

GEOLOGY.GEOTECH.GROUNDWATER

Julie Laughton Design Build 28885 Woodsprings Circle Trabuco Canyon, CA 92679-1021 June 28, 2021 Project No. 1-1183

Subject: Geotechnical Report Addendum Proposed New Residence Construction

References: See attached List of References

Dear Ms. Laughton,

In accordance with your request and authorization, G3SoilWorks, Inc. (G3), has been retained as the current Engineering Geologist / Geotechnical Engineer of Record for the subject project. As the Geotechnical Consultant of Record, G3 has reviewed the referenced documents for the project and has prepared this addendum report providing revised / updated recommendations, as appropriate, for the currently planned new residence construction. This addendum report was prepared based on the information provided by you, review of provided documents, discussions with Toal Engineering (Project Civil Engineer) and Burke Structural Engineers (Project Structural Engineer), and consultations with Advanced Geosolutions, Inc., (Ground Improvement Design-Build Contractor) and Griffin Dewatering (Dewatering Contractor).

SITE LOCATION / SETTING

The subject property is located on the south side of Balboa Peninsula / Balboa Avenue, northerly adjacent to West Oceanfront Avenue, between 16th and 17th Street, in the city of Newport Beach, California (Figure 1, attached). The site is part of a relatively narrow, beachfront, residential lot approximately 29.97-29.99 feet wide by 102.45-102.46 feet long and 3071.6± square feet in area. An approximately 30-feet-wide alleyway bounds the site to the north; existing residences bound the site to the east and west (1612 and 1618 West Oceanfront Avenue, respectively); and the beach / boardwalk (West Oceanfront Avenue) bound the site to the south. The site is elongated in the north-south direction and was previously occupied by a multi-story residential structure that was recently demolished to accommodate proposed new residence construction. Existing site grades (according to Reference No. 1) are approximately 10-12± feet above NAVD (North American Vertical Datum of 1988). The site is located approximately 460± feet inland of the Pacific coastline and 420± feet southwesterly of Newport

Harbor.

PROJECT DESCRIPTION AND BACKGROUND

General

The referenced Architectural Plan Sheets (Reference No. 2) depicts proposed new residence consisting of four (4) separate floor levels, including a basement-level Pickle Ball Court with Finish Floor (F.F.) Elevation (El.) of +5.00 feet, a second-story Main Floor and third-story Upper Floor with roof top Pool and Deck. The pickle ball court will be approximately 5.24 feet below the Lower Floor Level (El. 10.24 feet) adjacent to alleyway to the north and 7 feet 10 inches below the Game Room (F.F. = +12.80 feet) fronting West Oceanfront boardwalk to the north, with an average existing grade height shown as 11.83 feet.

Project Background

American Geotechnical, Inc. performed a preliminary geotechnical investigation for the site in May 2020 (Reference No. 3). Their investigation addressed replacement of the existing residence with a new three-story residential structure constructed approximately at-grade, with pickle ball court and pool in the lower and roof levels of the structure, respectively. Remedial grading recommendations included the removal / recompaction of the uppermost 4 feet of site grades for the support of shallow conventional foundations with floor-slab-on-grade. Their report also included preliminary criteria for retaining wall construction.

In July 2020, American Geotechnical provided an addendum report to address subterranean level construction 7-8 feet below existing site grades and included comment on basement waterproofing with structural consideration for predictable hydrostatic uplift. With respect to hydrostatic uplift, options for mat slab / waste slab, deep foundations, and anchors were suggested but preliminary recommendations specific to these options were not provided. Criteria for temporary shoring were included in this addendum, and development of a site dewatering plan was recommended, with the cautionary note that temporary lowering of the water table to facilitate subterranean level excavation / construction may produce adverse effects to existing off-property improvements proximal to the shoring system.

An Updated Report of Coastal Hazards Analyses was prepared by American Geotechnical for the project in November 2020. This report provides the results of their coastal hazards analyses for the proposed residential redevelopment and addressed potential flooding due to sea level rise and 100-year storm events, tsunami hazard, and shoreline change. Flood-proofing was recommended for site improvements below Elev. +10.70 NAVD 88 (North American Vertical Datum of 1988).

Earthwork / Foundations

According to the Civil and Structural Plan sheets for the project (Reference Nos. 1 and 6), belowgrade excavations will be required and will extend to a Rough Grade Pad Elevation of +1.54 feet NAVD 88. A 30-inch-thick mat slab is proposed below the proposed pickle ball court with associated retaining walls along east and west property lines; retaining walls and structural slab, grade beams, and caissons are also planned for the proposed garage and patio areas to the north and south, respectively.

Our recent groundwater monitoring work for the site (period of January 21st, 2021 through June 16th, 2021) indicates that groundwater elevations (unconfined, occurring in Quaternary Beach Sand) vary from approximately as deep as +2.7 to +2.9 feet to as shallow as +3.6 to +4.1 feet NAVD 88. Site dewatering will likely be required to accomplish the subject excavation work and new residence basement level / foundation construction.

Secant Piles / Deep Soil Mixing (DSM) Program

Secant pile installations and deep soil mixing / soil-cement by others (Reference No. 7) are planned to provide temporary shoring along property lines, cut off horizontal groundwater flow, limit soil permeability / groundwater seepage, and mitigate liquefaction as part of the final construction. The secant piles and soil cement columns will both be constructed using soil cement / Deep Soil Mixing (DSM) to depths of approximately 20-25 feet below ground surface (El. -13± feet NAVD 88). This method of ground improvement will be implemented to mitigate liquefaction potential and uses a truck-mounted drilling rig equipped with specialty purpose-built stem and mixing tool arrangement. As the mixing tool is advanced into the soil by a combination of rotation and crowd force, a grout slurry (comprised of cement and water) is injected through the hollowstem and blended with the soil mix, creating "soilcrete" columns. Once cured, the DSM-treated sands are cemented into relatively impervious, sandstone-like cylinders, thereby increasing their strength, limiting their permeability, and mitigating liquefaction potential. An added benefit of the secant pile / DSM program is a significant reduction in potential rates of groundwater influx that can develop during construction - provided that the work is performed carefully to limit / prevent imperfections in the cement treatment which would allow groundwater seepage through permeable / uncemented zones of sand.

In general, the planned secant pile / DSM program will proceed as follows:

- Secant piles (3-feet-diameter) will be installed along property lines and overlapped to form a cutoff to horizontal groundwater flow and provide temporary shoring during basement level construction – the planned secant piles will utilize higher strength cement mix and steel reinforcement (i.e., H-Beams);
- Interior soilcrete columns (6-feet-diameter) will be installed through the interior pad areas utilizing a lower strength cement mix to enhance excavatibility during construction – the resulting interior soilcrete columns serve to mitigate liquefaction and limit groundwater seepage / vertical flow from below the treatment zone.

Once installation and curing of the secant piles and interior soilcrete columns is complete, excavations will be performed to accommodate mat slab / basement retaining wall construction – dewatering will likely be required as excavations progress below the water table (EI. +2.7 to +4.1 feet) and down to the rough grade building pad (EI. +1.54 feet).

Dewatering Program

A Technical Memorandum - Hydrogeologic Evaluation Findings and Dewatering Plan Recommendations has been prepared for the project and is to be presented under separate cover as part of the Dewatering Plan for the project.

SCOPE OF WORK

The scope of work for this preliminary geotechnical report update included:

- Review of provided documents and available published geologic reports / maps for the site and vicinity;
- Field subsurface exploration, consisting of one boring to an approximate depth of 41.5 feet below existing site grades using a truck-mounted, hollow-stem auger drilling rig, and associated soil sampling and logging by our geologist / engineer (*).
- A temporary monitoring well was installed at the location of the above-described boring to monitor groundwater fluctuations with time;
- Laboratory testing of selected soil samples obtained in the field, including moisture / density, direct shear, maximum density, sieve, consolidation, and sulfate;
- Geologic / geotechnical evaluation and analysis of the findings relative to the currently proposed structure, including geologic hazards;
- Seismic hazard analysis and provision of seismic design parameters; and
- Preparation of this Geotechnical Report Addendum, presenting a summary of our field findings, laboratory test results, and recommendations for grading, foundation design, and construction.

GEOLOGY

Surficial Geology / Geomorphology / Site History

The project site is located on the south side of Balboa Peninsula – approximately 2.55± miles southeast of the modern Santa Ana River Channel, 420± feet southwesterly of Newport Harbor, 460± feet inland of the Pacific Ocean / coastline, and 140± feet southwesterly of Balboa Avenue (Figure 1, attached). Review of historic topographic maps dating back to 1896 (Figure 2, below) indicates that the site occupies the central axis of Balboa Peninsula – a late Holocene-age sand bar / barrier beach created by littoral drift, accumulation of intertidal beach sand, and near- surface eolian (wind-blown) sedimentation. Historically, the site also appears to have straddled the historic intertidal estuary of Newport Bay and the Santa Ana River. Beginning in the late 1890's / early 1900's, the former tidal mudflats of Newport Bay were dredged and reconfigured to create Newport Harbor. Development of Balboa Peninsula (in the form of Balboa Avenue, intersecting cross-streets, and sparse residential construction) is apparent as early as 1932. In 1935 (Figure 3, below), development of the site / vicinity and Balboa Peninsula overall appears

to have been well underway, with various cross-streets, side streets, and residential housing in place along Balboa Avenue. Between 1942 and 1965, the Balboa Peninsula and greater Newport Beach area is understood to have been largely developed with high-density residential housing. According to various real estate websites (e.g., Redfin, Zillow, and Realtor), the residence that occupied the site prior to demolition was reportedly constructed in 1972.



Figure 2. U.S. Geological Survey September 1896 Edition of the Santa Ana Sheet (1:62,500 Scale, 25-foot contour interval) topographic map showing approximate location of project site (green bullseye) on historic Balboa Peninsula, adjacent to Newport Bay (image from Google Earth overlay; scale and site location is approximate; for illustrative purposes only).



Figure 3. U.S. Geological Survey September 1935 Edition of Santa Ana Sheet (1:31,680 Scale, 5-foot contour interval) topographic map showing approximate location of project site (green bullseye) south of Balboa Avenue and Newport Harbor (image from Google Earth overlay; scale and site location is approximate; for illustrative purposes only).

Local Geologic Units and Occurrence

According to geologic mapping by Morton and Miller (Reference No. 8; Figure 4, attached), the site is shown as being underlain by Quaternary very young eolian deposits (Qe) and Quaternary very young marine deposits (Qm) of late Holocene age. The eolian deposits are described as being comprised of unconsolidated / fine-grained sand and silt derived from recently active, coastal sand dune deposits occurring in the Newport Beach area; the marine deposits are described as, "unconsolidated, active or recently active sandy beach deposits along coast". In general, for the purposes of this study, native sediments underlying the site are designated as Quaternary beach sand (Qb), representing a combination of native eolian and marine deposits. These soils intermingle with shallow / locally-derived / undifferentiated fills of similar character. Fill soils, where present, likely occur in the upper 3-5 feet and are similar to / reworked from the local native beach sands.

GEOTECHNICAL INVESTIGATION

Field and Laboratory Investigation

On January 20, 2021, one exploratory boring (GB-1) was advanced to a depth of approximately 41.5 feet below existing site grade utilizing truck-mounted, hollow-stem auger drilling rig. The

approximate location of this boring is shown on the attached Boring Location Map (Figure 5). Soil samples were obtained at selected depths and transported to the laboratory for testing. Laboratory testing was performed on representative soil samples obtained during the field exploration to determine geotechnical properties of the site's subsurface materials. Following the completion of this boring, a temporary monitoring well was installed and generally consisted of 2-inch-diameter solid and slotted Sch 40 PVC well casing, #2/12 sand filter pack, bentonite annular seal, 2-feet by 2-feet concrete well pad, and 8-inch well cover.

The log of our geotechnical boring and monitoring well is included in Appendix A and the laboratory test results are included in Appendix B.

Existing Subsurface Conditions

Based on the findings of our subsurface exploration and local experience, soils underlying the site are predominately sandy and are assigned herein as being representative of Quaternary beach sand (Qb) and undifferentiated, locally-derived fills of similar character. As shown on Figure 5 and described in Appendix A (attached), GB-1 was excavated near the center of the site to a depth 41.5 feet below existing ground surface. In general, soils encountered in GB-1 consisted of shallow / locally-derived / undifferentiated fill soils underlain by Quaternary beach sand. The uppermost 20± feet of these soils were poorly-graded, loose to medium-dense, fine- to medium-and locally coarse-grained, and quartz-rich with locally abundant shell hash. Below 20± feet, the sands are dense to very dense.

HYDROGEOLOGY / GROUNDWATER

Soils underlying the site are understood to consist of Quaternary-age beach sand to depths of at least 50 feet or more, with groundwater occurring at depths of approximately 6-9± feet below existing site grades. Groundwater is unconfined and understood to be essentially salty (saline) ocean water. Based on previous subsurface investigations for the site and other neighboring sites, there are understood to be no confining layers (aquicludes / aquitards) below the site to a depth of 50 feet. Groundwater below the site is understood to be in open-communication - vertically, horizontally, locally, and regionally - with the Pacific Ocean and Newport Harbor due to the presence of relatively continuous, sub-horizontally layered, moderate- to high- permeability, fineto medium-grained and locally coarse-grained sand horizons / lenses that comprise the native soils of Balboa Peninsula. Tidal fluctuations of the Pacific Ocean and Newport Harbor affect groundwater levels by inducing hydraulic gradients toward the ocean/harbor and away from the site during low tide conditions, and away from the ocean/harbor and toward the site during high tide conditions. Our recent groundwater monitoring for the period of January 21st, 2021 through June 21st, 2021 indicates that groundwater elevations range between approximately +2.7 to +2.9 feet (NAVD 88) during low- low tide conditions (e.g., -1.2 feet) and +3.6 to +4.1 feet during highhigh tide conditions (e.g.,

+6.0 feet). However, actual groundwater levels may vary slightly from these estimates due to apparent changes caused by barometric pressure variations over the monitoring period, relative to the pressure transducer data logger records. For planning purposes, water levels may be expected to vary between approximately +2.5 and +4.5 feet NAVD 88 – accounting for possible

measurement errors caused by barometric pressure variations. It should also be noted that these estimates are based on limited data obtained during the above referenced monitoring period and actual levels may occur outside the range reported. Nonetheless, the estimates provided herein are considered reasonable relative to the available data and intended use.

SEISMIC HAZARDS

General

Seismic hazards are typically categorized into two hazard classes, primary and secondary. Primary seismic hazards are those directly related to a seismic event and include surface rupture and strong ground motion due to regional earthquakes / fault lines. Secondary seismic hazards are functions of the primary hazards and include responses of the local ground to seismic shaking from liquefaction, lateral spreading, earthquake-induced landslides, etc. Additional hazards associated with coastal settings and open water bodies include tsunamis and seiche. Risks to the project site and proposed development associated with these earthquake-related hazards are described below.

Surface Rupture and Strong Ground Motion

There are no known active fault traces mapped across the project site and the site is not located in an Earthquake Fault Zone of Required Investigations. The nearest zoned active fault is located approximately 4.9 miles northwesterly of the subject site. However, as shown on Figure 6 (attached), the site is located approximately 500± feet southwest of the "presumed active" North Branch of the Newport-Inglewood Fault Zone (NIFZ) and within a Fault Hazard Management Zone designated by the City of Newport Beach. Therefore, there exists some risk of ground rupture occurring on and/or near the site during a large earthquake centered on the NIFZ. For the purposes of this study, we consider these strands of the NIFZ potentially active and capable of producing localized ground cracking and/or displacement of the relatively young, Holocene-age sediments associated with the site / vicinity – effects to the site itself may also include far-field ground deformation (uplift, subsidence, translation, etc.). Risks associated with on- and off-site ground rupture may include damage to local structures and disruption of utilities and transportation routes intersecting the "presumed active" strands of the NIFZ.

Strong ground motion as a result regional seismic activity will undoubtedly occur in the future and affect the project site via seismic shaking. The Newport-Inglewood Fault is the nearest active fault and believed to be the causative fault in the 1933 magnitude (M_w) 6.4 Long Beach Earthquake which reportedly caused severe ground shaking (Modified Mercalli Intensity VIII) and moderate to heavy damage to structures in the local area according to the California Department of Conservation (<u>https://www.conservation.ca.gov/cgs/earthquakes/long-beach</u>), based on the work of Barrows (1970, Reference 9), Trifunac (2003, Reference 10), and others.

Risks associated with seismic shaking and strong ground motion are considered moderate to high but can be mitigated / reduced through appropriate geotechnical / structural design and construction practices. Seismic design parameters based on ASCE 7-16 are included in Appendix C.

Liquefaction and Lateral Spread

Liquefaction is a phenomenon in which saturated, cohesionless or low-cohesion soils temporarily lose shear strength during relatively severe earthquake ground motions. Liquefaction has potential to adversely affect buildings, utilities, roads and other man-made structures due to a loss of foundation support during the event. In general, saturated / predominately granular soils tend to compact and decrease in volume when subjected to strong ground motion, resulting in an increase in pore water pressure if drainage is impeded. If the pore water pressure becomes equivalent to the overburden pressure, the effective stress becomes zero and, consequently, the soil loses its strength and is considered to be in a liquefied state. Factors known to influence the potential for liquefaction include soil type and depth, grain-size, relative density, groundwater level, degree of saturation, and both the intensity and duration of ground shaking.

According to the California Geological Survey's web-based application (EQ Zapp), the site is located in a liquefaction hazards zone of required investigations. The subject site is underlain by sandy materials, shallow groundwater, and is an area of high seismic exposure resulting from large earthquakes on the Newport-Inglewood Fault Zone and other regional fault lines. Based on USGS Seismic Hazard data, a site-modified peak ground acceleration (PGA_m) of 0.731 g, factored deterministic acceleration value (PGA_d) of 1.056 g, and a maximum earthquake magnitude of 7.5 (no magnitude scaling factor applied) were used in our analysis. Liquefaction analyses and assessment for the project site took into account the SPT blow count data recorded during the field exploration drilling, soil profile obtained in the site boring, review of available geotechnical reports in the vicinity of the site, and computerized analyses based on the methodology presented by Seed and Idriss.

Based on the results of liquefaction analysis, potential dynamic settlement for the existing site soil conditions under a major seismic event could be on the order of approximately 2-3 inches occuring in the upper 20 feet. These dynamic settlements are expected to occur over a large area and would generally result in areal subsidence. Liquefaction analysis is included in Appendix D.

Lateral Spread

Lateral spreading is defined as the finite lateral displacement of gently sloping ground as a result of pore pressure build-up / liquefaction in a shallow underlying deposit during an earthquake. Liquefaction induced lateral spreading under a major seismic event can also occur for nearly level ground sites with a free-face condition (e.g., channel or harbor). In general, the degree of / potential for lateral spreading decreases with distance away from free-face / sloping conditions. Confining layers with low permeability can increase the potential for liquefaction if they impede subsurface drainage / pore pressure dissipation of underlying, saturated sand layers with lower relative density.

Based on available subsurface information and interpretation of the site's geomorphology, the potential for adverse lateral spreading occurring at the site is considered relatively low

compared to other areas within and around Newport Harbor. The site is located 420 \pm feet southwesterly of Newport Harbor and 460 \pm feet inland of the Pacific Ocean; groundwater occurs at approximately 6-8 feet below ground surface; and there is potential for liquefaction occurring at relatively shallow depth. However, the local area is relatively flat-lying and appears to occupy the natural / pre-development portions of Balboa Peninsula – a late Holocene-age, strandline beach and dune ridge that appears to have remained relatively stable throughout recent / historic time. It is worth noting that Barrows (1970, Reference 9), in his review of reported "surface effects" associated with the 1933 M_w 6.4 Long Beach earthquake, made no references to liquefaction / lateral spreading occurring along Balboa Peninsula. Nonetheless, the potential for liquefaction / lateral spreading cannot be ruled out, making it a low to moderate risk associated with the site / vicinity, particularly in association with larger magnitude earthquakes on the NIFZ. Potential effects may include localized ground lurching / minor lateral displacements as a result of acute liquefaction phenomena (e.g., sand boiling) at shallow depth.

Earthquake-Induced Landslides

Review of published geologic mapping and the California Geological Survey's web-based application (EQ Zapp) indicates that the subject site is not identified as being in an earthquake-induced landslide hazard zone. The site itself is flat-lying and there are no slopes nearby which would be considered susceptible to any meaningful instability that would affect the site. Considering the above, the potential for earthquake-induced landsliding affecting the site is considered nil.

Tsunami

Topographic and regional maps indicate the subject site is approximately 460± feet inland of the Pacific Ocean and 420± feet southwest of Newport Harbor. The site sits at an estimated elevation of 10-12 feet NAVD 88 and the Tsunami Inundation Map for Emergency Planning, Newport Beach Quadrangle, prepared by the California Emergency Management Agency, California Geological Survey, and University of Southern California (2009, Reference 11) indicates that the site is within an area identified as having the potential for tsunami inundation under a major seismic event occurring in the adjacent offshore region as result of local faulting, submarine landsliding and/or more distal, subduction-related faulting around the pacific rim. Based on the above, there is potential risk of inundation due to a tsunami event from known sources in the Pacific Ocean.

Seiche

Seiche is defined as a standing wave oscillation effect generated in a closed or semi-closed body of water caused by wind, tidal current, and/or earthquake. Seiche potential is highest in large, deep, steep-sided reservoirs or water bodies. The site is not near any significant pools, lakes, reservoirs, or similar, is 420± feet from Newport Harbor and 460± feet inland of Pacific Ocean. Given that, the potential risk of seiche-related effects from existing water bodies is considered low. However, the proposed roof-top pool may be susceptible to seiche-related

effects which should be accounted for in design and construction to prevent adverse effects to the new residence structure and related appurtenances.

COASTAL FLOODING HAZARDS

In general, coastal flooding hazards can occur in association with astronomical high tides and/or exceptional storm events which can overwhelm storm drains and cause localized flooding as a result. Given that, the project site may be prone to localized flooding during such events and this should be accounted for in design and construction.

Coastal flooding hazards specific to the site in association with sea level rise, wave run up, and shoreline change were addressed by American Geotechnical in their coastal hazards report for the project (Reference No. 5).

Per Reference No. 5:

- The proposed building habitable area could be moved away from the north side of the property to avoid possible future SLR and flooding;
- The first-floor finished floor (FF) elevation for the proposed building could be raised above Elev. 10.65' NAVD88 to elevation 10.7';
- Curb walls could be constructed along the perimeter of the building and top of curb walls should be above Elev. 10.65' NAVD88 to elevation 10.7';
- The pickleball court below the 9.00' NAVD88 minimum required top of slab elevation for interior living areas will be reasonably safe based on our SLR analyses. As discussed earlier, the pickleball court will be designed with "boat-like" waterproofing and waste slab concrete sufficient to offset the buoyant uplift. As such, the mitigation measure, such as dewatering, is not required.
- Any proposed site improvement below Elev. 10.70' NAVD88 should be flood-proofed with waterproofing or other similar flood-proofing techniques.

Also, per Reference No. 5:

In addition, it is our opinion that no additional protective devices, such as seawall, will be necessary to protect the proposed development from any existing or anticipated future coastal hazards for the next 75 years, including shoreline movement, waves, wave runup, and flooding with future SLR over the next 75 years.

HYDROGEOLOGIC HAZARDS AND CONSIDERATIONS

Summarized below is a general overview of hydrogeologic factors to be considered in design and construction of the proposed new residence structure and site dewatering program:

• Site excavations will extend approximately 8-10 feet below existing site grades and approximately 1.2 to 2.6 feet below the water table – which varies as a result of tidal fluctuations that occur over periods of 3-5 hours and up to about 9 hours or more (e.g.,

water table dropped 0.5 feet over a period of 9 hours from +3.9 feet to +3.4 feet NAVD 88 going from high-high tide (+6.0 feet) to low-low tide (-1.2 feet)).

- The potential magnitude / volumetric rate of seepage will increase as overburden is removed and excavations progress further below the water table similarly, the potential for buoyant uplift and seepage forces will also increase as excavations progress.
- Buoyancy can cause uplift / heaving of excavation bottoms when hydrostatic head pressure (uplift) exceeds the weight of overburden (soilcrete cover). The magnitude of potential heave is directly proportional to the reduction in overburden loads below groundwater levels and upward buoyancy force due to hydrostatic pressures at the depth of overburden removal. Seepage forces, with regards to the above, are additional uplift forces that can develop as a result of vertical / upward groundwater seepage. Seepage forces can be viewed as a dragging force that is the product of hydraulic gradient and unit weight of water (62.4 pcf).
- Soil piping is a phenomenon caused by steep hydraulic gradients and high rates of groundwater seepage. As described above, groundwater seepage imparts a drag force (seepage force) on the soil media through which it permeates. When groundwater seepage exits a free-face through a particular soil media (e.g., cohesionless sands like those onsite), soil particles nearest the face can be mobilized if the hydraulic gradients / seepage forces exceed a certain threshold. In the case of the groundwater seepage through vertical or near-vertical seams of uncemented sand occurring in the planned soilcrete envelope, soil piping is a significant hazard that can cause uncemented sands to mobilize near the surface of the excavation and erode internally downward as material continues to be displaced by seepage to increase as material is displaced and made less restrictive to flow.
- Based on the results of sieve analysis and correlations (Hazen's Correlation, Kozeny-Carman Equation) between grain-size distribution and hydraulic conductivity (K), K-values are estimated to range between approximately 0.03 to 0.08 centimeters per second (cm/s); locally, K-values may be as low as 0.01 cm/s or less or as high as 0.1 cm/s or more these translate to a working average range of K-values between 0.06 and 0.16 feet per minute (ft/min), down to 0.02 ft/min or less, and up to 0.2 ft/min or more. K-values are expected to be significantly higher in the horizontal direction (due to a higher degree of horizontal bedding / continuous sedimentary structure and parallel groundwater flow through the sand) than in the vertical direction (due to flow being perpendicular to bedding and in series through multiple sand layers with higher and lower K-values limiting permeability and increasing hydraulic head losses).

Our forthcoming Technical Memorandum (Hydrogeologic Evaluation Findings and Dewatering Plan Recommendations) has been prepared for the project and is presented under separate cover to address hydrogeologic hazards and provide conceptual recommendations for site

dewatering.

GEOTECHNICAL CONSIDERATIONS

The major geotechnical factors that should be considered during project design include the following:

- Presence of relatively loose sands occurring in the shallow subsurface and saturated sands / groundwater at general depths of 6-9± feet below ground surface – site dewatering will likely be required.
- 2. Potential soil disturbance resulting from the demolition of the existing residence and ancillary elements.
- 3. Static settlement due to foundation / improvement loading and dynamic settlement resulting from earthquake-induced liquefaction and shallow dry sand settlement.
- 4. Required excavation to facilitate subterranean level construction proximal to adjacent property lines and below existing groundwater levels.
- 5. High ground accelerations / seismic shaking may be experienced at the site during its design life therefore, the proposed structures should be designed and constructed to the prevailing standards and seismic design requirements.
- 6. The site is located near "presumed active" strands of the Newport-Inglewood Fault Zone and is understood to be within a Fault Hazard Management Zone designated by the City of Newport Beach. Therefore, the potential for rupture-related ground deformation (uplift, subsidence, translation) and/or cracking / displacement cannot be ruled out for the site / vicinity.
- 7. Corrosion potential due to the local environment / coastal setting.
- 8. Engineering geologic considerations including the potential for shallow groundwater and coastal flooding.
- 9. Soil exposure issues related to control of external influences on the structure including water / moisture / vapor, vegetation (landscaping), soil chemistry (i.e. sulfate / pH issues), exposure to rain, weather, and coastal environment.

RECOMMENDATIONS

General

Based on the findings obtained during our field exploration phase, results of laboratory testing, and our understanding of the currently proposed new residential structure, it is our opinion that the proposed construction is feasible from a geotechnical standpoint, provided that the recommendations included herein and City of Newport Beach grading requirements are incorporated in the design and implemented during construction.

Secant Piles / Deep Soil Mixing and Site Dewatering

The major geotechnical earthwork challenges from a constructability standpoint are the excavation, shoring, and site dewatering aspects for the planned subterranean level when considering off-site property constraints. To facilitate planned excavations for the subterranean level of construction as well as minimize site dewatering efforts and potential adverse settlement / subsidence effects to off-site development, a secant pile / deep soil mixing (DSM) program has been recommended. This secant pile / DSM program will include reinforced shoring system along property lines and provide in-situ ground improvement to mitigate potential adverse effects due to soil liquefaction. With regards to temporary site dewatering, the secant pile / DSM program is also intended to limit / cut off horizontal groundwater flow from offsite, reduce the permeability of the underlying sands on/below the site, and limit the volumetric rate of vertical groundwater seepage that may develop during below grade excavations and construction – however, local imperfections in the cement treatment will conduct groundwater seepage and some level of dewatering should be anticipated.

A general description of the secant pile / DSM program is provided in the Project Description section of this report with reference to plans and supporting documents by Advanced Geosolutions, Inc. (Reference No. 7). Recommendations for site dewatering are presented under separate cover as part of our forthcoming Technical Memorandum (Hydrogeologic Evaluation Findings and Dewatering Plan Recommendations) and supplemental dewatering plan by Griffin Dewatering as part of the Dewatering Plan submittal for the project.

Pre-Construction Documentation / Vibration Monitoring / Survey Monitoring

The planned construction is to include heavy equipment operations, drilling / deep soil mixing, shoring installation along property line, and other related activities with the potential to generate significant noise, ground vibration, and other effects which may be perceived as potentially adverse. In order to mitigate potential issues related to noise, vibration, shoring installation, etc., a monitoring and mitigation program should be developed and implemented in advance of and during the planned construction activities. As a minimum, the monitoring and mitigation program should include the following components:

- <u>Pre-Construction Documentation</u> The site and neighboring properties (interior and exterior portions) should be photo-documented in advance of the planned construction to provide a baseline for pre-construction conditions and for comparison purposes during and post-construction. G3 can provide these services under separate cover.
- <u>Pre-Construction Noise / Vibration Monitoring</u> Noise and vibration monitoring should be performed in advance of the planned construction to establish normal levels of background noise / vibration. These background levels should be documented and "safe" thresholds should be established for in-construction noise and vibration monitoring. G3 can provide these services and additional criteria under separate cover.
- <u>In-Construction Noise / Vibration Monitoring</u> Noise and vibrations should be monitored during construction and regulated in accordance with established "safe" thresholds for

residential construction. A minimum three monitoring stations (two stationary, one floating) should be established during construction to provide adequate coverage near adjacent properties and ensure that vibration levels do not exceed established thresholds. G3 can provide these services and additional criteria under separate cover.

 <u>Survey Monitoring</u> – The planned secant pile shoring system should be monitored for deflection / movement via survey of dedicated benchmarks established at the regular intervals along property line. Baseline readings should be established prior to the start of any excavation work and surveyed at regular intervals following. For planning purposes, weekly surveys should be conducted by a licensed / qualified surveyor to ensure that the pile deflections do not exceed established regulatory thresholds (i.e., not to exceed ½-inch). Additional criteria for this work can be provided under separate cover.

Grading

In general, initial earthwork / grading would generally be limited to demolition / removal of the existing residence and improvements and preparation of the existing site surface to provide support for the DSM equipment. Excavation for planned subterranean construction is planned following the installation of secant piles and DSM ground improvement program, with temporary access ramp cut along the northern side of the subterranean level to facilitate access. Remaining grading would generally be limited to foundation excavation observations, retaining wall and utility line backfill placement and compaction, and precise grading for drainage.

Presented below are general grading recommendations relative to site clearing, preparation, excavation, etc. which should be included as part of grading operations, as appropriate.

Site Clearing and Preparation

- a) Site preparation and grading should be made under the observation of the Project Geotechnical Consultant or their representative.
- b) Proper measures should be implemented during the performance of remedial / precise grading work to protect the work site, particularly excavated areas, from flooding, ponding and inundation due to poor or improper temporary surface drainage. During periods of impending inclement weather, temporary provisions should be made to adequately direct surface drainage, from all sources, away from and off the work site and to provide adequate pumps and sumps to handle any flow into the excavations.
- c) Prior to the start of the required earthwork and grading, all vegetation, surface trash, debris and other deleterious materials should be removed from areas of planned grading and wasted away from the site. Vegetation removal should include root-balls and attendant root systems.
- d) Utility laterals / stub outs should also be located prior to grading and flagged.
- e) Any pipelines or conduits encountered within the zone of planned development that are designated for abandonment should be removed from the construction area and ends cut and plugged according to the applicable Code requirements but not less than 10 feet

outside the perimeter of the proposed construction area, or as property line considerations dictate. Non-reinforced concrete or clay pipes may be crushed in-place and incorporated in the fill.

- f) Alternately, deep hollow lines may be left in place, provided they are filled with concrete. No filled line should be permitted closer than 2 feet from the bottom of footings.
- g) Local ordinances relative to abandonment of underground utilities, if more restrictive, will supersede the above minimum requirements.

Excavation Procedures

Temporary excavations in site soils 4 feet or deeper should be shored or sloped in accordance with Cal OSHA requirements. Special construction techniques, such as slot cutting, may be utilized if excavations are greater than 4 feet vertical and site constraints preclude use of temporary slope cuts.

For subterranean level excavations made within the soilcrete mass, excavation slopes may be made at a 3/4:1 (H:V) gradient.

Excavations located along property lines and adjacent to the reinforced secant shoring systems may be made near vertical. Care should be taken when excavating along the secant wall to prevent the peeling of soilcrete soil layers – grinding of the exposed excavation face may be preferable.

A representative of this firm should be present on-site during excavations to verify acceptability of temporary slopes. Acceptability will be dependent upon the soil conditions encountered, excavation depths, construction procedures, and schedule.

During site excavation operations and construction, the secant walls should be periodically survey monitored to verify acceptability of the shoring system and enable our office to evaluate need for additional recommendations, as appropriate.

Testing and Observations

Site preparation, grading, compaction, and backfill operations should be performed under the observation and testing of the Project Geotechnical Consultant. As appropriate, an adequate number of field tests should be performed to verify compliance with recommendations presented in this report and local ordinances.

If it is determined during grading that site soils require over-excavation to greater depths for proper structural support, this additional work should be performed in accordance with the recommendations of the Project Geotechnical Consultant.

Fill materials should be compacted to the minimum 90 percent relative compaction based on the laboratory maximum density determined in accordance with ASTM: D1557.

Secant Pile and Deep Soil Mixing – Quality Assurance / Quality Control

A program of Quality Assurance / Quality Control (QA/QC) for the planned secant pile and deep soil mixing program should be established by the project's Ground Improvement Design-Build Contractor (Advanced Geosolutions, Inc.). G3 can provide additional input and collaboration as needed under separate cover to assist the ground improvement contractor in developing and implementing appropriate QA/QC protocols prior to and during construction. G3 can also provide third-party testing services and observations / testing during construction to appropriately document the subject work and provide input / additional recommendations as needed. It is the responsibility of the contractor performing the work to ensure that work is performed in accordance with the project plans / specifications and the intent of the recommendations provided herein and in our forthcoming Technical Memorandum which will be submitted as part of the Dewatering Plan for the project.

Foundation Recommendations

<u>General</u>

Presented below are preliminary recommendations for the construction of mat slab foundation systems for residence support and alternative shallow conventional footings for the at grade level of construction when support into and on soilcrete.

Mat Foundation Design

The proposed residence may be supported on mat foundation bearing on approved soilcrete. A mat foundation distributes structural load across the structure footprint, resulting in more uniform applied pressures to the bearing stratum. The contact pressure distribution beneath the mat is a function of foundation rigidity and the type of bearing material.

The following geotechnical criteria may be used in the design of mat foundation system founded on the DSM mix for support of the planned residential structure:

Allowable Bearing Pressure (1)	=	3,000 psf
Coefficient of Sub-grade Reaction	=	100 pci
Mat thickness	=	18 inches (minimum)
Passive Soil Pressure (2)	=	300 psf/ft.
Friction Coefficient	=	0.3 (ultimate)

- (1) Bearing pressure in shear only for mat foundation supported on soilcrete, and may be increased by one-third to resist transient loads such as wind or seismic.
- (2) Passive soil pressure value is for level bedrock grades adjacent to foundation, with a maximum value not to exceed 2,000 psf.
- (b) The structural details of the mat foundation such as thickness, reinforcements, concrete strength, etc. should be established by the Project Structural Engineer,

considering the loading and service conditions. The mat should be adequately reinforced based on structural design considerations and/or Code requirements.

- (c) Foundation excavations should be observed and approved by the Project Geologist and Geotechnical Engineer prior to the placement of reinforcement or concrete.
- (d) The mat foundation should be designed to resist both temporary hydrostatic conditions which may develop during construction and post-construction hydrostatic conditions which may develop over the project's intended design life, considering both temporary in-construction and permanent post-construction foundation loading and hydrostatic uplift pressures.
- (e) The mat foundation should be appropriately moisture / water-proofed, as recommended hereinafter (Refer to forthcoming Technical Memorandum – Hydrogeologic Evaluation Findings and Dewatering Plan Recommendations for additional information regarding proposed shallow dewatering system under slab and related subgrade preparation).
- (f) Pad subgrade is to be overlain by 4-inch-thick layer of ³/₄-inch crushed aggregate, in turn, overlain by Mirafi 140N (double-layer; second layer cross-lapped relative to first; 18-inch min. lapping for all fabric).
- (g) A 3-inch-thick waste slab (f'c = 4,500 psi min., w:c = 0.45, Xypex) is to be poured on top of 4-inch thick gravel layer and Mirafi 140N to provide flat / smooth surface for waterproofing installation.
- (h) An additional 3-inch protection slab (f'c = 4,500 psi min., w:c = 0.45, Xypex) is to be poured on top of waterproofing once installation is complete to protect waterproofing during rebar installation and mat slab pour.
- (i) Mat slab (f'c = 5,000 psi min., w:c = 0.4, Xypex, per Project Structural Engineer) to be poured directly on top of protection slab.

Conventional Footing Design Criteria

Presented below are preliminary recommendations for the construction of shallow conventional footings for the at grade level of construction when supported on approved soilcrete mix.

Allowable Bearing Pressure (1)	=	3,000 psf.
Minimum Footing Depth (2)	=	18 inches
Minimum Footing Width	=	Per 2019 CBC
Passive Soil Pressure (3)	=	300 psf/ft., subject to a maximum of 2,000 psf.
Friction Coefficient	=	0.30 (ultimate)

Minimum Footing Reinforcement

For continuous footings, min. four No. 4 bars, two at top and two at bottom.

(1) Allowable bearing pressures may be increased by one-third for short-term loading due to wind or seismic forces.

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- (2) Footing depth is below lowest adjacent soil grade. Footings should be deepened, as necessary, to depth equivalent to existing adjacent foundations.
- (3) Passive soil pressure value is for level soil conditions adjacent to footings.

General Foundation Remarks

- (i) Footing embedment depths should be maintained throughout the life of the structure, and not compromised via erosion softening, digging, landscaping, etc.
- (ii) Where foundations encroach closer than five (5) feet horizontally from the flow line of drainage swales or percolation features, the footings edges should be deepened sufficiently to maintain the required embedment depth below the adjacent flow line.
- (iii) Foundation details such as concrete strength, reinforcements, thickness, etc. should be established by the Project Structural Engineer, considering the loading conditions. The recommended foundation embedment, thickness and reinforcements are minimum requirements and should be established by the Project Structural Engineer. More restrictive criteria based on structural design considerations or Code requirements shall govern.
- (iv) Foundation excavations should be observed and approved by the Project Geotechnical Engineer prior to the placement of reinforcement or concrete. Forming of footing excavations may be required. Excavations should be free of slough and debris and thoroughly moisture conditioned prior to placing concrete.
- (v) Excavated material from footing and utility trenches should not be placed in slabon-grade areas unless properly compacted and tested.
- (vi) Isolated pad footings should be structurally tied in at least two orthogonal directions.
- (vii) Footings should be doweled to the existing floor slab with No. 4 bars at 18 inches on center.
- (viii) Floor slab-on-grade should be underlain by a moisture vapor retarder, as recommended hereinafter, to mitigate moisture / water vapor intrusion into the structure.

Pier / Caisson Design Criteria

For at-grade construction transitioning over basement level retaining wall backfill, drilled and

cast-in place concrete piers with floor slab structurally supported by grade beam system may be used, when designed and constructed as recommended below:

Allowable End Bearing Pressure	:	3,000 psf;
Embedment Depth (*)	:	10 feet below ground surface and bearing on / into soilcrete;
Pier Diameter	:	2 feet (minimum);
Minimum Pier Spacing	:	3 diameters center to center; and
Passive Pressure	:	300 psf/ft into soilcrete.

General guidelines for pier / caisson installation are provided below:

- Excavations should be drilled at design locations within the tolerances for lateral deviation and "plumb" condition specified by the Project Structural Engineer.
- The excavations should be constructed using proper drilling equipment with sufficient power to advance the holes to the required design tip elevation.
- Potential caving and hole instability should be anticipated within the weathered zone, and therefore temporary casing may be necessary to control caving or instability of drill holes within this zone. If temporary casing is used, it should be removed in stages as the concrete is being placed. During concreting and casing removal, a <u>minimum 5 feet</u> of casing should be maintained below the concrete surface at all times.
- Pier excavations should be thoroughly cleaned of loose soils and cuttings prior to the placement of reinforcements and concrete.
- Excavations should be observed and approved by the Project Geotechnical Engineer prior to placing reinforcing steel and concrete.
- Excavations should be filled with concrete on the same day that they are drilled. Concrete should be poured using the Tremie method, to prevent aggregate segregation.
- All concrete should be Type V Portland Cement, 4500 psi, 0.45 water/cement ratio.
- We recommend that the piers / piles be reinforced for the entire length. The pier reinforcement and concrete placement procedures should be in accordance with ACI and other applicable codes as well as the requirements of governing jurisdictions and should be established by the Project Structural Engineer.
- Pier / caisson installation specifications should be reviewed by the Project Geotechnical Engineer.

Foundation details such as concrete strength, reinforcements, etc. should be established by the Project Structural Engineer. More restrictive criteria based on structural design considerations or Code requirements shall govern.

Settlement

Some structure movement should be expected both during and following construction, even when supported on engineered compacted fill, due to various factors including, but not limited to:

- Sequence of foundation and slab loading during construction;
- Variation in structural loads along foundation elements;
- Variation in underlying soil types with different compressibility indices and subsurface soil profile, and associated primary and long-term secondary consolidation settlements; and
- Moisture changes and groundwater due to climatic and non-climatic influences following construction.

It should also be recognized that given residential construction tolerances, concrete floor slabs will not be cast perfectly level, and it has been our experience that floors slab elevations may vary by as much as an inch or more.

For design purposes and considering the above factors, total settlements for new foundations designed and constructed in accordance with the above criteria and supporting loads not exceeding the typical loadings for residential construction are not expected to exceed 1-inch. Potential differential settlements for foundations / slabs are not expected to exceed 1/2 inches across a distance of 30 feet.

Retaining Wall Criteria

The design earth pressures for retaining wall previously recommended by American Geotechnical in Reference No. 4 may be conservatively retained for use in the design of the planned retaining walls for the basement level construction. As indicated in Reference No. 4, subterranean retaining walls and associated waterproofing installations should be designed to accommodate full hydrostatic pressures and related conditions which may develop over the project's design life (see also Waterproofing – Subterranean Level).

Retaining Wall Backdrainage / Waterproofing

Retaining walls should be adequately waterproofed and incorporate a wall backdrainage system during construction to relieve potential hydrostatic pressure buildup behind walls. Preliminary recommendations for retaining wall backdrainage are presented in the Site Drainage / Wall Backdrainage section of this report.

Wall Backfill

Backfill materials behind walls should consist of predominantly granular, free draining material, and compacted to at least 90 percent relative compaction and near optimum moisture contents. For planning purposes, crushed miscellaneous base is recommended for subterranean level retaining wall backfill. However, we reserve the right to modify our recommendations, as appropriate.

Wall Backdrainage

Presented below are preliminary recommendations / considerations for wall backdrainage. Detailed recommendations specific to the proposed development will be provided by our office, in coordination with the Project Civil Engineer, as the project evolves and during subsequent plan review phases, and these recommendations should be incorporated into the final project plans and specifications.

Subterranean walls should include waterproofing and a drainage blanket behind the walls to provide a capillary break, where appropriate. As a minimum, this drainage blanket should consist of Miradrain 6200, applied fabric-side against soil.

Wall drains are to be hydraulically isolated, along with their outlet lines from surface drains.

Seismic Design Considerations

The site, as is all of Southern California, is within a zone of seismic activity. Strong ground motion from an earthquake generated along active faults should therefore be anticipated at this site. The proposed residence should be designed and constructed to the prevailing standards regarding seismic design. Seismic design should be based on current and applicable CBC requirements, as appropriate. Seismic design parameters based on ASCE 7-16 are included in Appendix C.

Concrete Slab and Exterior Flatwork

The concrete slab design and construction details should be established by the Project Design Engineer. From a geotechnical standpoint, the minimum criteria for slab-on grade are shown below:

a) <u>Floor Slabs</u>

Concrete floor slabs should be 6 inches thick (minimum) and should be reinforced with No. 4 bars at 12 inches on center, each way at mid height, and should be structurally tied to the footings. In order to minimize migration of moisture up the concrete slab from soil sub-grade and damage to floor coverings, a moisture barrier / water vapor retarder system should be placed beneath floor slabs constructed at grade as recommended hereinafter.

b) <u>Exterior Flatwork</u>

Sidewalks, walkways and patio slabs should be 4 inches thick (minimum) and should be

reinforced with No. 3 bars at 18 inches on center, each way at mid height.

c) Slab Sub-grade Compaction and Pre-saturation

Prior to concrete placement, the prepared soil sub-grade should be moisture conditioned to and maintained at about 1 to 3 percentage points wet of optimum moisture contents to a depth of 12 inches and exhibit at least 90 percent relative compaction as determined by ASTM: D1557 or as otherwise specifically recommended by the Project Geotechnical Consultant of record based on actual conditions.

d) <u>General Concrete Remarks</u>

- To minimize slab curling and other related adverse effects, a low shrinkage / low slump concrete (concrete mix with a minimum 4,500 psi compressive strength and maximum water cement ratio of 0.45) should be used for the floor slab construction, as determined by the Project Structural Engineer. The mix design should be verified by the project Civil / Structural Engineer, and placement of concrete should be observed and certified by the Concrete Deputy Inspector.
- Interior floor slabs and exterior concrete flatwork should be properly designed for the construction and service loading conditions, and potential differential movements. The structural details, such as slab thickness, concrete strength, reinforcing criteria, joint spacing, etc. should be established by the Project Civil / Structural Engineer. The recommended minimum reinforcements for concrete slabs provided above are intended for preliminary design only. More restrictive criteria as dictated by structural design or regulatory requirements shall govern.
- All reinforcement must be appropriately spaced and supported / maintained during the pouring / finishing work such that it remains in proper condition.
- Unless specifically allowed for and approved as such by the project Civil / Structural Engineer, no water is to be added to the concrete mix after the truck leaves the plant. It should be cautioned that addition of water to the concrete mix will change the water-cement ratio of the plant design mix and can lead to undesirable shrinkage cracking, curling, etc. of concrete slabs during curing.
- All concrete to be properly finished per American Concrete Institution / Portland Cement Association standards and moist cured (for preferably at least 7 days). If moist curing is not feasible, an appropriate curing compound / sealant should be applied in accordance with the timing and methodology specified by the curing compound manufacturer.
- Truck tickets to include mix design, time leaving plant, time of site arrival, and time onsite / location of pour to be documented and copies sent to the project Civil / Structural Engineer.

• All poured concrete should be protected from loading and traffic for at least 7 days without written approval of the project Structural engineer.

Waterproofing and Moisture / Water Vapor Retarder System

<u>General</u>

The following are key considerations which must be kept in mind when addressing inset level construction / foundation elements below grade which are sensitive to water / moisture / vapor. In our general experience, both from a design / build and a forensic standpoint, a large percentage of subterranean construction suffers from distress ranging from the all too common "musty odors" / dampness, floor and wall covering damage and debonding, to free water intrusion and wall / slab cracking and heaving. Understanding the role and behavior of water — in its multiple forms of occurrence — is a critical step in the proper addressing and mitigation of nuisance and damage to subterranean foundation elements:

- Water is the root driving mechanism controlling both expansion and related ground activity and moisture intrusion related distress.
- Water is insidious and will inevitably find its way into places it is not desired.
- Water buildup in the shallow subsurface over the life of the project is inevitable in the case of projects such as this.
- Water can exist and simultaneously co-exist / transform into multiple phases of occurrence: liquid / hydrostatic, capillarity, and vapor.
- The flow and migration of water is controlled by free energy gradients, which include gravity, suction / capillarity, salinity, humidity, temperature, and others.
- A major free energy gradient which drives water transmission through foundations into structures is the combination of humidity and temperature, and differences in humidity and temperature between the ground and interior spaces. Water, particularly as vapor, will tend to flow from areas of high humidity and temperature towards areas of lower humidity and temperature. This condition is created by atmospheric environment, particularly where air conditioning is used, forming a gradient of high humidity and temperature in the underslab subgrade environment and the typically much lower humidity and cooler environment in the interior space.
- The humidity, under equilibrium, in the subsurface including the void spaces of soil, rock, gravel, drains, pipes, cavities, vaults, and other features is typically at or near 100% relative humidity. It only takes a small drop in temperature for condensation to develop, which may accumulate faster than it can dissipate particularly where humidity remains nearly 100% and temperature changes are small. A similar condition will occur under low permeability floor coverings creating a major form of flooring distress and damage.
- Capillarity, in particular where it interphases with vapor, is a very difficult to control phase, as it involves wicking like through a paper towel. Even a tiny imperfection can

quickly grow a large downstream "wet spot" where it is controlled solely by a membrane or sheeting / coating.

- Since capillarity is controlled by the hydrophilic ("water-loving / attracting") chemistry of a substance, the use of a concrete mix unattractive to water in subterranean level construction will further mitigate the moisture vapor transmission and wet-spotting. Thus, the use of proven hydrophobic additives should be considered for use in all foundation members in contact with and/or below grade that will support / enclose living areas.
- The different phases of water require their own separate forms of mitigation hydrostatic
 / free water drainage or barriers (especially those relying on clay or "bentonite" sheeting
 or layers) will not stop capillarity or vapor; and mitigation measures to control vapor are
 not very effective at hydrostatic water control. Even then, the concrete itself should be
 made as watertight as possible.

A major key to success is to recognize that multiple systems must be incorporated in proper tandem to control all forms of water. Another key to success is to recognize that even with the best construction practice; some imperfections are inevitable and will be capitalized on by water.

Waterproofing – Subterranean Level

- Floor slab and wall waterproofing should effectively mitigate free water, capillary water, and water vapor into the inset level of construction and should be installed in conformance with manufacturer's recommendations to resist full hydrostatic pressures that may develop during and post-construction.
- Inset level slab construction and walls should be waterproofed to effectively mitigate free water, capillary water, and water vapor into the sublevel and should be installed in conformance with manufacturer's recommendations to resist full hydrostatic pressures that may develop during and post-construction.
- As an added measure to mitigate potential water / moisture vapor transmission into subterranean level construction, we recommend incorporating a hydrophobic admixture (Hycrete W1000, Xypex, or architect / structural engineer approved equivalent) in the concrete. This hydrophobic mixture should be considered for both the basement floor slab and subterranean structure walls. Considerations may also be made to incorporating hydrophobic admixture to secant pile walls.
- Dedicated waterstops and epoxy concrete bonding agents installed / applied according to manufacturer recommendations are required at all joints and between pours.
- A dedicated waterproofing membrane (e.g., Miraply) should included as part of the waterproofing system for the mat slab and retaining walls and installed in accordance with the manufacturer's recommendations to resist full hydrostatic pressures that may develop during and post-construction.

- All waterproofing membranes (including Miraclay products) should be rated for service in contact with seawater and approved by the manufacturer as part of the overall design and installation.
- As appropriate and/or required by the manufacturer, waterproofing membranes should be protected by dedicated drainboard / protection board (e.g., Miradrain 6200 XL) installed in accordance with the manufacturer's specifications for below-grade, vertical applications, with potential for full-hydrostatic conditions.
- Miraclay should not be installed in direct contract with concrete to mitigate transmission of capillary water into subterranean floor slab / retaining wall concrete.
- Waterproofing design and installation for the project is to be performed by a qualified waterproofing contractor (American Product Coatings) with oversight from the product manufacturer (Carlisle Coatings and Waterproofing). A representative of the manufacturer should be retained to provide inspection services during waterproofing installation and verify that waterproofing specifications and installation criteria are appropriately met during construction. (Note: G3 does not inspect or approve waterproofing specifications or installation – waterproofing specifications and installation for the project are under the purview of the waterproofing contractor and manufacturer's representative).

Moisture Water Vapor Retarder System

A moisture vapor retarder is recommended to reduce the potential for moisture / water vapor migration up through the slabs constructed at grade and possibly affecting floor covering. Presented below are recommendations based on the guidelines by the American Concrete Institute (ACI) to reduce the potential moisture / water vapor intrusion in concrete slab-on-grade:

- The moisture / water vapor retarder should consist of high strength membrane and should meet or exceed the ASTM: E-1745-97 Class A material requirements for water vapor permeance, tensile strength, and puncture resistance. The vapor retarder should consist of "Stego Wrap 15-mil" (Stego Industries, LLC) or "Vapor Block" VB 15 (Americover, Inc.), or approved equal. The vapor retarder should be underlain by a capillary break comprised of minimum 4 inches thick pea gravel layer. The gravel layer should be placed and compacted on approved soil sub-grade.
- The membrane should be placed on approved gravel layer and properly lapped and sealed. Protection of this membrane from punctures / tears is critically important. Membranes intersecting utility pipes, sewer lines, ducts, or drains must be properly wrapped around the penetrations and sealed. All punctures and rips in the membrane should be repaired prior to placement of concrete, following manufacturer's recommendations. The vapor retarder should be installed in general accordance with the procedures outlined in ASTM: E-1643, and in conformance with the installation procedures recommended by the manufacturer.

• In addition, floor coverings (e.g., wood, tile, etc.) and other built-in features should be carefully selected with vapor transmission in mind and include proper preparation and installation in accordance with the manufacturer's recommendations.

It should be recognized that, even with site surface and sub-drainage measures, there is potential for saturation of ground beneath concrete floor slabs due to water infiltration from irrigation, rain, and run-off, and adverse moisture / vapor development or flow through the soil subgrade. The upward migration of moisture in vapor phase from soil subgrade through the slab-on-grade is inevitable under normal living conditions as they exist within a closed environment (e.g., structure). It is imperative that the Contractor properly install the recommended site drainage measures, utility trench backfill, and the moisture/water vapor retarder system in accordance with the project design requirements and specifications to mitigate potential moisture / water vapor transmission into the structures.

It should be emphasized that proper moisture / water vapor retarder installation, proper control of irrigation, surface runoff, roof drainage, and landscape water adjacent to the structure is very important to minimize problems caused by moisture and water vapor intrusion and is the responsibility of the property owner. In addition, the property owner is responsible for maintaining proper site drainage as recommended hereinafter.

Expansive Soils

The near surface site soils underlying the subject site are comprised of poorly-graded sands, and these soils are expected to exhibit a very low soil expansion potential, and not considered a controlling factor in foundation design. The soil expansion potential should be verified during or at the completion of rough grading operations.

Soil Corrosion and Concrete Design

Soluble Sulfates

Laboratory test results presented in Appendix B indicate sulfate exposure for concrete is Not Applicable (negligible) – however, in consideration of the project location within a coastal environment, it is recommended that concrete in contact with soils be designed to resist potentially high sulfate exposure (i.e., Type V Portland Cement, minimum compressive strength of 4,500 psi, and maximum w:c = 0.45).

Metallic Installations

Laboratory tests to evaluate the potential soil corrosivity to metallic installations were not performed. In the absence of such testing, the soils along with any transient waters flowing through them should be considered to be highly corrosive to metals in contact with them. Attention to minimizing galvanic / chemical corrosivity (i.e., protective coatings, dielectric couplings, eliminating mixing metal types in contact or in near vicinity to each other) where in contact with soil and soil moisture can minimize these effects. An experienced corrosion consultant should be retained and their recommendations incorporated into the design if special

/ critical corrosive issues exist or further corrosion potential study is warranted.

Utility Trench Backfill

Bedding material should consist of sandy material exhibiting a Sand Equivalent (S.E.) value of 30 or greater and should comply with the requirements of the controlling governing jurisdiction. The on-site soils are not considered suitable for use as bedding material.

The site soils are considered suitable for trench backfill, provided they are free of organic material and rocks over 4 inches in maximum dimension.

Backfill of all exterior and interior trenches should be placed in thin lifts of appropriate thickness and mechanically compacted to achieve a relative compaction of not less than 90 percent throughout, based on ASTM: D1557. Care should be taken not to damage utility lines during compaction.

Utility trenches should not be located within the influence of footings. This is defined as a zone located below the footing and a line sloping at an inclination of 1:1 (horizontal to vertical) outward from the outside edge of footings. If utility lines are located within the zone of footings, the backfill should be compacted to a minimum 95 percent relative compaction or slurry backfilled (minimum 1-1/2 sack cement-sand mix).

Trenches greater than 4 feet in depth should be shored or sloped back as required by the local regulatory agency, the State of California Division of Industrial Safety Construction Safety Orders, and Federal OSHA requirements.

Utility trench points of connection / entryways into the residence should be appropriately sealed and cut-off to prevent moisture / free-water intrusion into the structure.

Site Drainage

It should be noted that potential problems may develop when drainage is altered through construction of retaining walls, paved walkways, and patios. Conditions which will lead to ground saturation must be avoided:

All roof and surface drainage should be directed away from structures and their appurtenances to approved drainage facilities. Ponding of water should be avoided. For graded soil areas, a minimum gradient of 5 percent away from structures should be maintained.

The recommended drainage patterns should be established at the time of fine grading and maintained throughout the life of the structure or, if altered, should be replaced with a properly designed area drain system.

Irrigation activities at the site should be monitored and controlled to prevent over-watering. Planter areas adjacent to structures should be avoided. If utilized, such planters should include measures to contain irrigation water and prevent moisture migration into walls and under foundations and slabs-on-grade.

Site drainage should also be designed, constructed, and maintained in accordance with appropriate City, County, State, and other jurisdictional requirements.

Landscape, Irrigation and Maintenance

General guidelines for landscape, irrigation and maintenance are shown below:

- Landscape planting should consist of appropriate drought resistant vegetation as recommended by the Landscape Architect. Landscape irrigation should minimize soil moisture variation and should be properly maintained.
- Trees / large shrubs with aggressive root systems should be avoided near structures and slopes.
- The property owner is responsible for proper irrigation and for maintenance and repair of installed irrigation systems. Leaks should be repaired immediately. Sprinklers should be adjusted to provide maximum coverage with a minimum of water usage and overlap. Overwatering with consequent excessive runoff and ground saturation must be avoided.
- If automatic sprinkler systems are installed, their use must be adjusted to account for natural rainfall conditions.
- All interceptor ditches, drainage terraces, down-drains, and any other drainage devices that are installed must be maintained and cleaned.
- Water must not be allowed to flow over constructed or natural slopes. This may require the construction of berms or ditches along the top of slopes, if such devices are not in place.
- With regard to foundation and slab / pavement performance adjacent to landscape areas, a key to maximum performance is landscaping and irrigation which minimizes soil moisture fluctuation over time. Avoiding saturation and ponding is also an important consideration. Diligent attention to maintenance is critical to adequate long-term performance.

Plan Review, Observations, and Testing

There are numerous geotechnical and engineering geologic conditions, phenomena, and issues present that will have considerable influence on the design, construction, and long-term performance of the proposed development. Therefore, it is considered of high importance and prudence that this firm be retained throughout the design and construction process to provide appropriate geotechnical and geologic support, input, review, and documentation services to assist the design and construction team with accounting for these issues appropriately. It is critical that the geotechnical and engineering geologic recommendations be properly taken into account and understood by the parties involved, and the intent of the recommendations properly incorporated into the final design, construction, and long-term maintenance of the project. Major milestones / areas of applicability include:

- Foundation and Grading Plan Reviews;
- Earthwork, Grading, and Subterranean Excavations;
- Dewatering system installation and implementation;

- Subterranean level waterproofing installation and mat slab / retaining wall construction; and
- Subsurface / Underground Utilities Installation.

It is the responsibility of the owner / developer to ensure the findings of our studies and intents of our recommendations are forwarded to the appropriate consultants and contractors of the project – and that they are incorporated into the final plans and construction. This report and the recommendations provided in this report should be considered a part of the project plans / specifications.

LIMITATIONS

This report has been prepared for the exclusive use of the Julie Laughton Design Build and their design consultants relative to the design and construction of the proposed residence remodel/ addition. This report is not intended for other parties, and it may not contain sufficient information for other purposes. This report and the recommendations confirmed herein are made with the understanding that G3SoilWorks will be appropriately retained to assist with the design and construction team in proper interpretation, incorporation, and implementation of the intent of our report recommendations. Should a different firm be retained to perform the subsequent phases of design and construction, this report will be considered null and void.

The Owner or their representative should make sure that the information and preliminary recommendations presented in this report are brought to the attention of the Project Architect, Project Civil, and Project Structural Engineer and made part of the project plans. It is the responsibility of the contractor performing to ensure that the subject work is performed in accordance with the project plans / specifications and intent of the recommendations provided herein as part of the final construction.

This office should be provided with final grading and foundation plans for review to enable us to confirm the preliminary recommendations and update the report as necessary. We reserve the right to modify our recommendations, as appropriate, to better accommodate actual conditions and/or means and methods employed by the contractor performing the work.

The findings contained in this report are based upon our evaluation and interpretation of the information obtained from limited borings and the results of the laboratory testing and engineering analysis. The opinions and recommendations provided were based on the assumption of the geotechnical conditions, which exist across the site, are similar to those observed in the test excavations. The conditions and characteristics of the sub-surface materials at locations and depth other than those excavated and observed may be different and no representations are made as to their quality and engineering properties. Based on our experience with similar sites, some variability and unanticipated conditions may be present, and some degree of "as-grading" is anticipated to be warranted to appropriately address these conditions and to meet the intent of the recommendations presented herein. As such, many of the overexcavation, embedment, and replacement issues, based on actual exposed conditions, may be at odds with the generalized considerations made herein. These issues and conditions

should be appropriately evaluated / addressed by this firm on a case-by-case basis at the time the work is performed – and the resulting recommendations and refinements reported in a final as-graded report documenting the geotechnical aspects of the project work.

Should any conditions encountered during construction differ from those described herein, this office should be contacted immediately for evaluation of the actual conditions and for appropriate recommendations prior to continuation of work.

The findings and recommendations presented herein were developed in accordance with generally accepted professional engineering principles and local practice in the field of geologic and geotechnical engineering and reflect our best professional judgment. We make no other warranty, either express or implied.

This report is subject to review by the controlling authorities.

CLOSURE

If you have any questions, or require additional information, please contact the undersigned.

Respectfully submitted,

G3SoilWorks, Inc.





Attachments: List of Selected References

- Figure 1: Site Location Map
- Figure 4: Geologic Map
- Figure 5: Boring Location Map
- Figure 6: Fault Map
- Appendix A: Geotechnical Boring Logs
- Appendix B: Laboratory Testing Results
- Appendix C: ASCE 7-16 Seismic Design Parameters
- Appendix D: Liquefaction Analysis Results

LIST OF SELECTED REFERENCES

- Toal Engineering, Inc., Precise Grading Plan for Smith Residence, Lot 8, Block 16, Section B, Newport Beach, , Newport Beach, CA, Sheets C-1 through C-4, Job No. 19204, dated May 6, 2021.
- Julie Laughton Designer Builder, Architectural Plan Sheets A0.1-A0.2 and A1-A10, Smith Residence, New Three Story Single Family Residence, Avenue, Newport Beach, California, 92663, dated November 16, 2020.
- 3) American Geotechnical, Inc., Preliminary Geotechnical Investigation, Proposed residential development, , Newport Beach, California, File No. 34165-01, dated May 5, 2020.
- 4) American Geotechnical, Inc., Addendum, Oceanfront Project Proposed residential development, , Newport Beach, California, File No. 34165-01, dated July 9, 2020.
- 5) American Geotechnical, Inc., Updated Report of Coastal Hazards Analyses, Proposed residential development, , Newport Beach, California, File No. 34165-02, dated November 18, 2020.
- Burke Structural Engineers, Foundation Plan Sheets S1.0, S2.0, and SD-1.0, Julie Laughton, Smith Residence, , Newport Beach, California, 92663, Job No. 19155, dated March 10, 2020, revised plan sheets received April 15, 2021.
- Advanced Geosolutions, Inc., Deep Soil Mixing, Newport Beach, California, Plan Sheets DSM-1, DSM-2, and DSM-3, and Results for Design Section 0: Base Model, Project No. L21-1950, dated June 21, 2021.
- Morton, P.K. and F.K. Miller, 2006, Geologic Map of the San Bernardino and Santa Ana 30' x 60' quadrangles, U.S. Geological Survey Open-File Report 2006-1217, Online Version 1.0, prepared in cooperation with California Geological Survey.
- Barrows, A.G., 1970, A Review of the Geology and Earthquake History of the Newport-Inglewood Structural Zone, Southern California, California Division of Mines and Geology Special Report 114.
- Trifunac, M.D., 2003, Nonlinear soil response as a natural passive isolation mechanism> Paper II. The 1933, Long Beach, California earthquake. Soil Dynamics and Earthquake Engineering 23, 549-562.
- 11) California Emergency Management Agency, et al., Tsunami inundation Map for Emergency Planning, Laguna Beach Quadrangle, State of California, County of Orange, dated March 15, 2009.

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10 50

0ft 25 100ft

EXPLANATION Approximate Property





Qe Very young eolian deposits

Geologic Map	Proj. No. 1- 1183	+VOF 2021	G ₃ SoilWorks	350 Fischer Ave. Front Costa Mesa, CA 92626
Newport Beach, CA Figur	4 Phone: (7 14) 668 5600 www.G3SoilWorks.com			
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Note: For illustrative purposes only. Boring Locations are approximate. Imagery from Google Earth.

EXPLANATION



Approximate Location of Proposed Boring / Temporary Monitoring Well

Approximate Limits of Project Site









APPENDIX A

GEOTECHNICAL BORING LOGS

PROJECT NO. DATE STARTED		<u>1-1183</u> 1/20/21	GEOTECHNICAL BORING	LOG BORING DESIG	SH G. GB-1	EET 1 OF 3
DATE FINISHED		1/20/21	GW DEPTH (FT) <u>10±</u>	LOGGED BY	ECH	
DRILLER		Martini	DRIVE WT. 140 lbs	NOTE		
TYPE OF DRILL R	IG <u>8</u> -	-in Hollow-s	em DROP <u>30 in</u>			
<u>-E<u></u>, ; щ</u>	%FT	_ಕಿರ್ದ			URE (%) (%)	ლ თ
DEP1 (fee) ELE' SAMPL	BLOWS	GROI SYMB	GEOTECHNICAL DESCRIPT	ΓΙΟΝ	MOISTI CONT. DRY (OTHE
BAG - - -	5	SP	Quaternary Beach Sand (Qb) and shallow / loca (undifferentiated) @ 0-5': Poorly-Graded SAND, light brownish gray, fine- to medium-grained, subangular to subrounded quartz-rich, occasional shell fragments and gravel 3/4'.	Illy-derived fill slightly moist, d grains , inclusions to –		
5 R -	12	SP 💆	@ 5': Poorly-Graded SAND, light yellowish brown moist, loose, fine- to medium- grained, quartz-rich, subrounded.	(2.5Y 6/3-6/4), subangular to	4.3 83.5	
_ SPT _	- 16	SP	@ 7.5': - Poorly-Graded SAND, medium-dense, Co horizon with shell hash, angular to subangular grain medium- grained above and below, quartz rich with mafic mineral grains.	barse SAND ns, fine- to n feldspar and 		
- R	52	SP	 20 10': - Poorly-Graded SAND, light olive brown, we fine-grained, very quartz- rich. Sample disturbed near tip - rings relatively undistured. 	et, dense, ź	21.7 102.6	
- _ SPT _	- 16	SP	@ 12.5': Fine - to medium - grained SAND with coa horizon, 1-2" thick in center, light olive brown with y brown, wet, medium-dense, generally subangular y and subrounded grain.	arse SAND /ellowish with angular	19.8	
- R	40	SP	@ 15': - No recovery.			
- SPT	- 10	SP	@ 17.5': - Poorly Graded SAND, wet, loose to med medium - to coarse - grained with fine Sand, subar abundant subrounded grains, angular shells to mor abundant, quartz rich with feldspar and lithic / heav grains (medium-grained.)	ium-dense, igular to derate y mineral	17.4	
				SAM	PLE	

S SPT (SPLIT SPOON) SAMPLE B BULK SAMPLE PROJECT NO. <u>1-1183</u>

GEOTECHNICAL BORING LOG

CONTRACT Share GS - Gran Size Analysis EI - Expansion Index CONS - Consolidation

PN: 1-1183 REPORT DATE: 06/28/2021

GEOTECHNICAL BORING LOG

PROJECT NO. <u>1-1183</u> DATE STARTED <u>1/20/21</u>		PROJECT NAME GROUND ELEV.(F <u>T)</u>	BORING DES	SIG	GB-1			
DATE F	INISHED		1/20/21	GW DEPTH (FT)	10±	LOGGED BY		ECH	
DRILLE	R		Martini	DRIVE WT.	140 lbs	NOTE			
TYPE C	OF DRILL	RIG 8	3-in Hollow-	stemDROP	30 in				
DEPTH (feet)	ELEV.	SAMFLE TYPE BLOWS/FT	GROUP SYMBOL	GEOTE	CHNICAL DESCR	RIPTION	MOISTURE CONT. (%)	DRY (pcf) DENSITY	OTHER TESTS
	R &	BAG 25	SP	@ 20': - No recovery. Predominantly medium - gr light brownish gray to light to be Poorly-Graded SAND subrounded with sparse sh	rained with fine and yellowish brown, we , medium- dense, s ell fragments throug	coarse SAND, t, cuttings appear ubangular to ghout.			
	SI	PT 31	SP	@ 22.5': Poorly-Graded SA fines, subangular to subrou lithics and shells.	ND, wet, dense, co unded, quartz rich w	parse-grained with ith tabular/coarse	14.6		
25	F	R 78	SP	@ 25': Poorly-Graded SAN medium - to coarse - graine lithics, mafic.	D, wet, very dense, ed, subangular, qua	predominanlty rtz, feldspar,	8.7	107.4	
	SPT 8	& BAG49	SP	@ 27.5': Poorly-Graded S/ medium - to coarse - graind lithics, mafic.	AND, wet, dense, p ed, subangular, qua	redominantly ırtz, feldspar,	22.3		
30	F	R 86	SP	@ 30': No Recovery.					
	SPT 8	& BAG39	SP	@ 32.5': Lower 2/3 - Poorly quartz SAND, upper discar grained.	r-Graded SAND, we ded - fine - to mediu	t, dense, fine ım - with coarse	27.6		
35	F	R 84	SP	@ 35': Partial recovery - sa Poorly-Graded SAND, gray medium - grained, quartz-ri	ample disturbed. vish brown, wet, ver ich micaceous.	y dense, fine - to -	26.8	96.0	

S SPT (SPLIT SPOON) SAMPLE PROJECTINO SAMPLE 1-1183

@ 37.5: No recovery. PROJECT NAME

SHEET 4 OF 3 15.1

	Bag: Cuttings appear to be, Poorly-Graded dense, predominantly medium with fine and subangular quartz feldspar minor lithics a	SAND, wet, very d coarse grains, and shells	
	Water Seepage Groundwater DS - Direct Shear GS - Grain Size Analysis EI - Expansion Index	REPORT DATE: 06	28/2021
	CONS - Consolidation	PN: 1-1183	
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GEOTECHNICAL BORING LOG

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PROJECT NO. DATE STARTED	<u>1-1183</u> 1/20/21	PROJECT NAME GROUND ELEV.(F <u>T)</u>		BORING DESIG.	GB-1
DATE FINISHED	1/20/21	GW DEPTH (FT)	10±	LOGGED BY	ECH
DRILLER	Martini	DRIVE WT.	140 lbs	NOTE	
TYPE OF DRILL RIG	8-in Hollow-stem	DROP	30 in		

DEPTH (feet)	ELEV.	SAMPLE TYPE	BLOWS/FT	GBQHBOL	GEOTECHNICAL DESC	CRIPTION	MOLSTURE	DRY((ggl)ry	OTHER TESTS
		SPT	62	SP	@ 40': Poorly-Graded SAND., wet, very dens Top 6": Medium-grained. Botton 6": Coarse-grained. Total depth = 41.5'; Groundwater encountered @ 6.5'±; 2-inch diameter, sch40 PVC monitoring well Casing = solid from 0-15' and 0.020-inch slot -Filter pack = #2/12 Sand from 13-40 feet; -Transition seal = bentonite pellets 10-13 feet -Annular sea = bentonite chips to ground su -8-inch Morrison well cover set in 2-foot x 2-f	was set; ted from 15-40 feet. t; fface; and oot concrete pad.	18.8 KS	50 Fiscl iosta Me hone: (7 www.G35	ner Ave. Front sa, CA 92626 14) 668 5600 oilWorks com
S <u>AM</u> F R	LE TYI	PES: (DRIVE) SAM	PLE	Water Seepage Groundwater				

APPENDIX B

LABORATORY TESTING RESULTS

LABORATORY TESTING RESULTS

The samples obtained during the field investigation were transported to the laboratory for testing and analysis. The results of tests performed on selected samples and the test procedures are summarized below.

Dry Density and Moisture Content

Field dry density and moisture contents of undisturbed soils samples retained in 2 3/8–inch inside diameter by one-inch height rings were determined, and moisture test results were obtained for the small bulk samples. Dry density and moisture content testing were performed in accordance with ASTM D2937 and ASTM D2216, respectively. The test results are posted on the Geotechnical Boring Logs in Appendix A.

Maximum Dry Density and Optimum Moisture Content

Maximum dry density and optimum moisture content test was performed on the submitted bulk soil samples in accordance with ASTM: D 1557. The results are shown below:

Sample Identification	Maximum Dry Density (pcf)	Optimum Moisture Content (%)				
GB-1 @ 0-5'	108.5	9.5				

Sulfate Content

Selected soil samples were tested for soluble sulfate content in accordance with the Hach method. The test results are shown below.

Sample Identification	Water Soluble Sulfate in Soil (ppm)	Sulfate Exposure (ACI 318-08, Table 4.2.1)
GB-1 @ 0-5'	49	SO

Direct Shear

Direct shear tests were performed on representative, relatively undisturbed soil samples with a direct shear machine of the strain-controlled type in which the rate of strain is 0.01 inches per minute. The soil specimens were soaked in a confined state prior to shearing and was sheared under varied normal loads ranging from 1.0 ksf to 4.0 ksf. The test results are plotted on Figures S-1 through S-4.

Consolidation

Consolidation tests was performed on samples identified as GB-1 @ 5 feet, 10 feet, and 25 feet. The test specimens were initially loaded to 0.2 tons per square foot and soaked during the test. Progressive loading was then applied to a maximum of 3.2 tons per square foot. Loading was then reduced to determine rebound characteristics. The consolidation tests are presented on Figures C-1 through C-3.

Sieve Analysis Test

Particle size analyses were performed in accordance with ASTM D442. The test results are presented on Plate A and Plate B.











Boring	Depth(ft.)	Dry Density	in situ Moist.	-200 sieve	Group Symbol	Soil Description
GB-1	5.0	83.5	4.3		SP	, Newport Beach

WATER ADDED AT .8 TSF.

FIGURE C-1 CONSOLIDATION CURVE PN:1-1183 REPORT DATE: 06/28/2021

FIG. C-1

COMPRESSIVE STRESS IN TSF





FIGURE C-3

CONSOLIDATION CURVE

PN:1-1183 REPORT DATE: 06/28/2021

					AS	TM SIE	VE DE	SIGN	ATION												
	0	3"	1 1/2"	1" 3/4'	" 1/2"	3/8" #	1 4	#8	#16	#30	#50	#100	#200								100
	10																				90
	20																				80
	30																				70
FAINED	40																				60
ENT RE	50																				50
PERC	60																				40
	70																				30
	80																				20
	90																				10
	100 100).0			10).0			1.0			0.	.1		.01			.001			0 .0001
			G	RAVE	ΞL		COAR	SE	MEDI	SAND JM		FINE		SIL	Т		CLAY		со	LLOIDS	
Sym	ibol Br	oring or French GB-1	Depth (ft.) 32.50	¹ L.I	L. P	P.L. P.	.I. %F #20	Passing 00 sieve	Group Symbo	I	٢	Typical I	Names			GF	RAIN S	SIZE D	ISTRI	BUTION	I

PERCENT PASSING

GB-1 35.00

GB-1

37.50

GB-1 40.00



● X ▲ ★

	ASTM SIEVE DESIGNATION										
1 1/2"	1" 3/4"	1/2"	3/8"	#4	#8	#16	#30	#50	#100	#200	

10	90
20	80
30	70
40	60
50	50
60	40

100

PERCENT PASSING

70						30
80						20
90						10
100 100.0	10.0	1.0	0.1	.01	.001	0 .0001

			CD				SAND						
	GRAVEL		COARSE	MEDIUM	FIN	IE	SILI	CLAY	COLLOIDS				
Symbol	Borir Trei GB GB	ng or nch 3-1 3-1	Depth (ft.) 12.50 17.50 22.50	L.L.	P.L.	P.I.	% Passi #200 sie	ng Group ve Symbol	Тур	oical Nam	nes	GRAIN SIZE	DISTRIBUTION

GB-1 25.00

3"

0

PERCENT RETAINED



APPENDIX C

ASCE 7-16 SEISMIC DESIGN PARAMETERS



Search Information

Address:	
Coordinates:	33.6067346, -117.9230466
Elevation:	12 ft
Timestamp:	2021-05-11T20:48:40.726Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	II

D-default



Basic Parameters

Site Class:

Name	Value	Description
SS	1.39	MCE _R ground motion (period=0.2s)
S ₁	0.494	MCE _R ground motion (period=1.0s)
S _{MS}	1.668	Site-modified spectral acceleration value
S _{M1}	* null	Site-modified spectral acceleration value
S _{DS}	1.112	Numeric seismic design value at 0.2s SA
S _{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

□ Additional Information

Name	Value	Description
SDC	* null	Seismic design category
Fa	1.2	Site amplification factor at 0.2s
Fv	* null	Site amplification factor at 1.0s
CRS	0.904	Coefficient of risk (0.2s)
CR ₁	0.918	Coefficient of risk (1.0s)
PGA	0.609	MCE _G peak ground acceleration
F _{PGA}	1.2	Site amplification factor at PGA
PGA _M	0.731	Site modified peak ground acceleration

TL	8	Long-period transition period (s)
SsRT	1.39	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.537	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.619	Factored deterministic acceleration value (0.2s)
S1RT	0.494	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.539	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.823	Factored deterministic acceleration value (1.0s)
PGAd	1.056	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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Newport Beach, California

APPENDIX D

LIQUEFACTION ANALYSIS RESULTS



****** LIQUEFACTION ANALYSIS SUMMARY Copyright by CivilTech Software www.civiltech.com ******* Font: Courier New, Regular, Size 8 is recommended for this report. Licensed to , 6/28/2021 4:29:43 PM Input File Name: S:\PROJECTS\1000s GEOTECH PROJECTS\1-1183 \Calcs\Liquefaction\1-1183 GB-1 (G3 ONLY).liq Title: 1-1183 GB-1 Subtitle: Surface Elev.= Hole No.=GB-1 Depth of Hole= 40.00 ft Water Table during Earthquake= 6.00 ft Water Table during In-Situ Testing= 7.00 ft Max. Acceleration= 0.73 g Earthquake Magnitude= 7.50 Input Data: Surface Elev.= Hole No.=GB-1 Depth of Hole=40.00 ft Water Table during Earthquake= 6.00 ft Water Table during In-Situ Testing= 7.00 ft Max. Acceleration=0.73 g Earthquake Magnitude=7.50 No-Liquefiable Soils: CL, OL are Non-Liq. Soil 1. SPT or BPT Calculation. 2. Settlement Analysis Method: Tokimatsu/Seed 3. Fines Correction for Liquefaction: Idriss/Seed 4. Fine Correction for Settlement: During Liquefaction* 5. Settlement Calculation in: All zones* 6. Hammer Energy Ratio, Ce = 1.257. Borehole Diameter, Cb = 18. Sampling Method, Cs = 19. User request factor of safety (apply to CSR) , User= 1 Plot one CSR curve (fs1=User) 10. Use Curve Smoothing: Yes* * Recommended Options In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.00	8.00	87.10	0.00
5.00	8.00	87.10	0.00
7.50	16.00	87.10	0.00
10.00	33.00	124.90	0.00
12.50	16.00	124.90	1.70
15.00	25.00	124.90	0.40
17.50	10.00	124.90	0.40
20.00	18.00	124.90	0.40
22.50	31.00	124.90	1.90
25.00	49.00	116.70	6.00
27.50	49.00	116.70	5.10
30.00	54.00	116.70	5.10
32.50	39.00	116.70	6.70
35.00	53.00	121.70	7.10
37.50	60.00	121.70	1.30
40.00	62.00	121.70	3.30

Output Results:

Settlement of Saturated Sands=1.30 in. Settlement of Unsaturated Sands=0.76 in. Total Settlement of Saturated and Unsaturated Sands=2.05 in. Differential Settlement=1.027 to 1.356 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	0.14	0.48	5.00	1.30	0.76	2.05
0.05	0.14	0.48	5.00	1.30	0.76	2.05
0.10	0.14	0.48	5.00	1.30	0.76	2.05
0.15	0.14	0.47	5.00	1.30	0.76	2.05
0.20	0.14	0.47	5.00	1.30	0.76	2.05
0.25	0.14	0.47	5.00	1.30	0.76	2.05
0.30	0.14	0.47	5.00	1.30	0.76	2.05
0.35	0.14	0.47	5.00	1.30	0.76	2.05
0.40	0.14	0.47	5.00	1.30	0.76	2.05
0.45	0.14	0.47	5.00	1.30	0.76	2.05
0.50	0.14	0.47	5.00	1.30	0.76	2.05
0.55	0.14	0.47	5.00	1.30	0.76	2.05
0.60	0.14	0.47	5.00	1.30	0.76	2.05
0.65	0.14	0.47	5.00	1.30	0.75	2.05
0.70	0.14	0.47	5.00	1.30	0.75	2.05
0.75	0.14	0.47	5.00	1.30	0.75	2.05
0.80	0.14	0.47	5.00	1.30	0.75	2.05
0.85	0.14	0.47	5.00	1.30	0.75	2.05
0.90	0.14	0.47	5.00	1.30	0.75	2.05
0.95	0.14	0.47	5.00	1.30	0.75	2.05

1.00	0.14	0.47	5.00	1.30	0.75	2.05
1.05	0.14	0.47	5.00	1.30	0.75	2.05
1.10	0.14	0.47	5.00	1.30	0.75	2.05
1.15	0.14	0.47	5.00	1.30	0.75	2.05
1.20	0.14	0.47	5.00	1.30	0.75	2.05
1.25	0.14	0.47	5.00	1.30	0.75	2.05
1.30	0.14	0.47	5.00	1.30	0.75	2.05
1.35	0.14	0.47	5.00	1.30	0.75	2.04
1.40	0.14	0.47	5.00	1.30	0.75	2.04
1.45	0.14	0.47	5.00	1.30	0.75	2.04
1.50	0.14	0.47	5.00	1.30	0.75	2.04
1.55	0.14	0.47	5.00	1.30	0.75	2.04
1.60	0.14	0.47	5.00	1.30	0.74	2.04
1.65	0.14	0.47	5.00	1.30	0.74	2.04
1 70	0 14	0.17 0.47	5 00	1 30	0.74	2 04
1 75	0 14	0.17	5 00	1 30	0.74	2.01
1 80	0.14	0.47	5 00	1 30	0.74 0.74	2.04
1 95	0.14	0.47	5.00	1 30	0.74	2.04
1 00	0.14	0.47	5.00	1 30	0.74	2.04
1 05	0.14	0.47	5.00	1 20	0.74	2.04
2 00	0.14	0.47	5.00	1 20	0.74	2.04
2.00	0.14	0.47	5.00	1 20	0.74	2.04
2.05	0.14	0.47	5.00	1 20	0.74	2.04
2.10	0.14	0.47	5.00	1.50	0.74	2.05
2.15	0.14	0.47	5.00	1.30	0.74	2.03
2.20	0.14	0.47	5.00	1.30	0.74	2.03
2.25	0.14	0.47	5.00	1.30	0.74	2.03
2.30	0.14	0.4/	5.00	1.30	0.73	2.03
2.35	0.14	0.4/	5.00	1.30	0.73	2.03
2.40	0.14	0.4/	5.00	1.30	0.73	2.03
2.45	0.14	0.47	5.00	1.30	0.73	2.03
2.50	0.14	0.47	5.00	1.30	0.73	2.03
2.55	0.14	0.47	5.00	1.30	0.73	2.03
2.60	0.14	0.47	5.00	1.30	0.73	2.03
2.65	0.14	0.47	5.00	1.30	0.73	2.03
2.70	0.14	0.47	5.00	1.30	0.73	2.02
2.75	0.14	0.47	5.00	1.30	0.73	2.02
2.80	0.14	0.47	5.00	1.30	0.73	2.02
2.85	0.14	0.47	5.00	1.30	0.72	2.02
2.90	0.14	0.47	5.00	1.30	0.72	2.02
2.95	0.14	0.47	5.00	1.30	0.72	2.02
3.00	0.14	0.47	5.00	1.30	0.72	2.02
3.05	0.14	0.47	5.00	1.30	0.72	2.02
3.10	0.14	0.47	5.00	1.30	0.72	2.01
3.15	0.14	0.47	5.00	1.30	0.72	2.01
3.20	0.14	0.47	5.00	1.30	0.71	2.01
3.25	0.14	0.47	5.00	1.30	0.71	2.01
3.30	0.14	0.47	5.00	1.30	0.71	2.01
3.35	0.14	0.47	5.00	1.30	0.71	2.00
3.40	0.14	0.47	5.00	1.30	0.70	2.00
3.45	0.14	0.47	5.00	1.30	0.70	2.00

3.50	0.14	0.47	5.00	1.30	0.70	2.00
3.55	0.14	0.47	5.00	1.30	0.69	1.99
3.60	0.14	0.47	5.00	1.30	0.69	1.99
3.65	0.14	0.47	5.00	1.30	0.69	1.98
3.70	0.14	0.47	5.00	1.30	0.68	1.98
3.75	0.14	0.47	5.00	1.30	0.68	1.97
3.80	0.14	0.47	5.00	1.30	0.67	1.97
3.85	0.14	0.47	5.00	1.30	0.67	1.96
3.90	0.14	0.47	5.00	1.30	0.66	1.96
3 95	0 14	0 47	5 00	1 30	0.65	1 95
4 99	0 14	0 47	5 00	1 30	0.63	1 94
4.00 1 05	0.14	0.47 0.17	5 00	1 30	0.0 4 0.61	1 93
1 10	0.14	0.47	5.00	1 20	0.04	1 02
4.10	0.14	0.47	5.00	1.30	0.05	1 01
4.15	0.14	0.47	5.00	1.30	0.61	1.91
4.20	0.14	0.47	5.00	1.30	0.60	1.90
4.25	0.14	0.47	5.00	1.30	0.59	1.88
4.30	0.14	0.4/	5.00	1.30	0.57	1.8/
4.35	0.14	0.47	5.00	1.30	0.55	1.85
4.40	0.14	0.47	5.00	1.30	0.53	1.82
4.45	0.14	0.47	5.00	1.30	0.51	1.80
4.50	0.14	0.47	5.00	1.30	0.48	1.78
4.55	0.14	0.47	5.00	1.30	0.46	1.76
4.60	0.14	0.47	5.00	1.30	0.44	1.74
4.65	0.14	0.47	5.00	1.30	0.42	1.71
4.70	0.14	0.47	5.00	1.30	0.39	1.69
4.75	0.14	0.47	5.00	1.30	0.37	1.67
4.80	0.14	0.47	5.00	1.30	0.35	1.65
4.85	0.14	0.47	5.00	1.30	0.33	1.62
4.90	0.14	0.47	5.00	1.30	0.30	1.60
4.95	0.14	0.47	5.00	1.30	0.28	1.58
5 00	0 14	0 17 0 17	5 00	1 30	0.20	1 56
5.00	0.14	0.47	5 00	1 30	0.20	1 53
5 10	0.14	0.47 0.17	5 00	1 30	0.2 4 0.27	1 51
5.10	0.14	0.47	5.00	1 20	0.22	1 /0
5.15	0.15	0.47	5.00	1.30	0.20	1 47
5.20	0.15	0.47	5.00	1 20	0.17	1,47
5.25	0.15	0.47	5.00	1.30	0.15	1.45
5.30	0.15	0.47	5.00	1.30	0.13	1.43
5.35	0.16	0.4/	5.00	1.30	0.12	1.41
5.40	0.16	0.4/	5.00	1.30	0.10	1.39
5.45	0.16	0.47	5.00	1.30	0.08	1.37
5.50	0.17	0.47	5.00	1.30	0.06	1.36
5.55	0.17	0.47	5.00	1.30	0.04	1.34
5.60	0.17	0.47	5.00	1.30	0.02	1.32
5.65	0.17	0.47	5.00	1.30	0.01	1.30
5.70	0.18	0.47	5.00	1.30	0.01	1.30
5.75	0.18	0.47	5.00	1.30	0.01	1.30
5.80	0.18	0.47	5.00	1.30	0.00	1.30
5.85	0.18	0.47	5.00	1.30	0.00	1.30
5.90	0.19	0.47	5.00	1.30	0.00	1.30
5.95	0.19	0.47	5.00	1.30	0.00	1.30
6.00 0.19 0.47 0.41^* 1.30 0.00 6.05 0.20 0.47 0.41^* 1.29 0.00 6.15 0.20 0.47 0.42^* 1.27 0.00 6.20 0.20 0.48 0.42^* 1.26 0.00 6.25 0.21 0.48 0.42^* 1.26 0.00 6.30 0.21 0.48 0.43^* 1.24 0.00 6.35 0.21 0.49 0.44^* 1.22 0.00 6.45 0.22 0.49 0.44^* 1.22 0.00 6.45 0.22 0.50 0.45^* 1.20 0.00 6.45 0.22 0.50 0.45^* 1.19 0.00 6.55 0.22 0.50 0.45^* 1.18 0.00 6.60 0.23 0.50 0.45^* 1.18 0.00 6.65 0.23 0.50 0.46^* 1.16 0.00 6.75 0.24 0.51 0.46^* 1.16 0.00 6.75 0.24 0.51 0.46^* 1.16 0.00 6.80 0.24 0.51 0.47^* 1.14 0.00 6.90 0.25 0.52 0.48^* 1.13 0.00 7.00 0.25 0.52 0.48^* 1.10 0.00 7.10 0.26 0.53 0.50^* 1.09 0.00 7.10 0.26 0.53 0.50^* 1.09 0.00 7.10 <th></th>						
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6.05 0.20 0.47 0.41^* 1.29 0.00 6.10 0.20 0.47 0.42^* 1.28 0.00 6.15 0.20 0.48 0.42^* 1.26 0.00 6.20 0.20 0.48 0.42^* 1.26 0.00 6.25 0.21 0.48 0.43^* 1.25 0.00 6.30 0.21 0.48 0.43^* 1.22 0.00 6.35 0.21 0.49 0.44^* 1.22 0.00 6.40 0.21 0.49 0.44^* 1.22 0.00 6.45 0.22 0.50 0.45^* 1.19 0.00 6.55 0.22 0.50 0.45^* 1.19 0.00 6.55 0.22 0.50 0.45^* 1.18 0.00 6.65 0.23 0.50 0.45^* 1.18 0.00 6.65 0.23 0.50 0.46^* 1.17 0.00 6.70 0.23 0.51 0.46^* 1.17 0.00 6.75 0.24 0.51 0.47^* 1.14 0.00 6.75 0.24 0.51 0.47^* 1.14 0.00 6.95 0.25 0.52 0.48^* 1.13 0.00 7.00 0.25 0.52 0.48^* 1.10 0.00 7.00 0.25 0.52 0.48^* 1.10 0.00 7.25 0.27 0.53 0.50^* 1.09 0.00 7.26 <td>1.30</td>	1.30					
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6.35 0.21 0.49 $0.44*$ 1.23 0.00 6.40 0.21 0.49 $0.44*$ 1.22 0.00 6.45 0.22 0.50 $0.45*$ 1.20 0.00 6.50 0.22 0.50 $0.45*$ 1.19 0.00 6.60 0.23 0.50 $0.45*$ 1.19 0.00 6.60 0.23 0.50 $0.45*$ 1.18 0.00 6.65 0.23 0.50 $0.46*$ 1.17 0.00 6.70 0.23 0.51 $0.46*$ 1.16 0.00 6.70 0.23 0.51 $0.47*$ 1.15 0.00 6.80 0.24 0.51 $0.47*$ 1.14 0.00 6.85 0.24 0.51 $0.47*$ 1.14 0.00 6.90 0.25 0.52 $0.48*$ 1.13 0.00 7.00 0.25 0.52 $0.48*$ 1.13 0.00 7.00 0.25 0.52 $0.48*$ 1.10 0.00 7.10 0.26 0.53 $0.50*$ 1.09 0.00 7.20 0.27 0.53 $0.50*$ 1.09 0.00 7.30 0.27 0.54 $0.51*$ 1.06 0.00 7.40 0.28 0.54 $0.52*$ 1.06 0.00 7.55 0.30 0.55 $0.58*$ 1.04 0.00 7.55 0.30 0.55 $0.58*$ 1.04 0.00 7.70 0.33 <td< td=""><td>1.24</td></td<>	1.24					
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7.55 0.30 0.55 0.55^* 1.04 0.00 7.60 0.31 0.55 0.57^* 1.03 0.00 7.65 0.32 0.55 0.58^* 1.02 0.00 7.70 0.33 0.55 0.60^* 1.02 0.00 7.75 0.35 0.56 0.63^* 1.01 0.00 7.80 0.37 0.56 0.65^* 1.00 0.00 7.85 0.39 0.56 0.69^* 1.00 0.00 7.90 0.43 0.56 0.76^* 0.99 0.00 7.95 0.50 0.57 0.88^* 0.99 0.00 8.00 0.50 0.57 0.88^* 0.99 0.00 8.10 0.50 0.57 0.87^* 0.98 0.00 8.15 0.50 0.57 0.87^* 0.97 0.00 8.20 0.50 0.58 0.87^* 0.97 0.00	1.04					
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7.65 0.32 0.55 0.58^* 1.02 0.00 7.70 0.33 0.55 0.60^* 1.02 0.00 7.75 0.35 0.56 0.63^* 1.01 0.00 7.80 0.37 0.56 0.65^* 1.00 0.00 7.80 0.37 0.56 0.65^* 1.00 0.00 7.85 0.39 0.56 0.69^* 1.00 0.00 7.90 0.43 0.56 0.76^* 0.99 0.00 7.95 0.50 0.57 0.88^* 0.99 0.00 8.00 0.50 0.57 0.88^* 0.99 0.00 8.05 0.50 0.57 0.87^* 0.98 0.00 8.10 0.50 0.57 0.87^* 0.97 0.00 8.15 0.50 0.57 0.87^* 0.97 0.00 8.20 0.50 0.58 0.87^* 0.97 0.00	1.03					
7.70 0.33 0.55 0.60^* 1.02 0.00 7.75 0.35 0.56 0.63^* 1.01 0.00 7.80 0.37 0.56 0.65^* 1.00 0.00 7.85 0.39 0.56 0.69^* 1.00 0.00 7.90 0.43 0.56 0.76^* 0.99 0.00 7.95 0.50 0.57 0.88^* 0.99 0.00 8.00 0.50 0.57 0.88^* 0.99 0.00 8.10 0.50 0.57 0.88^* 0.98 0.00 8.15 0.50 0.57 0.87^* 0.98 0.00 8.15 0.50 0.57 0.87^* 0.97 0.00 8.20 0.50 0.58 0.87^* 0.97 0.00	1.02					
7.75 0.35 0.56 0.63^* 1.01 0.00 7.80 0.37 0.56 0.65^* 1.00 0.00 7.85 0.39 0.56 0.69^* 1.00 0.00 7.90 0.43 0.56 0.76^* 0.99 0.00 7.95 0.50 0.57 0.88^* 0.99 0.00 8.00 0.50 0.57 0.88^* 0.99 0.00 8.10 0.50 0.57 0.88^* 0.98 0.00 8.15 0.50 0.57 0.87^* 0.98 0.00 8.20 0.50 0.57 0.87^* 0.97 0.00	1.02					
7.80 0.37 0.56 0.65^* 1.00 0.00 7.85 0.39 0.56 0.69^* 1.00 0.00 7.90 0.43 0.56 0.76^* 0.99 0.00 7.95 0.50 0.57 0.88^* 0.99 0.00 8.00 0.50 0.57 0.88^* 0.99 0.00 8.05 0.50 0.57 0.88^* 0.99 0.00 8.10 0.50 0.57 0.87^* 0.98 0.00 8.15 0.50 0.57 0.87^* 0.97 0.00 8.20 0.50 0.58 0.87^* 0.97 0.00	1.01					
7.850.390.560.69*1.000.007.900.430.560.76*0.990.007.950.500.570.88*0.990.008.000.500.570.88*0.990.008.050.500.570.88*0.990.008.100.500.570.88*0.980.008.150.500.570.87*0.980.008.200.500.580.87*0.970.00	1.00					
7.900.430.560.76*0.990.007.950.500.570.88*0.990.008.000.500.570.88*0.990.008.050.500.570.88*0.980.008.100.500.570.87*0.980.008.150.500.570.87*0.970.008.200.500.580.87*0.970.00	1.00					
7.950.500.570.88*0.990.008.000.500.570.88*0.990.008.050.500.570.88*0.980.008.100.500.570.87*0.980.008.150.500.570.87*0.970.008.200.500.580.87*0.970.00	0.99					
8.000.500.570.88*0.990.008.050.500.570.88*0.980.008.100.500.570.87*0.980.008.150.500.570.87*0.970.008.200.500.580.87*0.970.00	0.99					
8.05 0.50 0.57 0.88* 0.98 0.00 8.10 0.50 0.57 0.87* 0.98 0.00 8.15 0.50 0.57 0.87* 0.97 0.00 8.20 0.50 0.58 0.87* 0.97 0.00	0.99					
8.100.500.570.87*0.980.008.150.500.570.87*0.970.008.200.500.580.87*0.970.00	0.98					
8.150.500.570.87*0.970.008.200.500.580.87*0.970.00	0.98					
8.20 0.50 0.58 0.87* 0.97 0.00	0.97					
	0.97					
8.25 0.50 0.58 0.86* 0.97 0.00	0.97					
8.30 0.50 0.58 0.86* 0.97 0.00	0.97					
8.35 0.50 0.58 0.86* 0.97 0.00	0.97					
8.40 0.50 0.58 0.86* 0.97 0.00	0.97					
8.45 0.50 0.59 0.85* 0.97 0.00	0.97					

8 50	0 50	0 50	0 85*	0 07	0 00	0 Q7
0.50	0.50	0.59	0.05	0.97	0.00	0.97
0.55	0.50	0.39	0.03	0.97	0.00	0.97
0.00	0.50	0.59	0.84*	0.97	0.00	0.97
8.05	0.50	0.59	0.84*	0.97	0.00	0.97
8.70	0.50	0.60	0.84*	0.97	0.00	0.97
8.75	0.50	0.60	0.84*	0.97	0.00	0.9/
8.80	0.50	0.60	0.83*	0.97	0.00	0.97
8.85	0.50	0.60	0.83*	0.97	0.00	0.97
8.90	0.50	0.60	0.83*	0.97	0.00	0.97
8.95	0.50	0.61	0.83*	0.97	0.00	0.97
9.00	0.50	0.61	0.82*	0.97	0.00	0.97
9.05	0.50	0.61	0.82*	0.97	0.00	0.97
9.10	0.50	0.61	0.82*	0.97	0.00	0.97
9.15	0.50	0.61	0.82*	0.97	0.00	0.97
9.20	0.50	0.61	0.81*	0.97	0.00	0.97
9.25	0.50	0.62	0.81*	0.97	0.00	0.97
9.30	0.50	0.62	0.81*	0.97	0.00	0.97
9.35	0.50	0.62	0.81*	0.97	0.00	0.97
9.40	0.50	0.62	0.81*	0.97	0.00	0.97
9 45	0.50	0.62	0.01	0.97 0 97	0.00 0 00	0 97
9 50	0.50 0.50	0.02	0.00	0.57 0 97	0.00	0.J/ 0 97
0 55	0.50	0.02	0.00	0.57	0.00	0.57
9.55	0.50	0.05	0.00*	0.97	0.00	0.97
9.00	0.50	0.03	0.00*	0.97	0.00	0.97
9.05	0.50	0.63	0.80*	0.97	0.00	0.97
9.70	0.50	0.63	0.79*	0.97	0.00	0.97
9.75	0.50	0.63	0.79*	0.97	0.00	0.97
9.80	0.50	0.63	0.79*	0.9/	0.00	0.9/
9.85	0.50	0.63	0.79*	0.97	0.00	0.97
9.90	0.50	0.63	0.79*	0.97	0.00	0.97
9.95	0.50	0.64	0.79*	0.97	0.00	0.97
10.00	0.50	0.64	0.78*	0.97	0.00	0.97
10.05	0.50	0.64	0.78*	0.97	0.00	0.97
10.10	0.50	0.64	0.78*	0.97	0.00	0.97
10.15	0.50	0.64	0.78*	0.97	0.00	0.97
10.20	0.50	0.64	0.78*	0.97	0.00	0.97
10.25	0.50	0.64	0.78*	0.97	0.00	0.97
10.30	0.50	0.64	0.77*	0.97	0.00	0.97
10.35	0.50	0.65	0.77*	0.97	0.00	0.97
10.40	0.50	0.65	0.77*	0.97	0.00	0.97
10.45	0.50	0.65	0.77*	0.97	0.00	0.97
10.50	0.50	0.65	0.77*	0.97	0.00	0.97
10.50	0.50	0.65	0.77*	0.97 0 97	0.00 0 00	0 97
10.55	0.50 0 50	0.05	0.77*	0.37 0 97	0.00	0.97 0 97
10.00	0.50 0.50	0.05	0.77*	0.J7 0 97	0.00	0.J/ 0 97
10.05	0.50	0.05	0.77	0.07	0.00	0.07
10.70	0.50	0.03	0.70*	0.97	0.00	0.97
10.00	0.50	0.00	0.70°	0.97	0.00	0.97
10.00	0.50	0.00	0./b ⁺ 0.76*	0.97	0.00	0.97
10.02	0.50	0.66	Ø./b [↑]	0.97	0.00	0.9/
10.90	0.50	0.66	0./6*	0.9/	0.00	0.97
10.95	0.50	0.66	0./6*	0.9/	0.00	0.97

11.00	0.50	0.66	0.76*	0.97	0.00	0.97
11.05	0.50	0.66	0.76*	0.97	0.00	0.97
11,10	0.50	0.66	0.75*	0.97	0.00	0.97
11 15	0.50	0.00	0.75*	0.97 0 97	0.00	0.97 0.97
11 20	0.50	0.00	0.75*	0.97 0 97	0.00	0.97 0.97
11 25	0.50	0.00	0.75*	0.37 0 97	0.00	0.97 0 97
11 20	0.50	0.07	0.75	0.57	0.00	0.57
11 25	0.50	0.07	0.75	0.97	0.00	0.97
11.35	0.50	0.07	0.75*	0.97	0.00	0.97
11.40	0.50	0.67	0.75*	0.97	0.00	0.97
11.45	0.50	0.67	0.75*	0.97	0.00	0.97
11.50	0.50	0.67	0.75*	0.97	0.00	0.97
11.55	0.50	0.6/	0.74*	0.97	0.00	0.97
11.60	0.50	0.6/	0.74*	0.97	0.00	0.97
11.65	0.50	0.67	0.74*	0.97	0.00	0.97
11.70	0.50	0.67	0.74*	0.97	0.00	0.97
11.75	0.50	0.68	0.74*	0.97	0.00	0.97
11.80	0.50	0.68	0.74*	0.97	0.00	0.97
11.85	0.50	0.68	0.74*	0.97	0.00	0.97
11.90	0.50	0.68	0.74*	0.97	0.00	0.97
11.95	0.50	0.68	0.74*	0.97	0.00	0.97
12.00	0.50	0.68	0.74*	0.96	0.00	0.96
12.05	0.50	0.68	0.73*	0.96	0.00	0.96
12.10	0.50	0.68	0.73*	0.96	0.00	0.96
12.15	0.50	0.68	0.73*	0.96	0.00	0.96
12.20	0.45	0.68	0.65*	0.95	0.00	0.95
12.25	0.39	0.68	0.57*	0.95	0.00	0.95
12.30	0.36	0.69	0.53*	0.94	0.00	0.94
12.35	0.35	0.69	0.50*	0.94	0.00	0.94
12.40	0.33	0.69	0.48*	0.93	0.00	0.93
12.45	0.32	0.69	0.46*	0.92	0.00	0.92
12.50	0.30	0.69	0.44*	0.92	0.00	0.92
12.55	0.31	0.69	0.45*	0.91	0.00	0.91
12.60	0.31	0.69	0.46*	0.90	0.00	0.90
12.65	0.32	0.69	0.46*	0.90	0.00	0.90
12.70	0.32	0.69	0.47*	0.89	0.00	0.89
12.75	0.33	0.69	0.48*	0.89	0.00	0.89
12 80	0 34	0.69	0 49*	0 88	0.00	0 88
12.00	0.34	0.0J 0.69	0.49*	0.00 0 87	0.00	0.00 0.87
12.05	0.34	0.0J 0.69	0.45	0.07 0 87	0.00	0.07 0.87
12.90	0.35	0.0J 0 70	0.50	0.07	0.00 0 00	0.07
13 00	0.30	0.70	0.51	0.00	0.00	0.00
12 05	0.50	0.70	0.52*	0.00	0.00	0.00
12 10	0.57	0.70	0.54	0.05	0.00	0.07
12.10	0.30	0.70	0.55	0.04	0.00	0.04
12.12	0.40	0.70	0.57	0.04	0.00	0.04
13.20	0.41	0.70	0.59*	0.83	0.00	0.83
12.20	0.44	0.70	0.03™ 0.71*	6.03	0.00	6.83
12.30	0.50	0.70	0./⊥^	0.83	0.00	6.83
13.35	0.50	0.70	0./1*	0.82	0.00	0.82
13.40	0.50	0.70	0./1*	0.82	0.00	0.82
13.45	0.50	0.70	0./1↑	0.81	0.00	0.81

12 EQ	0 50	0 70	0 71*	A 01	0 00	A 01
12.50	0.50	0.70	0.71*	0.01	0.00	0.01
12.00	0.50	0.70	0.71*	0.01	0.00	0.01
13.60	0.50	0.70	0.71*	0.80	0.00	0.80
13.65	0.50	0.71	0.71*	0.80	0.00	0.80
13.70	0.50	0.71	0.71*	0.80	0.00	0.80
13.75	0.50	0.71	0.71*	0.79	0.00	0.79
13.80	0.50	0.71	0.71*	0.79	0.00	0.79
13.85	0.50	0.71	0.71*	0.79	0.00	0.79
13.90	0.50	0.71	0.71*	0.79	0.00	0.79
13.95	0.50	0.71	0.70*	0.78	0.00	0.78
14.00	0.50	0.71	0.70*	0.78	0.00	0.78
14.05	0.50	0.71	0.70*	0.78	0.00	0.78
14.10	0.50	0.71	0.70*	0.78	0.00	0.78
14.15	0.50	0.71	0.70*	0.78	0.00	0.78
14.20	0.50	0.71	0.70*	0.78	0.00	0.78
14.25	0.50	0.71	0.70*	0.78	0.00	0.78
14.30	0.50	0.71	0.70*	0.78	0.00	0.78
14.35	0.50	0.71	0.70*	0.77	0.00	0.77
14.40	0.50	0.71	0.70*	0.77	0.00	0.77
14 45	0.50	0 72	0 70*	0 77	0.00	0 77
14 50	0.50 0 50	0.72 0.72	0.70 0 70*	0.77 0 77	0.00	0.77 0 77
1/ 55	0.50	0.72	0.70*	0.77	0.00	0.77 0 77
14.55	0.50	0.72	0.70*	0.77	0.00	0.77
14.00	0.50	0.72	0.70*	0.77	0.00	0.77
14.05	0.50	0.72	0.70*	0.77	0.00	0.77
14.70	0.50	0.72	0.70*	0.77	0.00	0.77
14.75	0.50	0.72	0.70*	0.//	0.00	0.77
14.80	0.50	0.72	0.70*	0.//	0.00	0.77
14.85	0.50	0.72	0.69*	0.//	0.00	0.77
14.90	0.50	0.72	0.69*	0.77	0.00	0.77
14.95	0.50	0.72	0.69*	0.77	0.00	0.77
15.00	0.50	0.72	0.69*	0.77	0.00	0.77
15.05	0.50	0.72	0.69*	0.77	0.00	0.77
15.10	0.50	0.72	0.69*	0.77	0.00	0.77
15.15	0.50	0.72	0.69*	0.77	0.00	0.77
15.20	0.50	0.72	0.69*	0.77	0.00	0.77
15.25	0.50	0.72	0.69*	0.77	0.00	0.77
15.30	0.50	0.72	0.69*	0.77	0.00	0.77
15.35	0.50	0.72	0.69*	0.77	0.00	0.77
15.40	0.50	0.73	0.69*	0.77	0.00	0.77
15.45	0.50	0.73	0.69*	0.77	0.00	0.77
15.50	0.50	0.73	0.69*	0.77	0.00	0.77
15.55	0.50	0.73	0.69*	0.77	0.00	0.77
15.60	0.50	0.73	0.69*	0.77	0.00	0.77
15.65	0.50	0.73	0.69*	0.77	0.00	0.77
15 70	0.50	0 73	0 69*	0 77	0.00	0 77
15 75	0 50	0.75	0.69*	0 76	0.00 0 00	0.77 0.76
15 80	0.50 0 50	0.75 0 72	0.05	0.70 0 76	0.00 0 00	0.70 0 76
15 85	0.50	0.75 Q 72	0.05	0.70	0.00	0.70 0 76
15 00	0.50	0.75 Q 72	0.00	0.70	0.00	0.70
15 05	0.50	0.75 Q 72	0.00	0.70 0 76	0.00	0.70
T).2)	0.00	0./5	0.00	0./0	0.00	0.70

16.00	0.50	0.73	0.68*	0.75	0.00	0.75
16 05	0.50	0.73	0.68*	0.75	0.00 0 00	0.75
16 10	0.50	0.73	0.68*	0.75	0.00 0 00	0.75
16 15	0.50	0.75 0.73	0.00	0.7J 0.7/	0.00	0.75
16 20	0.72	0.75	0.50	0.74	0.00	0.74
16 25	0.50	0.73	0.32	0.74	0.00	0.74
10.25	0.50	0.73	0.49*	0.75	0.00	0.75
16.30	0.34	0.73	0.4/*	0.73	0.00	0.73
16.35	0.33	0.73	0.45*	0.72	0.00	0.72
16.40	0.32	0.73	0.43*	0.71	0.00	0.71
16.45	0.31	0.74	0.42*	0.71	0.00	0.71
16.50	0.30	0.74	0.41*	0.70	0.00	0.70
16.55	0.29	0.74	0.39*	0.70	0.00	0.70
16.60	0.28	0.74	0.38*	0.69	0.00	0.69
16.65	0.27	0.74	0.37*	0.68	0.00	0.68
16.70	0.26	0.74	0.36*	0.67	0.00	0.67
16.75	0.26	0.74	0.35*	0.67	0.00	0.67
16.80	0.25	0.74	0.34*	0.66	0.00	0.66
16.85	0.24	0.74	0.33*	0.65	0.00	0.65
16.90	0.24	0.74	0.32*	0.64	0.00	0.64
16.95	0.23	0.74	0.31*	0.63	0.00	0.63
17 00	0.23	0 74	0 30*	0 63	0.00 0 00	0.63
17 05	0.25	0.74 0 7/	0.30*	0.05	0.00	0.05
17 10	0.22	0.74	0.00	0.02	0.00	0.02
17 15	0.21	0.74	0.29*	0.01	0.00	0.01
17 20	0.21	0.74	0.28*	0.00	0.00	0.00
17.20	0.20	0.74	0.27*	0.59	0.00	0.59
17.25	0.20	0.74	0.2/*	0.58	0.00	0.58
17.30	0.19	0.74	0.26*	0.5/	0.00	0.5/
17.35	0.19	0.74	0.25*	0.56	0.00	0.56
17.40	0.18	0.74	0.24*	0.55	0.00	0.55
17.45	0.18	0.74	0.24*	0.54	0.00	0.54
17.50	0.17	0.74	0.23*	0.53	0.00	0.53
17.55	0.17	0.74	0.23*	0.52	0.00	0.52
17.60	0.18	0.74	0.24*	0.51	0.00	0.51
17.65	0.18	0.74	0.24*	0.49	0.00	0.49
17.70	0.18	0.74	0.24*	0.48	0.00	0.48
17.75	0.18	0.75	0.25*	0.47	0.00	0.47
17.80	0.19	0.75	0.25*	0.46	0.00	0.46
17.85	0.19	0.75	0.25*	0.45	0.00	0.45
17.90	0.19	0.75	0.25*	0.44	0.00	0.44
17.95	0.19	0.75	0.26*	0.43	0.00	0.43
18 00	0.19	0.75	0.20	0 42	0.00 0 00	0.13
18 05	0.10	0.75	0.20	0.42 0 /1	0.00	0.42 0 /1
10.05	0.20	0.75	0.20	0.41	0.00	0.41
10.10	0.20	0.75	0.27	0.40	0.00	0.40
10.10	0.20	0.75	0.27*	0.39	0.00	0.59
10.20	0.20	0.75	0.27*	0.00	0.00	0.50
10.25	0.21	0.75	0.28↑	0.3/	0.00	0.3/
18.30	0.21	0.75	0.28*	0.36	0.00	0.36
18.35	0.21	0.75	0.28*	0.35	0.00	0.35
18.40	0.21	0.75	0.29*	0.34	0.00	0.34
18.45	0.22	0.75	0.29*	0.34	0.00	0.34

18.50	0.22	0.75	0.29*	0.33	0.00	0.33
18.55	0.22	0.75	0.30*	0.32	0.00	0.32
18.60	0.22	0.75	0.30*	0.31	0.00	0.31
18.65	0.23	0.75	0.30*	0.30	0.00	0.30
18.70	0.23	0.75	0.31*	0.29	0.00	0.29
18.75	0.23	0.75	0.31*	0.28	0.00	0.28
18.80	0.24	0.75	0.31*	0.27	0.00	0.27
18 85	0.21	0.75	0.32*	0.27 0.27	0.00	0.27 0.27
18 90	0.24	0.75	0.32*	0.2/ 0.26	0.00	0.2/ 0.26
10.00	0.24	0.75	0.32*	0.20	0.00	0.20
10.00	0.24	0.75	0.32*	0.25	0.00	0.25
10.05	0.25	0.75	0.33*	0.24	0.00	0.24
10 10	0.25	0.75	0.33*	0.25	0.00	0.25
19.10	0.25	0.75	0.33	0.25	0.00	0.25
10 20	0.25	0.75	0.34	0.22	0.00	0.22
19.20	0.20	0.75	0.34*	0.21	0.00	0.21
19.25	0.26	0.75	0.35*	0.20	0.00	0.20
19.30	0.26	0.76	0.35*	0.19	0.00	0.19
19.35	0.27	0.76	0.35*	0.19	0.00	0.19
19.40	0.27	0.76	0.36*	0.18	0.00	0.18
19.45	0.27	0.76	0.36*	0.1/	0.00	0.1/
19.50	0.28	0.76	0.37*	0.16	0.00	0.16
19.55	0.28	0.76	0.37*	0.16	0.00	0.16
19.60	0.28	0.76	0.37*	0.15	0.00	0.15
19.65	0.29	0.76	0.38*	0.14	0.00	0.14
19.70	0.29	0.76	0.38*	0.14	0.00	0.14
19.75	0.29	0.76	0.39*	0.13	0.00	0.13
19.80	0.30	0.76	0.39*	0.12	0.00	0.12
19.85	0.30	0.76	0.40*	0.11	0.00	0.11
19.90	0.31	0.76	0.40*	0.11	0.00	0.11
19.95	0.31	0.76	0.41*	0.10	0.00	0.10
20.00	0.31	0.76	0.41*	0.09	0.00	0.09
20.05	0.32	0.76	0.42*	0.09	0.00	0.09
20.10	0.33	0.76	0.43*	0.08	0.00	0.08
20.15	0.34	0.76	0.44*	0.08	0.00	0.08
20.20	0.35	0.76	0.46*	0.07	0.00	0.07
20.25	0.36	0.76	0.47*	0.06	0.00	0.06
20.30	0.37	0.76	0.48*	0.06	0.00	0.06
20.35	0.38	0.76	0.50*	0.05	0.00	0.05
20.40	0.40	0.76	0.53*	0.05	0.00	0.05
20.45	0.44	0.76	0.57*	0.04	0.00	0.04
20.50	0.50	0.76	0.66*	0.04	0.00	0.04
20.55	0.50	0.76	0.66*	0.03	0.00	0.03
20.60	0.50	0.76	0.66*	0.03	0.00	0.03
20.65	0.50	0.76	0.66*	0.03	0.00	0.03
20.70	0.50	0.76	0.66*	0.02	0.00	0.02
20.75	0.50	0.76	0.66*	0.02	0.00	0.02
20.80	0.50	0.76	0.66*	0.02	0.00	0.02
20.85	0.50	0.76	0.65*	0.01	0.00	0.01
20.90	0.50	0.76	0.65*	0.01	0.00	0.01
20.95	0.50	0.76	0.65*	0.01	0.00	0.01

21.00	0.50	0.76	0.65*	0.01	0.00	0.01
21.05	0.50	0.76	0.65*	0.01	0.00	0.01
21.10	0.50	0.76	0.65*	0.01	0.00	0.01
21.15	0.50	0.76	0.65*	0.00	0.00	0.00
21 20	0.50	0.70 0.76	0.65*	0.00 0 00	0.00	a aa
21.20	0.50	0.70	0.05	a aa	0.00	a aa
21.25	0.50	0.77	0.05	0.00	0.00	0.00
21.50	0.50	0.77	0.05	0.00	0.00	0.00
21.33	0.50	0.77	0.05	0.00	0.00	0.00
21.40	0.50	0.77	0.65*	0.00	0.00	0.00
21.45	0.50	0.77	0.65*	0.00	0.00	0.00
21.50	0.50	0.//	0.65*	0.00	0.00	0.00
21.55	0.50	0.//	0.65*	0.00	0.00	0.00
21.60	0.50	0.//	0.65*	0.00	0.00	0.00
21.65	0.50	0.77	0.65*	0.00	0.00	0.00
21.70	0.50	0.77	0.65*	0.00	0.00	0.00
21.75	0.50	0.77	0.65*	0.00	0.00	0.00
21.80	0.50	0.77	0.65*	0.00	0.00	0.00
21.85	0.50	0.77	0.65*	0.00	0.00	0.00
21.90	0.50	0.77	0.65*	0.00	0.00	0.00
21.95	0.50	0.77	0.65*	0.00	0.00	0.00
22.00	0.50	0.77	0.65*	0.00	0.00	0.00
22.05	0.50	0.77	0.65*	0.00	0.00	0.00
22.10	0.50	0.77	0.65*	0.00	0.00	0.00
22.15	0.50	0.77	0.65*	0.00	0.00	0.00
22.20	0.50	0.77	0.65*	0.00	0.00	0.00
22.25	0.50	0.77	0.65*	0.00	0.00	0.00
22.30	0.50	0.77	0.65*	0.00	0.00	0.00
22.35	0.50	0.77	0.65*	0.00	0.00	0.00
22.40	0.50	0.77	0.65*	0.00	0.00	0.00
22.45	0.50	0.77	0.65*	0.00	0.00	0.00
22.45	0.50	0.77 0 77	0.05	a aa	0.00	a aa
22.50	0.50	0.77 0 77	0.05	a aa	0.00	a aa
22.55	0.50	0.77 0 77	0.05	0.00 0 00	0.00	0.00 0 00
22.00	0.50	0.77	0.05	0.00	0.00	0.00
22.05	0.50	0.77	0.05*	0.00	0.00	0.00
22.70	0.50	0.77	0.05*	0.00	0.00	0.00
22.75	0.50	0.77	0.05	0.00	0.00	0.00
	0.50	0.77	0.05	0.00	0.00	0.00
22.00	0.50	0.77		0.00	0.00	0.00
22.90	0.50	0.77	0.65*	0.00	0.00	0.00
22.95	0.50	0.//	0.65*	0.00	0.00	0.00
23.00	0.50	0.//	0.65*	0.00	0.00	0.00
23.05	0.50	0.//	0.65*	0.00	0.00	0.00
23.10	0.50	0.77	0.65*	0.00	0.00	0.00
23.15	0.50	0.77	0.65*	0.00	0.00	0.00
23.20	0.50	0.77	0.65*	0.00	0.00	0.00
23.25	0.50	0.77	0.65*	0.00	0.00	0.00
23.30	0.50	0.77	0.65*	0.00	0.00	0.00
23.35	0.50	0.77	0.65*	0.00	0.00	0.00
23.40	0.50	0.77	0.65*	0.00	0.00	0.00
23.45	0.50	0.77	0.65*	0.00	0.00	0.00

23 50	a 5a	Q 77	0 65*	a aa	a aa	a aa
23.50	0.50	0.77	0.05	0.00	0.00	0.00
22.22	0.50	0.77	0.05*	0.00	0.00	0.00
22.00	0.50	0.77	0.05	0.00	0.00	0.00
23.05	0.50	0.77	0.05	0.00	0.00	0.00
23.70	0.50	0.77	0.65*	0.00	0.00	0.00
23.75	0.50	0.77	0.65*	0.00	0.00	0.00
23.80	0.50	0.78	0.64*	0.00	0.00	0.00
23.85	0.50	0.78	0.64*	0.00	0.00	0.00
23.90	0.50	0.78	0.64*	0.00	0.00	0.00
23.95	0.50	0.78	0.64*	0.00	0.00	0.00
24.00	0.50	0.78	0.64*	0.00	0.00	0.00
24.05	0.50	0.78	0.64*	0.00	0.00	0.00
24.10	0.50	0.78	0.64*	0.00	0.00	0.00
24.15	0.50	0.78	0.64*	0.00	0.00	0.00
24.20	0.50	0.78	0.64*	0.00	0.00	0.00
24.25	0.50	0.78	0.64*	0.00	0.00	0.00
24.30	0.50	0.78	0.64*	0.00	0.00	0.00
24.35	0.50	0.78	0.64*	0.00	0.00	0.00
24.40	0.50	0.78	0.64*	0.00	0.00	0.00
24.45	0.50	0.78	0.64*	0.00	0.00	0.00
24.50	0.50	0.78	0.64*	0.00	0.00	0.00
24.55	0.50	0.78	0.64*	0.00	0.00	0.00
24.60	0.50	0.78	0.64*	0.00	0.00	0.00
24 65	0.50	0 78	0 64*	a aa	0.00	a aa
24.05	0.50	0.70 0.78	0.04 0.64*	a aa	0.00	a aa
24.70 24.75	0.50 0.50	0.70 0.78	0.04	0.00 0 00	0.00	0.00 0 00
24.75	0.50	0.70	0.04	0.00	0.00	0.00
24.00	0.50	0.70	0.04*	0.00	0.00	0.00
24.05	0.50	0.70	0.04	0.00	0.00	0.00
24.90	0.50	0.70	0.04	0.00	0.00	0.00
24.95	0.50	0.70	0.64*	0.00	0.00	0.00
25.00	0.50	0.78	0.64*	0.00	0.00	0.00
25.05	0.50	0.78	0.64*	0.00	0.00	0.00
25.10	0.50	0.78	0.64*	0.00	0.00	0.00
25.15	0.50	0.78	0.64*	0.00	0.00	0.00
25.20	0.50	0.78	0.64*	0.00	0.00	0.00
25.25	0.50	0.78	0.64*	0.00	0.00	0.00
25.30	0.50	0.78	0.64*	0.00	0.00	0.00
25.35	0.50	0.78	0.64*	0.00	0.00	0.00
25.40	0.50	0.78	0.64*	0.00	0.00	0.00
25.45	0.50	0.78	0.64*	0.00	0.00	0.00
25.50	0.50	0.78	0.64*	0.00	0.00	0.00
25.55	0.50	0.78	0.64*	0.00	0.00	0.00
25.60	0.50	0.78	0.64*	0.00	0.00	0.00
25.65	0.50	0.78	0.64*	0.00	0.00	0.00
25.70	0.50	0.78	0.64*	0.00	0.00	0.00
25.75	0.50	0.78	0.64*	0.00	0.00	0.00
25.80	0.50	0.78	0.64*	0.00	0.00	0.00
25.85	0.50	0.78	0.64*	0.00	0.00	0.00
25.90	0.50	0.78	0.64*	0.00	0.00	0.00
25.95	0.50	0.78	0.64*	0.00	0.00	0.00

26.00	0.50	0.78	0.64*	0.00	0.00	0.00
26.05	0.50	0.78	0.64*	0.00	0.00	0.00
26.10	0.50	0.78	0.64*	0.00	0.00	0.00
26.15	0.50	0.78	0.64*	0.00	0.00	0.00
26.20	0.50	0.78	0.64*	0.00	0.00	0.00
26.25	0.50	0.78	0.64*	0.00	0.00	0.00
26.30	0.50	0.79	0.64*	0.00	0.00	0.00
26.35	0.50	0.79	0.64*	0.00	0.00	0.00
26.40	0.50	0.79	0.64*	0.00	0.00	0.00
26.45	0.50	0.79	0.64*	0.00	0.00	0.00
26.50	0.50	0.79	0.64*	0.00	0.00	0.00
26.55	0.50	0.79	0.64*	0.00	0.00	0.00
26.60	0.50	0.79	0.64*	0.00	0.00	0.00
26.65	0.50	0.79	0.64*	0.00	0.00	0.00
26.70	0.50	0.79	0.64*	0.00	0.00	0.00
26 75	0 50	0 79	0 64*	a aa	0.00	a aa
26.80	0.50 0 50	0.79	0.04 0 64*	0.00 0 00	0.00 0 00	a aa
26.85	0.50	0.79	0.63*	a aa	0.00	a aa
26.05	0.50	0.75 0.79	0.05	0.00 0 00	0.00 0 00	a aa
26.95	0.50	0.75	0.05	0.00 0 00	0.00	0.00 0 00
20.00	0.50	0.75 0.79	0.05	0.00 0 00	0.00	0.00
27.00	0.50	0.75	0.05	0.00	0.00	0.00
27.05	0.50	0.79	0.03	0.00	0.00	0.00
27.10	0.50	0.79	0.03	0.00	0.00	0.00
27.15	0.50	0.79	0.03*	0.00	0.00	0.00
27.20	0.50	0.79	0.63*	0.00	0.00	0.00
27.25	0.50	0.79	0.63*	0.00	0.00	0.00
27.30	0.50	0.79	0.63*	0.00	0.00	0.00
27.35	0.50	0.79	0.63*	0.00	0.00	0.00
27.40	0.50	0.79	0.63*	0.00	0.00	0.00
27.45	0.50	0.79	0.63*	0.00	0.00	0.00
27.50	0.50	0.79	0.63*	0.00	0.00	0.00
27.55	0.50	0.79	0.63*	0.00	0.00	0.00
27.60	0.50	0.79	0.63*	0.00	0.00	0.00
27.65	0.50	0.79	0.63*	0.00	0.00	0.00
27.70	0.50	0.79	0.63*	0.00	0.00	0.00
27.75	0.50	0.79	0.63*	0.00	0.00	0.00
27.80	0.50	0.79	0.63*	0.00	0.00	0.00
27.85	0.50	0.79	0.63*	0.00	0.00	0.00
27.90	0.50	0.79	0.63*	0.00	0.00	0.00
27.95	0.50	0.79	0.63*	0.00	0.00	0.00
28.00	0.50	0.79	0.63*	0.00	0.00	0.00
28.05	0.50	0.79	0.63*	0.00	0.00	0.00
28.10	0.50	0.79	0.63*	0.00	0.00	0.00
28.15	0.50	0.79	0.63*	0.00	0.00	0.00
28.20	0.50	0.79	0.63*	0.00	0.00	0.00
28.25	0.50	0.79	0.63*	0.00	0.00	0.00
28.30	0.50	0.79	0.63*	0.00	0.00	0.00
28.35	0.50	0.79	0.63*	0.00	0.00	0.00
28.40	0.50	0.79	0.63*	0.00	0.00	0.00
28.45	0.50	0.79	0.63*	0.00	0.00	0.00

28 50	0 50	0 79	0 63*	a aa	a aa	a aa
28.50	0.50 0 50	0.75 0.79	0.63*	0.00 0 00	0.00 0 00	a aa
20.55	0.50	0.75 0 79	0.05	0.00 0 00	0.00 0 00	0.00 0 00
20.00	0.50	0.75	0.05	0.00	0.00	0.00
20.05	0.50	0.79	0.03	0.00	0.00	0.00
20.70	0.50	0.79	0.03*	0.00	0.00	0.00
28.75	0.50	0.79	0.63*	0.00	0.00	0.00
28.80	0.50	0.79	0.63*	0.00	0.00	0.00
28.85	0.50	0.79	0.63*	0.00	0.00	0.00
28.90	0.50	0.79	0.63*	0.00	0.00	0.00
28.95	0.50	0.79	0.63*	0.00	0.00	0.00
29.00	0.50	0.79	0.63*	0.00	0.00	0.00
29.05	0.50	0.79	0.63*	0.00	0.00	0.00
29.10	0.50	0.79	0.63*	0.00	0.00	0.00
29.15	0.50	0.79	0.63*	0.00	0.00	0.00
29.20	0.50	0.79	0.63*	0.00	0.00	0.00
29.25	0.50	0.79	0.63*	0.00	0.00	0.00
29.30	0.50	0.79	0.63*	0.00	0.00	0.00
29.35	0.50	0.79	0.63*	0.00	0.00	0.00
29.40	0.50	0.79	0.63*	0.00	0.00	0.00
29 45	0 50	0 80	0.63*	0.00	0.00	a aa
29.45	0.50 0 50	0.00	0.63*	0.00 0 00	0.00 0 00	a aa
20.50	0.50	0.00	0.05	0.00	0.00	0.00
29.55	0.50	0.80	0.03	0.00	0.00	0.00
29.00	0.50	0.00	0.03	0.00	0.00	0.00
29.65	0.50	0.80	0.63*	0.00	0.00	0.00
29.70	0.50	0.80	0.63*	0.00	0.00	0.00
29.75	0.50	0.80	0.63*	0.00	0.00	0.00
29.80	0.50	0.80	0.63*	0.00	0.00	0.00
29.85	0.50	0.80	0.63*	0.00	0.00	0.00
29.90	0.50	0.80	0.63*	0.00	0.00	0.00
29.95	0.50	0.80	0.63*	0.00	0.00	0.00
30.00	0.50	0.80	0.63*	0.00	0.00	0.00
30.05	0.50	0.80	0.63*	0.00	0.00	0.00
30.10	0.50	0.80	0.63*	0.00	0.00	0.00
30.15	0.50	0.80	0.63*	0.00	0.00	0.00
30.20	0.50	0.80	0.63*	0.00	0.00	0.00
30.25	0.50	0.80	0.63*	0.00	0.00	0.00
30.30	0.50	0.80	0.63*	0.00	0.00	0.00
30.35	0.50	0.80	0.63*	0.00	0.00	0.00
30.40	0.50	0.80	0.63*	0.00	0.00	0.00
30.45	0.50	0.00	0.63*	a aa	0.00	a aa
30.45	0.50	0.00 0 79	0.05	0.00 0 00	0.00 0 00	a aa
20.50	0.50	0.75	0.03*	0.00	0.00	0.00
	0.50	0.79	0.03	0.00	0.00	0.00
	0.50	0.79	0.03*	0.00	0.00	0.00
	0.50	0.79	0.03*	0.00	0.00	0.00
30.70	0.50	0.79	0.63*	0.00	0.00	0.00
30.75	0.50	0.79	0.63*	0.00	0.00	0.00
30.80	0.50	0.79	0.63*	0.00	0.00	0.00
30.85	0.50	0.79	0.63*	0.00	0.00	0.00
30.90	0.50	0.79	0.63*	0.00	0.00	0.00
30.95	0.50	0.79	0.63*	0.00	0.00	0.00

31,00	0.50	0.79	0.63*	0.00	0.00	0.00
31 05	0.50	0.79	0.63*	0.00	0.00 0 00	a aa
31 10	0.50	0.79	0.63*	0.00	0.00 0 00	a aa
31 15	0.50	0.79	0.05	0.00 0 00	0.00	a aa
31 20	0.50	0.75 0 79	0.05	0.00 0 00	0.00 0 00	0.00 0 00
21 25	0.50	0.75	0.05	0.00	0.00	0.00
21 20	0.50	0.79	0.05	0.00	0.00	0.00
21.20	0.50	0.79	0.03	0.00	0.00	0.00
31.35	0.50	0.79	0.63*	0.00	0.00	0.00
31.40	0.50	0.79	0.63*	0.00	0.00	0.00
31.45	0.50	0.79	0.63*	0.00	0.00	0.00
31.50	0.50	0.79	0.63*	0.00	0.00	0.00
31.55	0.50	0.79	0.63*	0.00	0.00	0.00
31.60	0.50	0.79	0.63*	0.00	0.00	0.00
31.65	0.50	0.79	0.63*	0.00	0.00	0.00
31.70	0.50	0.79	0.63*	0.00	0.00	0.00
31.75	0.50	0.79	0.63*	0.00	0.00	0.00
31.80	0.50	0.79	0.63*	0.00	0.00	0.00
31.85	0.50	0.79	0.63*	0.00	0.00	0.00
31.90	0.50	0.79	0.63*	0.00	0.00	0.00
31.95	0.50	0.79	0.63*	0.00	0.00	0.00
32.00	0.50	0.79	0.63*	0.00	0.00	0.00
32.05	0.50	0.79	0.63*	0.00	0.00	0.00
32.10	0.50	0.79	0.63*	0.00	0.00	0.00
32.15	0.50	0.79	0.63*	0.00	0.00	0.00
32.20	0.50	0.79	0.63*	0.00	0.00	0.00
32.25	0.50	0.79	0.63*	0.00	0.00	0.00
32.30	0.50	0.79	0.63*	0.00	0.00	0.00
32.35	0.50	0.79	0.63*	0.00	0.00	0.00
32.40	0.50	0.79	0.63*	0.00	0.00	0.00
32.45	0.50	0.79	0.63*	0.00	0.00	0.00
32.50	0.50	0.79	0.63*	0.00	0.00	0.00
32.55	0.50	0.79	0.63*	0.00	0.00	0.00
32.60	0.50	0.79	0.63*	0.00	0.00	0.00
32.65	0.50	0.79	0.63*	0.00	0.00	0.00
32.70	0.50	0.79	0.63*	0.00	0.00	0.00
32.75	0.50	0.79	0.63*	0.00	0.00	0.00
32.80	0.50	0.79	0.63*	0.00	0.00	0.00
32.85	0.50	0.79	0.63*	0.00	0.00 0 00	a aa
32.00	0.50 0 50	0.75 0.79	0.05	0.00 0 00	0.00 0 00	a aa
32.90	0.50 0 50	0.75 0.79	0.05	0.00 0 00	0.00 0 00	a aa
32.00	0.50	0.75 0 79	0.05	0.00 0 00	0.00 0 00	a aa
33.05	0.50	0.75	0.05	0.00	0.00	0.00
22 10	0.50	0.75	0.05	0.00	0.00	0.00
22 15	0.50	0.75	0.04*	0.00	0.00	0.00
22.12	0.50	0.79	0.04	0.00	0.00	0.00
22.20 סיר ככ	0.50 0.50	0.19	0.04" 0.64*	0.00	0.00	0.00
33.23 AC CC	0.50	0.79	0.04"	0.00	0.00	0.00
55.50	0.50	0.79	Ø.64 ⁺	0.00	0.00	0.00
33.35	0.50	0.79	0.64↑	0.00	0.00	0.00
33.40	0.50	0.79	0.64*	0.00	0.00	0.00
33.45	0.50	0./9	0.64*	0.00	0.00	0.00

			-			
33.50	0.50	0.79	0.64*	0.00	0.00	0.00
33.55	0.50	0.79	0.64*	0.00	0.00	0.00
33.60	0.50	0.79	0.64*	0.00	0.00	0.00
33.65	0.50	0.78	0.64*	0.00	0.00	0.00
33.70	0.50	0.78	0.64*	0.00	0.00	0.00
33.75	0.50	0.78	0.64*	0.00	0.00	0.00
33.80	0.50	0.78	0.64*	0.00	0.00	0.00
33.85	0.50	0.78	0.64*	0.00	0.00	0.00
33.90	0.50	0.78	0.64*	0.00	0.00	0.00
33.95	0.50	0.78	0.64*	0.00	0.00	0.00
34.00	0.50	0.78	0.64*	0.00	0.00	0.00
34.05	0.50	0.78	0.64*	0.00	0.00	0.00
34.10	0.50	0.78	0.64*	0.00	0.00	0.00
34.15	0.50	0.78	0.64*	0.00	0.00	0.00
34.20	0.50	0.78	0.64*	0.00	0.00	0.00
34 25	0 50	0 78	0 64*	a aa	0.00	a aa
34.20	0.50	0.70	0.04 0.64*	0.00 0 00	0.00 0 00	a aa
34.35	0.50	0.70 0.78	0.04 0.64*	a aa	0.00	a aa
34.00	0.50	0.70 0.78	0.04	0.00 0 00	0.00 0 00	a aa
3/ /5	0.50	0.70	0.04	0.00 0 00	0.00	0.00 0 00
34.40	0.50	0.70	0.04	0.00	0.00	0.00
24.50	0.50	0.70	0.04	0.00	0.00	0.00
24.55	0.50	0.70	0.04	0.00	0.00	0.00
24.00	0.50	0.70	0.04	0.00	0.00	0.00
54.05 24.70	0.50	0.70	0.64*	0.00	0.00	0.00
34.70	0.50	0.78	0.64*	0.00	0.00	0.00
34.75	0.50	0.78	0.64*	0.00	0.00	0.00
34.80	0.50	0.78	0.64*	0.00	0.00	0.00
34.85	0.50	0.78	0.64*	0.00	0.00	0.00
34.90	0.50	0.78	0.64*	0.00	0.00	0.00
34.95	0.50	0.78	0.64*	0.00	0.00	0.00
35.00	0.50	0.78	0.64*	0.00	0.00	0.00
35.05	0.50	0.78	0.64*	0.00	0.00	0.00
35.10	0.50	0.78	0.64*	0.00	0.00	0.00
35.15	0.50	0.78	0.64*	0.00	0.00	0.00
35.20	0.50	0.78	0.64*	0.00	0.00	0.00
35.25	0.50	0.78	0.64*	0.00	0.00	0.00
35.30	0.50	0.78	0.64*	0.00	0.00	0.00
35.35	0.50	0.78	0.64*	0.00	0.00	0.00
35.40	0.50	0.78	0.64*	0.00	0.00	0.00
35.45	0.50	0.78	0.64*	0.00	0.00	0.00
35.50	0.50	0.78	0.64*	0.00	0.00	0.00
35.55	0.50	0.78	0.64*	0.00	0.00	0.00
35.60	0.50	0.78	0.64*	0.00	0.00	0.00
35.65	0.50	0.78	0.64*	0.00	0.00	0.00
35.70	0.50	0.78	0.64*	0.00	0.00	0.00
35.75	0.50	0.78	0.64*	0.00	0.00	0.00
35.80	0.50	0.78	0.64*	0.00	0.00	0.00
35.85	0.50	0.77	0.64*	0.00	0.00	0.00
35.90	0.50	0.77	0.65*	0.00	0.00	0.00
35.95	0.50	0.77	0.65*	0.00	0.00	0.00

36 00	a 5a	Q 77	0 65*	a aa	a aa	a aa
36 05	0.50	0.77 0 77	0.05	a aa	0.00	a aa
36 10	0.50	0.77 0 77	0.05	0.00 0 00	0.00	a aa
36 15	0.50	0.77	0.05	0.00	0.00	0.00
36 20	0.50	0.77	0.05	0.00	0.00	0.00
26 25	0.50	0.77	0.05	0.00	0.00	0.00
20.25	0.50	0.77		0.00	0.00	0.00
36.30	0.50	0.77	0.65*	0.00	0.00	0.00
36.35	0.50	0.//	0.65*	0.00	0.00	0.00
36.40	0.50	0.77	0.65*	0.00	0.00	0.00
36.45	0.50	0.//	0.65*	0.00	0.00	0.00
36.50	0.50	0.77	0.65*	0.00	0.00	0.00
36.55	0.50	0.77	0.65*	0.00	0.00	0.00
36.60	0.50	0.77	0.65*	0.00	0.00	0.00
36.65	0.50	0.77	0.65*	0.00	0.00	0.00
36.70	0.50	0.77	0.65*	0.00	0.00	0.00
36.75	0.50	0.77	0.65*	0.00	0.00	0.00
36.80	0.50	0.77	0.65*	0.00	0.00	0.00
36.85	0.50	0.77	0.65*	0.00	0.00	0.00
36.90	0.50	0.77	0.65*	0.00	0.00	0.00
36.95	0.50	0.77	0.65*	0.00	0.00	0.00
37.00	0.50	0.77	0.65*	0.00	0.00	0.00
37.05	0.50	0.77	0.65*	0.00	0.00	0.00
37.10	0.50	0.77	0.65*	0.00	0.00	0.00
37.15	0.50	0.77	0.65*	0.00	0.00	0.00
37.20	0.50	0.77	0.65*	0.00	0.00	0.00
37.25	0.50	0.77	0.65*	0.00	0.00	0.00
37.30	0.50	0.77	0.65*	0.00	0.00	0.00
37.35	0.50	0.77	0.65*	0.00	0.00	0.00
37.40	0.50	0.77	0.65*	0.00	0.00	0.00
37.45	0.50	0.77	0.65*	0.00	0.00	0.00
37 50	0.50	0.77 0.77	0.65*	0.00 0 00	0.00	a aa
37 55	0.50	0.77 0 77	0.05	0.00 0 00	0.00 0 00	a aa
37 60	0.50	0.77 0 77	0.05	a aa	0.00	a aa
37 65	0.50	0.77 0 77	0.05	0.00 0 00	0.00	a aa
37.05	0.50	0.77	0.05	0.00	0.00	0.00
37.70	0.50	0.77	0.05*	0.00	0.00	0.00
	0.50	0.77	0.05	0.00	0.00	0.00
57.00 37.0E	0.50	0.77	0.05	0.00	0.00	0.00
57.05 57.00	0.50	0.70		0.00	0.00	0.00
37.90	0.50	0.76	0.65*	0.00	0.00	0.00
37.95	0.50	0.76	0.65*	0.00	0.00	0.00
38.00	0.50	0.76	0.65*	0.00	0.00	0.00
38.05	0.50	0.76	0.65*	0.00	0.00	0.00
38.10	0.50	0.76	0.65*	0.00	0.00	0.00
38.15	0.50	0.76	0.65*	0.00	0.00	0.00
38.20	0.50	0.76	0.65*	0.00	0.00	0.00
38.25	0.50	0.76	0.66*	0.00	0.00	0.00
38.30	0.50	0.76	0.66*	0.00	0.00	0.00
38.35	0.50	0.76	0.66*	0.00	0.00	0.00
38.40	0.50	0.76	0.66*	0.00	0.00	0.00
38.45	0.50	0.76	0.66*	0.00	0.00	0.00

38.50	0.50	0.76	0.66*	0.00	0.00	0.00
38.55	0.50	0.76	0.66*	0.00	0.00	0.00
38.60	0.50	0.76	0.66*	0.00	0.00	0.00
38.65	0.50	0.76	0.66*	0.00	0.00	0.00
38.70	0.50	0.76	0.66*	0.00	0.00	0.00
38.75	0.50	0.76	0.66*	0.00	0.00	0.00
38.80	0.50	0.76	0.66*	0.00	0.00	0.00
38.85	0.50	0.76	0.66*	0.00	0.00	0.00
38.90	0.50	0.76	0.66*	0.00	0.00	0.00
38.95	0.50	0.76	0.66*	0.00	0.00	0.00
39.00	0.50	0.76	0.66*	0.00	0.00	0.00
39.05	0.50	0.76	0.66*	0.00	0.00	0.00
39.10	0.50	0.76	0.66*	0.00	0.00	0.00
39.15	0.50	0.76	0.66*	0.00	0.00	0.00
39.20	0.50	0.76	0.66*	0.00	0.00	0.00
39.25	0.50	0.76	0.66*	0.00	0.00	0.00
39.30	0.50	0.76	0.66*	0.00	0.00	0.00
39.35	0.50	0.76	0.66*	0.00	0.00	0.00
39.40	0.50	0.76	0.66*	0.00	0.00	0.00
39.45	0.50	0.76	0.66*	0.00	0.00	0.00
39.50	0.50	0.76	0.66*	0.00	0.00	0.00
39.55	0.50	0.76	0.66*	0.00	0.00	0.00
39.60	0.50	0.76	0.66*	0.00	0.00	0.00
39.65	0.50	0.76	0.66*	0.00	0.00	0.00
39.70	0.50	0.76	0.66*	0.00	0.00	0.00
39.75	0.50	0.75	0.66*	0.00	0.00	0.00
39.80	0.50	0.75	0.66*	0.00	0.00	0.00
39.85	0.50	0.75	0.66*	0.00	0.00	0.00
39.90	0.50	0.75	0.66*	0.00	0.00	0.00
39.95	0.50	0.75	0.66*	0.00	0.00	0.00
40.00	0.50	0.75	0.66*	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.

1 atm (atmos	phere) = 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 Copyright by CivilTech Software www.civiltech.com ******* Font: Courier New, Regular, Size 8 is recommended for this report. Licensed to , 6/28/2021 4:57:45 PM Input File Name: S:\PROJECTS\1000s GEOTECH PROJECTS\1-1183 \Calcs\Liquefaction\LiquefyPro\1-1183 GB-1 (G3 ONLY).liq Title: 1-1183 GB-1 Subtitle: Factored deterministic acceleration value Surface Elev.= Hole No.=GB-1 Depth of Hole= 40.00 ft Water Table during Earthquake= 6.00 ft Water Table during In-Situ Testing= 7.00 ft Max. Acceleration= 1.06 g Earthquake Magnitude= 7.50 Input Data: Surface Elev.= Hole No.=GB-1 Depth of Hole=40.00 ft Water Table during Earthquake= 6.00 ft Water Table during In-Situ Testing= 7.00 ft Max. Acceleration=1.06 g Earthquake Magnitude=7.50 No-Liquefiable Soils: CL, OL are Non-Liq. Soil 1. SPT or BPT Calculation. 2. Settlement Analysis Method: Tokimatsu/Seed 3. Fines Correction for Liquefaction: Modify Stark/Olson 4. Fine Correction for Settlement: During Liquefaction* 5. Settlement Calculation in: All zones* 6. Hammer Energy Ratio, Ce = 1.257. Borehole Diameter, Cb = 18. Sampling Method, Cs = 19. User request factor of safety (apply to CSR) , User= 1 Plot one CSR curve (fs1=User) 10. Use Curve Smoothing: Yes* * Recommended Options In-Situ Test Data:

SPT	gamma pcf	Fines %
8.00	87.10	0.00
8.00	87.10	0.00
16.00	87.10	0.00
33.00	124.90	0.00
16.00	124.90	1.70
25.00	124.90	0.40
10.00	124.90	0.40
18.00	124.90	0.40
31.00	124.90	1.90
49.00	116.70	6.00
49.00	116.70	5.10
54.00	116.70	5.10
39.00	116.70	6.70
53.00	121.70	7.10
60.00	121.70	1.30
62.00	121.70	3.30
	SPT 8.00 8.00 16.00 33.00 16.00 25.00 10.00 18.00 31.00 49.00 54.00 39.00 53.00 60.00 62.00	SPTgamma pcf8.0087.108.0087.1016.0087.1033.00124.9016.00124.9025.00124.9010.00124.9018.00124.9031.00124.9049.00116.7054.00116.7053.00121.7060.00121.7062.00121.70

Output Results:

Settlement of Saturated Sands=1.30 in. Settlement of Unsaturated Sands=1.76 in. Total Settlement of Saturated and Unsaturated Sands=3.06 in. Differential Settlement=1.530 to 2.019 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	0.14	0.69	5.00	1.30	1.76	3.06
0.05	0.14	0.69	5.00	1.30	1.76	3.06
0.10	0.14	0.69	5.00	1.30	1.76	3.06
0.15	0.14	0.69	5.00	1.30	1.76	3.06
0.20	0.14	0.69	5.00	1.30	1.76	3.06
0.25	0.14	0.69	5.00	1.30	1.76	3.06
0.30	0.14	0.69	5.00	1.30	1.76	3.06
0.35	0.14	0.69	5.00	1.30	1.76	3.06
0.40	0.14	0.69	5.00	1.30	1.76	3.06
0.45	0.14	0.69	5.00	1.30	1.76	3.06
0.50	0.14	0.69	5.00	1.30	1.76	3.06
0.55	0.14	0.69	5.00	1.30	1.76	3.06
0.60	0.14	0.69	5.00	1.30	1.76	3.06
0.65	0.14	0.69	5.00	1.30	1.76	3.06
0.70	0.14	0.69	5.00	1.30	1.76	3.05
0.75	0.14	0.69	5.00	1.30	1.76	3.05
0.80	0.14	0.69	5.00	1.30	1.76	3.05
0.85	0.14	0.69	5.00	1.30	1.76	3.05
0.90	0.14	0.68	5.00	1.30	1.75	3.05
0.95	0.14	0.68	5.00	1.30	1.75	3.05

1.00	0.14	0.68	5.00	1.30	1.75	3.05
1.05	0.14	0.68	5.00	1.30	1.75	3.05
1.10	0.14	0.68	5.00	1.30	1.75	3.05
1.15	0.14	0.68	5.00	1.30	1.75	3.05
1.20	0.14	0.68	5.00	1.30	1.75	3.05
1.25	0.14	0.68	5.00	1.30	1.75	3.05
1.30	0.14	0.68	5.00	1.30	1.75	3.05
1.35	0.14	0.68	5.00	1.30	1.75	3.04
1.40	0.14	0.68	5.00	1.30	1.75	3.04
1.45	0.14	0.68	5.00	1.30	1.74	3.04
1.50	0.14	0.68	5.00	1.30	1.74	3.04
1.55	0.14	0.68	5.00	1.30	1.74	3.04
1.60	0.14	0.68	5.00	1.30	1.74	3.04
1.65	0.14	0.68	5.00	1.30	1.74	3.03
1 70	0 14	0.68	5 00	1 30	1 73	3 03
1 75	0 14	0.68	5 00	1 30	1 73	3 03
1 80	0.14	0.00	5 00	1 30	1 72	3.05
1 25	0.14	0.00	5.00	1 30	1 72	3 02
1 00	0.14	0.00	5.00	1 30	1 71	3 01
1 05	0.14	0.00	5.00	1 20	1 70	2.00
2 00	0.14	0.00	5.00	1 20	1.70	2 00
2.00	0.14	0.00	5.00	1 20	1.09	2.99
2.05	0.14	0.00	5.00	1.50	1.0/	2.9/
2.10	0.14	0.00	5.00	1.50	1.05	2.95
2.15	0.14	0.68	5.00	1.30	1.63	2.93
2.20	0.14	0.68	5.00	1.30	1.61	2.91
2.25	0.14	0.68	5.00	1.30	1.59	2.88
2.30	0.14	0.68	5.00	1.30	1.56	2.86
2.35	0.14	0.68	5.00	1.30	1.54	2.84
2.40	0.14	0.68	5.00	1.30	1.52	2.82
2.45	0.14	0.68	5.00	1.30	1.50	2.80
2.50	0.14	0.68	5.00	1.30	1.48	2.77
2.55	0.14	0.68	5.00	1.30	1.45	2.75
2.60	0.14	0.68	5.00	1.30	1.43	2.73
2.65	0.14	0.68	5.00	1.30	1.41	2.71
2.70	0.14	0.68	5.00	1.30	1.39	2.68
2.75	0.14	0.68	5.00	1.30	1.36	2.66
2.80	0.14	0.68	5.00	1.30	1.34	2.64
2.85	0.14	0.68	5.00	1.30	1.32	2.62
2.90	0.14	0.68	5.00	1.30	1.30	2.59
2.95	0.14	0.68	5.00	1.30	1.28	2.57
3.00	0.14	0.68	5.00	1.30	1.25	2.55
3.05	0.14	0.68	5.00	1.30	1.23	2.53
3.10	0.14	0.68	5.00	1.30	1.21	2.51
3.15	0.14	0.68	5.00	1.30	1.19	2.48
3.20	0.14	0.68	5.00	1.30	1.16	2.46
3.25	0.14	0.68	5.00	1.30	1.14	2.44
3.30	0.14	0.68	5.00	1.30	1.12	2.42
3.35	0.14	0.68	5.00	1.30	1.10	2.39
3.40	0.14	0.68	5.00	1.30	1.07	2.37
3.45	0.14	0.68	5.00	1.30	1.05	2.35

3.50	0.14	0.68	5.00	1.30	1.03	2.33
3.55	0.14	0.68	5.00	1.30	1.01	2.31
3.60	0.14	0.68	5.00	1.30	0.99	2.28
3.65	0.14	0.68	5.00	1.30	0.96	2.26
3.70	0.14	0.68	5.00	1.30	0.94	2.24
3.75	0.14	0.68	5.00	1.30	0.92	2.22
3.80	0.14	0.68	5.00	1.30	0.90	2.19
3.85	0.14	0.68	5.00	1.30	0.87	2.17
3.90	0.14	0.68	5.00	1.30	0.85	2.15
3.95	0.14	0.68	5.00	1.30	0.83	2.13
4.00	0.14	0.68	5.00	1.30	0.81	2.10
4.05	0.14	0.68	5.00	1.30	0.79	2.08
4.10	0.14	0.68	5.00	1.30	0.76	2.06
4.15	0.14	0.68	5.00	1.30	0.74	2.04
4.20	0.14	0.68	5.00	1.30	0.72	2.02
4.25	0.14	0.68	5.00	1.30	0.70	1.99
4.30	0.14	0.68	5.00	1.30	0.67	1.97
4 35	0 14	0.68	5 00	1 30	0.65	1 95
4 40	0 14	0.68	5 00	1 30	0.63	1 93
4.40	0.14 0 14	0.00 0.68	5 00	1 30	0.05	1 90
4.50	0.14	0.00 0.68	5 00	1 30	0.01	1 88
4.50	0.14	0.00	5.00	1 30	0.50	1 86
4.55	0.14	0.08	5.00	1 30	0.50	1 8/
4.00	0.14	0.00	5.00	1 20	0.54	1 07
4.05	0.14	0.00	5.00	1 20	0.52	1 70
4.70	0.14	0.00	5.00	1 20	0.50	1.79
4.75	0.14	0.00	5.00	1.50	0.47	1.//
4.80	0.14	0.68	5.00	1.30	0.45	1.75
4.85	0.14	0.68	5.00	1.30	0.43	1.73
4.90	0.14	0.68	5.00	1.30	0.41	1.70
4.95	0.14	0.68	5.00	1.30	0.38	1.68
5.00	0.14	0.68	5.00	1.30	0.36	1.66
5.05	0.14	0.68	5.00	1.30	0.34	1.64
5.10	0.14	0.68	5.00	1.30	0.32	1.62
5.15	0.15	0.68	5.00	1.30	0.30	1.59
5.20	0.15	0.68	5.00	1.30	0.28	1.57
5.25	0.15	0.68	5.00	1.30	0.26	1.55
5.30	0.15	0.68	5.00	1.30	0.24	1.53
5.35	0.16	0.68	5.00	1.30	0.22	1.51
5.40	0.16	0.68	5.00	1.30	0.20	1.50
5.45	0.16	0.68	5.00	1.30	0.18	1.48
5.50	0.17	0.68	5.00	1.30	0.16	1.46
5.55	0.17	0.68	5.00	1.30	0.14	1.44
5.60	0.17	0.68	5.00	1.30	0.13	1.42
5.65	0.17	0.68	5.00	1.30	0.11	1.41
5.70	0.18	0.68	5.00	1.30	0.09	1.39
5.75	0.18	0.68	5.00	1.30	0.08	1.37
5.80	0.18	0.68	5.00	1.30	0.06	1.36
5.85	0.18	0.68	5.00	1.30	0.05	1.34
5.90	0.19	0.68	5.00	1.30	0.03	1.33
5.95	0.19	0.68	5.00	1.30	0.01	1.31

6.00	0.19	0.68	0.28*	1.30	0.00	1.30
6.05	0.20	0.68	0.29*	1.29	0.00	1.29
6.10	0.20	0.68	0.29*	1.28	0.00	1.28
6.15	0.20	0.69	0.29*	1.27	0.00	1.27
6.20	0.20	0.69	0.29*	1.26	0.00	1.26
6.25	0.21	0.70	0.30*	1.25	0.00	1.25
6.30	0.21	0.70	0.30*	1.24	0.00	1.24
6.35	0.21	0.70	0.30*	1.23	0.00	1.23
6.40	0.21	0.71	0.30*	1.22	0.00	1.22
6.45	0.22	0.71	0.31*	1.21	0.00	1.21
6.50	0.22	0.72	0.31*	1.20	0.00	1.20
6.55	0.22	0.72	0.31*	1.19	0.00	1.19
6.60	0.23	0.72	0.31*	1.18	0.00	1.18
6.65	0.23	0.73	0.32*	1.18	0.00	1.18
6 70	0.23	0.73	0.32*	1 17	a aa	1 17
6 75	0.23	0.75 0.73	0.32*	1 16	a aa	1 16
6 80	0.24	0.75	0.32*	1 15	0.00	1 15
6 85	0.24	0.74	0.32*	1 1/	0.00	1 1/
6.00	0.24	0.74	0.33*	1 12	0.00	1 12
6 95	0.25	0.74	0.33*	1 12	0.00	1 12
7 00	0.25	0.75	0.33*	1 12	0.00	1 12
7.00	0.25	0.75	0.34	1 11	0.00	1 11
7.05	0.20	0.70	0.34*	1.11	0.00	1.11
7.10	0.20	0.70	0.34*	1.10	0.00	1.10
7.15	0.26	0.76	0.34*	1.09	0.00	1.09
7.20	0.27	0.77	0.35*	1.09	0.00	1.09
7.25	0.27	0.//	0.35*	1.08	0.00	1.08
7.30	0.27	0.//	0.35*	1.0/	0.00	1.0/
/.35	0.28	0.78	0.36*	1.06	0.00	1.06
7.40	0.28	0.78	0.36*	1.06	0.00	1.06
7.45	0.29	0.78	0.37*	1.05	0.00	1.05
7.50	0.29	0.79	0.37*	1.04	0.00	1.04
7.55	0.30	0.79	0.38*	1.04	0.00	1.04
7.60	0.31	0.79	0.39*	1.03	0.00	1.03
7.65	0.32	0.80	0.40*	1.02	0.00	1.02
7.70	0.33	0.80	0.42*	1.02	0.00	1.02
7.75	0.35	0.80	0.43*	1.01	0.00	1.01
7.80	0.37	0.81	0.45*	1.00	0.00	1.00
7.85	0.39	0.81	0.48*	1.00	0.00	1.00
7.90	0.43	0.81	0.53*	0.99	0.00	0.99
7.95	0.50	0.82	0.61*	0.99	0.00	0.99
8.00	0.50	0.82	0.61*	0.99	0.00	0.99
8.05	0.50	0.82	0.61*	0.98	0.00	0.98
8.10	0.50	0.83	0.60*	0.98	0.00	0.98
8.15	0.50	0.83	0.60*	0.97	0.00	0.97
8.20	0.50	0.83	0.60*	0.97	0.00	0.97
8.25	0.50	0.84	0.60*	0.97	0.00	0.97
8.30	0.50	0.84	0.60*	0.97	0.00	0.97
8.35	0.50	0.84	0.59*	0.97	0.00	0.97
8.40	0.50	0.84	0.59*	0.97	0.00	0.97
8.45	0.50	0.85	0.59*	0.97	0.00	0.97

8.50	0.50	0.85	0.59*	0.97	0.00	0.97
8.55	0.50	0.85	0.59*	0.97	0.00	0.97
8.60	0.50	0.86	0.58*	0.97	0.00	0.97
8.65	0.50	0.86	0.58*	0.97	0.00	0.97
8.70	0.50	0.86	0.58*	0.97	0.00	0.97
8.75	0.50	0.86	0.58*	0.97	0.00	0.97
8.80	0.50	0.87	0.58*	0.97	0.00	0.97
8.85	0.50	0.87	0.57*	0.97	0.00	0.97
8.90	0.50	0.87	0.57*	0.97	0.00	0.97
8.95	0.50	0.87	0.57*	0.97	0.00	0.97
9.00	0.50	0.88	0.57*	0.97	0.00	0.97
9.05	0.50	0.88	0.57*	0.97	0.00	0.97
9.10	0.50	0.88	0.57*	0.97	0.00	0.97
9.15	0.50	0.88	0.57*	0.97	0.00	0.97
9.20	0.50	0.89	0.56*	0.97	0.00	0.97
9.25	0.50	0.89	0.56*	0.97	0.00	0.97
9.30	0.50	0.89	0.56*	0.97	0.00	0.97
9.35	0.50	0.89	0.56*	0.97	0.00	0.97
9 40	0.50	0.0J	0.56*	0.97 0 97	0.00	0 97
9 45	0.50	0.50 0 90	0.50	0.97 0 97	0.00 0 00	0.97 0 97
9 50	0.50	0.90 0 90	0.50	0.57 0 97	0.00 0 00	0. <i>37</i>
9.50	0.50	0.00	0.55*	0.J7 0 07	0.00	0.J/ 0 07
9.55	0.50	0.90 0 01	0.55*	0.97	0.00	0.97
9.00	0.50	0.91	0.55*	0.97	0.00	0.97
9.05	0.50	0.91	0.55	0.97	0.00	0.97
9.70	0.50	0.91	0.55	0.97	0.00	0.97
9.75	0.50	0.91		0.97	0.00	0.97
9.80	0.50	0.91	0.55*	0.97	0.00	0.97
9.85	0.50	0.92	0.55*	0.97	0.00	0.97
9.90	0.50	0.92	0.54*	0.97	0.00	0.97
9.95	0.50	0.92	0.54*	0.97	0.00	0.97
10.00	0.50	0.92	0.54*	0.97	0.00	0.9/
10.05	0.50	0.92	0.54*	0.97	0.00	0.9/
10.10	0.50	0.92	0.54*	0.97	0.00	0.97
10.15	0.50	0.93	0.54*	0.97	0.00	0.97
10.20	0.50	0.93	0.54*	0.97	0.00	0.97
10.25	0.50	0.93	0.54*	0.97	0.00	0.97
10.30	0.50	0.93	0.54*	0.97	0.00	0.97
10.35	0.50	0.93	0.54*	0.97	0.00	0.97
10.40	0.50	0.94	0.53*	0.97	0.00	0.97
10.45	0.50	0.94	0.53*	0.97	0.00	0.97
10.50	0.50	0.94	0.53*	0.97	0.00	0.97
10.55	0.50	0.94	0.53*	0.97	0.00	0.97
10.60	0.50	0.94	0.53*	0.97	0.00	0.97
10.65	0.50	0.94	0.53*	0.97	0.00	0.97
10.70	0.50	0.95	0.53*	0.97	0.00	0.97
10.75	0.50	0.95	0.53*	0.97	0.00	0.97
10.80	0.50	0.95	0.53*	0.97	0.00	0.97
10.85	0.50	0.95	0.53*	0.97	0.00	0.97
10.90	0.50	0.95	0.53*	0.97	0.00	0.97
10.95	0.50	0.95	0.52*	0.97	0.00	0.97
-	-	-			-	

11.00	0.50	0.95	0.52*	0.97	0.00	0.97
11 05	0.50	0.95	0.52*	0.97 0 97	0.00	0.97 0.97
11 10	0.50	0.96	0.52*	0.97 0 97	0.00	0.97 0.97
11 15	0.50	0.90	0.52	0.37 0 97	0.00	0.97 0 97
11 20	0.50	0.90 0.96	0.52	0.J7 0 97	0.00	0.J7 0 97
11 25	0.50	0.90	0.52*	0.97	0.00	0.97
11 20	0.50	0.90	0.52*	0.97	0.00	0.97
11.50	0.50	0.96	0.52*	0.97	0.00	0.97
11.35	0.50	0.96	0.52*	0.97	0.00	0.97
11.40	0.50	0.97	0.52*	0.97	0.00	0.97
11.45	0.50	0.97	0.52*	0.9/	0.00	0.97
11.50	0.50	0.97	0.52*	0.9/	0.00	0.9/
11.55	0.50	0.97	0.52*	0.97	0.00	0.97
11.60	0.50	0.97	0.51*	0.97	0.00	0.97
11.65	0.50	0.97	0.51*	0.97	0.00	0.97
11.70	0.50	0.97	0.51*	0.97	0.00	0.97
11.75	0.50	0.98	0.51*	0.97	0.00	0.97
11.80	0.50	0.98	0.51*	0.97	0.00	0.97
11.85	0.50	0.98	0.51*	0.97	0.00	0.97
11.90	0.50	0.98	0.51*	0.97	0.00	0.97
11.95	0.50	0.98	0.51*	0.97	0.00	0.97
12.00	0.50	0.98	0.51*	0.96	0.00	0.96
12.05	0.50	0.98	0.51*	0.96	0.00	0.96
12.10	0.50	0.98	0.51*	0.96	0.00	0.96
12.15	0.50	0.99	0.51*	0.96	0.00	0.96
12.20	0.45	0.99	0.45*	0.95	0.00	0.95
12.25	0.39	0.99	0.39*	0.95	0.00	0.95
12.30	0.36	0.99	0.37*	0.94	0.00	0.94
12.35	0.35	0.99	0.35*	0.94	0.00	0.94
12 40	0.33	0.99 0 99	0.33*	0.93	0.00	0.91
12.45	0.32	0.99 0 99	0.32*	0.93 0 92	0.00	0.55 0 92
12.45	0.32	0.00	0.32	0.JZ 0.02	0.00	0.52
12.50	0.20	1 00	0.31*	0.92	0.00	0.92
12.55	0.21	1 00	0.31	0.01	0.00	0.01
12.00	0.22	1 00	0.52*	0.90	0.00	0.90
12.05	0.52	1.00	0.52	0.90	0.00	0.90
12.70	0.52	1.00	0.33*	0.09	0.00	0.89
12.75	0.22	1.00	0.33*	0.09	0.00	0.09
12.80	0.34	1.00	0.34*	0.88	0.00	0.88
12.85	0.34	1.00	0.34*	0.8/	0.00	0.8/
12.90	0.35	1.00	0.35*	0.8/	0.00	0.8/
12.95	0.36	1.00	0.35*	0.86	0.00	0.86
13.00	0.36	1.01	0.36*	0.86	0.00	0.86
13.05	0.37	1.01	0.37*	0.85	0.00	0.85
13.10	0.38	1.01	0.38*	0.84	0.00	0.84
13.15	0.40	1.01	0.39*	0.84	0.00	0.84
13.20	0.41	1.01	0.41*	0.83	0.00	0.83
13.25	0.44	1.01	0.44*	0.83	0.00	0.83
13.30	0.50	1.01	0.49*	0.83	0.00	0.83
13.35	0.50	1.01	0.49*	0.82	0.00	0.82
13.40	0.50	1.01	0.49*	0.82	0.00	0.82
13.45	0.50	1.01	0.49*	0.81	0.00	0.81

13 50	0 50	1 02	0 10*	Q 81	a aa	0 Q1
13 55	0.50	1 02	0.45	0.01 0 Q1	0.00	0.01
12 60	0.50	1 02	0.49*	0.01	0.00	0.01
12 65	0.50	1 02	0.49	0.00	0.00	0.00
12 70	0.50	1 02	0.49	0.00	0.00	0.00
12.70	0.50	1.02	0.49*	0.00	0.00	0.00
13./5	0.50	1.02	0.49*	0.79	0.00	0.79
13.80	0.50	1.02	0.49*	0.79	0.00	0.79
13.85	0.50	1.02	0.49*	0.79	0.00	0.79
13.90	0.50	1.02	0.49*	0.79	0.00	0.79
13.95	0.50	1.02	0.49*	0.78	0.00	0.78
14.00	0.50	1.03	0.49*	0.78	0.00	0.78
14.05	0.50	1.03	0.49*	0.78	0.00	0.78
14.10	0.50	1.03	0.49*	0.78	0.00	0.78
14.15	0.50	1.03	0.49*	0.78	0.00	0.78
14.20	0.50	1.03	0.49*	0.78	0.00	0.78
14.25	0.50	1.03	0.49*	0.78	0.00	0.78
14.30	0.50	1.03	0.49*	0.78	0.00	0.78
14.35	0.50	1.03	0.48*	0.77	0.00	0.77
14.40	0.50	1.03	0.48*	0.77	0.00	0.77
14.45	0.50	1.03	0.48*	0.77	0.00	0.77
14.50	0.50	1.03	0.48*	0.77	0.00	0.77
14.55	0.50	1.03	0.48*	0.77	0.00	0.77
14.60	0.50	1.04	0.48*	0.77	0.00	0.77
14.65	0.50	1.04	0.48*	0.77	0.00	0.77
14.70	0.50	1.04	0.48*	0.77	0.00	0.77
14.75	0.50	1.04	0.48*	0.77	0.00	0.77
14 80	0.50	1 04	0 48*	0.77 0 77	0.00	0.77 0 77
14 85	0.50	1 04	0 48*	0.77 0 77	0.00	0.77 0 77
14.00	0.50	1 04	0.40	0.77 0 77	0.00	0.77 0 77
1/ 05	0.50	1 0/	0.40	0.77	0.00	0.77 0 77
15 00	0.50	1 04	0.40	0.77	0.00	0.77
15.00	0.50	1 04	0.40	0.77	0.00	0.77
15.05	0.50	1.04	0.40	0.77	0.00	0.77
15.10	0.50	1.04	0.48*	0.77	0.00	0.77
15.15	0.50	1.04	0.48*	0.77	0.00	0.77
15.20	0.50	1.04	0.48*	0.77	0.00	0.77
15.25	0.50	1.05	0.48*	0.//	0.00	0.77
15.30	0.50	1.05	0.48*	0.//	0.00	0.//
15.35	0.50	1.05	0.48*	0.//	0.00	0.//
15.40	0.50	1.05	0.48*	0.//	0.00	0.//
15.45	0.50	1.05	0.48*	0.77	0.00	0.77
15.50	0.50	1.05	0.48*	0.77	0.00	0.77
15.55	0.50	1.05	0.48*	0.77	0.00	0.77
15.60	0.50	1.05	0.48*	0.77	0.00	0.77
15.65	0.50	1.05	0.48*	0.77	0.00	0.77
15.70	0.50	1.05	0.48*	0.77	0.00	0.77
15.75	0.50	1.05	0.47*	0.76	0.00	0.76
15.80	0.50	1.05	0.47*	0.76	0.00	0.76
15.85	0.50	1.05	0.47*	0.76	0.00	0.76
15.90	0.50	1.05	0.47*	0.76	0.00	0.76
15.95	0.50	1.06	0.47*	0.76	0.00	0.76

16 00	a 5a	1 06	0 17*	0 75	a aa	0 75
16.00	0.50	1.00	0.47	0.75	0.00	0.75
16 10	0.50	1.00	0.47*	0.75	0.00	0.75
16 15	0.11	1.00	0.47	0.75	0.00	0.75
10.15	0.41	1.00	0.39*	0.74	0.00	0.74
16.20	0.38	1.06	0.30*	0.74	0.00	0.74
16.25	0.36	1.06	0.34*	0.73	0.00	0.73
16.30	0.34	1.06	0.32*	0.73	0.00	0.73
16.35	0.33	1.06	0.31*	0.72	0.00	0.72
16.40	0.32	1.06	0.30*	0.71	0.00	0.71
16.45	0.31	1.06	0.29*	0.71	0.00	0.71
16.50	0.30	1.06	0.28*	0.70	0.00	0.70
16.55	0.29	1.06	0.27*	0.70	0.00	0.70
16.60	0.28	1.06	0.26*	0.69	0.00	0.69
16.65	0.27	1.06	0.26*	0.68	0.00	0.68
16.70	0.26	1.07	0.25*	0.67	0.00	0.67
16.75	0.26	1.07	0.24*	0.67	0.00	0.67
16.80	0.25	1.07	0.24*	0.66	0.00	0.66
16.85	0.24	1.07	0.23*	0.65	0.00	0.65
16.90	0.24	1.07	0.22*	0.64	0.00	0.64
16.95	0.23	1.07	0.22*	0.63	0.00	0.63
17 00	0.23	1 07	0.22	0.63	0.00	0.63
17 05	0.25	1 07	0.21*	0.05	0.00	0.05
17 10	0.22	1 07	0.21	0.02	0.00	0.02
17 15	0.21	1 07	0.20*	0.01	0.00	0.01
17 20	0.21	1.07	0.19	0.00	0.00	0.00
17.20	0.20	1.07	0.19*	0.59	0.00	0.59
17.25	0.20	1.07	0.18*	0.58	0.00	0.58
17.30	0.19	1.07	0.18*	0.5/	0.00	0.5/
17.35	0.19	1.0/	0.1/*	0.56	0.00	0.56
17.40	0.18	1.07	0.17*	0.55	0.00	0.55
17.45	0.18	1.07	0.16*	0.54	0.00	0.54
17.50	0.17	1.07	0.16*	0.53	0.00	0.53
17.55	0.17	1.07	0.16*	0.52	0.00	0.52
17.60	0.18	1.08	0.16*	0.51	0.00	0.51
17.65	0.18	1.08	0.17*	0.49	0.00	0.49
17.70	0.18	1.08	0.17*	0.48	0.00	0.48
17.75	0.18	1.08	0.17*	0.47	0.00	0.47
17.80	0.19	1.08	0.17*	0.46	0.00	0.46
17.85	0.19	1.08	0.17*	0.45	0.00	0.45
17.90	0.19	1.08	0.18*	0.44	0.00	0.44
17.95	0.19	1.08	0.18*	0.43	0.00	0.43
18.00	0.19	1.08	0.18*	0.42	0.00	0.42
18.05	0.20	1.08	0.18*	0.41	0.00	0.41
18,10	0.20	1.08	0.18*	0.40	0.00	0.40
18 15	0.20	1 08	0.10*	0.10	0.00	0.10
18 20	0.20	1 08	0.19*	0.32	0.00	0.32
10.20	0.20	1 00	0.10*	0.30	0.00	0.50
10.20	0.21 0 01	1 00	0.10*	0.27	0.00	0.5/
10.JE	0.21	1 00	0 70*	0.JC	0.00	0.50
10.33	0.21	1 00	0.20	دد.ש ۱	0.00	55.0 م د م
10.40	0.21 0.22	1.00	U.20™ 0.20*	0.54 0.74	0.00	0.34
10.45	0.22	т.00	0.20*	v.34	0.00	0.34

18.50	0.22	1.08	0.20*	0.33	0.00	0.33
18.55	0.22	1.08	0.20*	0.32	0.00	0.32
18,60	0.22	1.08	0.21*	0.31	0.00	0.31
18 65	0.22	1 09	0.21*	0.31 0 30	0.00	0.31 0 30
18 70	0.2J 0.23	1 00	0.21	a 29	0.00	0.50 0.20
10.70	0.25	1 00	0.21	0.2J 0.20	0.00	0.2J
10./5	0.25	1.09	0.21	0.20	0.00	0.20
10.00	0.24	1.09	0.22*	0.27	0.00	0.27
18.85	0.24	1.09	0.22*	0.2/	0.00	0.2/
18.90	0.24	1.09	0.22*	0.26	0.00	0.26
18.95	0.24	1.09	0.22*	0.25	0.00	0.25
19.00	0.25	1.09	0.23*	0.24	0.00	0.24
19.05	0.25	1.09	0.23*	0.23	0.00	0.23
19.10	0.25	1.09	0.23*	0.23	0.00	0.23
19.15	0.25	1.09	0.23*	0.22	0.00	0.22
19.20	0.26	1.09	0.24*	0.21	0.00	0.21
19.25	0.26	1.09	0.24*	0.20	0.00	0.20
19.30	0.26	1.09	0.24*	0.19	0.00	0.19
19.35	0.27	1.09	0.24*	0.19	0.00	0.19
19.40	0.27	1.09	0.25*	0.18	0.00	0.18
19.45	0.27	1.09	0.25*	0.17	0.00	0.17
19.50	0.28	1.09	0.25*	0.16	0.00	0.16
19.55	0.28	1.09	0.26*	0.16	0.00	0.16
19.60	0.28	1.09	0.26*	0.15	0.00	0.15
19 65	0.29	1 09	0 26*	0 14	0.00	0.14
19.05	0.2J 0.20	1 00	0.20	0.14 0 1/	0.00	0.14
10 75	0.2J	1 00	0.27	0.14	0.00	0.14
10 00	0.29	1 10	0.27*	0.15	0.00	0.15
10 00	0.30	1 10	0.27*	0.12	0.00	0.12
19.05	0.30	1.10	0.20*	0.11	0.00	0.11
19.90	0.31	1.10	0.28*	0.11	0.00	0.11
19.95	0.31	1.10	0.28*	0.10	0.00	0.10
20.00	0.31	1.10	0.29*	0.09	0.00	0.09
20.05	0.32	1.10	0.29*	0.09	0.00	0.09
20.10	0.33	1.10	0.30*	0.08	0.00	0.08
20.15	0.34	1.10	0.31*	0.08	0.00	0.08
20.20	0.35	1.10	0.32*	0.07	0.00	0.07
20.25	0.36	1.10	0.32*	0.06	0.00	0.06
20.30	0.37	1.10	0.34*	0.06	0.00	0.06
20.35	0.38	1.10	0.35*	0.05	0.00	0.05
20.40	0.40	1.10	0.37*	0.05	0.00	0.05
20.45	0.44	1.10	0.40*	0.04	0.00	0.04
20.50	0.50	1.10	0.45*	0.04	0.00	0.04
20.55	0.50	1.10	0.45*	0.03	0.00	0.03
20.60	0.50	1.10	0.45*	0.03	0.00	0.03
20.65	0.50	1.10	0.45*	0.03	0.00	0.03
20.70	0.50	1.10	0.45*	0.02	0.00	0.02
20.75	0.50	1,10	0.45*	0.02	0.00	0.02
20.80	0.50	1,10	0.45*	0.02	0.00	0 02
20.00	0 50	1 10	0.45*	0 01	0.00 0 00	0 01
20.05	0.50	1 10	0.45	0.01 0 01	0.00 0 00	0.01 0 01
20.90	0.50	1 10	0.45*	0.01 0 01	0.00 0 00	0.01 0 01
20.77	0.00	T · TO	0.40	0.01	0.00	0.01

21.00	0.50	1.10	0.45*	0.01	0.00	0.01
21.05	0.50	1.10	0.45*	0.01	0.00	0.01
21.10	0.50	1.10	0.45*	0.01	0.00	0.01
21.15	0.50	1,10	0.45*	0.00	0.00	0.00
21 20	0.50	1 10	0.45*	0.00 0 00	0.00	a aa
21.20	0.50	1 11	0.45*	a aa	0.00	a aa
21.20	0.50	1 11	0.45	0.00	0.00	0.00
21.50	0.50	1 11	0.45	0.00	0.00	0.00
21.35	0.50		0.45*	0.00	0.00	0.00
21.40	0.50		0.45*	0.00	0.00	0.00
21.45	0.50	1.11	0.45*	0.00	0.00	0.00
21.50	0.50	1.11	0.45*	0.00	0.00	0.00
21.55	0.50	1.11	0.45*	0.00	0.00	0.00
21.60	0.50	1.11	0.45*	0.00	0.00	0.00
21.65	0.50	1.11	0.45*	0.00	0.00	0.00
21.70	0.50	1.11	0.45*	0.00	0.00	0.00
21.75	0.50	1.11	0.45*	0.00	0.00	0.00
21.80	0.50	1.11	0.45*	0.00	0.00	0.00
21.85	0.50	1.11	0.45*	0.00	0.00	0.00
21.90	0.50	1.11	0.45*	0.00	0.00	0.00
21.95	0.50	1.11	0.45*	0.00	0.00	0.00
22.00	0.50	1.11	0.45*	0.00	0.00	0.00
22.05	0.50	1.11	0.45*	0.00	0.00	0.00
22.10	0.50	1.11	0.45*	0.00	0.00	0.00
22.15	0.50	1.11	0.45*	0.00	0.00	0.00
22.20	0.50	1.11	0.45*	0.00	0.00	0.00
22.25	0.50	1.11	0.45*	0.00	0.00	0.00
22.30	0.50	1,11	0.45*	0.00	0.00	0.00
22.30	0.50	1 11	0.45*	0.00 0 00	0.00	a aa
22.35	0.50	1 11	0.45*	0.00 0 00	0.00	a aa
22.40	0.50	1 11	0.45*	a aa	0.00	a aa
22.45	0.50	1 11	0.45	0.00	0.00	0.00
22.50	0.50	1 11	0.45*	0.00	0.00	0.00
22.55	0.50	1 11	0.45*	0.00	0.00	0.00
22.00	0.50	1 11	0.45	0.00	0.00	0.00
22.05	0.50	1.11	0.45	0.00	0.00	0.00
22.70	0.50	1.11	0.45*	0.00	0.00	0.00
22.75	0.50		0.45*	0.00	0.00	0.00
22.80	0.50		0.45*	0.00	0.00	0.00
22.85	0.50	1.11	0.45*	0.00	0.00	0.00
22.90	0.50	1.11	0.45*	0.00	0.00	0.00
22.95	0.50	1.11	0.45*	0.00	0.00	0.00
23.00	0.50	1.12	0.45*	0.00	0.00	0.00
23.05	0.50	1.12	0.45*	0.00	0.00	0.00
23.10	0.50	1.12	0.45*	0.00	0.00	0.00
23.15	0.50	1.12	0.45*	0.00	0.00	0.00
23.20	0.50	1.12	0.45*	0.00	0.00	0.00
23.25	0.50	1.12	0.45*	0.00	0.00	0.00
23.30	0.50	1.12	0.45*	0.00	0.00	0.00
23.35	0.50	1.12	0.45*	0.00	0.00	0.00
23.40	0.50	1.12	0.45*	0.00	0.00	0.00
23.45	0.50	1.12	0.45*	0.00	0.00	0.00

23 50	0 50	1 12	0 15*	a aa	a aa	a aa
23.50	0.50	1 12	0.45*	a aa	0.00	a aa
23.55	0.50 0.50	1 12	0.45*	0.00 0 00	0.00	a aa
23.00	0.50	1 12	0.45	0.00	0.00	0.00
23.05	0.50	1.12	0.45	0.00	0.00	0.00
23.70	0.50	1.12	0.45	0.00	0.00	0.00
23./5	0.50	1.12	0.45*	0.00	0.00	0.00
23.80	0.50	1.12	0.45*	0.00	0.00	0.00
23.85	0.50	1.12	0.45*	0.00	0.00	0.00
23.90	0.50	1.12	0.45*	0.00	0.00	0.00
23.95	0.50	1.12	0.45*	0.00	0.00	0.00
24.00	0.50	1.12	0.45*	0.00	0.00	0.00
24.05	0.50	1.12	0.45*	0.00	0.00	0.00
24.10	0.50	1.12	0.45*	0.00	0.00	0.00
24.15	0.50	1.12	0.45*	0.00	0.00	0.00
24.20	0.50	1.12	0.45*	0.00	0.00	0.00
24.25	0.50	1.12	0.45*	0.00	0.00	0.00
24.30	0.50	1.12	0.45*	0.00	0.00	0.00
24.35	0.50	1.12	0.45*	0.00	0.00	0.00
24.40	0.50	1.12	0.44*	0.00	0.00	0.00
24.45	0.50	1.12	0.44*	0.00	0.00	0.00
24.50	0.50	1.12	0.44*	0.00	0.00	0.00
24.55	0.50	1.12	0.44*	0.00	0.00	0.00
24.60	0.50	1.12	0.44*	0.00	0.00	0.00
24 65	0.50	1 12	0 44*	a aa	0.00	a aa
24.05	0.50	1 12	0. <u></u> 0.11*	a aa	0.00	a aa
24.70 24.75	0.50 0.50	1 13	0.44	0.00 0 00	0.00	a aa
24.75	0.50	1 13	0.44	0.00	0.00	0.00
24.00	0.50	1 12	0.44	0.00	0.00	0.00
24.05	0.50	1 12	0.44	0.00	0.00	0.00
24.90	0.50	1 1 2	0.44	0.00	0.00	0.00
24.95	0.50	1.15	0.44*	0.00	0.00	0.00
25.00	0.50	1.13	0.44*	0.00	0.00	0.00
25.05	0.50	1.13	0.44*	0.00	0.00	0.00
25.10	0.50	1.13	0.44*	0.00	0.00	0.00
25.15	0.50	1.13	0.44*	0.00	0.00	0.00
25.20	0.50	1.13	0.44*	0.00	0.00	0.00
25.25	0.50	1.13	0.44*	0.00	0.00	0.00
25.30	0.50	1.13	0.44*	0.00	0.00	0.00
25.35	0.50	1.13	0.44*	0.00	0.00	0.00
25.40	0.50	1.13	0.44*	0.00	0.00	0.00
25.45	0.50	1.13	0.44*	0.00	0.00	0.00
25.50	0.50	1.13	0.44*	0.00	0.00	0.00
25.55	0.50	1.13	0.44*	0.00	0.00	0.00
25.60	0.50	1.13	0.44*	0.00	0.00	0.00
25.65	0.50	1.13	0.44*	0.00	0.00	0.00
25.70	0.50	1.13	0.44*	0.00	0.00	0.00
25.75	0.50	1.13	0.44*	0.00	0.00	0.00
25.80	0.50	1.13	0.44*	0.00	0.00	0.00
25.85	0.50	1.13	0.44*	0.00	0.00	0.00
25.90	0.50	1.13	0.44*	0.00	0.00	0.00
25.95	0.50	1.13	0.44*	0.00	0.00	0.00

26.00	0.50	1.13	0.44*	0.00	0.00	0.00
26.05	0.50	1.13	0.44*	0.00	0.00	0.00
26.10	0.50	1.13	0.44*	0.00	0.00	0.00
26.15	0.50	1,13	0.44*	0.00	0.00	0.00
26 20	0.50	1 13	0 44*	0.00 0 00	0.00	a aa
26.25	0.50 0 50	1 13	0. <u></u> 0.11*	a aa	0.00	a aa
20.25	0.50	1 13	0.44	0.00	0.00	0.00
20.50	0.50	1 1 2	0.44	0.00	0.00	0.00
20.35	0.50	1.15	0.44*	0.00	0.00	0.00
26.40	0.50	1.13	0.44*	0.00	0.00	0.00
26.45	0.50	1.14	0.44*	0.00	0.00	0.00
26.50	0.50	1.14	0.44*	0.00	0.00	0.00
26.55	0.50	1.14	0.44*	0.00	0.00	0.00
26.60	0.50	1.14	0.44*	0.00	0.00	0.00
26.65	0.50	1.14	0.44*	0.00	0.00	0.00
26.70	0.50	1.14	0.44*	0.00	0.00	0.00
26.75	0.50	1.14	0.44*	0.00	0.00	0.00
26.80	0.50	1.14	0.44*	0.00	0.00	0.00
26.85	0.50	1.14	0.44*	0.00	0.00	0.00
26.90	0.50	1.14	0.44*	0.00	0.00	0.00
26.95	0.50	1.14	0.44*	0.00	0.00	0.00
27.00	0.50	1.14	0.44*	0.00	0.00	0.00
27.05	0.50	1.14	0.44*	0.00	0.00	0.00
27.10	0.50	1.14	0.44*	0.00	0.00	0.00
27.15	0.50	1.14	0.44*	0.00	0.00	0.00
27.20	0.50	1.14	0.44*	0.00	0.00	0.00
27.25	0.50	1.14	0.44*	0.00	0.00	0.00
27.30	0.50	1.14	0.44*	0.00	0.00	0.00
27.35	0.50	1.14	0.44*	0.00	0.00	0.00
27 40	0.50	1 14	0 44*	0.00 0 00	0.00	a aa
27.10	0.50	1 1/	0.11*	a aa	0.00	a aa
27.45	0.50 0.50	1 1/	0.44	0.00 0 00	0.00	a aa
27.50	0.50	1 1/	0.44	0.00	0.00	0.00
27.55	0.50	1 1/	0.44	0.00	0.00	0.00
27.00	0.50	1 1/	0.44	0.00	0.00	0.00
27.05	0.50	1 1/	0.44	0.00	0.00	0.00
27.70	0.50	1.14	0.44	0.00	0.00	0.00
27.75	0.50	1.14	0.44*	0.00	0.00	0.00
27.80	0.50	1.14	0.44*	0.00	0.00	0.00
27.85	0.50	1.14	0.44*	0.00	0.00	0.00
27.90	0.50	1.14	0.44*	0.00	0.00	0.00
27.95	0.50	1.14	0.44*	0.00	0.00	0.00
28.00	0.50	1.14	0.44*	0.00	0.00	0.00
28.05	0.50	1.14	0.44*	0.00	0.00	0.00
28.10	0.50	1.14	0.44*	0.00	0.00	0.00
28.15	0.50	1.14	0.44*	0.00	0.00	0.00
28.20	0.50	1.14	0.44*	0.00	0.00	0.00
28.25	0.50	1.14	0.44*	0.00	0.00	0.00
28.30	0.50	1.14	0.44*	0.00	0.00	0.00
28.35	0.50	1.14	0.44*	0.00	0.00	0.00
28.40	0.50	1.14	0.44*	0.00	0.00	0.00
28.45	0.50	1.14	0.44*	0.00	0.00	0.00

28 50	a 5a	1 14	Q 11*	a aa	a aa	a aa
20.50	0.50	1 1/	0.44	0.00	0.00	0.00
20.55	0.50	1 15	0.44	0.00	0.00	0.00
20.00	0.50	1 15	0.44	0.00	0.00	0.00
20.00	0.50	1.15	0.44*	0.00	0.00	0.00
28.70	0.50	1.15	0.44*	0.00	0.00	0.00
28.75	0.50	1.15	0.44*	0.00	0.00	0.00
28.80	0.50	1.15	0.44*	0.00	0.00	0.00
28.85	0.50	1.15	0.44*	0.00	0.00	0.00
28.90	0.50	1.15	0.44*	0.00	0.00	0.00
28.95	0.50	1.15	0.44*	0.00	0.00	0.00
29.00	0.50	1.15	0.44*	0.00	0.00	0.00
29.05	0.50	1.15	0.44*	0.00	0.00	0.00
29.10	0.50	1.15	0.44*	0.00	0.00	0.00
29.15	0.50	1.15	0.44*	0.00	0.00	0.00
29.20	0.50	1.15	0.44*	0.00	0.00	0.00
29.25	0.50	1.15	0.44*	0.00	0.00	0.00
29.30	0.50	1.15	0.44*	0.00	0.00	0.00
29.35	0.50	1,15	0.44*	0.00	0.00	0.00
29 40	0 50	1 15	0 44*	0.00	0 00	a aa
29.40	0.50	1 15	0.44 0.44*	0.00 0 00	0.00	a aa
29.45	0.50	1 15	0.44 0.77*	0.00 0 00	0.00	a aa
29.50	0.50	1 15	0.44	0.00	0.00	0.00
29.55	0.50	1 15	0.44	0.00	0.00	0.00
29.00	0.50	1.15	0.43*	0.00	0.00	0.00
29.65	0.50	1.15	0.43*	0.00	0.00	0.00
29.70	0.50	1.15	0.43*	0.00	0.00	0.00
29.75	0.50	1.15	0.43*	0.00	0.00	0.00
29.80	0.50	1.15	0.43*	0.00	0.00	0.00
29.85	0.50	1.15	0.43*	0.00	0.00	0.00
29.90	0.50	1.15	0.43*	0.00	0.00	0.00
29.95	0.50	1.15	0.43*	0.00	0.00	0.00
30.00	0.50	1.15	0.43*	0.00	0.00	0.00
30.05	0.50	1.15	0.43*	0.00	0.00	0.00
30.10	0.50	1.15	0.43*	0.00	0.00	0.00
30.15	0.50	1.15	0.43*	0.00	0.00	0.00
30.20	0.50	1.15	0.43*	0.00	0.00	0.00
30.25	0.50	1.15	0.43*	0.00	0.00	0.00
30.30	0.50	1.15	0.43*	0.00	0.00	0.00
30.35	0.50	1.15	0.43*	0.00	0.00	0.00
30.40	0.50	1.15	0.44*	0.00	0.00	0.00
30.45	0.50	1 15	0 11*	a aa	0.00	a aa
30.45	0.50	1 15	0.44 0.77*	0.00 0 00	0.00	a aa
30.50	0.50	1 15	0.44	0.00	0.00	0.00
20.55	0.50	1.15	0.44	0.00	0.00	0.00
	0.50	1.15	0.44	0.00	0.00	0.00
	0.50	1.15	0.44*	0.00	0.00	0.00
30.70	0.50	1.15	0.44↑	0.00	0.00	0.00
30.75	0.50	1.15	0.44*	0.00	0.00	0.00
30.80	0.50	1.15	0.44*	0.00	0.00	0.00
30.85	0.50	1.15	0.44*	0.00	0.00	0.00
30.90	0.50	1.15	0.44*	0.00	0.00	0.00
30.95	0.50	1.15	0.44*	0.00	0.00	0.00

31.00	0.50	1.15	0.44*	0.00	0.00	0.00
31 05	0.50	1 15	0. <u></u> 0.11*	0.00 0 00	0.00	a aa
31 10	0.50 0.50	1 15	0.44	0.00 0 00	0.00	a aa
21 15	0.50	1 15	0.44	0.00	0.00	0.00
31 20	0.50	1 15	0.44	0.00	0.00	0.00
21 25	0.50	1 15	0.44	0.00	0.00	0.00
21.22	0.50	1.15	0.44*	0.00	0.00	0.00
31.30	0.50	1.15	0.44*	0.00	0.00	0.00
31.35	0.50	1.15	0.44*	0.00	0.00	0.00
31.40	0.50	1.14	0.44*	0.00	0.00	0.00
31.45	0.50	1.14	0.44*	0.00	0.00	0.00
31.50	0.50	1.14	0.44*	0.00	0.00	0.00
31.55	0.50	1.14	0.44*	0.00	0.00	0.00
31.60	0.50	1.14	0.44*	0.00	0.00	0.00
31.65	0.50	1.14	0.44*	0.00	0.00	0.00
31.70	0.50	1.14	0.44*	0.00	0.00	0.00
31.75	0.50	1.14	0.44*	0.00	0.00	0.00
31.80	0.50	1.14	0.44*	0.00	0.00	0.00
31.85	0.50	1.14	0.44*	0.00	0.00	0.00
31.90	0.50	1.14	0.44*	0.00	0.00	0.00
31.95	0.50	1.14	0.44*	0.00	0.00	0.00
32.00	0.50	1.14	0.44*	0.00	0.00	0.00
32.05	0.50	1.14	0.44*	0.00	0.00	0.00
32.10	0.50	1.14	0.44*	0.00	0.00	0.00
32.15	0.50	1.14	0.44*	0.00	0.00	0.00
32.20	0.50	1.14	0.44*	0.00	0.00	0.00
32.25	0.50	1.14	0.44*	0.00	0.00	0.00
32 30	0.50	1 14	0 44*	0.00 0 00	0.00	a aa
32.30	0.50	1 14	0. <u></u> 0.11*	0.00 0 00	0.00	a aa
32.00	0.50	1 14	0. <u></u> 0.11*	0.00 0 00	0.00	a aa
32.40	0.50	1 1/	0.44	0.00	0.00	0.00
22.45	0.50	1 1/	0.44	0.00	0.00	0.00
22.JU	0.50	1 1/	0.44	0.00	0.00	0.00
22.22	0.50	1 1/	0.44	0.00	0.00	0.00
22.00	0.50	1.14	0.44	0.00	0.00	0.00
	0.50	1.14	0.44*	0.00	0.00	0.00
32.70	0.50	1.14	0.44*	0.00	0.00	0.00
32.75	0.50	1.14	0.44*	0.00	0.00	0.00
32.80	0.50	1.14	0.44*	0.00	0.00	0.00
32.85	0.50	1.14	0.44*	0.00	0.00	0.00
32.90	0.50	1.14	0.44*	0.00	0.00	0.00
32.95	0.50	1.14	0.44*	0.00	0.00	0.00
33.00	0.50	1.14	0.44*	0.00	0.00	0.00
33.05	0.50	1.14	0.44*	0.00	0.00	0.00
33.10	0.50	1.14	0.44*	0.00	0.00	0.00
33.15	0.50	1.14	0.44*	0.00	0.00	0.00
33.20	0.50	1.14	0.44*	0.00	0.00	0.00
33.25	0.50	1.14	0.44*	0.00	0.00	0.00
33.30	0.50	1.14	0.44*	0.00	0.00	0.00
33.35	0.50	1.14	0.44*	0.00	0.00	0.00
33.40	0.50	1.14	0.44*	0.00	0.00	0.00
33.45	0.50	1.13	0.44*	0.00	0.00	0.00

22 50	0 50	1 1 2	Q 11*	0 00	0 00	0 00
22 55	0.50	1 12	0.44	0.00	0.00	0.00
22 60	0.50	1 12	0.44	0.00	0.00	0.00
22 65	0.50	1 12	0.44	0.00	0.00	0.00
22.05 07.02	0.50	1 12	0.44	0.00	0.00	0.00
22.70 22.75	0.50	1 1 2	0.44	0.00	0.00	0.00
22./2	0.50	1.15	0.44*	0.00	0.00	0.00
33.80	0.50	1.13	0.44*	0.00	0.00	0.00
33.85	0.50	1.13	0.44*	0.00	0.00	0.00
33.90	0.50	1.13	0.44*	0.00	0.00	0.00
33.95	0.50	1.13	0.44*	0.00	0.00	0.00
34.00	0.50	1.13	0.44*	0.00	0.00	0.00
34.05	0.50	1.13	0.44*	0.00	0.00	0.00
34.10	0.50	1.13	0.44*	0.00	0.00	0.00
34.15	0.50	1.13	0.44*	0.00	0.00	0.00
34.20	0.50	1.13	0.44*	0.00	0.00	0.00
34.25	0.50	1.13	0.44*	0.00	0.00	0.00
34.30	0.50	1.13	0.44*	0.00	0.00	0.00
34.35	0.50	1.13	0.44*	0.00	0.00	0.00
34.40	0.50	1.13	0.44*	0.00	0.00	0.00
34.45	0.50	1.13	0.44*	0.00	0.00	0.00
34.50	0.50	1.13	0.44*	0.00	0.00	0.00
34.55	0.50	1.13	0.44*	0.00	0.00	0.00
34.60	0.50	1.13	0.44*	0.00	0.00	0.00
34.65	0.50	1.13	0.44*	0.00	0.00	0.00
34.70	0.50	1.13	0.44*	0.00	0.00	0.00
34.75	0.50	1.13	0.44*	0.00	0.00	0.00
34.80	0.50	1.13	0.44*	0.00	0.00	0.00
34.85	0.50	1.13	0.44*	0.00	0.00	0.00
34.90	0.50	1.13	0.44*	0.00	0.00	0.00
34.95	0.50	1.13	0.44*	0.00	0.00	0.00
35.00	0.50	1.13	0.44*	0.00	0.00	0.00
35.05	0.50	1.13	0.44*	0.00	0.00	0.00
35.10	0.50	1.12	0.44*	0.00	0.00	0.00
35.15	0.50	1.12	0.44*	0.00	0.00	0.00
35.20	0.50	1.12	0.44*	0.00	0.00	0.00
35.25	0.50	1.12	0.44*	0.00	0.00	0.00
35.30	0.50	1.12	0.44*	0.00	0.00	0.00
35.35	0.50	1.12	0.45*	0.00	0.00	0.00
35.40	0.50	1.12	0.45*	0.00	0.00	0.00
35 45	0.50	1 12	0.45*	0.00 0 00	0.00	a aa
35 50	0.50	1 12	0.45*	0.00 0 00	0.00 0 00	a aa
35 55	0.50	1 12	0.45*	a aa	0.00	a aa
35 60	0.50	1 12	0.45	0.00	0.00	0.00
25 65	0.50	1 1 2	0.45*	0.00	0.00	0.00
	0.50	1 1 2	0.45*	0.00	0.00	0.00
	0.50	1.12	0.45	0.00	0.00	0.00
22./2	0.50	1.12	U.45" 0 45*	0.00	0.00	0.00
	0.50	1 1 2	0.45" 0.45*	0.00	0.00	0.00
32.85	0.50	1 12	0.45 [™]	0.00	0.00	0.00
35.90	0.50	1.12	0.45 [↑]	0.00	0.00	0.00
35.95	0.50	1.12	0.45↑	0.00	0.00	0.00

36.00	0.50	1.12	0.45*	0.00	0.00	0.00
36.05	0.50	1.12	0.45*	0.00	0.00	0.00
36.10	0.50	1.12	0.45*	0.00	0.00	0.00
36 15	0.50	1 12	0.45*	0.00 0 00	0.00 0 00	a aa
36 20	0.50 0.50	1 12	0.45*	0.00 0 00	0.00	a aa
26 25	0.50	1 12	0.45*	0.00	0.00	0.00
26.20	0.50	1.12	0.45	0.00	0.00	0.00
20.20	0.50	1.12	0.45*	0.00	0.00	0.00
30.35	0.50	1.12	0.45*	0.00	0.00	0.00
36.40	0.50	1.12	0.45*	0.00	0.00	0.00
36.45	0.50	1.12	0.45*	0.00	0.00	0.00
36.50	0.50	1.11	0.45*	0.00	0.00	0.00
36.55	0.50	1.11	0.45*	0.00	0.00	0.00
36.60	0.50	1.11	0.45*	0.00	0.00	0.00
36.65	0.50	1.11	0.45*	0.00	0.00	0.00
36.70	0.50	1.11	0.45*	0.00	0.00	0.00
36.75	0.50	1.11	0.45*	0.00	0.00	0.00
36.80	0.50	1.11	0.45*	0.00	0.00	0.00
36.85	0.50	1.11	0.45*	0.00	0.00	0.00
36.90	0.50	1.11	0.45*	0.00	0.00	0.00
36.95	0.50	1.11	0.45*	0.00	0.00	0.00
37.00	0.50	1.11	0.45*	0.00	0.00	0.00
37.05	0.50	1.11	0.45*	0.00	0.00	0.00
37.10	0.50	1.11	0.45*	0.00	0.00	0.00
37.15	0.50	1.11	0.45*	0.00	0.00	0.00
37.20	0.50	1.11	0.45*	0.00	0.00	0.00
37.25	0.50	1.11	0.45*	0.00	0.00	0.00
37.30	0.50	1.11	0.45*	0.00	0.00	0.00
37.35	0.50	1,11	0.45*	0.00	0.00	0.00
37 40	0.50	1 11	0.45*	0.00 0 00	0.00 0 00	a aa
37 45	0.50	1 11	0.45*	a aa	0.00 0 00	a aa
37 50	0.50 0.50	1 11	0.45*	0.00 0 00	0.00	a aa
37 55	0.50	1 11	0.45	0.00	0.00	0.00
37.60	0.50	1 11	0.45	0.00	0.00	0.00
27 65	0.50	1 11	0.45*	0.00	0.00	0.00
	0.50	1.11	0.45	0.00	0.00	0.00
5/./U	0.50	1.11	0.45	0.00	0.00	0.00
	0.50	1 11	0.45	0.00	0.00	0.00
37.80	0.50		0.45*	0.00	0.00	0.00
37.85	0.50	1.11	0.45*	0.00	0.00	0.00
37.90	0.50	1.10	0.45*	0.00	0.00	0.00
37.95	0.50	1.10	0.45*	0.00	0.00	0.00
38.00	0.50	1.10	0.45*	0.00	0.00	0.00
38.05	0.50	1.10	0.45*	0.00	0.00	0.00
38.10	0.50	1.10	0.45*	0.00	0.00	0.00
38.15	0.50	1.10	0.45*	0.00	0.00	0.00
38.20	0.50	1.10	0.45*	0.00	0.00	0.00
38.25	0.50	1.10	0.45*	0.00	0.00	0.00
38.30	0.50	1.10	0.45*	0.00	0.00	0.00
38.35	0.50	1.10	0.45*	0.00	0.00	0.00
38.40	0.50	1.10	0.45*	0.00	0.00	0.00
38.45	0.50	1.10	0.45*	0.00	0.00	0.00

38.50	0.50	1.10	0.45*	0.00	0.00	0.00
38.55	0.50	1.10	0.45*	0.00	0.00	0.00
38.60	0.50	1.10	0.45*	0.00	0.00	0.00
38.65	0.50	1.10	0.45*	0.00	0.00	0.00
38.70	0.50	1.10	0.45*	0.00	0.00	0.00
38.75	0.50	1.10	0.46*	0.00	0.00	0.00
38.80	0.50	1.10	0.46*	0.00	0.00	0.00
38.85	0.50	1.10	0.46*	0.00	0.00	0.00
38.90	0.50	1.10	0.46*	0.00	0.00	0.00
38.95	0.50	1.10	0.46*	0.00	0.00	0.00
39.00	0.50	1.10	0.46*	0.00	0.00	0.00
39.05	0.50	1.10	0.46*	0.00	0.00	0.00
39.10	0.50	1.10	0.46*	0.00	0.00	0.00
39.15	0.50	1.10	0.46*	0.00	0.00	0.00
39.20	0.50	1.09	0.46*	0.00	0.00	0.00
39.25	0.50	1.09	0.46*	0.00	0.00	0.00
39.30	0.50	1.09	0.46*	0.00	0.00	0.00
39.35	0.50	1.09	0.46*	0.00	0.00	0.00
39.40	0.50	1.09	0.46*	0.00	0.00	0.00
39.45	0.50	1.09	0.46*	0.00	0.00	0.00
39.50	0.50	1.09	0.46*	0.00	0.00	0.00
39.55	0.50	1.09	0.46*	0.00	0.00	0.00
39.60	0.50	1.09	0.46*	0.00	0.00	0.00
39.65	0.50	1.09	0.46*	0.00	0.00	0.00
39.70	0.50	1.09	0.46*	0.00	0.00	0.00
39.75	0.50	1.09	0.46*	0.00	0.00	0.00
39.80	0.50	1.09	0.46*	0.00	0.00	0.00
39.85	0.50	1.09	0.46*	0.00	0.00	0.00
39.90	0.50	1.09	0.46*	0.00	0.00	0.00
39.95	0.50	1.09	0.46*	0.00	0.00	0.00
40.00	0.50	1.09	0.46*	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.

1 atm (atmos	phere) = 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