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Appendix 5.4A
Preliminary Geotechnical Report

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

September 26, 2016
Project No.: 113815-00763.00

Attention: Mr. Paul Cummins

Subject: Preliminary Geotechnical Investigation

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

Dear Mr. Cummins:

As requested, NV5 West, Inc. (NV5) is pleased to submit the results f our preliminary geotechnical investigation for the subject project. The purpose of this investigation was to aluate the subsurface conditions at the proposed Stanton Wellhead Energy Reliability Center site located on the west side of Dale Street in Stanton, California. The results of the geotechnical fiel exp ation, laboratory tests, and preliminary geotechnical engineering recommendations and conclusions are present d h with.

Based on the subsurface exploration, subsequent tes g of the subsurface soils, and engineering analyses it was concluded that the construction of th proposed projec is geotechnically feasible. The geotechnical information presented herein is intended to a ist th 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 constr tion

It is recommended that the forth oming project specifications, in particular the earthwork/compaction sections, be review d by NV5 for co sistency with our report prior to the bid process in order to avoid possible confli s, misin rpretations, and inadvertent omissions, etc. It should also be noted that the applicability nd final eva ation of recommendations presented herein are contingent upon construction phase field mo itoring by NV5 in light of the widely acknowledged importance of geotechnical consultant continuity through he vari us 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 M nager

Reviewed by:

Guillaume Gau, GE 2986
Senior Vice President

GC/SK/GG:ma

Distribution: (3) Address , (1) via email
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1.0 INTRODUCTION

This report presents the results of NV5's preliminary geotechnical investigation for the proposed Wellhead Stanton Energy Reliability Center site (WSERC) 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 th ir c nsultants to describe the geotechnical factors at the project site which should be considered in the design nd 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 shou d 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 feasibili . Cont ct requirements as set forth by the project plans and specifications will supersede any general o ser ations and specific recommendations presented in this report.

2.0 SCOPE OF SERVICES

The scope of services for this project consisted of t e ollowing tasks:

- Review of a preliminary site plan.
- Review of readily av lable b kground data, including Client provided geotechnical data, geotechnical literature, geol gi maps, topographic maps, seismic hazard maps, and literature relevant to the subject site.
- A site recon aissanc to observe the general surficial site conditions and to select boring locations.
- Preparatio of an Orang County Health Care Agency, Environmental Health Division, geotechnical boring constr ction per it.
- A subsurface inv stigation, 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 WSERC 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*. 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, Geotechnical Map*.

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 Ra e (minutes pe in h)	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 r te was iable across the site, but in general the near-surface soils (upper 10 feet) exhibit high percolatio characteristics.

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

6.0 LABORATORY T STING

Laboratory testing w erformed 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 op n to the sea except at the Palos Verdes hills. Major rivers and drainages throughout the basin have b n modified by agricultural, urban and commercial development and are now largely confined within ned channels. Regional geological maps of Orange County (Morton and Miller, 1981; California Ge logical Survey, 1997) indicate the surface of the site is occupied by Holocene-age alluvium. Region 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 u its are underlain by non-indurated to poorly indurated, marine and non-marine, Pleistocene-age sediments f th Lakewood and San Pedro formations. These Pleistocene units extend to depths on the order of several undred feet (~500 to 1,000 feet). The depth to the top of Tertiary-age sedimentary rock is more than 100 feet deep, and crystalline basement rock is about 24,000 feet deep in the site region

Geologic Materials - Geologic materials enc unter d ring the subsurface explorations include Quaternary-aged alluvial deposits. Minor surficia d posits 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 a ials encounte d are presented on the boring logs in *Appendix A.* A description of the geologic materials ncountered are provided below:

- Alluvium – Quaternar a ed alluvium was encountered in all of the exploratory borings. Alluvium was encountered o the total depth explored (maximum of approximately 51.5 feet). As encountered these materials enerally consisted of light brown to dark gray, moist, medium dense, mi aceo silty to clayey sands and soft to firm sandy to clayey silts.

Groundwate - Groundwa er was encountered in all six of the exploratory borings at a depth of approximately 2 feet bgs. roundwater levels may vary due to seasonal fluctuations and factors such as a substantial increa in s rface water infiltration from landscape irrigation, agricultural activity, storage facility leaks or unusu y 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 wa not observed during the subsurface investigation. The relative location of the site to known active fa ts in the region is depicted on *Figure 4, Regional Fault Map*. The distance from the site to the projec on f traces of surface rupture along major active earthquake fault zones, that could affect the site are listed in th 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 Sha ing - The pro ect site is located in southern California which is considered a seismically active area, and such, the eismic hazard most likely to impact the site is ground shaking resulting from an earthquake alon one o the known active faults in the region. The seismic design of the project may be performed using s i mic 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 alluvia silt and sand with varying contents of clay, along with a relatively shallow ground water table. The S te of California Seismic Hazard Zones, Anaheim Quadrangle Map (California Department of Conserv ion, 1998) the site is located within a zone mapped as having potential for earthquake-induced soil l uefaction (refer to *Figure 5, Liquefaction Susceptibility Map*).

Liquefaction analyses were performed using the Civiltech oftware rogram LiquefyPro – Version 5.8. The Seed method was used, which consists of comparing a Cy lic tress 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 li efaction induced settlements were performed utilizing the Tokimatsu & Seed meth d Detailed information regarding liquefaction analysis is presented in a published National Center for Eart uake Engineering Research (NCEER) document referenced in *Section 13.0: References*.

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

Based on our an lysis, it is e timated that up to 6 inches of total seismic settlement could occur within the footprint of propos d structures for the design-event earthquake. In addition, differential settlements could be expected. n 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 he associated laboratory test results, engineering analyses, and experience with similar site conditio s, it is NV5's opinion that construction of the proposed project and associated improvements is feasibl rom a g otechnical standpoint.

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

- The near-surface materials are considered compressible and not capable of reliably supporting the proposed recycled water res voir and ass ciated improvements in their present condition. Overexcavation and re ompacti n of these materials are recommended for the proposed structure and fill loads.

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

- Conside ng the latively high rate percolation characteristics of the onsite soils, it is our opinion that Low Impact D velopment (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 sin 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-exca ate a minimum thickness of approximately 3 feet below the bottom of the foundation and replace with compacted granular non-expansive or very low expansive fill. The excavation s uld extend laterally a distance of at least 5 feet beyond the perimeter of the footprint of propose structures.

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

      For the above geogrid-reinforced eng neere fill, e recommend that three layers of geogrid (Tensar TX140 or equivalent) be place ithin 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 reco me d that the geo rid layers be placed at approximately 12 inches, 36 inches and 60 inch s below he bottom of foundations.

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

- Excavatability – B ed on our subsurface exploration, it is anticipated that the on-site soils can be excav ed by mod rn conventional heavy-duty excavating equipment in good operating condition

- Structural Fill lacement - 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 material should consist of clean granular soils free from vegetation, debris, or rocks larger than 3 in es in maximum dimension. The Expansion Index value should not exceed a maximum of 20 (i e., e entially non-expansive).

10.2 Liquefaction Potential

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

- **Compaction Grouting** Also known as Low Mobility Grouting, is a grouting technique that displaces and densifi loose granular soils and reinforces fine grained soils by the staged injection of low-slump, low bility aggregate grout. Typically, an injection pipe is first advanced to the maximum reatment depth. The low mobility grout is then injected as the pipe is slowly extracted in lifts, cr ting a column of overlapping grout bulbs. The expansion of the low mobility grout bulbs displace surrounding soils. When performed in granular soil, compaction grouting increas the surrounding soils density, friction angle and stiffness. In all soils, the high modu us grout co mn reinforces the soils within the treatment zone. By sequencing the compa tion groutin work from primary to secondary to tertiary locations, the densification process c n be per ormed to achieve significant improvement. Compaction is achieved above and below e w ter 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 he drill string. During penetration, the tool shears the soils preparing them for mixing. Aft the tool reaches the design depth, the binder is pumped pneumatically through the drill ste to e tool where it is mixed with the soil as the tool is withdrawn. The dry soil mixing process constr ts individual soilcrete columns, rows of overlapping columns or 100% mass stabilization, all with designed strength and stiffness. This method permits the use of economical continuous and spread footings. Seismic settlement and liquefaction potential are reduc d. Dry soil mixing is low vibration, quiet, and clean, and uses readily available materials. Th process s often used in high ground water conditions and has the advantage of producing practica y o spoil for disposal.

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

10.3 Foundations

Subsequent to implemen tion of e selected ground improvement, the proposed foundations should be founded entirely in com act d 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

Foun tions should be designed using the geotechnical design parameters presented in the followin Table 4 Footings should be designed and reinforced in accordance with the recommend tions of the structural engineer and should conform to the latest edition of the California Bui ing 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) p foot of depth to a maximum of 2,500 psf. One third increase in passive value ay be used for wind and seismic loads. The total allowabl lateral resistance may be taken as the sum of the ictional resistance and the passive resistance, pro ded th t the passive bearing resistance does not exceed thirds of the total allowable resistance.

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

10.3.2 Settlement

Estimated settlements will depend on the f undation size and depth, and the loads imposed and the allowable bearing values used for desig For preliminary design purposes, the total static settlement for continuou or m t foundation loaded to accordance with the allowable bearing capacities recommend d above is estimated to be less than 1 inch. Based on our knowledge of the project, differentia static ts are anticipated to be 0.5 inch or less.

10.3.3 Foundation Obser tion

To verif the pr ence of satisfactory materials at design elevations, footing excavations should be ob erved to be ean of loosened soil and debris before placing steel or concrete and probed for sof areas.

10.4 Seis ic 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 sho periods, S_{MS} adjusted for Site Class (Equation 11.4-1)	1.492g
Maximum considered earthquake spectral response acc eration at 1-sec period, S_{M1} adjusted for Site Class (Equation 11.4-2)	0.814g
Five-percent damped design spectral response acc leration t short periods, S_{DS}; (Equation 11.4-3)	0.995g
Five-percent damped design spectral response acceler on at 1-sec period, S_{D1}; (Equation 11.4-4)	0.543g

10.5 Utility Trenching and Tempora y Ex ava ns

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

Temporary shallow ex avations with vertical side slopes less than 4 feet high will generally be stable, altho gh due to he low density of the alluvium, there is a potential for localized sloughing. Vertical excav ions greater than 4 feet high should not be attempted without proper shoring to prevent local inst ilities. 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

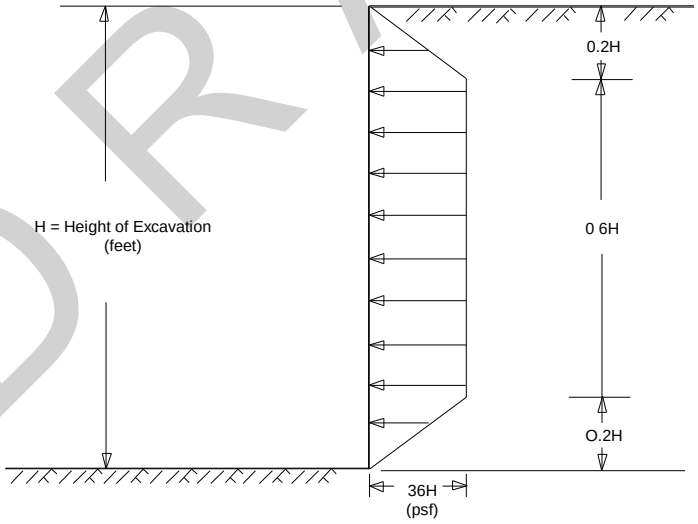
similar soil conditions. If soldier piles and lagging are to be used, we should be contacted for additional recommendations.

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 a d cranes. NV5 should be advised of such heavy loadings so that specific setback requiremen m y be established. If the temporary construction slopes are to be maintained during the rainy season, rms are recommended along the tops of the slopes, to prevent runoff water from entering the excava on 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 beh nd 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 pressu The recommended pressure distribution, for the case where the grade is level behind the horin is illustrated in the following diagram with the maximum pressure equal to 36H in psf, whe 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 su surface exploration and onsite percolation testing, the onsite soils maybe considered to be relative permeable.

10.7 Trench Bottom Stability

The bottom of onsite excavations will likely expose medium ense 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 pound per squ e inch is recommended.

While groundwater is not anticipated to be encountered, if t se soils become wet or saturated they may be prone to settlement due to construction activities su as placement and compaction of backfill soils. Buried improvements underl in by these soils could also be damaged or subjected to unacceptable settlement due to subsidence f th soils. If wet or unusually soft conditions are encountered in the trench bottom, the bottom of the xc tions will need to be stabilized. A typical stabilization method includes overexcavation o the soft or saturated soil and replacement with properly compacted fill, gravel or lean concre to form a "mat" or stable working surface in the bottom of the excavation. Th e re other accep able methods that can be implemented to mitigate the presence of compr sible oils or unstable trench bottom conditions, and specific recommendations for a articula alternative can be discussed based on the actual construction techniques and conditions e countered.

10.8 Pipe Bedding

It is recommended tha 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 ab ve the top of the pipe. A cement slurry may not be used as bedding. The bedding materials shoul be approved by the geotechnical consultant prior to hauling on site. A minimum six-inch layer of pipe edding 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 compact d. 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 omplia ce with the appropriate agency's ordinance.

10.10.1. Flexural Asphalt Concrete (AC) Pavement

To determine the minimum structural s ction n R-Value test was performed on a near surface soil sample. The test results provided an -Value of 0; 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 De gn Manual", Chapter 630 for Flexible Pavements.

The table below presents the s ructural sections for the assumed traffic conditions for parking areas and heavy truck drivew ys (i e delivery trucks and garbage service trucks).

Table 7
Fle ible Asphalt Pavement Sections

Pa ement Area	*Traffic Index (TI)*	*Pavement Section*	
		AC(1) (inches)	*AB(2) (inches)*
Parking ar	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. Wh re planters are proposed, the perimeter curb should extend at least 6 inches below the subgra e elevation of the adjacent pavement. In addition, our experience indicates that even with the 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 ample o the on-site soils to evaluate pH, minimum resistivity, and chloride and soluble sulfate co ten Table 9 presents the results of the corrosivity testing.

Table 9
Corro ivity Test Results

Test Location	Exploratory Boring B-5
Depth (et)	0 – 5
H	8.0
Re istivity (ohm cm)	1000
C loride 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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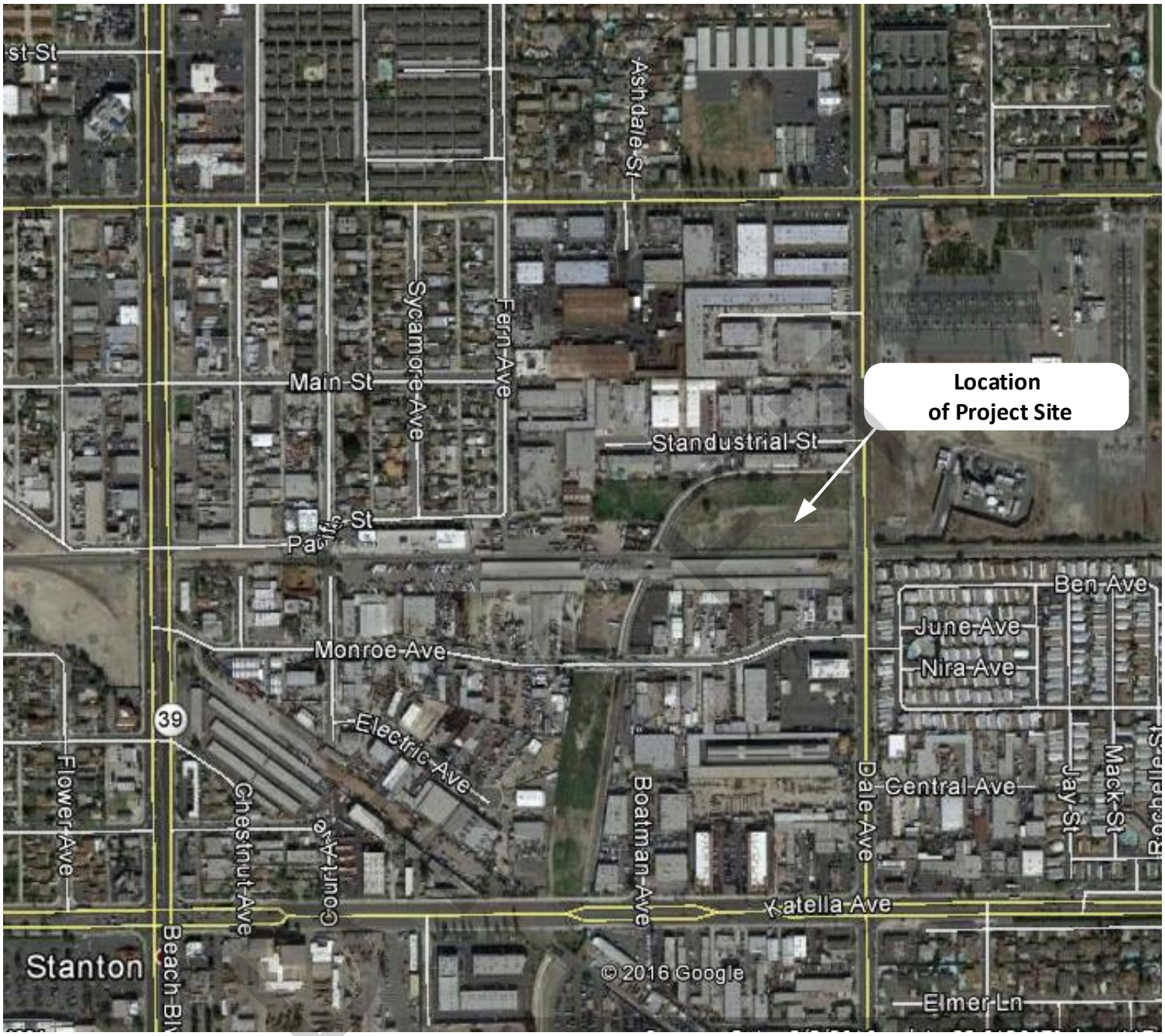
Figures



Reference: Google Maps 2016

N

No Scale

Not a Construction Drawing

NV5
An NV5 West, Inc. Company – Offices Nationwide
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

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

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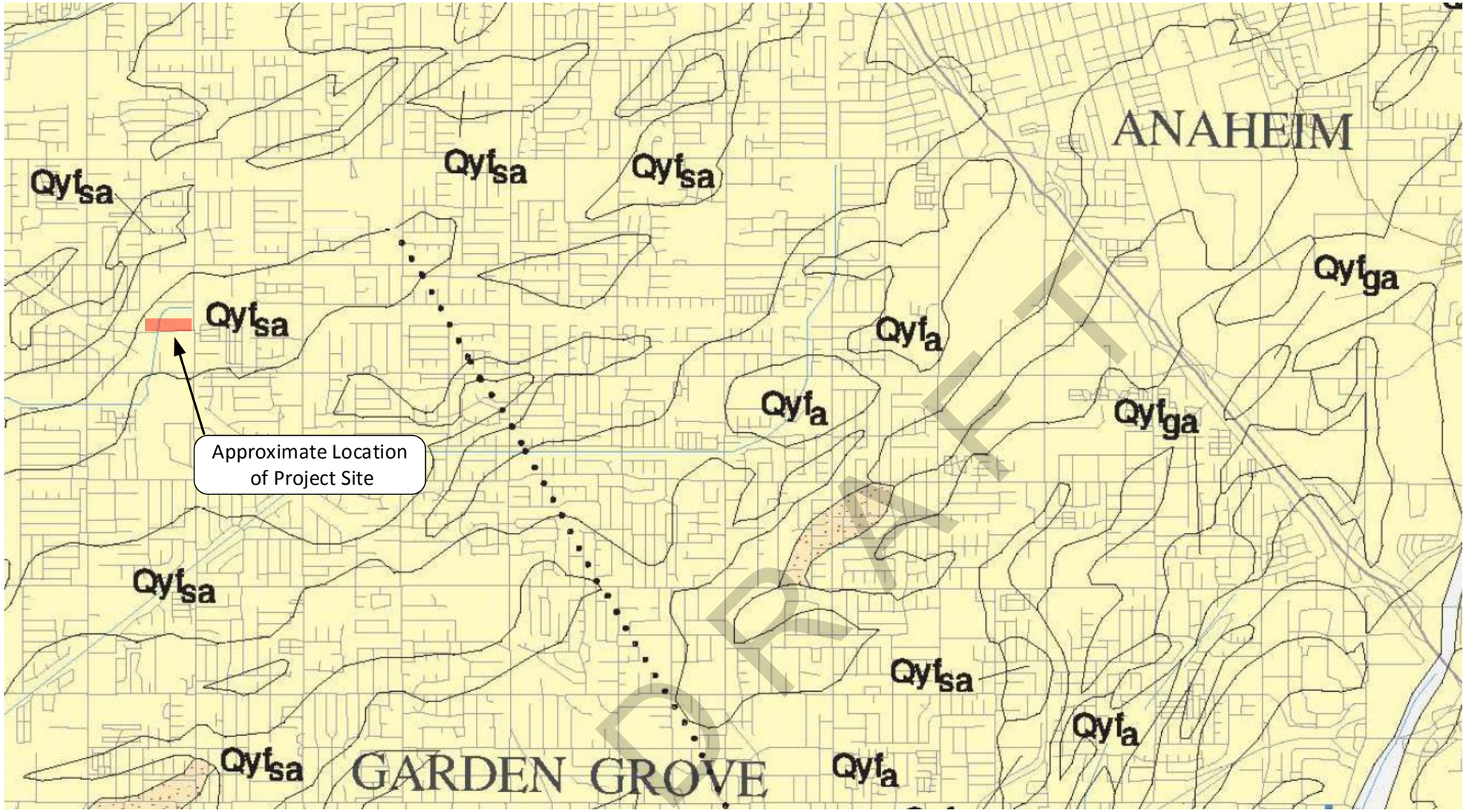
Geotechnical Map
Stanton Energy Reliability Center
Stanton, California

Figure No. 2



Approximate Scale (in miles)

DESCRIPTION OF MAP UNITS

Qyf	Quaternary alluvial flood-plain deposits

N

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

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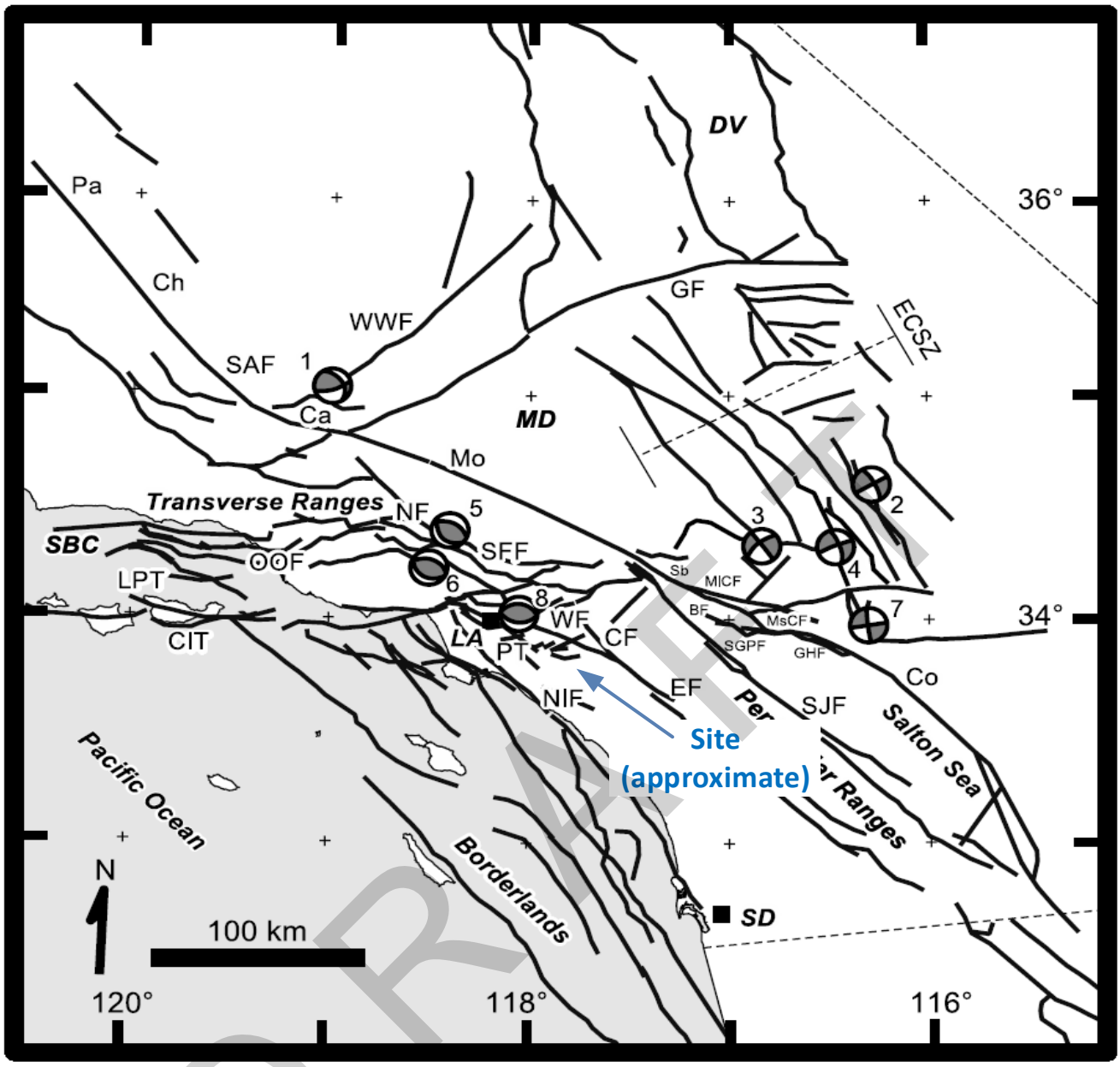
Drawn: **GC**
Date: **September 2016**

Regional Geologic Map
Wellhead Stanton Energy ReliabilityCenter
Stanton, California
Figure No. 3



Map of southern alifornia sh wing the geographic regions, faults and focal mechanisms of the more significant earthquakes. **Regi s:** Death Vall , DV; Mojave Desert MD; Los Angeles, LA; Santa Barbara Channel, SBC; and San Diego, SD. **Indicated Faults:** Banning fa t, BF; Channel Island thrust, CIT; Chino fault, CF; Eastern California Shear Zone, ECSZ; Elsinore fault, EF; Garloc fault F; Garnet Hill fault, GHF; Lower Pitas Point thrust, LPT; Mill Creek fault, MICF; Mission Creek fault, MsCF; Northridg ault, 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

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 br ss ings. 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 h mmer allowed to drop freely 30 inches in general accordance with ASTM D1586. he number of blows per foot recorded during sampling is presented in the logs of exp ratory borings. The sampler has external and internal diameters of 2 0 nd 1.5 inches, respectively. The soil sample obtained in the interior of the barrel is measur 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: Wellhead Stanton Energy Reliability Center
Stanton, California

Soil Classification Chart

Major Divisions			Symbols: Graph	Symbols: Letter	Typical Descriptions
Coarse Grained Soils	Gravel and Gravelly soils	Clean Gravels (Little or no fines)		GW	Well-Graded Gravel, Gravel SAND mixtures, little of no fines
				GP	Poorly-Graded Gravels, Gravel - SAND mixtures, little or no fines
	more than 50% of coarse fraction retained on No. 4 sieve	Gravels with fines (Appreciable amount of fines)		GM	Silty Gravels, Gravel- SAND-Silt mixture
				GC	Clayey Gravels, Gravel - SAND - Clay mixtures
More than 50& of material is larger than No. 200 sieve size	Sand and Sandy Soils	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
	More than 50% of coarse fraction passing on No.4 sieve	Sands with Fines (Appreciable amount of fines)		SM	Silty SANDS, SAND-Silt mixtures
				SC	Clayey SANDS, SAND - Clay mixtures
Fine grained soils	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
More than 50% of material is smaller than No. 200 sieve size	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.
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: Wellhead 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)

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:			
1								
2								
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, micace us, fine grained.			
		7						
			Bag 3					
15		5				5.2		
		7	SPT2	SP	Graded SAND: Medi m 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								

Cal. Mod. SPT

Sample Type: 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	Cal. Mod.	10 22 28	Cal 3	SP	Poorly Graded SAND: Dense, light brown, wet, micaceous, fine grained	23.0	104	
35	SPT	10 12 14	SPT4	SP	Poorly Graded SAND: Medium dense, light brown, wet, m ceous, fi grained	19.8		
40	Cal. Mod.	12 18 21	Cal 4	SP	Poorly Graded SAND: Dense, light brown, we micaceous, fine grained	20.8	105	
45	SPT	5 6 7	SPT5	SP	P ly Graded SAND: Med m dense, light brown, wet, micaceous, fine grained	18.8		
50	SPT	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)

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:			
1				ML	SANDY SILT: hard, grayish brown, dry, micaceous, fine grained.			
2								
3		14				1		
		20	SPT1					
4		12						
			Bag 1					
5		10				2.6	100	
		14	Cal 1	SM	SILTY SAND: medium dense, grayish brown, dry, micaceou ine grai d			
		16				21.8		
		1						
		2	SPT2	SC	Silty CLAYEY SAND: Loose, dark grayis own, 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: l e, dark gr h own moist, micaceous, fine grained			
		5						
			Bag 3					
15		9				11.3	102	
		12	Cal 3	SP	Graded SAND: Medi m 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		4 6 9	SPT6	SP	Poorly Graded SAND: Medium dense, light brown, wet, micaceous, fine-medium grained.			
35		6 12 18	SPT7	SP	SAME			
					SAME: fine grained			
40		4 5 6	SPT8	SC	Silty CLAYEY SAND: Medium dense, grayish b own, wet, micaceous, fine grained.	20.9		
					downward fining, i sing silt, decreasing sand			
45		6 6 9	SPT9	CL	S TY CLAY: Stiff, grayish wn, wet			
				SM	S TY S ND: Medium dense, grayish brown, wet, micaceous, fine grained			
50		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)

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					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 ne grained	2.4	99	
		23						
		29	Cal 1					
			Bag 2		Increasing clay content	17.8		
10		3		SC	Silty CLAYEY SAND: Loose, mottled dark gr t brown, moist, micaceous,			
		4	SPT1		fine grained			
		5						
			Bag 3					
15		9		SM	SILTY SAND: Medium de e, 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 ained	20.3	104	
					Downward coarsening Increasing grain size, (fine - medium grain)			
40		7 11 14	SPT4	ML	SANDY SILT: Very stiff, dark grey, moist wet caceous, 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)

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:	2.5		
1				SM	SILTY SAND: Loose, yelowish brown, dry, fine grained			
2								
3								
4			Bag 1					
5		11		SP	Poorly graded SAND: Medium dense, light brown, dry, mic eous,			
		13	SPT1		fine-medium grained			
		13						
			Bag 2					
10		4		SP	Poorly graded SAND: Medium dense, grayis b wn, moist, micaceous,			
		12	Cal 1		fine-medium, grained			
		16						
			Bag 3					
15		11		SW	Well graded SAND: Dens light brown, moist, fine-coarse grained	2.1		
		14	SPT2					
		17						
			Bag 4					
20		8		SP	SILTY SAND: Dense, dary gray, wet, micaceous, fine grained	19.5	104	▼ Wet at 20' bgs
		14	Cal 2					
		17						
				ML	SANDY SILT: Very stiff, dark gray, wet, micaceous			
25		4				22.4		
		7	SPT3	SP	Poorly graded SAND: Medium dense, dark gray, wet, micaceous, fine grained			
		11						
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	Cal. Mod.	7 19 31	Cal 3	SP	Poorly graded SAND: Dense, dark gray, wet, micaceous, fine-medium grained	18.9	105	
35	SPT	4 9 13	SPT4	ML SP	Increase in silt content 35.5' - 36' Poorly graded SAND: Medium dense, dark grey, wet, mic ous, fine ained	20.1		
40	Cal. Mod.	9 17 24	Cal 4	ML	CLAYEY SILT: Hard, mottled dark gray, we mic eous	31.9	87	
					Decresing silt, i easing and			
45	SPT	6 16 19	SPT5	SP ML	Poorly graded SAND: De e, dark gray, wet, micaceous, fine grained CLAY SILT: Hard, mottled dark gray, moist, micaceous.	28.5		
				SP	P ly g ded SAND: Dense, dark gray, wet, micaceous, fine grained.			
50	Cal. Mod.	10 13 26	Cal 5			34.8	81	
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 100 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 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, micaceou fine graine			
			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)

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		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	C YEY SILT: Hard, dark g y, wet, micaceous.	30.1	95	
50		4 7 11	SPT5	ML	Incr e 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)

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				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, micac us, fine grained.			
10		2 3 3	Bag 2 SPT1	ML	Sandy SILT: Medium stiff, dark brown, m t, mic ceous, h fine grained sand.	16.9		
			Bag 3					
15		5 9 12	Cal 2	SM	Y SAND: Medium dens , brown, moist, micaceous, fine grained, downwa fining, with increasing silt and clay.	25.6	98	
			Bag 4					
20		5 5 6	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, micace s fine gr ed, slight increase in silt.	22.5	106	
40	X	5 12 12	SPT4	ML	CLAYEY SILT: Very stiff, olive gray with orang mottling, wet.			
45	▨	6 8 10	Cal 5	CL	SILTY AY: Very stiff, olive gray, wet.	40.1	82	
50	X	7 18 26	SPT5	SC	Incr ing 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 TES S
(ASTM D2216)

Sample Location	Moisture Content (pe ent)	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	2	105
Boring 1 @ 25-26.5 feet	2 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 fe t	16.0	-
Boring 2 @ 2.5-4 feet	3.1	-
Boring 2 @ 5- 5 feet	2.6	100
Boring 2 @ 7.5-9 et	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.	-
Boring 5 @ 25-26.5 feet	7 8	114
Boring 5 @ 30-31.5 feet	2 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 @ 5-16.5 et	25.6	98
Boring 6 @ 20-21.5 fee	20.5	-
Boring 6 @ 2 26.5 fee	23.0	105
Boring 6 @ 30-3 5 eet	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 n accordance with the Unified Soil Classification System. Particle size distribu on test results are presented on the laboratory test sheets attached in this appendi

Material Finer Than 75-µm (No.200)

Material Finer Than 75-µm (No.200) test was perf rmed in accordance with ASTM D1140. This test was useful in classification of the oil. Tes 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 Loc tion	B3 @ 40-41.5ft	B3 @ 50-51.5ft	B5 @ 50-51.5 ft
% Finer Than 75-µ	78.3	79.6	91.7

Atterber Limits

Atterberg lim test was performed in accordance with ASTM D4318. This test was useful in classific tion 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 D 557. This test was useful in evaluating the compaction of the soil in the field. Test results a e 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 compacte soil. Test results are attached in this appendix.

ample Location	B3 @ 0-5ft
R-Val e 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	12	43

Direct shear

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

RESULT OF DIRECT SHEAR TEST
(ASTM D3080)

Lo ation	Peak Angle of Internal Friction (degrees)	Peak Cohesion Intercept (psf)	Notes
B5, 15- 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 Wellhead Energy Site		
Project Add:	West of Dale Street, Stanton, CA		
Sampled By:	Sean Roy		
Date Rcvd:	8/8/16		

Lab Number	113243	113244	1132	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 1.5	35-36.5	40-41.5	45-46.5	50-51.5
Moisture Content, %	23	8	20.8	18.8	16.0
Dry Density, pcf.	103.6	-	104.8	-	-

Lab Number	113253	113254	113255	113256	113258
Exploration No	2-SPT1	B2-D1	B2-SPT2	B2-D2	B2-D3
Depth, feet	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	-

Moisture Density Report

(ASTM 2216,2937)

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

Lab Number	113267	113268	11326	113270	113271
Exploration No.	B6-D3	B6-SPT3	B6-D4	B6-5	B6-SPT5
Depth, feet	25-26.5	30-3 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 Wellhead Energy Site		
Project Add:	West of Dale Street, Stanton, CA		
Sampled By:	Sean Roy		
Date Rcvd:	8/8/16		

Lab Number	113194	113195	1131	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	-	5.6	106.3	-

Lab Number	113199	113200	113201	113203	113205
Exploration No.	B3-D4	B3-SPT4	B3-D5	B4-SPT1	B4-SPT2
Depth, feet	35 6.5	40-41.5	45-46.5	5-6.5	15-16.5
Moisture Content, %	20	6	30.0	2.5	2.1
Dry Density, pcf.	105.3	-	91.4	-	-

Lab Number	113206	113207	113208	113209	113210
Exploration No	4-D2	B4-SPT3	B4-D3	B4-SPT4	B4-D4
Depth, feet	2 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 Wellhead Energy Site
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	5 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

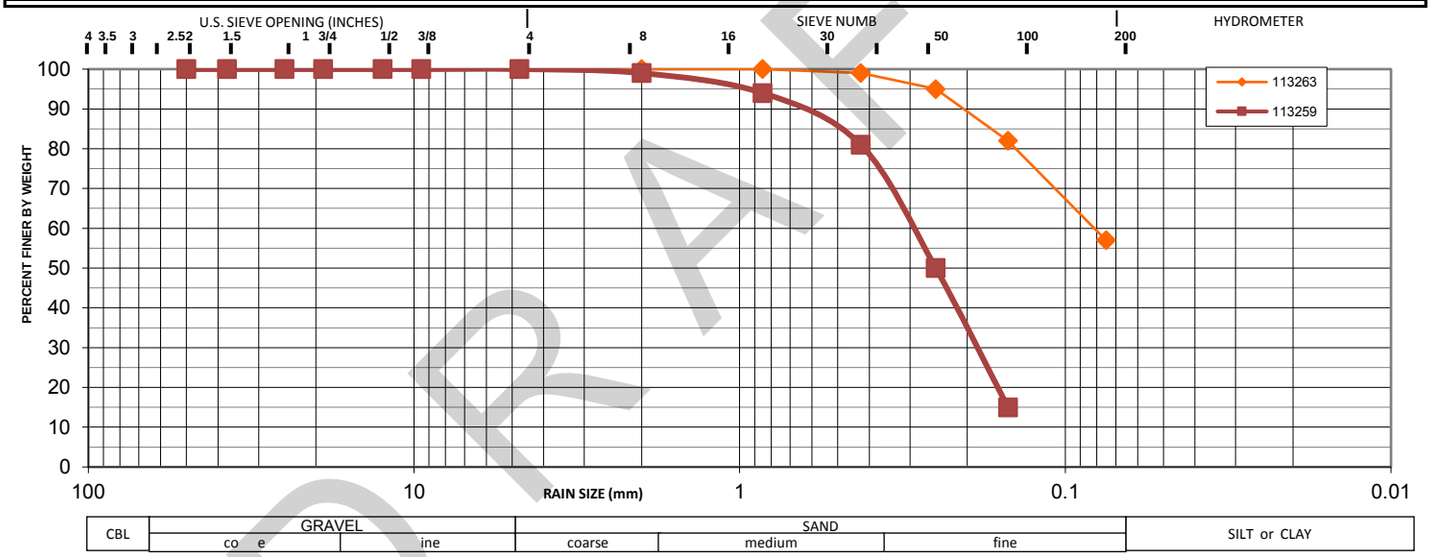
REPORT OF SIEVE ANALYSIS TEST

ASTM D422 - Soil

Date: August 22, 2016
Client: Stanton Energy Reliability Center, LLC
Address: 650 Bercut Drive, Ste A
Sacramento, CA
Project : Stanton Energy Reliability Center
Project Address: West of Dale Street, Stanton, CA

Job Number: 113815-00763.00
Report Number: 4531
Lab Number: 112845

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:	263	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.

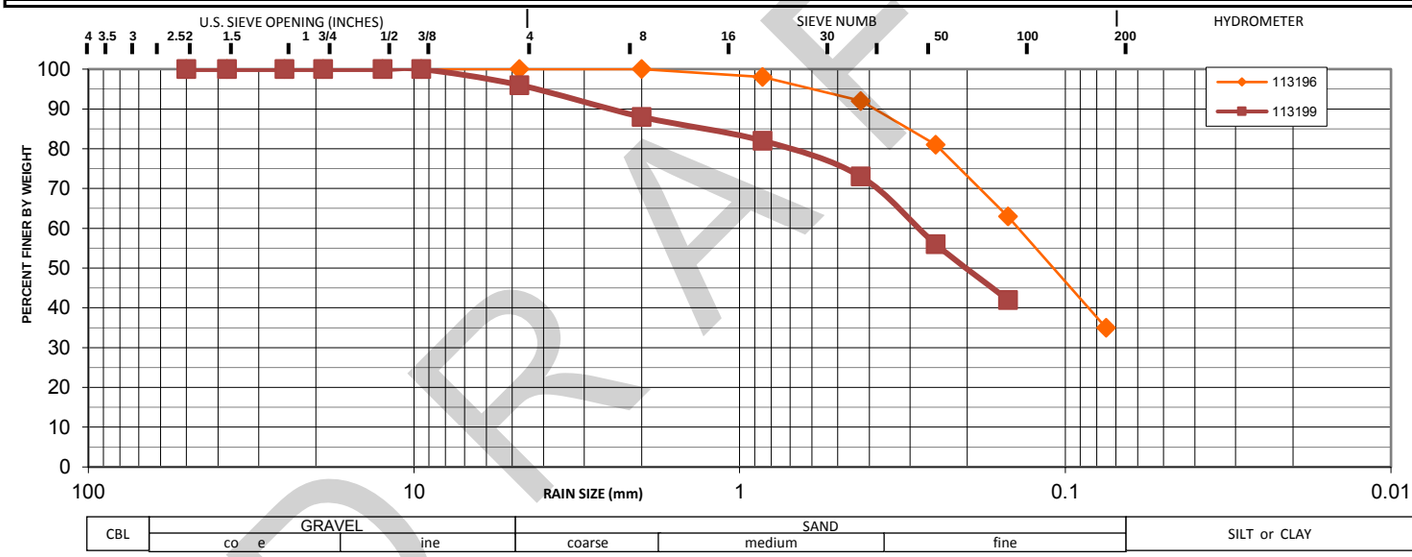
Sam Koohi, PE
Engineering Manager

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 Sacramento, CA	Lab Number:	113196, 113199
Project :	Stanton Wellhead Energy Site		
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:	196	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 Wellhead Energy Site		
Project Add:	West of Dale Street, Stanton, CA		
Sampled By:	Sean Roy		
Date Rcvd:	8/8/16		

Lab Number	113254	1 255	113257	1132652
Exploration No.	B2 D1	B2- PT2	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 Wellhead Energy Site		
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.

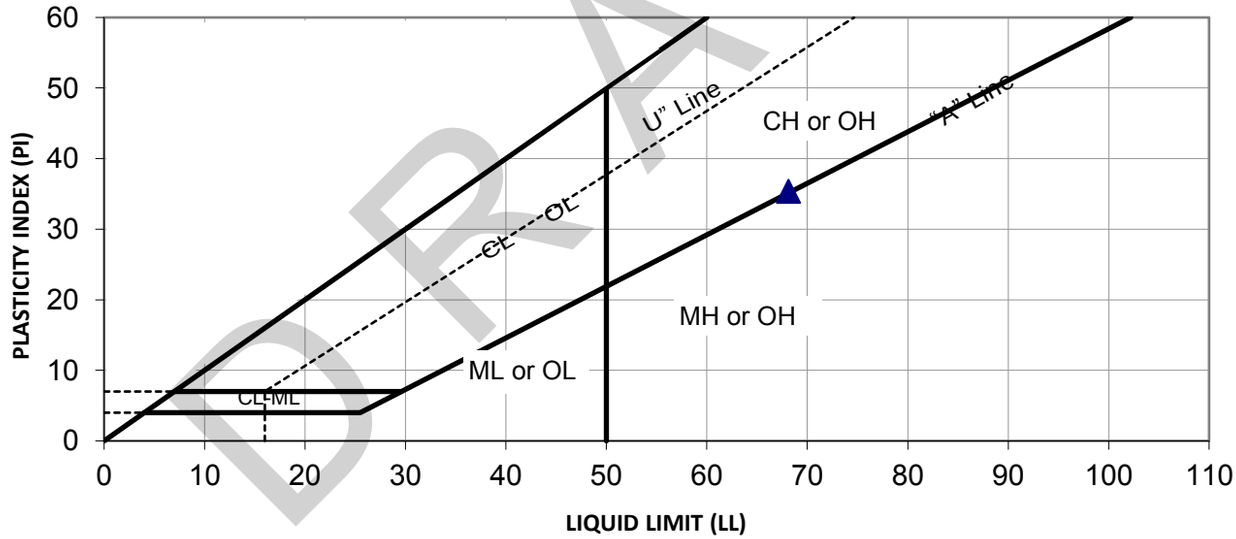
Sam Koohi, PE
Engineering Manager

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 Wellhead Energy Site
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:	1131 0, 113191
	Sacramento, CA		
Project:	Stanton Wellhead Energy Site		
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’
Sampl No.	1	2
Initial Moisture C tent, %	10.0	8.2
Final Moisture Conte t %	19.8	16.0
D Density, pcf	109.8	109.6
Sat ation, %	50.5	50.8
Expan on Index	**7.0**	**0**
Potenti l 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

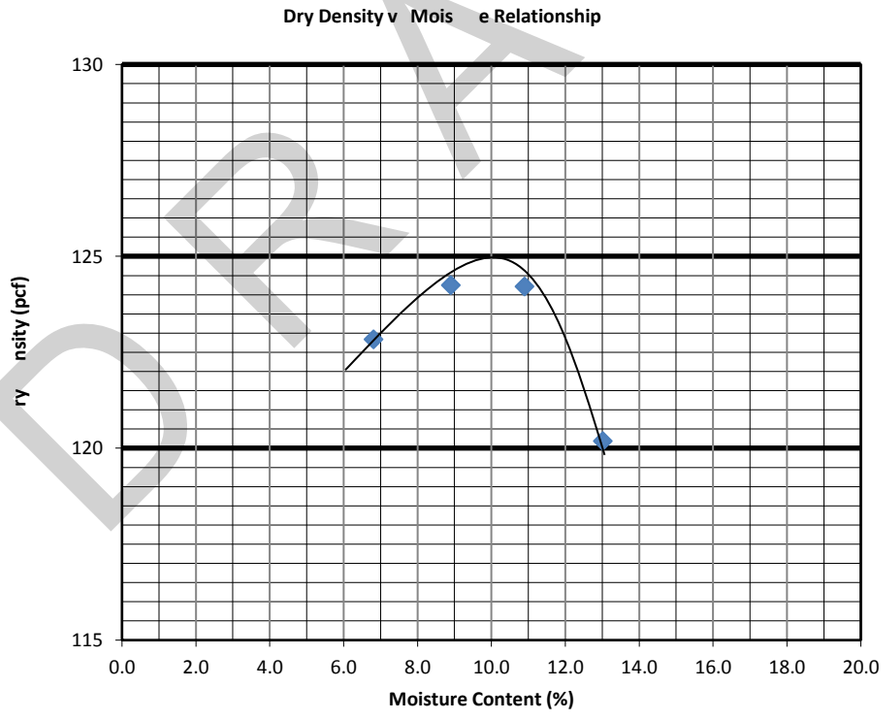
Job Number: 113815-00763.00
Report Number: 4513
Lab Number: 113192

Project: Stanton Wellhead Energy Site
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 Si e: 4 inch
ASTM D1557 A

Maximum Dry Density = 125.0 pcf

Optimum Moisture = 10.0%



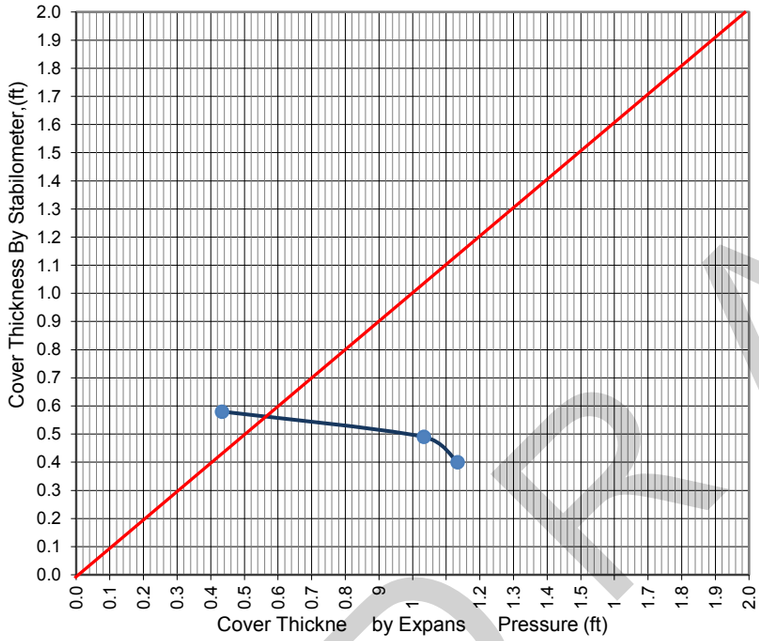
Distribution
Client
File

Reviewed By: _____
Sam Koohi, PE
Engineering Manager

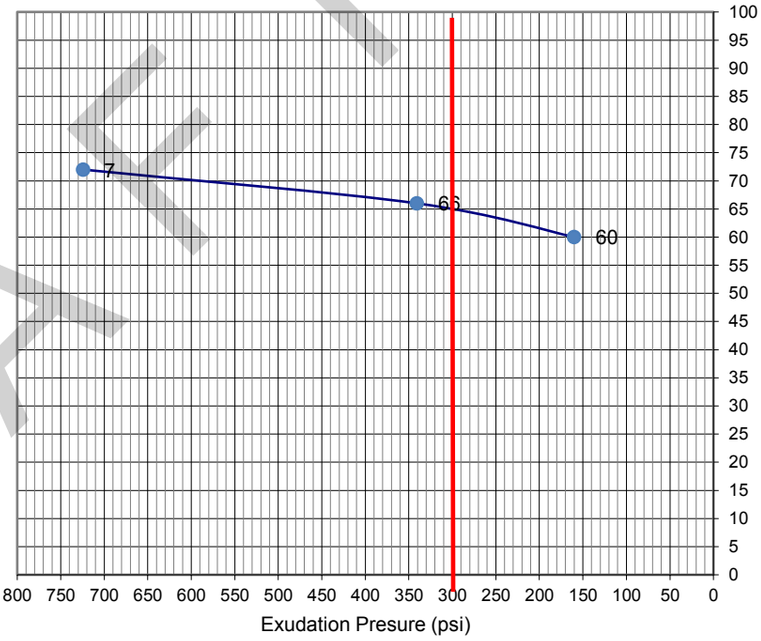
RESISTANCE "R" VALUE TEST
(CTM301 Caltrans / ASTM D2844)

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 Wellhead Energy Site		
Project Address :	West of Dale Street, Stanton, CA		

EXPANSION PRESSURE CHART



EXUDATI N 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- 800
Fax: 858-715-58 0
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 Sa ple).

Analysis By California Test 643, 1999, Department of Transportation
Division of Construction, Method for E imating 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 Wellhead Energy Site**
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**

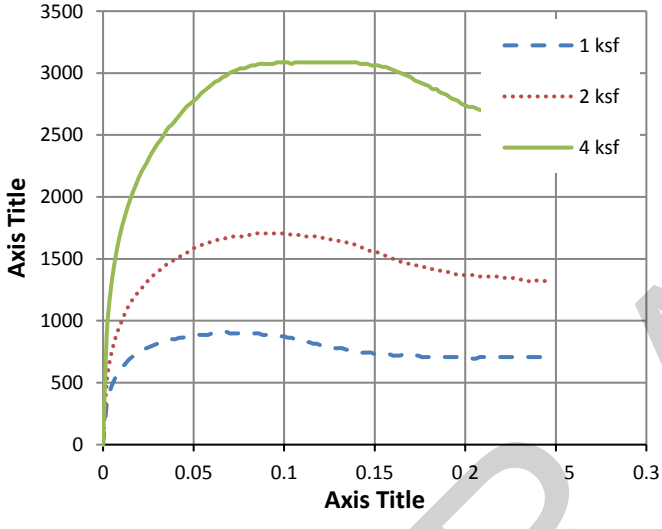
TEST DATA:

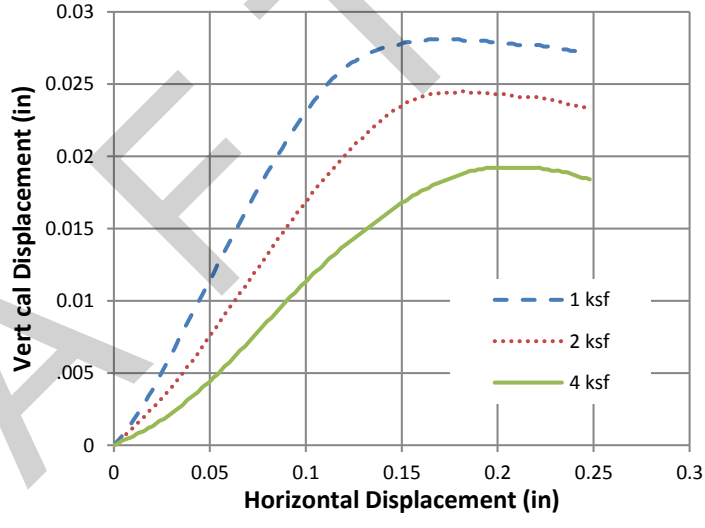
	Sample ID:	1 ksf	2 ksf	4 ksf
Initial	Water Content (%)	5.3	5.5	10.4
	Dry Density	105.0	103.3	100.4
	Saturation (%)	25.3	25.2	44.0
Final	Water Content (%)	20.5	20.9	21.0
	Dry Density	105.0	103.3	100.4
	Saturation (%)	98.0	95.4	88.8
Normal Stress (psf)		1000	2000	4000
Ultimate Shear Stress (psf)		707	1321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

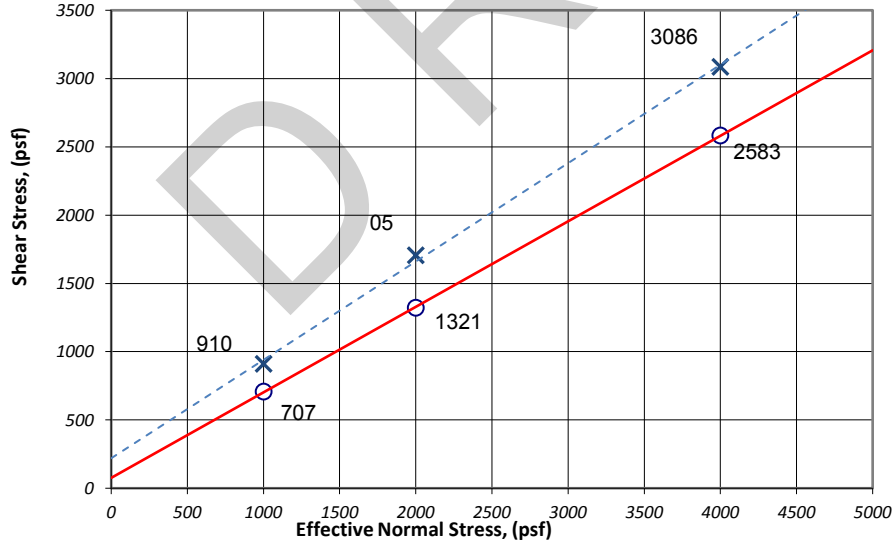
Sample Type: Undistrubed

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): **35.8**

Ultimate Cohesion, C'(psf): **76**
Ultimate Friction,Φ' (deg): **32.1**

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 Wellhead Energy Site**
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**

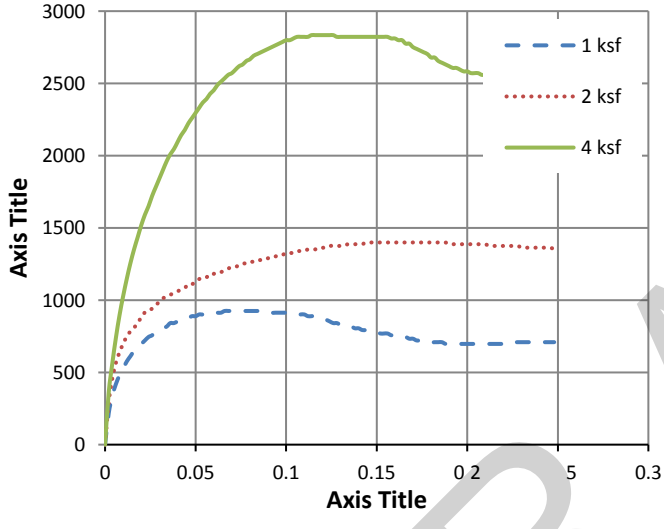
TEST DATA:

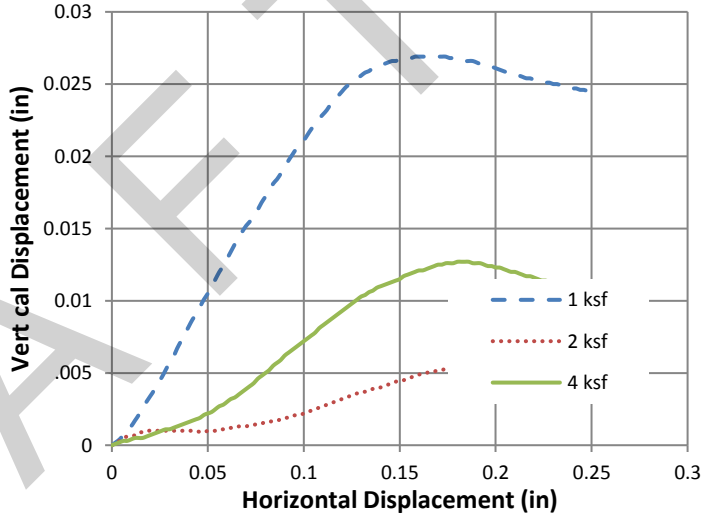
	Sample ID:	1 ksf	2 ksf	4 ksf
Initial	Water Content (%)	14.3	13.2	14.2
	Dry Density	101.4	95.1	98.0
	Saturation (%)	61.9	48.5	56.3
Final	Water Content (%)	25.4	28.5	24.8
	Dry Density	101.4	95.1	98.0
	Saturation (%)	110.4	105.1	98.4
Normal Stress (psf)		1000	2000	4000
Ultimate Shear Stress (psf)		721	1363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

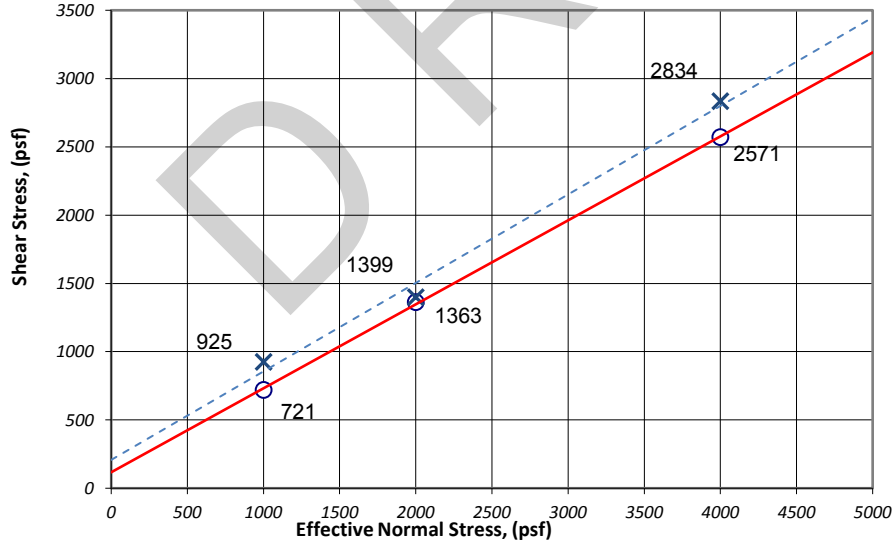
Sample Type: Undistrubed

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): **32.9**

Ultimate Cohesion, C'(psf): **117**
Ultimate Friction,Φ' (deg): **31.6**

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

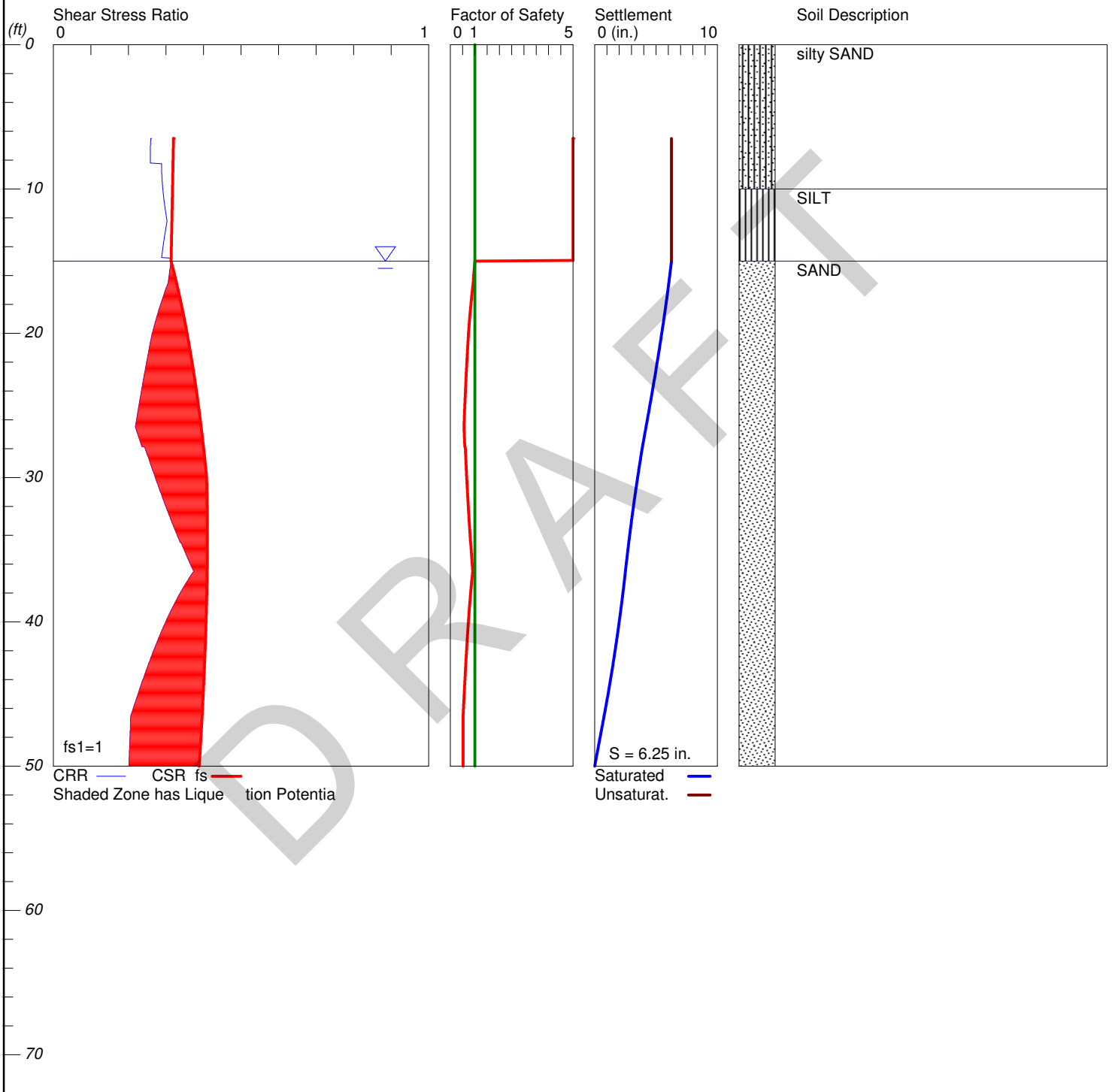
Liquefaction Analysis

LIQUEFACTION ANALYSIS

Stanton Energy Reliability Center-B1

Hole No.=B1 Water Depth=15 ft Surface Elev.=68

Magnitude=6.9
Acceleration=0.5g

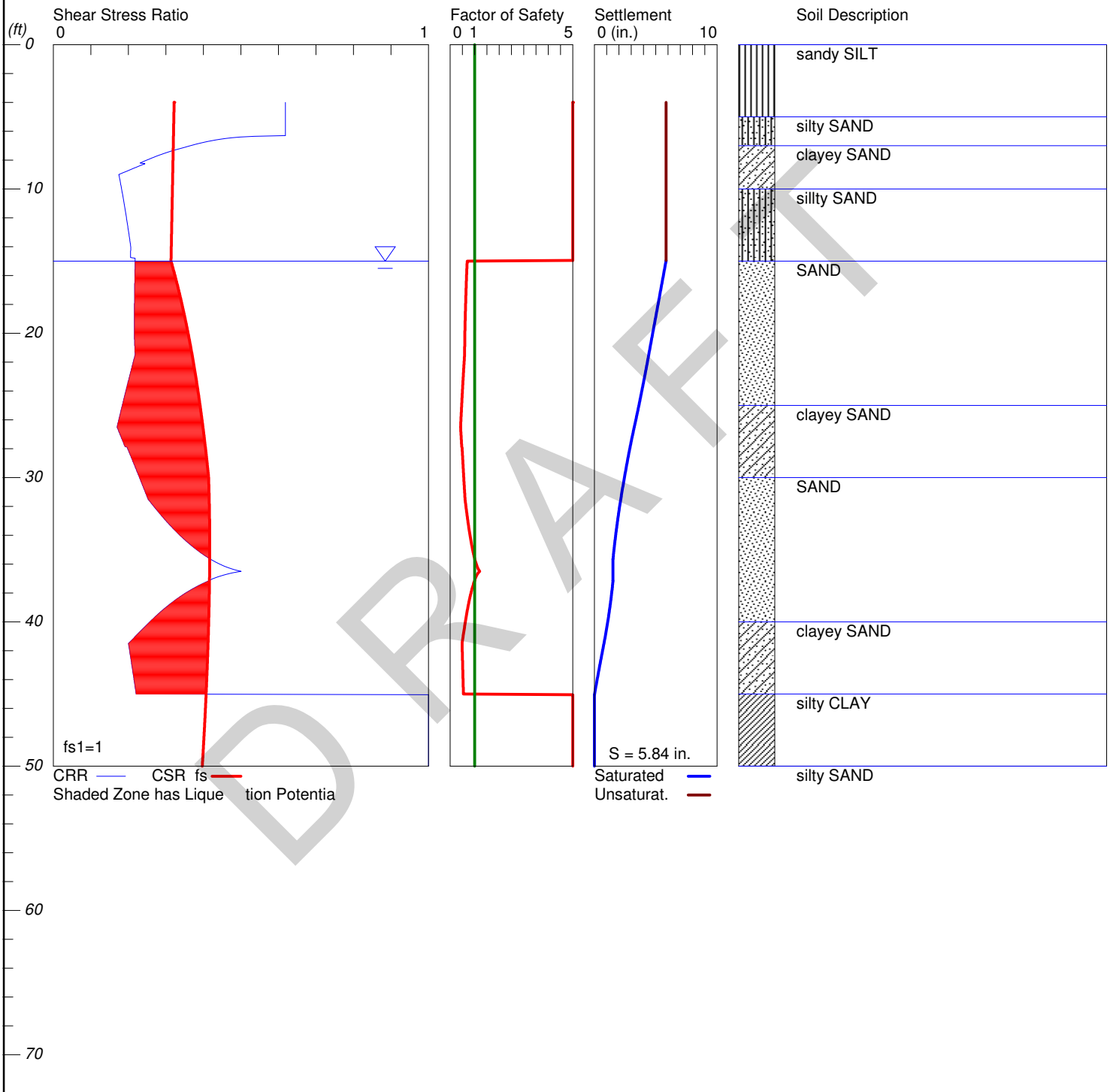


LIQUEFACTION ANALYSIS

Stanton Energy Reliability Center-B2

Hole No.=B2 Water Depth=15 ft Surface Elev.=68

Magnitude=6.9
Acceleration=0.5g

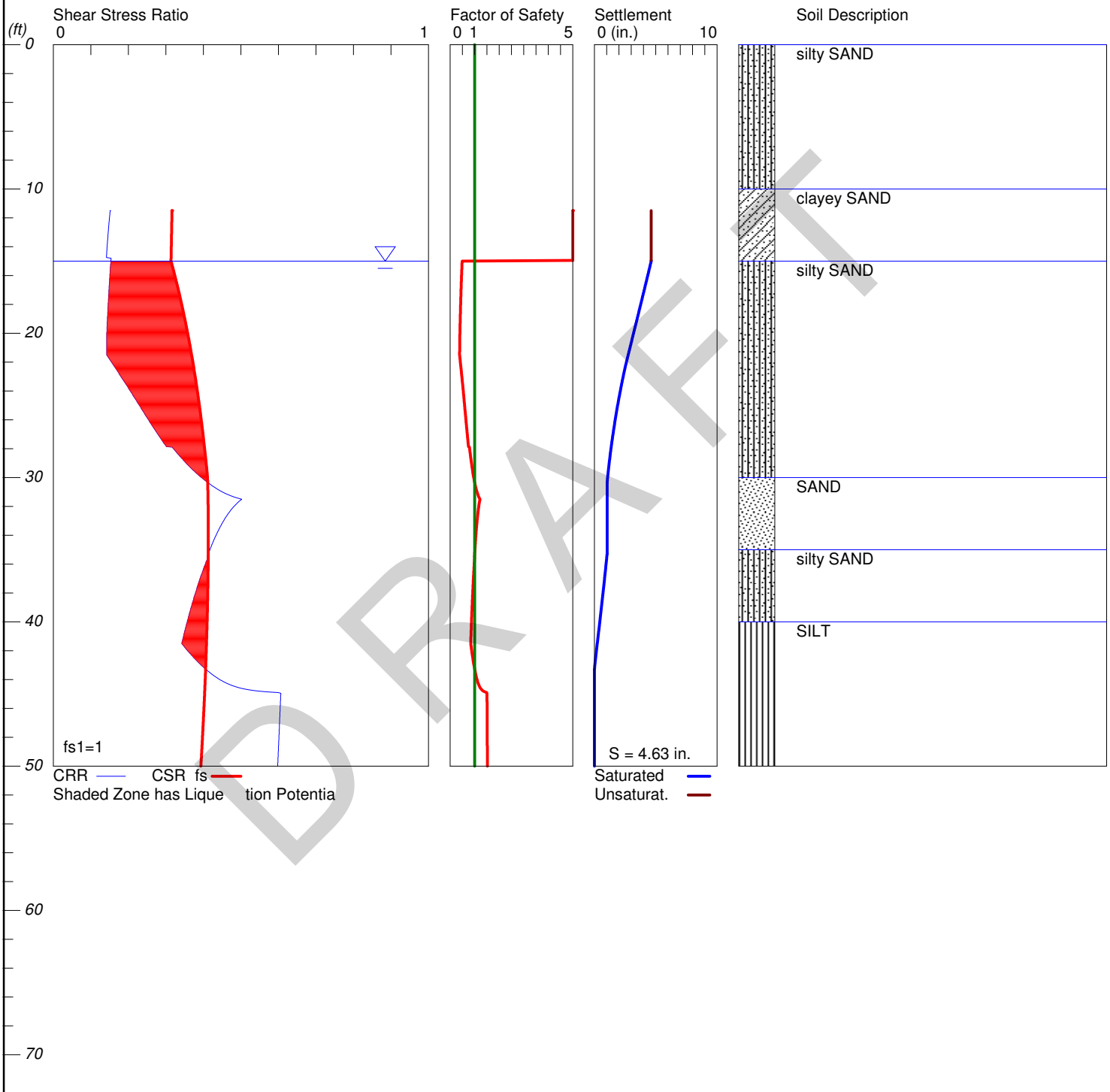


LIQUEFACTION ANALYSIS

Stanton Energy Reliability Center-B3

Hole No.=B3 Water Depth=15 ft Surface Elev.=68

Magnitude=6.9
Acceleration=0.5g

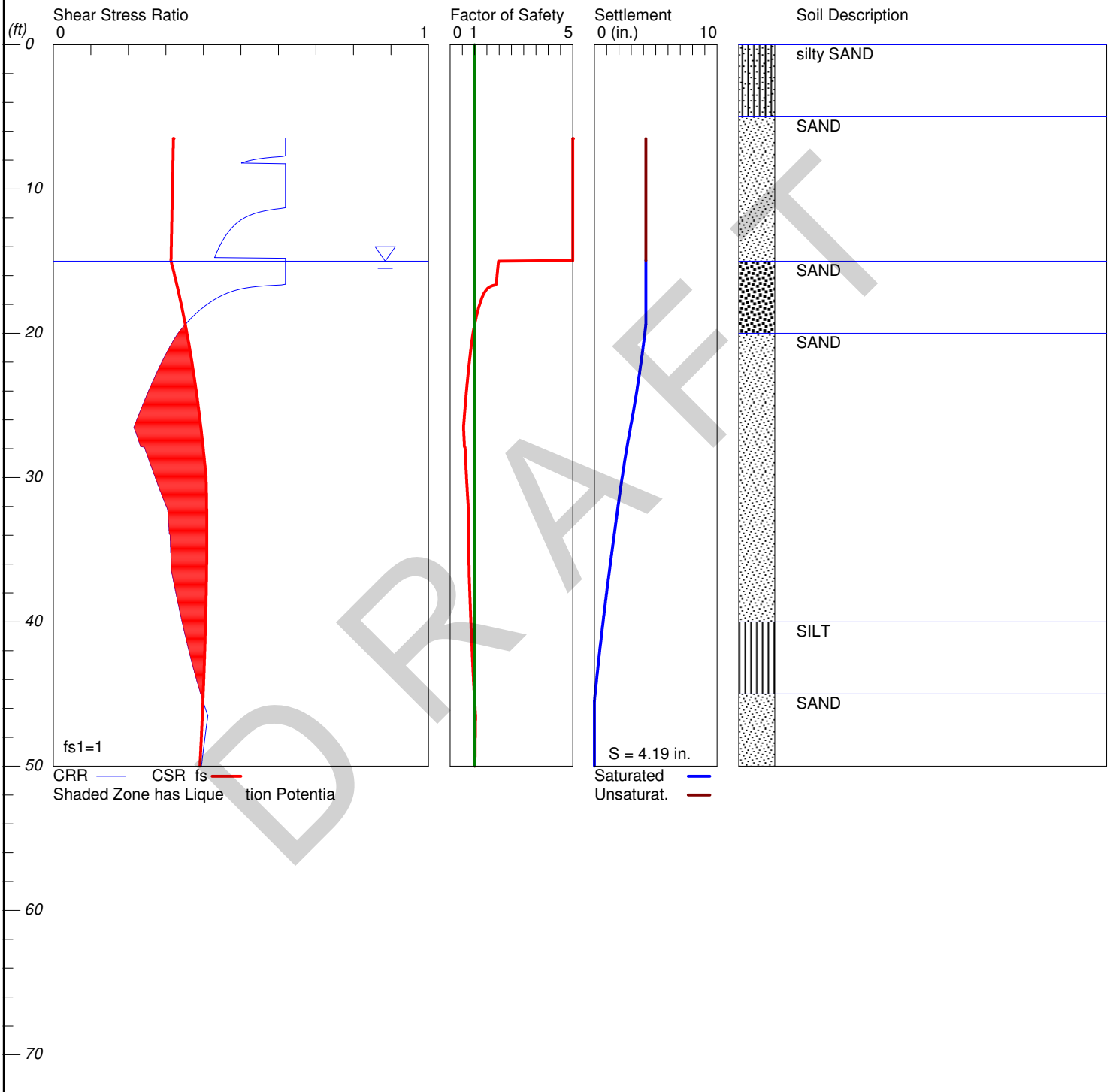


LIQUEFACTION ANALYSIS

Stanton Energy Reliability Center-B4

Hole No.=B4 Water Depth=15 ft Surface Elev.=68

Magnitude=6.9
Acceleration=0.5g

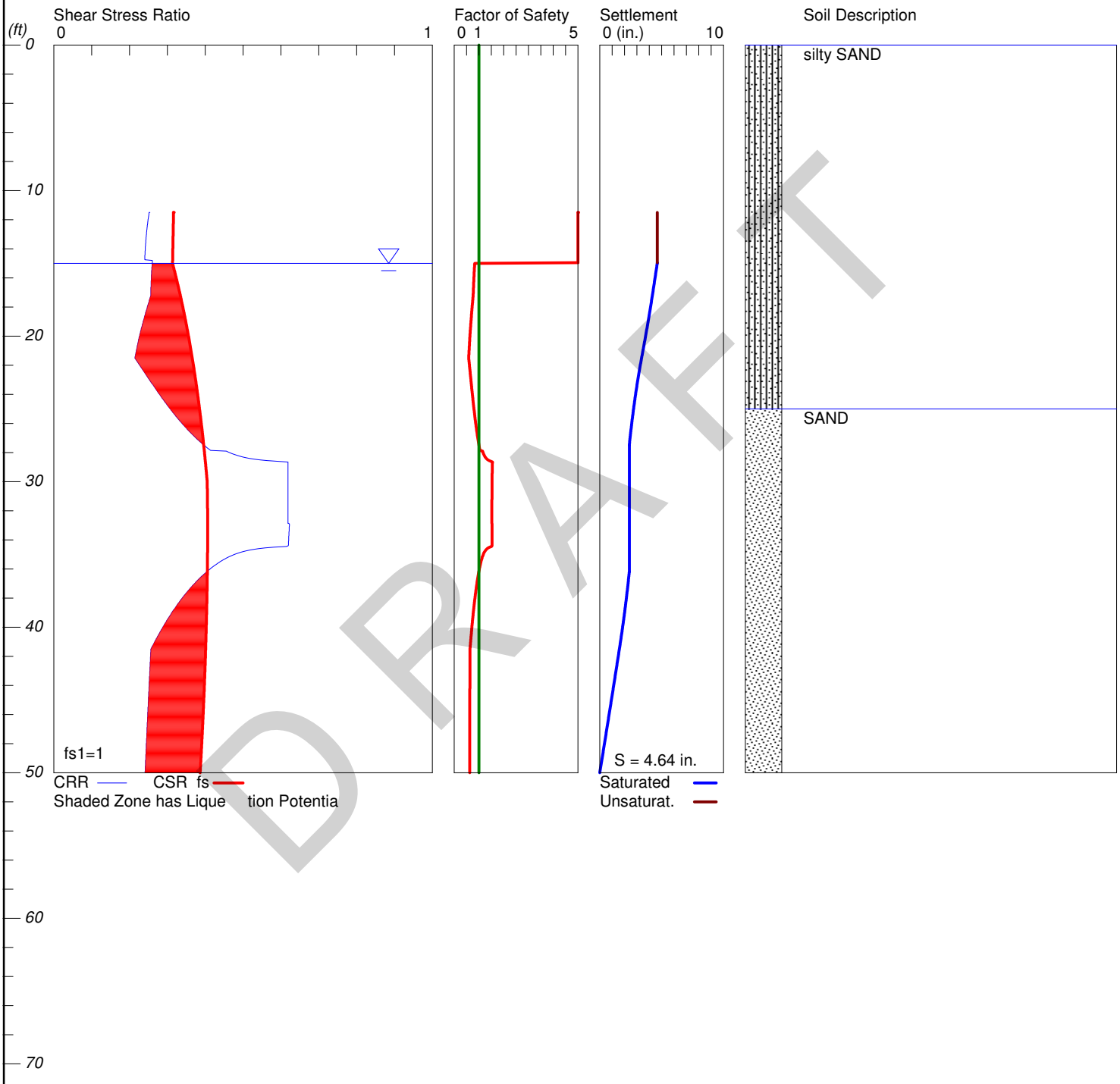


LIQUEFACTION ANALYSIS

Stanton Energy Reliability Center-B5

Hole No.=B5 Water Depth=15 ft Surface Elev.=68

Magnitude=6.9
Acceleration=0.5g

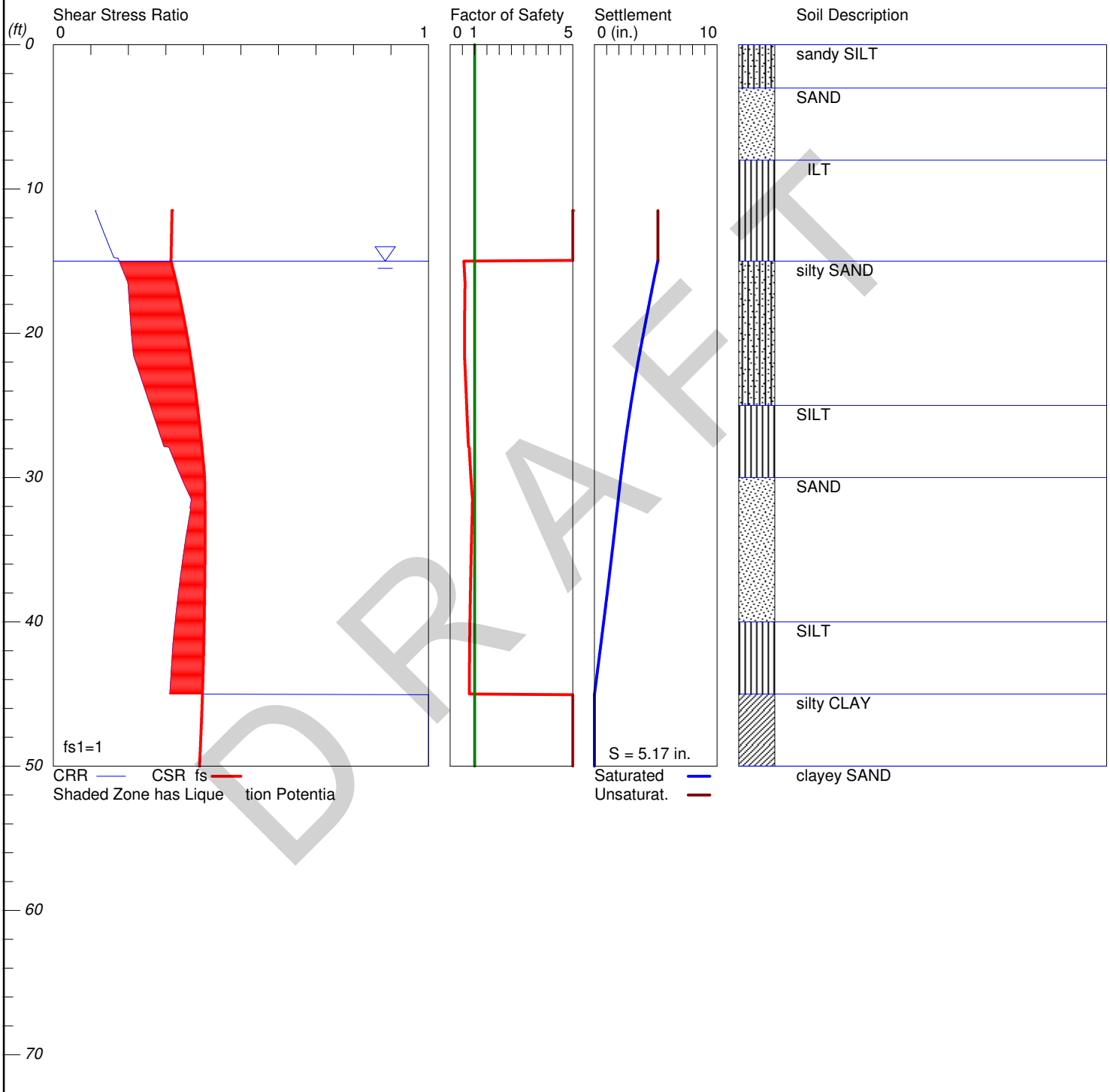


LIQUEFACTION ANALYSIS

Stanton Energy Reliability Center-B6

Hole No.=B6 Water Depth=15 ft Surface Elev.=68

Magnitude=6.9
Acceleration=0.5g



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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\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= 5.00 ft
Water Table during In-Situ Testi g= 0.0 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=6.90
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calc latio .
2. Settlement An ysis Method: Tokimatsu/Seed
3. Fines Correctio fo Liqu action: Stark/Olson et al.*
4. Fine Correction Settlement: During Liquefaction*
5. Settlement Calcula ion in: Liq. zone only
6. Hammer Energy Ratio, Ce = 0.8
7. Boreh e iameter, Cb= 1.15
8. Sam ling Me hod, Cs= 1
9. U r request factor of safety (apply to CSR) , User= 1
Pl one CSR urve (fs1=1)
10. Use Curve Smoothing: Yes*
* Recomme ded 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	6.2
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	0.0	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	00	6.25
7.45	0.26	0.32	5.00	6.25	0. 0	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	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. 5	0.00	6.25
7.95	0.26	0.32	.00	6.25	0.00	6.25
8.00	0.26	0 2	.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	0.3	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 2	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	.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. 9	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	6.2
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	0.0	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	00	6.25
10.60	0.29	0.32	5.00	6.25	0. 0	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	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. 5	0.00	6.25
11.10	0.30	0.32	.00	6.25	0.00	6.25
11.15	0.30	0 2	.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	0.3	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 3	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	.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. 0	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	6.2
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	0.0	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	00	6.25
13.75	0.29	0.31	5.00	6.25	0. 0	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	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. 5	0.00	6.25
14.25	0.29	0.31	.00	6.25	0.00	6.25
14.30	0.29	0 1	.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	0.3	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 2	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	.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.	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	6.0
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	0.0	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	00	5.99
16.90	0.30	0.33	0.91*	5.98	0. 0	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	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. 1	0.00	5.91
17.40	0.29	0.34	.87*	5.9	0.00	5.90
17.45	0.29	0 4	.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	0.3	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 2	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	.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. 9	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	5.5
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	0.0	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	00	5.47
20.05	0.26	0.36	0.74*	5.46	0. 0	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	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. 8	0.00	5.38
20.55	0.26	0.36	.72*	5.37	0.00	5.37
20.60	0.26	0 6	.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	0.3	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 2	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	.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. 5	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	4.9
22.80	0.24	0.37	0.65*	4.94	0.00	4 4
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	0.0	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	00	4.87
23.20	0.24	0.38	0.64*	4.86	0. 0	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*	.80	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. 7	0.00	4.77
23.70	0.24	0.38	.62*	4.76	0.00	4.76
23.75	0.24	0 8	.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	0.3	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 2	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	.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. 3	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	4.3
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	0.0	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	00	4.22
26.35	0.22	0.39	0.56*	4.21	0. 0	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*	.15	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. 2	0.00	4.12
26.85	0.22	0.40	.56*	4.11	0.00	4.11
26.90	0.22	0 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	0.4	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 2	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	.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. 3	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	3.6
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	0.0	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	00	3.60
29.50	0.27	0.41	0.65*	3.59	0. 0	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	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. 1	0.00	3.51
30.00	0.27	0.41	.67*	3.5	0.00	3.50
30.05	0.27	0 1	.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	0.4	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 2	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	.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. 8	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	3.1
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	0.0	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	00	3.06
32.65	0.31	0.41	0.75*	3.06	0. 0	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	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. 9	0.00	2.99
33.15	0.32	0.41	.77*	2.9	0.00	2.98
33.20	0.32	0 1	.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	0.4	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 3	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	.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. 3	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	2.6
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	0.0	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	00	2.60
35.80	0.36	0.41	0.88*	2.60	0. 0	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*	.56	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. 4	0.00	2.54
36.30	0.37	0.41	.90*	2.53	0.00	2.53
36.35	0.37	0 1	.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	0.4	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 3	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	.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. 6	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	2.2
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	0.0	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	00	2.17
38.95	0.32	0.41	0.78*	2.16	0. 0	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*	.12	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. 9	0.00	2.09
39.45	0.31	0.41	.76*	2.0	0.00	2.08
39.50	0.31	0 1	.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	0.4	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 3	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	.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. 0	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	1.7
41.70	0.27	0.40	0.67*	1.71	0.00	1 1
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	0.0	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	00	1.65
42.10	0.27	0.40	0.66*	1.64	0. 0	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*	.59	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. 6	0.00	1.56
42.60	0.26	0.40	.64*	1.55	0.00	1.55
42.65	0.26	0 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	0.6	1.53	0.00	1.53
42.80	0.26	0.4	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 2	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	.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. 5	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	1.1
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	0.0	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	00	1.05
45.25	0.22	0.40	0.56*	1.04	0. 0	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*	.98	00	0.98
45.60	0.22	0.40	0.55*	0 9	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. 4	0.00	0.94
45.75	0.22	0.40	.54*	0.93	0.00	0.93
45.80	0.22	0 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	0.5	0.90	0.00	0.90
45.95	0.21	0.4	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 2	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	.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.	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	0.4
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	0.0	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	00	0.37
48.40	0.20	0.39	0.52*	0.35	0. 0	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*	.29	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. 5	0.00	0.25
48.90	0.20	0.39	.52*	0.2	0.00	0.24
48.95	0.20	0 9	.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	0.3	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 2	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	.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. 0	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= 5.00 ft
Water Table during In-Situ Testi g= 0.0 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=6.90
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calc latio .
2. Settlement An ysis Method: Tokimatsu/Seed
3. Fines Correctio fo Liqu action: Stark/Olson et al.*
4. Fine Correction Settlement: During Liquefaction*
5. Settlement Calcula ion in: Liq. zone only
6. Hammer Energy Ratio, Ce = 0.8
7. Boreh e iameter, Cb= 1.15
8. Sam ling Me hod, Cs= 1
9. U r request factor of safety (apply to CSR) , User= 1
Pl one CSR urve (fs1=1)
10. Use Curve Smoothing: Yes*
* Recomme ded 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	5.8
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	0.0	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	00	5.84
4.75	0.62	0.32	5.00	5.84	0. 0	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	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. 4	0.00	5.84
5.25	0.62	0.32	.00	5.8	0.00	5.84
5.30	0.62	0 2	.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	0.3	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 6	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	.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. 2	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	5.8
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	0.0	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	00	5.84
7.90	0.26	0.32	5.00	5.84	0. 0	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	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. 4	0.00	5.84
8.40	0.23	0.32	.00	5.8	0.00	5.84
8.45	0.22	0 2	.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	0.3	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 2	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	.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	5.8
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	0.0	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	00	5.84
11.05	0.19	0.32	5.00	5.84	0. 0	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	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. 4	0.00	5.84
11.55	0.19	0.32	.00	5.8	0.00	5.84
11.60	0.19	0 2	.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	0.3	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 1	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	.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. 0	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	5.8
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	0.0	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	00	5.84
14.20	0.21	0.31	5.00	5.84	0. 0	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	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. 4	0.00	5.84
14.70	0.21	0.31	.00	5.8	0.00	5.84
14.75	0.21	0 1	.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	0.3	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 2	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	.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. 2	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	5.4
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	0.0	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	00	5.34
17.35	0.22	0.34	0.64*	5.33	0. 0	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	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. 3	0.00	5.23
17.85	0.22	0.34	.63*	5.22	0.00	5.22
17.90	0.22	0 4	.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	0.3	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 2	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	.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. 2	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	4.7
20.10	0.22	0.36	0.60*	4.73	0.00	4 3
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	0.0	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	00	4.65
20.50	0.22	0.36	0.60*	4.64	0. 0	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*	.58	00	4.58
20.85	0.22	0.37	0.59*	4 5	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. 5	0.00	4.55
21.00	0.22	0.37	.59*	4.53	0.00	4.53
21.05	0.22	0 7	.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	0.3	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 2	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	.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. 2	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	4.0
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	0.0	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	00	3.96
23.65	0.20	0.38	0.51*	3.94	0. 0	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	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. 4	0.00	3.84
24.15	0.19	0.39	.50*	3.83	0.00	3.83
24.20	0.19	0 9	.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	0.3	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 1	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	.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	3.2
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	0.0	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	00	3.19
26.80	0.17	0.40	0.44*	3.17	0. 0	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	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. 6	0.00	3.06
27.30	0.18	0.40	.45*	3.05	0.00	3.05
27.35	0.18	0 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	0.4	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 1	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	.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. 0	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	2.5
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	0.0	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	00	2.47
29.95	0.23	0.41	0.55*	2.46	0. 0	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*	.39	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. 6	0.00	2.36
30.45	0.24	0.41	.57*	2.35	0.00	2.35
30.50	0.24	0 1	.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	0.4	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 2	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	.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. 5	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	1.9
32.70	0.29	0.42	0.70*	1.93	0.00	1 3
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	0.0	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	00	1.88
33.10	0.30	0.42	0.73*	1.87	0. 0	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*	.82	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. 0	0.00	1.80
33.60	0.32	0.42	.77*	1.7	0.00	1.79
33.65	0.32	0 2	.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	0.4	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 3	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	.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. 5	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	1.5
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	0.0	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	00	1.52
36.25	0.47	0.42	1.12	1.52	0. 0	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	.52	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. 2	0.00	1.52
36.75	0.45	0.42	.09	1.52	0.00	1.52
36.80	0.45	0 2	.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	0.4	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 4	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	.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. 9	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	1.2
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	0.0	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	00	1.20
39.40	0.28	0.41	0.68*	1.19	0. 0	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*	.14	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. 1	0.00	1.11
39.90	0.26	0.41	.63*	1.1	0.00	1.10
39.95	0.26	0 1	.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	0.4	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 2	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	.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. 4	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	0.6
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	0.0	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	00	0.55
42.55	0.21	0.41	0.50*	0.54	0. 0	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*	.47	00	0.47
42.90	0.21	0.41	0.51*	0 6	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. 4	0.00	0.44
43.05	0.21	0.41	.51*	0.43	0.00	0.43
43.10	0.21	0 1	.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	0.4	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 2	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	.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.	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	0.0
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	0.0	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	00	0.00
45.70	2.00	0.41	5.00	0.00	0. 0	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	.00	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. 0	0.00	0.00
46.20	2.00	0.41	.00	0.0	0.00	0.00
46.25	2.00	0 0	.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	0.4	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 0	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	.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. 0	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	0.0
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	0.0	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	00	0.00
48.85	2.00	0.40	5.00	0.00	0. 0	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	.00	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. 0	0.00	0.00
49.35	2.00	0.40	.00	0.0	0.00	0.00
49.40	2.00	0 0	.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	0.4	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 0	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	.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. 0	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= 5.00 ft
Water Table during In-Situ Testi g= 0.0 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=6.90
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calc latio .
2. Settlement An ysis Method: Tokimatsu/Seed
3. Fines Correctio fo Liqu action: Stark/Olson et al.*
4. Fine Correction Settlement: During Liquefaction*
5. Settlement Calcula ion in: Liq. zone only
6. Hammer Energy Ratio, Ce = 0.8
7. Boreh e iameter, Cb= 1.15
8. Sam ling Me hod, Cs= 1
9. U r request factor of safety (apply to CSR) , User= 1
   Pl one CSR urve (fs1=1)
10. Use Curve Smoothing: Yes*
* Recomme ded 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	4.6
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	0.0	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	00	4.63
12.45	0.15	0.32	5.00	4.63	0. 0	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	.63	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. 3	0.00	4.63
12.95	0.15	0.32	.00	4.63	0.00	4.63
13.00	0.15	0 2	.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	0.3	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 1	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	.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	4.5
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	0.0	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	00	4.47
15.60	0.15	0.32	0.47*	4.46	0. 0	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*	.37	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. 3	0.00	4.33
16.10	0.15	0.32	.46*	4.32	0.00	4.32
16.15	0.15	0 3	.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	0.3	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 1	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	.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	3.6
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	0.0	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	00	3.57
18.75	0.14	0.35	0.42*	3.56	0. 0	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	00	3.47
19.10	0.14	0.35	0.41*	3 5	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. 2	0.00	3.42
19.25	0.14	0.35	.41*	3.41	0.00	3.41
19.30	0.14	0 5	.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	0.3	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 1	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	.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	2.7
21.50	0.14	0.37	0.39*	2.75	0.00	2 5
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	0.0	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	00	2.65
21.90	0.15	0.37	0.41*	2.64	0. 0	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*	.55	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. 1	0.00	2.51
22.40	0.17	0.37	.44*	2.5	0.00	2.50
22.45	0.17	0 7	.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	0.3	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 1	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	.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	1.9
24.65	0.22	0.39	0.57*	1.97	0.00	1 7
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	0.0	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	00	1.89
25.05	0.23	0.39	0.59*	1.88	0. 0	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*	.82	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. 9	0.00	1.79
25.55	0.24	0.39	.62*	1.7	0.00	1.78
25.60	0.24	0 9	.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	0.3	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 2	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	.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. 6	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	1.3
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	0.0	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	00	1.33
28.20	0.33	0.40	0.81*	1.32	0. 0	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*	.27	00	1.27
28.55	0.34	0.41	0.83*	1 2	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. 5	0.00	1.25
28.70	0.34	0.41	.85*	1.25	0.00	1.25
28.75	0.35	0 1	.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	0.4	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 3	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	.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. 7	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	1.0
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	0.0	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	00	1.03
31.35	0.48	0.41	1.17	1.03	0. 0	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	.03	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. 3	0.00	1.03
31.85	0.49	0.41	.18	1.03	0.00	1.03
31.90	0.49	0 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	0.4	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 4	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	.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. 7	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	1.0
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	0.0	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	00	1.03
34.50	0.43	0.41	1.03	1.03	0. 0	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	.03	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. 3	0.00	1.03
35.00	0.42	0.41	.01	1.03	0.00	1.03
35.05	0.42	0 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	0.4	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 4	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	.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.	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	0.8
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	0.0	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	00	0.75
37.65	0.38	0.41	0.93*	0.75	0. 0	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*	.71	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. 9	0.00	0.69
38.15	0.38	0.41	.92*	0.6	0.00	0.68
38.20	0.38	0 1	.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	0.4	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 3	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	.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. 7	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	0.3
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	0.0	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	00	0.34
40.80	0.35	0.41	0.85*	0.33	0. 0	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*	.29	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. 7	0.00	0.27
41.30	0.34	0.41	.84*	0.26	0.00	0.26
41.35	0.34	0 1	.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	0.8	0.24	0.00	0.24
41.50	0.34	0.4	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 3	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	.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. 6	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	0.0
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	0.0	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	00	0.00
43.95	0.44	0.40	1.09	0.00	0. 0	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	.00	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. 0	0.00	0.00
44.45	0.48	0.40	.19	0.0	0.00	0.00
44.50	0.49	0 0	.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	1.2	0.00	0.00	0.00
44.65	0.51	0.4	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 5	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	.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.	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	0.0
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	0.0	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	00	0.00
47.10	0.60	0.40	1.51	0.00	0. 0	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	.00	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. 0	0.00	0.00
47.60	0.60	0.40	.51	0.0	0.00	0.00
47.65	0.60	0 0	.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	0.4	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 6	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	.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. 0	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	0.0
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

* 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 = tm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

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1 atm (atmosphere) = 1 tsf (ton/f 2)
CRRm Cyclic resistan e ra i from soils
CSRsf Cyclic stress ra io ndu d by a given earthquake (with user request factor of safety)
F.S. Factor of Safety gainst liquefaction, F.S.=CRRm/CSRsf
S_sat Settlement from sa urated sands
S_dry Sett eme t from Unsaturated Sands
S_all To al Se tlement from Saturated and Unsaturated Sands
NoLiq No-Lique y Soils

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LIQUEFACTION ANALYSIS SUMMARY

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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= 5.00 ft
Water Table during In-Situ Testi g= 0.0 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=6.90
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calc latio .
2. Settlement An ysis Method: Tokimatsu/Seed
3. Fines Correctio fo Liqu action: Stark/Olson et al.*
4. Fine Correction Settlement: During Liquefaction*
5. Settlement Calcula ion in: Liq. zone only
6. Hammer Energy Ratio, Ce = 0.8
7. Boreh e iameter, Cb= 1.15
8. Sam ling Me hod, Cs= 1
9. U r request factor of safety (apply to CSR) , User= 1
   Pl one CSR urve (fs1=1)
10. Use Curve Smoothing: Yes*
* Recomme ded 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	4.1
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	0.0	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	00	4.19
7.45	0.62	0.32	5.00	4.19	0. 0	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	.19	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. 9	0.00	4.19
7.95	0.54	0.32	.00	4.1	0.00	4.19
8.00	0.53	0 2	.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	0.3	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 6	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	.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. 2	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	4.1
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	0.0	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	00	4.19
10.60	0.62	0.32	5.00	4.19	0. 0	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	.19	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. 9	0.00	4.19
11.10	0.62	0.32	.00	4.1	0.00	4.19
11.15	0.62	0 2	.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	0.3	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 5	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	.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. 3	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	4.1
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	0.0	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	00	4.19
13.75	0.45	0.31	5.00	4.19	0. 0	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	.19	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. 9	0.00	4.19
14.25	0.44	0.31	.00	4.1	0.00	4.19
14.30	0.44	0 1	.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	0.3	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 4	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	.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. 2	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	4.1
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	0.0	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	00	4.19
16.90	0.51	0.33	1.52	4.19	0. 0	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	.19	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. 9	0.00	4.19
17.40	0.45	0.34	.33	4.1	0.00	4.19
17.45	0.44	0 4	.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	0.3	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 4	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	.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.	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	4.1
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	0.0	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	00	4.11
20.05	0.33	0.36	0.93*	4.10	0. 0	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*	.06	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. 4	0.00	4.04
20.55	0.32	0.36	.89*	4.03	0.00	4.03
20.60	0.32	0 6	.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	0.3	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 3	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	.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.	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	3.6
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	0.0	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	00	3.61
23.20	0.27	0.38	0.71*	3.60	0. 0	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	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. 2	0.00	3.52
23.70	0.26	0.38	.68*	3.51	0.00	3.51
23.75	0.26	0 8	.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	0.3	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 2	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	.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. 5	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	3.0
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	0.0	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	00	2.99
26.35	0.22	0.39	0.55*	2.98	0. 0	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*	.91	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. 8	0.00	2.88
26.85	0.22	0.39	.56*	2.87	0.00	2.87
26.90	0.22	0 9	.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	0.4	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 2	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	.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. 3	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	2.4
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	0.0	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	00	2.36
29.50	0.26	0.41	0.65*	2.35	0. 0	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*	.30	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. 7	0.00	2.27
30.00	0.27	0.41	.67*	2.26	0.00	2.26
30.05	0.27	0 1	.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	0.4	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 2	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	.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. 8	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	1.8
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	0.0	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	00	1.83
32.65	0.31	0.41	0.75*	1.82	0. 0	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*	.77	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. 5	0.00	1.75
33.15	0.31	0.41	.75*	1.7	0.00	1.74
33.20	0.31	0 1	.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	0.4	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 3	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	.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.	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	1.4
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	0.0	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	00	1.33
35.80	0.31	0.41	0.77*	1.33	0. 0	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*	.28	00	1.28
36.15	0.31	0.41	0.77*	1 2	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. 6	0.00	1.26
36.30	0.31	0.41	.77*	1.25	0.00	1.25
36.35	0.31	0 1	.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	0.4	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 3	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	.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. 2	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	0.9
38.55	0.33	0.41	0.81*	0.91	0.00	0 1
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	0.0	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	00	0.86
38.95	0.33	0.41	0.82*	0.85	0. 0	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*	.81	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. 9	0.00	0.79
39.45	0.34	0.41	.83*	0.7	0.00	0.78
39.50	0.34	0 1	.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	0.8	0.76	0.00	0.76
39.65	0.34	0.4	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 3	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	.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. 4	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	0.4
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	0.0	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	00	0.43
42.10	0.36	0.40	0.90*	0.42	0. 0	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*	.38	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. 6	0.00	0.36
42.60	0.37	0.40	.91*	0.36	0.00	0.36
42.65	0.37	0 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	0.4	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 3	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	.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. 7	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	0.0
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	0.0	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	00	0.03
45.25	0.40	0.40	0.99*	0.03	0. 0	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	.00	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. 0	0.00	0.00
45.75	0.40	0.40	.01	0.0	0.00	0.00
45.80	0.40	0 0	.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	0.4	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 4	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	.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.	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	0.0
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	0.0	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	00	0.00
48.40	0.40	0.39	1.02	0.00	0. 0	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	.00	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. 0	0.00	0.00
48.90	0.40	0.39	.02	0.0	0.00	0.00
48.95	0.40	0 9	.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	0.3	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 4	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	.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. 0	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

****

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\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= 5.00 ft
Water Table during In-Situ Testi g= 0.0 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=6.90
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calc latio .
2. Settlement An ysis Method: Tokimatsu/Seed
3. Fines Correctio fo Liqu action: Stark/Olson et al.*
4. Fine Correction Settlement: During Liquefaction*
5. Settlement Calcula ion in: Liq. zone only
6. Hammer Energy Ratio, Ce = 0.8
7. Boreh e iameter, Cb= 1.15
8. Sam ling Me hod, Cs= 1
9. U r request factor of safety (apply to CSR) , User= 1
   Pl one CSR urve (fs1=1)
10. Use Curve Smoothing: Yes*
* Recomme ded 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	4.6
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	0.0	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	00	4.64
12.50	0.25	0.32	5.00	4.64	0. 0	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	.64	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. 4	0.00	4.64
13.00	0.24	0.32	.00	4.6	0.00	4.64
13.05	0.24	0 2	.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	0.3	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 2	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	.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. 4	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	4.6
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	0.0	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	00	4.54
15.65	0.26	0.32	0.81*	4.53	0. 0	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*	.47	00	4.47
16.00	0.26	0.32	0.80*	4	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. 5	0.00	4.45
16.15	0.26	0.32	.79*	4.4	0.00	4.44
16.20	0.26	0 3	.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	0.3	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 2	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	.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. 6	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	4.0
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	0.0	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	00	3.96
18.80	0.24	0.35	0.69*	3.95	0. 0	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	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. 6	0.00	3.86
19.30	0.23	0.35	.66*	3.85	0.00	3.85
19.35	0.23	0 5	.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	0.3	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 2	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	.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. 3	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	3.3
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	0.0	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	00	3.29
21.95	0.23	0.37	0.61*	3.28	0. 0	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	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. 9	0.00	3.19
22.45	0.24	0.37	.64*	3.1	0.00	3.18
22.50	0.24	0 7	.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	0.3	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 2	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	.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. 6	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	2.7
24.70	0.30	0.38	0.78*	2.78	0.00	2 8
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	0.0	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	00	2.72
25.10	0.31	0.39	0.81*	2.71	0. 0	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*	.67	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. 5	0.00	2.65
25.60	0.33	0.39	.84*	2.6	0.00	2.64
25.65	0.33	0 9	.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	0.3	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 3	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	.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. 5	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	2.3
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	0.0	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	00	2.38
28.25	0.49	0.40	1.23	2.38	0. 0	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	.38	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. 8	0.00	2.38
28.75	0.62	0.40	.54	2.3	0.00	2.38
28.80	0.62	0 0	.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	1.5	2.38	0.00	2.38
28.95	0.62	0.4	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 6	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	.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. 2	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	2.3
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	0.0	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	00	2.38
31.40	0.62	0.41	1.52	2.38	0. 0	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	.38	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. 8	0.00	2.38
31.90	0.62	0.41	.52	2.3	0.00	2.38
31.95	0.62	0 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	0.4	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 6	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	.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. 2	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	2.3
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	0.0	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	00	2.38
34.55	0.56	0.41	1.37	2.38	0. 0	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	.38	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. 8	0.00	2.38
35.05	0.47	0.41	.16	2.3	0.00	2.38
35.10	0.47	0 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	0.4	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 4	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	.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. 3	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	2.2
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	0.0	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	00	2.20
37.70	0.35	0.40	0.86*	2.19	0. 0	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*	.15	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. 3	0.00	2.13
38.20	0.33	0.40	.82*	2.12	0.00	2.12
38.25	0.33	0 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	0.4	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 3	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	.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. 2	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	1.7
40.45	0.28	0.40	0.69*	1.77	0.00	1 7
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	0.0	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	00	1.71
40.85	0.27	0.40	0.67*	1.70	0. 0	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*	.65	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. 2	0.00	1.62
41.35	0.26	0.40	.65*	1.61	0.00	1.61
41.40	0.26	0 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	0.6	1.58	0.00	1.58
41.55	0.26	0.4	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 2	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	.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. 6	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	1.2
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	0.0	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	00	1.13
44.00	0.25	0.40	0.63*	1.12	0. 0	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*	.07	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. 4	0.00	1.04
44.50	0.25	0.40	.63*	1.03	0.00	1.03
44.55	0.25	0 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	0.4	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 2	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	.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. 5	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	0.6
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	0.0	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	00	0.55
47.15	0.25	0.39	0.63*	0.54	0. 0	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*	.48	00	0.48
47.50	0.25	0.39	0.63*	0	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. 5	0.00	0.45
47.65	0.25	0.39	.63*	0.4	0.00	0.44
47.70	0.25	0 9	.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	0.3	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 2	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	.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. 4	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	0.0
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 at (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

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1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm Cyclic resistance atio from soils
CSRsf Cyclic stress r tio duced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety a ainst liquefaction, F.S.=CRRm/CSRsf
S_sat Settlement from s turated sands
S_dry Settlement from Un aturated Sands
S_all Tota Se tlement fr m Saturated and Unsaturated Sands
NoLiq No Lique y 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= 5.00 ft
Water Table during In-Situ Testi g= 0.0 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=6.90
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calc latio .
2. Settlement An ysis Method: Tokimatsu/Seed
3. Fines Correctio fo Liqu action: Stark/Olson et al.*
4. Fine Correction Settlement: During Liquefaction*
5. Settlement Calcula ion in: Liq. zone only
6. Hammer Energy Ratio, Ce = 0.8
7. Boreh e iameter, Cb= 1.15
8. Sam ling Me hod, Cs= 1
9. U r request factor of safety (apply to CSR) , User= 1
   Pl one CSR urve (fs1=1)
10. Use Curve Smoothing: Yes*
* Recomme ded 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	5.1
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	0.0	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	00	5.17
12.50	0.13	0.32	5.00	5.17	0. 0	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	00	5.17
12.85	0.13	0.32	5.00	5 1	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. 7	0.00	5.17
13.00	0.13	0.32	.00	5.17	0.00	5.17
13.05	0.13	0 2	.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	0.3	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 1	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	.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	5.1
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	0.0	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	00	5.02
15.65	0.19	0.32	0.58*	5.00	0. 0	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*	.93	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. 0	0.00	4.90
16.15	0.19	0.32	.60*	4.8	0.00	4.88
16.20	0.19	0 3	.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	0.3	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 2	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	.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. 0	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	4.3
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	0.0	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	00	4.28
18.80	0.20	0.35	0.59*	4.27	0. 0	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*	.20	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. 7	0.00	4.17
19.30	0.21	0.35	.59*	4.16	0.00	4.16
19.35	0.21	0 5	.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	0.3	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 2	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	.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.	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	3.6
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	0.0	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	00	3.58
21.95	0.22	0.37	0.60*	3.57	0. 0	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	00	3.51
22.30	0.22	0.37	0.61*	3 9	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. 7	0.00	3.47
22.45	0.23	0.37	.61*	3.46	0.00	3.46
22.50	0.23	0 7	.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	0.3	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 2	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	.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. 3	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	3.0
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	0.0	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	00	2.95
25.10	0.26	0.38	0.68*	2.94	0. 0	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*	.89	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. 6	0.00	2.86
25.60	0.27	0.39	.69*	2.85	0.00	2.85
25.65	0.27	0 9	.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	0.3	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 2	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	.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. 7	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	2.4
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	0.0	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	00	2.41
28.25	0.31	0.40	0.79*	2.40	0. 0	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*	.36	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. 3	0.00	2.33
28.75	0.32	0.40	.80*	2.33	0.00	2.33
28.80	0.32	0 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	0.4	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 3	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	.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. 3	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	2.0
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	0.0	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	00	1.96
31.40	0.37	0.40	0.91*	1.95	0. 0	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*	.91	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. 9	0.00	1.89
31.90	0.37	0.40	.90*	1.8	0.00	1.89
31.95	0.37	0 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	0.4	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 3	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	.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. 6	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	1.5
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	0.0	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	00	1.54
34.55	0.35	0.40	0.87*	1.53	0. 0	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*	.49	00	1.49
34.90	0.35	0.40	0.86*	1 8	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. 7	0.00	1.47
35.05	0.35	0.40	.86*	1.46	0.00	1.46
35.10	0.35	0 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	0.4	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 3	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	.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. 4	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	1.1
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	0.0	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	00	1.09
37.70	0.33	0.40	0.83*	1.09	0. 0	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*	.04	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. 2	0.00	1.02
38.20	0.33	0.40	.82*	1.02	0.00	1.02
38.25	0.33	0 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	0.4	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 3	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	.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. 3	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	0.7
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	0.0	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	00	0.64
40.85	0.32	0.40	0.80*	0.63	0. 0	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*	.58	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. 6	0.00	0.56
41.35	0.32	0.40	.80*	0.55	0.00	0.55
41.40	0.32	0 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	0.4	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 3	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	.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. 2	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	0.2
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	0.0	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	00	0.17
44.00	0.31	0.40	0.78*	0.16	0. 0	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*	.11	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. 9	0.00	0.09
44.50	0.31	0.40	.78*	0.0	0.00	0.08
44.55	0.31	0 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	0.4	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 3	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	.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. 0	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	0.0
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	0.0	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	00	0.00
47.15	2.00	0.39	5.00	0.00	0. 0	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	.00	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. 0	0.00	0.00
47.65	2.00	0.39	.00	0.0	0.00	0.00
47.70	2.00	0 9	.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	0.3	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 0	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	.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. 0	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	0.0
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 at (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

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1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm Cyclic resistance atio from soils
CSRsf Cyclic stress r tio duced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety a ainst liquefaction, F.S.=CRRm/CSRsf
S_sat Settlement from s turated sands
S_dry Settlement from Un aturated Sands
S_all Tota Se tlement fr m Saturated and Unsaturated Sands
NoLiq No Lique y Soils

Appendix D

Typical Earthwork Guidelines

NV5

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 diam ter, and other deleterious materials from the areas to be graded. Clearing and grubb ng sh ll extend to the outside of the proposed excavation and fill areas.

2.3. Demolition in the areas to be graded shall in lude removal of building structures, foundations, reservoirs, utilities (including underground pipelines, septic tanks, leach fields, seepage pits, cisterns, etc.), and her manmade surface and subsurface improvements, and the backfilling of mining s ts, tunnels and surface depressions. Demolition of utilities shall include capping or r routing of pipelines at the project perimeter, and abandonment of wells in accordanc with the requirements of the governing authorities and the recomm ndations 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 t b graded and d sposed of off site at a legal dump site. Clearing, grubbing, and demolition operations shall be performed under the observation of the geotechnical co ultant.

2.5. The ground surface neath proposed fill areas shall be stripped of loose or unsuitable soil. These soils may e used as compacted fill provided they are generally free of orga ic or other deleterious materials and evaluated for use by the geotechnical c nsultant. T e resulting surface shall be evaluated by the geotechnical consultant prior to proceeding. The cleared, natural ground surface shall be scarified to a depth of appr ximately 8 inches, moisture conditioned, and compacted in accordance with the specific tion 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 f l or natural materials may be made with vertical side slopes. To satisfy Calif rnia Occupational Safety and Health Administration (CAL OSHA) requirements, any e cavation deeper than 4 feet shall be shored or laid back at a 1:1 inclination or fla ter, depending on material type, if construction workers are t enter the excavation.

4. COMPACTED FILL

Fill shall be constructed as specified below or by other method 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 fi the contractor shall request an evaluation of the exposed ground surface by the geotec nical consultant. Unless otherwise recommended, the exposed ground s f ce shall then e scarified to a depth of approximately 8 inches and watered or dri d, as eeded, to achieve a generally uniform moisture content at or near the optimum moistu e content. The scarified materials shall then be compacted to 90 percent relativ c mpaction. 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 geot hnic l consultant and the appropriate governing agency when project areas are ready for obse vation, and to provide reasonable time for that review.

4.2. Exca ated on- te materials which are in general compliance with the recommendations of the eote hnical 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 follo ing a delay in the grading operations, the exposed surface of previously compacted fi l sha l be prepared to receive fill. Preparation may include scarification, moisture conditioning, a d recompaction.

4.7. Compacted fill shall be placed in horizontal lift 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 c mpacted by mechanical methods, using sheepsfoot rollers, multiple-wheel pneum c-tired rollers, or other appropriate compacting rollers, to the specified relative compac on. Successive lifts shall be treated in a like manner until the desired finished grades are ac ieved.

4.8. Fill shall be tested in the field by he geo hnical consultant for evaluation of general compliance with the recommended ela ive compaction and moisture conditions. Field density testing shall conform to AS M D 1556-00 (Sand Cone method), D 2937-00 (Drive-Cylinder meth d) and/or D 2922-96 and D 3017-96 (Nuclear Gauge method). Generally, one test shall b provided for approximately every 2 vertical feet of fin placed, or for approxim tely eve y 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 recommen tions shall be removed, moisture conditioned, and compacted or otherwise h ndled to acc mplish general compliance with the grading recommendations.

4.9. The ontractor hall assist the geotechnical consultant by excavating suitable test pits for remova 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 observati n by the geotechnical consultant, no further filling or excavating, including that planned for footings, foundations, retaining walls or other features, shall be perfo med 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 he contractor's expense. The depth and extent of removal of the unobserved and und umen ed fill will be decided based upon review of the field conditions by the geotechnical nsultant.

4.16. Off-site fill shall be treated in the same manner as rec mmended in these specifications for on-site fills. Off-site fill su dr ins temporarily terminated (up gradient) shall be surveyed for future locating and connectio

5. OVERSIZED MATERIAL

Oversized material shall be pla ed in a cordance with the following recommendations.

5.1. During the course of grading operations, rocks or similar irreducible materials greater than 6 inches in dime sion (oversized material) may be generated. These materials shall not be placed within th compacted fill unless placed in general accordance with the recommen tions of the geotechnical consultant.

5.2. W ere oversize rock (greater than 6 inches in dimension) or similar irreducible material is ge erated du ing grading, it is recommended, where practical, to waste such material off site or n 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, adver or potentially adverse geotechnical conditions are encountered in the slope which were not anticipated in the preliminary evaluation report, the geotechni al consultant shall evaluate the conditions and provide approp iate recommendations.

6.2. Fill Slopes

6.2.1. When placing fill on slopes st per than 5:1 (horizontal:vertical), topsoil, slope wash, collu ium, and other materials deemed unsuitable shall be removed. Near-horizont l keys a d near-vertical benches shall be excavated into sound bedrock or fine fill mat rial, 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 bee observed by the geotechnical consultant. Where the natural gradient of a slope less than 5:1, benching is generally not recommended. However, fill shall no be placed on compressible or otherwise unsuitable materials left on the slope f ce.

6.2.2. W thin 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 cons aints limit overbuilding and cutting back of the slope face, an alternative me od for compaction of the slope face may be attempted by conventional con truct n procedures including backrolling at intervals of 4 feet or less in vertical slope he ght, or as dictated by the capability of the available equipment, whichever is less. Fill slopes shall be backrolled utilizing a conventional sheeps oot-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 recommendatio s presented in Section 5 of these guidelines.

6.2.7. The contractor shall be ultim tel responsible for placing and compacting the soil out to the slope face to obtain relative compaction of 90 percent as evaluated by ASTM D 1557 and a moistu e content in accordance with Section 5. The geotechnic l cons tant shall perform field moisture and density tests at intervals of one t t for app oximately every 10,000 square feet of slope.

6.2.8. Backdrains s all be provided in fill as recommended by the geotechnical consultant.

6.3. T p-of-Slope Drainage

6.3.1 For pad areas above slopes, positive drainage shall be established away from the op o 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 pla ts.

6.4.4. Graded swales at the top of slopes and terrace drains shall b installed and the property owners notified that the drains sh ll be periodically checked so that they may be kept clear. Damage to dr inage improvements shall be repaired immediately. To reduce siltation, terra e drai s shall be constructed at a gradient of 3 percent or steeper, in accordance w h the recommendations of the project civil engineer.

6.4.5. If slope failures occur, the geo chnical consultant shall be contacted immediately for field review of site condition nd development of recommendations for evaluation and repair.

7. TRENCH BACKFILL

The following sections prov de recommendations for backfilling of trenches.

7.1. Trench backfill shall onsist 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 otec ical consultant may be used above the granular backfill. The cover soils di ectly in co tact with the pipe shall be classified as having a very low expansion p ential, in acc rdance with UBC Standard 18-2, and shall contain no rocks or chunks of hard oil 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 rom both edges.

7.6. Trench backfill within slab areas shall be compacted by mecha ical means to a relative compaction of 90 percent, as evaluated by ASTM D 1557. For m nor interior trenches, density testing may be omitted or spot testing may be performed, as d emed appropriate by the geotechnical consultant.

7.7. When compacting soil in close proximity to ilities care shall be taken by the grading contractor so that mechanical methods used to mpact the soils do not damage the utilities. If the utility contractors indicate that i is undesirable to use compaction equipment in close proximity to a buried conduit, then he grading contractor may elect to use light mechanical compaction eq ipment or, with the approval of the geotechnical consultant, cover the conduit with c ean gr lar material. These granular materials shall be jetted in place to the top of the on uit in accordance with the recommendations of Section 8.4 prior to initiating mechanical compaction procedures. Other methods of utility trench compacti may also b appropriate, upon review by the geotechnical consultant and the utility c ntractor, at the time of construction.

7.8. Clean granular ba kfill and/or bedding materials are not recommended for use in slope areas unless provisio s are made for a drainage system to mitigate the potential for buildup of seepage force or piping of backfill materials.

7.9. The contracto shall exercise the specified safety precautions, in accordance with OSHA T nch Safety Regulations, while conducting trenching operations. Such precautions include shoring or laying back trench excavations at 1:1 or flatter, depending on material type, f trenches in excess of 5 feet in depth. The geotechnical consultant is not responsibl 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 section

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 area 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 overexcavatio and replacement with compacted fill or to other remedial grading as recomm ded by the geotechnical consultant.

9.8. Relatively level areas where saturated soils and/or erosion gullies exi to depths greater than 1 foot shall be overexcavated to comp tent materials as evaluated by the geotechnical consultant. Where adverse condi ions extend to less than 1 foot in depth, saturated and/or eroded materials may be proc ssed i place. Overexcavated or in-place processed materials shall be moisture conditioned nd compacted in accordance with the recommendations provided in Section 5. If the d sired 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 rosion gullies exist to depths greater than 1 foot shall be overexcavated and replaced a compacted fill in accordance with the applicable specifications. Where dversely affect d materials exist to depths of I foot or less below proposed finished grade remedial grading by moisture conditioning in-place and compaction in cordanc with the appropriate specifications may be attempted. If the desired results are not achieved, the affected materials shall be overexcavated, moisture conditioned, and com acted until the specifications are met. As conditions dictate, other slope repair procedures ay also be recommended by the geotechnical consultant.

9.10. During constr ction, the contractor shall grade the site to provide positive drainage away fr m structures nd to keep water from ponding adjacent to structures. Water shall not be allow d to damage adjacent properties. Positive drainage shall be maintained by the contrac r until permanent drainage and erosion reducing devices are installed in accordanc with project plans.

Appendix E

ASFE Important Information a out 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 E ch R port on a Unique Set of Project-Specif c Facto s

Geotechnical engineers consider man unique oj t specific factors when establishing the scope of a s udy Typical factors include: the client's goals, objectives, and ri management preferences; the general nature of the structur nvolved, its size, and configuration; th tion of the struct re on the site; and other planne or existing ite improvements, such as access roads, parkin lots, and unde ground utilities. Unless the geotechnical eng eer who cond ted the study specifically indicates otherwise, do t 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 liabilit for problems that occur because their reports do not conside developments of which they were not informed.*

Subsurface Conditions C n Change

A geotechnical-engineering report based on conditions that existed at th ime the geotechnical engineer performed the study. *Do ot rely on a geotechnical-engineering report whose adequ y may hav been affected by*: the passage of time; man-ma e eve s, such as construction on or adjacent to the site; or nat l events, such as floods, droughts, earthquakes, or groundwa fluctuations. *Contact the geotechnical engineer before applying t s report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent jor 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.

GEOTECHNICAL BUSINESS COUNCIL
of the Geoprofessional Business Association

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org