0.63*	0.76	0.00	0.76
46.00	0.25	0.39	0.63*	0.75	0.00	0.75
46.05	0.25	0.39	0.63*	0.74	0.00	0.74
46.10	0.25	0.39	0.63*	0.73	0.00	0.73
46.15	0.25	0.39	0.63*	0.72	0.00	0.72
46.20	0.25	0.39	0.63*	0.72	0.00	0.72
46.25	0.25	0.39	0.63*	0.71	0.00	0.71
46.30	0.25	0.39	0.63*	0.70	0.00	0.70
46.35	0.25	0.39	0.63*	0.69	0.00	0.69
46.40	0.25	0.39	0.63*	0.68	0.00	0.68
46.45	0.25	0.39	0.63*	0.67	0.00	0.67
46.50	0.25	0.39	0.63*	0.66	0.00	0.66
46.55	0.25	0.39	0.63*	0.65	0.00	0.65
46.60	0.25	0.39	0.63*	0.64	0.00	0.64
46.65	0.25	0.39	0.63*	0.63	0.00	0.63
46.70	0.25	0.39	0.63*	0.62	0.00	0.62
46.75	0.25	0.39	0.63*	0.61	0.00	0.61
46.80	0.25	0.39	0.63*	0.60	0.00	0.60
46.85	0.25	0.39	0.63*	0.59	0.00	0.59
46.90	0.25	0.39	0.63*	0.58	0.00	0.58
46.95	0.25	0.39	0.63*	0.58	0.00	0.58
47.00	0.25	0.39	0.63*	0.57	0.00	0.57
47.05	0.25	0.39	0.63*	0.56	0.00	0.56
47.10	0.25	0.39	0.63*	0.55	0.00	0.55
47.15	0.25	0.39	0.63*	0.54	0.00	0.54
47.20	0.25	0.39	0.63*	0.53	0.00	0.53
47.25	0.25	0.39	0.63*	0.52	0.00	0.52
47.30	0.25	0.39	0.63*	0.51	0.00	0.51
47.35	0.25	0.39	0.63*	0.50	0.00	0.50
47.40	0.25	0.39	0.63*	0.49	0.00	0.49
47.45	0.25	0.39	0.63*	0.48	0.00	0.48
47.50	0.25	0.39	0.63*	0.47	0.00	0.47
47.55	0.25	0.39	0.63*	0.46	0.00	0.46
47.60	0.25	0.39	0.63*	0.45	0.00	0.45
47.65	0.25	0.39	0.63*	0.44	0.00	0.44
47.70	0.25	0.39	0.63*	0.43	0.00	0.43
47.75	0.24	0.39	0.63*	0.42	0.00	0.42
47.80	0.24	0.39	0.63*	0.42	0.00	0.42
47.85	0.24	0.39	0.63*	0.41	0.00	0.41
47.90	0.24	0.39	0.63*	0.40	0.00	0.40
47.95	0.24	0.39	0.63*	0.39	0.00	0.39
48.00	0.24	0.39	0.63*	0.38	0.00	0.38
48.05	0.24	0.39	0.63*	0.37	0.00	0.37
48.10	0.24	0.39	0.63*	0.36	0.00	0.36
48.15	0.24	0.39	0.63*	0.35	0.00	0.35
48.20	0.24	0.39	0.63*	0.34	0.00	0.34
48.25	0.24	0.39	0.63*	0.33	0.00	0.33
48.30	0.24	0.39	0.63*	0.32	0.00	0.32
48.35	0.24	0.39	0.63*	0.31	0.00	0.31
48.40	0.24	0.39	0.63*	0.30	0.00	0.30
48.45	0.24	0.39	0.63*	0.29	0.00	0.29
48.50	0.24	0.39	0.63*	0.28	0.00	0.28
48.55	0.24	0.39	0.63*	0.27	0.00	0.27
48.60	0.24	0.39	0.63*	0.26	0.00	0.26
48.65	0.24	0.39	0.63*	0.26	0.00	0.26
48.70	0.24	0.39	0.62*	0.25	0.00	0.25
48.75	0.24	0.39	0.62*	0.24	0.00	0.24
48.80	0.24	0.39	0.62*	0.23	0.00	0.23
48.85	0.24	0.39	0.62*	0.22	0.00	0.22
48.90	0.24	0.39	0.62*	0.21	0.00	0.21
48.95	0.24	0.39	0.62*	0.20	0.00	0.20
49.00	0.24	0.39	0.62*	0.19	0.00	0.19
49.05	0.24	0.39	0.62*	0.18	0.00	0.18

49.10	0.24	0.39	0.62*	0.17	0.00	0.17
49.15	0.24	0.39	0.62*	0.16	0.00	0.16
49.20	0.24	0.39	0.62*	0.15	0.00	0.15
49.25	0.24	0.39	0.62*	0.14	0.00	0.14
49.30	0.24	0.39	0.62*	0.13	0.00	0.13
49.35	0.24	0.39	0.62*	0.12	0.00	0.12
49.40	0.24	0.39	0.62*	0.11	0.00	0.11
49.45	0.24	0.39	0.62*	0.10	0.00	0.10
49.50	0.24	0.39	0.62*	0.09	0.00	0.09
49.55	0.24	0.39	0.62*	0.09	0.00	0.09
49.60	0.24	0.39	0.62*	0.08	0.00	0.08
49.65	0.24	0.39	0.62*	0.07	0.00	0.07
49.70	0.24	0.39	0.62*	0.06	0.00	0.06
49.75	0.24	0.39	0.62*	0.05	0.00	0.05
49.80	0.24	0.39	0.62*	0.04	0.00	0.04
49.85	0.24	0.39	0.62*	0.03	0.00	0.03
49.90	0.24	0.39	0.62*	0.02	0.00	0.02
49.95	0.24	0.39	0.62*	0.01	0.00	0.01
50.00	0.24	0.39	0.62*	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: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

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1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm Cyclic resistance ratio from soils
CSRsf Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat Settlement from saturated sands
S_dry Settlement from Unsaturated Sands
S_all Total Settlement from Saturated and Unsaturated Sands
NoLiq No-Liquefy Soils

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LIQUEFACTION ANALYSIS SUMMARY

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Input File Name: C:\Users\koohi\Desktop\Stanton\B6.liq
Title: Stanton Energy Reliability Center-B6
Subtitle: Stanton, CA

Surface Elev.=68
Hole No.=B6
Depth of Hole= 50.00 ft
Water Table during Earthquake= 15.00 ft
Water Table during In-Situ Testing= 20.00 ft
Max. Acceleration= 0.5 g
Earthquake Magnitude= 6.90

Input Data:
Surface Elev.=68
Hole No.=B6
Depth of Hole=50.00 ft
Water Table during Earthquake= 15.00 ft
Water Table during In-Situ Testing= 20.00 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=6.90
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Tokimatsu/Seed
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: Liq. zone only
6. Hammer Energy Ratio, Ce = 0.8
7. Borehole Diameter, Cb= 1.15
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 %
11.50	6.00	120.00	15.00
21.50	11.00	130.00	55.00
31.50	25.00	130.00	55.00
41.50	24.00	110.00	90.00

Output Results:
Settlement of Saturated Sands=5.17 in.
Settlement of Unsaturated Sands=0.00 in.
Total Settlement of Saturated and Unsaturated Sands=5.17 in.
Differential Settlement=2.585 to 3.412 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
11.50	0.11	0.32	5.00	5.17	0.00	5.17
11.55	0.11	0.32	5.00	5.17	0.00	5.17
11.60	0.11	0.32	5.00	5.17	0.00	5.17
11.65	0.11	0.32	5.00	5.17	0.00	5.17
11.70	0.11	0.32	5.00	5.17	0.00	5.17
11.75	0.12	0.32	5.00	5.17	0.00	5.17
11.80	0.12	0.32	5.00	5.17	0.00	5.17
11.85	0.12	0.32	5.00	5.17	0.00	5.17
11.90	0.12	0.32	5.00	5.17	0.00	5.17
11.95	0.12	0.32	5.00	5.17	0.00	5.17
12.00	0.12	0.32	5.00	5.17	0.00	5.17
12.05	0.12	0.32	5.00	5.17	0.00	5.17
12.10	0.12	0.32	5.00	5.17	0.00	5.17
12.15	0.12	0.32	5.00	5.17	0.00	5.17
12.20	0.12	0.32	5.00	5.17	0.00	5.17
12.25	0.12	0.32	5.00	5.17	0.00	5.17
12.30	0.12	0.32	5.00	5.17	0.00	5.17
12.35	0.12	0.32	5.00	5.17	0.00	5.17
12.40	0.13	0.32	5.00	5.17	0.00	5.17
12.45	0.13	0.32	5.00	5.17	0.00	5.17
12.50	0.13	0.32	5.00	5.17	0.00	5.17
12.55	0.13	0.32	5.00	5.17	0.00	5.17
12.60	0.13	0.32	5.00	5.17	0.00	5.17
12.65	0.13	0.32	5.00	5.17	0.00	5.17
12.70	0.13	0.32	5.00	5.17	0.00	5.17
12.75	0.13	0.32	5.00	5.17	0.00	5.17
12.80	0.13	0.32	5.00	5.17	0.00	5.17
12.85	0.13	0.32	5.00	5.17	0.00	5.17
12.90	0.13	0.32	5.00	5.17	0.00	5.17
12.95	0.13	0.32	5.00	5.17	0.00	5.17
13.00	0.13	0.32	5.00	5.17	0.00	5.17
13.05	0.13	0.32	5.00	5.17	0.00	5.17
13.10	0.14	0.32	5.00	5.17	0.00	5.17
13.15	0.14	0.32	5.00	5.17	0.00	5.17
13.20	0.14	0.31	5.00	5.17	0.00	5.17
13.25	0.14	0.31	5.00	5.17	0.00	5.17
13.30	0.14	0.31	5.00	5.17	0.00	5.17
13.35	0.14	0.31	5.00	5.17	0.00	5.17
13.40	0.14	0.31	5.00	5.17	0.00	5.17
13.45	0.14	0.31	5.00	5.17	0.00	5.17
13.50	0.14	0.31	5.00	5.17	0.00	5.17
13.55	0.14	0.31	5.00	5.17	0.00	5.17
13.60	0.14	0.31	5.00	5.17	0.00	5.17
13.65	0.14	0.31	5.00	5.17	0.00	5.17
13.70	0.14	0.31	5.00	5.17	0.00	5.17
13.75	0.15	0.31	5.00	5.17	0.00	5.17
13.80	0.15	0.31	5.00	5.17	0.00	5.17
13.85	0.15	0.31	5.00	5.17	0.00	5.17
13.90	0.15	0.31	5.00	5.17	0.00	5.17
13.95	0.15	0.31	5.00	5.17	0.00	5.17
14.00	0.15	0.31	5.00	5.17	0.00	5.17
14.05	0.15	0.31	5.00	5.17	0.00	5.17
14.10	0.15	0.31	5.00	5.17	0.00	5.17
14.15	0.15	0.31	5.00	5.17	0.00	5.17
14.20	0.15	0.31	5.00	5.17	0.00	5.17
14.25	0.15	0.31	5.00	5.17	0.00	5.17
14.30	0.15	0.31	5.00	5.17	0.00	5.17
14.35	0.15	0.31	5.00	5.17	0.00	5.17
14.40	0.16	0.31	5.00	5.17	0.00	5.17

14.45	0.16	0.31	5.00	5.17	0.00	5.17
14.50	0.16	0.31	5.00	5.17	0.00	5.17
14.55	0.16	0.31	5.00	5.17	0.00	5.17
14.60	0.16	0.31	5.00	5.17	0.00	5.17
14.65	0.16	0.31	5.00	5.17	0.00	5.17
14.70	0.16	0.31	5.00	5.17	0.00	5.17
14.75	0.16	0.31	5.00	5.17	0.00	5.17
14.80	0.17	0.31	5.00	5.17	0.00	5.17
14.85	0.17	0.31	5.00	5.17	0.00	5.17
14.90	0.17	0.31	5.00	5.17	0.00	5.17
14.95	0.17	0.31	5.00	5.17	0.00	5.17
15.00	0.18	0.31	0.56*	5.17	0.00	5.17
15.05	0.18	0.31	0.56*	5.16	0.00	5.16
15.10	0.18	0.31	0.56*	5.14	0.00	5.14
15.15	0.18	0.32	0.56*	5.13	0.00	5.13
15.20	0.18	0.32	0.57*	5.12	0.00	5.12
15.25	0.18	0.32	0.57*	5.11	0.00	5.11
15.30	0.18	0.32	0.57*	5.09	0.00	5.09
15.35	0.18	0.32	0.57*	5.08	0.00	5.08
15.40	0.18	0.32	0.57*	5.07	0.00	5.07
15.45	0.18	0.32	0.57*	5.05	0.00	5.05
15.50	0.18	0.32	0.58*	5.04	0.00	5.04
15.55	0.18	0.32	0.58*	5.03	0.00	5.03
15.60	0.18	0.32	0.58*	5.02	0.00	5.02
15.65	0.19	0.32	0.58*	5.00	0.00	5.00
15.70	0.19	0.32	0.58*	4.99	0.00	4.99
15.75	0.19	0.32	0.58*	4.98	0.00	4.98
15.80	0.19	0.32	0.58*	4.97	0.00	4.97
15.85	0.19	0.32	0.59*	4.96	0.00	4.96
15.90	0.19	0.32	0.59*	4.94	0.00	4.94
15.95	0.19	0.32	0.59*	4.93	0.00	4.93
16.00	0.19	0.32	0.59*	4.92	0.00	4.92
16.05	0.19	0.32	0.59*	4.91	0.00	4.91
16.10	0.19	0.32	0.59*	4.90	0.00	4.90
16.15	0.19	0.32	0.60*	4.88	0.00	4.88
16.20	0.19	0.33	0.60*	4.87	0.00	4.87
16.25	0.19	0.33	0.60*	4.86	0.00	4.86
16.30	0.20	0.33	0.60*	4.85	0.00	4.85
16.35	0.20	0.33	0.60*	4.84	0.00	4.84
16.40	0.20	0.33	0.60*	4.82	0.00	4.82
16.45	0.20	0.33	0.60*	4.81	0.00	4.81
16.50	0.20	0.33	0.61*	4.80	0.00	4.80
16.55	0.20	0.33	0.61*	4.79	0.00	4.79
16.60	0.20	0.33	0.61*	4.78	0.00	4.78
16.65	0.20	0.33	0.61*	4.77	0.00	4.77
16.70	0.20	0.33	0.60*	4.75	0.00	4.75
16.75	0.20	0.33	0.60*	4.74	0.00	4.74
16.80	0.20	0.33	0.60*	4.73	0.00	4.73
16.85	0.20	0.33	0.60*	4.72	0.00	4.72
16.90	0.20	0.33	0.60*	4.71	0.00	4.71
16.95	0.20	0.33	0.60*	4.70	0.00	4.70
17.00	0.20	0.33	0.60*	4.68	0.00	4.68
17.05	0.20	0.33	0.60*	4.67	0.00	4.67
17.10	0.20	0.33	0.60*	4.66	0.00	4.66
17.15	0.20	0.33	0.60*	4.65	0.00	4.65
17.20	0.20	0.33	0.60*	4.64	0.00	4.64
17.25	0.20	0.33	0.60*	4.63	0.00	4.63
17.30	0.20	0.33	0.60*	4.61	0.00	4.61
17.35	0.20	0.34	0.60*	4.60	0.00	4.60
17.40	0.20	0.34	0.60*	4.59	0.00	4.59
17.45	0.20	0.34	0.60*	4.58	0.00	4.58
17.50	0.20	0.34	0.60*	4.57	0.00	4.57
17.55	0.20	0.34	0.60*	4.56	0.00	4.56

17.60	0.20	0.34	0.60*	4.55	0.00	4.55
17.65	0.20	0.34	0.60*	4.53	0.00	4.53
17.70	0.20	0.34	0.60*	4.52	0.00	4.52
17.75	0.20	0.34	0.60*	4.51	0.00	4.51
17.80	0.20	0.34	0.60*	4.50	0.00	4.50
17.85	0.20	0.34	0.60*	4.49	0.00	4.49
17.90	0.20	0.34	0.60*	4.48	0.00	4.48
17.95	0.20	0.34	0.60*	4.46	0.00	4.46
18.00	0.20	0.34	0.60*	4.45	0.00	4.45
18.05	0.20	0.34	0.60*	4.44	0.00	4.44
18.10	0.20	0.34	0.60*	4.43	0.00	4.43
18.15	0.20	0.34	0.59*	4.42	0.00	4.42
18.20	0.20	0.34	0.59*	4.41	0.00	4.41
18.25	0.20	0.34	0.59*	4.40	0.00	4.40
18.30	0.20	0.34	0.59*	4.38	0.00	4.38
18.35	0.20	0.34	0.59*	4.37	0.00	4.37
18.40	0.20	0.34	0.59*	4.36	0.00	4.36
18.45	0.20	0.34	0.59*	4.35	0.00	4.35
18.50	0.20	0.34	0.59*	4.34	0.00	4.34
18.55	0.20	0.34	0.59*	4.33	0.00	4.33
18.60	0.20	0.35	0.59*	4.32	0.00	4.32
18.65	0.20	0.35	0.59*	4.30	0.00	4.30
18.70	0.20	0.35	0.59*	4.29	0.00	4.29
18.75	0.20	0.35	0.59*	4.28	0.00	4.28
18.80	0.20	0.35	0.59*	4.27	0.00	4.27
18.85	0.21	0.35	0.59*	4.26	0.00	4.26
18.90	0.21	0.35	0.59*	4.25	0.00	4.25
18.95	0.21	0.35	0.59*	4.24	0.00	4.24
19.00	0.21	0.35	0.59*	4.23	0.00	4.23
19.05	0.21	0.35	0.59*	4.21	0.00	4.21
19.10	0.21	0.35	0.59*	4.20	0.00	4.20
19.15	0.21	0.35	0.59*	4.19	0.00	4.19
19.20	0.21	0.35	0.59*	4.18	0.00	4.18
19.25	0.21	0.35	0.59*	4.17	0.00	4.17
19.30	0.21	0.35	0.59*	4.16	0.00	4.16
19.35	0.21	0.35	0.59*	4.15	0.00	4.15
19.40	0.21	0.35	0.59*	4.13	0.00	4.13
19.45	0.21	0.35	0.59*	4.12	0.00	4.12
19.50	0.21	0.35	0.59*	4.11	0.00	4.11
19.55	0.21	0.35	0.59*	4.10	0.00	4.10
19.60	0.21	0.35	0.59*	4.09	0.00	4.09
19.65	0.21	0.35	0.59*	4.08	0.00	4.08
19.70	0.21	0.35	0.59*	4.07	0.00	4.07
19.75	0.21	0.35	0.59*	4.06	0.00	4.06
19.80	0.21	0.35	0.59*	4.04	0.00	4.04
19.85	0.21	0.35	0.59*	4.03	0.00	4.03
19.90	0.21	0.35	0.59*	4.02	0.00	4.02
19.95	0.21	0.36	0.59*	4.01	0.00	4.01
20.00	0.21	0.36	0.59*	4.00	0.00	4.00
20.05	0.21	0.36	0.59*	3.99	0.00	3.99
20.10	0.21	0.36	0.59*	3.98	0.00	3.98
20.15	0.21	0.36	0.59*	3.97	0.00	3.97
20.20	0.21	0.36	0.59*	3.95	0.00	3.95
20.25	0.21	0.36	0.58*	3.94	0.00	3.94
20.30	0.21	0.36	0.58*	3.93	0.00	3.93
20.35	0.21	0.36	0.58*	3.92	0.00	3.92
20.40	0.21	0.36	0.58*	3.91	0.00	3.91
20.45	0.21	0.36	0.58*	3.90	0.00	3.90
20.50	0.21	0.36	0.58*	3.89	0.00	3.89
20.55	0.21	0.36	0.58*	3.88	0.00	3.88
20.60	0.21	0.36	0.58*	3.87	0.00	3.87
20.65	0.21	0.36	0.58*	3.85	0.00	3.85
20.70	0.21	0.36	0.58*	3.84	0.00	3.84

20.75	0.21	0.36	0.58*	3.83	0.00	3.83
20.80	0.21	0.36	0.58*	3.82	0.00	3.82
20.85	0.21	0.36	0.58*	3.81	0.00	3.81
20.90	0.21	0.36	0.58*	3.80	0.00	3.80
20.95	0.21	0.36	0.58*	3.79	0.00	3.79
21.00	0.21	0.36	0.58*	3.78	0.00	3.78
21.05	0.21	0.36	0.59*	3.77	0.00	3.77
21.10	0.21	0.36	0.59*	3.75	0.00	3.75
21.15	0.21	0.36	0.59*	3.74	0.00	3.74
21.20	0.21	0.36	0.59*	3.73	0.00	3.73
21.25	0.21	0.36	0.59*	3.72	0.00	3.72
21.30	0.21	0.36	0.59*	3.71	0.00	3.71
21.35	0.21	0.36	0.59*	3.70	0.00	3.70
21.40	0.21	0.36	0.59*	3.69	0.00	3.69
21.45	0.21	0.36	0.59*	3.68	0.00	3.68
21.50	0.21	0.37	0.59*	3.67	0.00	3.67
21.55	0.21	0.37	0.59*	3.66	0.00	3.66
21.60	0.21	0.37	0.59*	3.64	0.00	3.64
21.65	0.22	0.37	0.59*	3.63	0.00	3.63
21.70	0.22	0.37	0.59*	3.62	0.00	3.62
21.75	0.22	0.37	0.59*	3.61	0.00	3.61
21.80	0.22	0.37	0.59*	3.60	0.00	3.60
21.85	0.22	0.37	0.59*	3.59	0.00	3.59
21.90	0.22	0.37	0.60*	3.58	0.00	3.58
21.95	0.22	0.37	0.60*	3.57	0.00	3.57
22.00	0.22	0.37	0.60*	3.56	0.00	3.56
22.05	0.22	0.37	0.60*	3.55	0.00	3.55
22.10	0.22	0.37	0.60*	3.54	0.00	3.54
22.15	0.22	0.37	0.60*	3.53	0.00	3.53
22.20	0.22	0.37	0.60*	3.52	0.00	3.52
22.25	0.22	0.37	0.60*	3.51	0.00	3.51
22.30	0.22	0.37	0.61*	3.49	0.00	3.49
22.35	0.22	0.37	0.61*	3.48	0.00	3.48
22.40	0.23	0.37	0.61*	3.47	0.00	3.47
22.45	0.23	0.37	0.61*	3.46	0.00	3.46
22.50	0.23	0.37	0.61*	3.45	0.00	3.45
22.55	0.23	0.37	0.61*	3.44	0.00	3.44
22.60	0.23	0.37	0.61*	3.43	0.00	3.43
22.65	0.23	0.37	0.61*	3.42	0.00	3.42
22.70	0.23	0.37	0.62*	3.41	0.00	3.41
22.75	0.23	0.37	0.62*	3.40	0.00	3.40
22.80	0.23	0.37	0.62*	3.39	0.00	3.39
22.85	0.23	0.37	0.62*	3.38	0.00	3.38
22.90	0.23	0.37	0.62*	3.37	0.00	3.37
22.95	0.23	0.37	0.62*	3.36	0.00	3.36
23.00	0.23	0.37	0.62*	3.35	0.00	3.35
23.05	0.23	0.37	0.62*	3.34	0.00	3.34
23.10	0.23	0.37	0.63*	3.33	0.00	3.33
23.15	0.23	0.37	0.63*	3.32	0.00	3.32
23.20	0.24	0.37	0.63*	3.31	0.00	3.31
23.25	0.24	0.37	0.63*	3.30	0.00	3.30
23.30	0.24	0.38	0.63*	3.29	0.00	3.29
23.35	0.24	0.38	0.63*	3.28	0.00	3.28
23.40	0.24	0.38	0.63*	3.27	0.00	3.27
23.45	0.24	0.38	0.63*	3.26	0.00	3.26
23.50	0.24	0.38	0.64*	3.25	0.00	3.25
23.55	0.24	0.38	0.64*	3.24	0.00	3.24
23.60	0.24	0.38	0.64*	3.23	0.00	3.23
23.65	0.24	0.38	0.64*	3.22	0.00	3.22
23.70	0.24	0.38	0.64*	3.21	0.00	3.21
23.75	0.24	0.38	0.64*	3.20	0.00	3.20
23.80	0.24	0.38	0.64*	3.19	0.00	3.19
23.85	0.24	0.38	0.64*	3.18	0.00	3.18

23.90	0.24	0.38	0.65*	3.17	0.00	3.17
23.95	0.25	0.38	0.65*	3.16	0.00	3.16
24.00	0.25	0.38	0.65*	3.15	0.00	3.15
24.05	0.25	0.38	0.65*	3.14	0.00	3.14
24.10	0.25	0.38	0.65*	3.13	0.00	3.13
24.15	0.25	0.38	0.65*	3.12	0.00	3.12
24.20	0.25	0.38	0.65*	3.11	0.00	3.11
24.25	0.25	0.38	0.65*	3.10	0.00	3.10
24.30	0.25	0.38	0.66*	3.09	0.00	3.09
24.35	0.25	0.38	0.66*	3.08	0.00	3.08
24.40	0.25	0.38	0.66*	3.07	0.00	3.07
24.45	0.25	0.38	0.66*	3.06	0.00	3.06
24.50	0.25	0.38	0.66*	3.05	0.00	3.05
24.55	0.25	0.38	0.66*	3.04	0.00	3.04
24.60	0.25	0.38	0.66*	3.04	0.00	3.04
24.65	0.25	0.38	0.66*	3.03	0.00	3.03
24.70	0.25	0.38	0.67*	3.02	0.00	3.02
24.75	0.26	0.38	0.67*	3.01	0.00	3.01
24.80	0.26	0.38	0.67*	3.00	0.00	3.00
24.85	0.26	0.38	0.67*	2.99	0.00	2.99
24.90	0.26	0.38	0.67*	2.98	0.00	2.98
24.95	0.26	0.38	0.67*	2.97	0.00	2.97
25.00	0.26	0.38	0.67*	2.96	0.00	2.96
25.05	0.26	0.38	0.67*	2.95	0.00	2.95
25.10	0.26	0.38	0.68*	2.94	0.00	2.94
25.15	0.26	0.38	0.68*	2.93	0.00	2.93
25.20	0.26	0.38	0.68*	2.92	0.00	2.92
25.25	0.26	0.38	0.68*	2.91	0.00	2.91
25.30	0.26	0.39	0.68*	2.91	0.00	2.91
25.35	0.26	0.39	0.68*	2.90	0.00	2.90
25.40	0.26	0.39	0.68*	2.89	0.00	2.89
25.45	0.26	0.39	0.68*	2.88	0.00	2.88
25.50	0.26	0.39	0.69*	2.87	0.00	2.87
25.55	0.27	0.39	0.69*	2.86	0.00	2.86
25.60	0.27	0.39	0.69*	2.85	0.00	2.85
25.65	0.27	0.39	0.69*	2.84	0.00	2.84
25.70	0.27	0.39	0.69*	2.83	0.00	2.83
25.75	0.27	0.39	0.69*	2.82	0.00	2.82
25.80	0.27	0.39	0.69*	2.82	0.00	2.82
25.85	0.27	0.39	0.69*	2.81	0.00	2.81
25.90	0.27	0.39	0.70*	2.80	0.00	2.80
25.95	0.27	0.39	0.70*	2.79	0.00	2.79
26.00	0.27	0.39	0.70*	2.78	0.00	2.78
26.05	0.27	0.39	0.70*	2.77	0.00	2.77
26.10	0.27	0.39	0.70*	2.76	0.00	2.76
26.15	0.27	0.39	0.70*	2.75	0.00	2.75
26.20	0.27	0.39	0.70*	2.75	0.00	2.75
26.25	0.27	0.39	0.70*	2.74	0.00	2.74
26.30	0.27	0.39	0.71*	2.73	0.00	2.73
26.35	0.28	0.39	0.71*	2.72	0.00	2.72
26.40	0.28	0.39	0.71*	2.71	0.00	2.71
26.45	0.28	0.39	0.71*	2.70	0.00	2.70
26.50	0.28	0.39	0.71*	2.69	0.00	2.69
26.55	0.28	0.39	0.71*	2.68	0.00	2.68
26.60	0.28	0.39	0.71*	2.68	0.00	2.68
26.65	0.28	0.39	0.71*	2.67	0.00	2.67
26.70	0.28	0.39	0.72*	2.66	0.00	2.66
26.75	0.28	0.39	0.72*	2.65	0.00	2.65
26.80	0.28	0.39	0.72*	2.64	0.00	2.64
26.85	0.28	0.39	0.72*	2.63	0.00	2.63
26.90	0.28	0.39	0.72*	2.62	0.00	2.62
26.95	0.28	0.39	0.72*	2.62	0.00	2.62
27.00	0.28	0.39	0.72*	2.61	0.00	2.61

27.05	0.28	0.39	0.72*	2.60	0.00	2.60
27.10	0.29	0.39	0.73*	2.59	0.00	2.59
27.15	0.29	0.39	0.73*	2.58	0.00	2.58
27.20	0.29	0.39	0.73*	2.57	0.00	2.57
27.25	0.29	0.39	0.73*	2.57	0.00	2.57
27.30	0.29	0.39	0.73*	2.56	0.00	2.56
27.35	0.29	0.39	0.73*	2.55	0.00	2.55
27.40	0.29	0.39	0.73*	2.54	0.00	2.54
27.45	0.29	0.39	0.74*	2.53	0.00	2.53
27.50	0.29	0.39	0.74*	2.52	0.00	2.52
27.55	0.29	0.39	0.74*	2.52	0.00	2.52
27.60	0.29	0.39	0.74*	2.51	0.00	2.51
27.65	0.29	0.39	0.74*	2.50	0.00	2.50
27.70	0.29	0.40	0.74*	2.49	0.00	2.49
27.75	0.29	0.40	0.74*	2.48	0.00	2.48
27.80	0.29	0.40	0.74*	2.47	0.00	2.47
27.85	0.30	0.40	0.75*	2.47	0.00	2.47
27.90	0.31	0.40	0.78*	2.46	0.00	2.46
27.95	0.31	0.40	0.78*	2.45	0.00	2.45
28.00	0.31	0.40	0.78*	2.44	0.00	2.44
28.05	0.31	0.40	0.78*	2.43	0.00	2.43
28.10	0.31	0.40	0.78*	2.43	0.00	2.43
28.15	0.31	0.40	0.79*	2.42	0.00	2.42
28.20	0.31	0.40	0.79*	2.41	0.00	2.41
28.25	0.31	0.40	0.79*	2.40	0.00	2.40
28.30	0.31	0.40	0.79*	2.40	0.00	2.40
28.35	0.31	0.40	0.79*	2.39	0.00	2.39
28.40	0.32	0.40	0.79*	2.38	0.00	2.38
28.45	0.32	0.40	0.80*	2.37	0.00	2.37
28.50	0.32	0.40	0.80*	2.36	0.00	2.36
28.55	0.32	0.40	0.80*	2.36	0.00	2.36
28.60	0.32	0.40	0.80*	2.35	0.00	2.35
28.65	0.32	0.40	0.80*	2.34	0.00	2.34
28.70	0.32	0.40	0.80*	2.33	0.00	2.33
28.75	0.32	0.40	0.80*	2.33	0.00	2.33
28.80	0.32	0.40	0.81*	2.32	0.00	2.32
28.85	0.32	0.40	0.81*	2.31	0.00	2.31
28.90	0.32	0.40	0.81*	2.30	0.00	2.30
28.95	0.32	0.40	0.81*	2.30	0.00	2.30
29.00	0.33	0.40	0.81*	2.29	0.00	2.29
29.05	0.33	0.40	0.81*	2.28	0.00	2.28
29.10	0.33	0.40	0.82*	2.27	0.00	2.27
29.15	0.33	0.40	0.82*	2.27	0.00	2.27
29.20	0.33	0.40	0.82*	2.26	0.00	2.26
29.25	0.33	0.40	0.82*	2.25	0.00	2.25
29.30	0.33	0.40	0.82*	2.25	0.00	2.25
29.35	0.33	0.40	0.82*	2.24	0.00	2.24
29.40	0.33	0.40	0.83*	2.23	0.00	2.23
29.45	0.33	0.40	0.83*	2.22	0.00	2.22
29.50	0.33	0.40	0.83*	2.22	0.00	2.22
29.55	0.33	0.40	0.83*	2.21	0.00	2.21
29.60	0.33	0.40	0.83*	2.20	0.00	2.20
29.65	0.34	0.40	0.83*	2.19	0.00	2.19
29.70	0.34	0.40	0.84*	2.19	0.00	2.19
29.75	0.34	0.40	0.84*	2.18	0.00	2.18
29.80	0.34	0.40	0.84*	2.17	0.00	2.17
29.85	0.34	0.40	0.84*	2.17	0.00	2.17
29.90	0.34	0.40	0.84*	2.16	0.00	2.16
29.95	0.34	0.40	0.84*	2.15	0.00	2.15
30.00	0.34	0.40	0.85*	2.14	0.00	2.14
30.05	0.34	0.40	0.85*	2.14	0.00	2.14
30.10	0.34	0.40	0.85*	2.13	0.00	2.13
30.15	0.34	0.40	0.85*	2.12	0.00	2.12

30.20	0.34	0.40	0.85*	2.12	0.00	2.12
30.25	0.35	0.40	0.86*	2.11	0.00	2.11
30.30	0.35	0.40	0.86*	2.10	0.00	2.10
30.35	0.35	0.40	0.86*	2.10	0.00	2.10
30.40	0.35	0.40	0.86*	2.09	0.00	2.09
30.45	0.35	0.40	0.86*	2.08	0.00	2.08
30.50	0.35	0.40	0.87*	2.07	0.00	2.07
30.55	0.35	0.40	0.87*	2.07	0.00	2.07
30.60	0.35	0.40	0.87*	2.06	0.00	2.06
30.65	0.35	0.40	0.87*	2.05	0.00	2.05
30.70	0.35	0.40	0.88*	2.05	0.00	2.05
30.75	0.35	0.40	0.88*	2.04	0.00	2.04
30.80	0.36	0.40	0.88*	2.03	0.00	2.03
30.85	0.36	0.40	0.88*	2.03	0.00	2.03
30.90	0.36	0.40	0.88*	2.02	0.00	2.02
30.95	0.36	0.40	0.89*	2.01	0.00	2.01
31.00	0.36	0.40	0.89*	2.01	0.00	2.01
31.05	0.36	0.40	0.89*	2.00	0.00	2.00
31.10	0.36	0.40	0.89*	1.99	0.00	1.99
31.15	0.36	0.40	0.89*	1.99	0.00	1.99
31.20	0.36	0.40	0.90*	1.98	0.00	1.98
31.25	0.36	0.40	0.90*	1.97	0.00	1.97
31.30	0.36	0.40	0.90*	1.97	0.00	1.97
31.35	0.37	0.40	0.90*	1.96	0.00	1.96
31.40	0.37	0.40	0.91*	1.95	0.00	1.95
31.45	0.37	0.40	0.91*	1.95	0.00	1.95
31.50	0.37	0.40	0.91*	1.94	0.00	1.94
31.55	0.37	0.40	0.91*	1.93	0.00	1.93
31.60	0.37	0.40	0.91*	1.93	0.00	1.93
31.65	0.37	0.40	0.91*	1.92	0.00	1.92
31.70	0.37	0.40	0.91*	1.91	0.00	1.91
31.75	0.37	0.40	0.91*	1.91	0.00	1.91
31.80	0.37	0.40	0.91*	1.90	0.00	1.90
31.85	0.37	0.40	0.90*	1.89	0.00	1.89
31.90	0.37	0.40	0.90*	1.89	0.00	1.89
31.95	0.37	0.40	0.90*	1.88	0.00	1.88
32.00	0.36	0.40	0.90*	1.87	0.00	1.87
32.05	0.36	0.40	0.90*	1.87	0.00	1.87
32.10	0.36	0.40	0.90*	1.86	0.00	1.86
32.15	0.37	0.40	0.91*	1.85	0.00	1.85
32.20	0.37	0.40	0.91*	1.85	0.00	1.85
32.25	0.37	0.40	0.90*	1.84	0.00	1.84
32.30	0.37	0.40	0.90*	1.83	0.00	1.83
32.35	0.36	0.40	0.90*	1.83	0.00	1.83
32.40	0.36	0.40	0.90*	1.82	0.00	1.82
32.45	0.36	0.40	0.90*	1.81	0.00	1.81
32.50	0.36	0.40	0.90*	1.81	0.00	1.81
32.55	0.36	0.40	0.90*	1.80	0.00	1.80
32.60	0.36	0.40	0.90*	1.79	0.00	1.79
32.65	0.36	0.40	0.90*	1.79	0.00	1.79
32.70	0.36	0.40	0.90*	1.78	0.00	1.78
32.75	0.36	0.40	0.90*	1.77	0.00	1.77
32.80	0.36	0.40	0.89*	1.77	0.00	1.77
32.85	0.36	0.40	0.89*	1.76	0.00	1.76
32.90	0.36	0.40	0.89*	1.75	0.00	1.75
32.95	0.36	0.40	0.89*	1.75	0.00	1.75
33.00	0.36	0.40	0.89*	1.74	0.00	1.74
33.05	0.36	0.40	0.89*	1.73	0.00	1.73
33.10	0.36	0.40	0.89*	1.73	0.00	1.73
33.15	0.36	0.40	0.89*	1.72	0.00	1.72
33.20	0.36	0.40	0.89*	1.71	0.00	1.71
33.25	0.36	0.40	0.89*	1.71	0.00	1.71
33.30	0.36	0.40	0.89*	1.70	0.00	1.70

33.35	0.36	0.40	0.89*	1.69	0.00	1.69
33.40	0.36	0.40	0.89*	1.69	0.00	1.69
33.45	0.36	0.40	0.88*	1.68	0.00	1.68
33.50	0.36	0.40	0.88*	1.67	0.00	1.67
33.55	0.36	0.40	0.88*	1.67	0.00	1.67
33.60	0.36	0.40	0.88*	1.66	0.00	1.66
33.65	0.36	0.40	0.88*	1.65	0.00	1.65
33.70	0.36	0.40	0.88*	1.65	0.00	1.65
33.75	0.36	0.40	0.88*	1.64	0.00	1.64
33.80	0.36	0.40	0.88*	1.63	0.00	1.63
33.85	0.36	0.40	0.88*	1.62	0.00	1.62
33.90	0.35	0.40	0.88*	1.62	0.00	1.62
33.95	0.35	0.40	0.88*	1.61	0.00	1.61
34.00	0.35	0.40	0.88*	1.60	0.00	1.60
34.05	0.35	0.40	0.88*	1.60	0.00	1.60
34.10	0.35	0.40	0.87*	1.59	0.00	1.59
34.15	0.35	0.40	0.87*	1.58	0.00	1.58
34.20	0.35	0.40	0.87*	1.58	0.00	1.58
34.25	0.35	0.40	0.87*	1.57	0.00	1.57
34.30	0.35	0.40	0.87*	1.56	0.00	1.56
34.35	0.35	0.40	0.87*	1.56	0.00	1.56
34.40	0.35	0.40	0.87*	1.55	0.00	1.55
34.45	0.35	0.40	0.87*	1.54	0.00	1.54
34.50	0.35	0.40	0.87*	1.54	0.00	1.54
34.55	0.35	0.40	0.87*	1.53	0.00	1.53
34.60	0.35	0.40	0.87*	1.52	0.00	1.52
34.65	0.35	0.40	0.87*	1.52	0.00	1.52
34.70	0.35	0.40	0.87*	1.51	0.00	1.51
34.75	0.35	0.40	0.87*	1.50	0.00	1.50
34.80	0.35	0.40	0.86*	1.49	0.00	1.49
34.85	0.35	0.40	0.86*	1.49	0.00	1.49
34.90	0.35	0.40	0.86*	1.48	0.00	1.48
34.95	0.35	0.40	0.86*	1.47	0.00	1.47
35.00	0.35	0.40	0.86*	1.47	0.00	1.47
35.05	0.35	0.40	0.86*	1.46	0.00	1.46
35.10	0.35	0.40	0.86*	1.45	0.00	1.45
35.15	0.35	0.40	0.86*	1.45	0.00	1.45
35.20	0.35	0.40	0.86*	1.44	0.00	1.44
35.25	0.35	0.40	0.86*	1.43	0.00	1.43
35.30	0.35	0.40	0.86*	1.43	0.00	1.43
35.35	0.35	0.40	0.86*	1.42	0.00	1.42
35.40	0.35	0.40	0.86*	1.41	0.00	1.41
35.45	0.35	0.40	0.86*	1.40	0.00	1.40
35.50	0.35	0.40	0.86*	1.40	0.00	1.40
35.55	0.35	0.40	0.85*	1.39	0.00	1.39
35.60	0.35	0.40	0.85*	1.38	0.00	1.38
35.65	0.35	0.40	0.85*	1.38	0.00	1.38
35.70	0.34	0.40	0.85*	1.37	0.00	1.37
35.75	0.34	0.40	0.85*	1.36	0.00	1.36
35.80	0.34	0.40	0.85*	1.36	0.00	1.36
35.85	0.34	0.40	0.85*	1.35	0.00	1.35
35.90	0.34	0.40	0.85*	1.34	0.00	1.34
35.95	0.34	0.40	0.85*	1.33	0.00	1.33
36.00	0.34	0.40	0.85*	1.33	0.00	1.33
36.05	0.34	0.40	0.85*	1.32	0.00	1.32
36.10	0.34	0.40	0.85*	1.31	0.00	1.31
36.15	0.34	0.40	0.85*	1.31	0.00	1.31
36.20	0.34	0.40	0.85*	1.30	0.00	1.30
36.25	0.34	0.40	0.85*	1.29	0.00	1.29
36.30	0.34	0.40	0.85*	1.29	0.00	1.29
36.35	0.34	0.40	0.84*	1.28	0.00	1.28
36.40	0.34	0.40	0.84*	1.27	0.00	1.27
36.45	0.34	0.40	0.84*	1.26	0.00	1.26

36.50	0.34	0.40	0.84*	1.26	0.00	1.26
36.55	0.34	0.40	0.84*	1.25	0.00	1.25
36.60	0.34	0.40	0.84*	1.24	0.00	1.24
36.65	0.34	0.40	0.84*	1.24	0.00	1.24
36.70	0.34	0.40	0.84*	1.23	0.00	1.23
36.75	0.34	0.40	0.84*	1.22	0.00	1.22
36.80	0.34	0.40	0.84*	1.22	0.00	1.22
36.85	0.34	0.40	0.84*	1.21	0.00	1.21
36.90	0.34	0.40	0.84*	1.20	0.00	1.20
36.95	0.34	0.40	0.84*	1.19	0.00	1.19
37.00	0.34	0.40	0.84*	1.19	0.00	1.19
37.05	0.34	0.40	0.84*	1.18	0.00	1.18
37.10	0.34	0.40	0.84*	1.17	0.00	1.17
37.15	0.34	0.40	0.84*	1.17	0.00	1.17
37.20	0.34	0.40	0.83*	1.16	0.00	1.16
37.25	0.34	0.40	0.83*	1.15	0.00	1.15
37.30	0.34	0.40	0.83*	1.14	0.00	1.14
37.35	0.34	0.40	0.83*	1.14	0.00	1.14
37.40	0.34	0.40	0.83*	1.13	0.00	1.13
37.45	0.34	0.40	0.83*	1.12	0.00	1.12
37.50	0.34	0.40	0.83*	1.12	0.00	1.12
37.55	0.34	0.40	0.83*	1.11	0.00	1.11
37.60	0.34	0.40	0.83*	1.10	0.00	1.10
37.65	0.33	0.40	0.83*	1.09	0.00	1.09
37.70	0.33	0.40	0.83*	1.09	0.00	1.09
37.75	0.33	0.40	0.83*	1.08	0.00	1.08
37.80	0.33	0.40	0.83*	1.07	0.00	1.07
37.85	0.33	0.40	0.83*	1.07	0.00	1.07
37.90	0.33	0.40	0.83*	1.06	0.00	1.06
37.95	0.33	0.40	0.83*	1.05	0.00	1.05
38.00	0.33	0.40	0.83*	1.04	0.00	1.04
38.05	0.33	0.40	0.83*	1.04	0.00	1.04
38.10	0.33	0.40	0.83*	1.03	0.00	1.03
38.15	0.33	0.40	0.82*	1.02	0.00	1.02
38.20	0.33	0.40	0.82*	1.02	0.00	1.02
38.25	0.33	0.40	0.82*	1.01	0.00	1.01
38.30	0.33	0.40	0.82*	1.00	0.00	1.00
38.35	0.33	0.40	0.82*	0.99	0.00	0.99
38.40	0.33	0.40	0.82*	0.99	0.00	0.99
38.45	0.33	0.40	0.82*	0.98	0.00	0.98
38.50	0.33	0.40	0.82*	0.97	0.00	0.97
38.55	0.33	0.40	0.82*	0.96	0.00	0.96
38.60	0.33	0.40	0.82*	0.96	0.00	0.96
38.65	0.33	0.40	0.82*	0.95	0.00	0.95
38.70	0.33	0.40	0.82*	0.94	0.00	0.94
38.75	0.33	0.40	0.82*	0.94	0.00	0.94
38.80	0.33	0.40	0.82*	0.93	0.00	0.93
38.85	0.33	0.40	0.82*	0.92	0.00	0.92
38.90	0.33	0.40	0.82*	0.91	0.00	0.91
38.95	0.33	0.40	0.82*	0.91	0.00	0.91
39.00	0.33	0.40	0.82*	0.90	0.00	0.90
39.05	0.33	0.40	0.82*	0.89	0.00	0.89
39.10	0.33	0.40	0.82*	0.89	0.00	0.89
39.15	0.33	0.40	0.82*	0.88	0.00	0.88
39.20	0.33	0.40	0.81*	0.87	0.00	0.87
39.25	0.33	0.40	0.81*	0.86	0.00	0.86
39.30	0.33	0.40	0.81*	0.86	0.00	0.86
39.35	0.33	0.40	0.81*	0.85	0.00	0.85
39.40	0.33	0.40	0.81*	0.84	0.00	0.84
39.45	0.33	0.40	0.81*	0.83	0.00	0.83
39.50	0.33	0.40	0.81*	0.83	0.00	0.83
39.55	0.33	0.40	0.81*	0.82	0.00	0.82
39.60	0.33	0.40	0.81*	0.81	0.00	0.81

39.65	0.33	0.40	0.81*	0.81	0.00	0.81
39.70	0.33	0.40	0.81*	0.80	0.00	0.80
39.75	0.33	0.40	0.81*	0.79	0.00	0.79
39.80	0.33	0.40	0.81*	0.78	0.00	0.78
39.85	0.33	0.40	0.81*	0.78	0.00	0.78
39.90	0.33	0.40	0.81*	0.77	0.00	0.77
39.95	0.32	0.40	0.81*	0.76	0.00	0.76
40.00	0.32	0.40	0.81*	0.75	0.00	0.75
40.05	0.32	0.40	0.81*	0.75	0.00	0.75
40.10	0.32	0.40	0.81*	0.74	0.00	0.74
40.15	0.32	0.40	0.81*	0.73	0.00	0.73
40.20	0.32	0.40	0.81*	0.72	0.00	0.72
40.25	0.32	0.40	0.81*	0.72	0.00	0.72
40.30	0.32	0.40	0.80*	0.71	0.00	0.71
40.35	0.32	0.40	0.80*	0.70	0.00	0.70
40.40	0.32	0.40	0.80*	0.70	0.00	0.70
40.45	0.32	0.40	0.80*	0.69	0.00	0.69
40.50	0.32	0.40	0.80*	0.68	0.00	0.68
40.55	0.32	0.40	0.80*	0.67	0.00	0.67
40.60	0.32	0.40	0.80*	0.67	0.00	0.67
40.65	0.32	0.40	0.80*	0.66	0.00	0.66
40.70	0.32	0.40	0.80*	0.65	0.00	0.65
40.75	0.32	0.40	0.80*	0.64	0.00	0.64
40.80	0.32	0.40	0.80*	0.64	0.00	0.64
40.85	0.32	0.40	0.80*	0.63	0.00	0.63
40.90	0.32	0.40	0.80*	0.62	0.00	0.62
40.95	0.32	0.40	0.80*	0.61	0.00	0.61
41.00	0.32	0.40	0.80*	0.61	0.00	0.61
41.05	0.32	0.40	0.80*	0.60	0.00	0.60
41.10	0.32	0.40	0.80*	0.59	0.00	0.59
41.15	0.32	0.40	0.80*	0.58	0.00	0.58
41.20	0.32	0.40	0.80*	0.58	0.00	0.58
41.25	0.32	0.40	0.80*	0.57	0.00	0.57
41.30	0.32	0.40	0.80*	0.56	0.00	0.56
41.35	0.32	0.40	0.80*	0.55	0.00	0.55
41.40	0.32	0.40	0.80*	0.55	0.00	0.55
41.45	0.32	0.40	0.80*	0.54	0.00	0.54
41.50	0.32	0.40	0.80*	0.53	0.00	0.53
41.55	0.32	0.40	0.79*	0.53	0.00	0.53
41.60	0.32	0.40	0.79*	0.52	0.00	0.52
41.65	0.32	0.40	0.79*	0.51	0.00	0.51
41.70	0.32	0.40	0.79*	0.50	0.00	0.50
41.75	0.32	0.40	0.79*	0.50	0.00	0.50
41.80	0.32	0.40	0.79*	0.49	0.00	0.49
41.85	0.32	0.40	0.79*	0.48	0.00	0.48
41.90	0.32	0.40	0.79*	0.47	0.00	0.47
41.95	0.32	0.40	0.79*	0.47	0.00	0.47
42.00	0.32	0.40	0.79*	0.46	0.00	0.46
42.05	0.32	0.40	0.79*	0.45	0.00	0.45
42.10	0.32	0.40	0.79*	0.44	0.00	0.44
42.15	0.32	0.40	0.79*	0.44	0.00	0.44
42.20	0.32	0.40	0.79*	0.43	0.00	0.43
42.25	0.32	0.40	0.79*	0.42	0.00	0.42
42.30	0.32	0.40	0.79*	0.41	0.00	0.41
42.35	0.32	0.40	0.79*	0.41	0.00	0.41
42.40	0.32	0.40	0.79*	0.40	0.00	0.40
42.45	0.32	0.40	0.79*	0.39	0.00	0.39
42.50	0.32	0.40	0.79*	0.38	0.00	0.38
42.55	0.32	0.40	0.79*	0.38	0.00	0.38
42.60	0.32	0.40	0.79*	0.37	0.00	0.37
42.65	0.32	0.40	0.79*	0.36	0.00	0.36
42.70	0.32	0.40	0.79*	0.35	0.00	0.35
42.75	0.32	0.40	0.79*	0.35	0.00	0.35

42.80	0.32	0.40	0.79*	0.34	0.00	0.34
42.85	0.32	0.40	0.79*	0.33	0.00	0.33
42.90	0.32	0.40	0.79*	0.32	0.00	0.32
42.95	0.32	0.40	0.79*	0.32	0.00	0.32
43.00	0.32	0.40	0.79*	0.31	0.00	0.31
43.05	0.32	0.40	0.79*	0.30	0.00	0.30
43.10	0.31	0.40	0.79*	0.29	0.00	0.29
43.15	0.31	0.40	0.79*	0.29	0.00	0.29
43.20	0.31	0.40	0.79*	0.28	0.00	0.28
43.25	0.31	0.40	0.79*	0.27	0.00	0.27
43.30	0.31	0.40	0.79*	0.26	0.00	0.26
43.35	0.31	0.40	0.79*	0.26	0.00	0.26
43.40	0.31	0.40	0.79*	0.25	0.00	0.25
43.45	0.31	0.40	0.79*	0.24	0.00	0.24
43.50	0.31	0.40	0.79*	0.23	0.00	0.23
43.55	0.31	0.40	0.79*	0.23	0.00	0.23
43.60	0.31	0.40	0.79*	0.22	0.00	0.22
43.65	0.31	0.40	0.79*	0.21	0.00	0.21
43.70	0.31	0.40	0.79*	0.20	0.00	0.20
43.75	0.31	0.40	0.79*	0.20	0.00	0.20
43.80	0.31	0.40	0.79*	0.19	0.00	0.19
43.85	0.31	0.40	0.79*	0.18	0.00	0.18
43.90	0.31	0.40	0.79*	0.17	0.00	0.17
43.95	0.31	0.40	0.78*	0.17	0.00	0.17
44.00	0.31	0.40	0.78*	0.16	0.00	0.16
44.05	0.31	0.40	0.78*	0.15	0.00	0.15
44.10	0.31	0.40	0.78*	0.14	0.00	0.14
44.15	0.31	0.40	0.78*	0.14	0.00	0.14
44.20	0.31	0.40	0.78*	0.13	0.00	0.13
44.25	0.31	0.40	0.78*	0.12	0.00	0.12
44.30	0.31	0.40	0.78*	0.11	0.00	0.11
44.35	0.31	0.40	0.78*	0.11	0.00	0.11
44.40	0.31	0.40	0.78*	0.10	0.00	0.10
44.45	0.31	0.40	0.78*	0.09	0.00	0.09
44.50	0.31	0.40	0.78*	0.08	0.00	0.08
44.55	0.31	0.40	0.78*	0.08	0.00	0.08
44.60	0.31	0.40	0.78*	0.07	0.00	0.07
44.65	0.31	0.40	0.78*	0.06	0.00	0.06
44.70	0.31	0.40	0.78*	0.05	0.00	0.05
44.75	0.31	0.40	0.78*	0.05	0.00	0.05
44.80	0.31	0.40	0.78*	0.04	0.00	0.04
44.85	0.31	0.40	0.78*	0.03	0.00	0.03
44.90	0.31	0.40	0.78*	0.02	0.00	0.02
44.95	0.31	0.40	0.78*	0.02	0.00	0.02
45.00	0.31	0.40	0.78*	0.01	0.00	0.01
45.05	2.00	0.40	5.00	0.00	0.00	0.00
45.10	2.00	0.40	5.00	0.00	0.00	0.00
45.15	2.00	0.40	5.00	0.00	0.00	0.00
45.20	2.00	0.40	5.00	0.00	0.00	0.00
45.25	2.00	0.40	5.00	0.00	0.00	0.00
45.30	2.00	0.40	5.00	0.00	0.00	0.00
45.35	2.00	0.40	5.00	0.00	0.00	0.00
45.40	2.00	0.40	5.00	0.00	0.00	0.00
45.45	2.00	0.40	5.00	0.00	0.00	0.00
45.50	2.00	0.40	5.00	0.00	0.00	0.00
45.55	2.00	0.40	5.00	0.00	0.00	0.00
45.60	2.00	0.40	5.00	0.00	0.00	0.00
45.65	2.00	0.40	5.00	0.00	0.00	0.00
45.70	2.00	0.40	5.00	0.00	0.00	0.00
45.75	2.00	0.40	5.00	0.00	0.00	0.00
45.80	2.00	0.40	5.00	0.00	0.00	0.00
45.85	2.00	0.40	5.00	0.00	0.00	0.00
45.90	2.00	0.40	5.00	0.00	0.00	0.00

45.95	2.00	0.40	5.00	0.00	0.00	0.00
46.00	2.00	0.40	5.00	0.00	0.00	0.00
46.05	2.00	0.40	5.00	0.00	0.00	0.00
46.10	2.00	0.40	5.00	0.00	0.00	0.00
46.15	2.00	0.40	5.00	0.00	0.00	0.00
46.20	2.00	0.40	5.00	0.00	0.00	0.00
46.25	2.00	0.40	5.00	0.00	0.00	0.00
46.30	2.00	0.40	5.00	0.00	0.00	0.00
46.35	2.00	0.40	5.00	0.00	0.00	0.00
46.40	2.00	0.40	5.00	0.00	0.00	0.00
46.45	2.00	0.40	5.00	0.00	0.00	0.00
46.50	2.00	0.40	5.00	0.00	0.00	0.00
46.55	2.00	0.40	5.00	0.00	0.00	0.00
46.60	2.00	0.40	5.00	0.00	0.00	0.00
46.65	2.00	0.40	5.00	0.00	0.00	0.00
46.70	2.00	0.40	5.00	0.00	0.00	0.00
46.75	2.00	0.40	5.00	0.00	0.00	0.00
46.80	2.00	0.39	5.00	0.00	0.00	0.00
46.85	2.00	0.39	5.00	0.00	0.00	0.00
46.90	2.00	0.39	5.00	0.00	0.00	0.00
46.95	2.00	0.39	5.00	0.00	0.00	0.00
47.00	2.00	0.39	5.00	0.00	0.00	0.00
47.05	2.00	0.39	5.00	0.00	0.00	0.00
47.10	2.00	0.39	5.00	0.00	0.00	0.00
47.15	2.00	0.39	5.00	0.00	0.00	0.00
47.20	2.00	0.39	5.00	0.00	0.00	0.00
47.25	2.00	0.39	5.00	0.00	0.00	0.00
47.30	2.00	0.39	5.00	0.00	0.00	0.00
47.35	2.00	0.39	5.00	0.00	0.00	0.00
47.40	2.00	0.39	5.00	0.00	0.00	0.00
47.45	2.00	0.39	5.00	0.00	0.00	0.00
47.50	2.00	0.39	5.00	0.00	0.00	0.00
47.55	2.00	0.39	5.00	0.00	0.00	0.00
47.60	2.00	0.39	5.00	0.00	0.00	0.00
47.65	2.00	0.39	5.00	0.00	0.00	0.00
47.70	2.00	0.39	5.00	0.00	0.00	0.00
47.75	2.00	0.39	5.00	0.00	0.00	0.00
47.80	2.00	0.39	5.00	0.00	0.00	0.00
47.85	2.00	0.39	5.00	0.00	0.00	0.00
47.90	2.00	0.39	5.00	0.00	0.00	0.00
47.95	2.00	0.39	5.00	0.00	0.00	0.00
48.00	2.00	0.39	5.00	0.00	0.00	0.00
48.05	2.00	0.39	5.00	0.00	0.00	0.00
48.10	2.00	0.39	5.00	0.00	0.00	0.00
48.15	2.00	0.39	5.00	0.00	0.00	0.00
48.20	2.00	0.39	5.00	0.00	0.00	0.00
48.25	2.00	0.39	5.00	0.00	0.00	0.00
48.30	2.00	0.39	5.00	0.00	0.00	0.00
48.35	2.00	0.39	5.00	0.00	0.00	0.00
48.40	2.00	0.39	5.00	0.00	0.00	0.00
48.45	2.00	0.39	5.00	0.00	0.00	0.00
48.50	2.00	0.39	5.00	0.00	0.00	0.00
48.55	2.00	0.39	5.00	0.00	0.00	0.00
48.60	2.00	0.39	5.00	0.00	0.00	0.00
48.65	2.00	0.39	5.00	0.00	0.00	0.00
48.70	2.00	0.39	5.00	0.00	0.00	0.00
48.75	2.00	0.39	5.00	0.00	0.00	0.00
48.80	2.00	0.39	5.00	0.00	0.00	0.00
48.85	2.00	0.39	5.00	0.00	0.00	0.00
48.90	2.00	0.39	5.00	0.00	0.00	0.00
48.95	2.00	0.39	5.00	0.00	0.00	0.00
49.00	2.00	0.39	5.00	0.00	0.00	0.00
49.05	2.00	0.39	5.00	0.00	0.00	0.00

49.10	2.00	0.39	5.00	0.00	0.00	0.00
49.15	2.00	0.39	5.00	0.00	0.00	0.00
49.20	2.00	0.39	5.00	0.00	0.00	0.00
49.25	2.00	0.39	5.00	0.00	0.00	0.00
49.30	2.00	0.39	5.00	0.00	0.00	0.00
49.35	2.00	0.39	5.00	0.00	0.00	0.00
49.40	2.00	0.39	5.00	0.00	0.00	0.00
49.45	2.00	0.39	5.00	0.00	0.00	0.00
49.50	2.00	0.39	5.00	0.00	0.00	0.00
49.55	2.00	0.39	5.00	0.00	0.00	0.00
49.60	2.00	0.39	5.00	0.00	0.00	0.00
49.65	2.00	0.39	5.00	0.00	0.00	0.00
49.70	2.00	0.39	5.00	0.00	0.00	0.00
49.75	2.00	0.39	5.00	0.00	0.00	0.00
49.80	2.00	0.39	5.00	0.00	0.00	0.00
49.85	2.00	0.39	5.00	0.00	0.00	0.00
49.90	2.00	0.39	5.00	0.00	0.00	0.00
49.95	2.00	0.39	5.00	0.00	0.00	0.00
50.00	2.00	0.39	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: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

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1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm Cyclic resistance ratio from soils
CSRsf Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat Settlement from saturated sands
S_dry Settlement from Unsaturated Sands
S_all Total Settlement from Saturated and Unsaturated Sands
NoLiq No-Liquefy Soils

Appendix D

Typical Earthwork Guidelines

TYPICAL EARTHWORK GUIDELINES

1. GENERAL

These guidelines and the standard details attached hereto are presented as general procedures for earthwork construction for sites having slopes less than 10 feet high. They are to be utilized in conjunction with the project grading plans. These guidelines are considered a part of the geotechnical report, but are superseded by recommendations in the geotechnical report in the case of conflict. Evaluations performed by the consultant during the course of grading may result in new recommendations which could supersede these specifications and/or the recommendations of the geotechnical report. It is the responsibility of the contractor to read and understand these guidelines as well as the geotechnical report and project grading plans.

1.1. The contractor shall not vary from these guidelines without prior recommendations by the geotechnical consultant and the approval of the client or the client's authorized representative. Recommendations by the geotechnical consultant and/or client shall not be considered to preclude requirements for approval by the jurisdictional agency prior to the execution of any changes.

1.2. The contractor shall perform the grading operations in accordance with these specifications, and shall be responsible for the quality of the finished product notwithstanding the fact that grading work will be observed and tested by the geotechnical consultant.

1.3. It is the responsibility of the grading contractor to notify the geotechnical consultant and the jurisdictional agencies, as needed, prior to the start of work at the site and at any time that grading resumes after interruption. Each step of the grading operations shall be observed and documented by the geotechnical consultant and, where needed, reviewed by the appropriate jurisdictional agency prior to proceeding with subsequent work.

1.4. If, during the grading operations, geotechnical conditions are encountered which were not anticipated or described in the geotechnical report, the geotechnical consultant shall be notified immediately and additional recommendations, if applicable, may be provided.

1.5. An as-graded report shall be prepared by the geotechnical consultant and signed by a registered engineer and registered engineering geologist. The report documents the geotechnical consultants' observations, and field and laboratory test results, and provides conclusions regarding whether or not earthwork construction was performed in accordance with the geotechnical recommendations and the grading plans. Recommendations for foundation design, pavement design, subgrade treatment, etc., may also be included in the as-graded report.

1.6. For the purpose of evaluating quantities of materials excavated during grading and/or locating the limits of excavations, a licensed land surveyor or civil engineer shall be retained.

2. SITE PREPARATION

Site preparation shall be performed in accordance with the recommendations presented in the following sections.

2.1. The client, prior to any site preparation or grading, shall arrange and attend a pre-grading meeting between the grading contractor, the design engineer, the geotechnical consultant, and representatives of appropriate governing authorities, as well as any other involved parties. The parties shall be given two working days notice.

2.2. Clearing and grubbing shall consist of the substantial removal of vegetation, brush, grass, wood, stumps, trees, tree roots greater than 1/2-inch in diameter, and other deleterious materials from the areas to be graded. Clearing and grubbing shall extend to the outside of the proposed excavation and fill areas.

2.3. Demolition in the areas to be graded shall include removal of building structures, foundations, reservoirs, utilities (including underground pipelines, septic tanks, leach fields, seepage pits, cisterns, etc.), and other manmade surface and subsurface improvements, and the backfilling of mining shafts, tunnels and surface depressions. Demolition of utilities shall include capping or rerouting of pipelines at the project perimeter, and abandonment of wells in accordance with the requirements of the governing authorities and the recommendations of the geotechnical consultant at the time of demolition.

2.4. The debris generated during clearing, grubbing and/or demolition operations shall be removed from areas to be graded and disposed of off site at a legal dump site. Clearing, grubbing, and demolition operations shall be performed under the observation of the geotechnical consultant.

2.5. The ground surface beneath proposed fill areas shall be stripped of loose or unsuitable soil. These soils may be used as compacted fill provided they are generally free of organic or other deleterious materials and evaluated for use by the geotechnical consultant. The resulting surface shall be evaluated by the geotechnical consultant prior to proceeding. The cleared, natural ground surface shall be scarified to a depth of approximately 8 inches, moisture conditioned, and compacted in accordance with the specifications presented in Section 5 of these guidelines.

3. REMOVALS AND EXCAVATIONS

Removals and excavations shall be performed as recommended in the following sections.

3.1. Removals

3.1.1. Materials which are considered unsuitable shall be excavated under the observation of the geotechnical consultant in accordance with the recommendations contained herein. Unsuitable materials include, but may not be limited to, dry, loose, soft, wet, organic, compressible natural soils, fractured,

weathered, soft bedrock, and undocumented or otherwise deleterious fill materials.

3.1.2. Materials deemed by the geotechnical consultant to be unsatisfactory due to moisture conditions shall be excavated in accordance with the recommendations of the geotechnical consultant, watered or dried as needed, and mixed to generally uniform moisture content in accordance with the specifications presented in Section 5 of this document.

3.2. Excavations

3.2.1. Temporary excavations no deeper than 4 feet in firm fill or natural materials may be made with vertical side slopes. To satisfy California Occupational Safety and Health Administration (CAL OSHA) requirements, any excavation deeper than 4 feet shall be shored or laid back at a 1:1 inclination or flatter, depending on material type, if construction workers are to enter the excavation.

4. COMPACTED FILL

Fill shall be constructed as specified below or by other methods recommended by the geotec1mical consultant. Unless otherwise specified, fill soils shall be compacted to 90 percent relative compaction, as evaluated in accordance with ASTM Test Method D 1557.

4.1. Prior to placement of compacted fill, the contractor shall request an evaluation of the exposed ground surface by the geotechnical consultant. Unless otherwise recommended, the exposed ground surface shall then be scarified to a depth of approximately 8 inches and watered or dried, as needed, to achieve a generally uniform moisture content at or near the optimum moisture content. The scarified materials shall then be compacted to 90 percent relative compaction. The evaluation of compaction by the geotechnical consultant shall not be considered to preclude any requirements for observation or approval by governing agencies. It is the contractor's responsibility to notify the geotechnical consultant and the appropriate governing agency when project areas are ready for observation, and to provide reasonable time for that review.

4.2. Excavated on-site materials which are in general compliance with the recommendations of the geotechnical consultant may be utilized as compacted fill provided they are generally free of organic or other deleterious materials and do not contain rock fragments greater than 6 inches in dimension. During grading, the contractor may encounter soil types other than those analyzed during the preliminary geotechnical study. The geotechnical consultant shall be consulted to evaluate the suitability of any such soils for use as compacted fill.

4.3. Where imported materials are to be used on site, the geotechnical consultant shall be notified three working days in advance of importation in order that it may sample and test the materials from the proposed borrow sites. No imported materials shall be delivered for use on site without prior sampling, testing, and evaluation by the geotechnical consultant.

4.4. Soils imported for on-site use shall preferably have very low to low expansion potential (based on UBC Standard 18-2 test procedures). Lots on which expansive soils may be exposed at grade shall be undercut 3 feet or more and capped with very low to low expansion potential fill. In the event expansive soils are present near the ground surface, special design and construction considerations shall be utilized in general accordance with the recommendations of the geotechnical consultant.

4.5. Fill materials shall be moisture conditioned to near optimum moisture content prior to placement. The optimum moisture content will vary with material type and other factors. Moisture conditioning of fill soils shall be generally uniform in the soil mass.

4.6. Prior to placement of additional compacted fill material following a delay in the grading operations, the exposed surface of previously compacted fill shall be prepared to receive fill. Preparation may include scarification, moisture conditioning, and recompaction.

4.7. Compacted fill shall be placed in horizontal lifts of approximately 8 inches in loose thickness. Prior to compaction, each lift shall be watered or dried as needed to achieve near optimum moisture condition, mixed, and then compacted by mechanical methods, using sheepsfoot rollers, multiple-wheel pneumatic-tired rollers, or other appropriate compacting rollers, to the specified relative compaction. Successive lifts shall be treated in a like manner until the desired finished grades are achieved.

4.8. Fill shall be tested in the field by the geotechnical consultant for evaluation of general compliance with the recommended relative compaction and moisture conditions. Field density testing shall conform to ASTM D 1556-00 (Sand Cone method), D 2937-00 (Drive-Cylinder method), and/or D 2922-96 and D 3017-96 (Nuclear Gauge method). Generally, one test shall be provided for approximately every 2 vertical feet of fin placed, or for approximately every 1000 cubic yards of fill placed. In addition, on slope faces one or more tests shall be taken for approximately every 10,000 square feet of slope face and/or approximately every 10 vertical feet of slope height. Actual test intervals may vary as field conditions dictate. Fill found to be out of conformance with the grading recommendations shall be removed, moisture conditioned, and compacted or otherwise handled to accomplish general compliance with the grading recommendations.

4.9. The contractor shall assist the geotechnical consultant by excavating suitable test pits for removal evaluation and/or for testing of compacted fill.

4.10. At the request of the geotechnical consultant, the contractor shall "shut down" or restrict grading equipment from operating in the area being tested to provide adequate testing time and safety for the field technician.

4.11. The geotechnical consultant shall maintain a map with the approximate locations of field density tests. Unless the client provides for surveying of the test locations, the locations shown by the geotechnical consultant will be estimated. The geotechnical consultant shall not be held responsible for the accuracy of the horizontal or vertical locations or elevations.

4.12. Grading operations shall be performed under the observation of the geotechnical consultant. Testing and evaluation by the geotechnical consultant does not preclude the need for approval by or other requirements of the jurisdictional agencies.

4.13. Fill materials shall not be placed, spread or compacted during unfavorable weather conditions. When work is interrupted by heavy rains, the filling operation shall not be resumed until tests indicate that moisture content and density of the fill meet the project specifications. Regrading of the near-surface soil may be needed to achieve the specified moisture content and density.

4.14. Upon completion of grading and termination of observation by the geotechnical consultant, no further filling or excavating, including that planned for footings, foundations, retaining walls or other features, shall be performed without the involvement of the geotechnical consultant.

4.15. Fill placed in areas not previously viewed and evaluated by the geotechnical consultant may have to be removed and recompacted at the contractor's expense. The depth and extent of removal of the unobserved and undocumented fill will be decided based upon review of the field conditions by the geotechnical consultant.

4.16. Off-site fill shall be treated in the same manner as recommended in these specifications for on-site fills. Off-site fill subdrains temporarily terminated (up gradient) shall be surveyed for future locating and connection.

5. OVERSIZED MATERIAL

Oversized material shall be placed in accordance with the following recommendations.

5.1. During the course of grading operations, rocks or similar irreducible materials greater than 6 inches in dimension (oversized material) may be generated. These materials shall not be placed within the compacted fill unless placed in general accordance with the recommendations of the geotechnical consultant.

5.2. Where oversized rock (greater than 6 inches in dimension) or similar irreducible material is generated during grading, it is recommended, where practical, to waste such material off site, or on site in areas designated as "nonstructural rock disposal areas." Rock designated for disposal areas shall be placed with sufficient sandy soil to generally fill voids. The disposal area shall be capped with a 5-foot thickness of fill which is generally free of oversized material.

5.3. Rocks 6 inches in dimension and smaller may be utilized within the compacted fill, provided they are placed in such a manner that nesting of rock is not permitted. Fill shall be placed and compacted over and around the rock. The amount of rock greater than ¾-inch in dimension shall generally not exceed 40 percent of the total dry weight of the fill mass, unless the fill is specially designed and constructed as a "rock fill."

5.4. Rocks or similar irreducible materials greater than 6 inches but less than 4 feet in dimension generated during grading may be placed in windrows and capped with finer

materials in accordance with the recommendations of the geotechnical consultant and the approval of the governing agencies. Selected native or imported granular soil (Sand Equivalent of 30 or higher) shall be placed and flooded over and around the windrowed rock such that voids are filled. Windrows of oversized materials shall be staggered so that successive windrows of oversized materials are not in the same vertical plane. Rocks greater than 4 feet in dimension shall be broken down to 4 feet or smaller before placement, or they shall be disposed of off site.

6. SLOPES

The following sections provide recommendations for cut and fill slopes.

6.1. Cut Slopes

6.1.1. The geotechnical consultant shall observe cut slopes during excavation. The geotechnical consultant shall be notified by the contractor prior to beginning slope excavations.

6.1.2. If, during the course of grading, adverse or potentially adverse geotechnical conditions are encountered in the slope which were not anticipated in the preliminary evaluation report, the geotechnical consultant shall evaluate the conditions and provide appropriate recommendations.

6.2. Fill Slopes

6.2.1. When placing fill on slopes steeper than 5:1 (horizontal:vertical), topsoil, slope wash, colluvium, and other materials deemed unsuitable shall be removed. Near-horizontal keys and near-vertical benches shall be excavated into sound bedrock or fine fill material, in accordance with the recommendation of the geotechnical consultant. Keying and benching shall be accomplished. Compacted fill shall not be placed in an area subsequent to keying and benching until the area has been observed by the geotechnical consultant. Where the natural gradient of a slope is less than 5:1, benching is generally not recommended. However, fill shall not be placed on compressible or otherwise unsuitable materials left on the slope face.

6.2.2. Within a single fill area where grading procedures dictate two or more separate fills, temporary slopes (false slopes) may be created. When placing fill adjacent to a temporary slope, benching shall be conducted in the manner described in Section 7.2. A 3-foot or higher near-vertical bench shall be excavated into the documented fill prior to placement of additional fill.

6.2.3. Unless otherwise recommended by the geotechnical consultant and accepted by the Building Official, permanent fill slopes shall not be steeper than 2:1 (horizontal:vertical). The height of a fill slope shall be evaluated by the geotechnical consultant.

6.2.4. Unless specifically recommended otherwise, compacted fill slopes shall be overbuilt and cut back to grade, exposing firm compacted fill. The actual amount of overbuilding may vary as field conditions dictate. If the desired results are not achieved, the existing slopes shall be overexcavated and reconstructed in accordance with the recommendations of the geotechnical consultant. The degree of overbuilding may be increased until the desired compacted slope face condition is achieved. Care shall be taken by the contractor to provide mechanical compaction as close to the outer edge of the overbuilt slope surface as practical.

6.2.5. If access restrictions, property line location, or other constraints limit overbuilding and cutting back of the slope face, an alternative method for compaction of the slope face may be attempted by conventional construction procedures including backrolling at intervals of 4 feet or less in vertical slope height, or as dictated by the capability of the available equipment, whichever is less. Fill slopes shall be backrolled utilizing a conventional sheepsfoot-type roller. Care shall be taken to maintain the specified moisture conditions and/or reestablish the same, as needed, prior to backrolling.

6.2.6. The placement, moisture conditioning and compaction of fill slope materials shall be done in accordance with the recommendations presented in Section 5 of these guidelines.

6.2.7. The contractor shall be ultimately responsible for placing and compacting the soil out to the slope face to obtain a relative compaction of 90 percent as evaluated by ASTM D 1557 and a moisture content in accordance with Section 5. The geotechnical consultant shall perform field moisture and density tests at intervals of one test for approximately every 10,000 square feet of slope.

6.2.8. Backdrains shall be provided in fill as recommended by the geotechnical consultant.

6.3. Top-of-Slope Drainage

6.3.1. For pad areas above slopes, positive drainage shall be established away from the top of slope. This may be accomplished utilizing a berm and pad gradient of 2 percent or steeper at the top-of-slope areas. Site runoff shall not be permitted to flow over the tops of slopes.

6.3.2. Gunite-lined brow ditches shall be placed at the top of cut slopes to redirect surface runoff away from the slope face where drainage devices are not otherwise provided.

6.4. Slope Maintenance

6.4.1. In order to enhance surficial slope stability, slope planting shall be accomplished at the completion of grading. Slope plants shall consist of deep-rooting, variable root depth, drought-tolerant vegetation. Native vegetation is generally desirable.

Plants native to semiarid and mid areas may also be appropriate. Large-leafed ice plant should not be used on slopes. A landscape architect shall be consulted regarding the actual types of plants and planting configuration to be used.

6.4.2. Irrigation pipes shall be anchored to slope faces and not placed in trenches excavated into slope faces. Slope irrigation shall be maintained at a level just sufficient to support plant growth. Property owners shall be made aware that over watering of slopes is detrimental to slope stability. Slopes shall be monitored regularly and broken sprinkler heads and/or pipes shall be repaired immediately.

6.4.3. Periodic observation of landscaped slope areas shall be planned and appropriate measures taken to enhance growth of landscape plants.

6.4.4. Graded swales at the top of slopes and terrace drains shall be installed and the property owners notified that the drains shall be periodically checked so that they may be kept clear. Damage to drainage improvements shall be repaired immediately. To reduce siltation, terrace drains shall be constructed at a gradient of 3 percent or steeper, in accordance with the recommendations of the project civil engineer.

6.4.5. If slope failures occur, the geotechnical consultant shall be contacted immediately for field review of site conditions and development of recommendations for evaluation and repair.

7. TRENCH BACKFILL

The following sections provide recommendations for backfilling of trenches.

7.1. Trench backfill shall consist of granular soils (bedding) extending from the trench bottom to 1 foot or more above the pipe. On-site or imported fill which has been evaluated by the geotechnical consultant may be used above the granular backfill. The cover soils directly in contact with the pipe shall be classified as having a very low expansion potential, in accordance with UBC Standard 18-2, and shall contain no rocks or chunks of hard soil larger than 3/4-inch in diameter.

7.2. Trench backfill shall, unless otherwise recommended, be compacted by mechanical means to 90 percent relative compaction as evaluated by ASTM D 1557. Backfill soils shall be placed in loose lifts 8-inches thick or thinner, moisture conditioned, and compacted in accordance with the recommendations of Section 5 of these guidelines. The backfill shall be tested by the geotechnical consultant at vertical intervals of approximately 2 feet of backfill placed and at spacings along the trench of approximately 100 feet in the same lift.

7.3. Jetting of trench backfill materials is generally not a recommended method of densification, unless the on-site soils are sufficiently free-draining and provisions have been made for adequate dissipation of the water utilized in the jetting process.

7.4. If it is decided that jetting may be utilized, granular material with a sand equivalent greater than 30 shall be used for backfilling in the areas to be jetted. Jetting shall generally be considered for trenches 2 feet or narrower in width and 4 feet or shallower in depth. Following jetting operations, trench backfill shall be mechanically compacted to the specified compaction to finish grade.

7.5. Trench backfill which underlies the zone of influence of foundations shall be mechanically compacted to 90 percent or greater relative compaction, as evaluated by ASTM D 1557-02. The zone of influence of the foundations is generally defined as the roughly triangular area within the limits of a 1:1 (horizontal:vertical) projection from the inner and outer edges of the foundation, projected down and out from both edges.

7.6. Trench backfill within slab areas shall be compacted by mechanical means to a relative compaction of 90 percent, as evaluated by ASTM D 1557. For minor interior trenches, density testing may be omitted or spot testing may be performed, as deemed appropriate by the geotechnical consultant.

7.7. When compacting soil in close proximity to utilities, care shall be taken by the grading contractor so that mechanical methods used to compact the soils do not damage the utilities. If the utility contractors indicate that it is undesirable to use compaction equipment in close proximity to a buried conduit, then the grading contractor may elect to use light mechanical compaction equipment or, with the approval of the geotechnical consultant, cover the conduit with clean granular material. These granular materials shall be jetted in place to the top of the conduit in accordance with the recommendations of Section 8.4 prior to initiating mechanical compaction procedures. Other methods of utility trench compaction may also be appropriate, upon review by the geotechnical consultant and the utility contractor, at the time of construction.

7.8. Clean granular backfill and/or bedding materials are not recommended for use in slope areas unless provisions are made for a drainage system to mitigate the potential for buildup of seepage forces or piping of backfill materials.

7.9. The contractor shall exercise the specified safety precautions, in accordance with OSHA Trench Safety Regulations, while conducting trenching operations. Such precautions include shoring or laying back trench excavations at 1:1 or flatter, depending on material type, for trenches in excess of 5 feet in depth. The geotechnical consultant is not responsible for the safety of trench operations or stability of the trenches.

8. DRAINAGE

The following sections provide recommendations pertaining to site drainage.

8.1. Roof, pad, and slope drainage shall be such that it is away from slopes and structures to suitable discharge areas by nonerodible devices (e.g., gutters, downspouts, concrete swales, etc.).

8.2. Positive drainage adjacent to structures shall be established and maintained. Positive drainage may be accomplished by providing drainage away from the foundations of the

structure at a gradient of 2 percent or steeper for a distance of 5 feet or more outside the building perimeter, further maintained by a graded swale leading to an appropriate outlet, in accordance with the recommendations of the project civil engineer and/or landscape architect.

8.3. Surface drainage on the site shall be provided so that water is not permitted to pond. A gradient of 2 percent or steeper shall be maintained over the pad area and drainage patterns shall be established to remove water from the site to an appropriate outlet.

8.4. Care shall be taken by the contractor during grading to preserve any berms, drainage terraces, interceptor swales or other drainage devices of a permanent nature on or adjacent to the property. Drainage patterns established at the time of finish grading shall be maintained for the life of the project. Property owners shall be made very clearly aware that altering drainage patterns may be detrimental to slope stability and foundation performance.

9. SITE PROTECTION

The site shall be protected as outlined in the following sections.

9.1. Protection of the site during the period of grading shall be the responsibility of the contractor unless other provisions are made in writing and agreed upon among the concerned parties. Completion of a portion of the project shall not be considered to preclude that portion or adjacent areas from the need for site protection, until such time as the project is finished as agreed upon by the geotechnical consultant, the client, and the regulatory agency.

9.2. The contractor is responsible for the stability of temporary excavations. Recommendations by the geotechnical consultant pertaining to temporary excavations are made in consideration of stability of the finished project and, therefore, shall not be considered to preclude the responsibilities of the contractor. Recommendations by the geotechnical consultant shall also not be considered to preclude more restrictive requirements by the applicable regulatory agencies.

9.3. Precautions shall be taken during the performance of site clearing, excavation, and grading to protect the site from flooding, ponding, or inundation by surface runoff. Temporary provisions shall be made during the rainy season so that surface runoff is away from and off the working site. Where low areas cannot be avoided, pumps shall be provided to remove water as needed during periods of rainfall.

9.4. During periods of rainfall, plastic sheeting shall be used as needed to reduce the potential for unprotected slopes to become saturated. Where needed, the contractor shall install check dams, desilting basins, riprap, sandbags or other appropriate devices or methods to reduce erosion and provide recommended conditions during inclement weather.

9.5. During periods of rainfall, the geotechnical consultant shall be kept informed by the contractor of the nature of remedial or precautionary work being performed on site (e.g., pumping, placement of sandbags or plastic sheeting, other labor, dozing, etc.).

9.6. Following periods of rainfall, the contractor shall contact the geotechnical consultant and arrange a walk-over of the site in order to visually assess rain-related damage. The geotechnical consultant may also recommend excavation and testing in order to aid in the evaluation. At the request of the geotechnical consultant, the contractor shall make excavations in order to aid in evaluation of the extent of rain-related damage.

9.7. Rain or irrigation related damage shall be considered to include, but may not be limited to, erosion, silting, saturation, swelling, structural distress, and other adverse conditions noted by the geotechnical consultant. Soil adversely affected shall be classified as "Unsuitable Material" and shall be subject to overexcavation and replacement with compacted fill or to other remedial grading as recommended by the geotechnical consultant.

9.8. Relatively level areas where saturated soils and/or erosion gullies exist to depths greater than 1 foot shall be overexcavated to competent materials as evaluated by the geotechnical consultant. Where adverse conditions extend to less than 1 foot in depth, saturated and/or eroded materials may be processed in-place. Overexcavated or in-place processed materials shall be moisture conditioned and compacted in accordance with the recommendations provided in Section 5. If the desired results are not achieved, the affected materials shall be overexcavated, moisture conditioned, and compacted until the specifications are met.

9.9. Slope areas where saturated soil and/or erosion gullies exist to depths greater than 1 foot shall be overexcavated and replaced as compacted fill in accordance with the applicable specifications. Where adversely affected materials exist to depths of I foot or less below proposed finished grade, remedial grading by moisture conditioning in-place and compaction in accordance with the appropriate specifications may be attempted. If the desired results are not achieved, the affected materials shall be overexcavated, moisture conditioned, and compacted until the specifications are met. As conditions dictate, other slope repair procedures may also be recommended by the geotechnical consultant.

9.10. During construction, the contractor shall grade the site to provide positive drainage away from structures and to keep water from ponding adjacent to structures. Water shall not be allowed to damage adjacent properties. Positive drainage shall be maintained by the contractor until permanent drainage and erosion reducing devices are installed in accordance with project plans.

Appendix E

ASFE Important Information about Your Geotechnical Engineering Report

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

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