Appendix G2 Stadium Geotechnical Report

Appendices

This page intentionally left blank.

RMA Group
Every Project Matters | www.rmacompanies.com

GEOTECHNICAL INVESTIGATION
FOR
ONTARIO SPORTS COMPLEX
SE CORNER OF EAST RIVERSIDE DR AND ONTARIO AVE
ONTARIO, CA

DRAFT

for

City of Ontario
1425 S Bon View Ave.
Ontario, CA 91761

October 18, 2023
Updated December 6, 2023

00-232255-01

RMA Group
Every Project Matters | www.rmacompanies.com

October 18, 2023
Updated December 6, 2023

City of Ontario
1425 S Bon View Ave.
Ontario, CA 91761

Attention: Daniel Beers, Design & Construction – Principal Project Manager

Subject: Geotechnical Investigation for
Ontario Sports Complex
SE Corner of East Riverside Dr and Ontario Ave
Ontario, CA

Dear Mr. Beers:

In accordance with your request, a geotechnical investigation has been completed for the above referenced project. The report addresses both engineering geologic and geotechnical conditions. The results of the investigation are presented in the accompanying report, which includes a description of site conditions, results of our field exploration, laboratory testing, conclusions, and recommendations.

We appreciate this opportunity to be of continued service to you. If you have any questions regarding this report, please do not hesitate to contact us at your convenience.

Respectfully submitted,

RMA Group

Ken Dowell, PG, CEG
Project Geologist
CEG 2470

PROFESSIONAL GEOLOGIST
KENNETH R. DOWELL
No. 2470
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Haitham Dawood, PhD|PE|GE
Engineering Manager
GE 3227

REGISTERED PROFESSIONAL ENGINEER
HAITHAM DAWOOD
No. 3227
GEOTECHNICAL
STATE OF CALIFORNIA

DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

TABLE OF CONTENTS

DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

TABLE OF CONTENTS
(Continued)

FIGURES AND TABLES

APPENDICES

DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

1.00 INTRODUCTION

1.01 Purpose

A draft geotechnical investigation has been completed for a portion of the proposed Sports Complex located at the southeast corner of Vineyard Avenue and East Riverside Drive in the City of Ontario, California, California. This draft reports includes the northeastern portion of the project, specifically the proposed baseball stadium and parking structure. Location of the area subject to this draft report is indicated on Figure 3. A final report will be issued for the whole project area once full field exploration is completed. The purpose of the investigation was to summarize geotechnical and geologic conditions at the site, to assess their potential impact on the proposed development, and to develop geotechnical and engineering geologic design parameters.

1.02 Scope of the Investigation

The general scope of this investigation included the following:

- Review of published and unpublished geologic, seismic, groundwater and geotechnical literature.
- Examination of aerial photographs.
- Contacting of underground service alert to locate onsite utility lines.
- Logging, sampling and backfilling of 17 exploratory borings drilled with a CME-75 drill rig for this portion of the project. At total of 22 borings are proposed throughout the entire project area.
- Performance of 2 soil infiltration tests in accordance with the borehole method detailed in the San Bernardino County Technical Guidance for Water Quality Management Plans.
- Laboratory testing of representative soil samples.
- Geotechnical evaluation of the compiled data.
- Preparation of this report presenting our findings, conclusions and recommendations.

Our scope of work did not include a preliminary site assessment for the potential of hazardous materials onsite.

1.03 Site Location and Description

The proposed sports complex will be located at the southeast corner of southeast corner of East Riverside Drive and Vineyard Avenue in the southeast portion of the City of Ontario, San Bernardino County, California. Ontario Avenue crosses the site. The proposed baseball stadium and parking structure is located in the northeast portion of the overall site.

The site is bounded by East Riverside Drive to the north, the Cucamonga Creek Channel to the east, Chino Avenue to the south and, a nursery, and RV and boat storage property, and agricultural fields to the west (Figure 1). Its geographic position is at Latitude 34.017890° and Longitude -117.604962°. Elevation range from 750 to 780 feet above sea level.

DRAFT

1.04 Current and Past Land Usage

The site is currently utilized for various purposes. A dairy is located in the northeast part, agricultural fields are located on the south half of the site and an unused field is located in the northwest portion of the site. The dairy includes animal pens, a milk barn, other structures used for residences, office, equipment and feed storage. The pens are surrounded by metal pipe fencing and there are additional perimeter and some interior barbed wire fencing. The portion of the site between Ontario Avenue and the Cucamonga Creek Channel is used for nurseries, a few residential structures and horse stables. Five basins used to hold dairy water is located south of the dairy. The basins are surrounded by earthen berms. An earthen berm is located at the south end of the site, along Chino Avenue. Three dry basins surrounded by earthen berms are also located in the southeast corner of the site.

Historically, the site was used as orchards and agricultural fields since before 1938 until the late 1950's and early 1960's when the dairy was constructed. The east half of the current dairy was at this time used to house and train racehorses. The portion of the site east of Ontario Avenue had a dairy constructed on the north half in the late 1950's. A few residential structures and agricultural fields appear in the south half in the 1980's. The current nursery appears in the 2010's.

1.05 Planned Usage

It is our understanding that the proposed construction will consist of A minor league baseball stadium, a hotel, two parking structures, a gymnasium building, community center, community pool, a skate park retail structures, several sports fields including soccer, baseball and tennis courts and associated surface paved parking and roads.

Our investigation was performed prior to the preparation of grading or foundation plans. To aid in preparation of this report, we utilized the following assumptions:

- Maximum foundation loads of 2 to 3 kips per linear foot for continuous footings and 50 kips for isolated spread footings. As foundation loads are known they should be provided to determine if revised recommendations would be needed.
- Cuts and fills will be less than 5 feet except in the area of the baseball stadium where excavation of up to 20 feet is proposed.

1.06 Investigation Methods

Our investigation consisted of office research, field exploration, laboratory testing, review of the compiled data, and preparation of this report. It has been performed in a manner consistent with generally accepted engineering and geologic principles and practices, and has incorporated applicable requirements of California Building Code. Definitions of technical terms and symbols used in this report include those of the ASTM International, the California Building Code, and commonly used geologic nomenclature.

Technical supporting data are presented in the attached appendices. Appendix A presents a description of the methods and equipment used in performing the field exploration and logs of our subsurface exploration. Appendix B presents a description of our laboratory testing and the test results. Standard grading specifications and references are presented in Appendices C and D, respectively.

DRAFT

2.00 FINDINGS

2.01 Geologic Setting

The site is located on a deep structural depression known as the upper Santa Ana River Valley. According to Fife and others (1976), the alluvial deposits beneath the site are approximately 700 to 900 feet thick and rest on a basement of granitic bedrock.

The upper Santa Ana River Valley is bordered by the San Gabriel Mountains and the active Cucamonga fault to the north, and the Puente Hills and potentially active Chino fault to the west. To the south are the Jurupa Mountains and other resistant granitic and metamorphic hills. The eastern boundary of the valley is the San Bernardino Mountains and the active San Andreas fault.

According to regional geologic mapping by Bedrossian, Hayhurst and Roffers (2010), the site is underlain by Holocene to late Pleistocene age young eolian and dune deposits (Figure 2).

2.02 Earth Materials

Our subsurface investigation encountered manure and manure impacted soil, asphalt, concrete, artificial fill and alluvium.

The manure and manure impacted soils were encountered and observed in the animal pens. The manure and manure impacted soils thickness ranged from only a few inches up to a couple feet. The manure and manure impacted soils were thicker along the edges of the pens and, particularly, between the feed aisle and shade structures in the pens where the cows congregate. Actual thickness of the manure and manure impacted soils will vary. It is typical that dairy operators will drag the pens to limit wet manure buildup by redistributing the surface by dragging the surface and moving areas of wet manure. They will also typically remove manure buildup prior to winter and then again after winter. The areas of thicker manure are the pens used for the dairy cows. The pens not used for dairy cows have thinner amounts of manure. The basins should be expected to include manure impacted soil at their bottom, but how much is unknown at this time since the basins contained water at the time of our field investigation and thus inaccessible.

Asphalt was observed as pavement throughout the dairy and is three to four inches or less in thickness. The concrete was observed and encountered as pavement, particularly in the feed aisles between the pens. The concrete pavement is assumed to be six to eight inches thick. Other area of concrete pavement was found to be three to four inches thick.

Artificial fill was encountered consisting of gray silty sand in the pens that was encountered under the manure and was about a foot thick. This fill is expected to range from a few inches to up to three feet in the pens. The fill was placed to create drainage in the pens away from the feed aisles to the rear of the pens. Artificial fill was also observed as earthen berm around the basins and in the southern portion of the site. The soil in the berms appears to be excavated from the basins and is similar to the alluvial soil.

Alluvial soils encountered in our borings and observed around the site consisted of consisted of light brown to grayish-brown and brown silty fine sand with thin layers of clay, sandy silt and trace to minor amounts of gravel. Isolated filled old stream channels were also encountered where layers of sand were encountered in a boring, but these sand layers were not continuous across the site between borings. This is typical of alluvial depositional

DRAFT

environments.

The subsurface soils encountered in the exploratory borings drilled at the site are described in greater detail on the logs contained in Appendix A.

2.03 Expansive Soils

Expansion testing performed in accordance with ASTM D4829 indicates that earth materials underlying the site have an expansion classification of very low.

Results of expansion test and other soil index tests are presented in Appendix B. Since site grading will redistribute earth materials, potential expansive properties should be verified at the completion of rough grading.

2.04 Surface and Groundwater Conditions

Areas of ponding or standing water were present at the time of our study. Standing water was observed within the dairy wash ponds located in the east center of the site. Based upon the topography of the site, the depth of water within the basins is expected to be less than 10 feet. Water within these basins is from runoff of wash water from the milk barn and not surface expression of groundwater levels and subsurface infiltration from the basins is expected to yield very limited saturated soils around the base of the basins, particularly south of the basins due to the natural gradient of the site. Since the basing will be pumped dry and filled with engineered fill, the water in the basins will not affect the proposed development.

Further, no springs or areas of natural seepage were found. According to Carson and Matti, 1985, the depth to groundwater beneath the project is ranges from 150 to 175 feet below the ground surface. A water well (State well 340045N1176407W001) located about 2 miles southwest of the site had a groundwater measurement on April 14, 2022 of 136 feet below the ground surface. The ground surface elevation at the well is 30 to 60 feet below the site, therefore the depth to groundwater based on the well measurement would be about 160 to 190 feet below the ground surface.

2.05 Faults

The site is not located within the boundaries of an Earthquake Fault Zone for fault-rupture hazard as defined by the Alquist-Priolo Earthquake Fault Zoning Act and no faults are known to pass through the property. The nearest Earthquake Fault Zone is located about 7 miles to the west of the site along the Chino Central Avenue fault.

The nearest fault is the Chino Central Avenue fault located approximately 7 miles to the west.

The accompanying Regional Fault Map (Figure 4) illustrates the location of the site with respect to major faults in the region. The distance to notable faults within 100 kilometers of the site is presented on Table 1.

2.06 Historic Seismicity

The nearest historic strong earthquakes were epicentered within about 18 miles from the site. They were the 6.0 magnitude San Bernardino Earthquake that occurred in 1923 on the San Jacinto Fault and the 6.0 magnitude that occurred in the San Bernardino area in 1858. Historic strong earthquakes in the southern California region are summarized on Table 2.

DRAFT

Strong earthquakes that have occurred in this region in historic time and their approximate epicentral distances are summarized in Table 2.

2.07 Flooding Potential

According to the Federal Emergency Management Agency (F.I.R.M. Map No. 06071C8638H, dated August 28, 2008) the site is located in a flood hazard zone designated Zone X with 0.2 percent annual chance flood hazard, typically referred to a 500-year flood zone.

Control of surface runoff originating from within and outside of the site should, of course, be included in design of the project.

2.08 Landslides

Due to the low gradient of the site and surrounding area, landsliding is not a hazard at this property.

3.00 Conclusions and Recommendations

3.01 General Conclusion

Based on specific data and information contained in this report, our understanding of the project and our general experience in engineering geology and geotechnical engineering, it is our professional judgment that the proposed development is geologically and geotechnically feasible. This is provided that the recommendations presented below are fully implemented during design, grading and construction.

3.02 General Earthwork and Grading

All grading should be performed in accordance with the General Earthwork and Grading Specifications outlined in Appendix C, unless specifically revised or amended below. Recommendations contained in Appendix C are general specifications for typical grading projects and may not be entirely applicable to this project.

It is also recommended that all earthwork and grading be performed in accordance with Appendix J of the 2022 California Building Code and all applicable governmental agency requirements. In the event of conflicts between this report and Appendix J, this report shall govern.

3.03 Earthwork Shrinkage and Subsidence

Shrinkage is the decrease in volume of soil upon removal and recompaction expressed as a percentage of the original in-place volume. Subsidence occurs as natural ground is densified to receive fill. These factors account for changes in earth volumes that will occur during grading. Our estimates are as follows:

- Shrinkage factor = 7% - 12% for soil removed and replaced as compacted fill.
- Subsidence factor = 0.15 foot.

The degree to which fill soils are compacted and variations in the insitu density of existing soils will influence earth volume changes. Consequently, some adjustments in grades near the completion of grading could be required to

DRAFT

balance the earthwork.

3.04 Removals and Overexcavation

All vegetation, trash and debris should be cleared from the grading area and removed from the site. Prior to placement of compacted fills, all non-engineered fills and loose, porous, or compressible soils will need to be removed down to competent ground. Removal and requirements will also apply to cut areas, if the depth of cut is not sufficient to reach competent ground. Removed and/or overexcavated soils may be moisture-conditioned and recompacted as engineered fill, except for soils containing detrimental amounts of organic material. Estimated depths of removals are as follows:

- Non-engineered fill ranging from less than 1 foot to 3 feet deep was encountered and observed within the property, particularly within the existing cattle pens. Non-engineered fill ranging from 1 to 10 feet in height was also observed as earthen berms around the dairy basins and in the southern portion of the site. Complete removal of these fills and underlying compressible native soils will need to be performed. If other non-engineered fills are encountered during grading, they will also need to be removed along with any underlying compressible native soils.

- Manure and manure impacted soils were encountered and observed within the existing cattle pens. At the time of our field investigation, manure in the pens ranged from only a few inches up to 2 to 3 feet thick. The amount of manure on the surface of the pens will vary and the actual thickness when dairy operations cease will be different than what was encountered during our field investigation. Additional investigation of manure and manure impacted soil should be done after dairy operations have ceased or during demolition and cleanup of the dairies and prior to commencement of grading to determine actual removals needed. It is expected that manure impacted soils will be found at the bottom of the dairy wash ponds, however at the time of our field investigation they were full of water and inaccessible. Actual depth of removal of these soils should be reviewed once the basing have been pumped dry after the dairy operations cease.

- Loose, porous and compressible native soils were encountered to depths of about 2 to 5 feet below existing grades. The average depth of removal of these soils is expected to be 4 feet with some local areas extending to 6 feet below the existing ground surface or the base of existing non-engineered fill.

- Areas of deep excavations, such as the baseball stadium that is planned for excavation to reach field level of over 15 feet, that competent native soil will be encountered. At these deeper removals, once design elevation is reached the geotechnical engineer's representative should review soil conditions and if found suitable the surface should be scarified to a minimum depth of 12 inches, moisture conditioned and compacted to at least 90 percent of the maximum dry density.

- It is expected that competent native soils will be encountered in cuts deeper than approximately 3 to 5 feet below existing grade or the base of existing non-engineered fill. Provided competent soils are exposed, these cut surfaces should be scarified to a minimum depth of 12 inches, moisture conditioned and compacted to at least 90 percent of the maximum dry density, provided that footing overexcavation requirements are met.

- Soils disturbed by demolition of existing structures will need to be over-excavated to competent native ground and then scarified to a minimum depth of 12 inches, moisture conditioned and compacted to at least 90 percent of the maximum dry density

DRAFT

- The asphalt and concrete currently onsite may be either processed and placed in the compacted fill, or hauled off the site. If the asphalt and concrete is use as fill material, it must be broken down to approximately 4 to 8-inch particles and mixed thoroughly with on-site soils. No large and flat pieces are to be used for fill. If asphalt is processed by grinding, it cannot be used in fills and must be removed from the site.

In addition to the above requirements, overexcavation will also need to meet the following criteria for the building pads, concrete flatwork and pavement areas:

- All footing areas, both continuous and spread, shall be undercut, moistened, and compacted as necessary to produce soils compacted to a minimum of 90% relative compaction to a depth equal to the width of the footing below the bottom of the footing or to a depth of 3 feet below the bottom of the footing, whichever is less. Footing areas shall be defined as the area extending from the edge of the footing for a distance of 5 feet.

- All floor slabs, concrete flatwork and paved areas shall be underlain by a minimum of 12 inches of soil compacted to a minimum of 90% relative compaction.

- Overexcavation will not be required for the pole foundations.

The exposed soils beneath all overexcavation should be scarified an additional 12 inches, moisture conditioned and compacted to a minimum of 90% relative compaction.

The above recommendations are based on the assumption that soils encountered during field exploration are representative of soils throughout the site. However, there can be unforeseen and unanticipated variations in soils between points of subsurface exploration. Hence, overexcavation depths must be verified, and adjusted if necessary, at the time of grading. The overexcavated materials may be moisture-conditioned and re-compacted as engineered fill.

DRAFT

3.05 Rippability and Rock Disposal

Our exploratory borings were advanced without difficulty and no oversize materials were encountered in our subsurface investigation. Accordingly we expect that all earth materials will be rippable with conventional heavy duty grading equipment and oversized materials are not expected.

3.06 Subdrains

Groundwater and surface water were not encountered during the course of our investigation, the proposed grading is will not fill any large canyons and the underlying soils are fairly permeable. Consequently, installation of canyon subdrains is not expected to be necessary.

3.07 Permanent Fill and Cut Slopes

Fill and cut slopes constructed at inclinations of 2 horizontal to 1 vertical or flatter are expected to be grossly and surficially stable. This is provided that fill slopes are properly keyed and compacted, as indicated in Appendix C, and cut slopes expose competent native soils. Cut and fill slope stability should be further reviewed upon development of a grading plan.

3.08 Faulting

Since the site is not located within the boundaries of an Earthquake Fault Zone and no faults are known to pass through the property, surface fault rupture within the site is considered unlikely.

3.09 Seismic Design Parameters

The potential damaging effects of regional earthquake activity must be considered in the design of structures.

ASCE 7-16, Site-Specific Response Spectra

A site-specific seismic hazard has been performed using the SCEC UGMS MCER Tool available at https://data2.scec.org/ugms-mcerGM-tool_v18.4/ in accordance with the 2022 California Building Code and Section 21 of ASCE 7-16. A risk category of III was also utilized. The methodology and results of the site-specific analysis are presented in Appendix D. The recommended site-specific seismic design parameters are summarized in the table below.

Site Specific Design Parameters

Design Acceleration Parameter	Value (g)
S_{DS}	1.349
S_{D1}	0.806
S_{MS}	2.024
S_{M1}	1.210

DRAFT

The numerical values for the site-specific MCE_R and Design response spectra are provided in the table below.

Period (s)	Site Specific MCER Sa (g)	Site Specific Design Response Spectrum (g)
0.01	0.932	0.621
0.02	0.936	0.624
0.03	0.955	0.637
0.05	1.066	0.711
0.075	1.269	0.846
0.1	1.442	0.961
0.15	1.716	1.144
0.2	1.928	1.285
0.25	2.111	1.408
0.3	2.249	1.499
0.4	2.24	1.493
0.5	2.07	1.38
0.75	1.58	1.054
1	1.21	0.806
1.5	0.785	0.523
2	0.559	0.372
3	0.348	0.232
4	0.248	0.165
5	0.192	0.128
7.5	0.117	0.078
10.0	0.077	0.052

DRAFT

The Seismic Design Category is D for all Risk Categories (CBC Section 1613A.5.6). Consequently, as required for Seismic Design Categories D through F by CBC Section 1803A.5.12, lateral pressures for earthquake ground motions, liquefaction and soil strength loss have been evaluated (see Sections 3.10 and 3.16).

In addition, the calculated maximum considered earthquake geometric mean peak ground acceleration (MCE_G) is PGA_M = 0.778g.

3.10 Liquefaction and Secondary Earthquake Hazards

Potential secondary seismic hazards that can affect land development projects include liquefaction, tsunamis, seiches, seismically induced settlement, seismically induced flooding and seismically induced landsliding.

Liquefaction

Liquefaction is a phenomenon where earthquake-induced ground motions increase the pore pressure in saturated, sand-like soils until it is equal to the confining, overburden pressure. When this occurs, the soil can completely lose its shear strength and enter a liquefied state. The possibility of liquefaction is dependent upon grain size, relative density, confining pressure, saturation of the soils, and intensity and duration of ground motion. In order for

liquefaction to occur, three criteria must be met: underlying loose, sand-like soils, a groundwater depth of less than about 50 feet, and a potential for seismic shaking from nearby large-magnitude earthquake.

As ground water table was not encountered in the upper 50 ft and per Section 2.04 above, the ground water table may be much deeper, liquefaction at the site is unlikely to occur and hence it is not a design concern.

Tsunamis and Seiches

Tsunamis are sea waves that are generated in response to large-magnitude earthquakes. When these waves reach shorelines, they sometimes produce coastal flooding. Seiches are the oscillation of large bodies of standing water, such as lakes, that can occur in response to ground shaking. Tsunamis and seiches do not pose hazards due to the inland location of the site and lack of nearby bodies of standing water.

Seismically Induced Settlement

Seismically induced settlement occurs most frequently in areas underlain by loose, granular sediments. Damage as a result of seismically induced settlement is most dramatic when differential settlement occurs in areas with large variations in the thickness of underlying sediments. Settlement caused by ground shaking is often non-uniformly distributed, which can result in differential settlement.

Seismic settlement was evaluated for the Design Earthquake event using an empirical method developed by Tokimatsu and Seed (1987) based on site-specific SPT blow count and grain size data obtained from our borings. We estimate 0.70-inch of total seismically induced ground settlement may occur at the site when subjected to a Design Earthquake event (see calculations in Appendix D). In our opinion, differential seismic settlement may be taken as one-half of the computed total seismic settlement over 30 feet. Calculations of seismically induced settlements are presented in Appendix D.

Seismically Induced Flooding

According to City of Ontario General Plan (2010), the site is located in the potential inundation area of San Antonio Dam.

Seismically Induced Landsliding

Due to the low gradient of the site, the potential for seismically induced landsliding is nil. This assumes that any slopes created during development of the site will be properly designed and constructed. It should be noted that the California Geological Survey has not yet prepared a Seismic Hazard Zone Map of potential earthquake-induced landslide hazards for the quadrangle in which the site is located.

3.11 Foundations

Isolated spread footings and/or continuous wall footings are recommended to support the proposed structures. If the recommendations in the section on grading are followed and footings are established in firm native soils or compacted fill materials, footings may be designed using the following allowable soil bearing values:

- Continuous Wall Footings:

  Footings having a minimum width of 12 inches and a minimum depth of 12 inches below the lowest

DRAFT

adjacent grade have allowable bearing capacity of 2,000 pounds per square foot (psf). This value may be increased by 10% for each additional foot of width and/or depth to a maximum value of 3,500 psf.

- Isolated Spread Footings:

  Footings having a minimum width of 12 inches and a minimum depth of 12 inches below the lowest adjacent grade have allowable bearing capacity of 2,000 psf. This value may be increased by 10% for each additional foot of width or depth to a maximum value of 3,500 psf.

- Retaining Wall Footings:

  Footings for retaining walls should be founded a minimum depth of 12 inches and have a minimum width of 12 inches. Footings may be designed using the allowable bearing capacity and lateral resistance values recommended for building footings. However, when calculating passive resistance, the upper 6 inches of the footings should be ignored in areas where the footings will not be covered with concrete flatwork. This value may also be increased by 10% for each additional foot of width or depth to a maximum value of 3,000 psf. Reinforcement should be provided for structural considerations as determined by the design engineer.

- Sitework Element Footings:

  Footings for sitework elements (i.e. seat walls, planters, site/screening walls not retaining soil, and ball walls should be founded a minimum depth of 12 inches and have a minimum width of 12 inches. Footings may be designed using the allowable bearing capacity and lateral resistance values recommended for building footings. This value may also be increased by 10% for each additional foot of width or depth to a maximum value of 3,500 psf. Reinforcement should be provided for structural considerations as determined by the design engineer.

- Lateral Earth Resistance for Pole Foundations:

  Lateral bearing pressures of 150 psf/ft below design grade may be used.

  Construction

  Exploratory borings drilled for this investigation were advanced using continuous augers. Therefore, there is no indication as to the amount of caving that should be anticipated. However, caving of granular soils would be expected to occur during installation of pole foundations. It should be cautioned that the diameter of the piles may vary along their lengths possibly due to over-drilling or soil caving during construction. The contractor should be prepared to employ proper equipment for successful drilling. The contractor shall be prepared to employ temporary casing at his discretion, or to utilize other methods of advancing the pole foundations or other temporary shoring elements, to mitigate the potential of soil caving. Excavations should not be allowed to stand open overnight; excavations should be poured as soon as possible after inspection. The actual required depths should be field verified by the project geotechnical engineer or his representative.

- Musco Lighting Pole Foundations:

  The following may be used for pier/pole foundation recommendations for Musco Lighting light poles:

DRAFT

Allowable skin friction / vertical bearing pressure: 500psf

The allowable lateral bearing pressure shall be taken as 150 psf/ft with allowable increase of 50% for depths greater than 12 feet.

The effective width for lateral bearing pressure will be 3 times the diameter of the pier footing.

The minimum distance of the pole foundations from the adjacent building shall be no less than 3 times the diameter of the pole foundation to prevent surcharging the adjacent building foundations. If this minimum distance cannot be maintained, then the design shall neglect the passive pressure to a depth equal to 3 times the diameter of the pile below the ground surface.

There are no requirements for casing during construction. Groundwater was not encountered in our borings and not expected during excavation for the pole foundation.

The above bearing capacities represent an allowable net increase in soil pressure over existing soil pressure and may be increased by one-third for short-term wind or seismic loads. The maximum expected settlement of footings designed with the recommended allowable bearing capacity is expected to be on the order of ½ inch with differential settlement on the order of ¼ inch.

3.12 Foundation Setbacks from Slopes

Setbacks for footings adjacent to slopes should conform to the requirements of the California Building Code. Specifically, footings should maintain a horizontal distance or setback between any adjacent slope face and the bottom outer edge of the footing.

For slopes descending away from the foundation, the horizontal distance may be calculated by using h/3, where h is the height of the slope. The horizontal setback should not be less than 5 feet, nor need not be greater than 40 feet per the California Building Code. Where structures encroach within the zone of h/3 from the top of the slope the setback may be maintained by deepening the foundations. Flatwork and utilities within the zone of h/3 from the top of slope may be subject to lateral distortion caused by gradual downslope creep. Walls, fences and landscaping improvements constructed at the top of descending slopes should be designed with consideration of the potential for gradual downslope creep.

For ascending slopes, the horizontal setback required may be calculated by using h/2 where h is the height of the slope. The horizontal setback need not be greater than 15 feet per the California Building Code.

3.13 Slabs on Grade

We recommend the use of unreinforced slabs on grade for structures. These floor slabs should have a minimum thickness of 4 inches and should be divided into squares or rectangles using weakened plane joints (contraction joints), each with maximum dimensions not exceeding 15 feet. Contraction joints should be made in accordance with American Concrete Institute (ACI) guidelines. If weakened plane joints are not used, then the slabs shall be reinforced with at a minimum 6x6-10/10 welded wire fabric placed at mid-height of the slab. The project structural engineer may require additional reinforcement.

If heavy concentrated or moving loads are anticipated, slabs should be designed using a modulus of subgrade

DRAFT

reaction (k) of 150psi/in when soils are prepared in conformance with the grading recommendations contained within the report.

Special care should be taken on floors slabs to be covered with thin-set tile or other inflexible coverings. These areas may be reinforced with 6x6-10/10 welded wire fabric placed at mid-height of the slab, to mitigate drying shrinkage cracks. Alternatively, inflexible flooring may be installed with unbonded fabric or liners to prevent reflection of slab cracks through the flooring.

A moisture vapor retarder/barrier is recommended beneath all slabs-on-grade that will be covered by moisture-sensitive flooring materials such as vinyl, linoleum, wood, carpet, rubber, rubber-backed carpet, tile, impermeable floor coatings, adhesives, or where moisture-sensitive equipment, products, or environments will exist. We recommend that design and construction of the vapor retarder or barrier conform to Section 1805 of the 2019 California Building Code (CBC) and pertinent sections of American Concrete Institute (ACI) guidance documents 302.1R-04, 302.2R-06 and 360R-10.

The moisture vapor retarder/barrier should consist of a minimum 10 mils thick polyethylene with a maximum perm rating of 0.3 in accordance with ASTM E 1745. Seams in the moisture vapor retarder/barrier should be overlapped no less than 6 inches or in accordance with the manufacturer's recommendations. Joints and penetrations should be sealed with the manufacturer's recommended adhesives, pressure-sensitive tape, or both. The contractor must avoid damaging or puncturing the vapor retarder/barrier and repair any punctures with additional polyethylene properly lapped and sealed.

ACI guidelines allow for the placement of moisture vapor retarder/barriers either directly beneath floor slabs or below an intermediate granular soil layer.

Placing the moisture retarder/barrier directly beneath the floor slab will provide improved curing of the slab bottom and will eliminate potential problems caused by water being trapped in a granular fill layer. Concrete slabs poured directly on a vapor retarder/barrier can experience shrinkage cracking and curling due to differential rates of curing through the thickness of the slab. Therefore, for concrete placed directly on the vapor retarded, we recommend a maximum water cement ratio of 0.45 and the use of water-reducing admixtures to increase workability and decrease bleeding.

If granular soil is placed over the vapor retarder/barrier, we recommend that the layer be at least 2 inches thick in accordance with traditional practice in southern California. Granular fill should consist of clean fine graded materials with 10 to 30% passing the No. 100 sieve and free from clay or silt. The granular layer should be uniformly compacted and trimmed to provide the full design thickness of the proposed slab. The granular fill layer should not be left exposed to rain or other sources of water such as wet-grinding, power washing, pipe leaks or other processes, and should be dry at the time of concrete placement. Granular fill layers that become saturated should be removed and replaced prior to concrete placement.

An additional layer of sand may be placed beneath the vapor retarder/barrier at the developer's discretion to minimize the potential of the retarder/barrier being punctured by underlying soils.

DRAFT

3.14 Miscellaneous Concrete Flatwork

Miscellaneous concrete flatwork and walkways may be designed with a minimum thickness of 4 inches. Large slabs should be reinforced with a minimum of 6x6-10/10 welded wire mesh placed at mid-height in the slab. Control joints should be constructed to create squares or rectangles with a maximum spacing of 15 feet.

Walkways may be constructed without reinforcement. Walkways should be separated from foundations with a thick expansion joint filler. Control joints should be constructed into non-reinforced walkways at a maximum of 5 feet spacing.

The subgrade soils beneath all miscellaneous concrete flatwork should be compacted to a minimum of 90 percent relative compaction for a minimum depth of 12 inches. The geotechnical engineer should monitor the compaction of the subgrade soils and perform testing to verify that proper compaction has been obtained.

3.15 Footing Excavation and Slab Preparations

All footing excavations should be observed by the geotechnical consultant to verify that they have been excavated into competent soils. The foundation excavations should be observed prior to the placement of forms, reinforcement steel, or concrete. These excavations should be evenly trimmed and level. Prior to concrete placement, any loose or soft soils should be removed. Excavated soils should not be placed on slab or footing areas unless properly compacted.

Prior to the placement of the moisture barrier and sand, the subgrade soils underlying the slab should be observed by the geotechnical consultant to verify that all under-slab utility trenches have been properly backfilled and compacted, that no loose or soft soils are present, and that the slab subgrade has been properly compacted to a minimum of 90 percent relative compaction within the upper 12 inches.

Footings may experience and overall loss in bearing capacity or an increased potential to settle where located in close proximity to existing or future utility trenches. Furthermore, stresses imposed by the footings on the utility lines may cause cracking, collapse and/or a loss of serviceability. To reduce this risk, footings should extend below a 1:1 plane projected upward from the closest bottom of the trench.

Slabs on grade and walkways should be brought to a minimum of 2% and a maximum of 6% above their optimum moisture content for a depth of 18 inches prior to the placement of concrete. The geotechnical consultant should perform insitu moisture tests to verify that the appropriate moisture content has been achieved a maximum of 24 hours prior to the placement of concrete or moisture barriers.

3.16 Lateral Load Resistance

Lateral loads may be resisted by soil friction and the passive resistance of the soil. The following parameters are recommended.

- Passive Earth Pressure = 500 pcf (equivalent fluid weight).
- Coefficient of Friction (soil to footing) = 0.48
- Retaining structures should be designed to resist the following lateral active earth pressures:

DRAFT

Surface Slope of Retained Materials (Horizontal:Vertical)	Equivalent Fluid Weight (pcf)
Level	30
5:1	32
4:1	33
3:1	35
2:1	41

These active earth pressures are only applicable if the retained earth is allowed to strain sufficiently to achieve the active state. The required minimum horizontal strain to achieve the active state is approximately 0.0025H. Retaining structures should be designed to resist an at-rest lateral earth pressure if this horizontal strain cannot be achieved.

- At-rest Lateral Earth Pressure = 50 pcf (equivalent fluid weight)

The Mononobe-Okabe method is commonly utilized for calculating seismically induced active and passive lateral earth pressures and is based on the limit equilibrium Coulomb theory for static stress conditions. This method entails three fundamental assumptions (e.g., Seed and Whitman, 1970): Wall movement is sufficient to ensure either active or passive conditions, the driving soil wedge inducing the lateral earth pressures is formed by a planar failure surface starting at the heel of the wall and extending to the free surface of the backfill, and the driving soil wedge and the retaining structure act as rigid bodies, and therefore, experiences uniform accelerations throughout the respective bodies (U.S. Army Corps of Engineers, 2003, Engineering and Design - Stability Analysis of Concrete Structures).

- Seismic Lateral Earth Pressure = 21 pcf (equivalent fluid weight).

The seismic lateral earth pressure given above is a triangle increasing with depth, and the resultant of this pressure is an increment of force which should be applied to the back of the wall at 1/3 of the wall height from the wall base. The seismic increment of earth pressure should be added to the static active earth pressure. Even for the at-rest (Ko) condition, the seismic increment of earth pressure should be added to the static active earth pressure, not to the at-rest static earth pressure (SEAOC Seismology Committee 2019).

Per 2022 CBC Section 1803.5.12 dynamic seismic lateral earth pressures shall be applied to foundation walls and retaining walls supporting more than 6 feet of backfill. Dynamic seismic lateral earth pressures may also be applied to shorter walls at the discretion of the structural engineer.

3.17 Drainage and Moisture Proofing

Surface drainage should be directed away from the proposed structure into suitable drainage devices. Neither excess irrigation nor rainwater should be allowed to collect or pond against building foundations or within low-lying or level areas of the lot. Surface waters should be diverted away from the tops of slopes and prevented from draining over the top of slopes and down the slope face.

DRAFT

Walls and portions thereof that retain soil and enclose interior spaces and floors below grade should be waterproofed and dampproofed in accordance with CBC Section 1805.

Retaining structures should be drained to prevent the accumulation of subsurface water behind the walls. Backdrains should be installed behind all retaining walls exceeding 3 feet in height. A typical detail for retaining wall back drains is presented in Appendix C. All backdrains should be outlet to suitable drainage devices. Retaining wall less than 3 feet in height should be provided with backdrains or weep holes. Dampproofing and/or waterproofing should also be provided on all retaining walls exceeding 3 feet in height.

3.18 Cement Type and Corrosion Potential

Soluble sulfate tests indicate that concrete at the subject site will have a negligible exposure to water-soluble sulfate in the soil. Our recommendations for concrete exposed to sulfate-containing soils are presented in the table below.

Recommendations for Concrete exposed to Sulfate-containing Soils

Sulfate Exposure	Water Soluble Sulfate (SO_4) in Soil (% by Weight)	Sulfate (SO_4) in Water (ppm)	Cement Type (ASTM C150)	Maximum Water-Cement Ratio (by Weight)	Minimum Compressive Strength (psi)
Negligible	0.00 - 0.10	0-150	--	--	2,500
Moderate	0.10 - 0.20	150-1,500	II	0.50	4,000
Severe	0.20 - 2.00	1,500-10,000	V	0.45	4,500
Very Severe	Over 2.00	Over 10,000	V plus pozzolan or slag	0.45	4,500

DRAFT

Use of alternate combinations of cementitious materials may be permitted if the combinations meet design recommendations contained in American Concrete Institute guideline ACI 318-11.

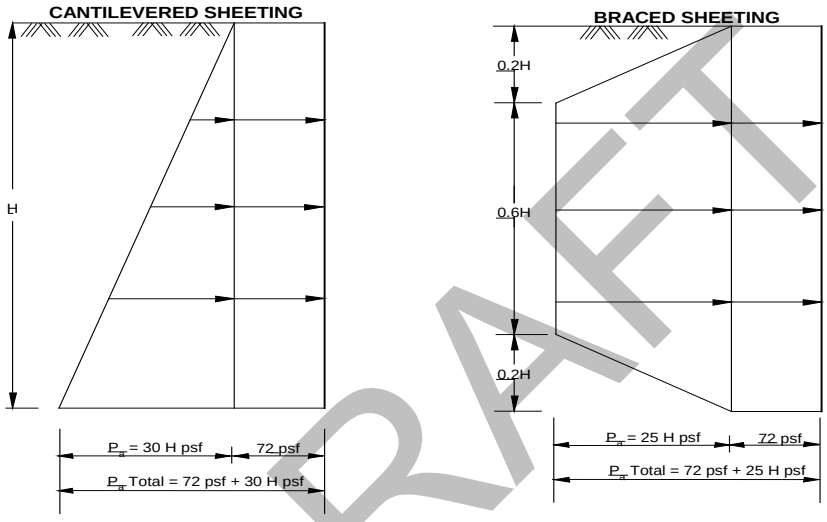
The soils were also tested for soil reactivity (pH), electrical resistivity (ohm-cm) and chloride content. The test results indicate that the on-site soils have a soil reactivity of 6.8, an electrical resistivity of 770 ohm-cm, and a chloride content of 153 ppm. Note that:

- A neutral or non-corrosive soil has a pH value ranging from 5.5 to 8.4.
- Generally, soils that could be considered moderately corrosive to ferrous metals have resistivity values of about 3,000 ohm-cm to 10,000 ohm-cm. Soils with resistivity values less than 3,000 ohm-cm can be considered corrosive and soils with resistivity values less than 1,000 ohm-cm can be considered extremely corrosive.
- Chloride contents of approximately 500 ppm or greater are generally considered corrosive.

Based on our analysis, it appears that the underlying onsite soils are corrosive to ferrous metals. Protection of buried pipes utilizing coatings on all underground pipes; clean backfills and a cathodic protection system can be effective in controlling corrosion. A qualified corrosion engineer may be consulted to further assess the corrosive properties of the soil.

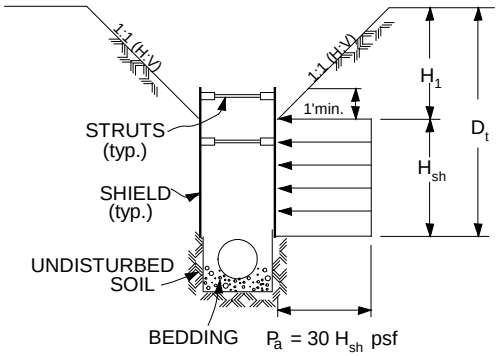
3.19 Temporary Slopes

Excavation of utility trenches will require either temporary sloped excavations or shoring. Temporary excavations in existing alluvial soils may be safely made at an inclination of 1:1 or flatter. If vertical sidewalls are required in excavations greater than 5 feet in depth, the use of cantilevered or braced shoring is recommended. Excavations less than 5 feet in depth may be constructed with vertical sidewalls without shoring or shielding. Our recommendations for lateral earth pressures to be used in the design of cantilevered and/or braced shoring are presented below. These values incorporate a uniform lateral pressure of 72 psf to provide for the normal construction loads imposed by vehicles, equipment, materials, and workmen on the surface adjacent to the trench excavation. However, if vehicles, equipment, materials, etc., are kept a minimum distance equal to the height of the excavation away from the edge of the excavation, this surcharge load need not be applied.



SHORING DESIGN: LATERAL SHORING PRESSURES

Design of the shield struts should be based on a value of 0.65 times the indicated pressure, Pa, for the approximate trench depth. The wales and sheeting can be designed for a value of 2/3 the design strut value.



HEIGHT OF SHIELD, H_{sh} = DEPTH OF TRENCH, D_t , MINUS DEPTH OF SLOPE, H_1

TYPICAL SHORING DETAIL

DRAFT

Placement of the shield may be made after the excavation is completed or driven down as the material is excavated from inside of the shield. If placed after the excavation, some overexcavation may be required to allow for the shield width and advancement of the shield. The shield may be placed at either the top or the bottom of the pipe zone. Due to the anticipated thinness of the shield walls, removal of the shield after construction should have negligible effects on the load factor of pipes. Shields may be successively placed with conventional trenching equipment.

Vehicles, equipment, materials, etc. should be set back away from the edge of temporary excavations a minimum distance of 15 feet from the top edge of the excavation. Surface waters should be diverted away from temporary excavations and prevented from draining over the top of the excavation and down the slope face. During periods of heavy rain, the slope face should be protected with sandbags to prevent drainage over the edge of the slope, and a visqueen liner placed on the slope face to prevent erosion of the slope face.

Periodic observations of the excavations should be made by the geotechnical consultant to verify that the soil conditions have not varied from those anticipated and to monitor the overall condition of the temporary excavations over time. If at any time during construction conditions are encountered which differ from those anticipated, the geotechnical consultant should be contacted and allowed to analyze the field conditions prior to commencing work within the excavation.

Cal/OSHA construction safety orders should be observed during all underground work.

3.20 Soil Infiltration Testing

Two soil infiltration tests were performed using the bore hole percolation test procedure described in the San Bernardino County Stormwater Program Technical Guidance Document for Water Quality Management Plans (WQMP).

The testing was performed in 8-inch diameter borings that were drilled with a truck mounted CME-75 drill rig. The test holes extended to depths of 10 feet below the existing ground surface. The tests were performed in alluvial soil consisting of silty fine sand in Boring B-11 and sand with silt in Boring B-12, classified as SM and SP-SM, respectively, by the Unified Soil Classification System.

Prior to performing the tests, the auger used to drill the test holes was rotated until cuttings were removed from the hole. A 3-inch diameter perforated PVC pipe was then inserted into each test boring through the auger. A filter sock was installed around the pipe prior to placement in the boring in lieu of gravel or sand packing to prevent siltation in the pipe during testing and to facilitate removal of the pipe at the conclusion of the testing. Water levels were measured to the nearest 0.01 of a foot using an electronic well sounder. The test holes were presoaked for 60 minutes and water levels were measured every 30 minutes in B-11 and 10 minutes in B-12 because the initial water seeped away in less than 30 minutes. A total of 6 measurements were made following completion of presoaking.

Results of the testing are summarized in the table below.

Soil Infiltration Rates

Test No.	Depth (ft)	Soil Type	Infiltration Rate (in/hr)
P-1	10	SM	1.25
P-2	10	SP	13.25

DRAFT

Design of the infiltration systems should include an appropriate factor of safety to account for degradation of soil conditions by fine grained materials carried by runoff, potential growth of vegetation, accumulation of trash and other appropriate considerations. The factor of safety should be determined in accordance with the methodology presented in San Bernardino County Program – Technical Guidance Document for Water Quality Management Plans (Appendix D, Section VII) using a medium concern for the assessment method, low concerns for texture class (granular soils) and soil variability (relatively homogeneous soils), a low concern for groundwater (depth to groundwater greater than 100 feet), and appropriate design related considerations. Per the Technical Guidance Document, the factor a safety should not be less than 2. We recommend that the slowest field test rate (P-1, 1.25 in/hr) be used to determine the design rate. As discussed in Section 2.02, the sand layers encountered in some of our borings are most likely buried paleo-channels within the overall alluvial deposition pattern and are not continuous across the borings and are considered incongruous. Infiltration systems that are located within these paleo-channels may exhibit lowered infiltration rates as the wetted front encounters the prevalent silty fine sand.

The above rates apply to existing natural soils. Compaction of soils will reduce infiltration rates. Therefore soils at the bottom of the proposed infiltration systems should not be rolled or otherwise compacted, and construction traffic should not be allowed in the area where the infiltration systems will be constructed. A maintenance plan should also be developed and implemented to restore infiltration properties of soils that may be impacted by sedimentation or other adverse conditions.

The test data sheets for the soil infiltration tests are presented in Appendix A.

3.21 Utility Trench Backfill

The onsite fill soils will not be suitable for use as pipe bedding for buried utilities. All pipes should be bedded in a sand, gravel or crushed aggregate imported material complying with the requirements of the Standard Specifications for Public Works Construction Section 306-1.2.1. Crushed rock products that do not contain appreciable fines should not be utilized as pipe bedding and/or backfill. Bedding materials should be densified to at least 90% relative compaction (ASTM D1557) by mechanical methods. The geotechnical consultant should review and approve of proposed bedding materials prior to use.

All utility trench backfill within street right of way, utility easements, under or adjacent to sidewalks, driveways, or building pads should be observed and tested by the geotechnical consultant to verify proper compaction. Trenches excavated adjacent to foundations should not extend within the footing influence zone defined as the area within a line projected at a 1:1 drawn from the bottom edge of the footing. Trenches crossing perpendicular to foundations should be excavated and backfilled prior to the construction of the foundations. The excavations should be backfilled in the presence of the geotechnical engineer and tested to verify adequate compaction beneath the proposed footing.

Cal/OSHA construction safety orders should be observed during all underground work.

3.22 Pavement Sections

An R-value test was performed on the anticipated subgrade soil at the site in order to provide information on their soil properties for design of pavement structural sections. The R-value test was done in compliance with CTM-301. Structural sections were designed using the procedures outlined in Chapter 630 of the California Highway Design Manual (Caltrans, 2023) and the Caltrans Mechanistic-Emperical Tool program that utilizes an equivalent resilient modulus, traffic index and project climate to calculate asphalt pavement sections. This procedure uses the principle

DRAFT

that the pavement structural section must be of adequate thickness to distribute the load from the design traffic index (TI) to the subgrade soils in such a manner that the stresses from the applied loads do not exceed the resilient modulus (M_r) of the soil.

Development of the design traffic indexes on the basis of a traffic study is beyond the scope of this report; however, our experience indicates that a traffic index of 5.0 is typical for automobile traffic lanes and parking and that a traffic index of 7.0 is typical for truck driving lanes and parking. We have provided alternate structural sections for each traffic index. Selection of the final pavement structural section should be based on economic considerations which are beyond the scope of this investigation. Recommended structural sections are as follows:

- Auto parking and minor streets (TI=5, R-Value=35 (M_r=20.5ksi)):
  4.0 inches of asphaltic concrete over
  4.5 inches of crushed aggregate base

- Truck and bus lanes and collector streets (TI=7, R-Value=35 (M_r=20.5ksi)):
  5.5 inches of asphaltic concrete over
  6.0 inches of crushed aggregate base

Portland cement concrete (PCC) pavements for areas which are not subject to traffic loads may be designed with a minimum thickness of 4.0 inches of Portland cement concrete on compacted non-expansive engineered fill soils. If traffic loads are anticipated, PCC pavements should be designed for a minimum thickness of 6.0 inches of Portland cement concrete on 12.0 inches of crushed aggregate base. Control joints to limit cracking of the concrete pavement should be spaced no more than 10 feet apart. According to ACI 330, reinforcement to control is not necessary when pavement is jointed to form short panel lengths of 15 feet or less. Reinforcement in the concrete paving will not add to the load carrying capacity of the concrete. Any reinforcement of concrete paving may be included in design as desired, to limit cracking of the concrete with at least number 4 reinforcing steel placed mid-height of the concrete at 18-inches on center typical.

Prior to paving, the subgrade soils should be scarified and the moisture adjusted to within 2% of the optimum moisture content. The subgrade soils should be compacted to a minimum of 90% relative compaction. All aggregate base courses should be compacted to a minimum of 95% relative compaction.

DRAFT

3.23 Plan Review

Once a formal grading and foundation plans are prepared for the subject property, this office should review the plans from a geotechnical viewpoint, comment on changes from the plan used during preparation of this report and revise the recommendations of this report where necessary.

3.24 Geotechnical Observation and Testing During Rough Grading

The geotechnical engineer should be contacted to provide observation and testing during the following stages of grading:

- During the clearing and grubbing of the site.
- During the demolition of any existing structures, buried utilities or other existing improvements.
- During excavation and overexcavation of compressible soils.

- During all phases of grading including ground preparation and filling operations.
- When any unusual conditions are encountered during grading.

A final geotechnical report summarizing conditions encountered during grading should be submitted upon completion of the rough grading operations.

3.25 Post-Grading Geotechnical Observation and Testing

After the completion of grading the geotechnical engineer should be contacted to provide additional observation and testing during the following construction activities:

- During trenching and backfilling operations of buried improvements and utilities to verify proper backfill and compaction of the utility trenches.
- After excavation and prior to placement of reinforcing steel or concrete within footing trenches to verify that footings are properly founded in competent materials.
- During fine or precise grading involving the placement of any fills underlying driveways, sidewalks, walkways, or other miscellaneous concrete flatwork to verify proper placement, mixing and compaction of fills.
- When any unusual conditions are encountered during construction.

DRAFT

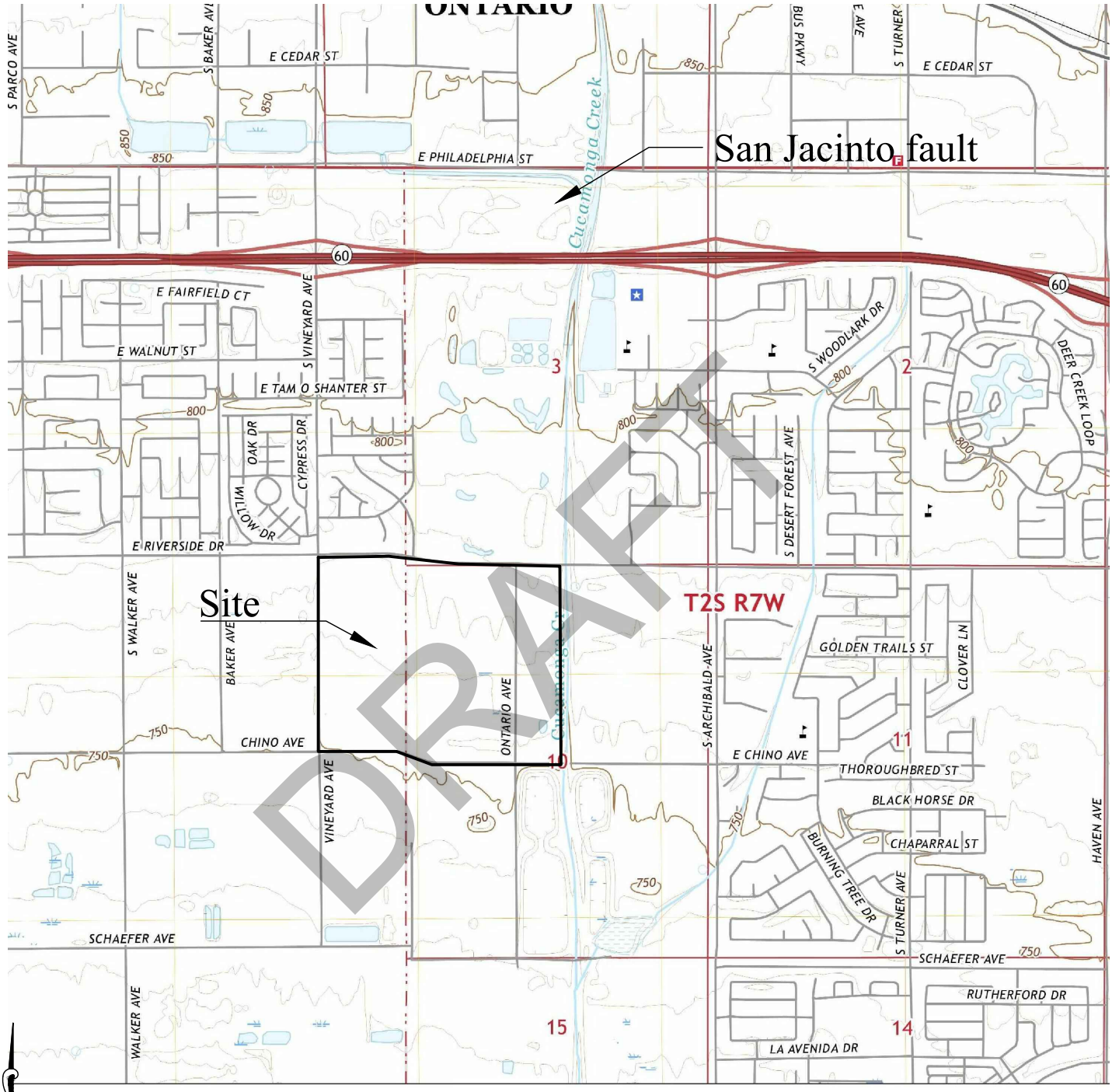
4.00 CLOSURE

The findings, conclusions and recommendations in this report were prepared in accordance with generally accepted engineering and geologic principles and practices. No other warranty, either expressed or implied, is made. This report has been prepared for City of Ontario to be used solely for design purposes. Anyone using this report for any other purpose must draw their own conclusions regarding required construction procedures and subsurface conditions.

The geotechnical and geologic consultant should be retained during the earthwork and foundation phases of construction to monitor compliance with the design concepts and recommendations and to provide additional recommendations as needed. Should subsurface conditions be encountered during construction that are different from those described in this report, this office should be notified immediately so that our recommendations may be re-evaluated.

FIGURES AND TABLES

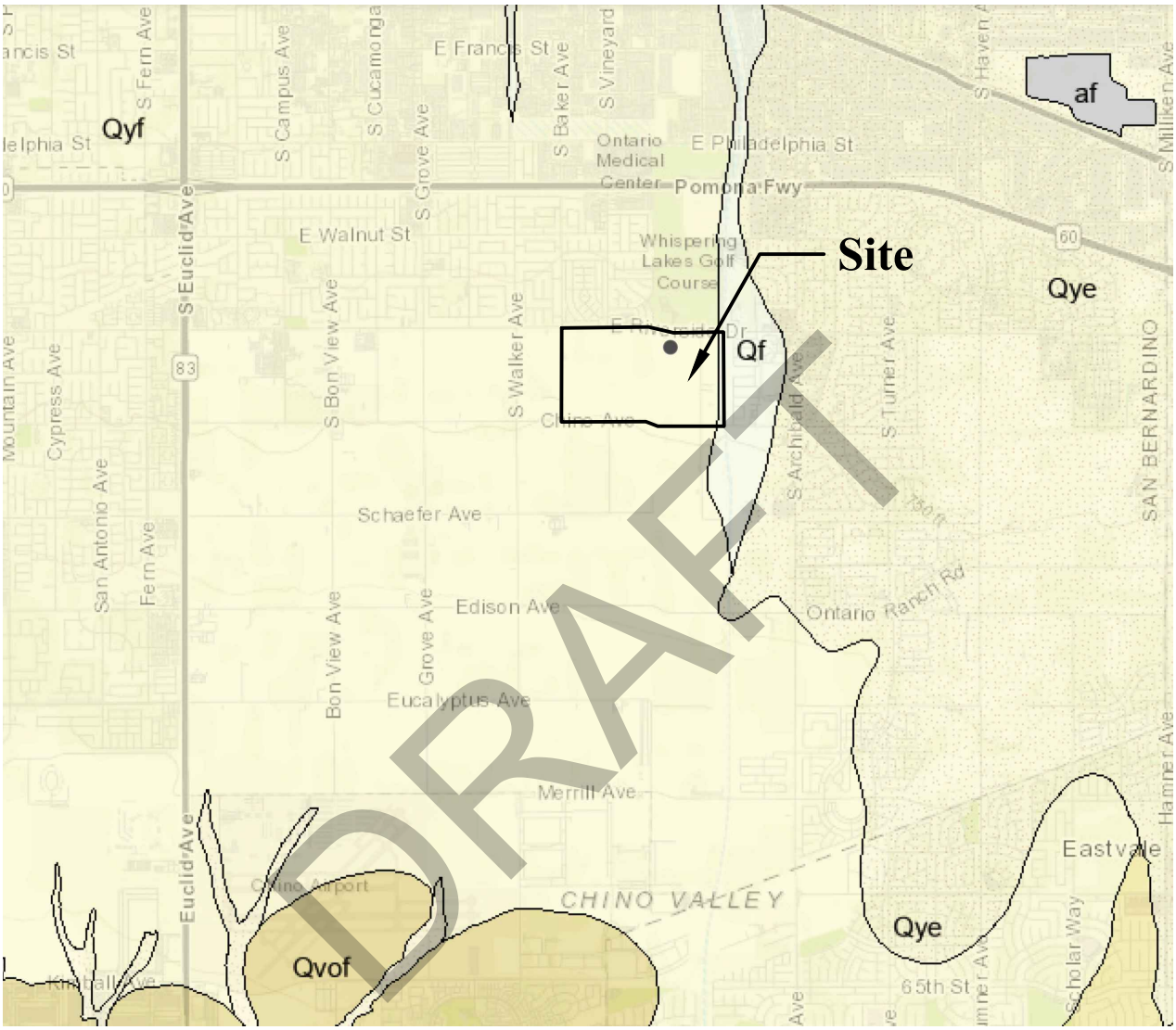
DRAFT



Site Location Map

Scale: 1"=2,000'

Base Map: USGS, 2021, Guast 7.5-minute Topographic Quadrangle



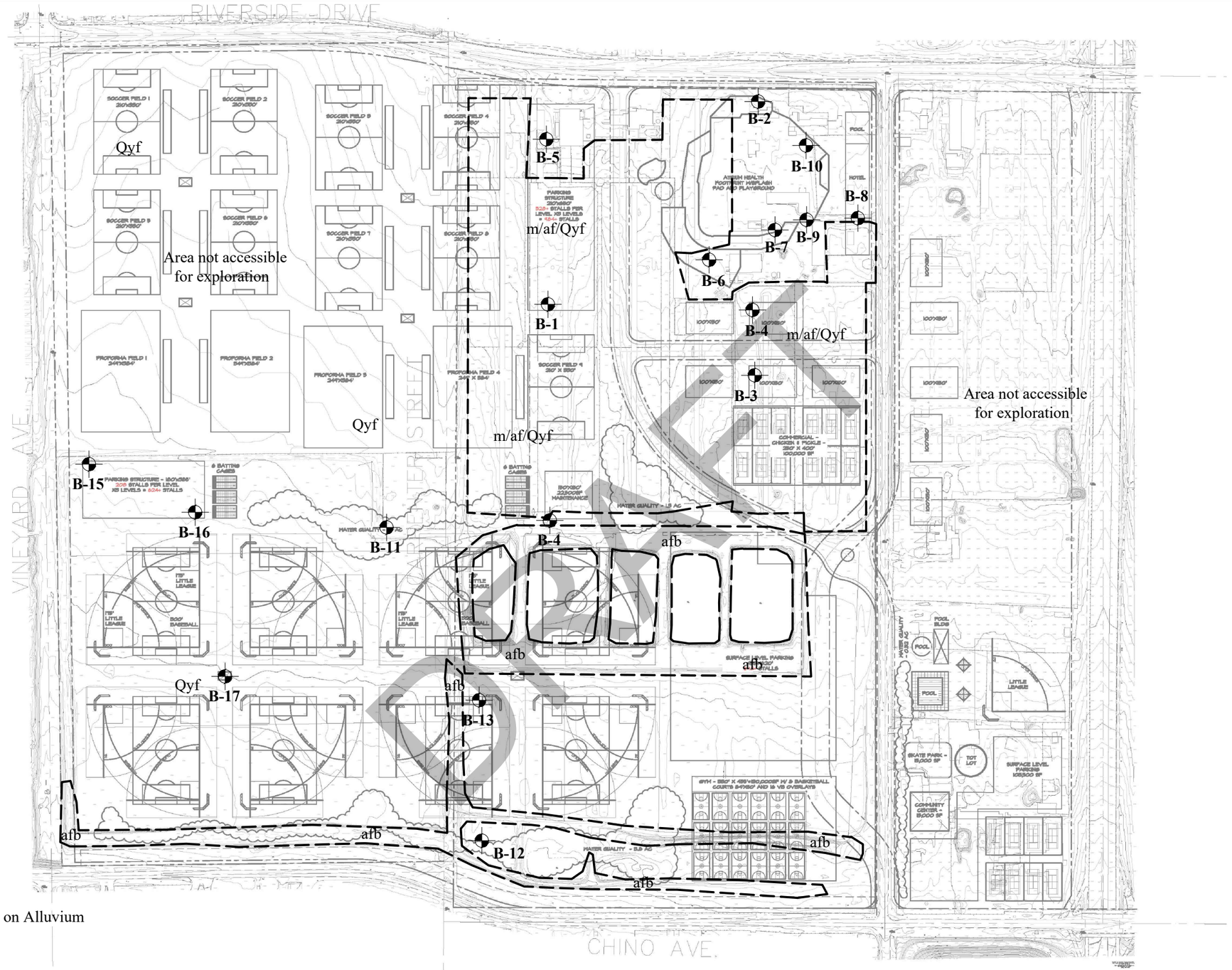
REGIONAL GEOLOGIC MAP

Partial Legend

af - Artificial Fill
Qye -Late Holocene Wash Deposits
Qyf - Holocene to Late Pleistocene Young Eolian and Dune Deposits
Qvof - Late to Middle Pleistocene Old Alluvial fan Deposits

Scale: 1"=3,000'

Source Map: Bedrossian, T.L., Hayhurst, C. A. and Roffers, P.D., 2010, Geologic Compilation of Quaternary Surficial Deposits in Southern California, San Bernardino 30' x 60' Quadrangle: California Geological Survey Special Report 217, Plate 13.



LEGEND

afb - Artificial fill (berm)

m/af/Qyf - Thin manure/Artificial fill on Alluvium

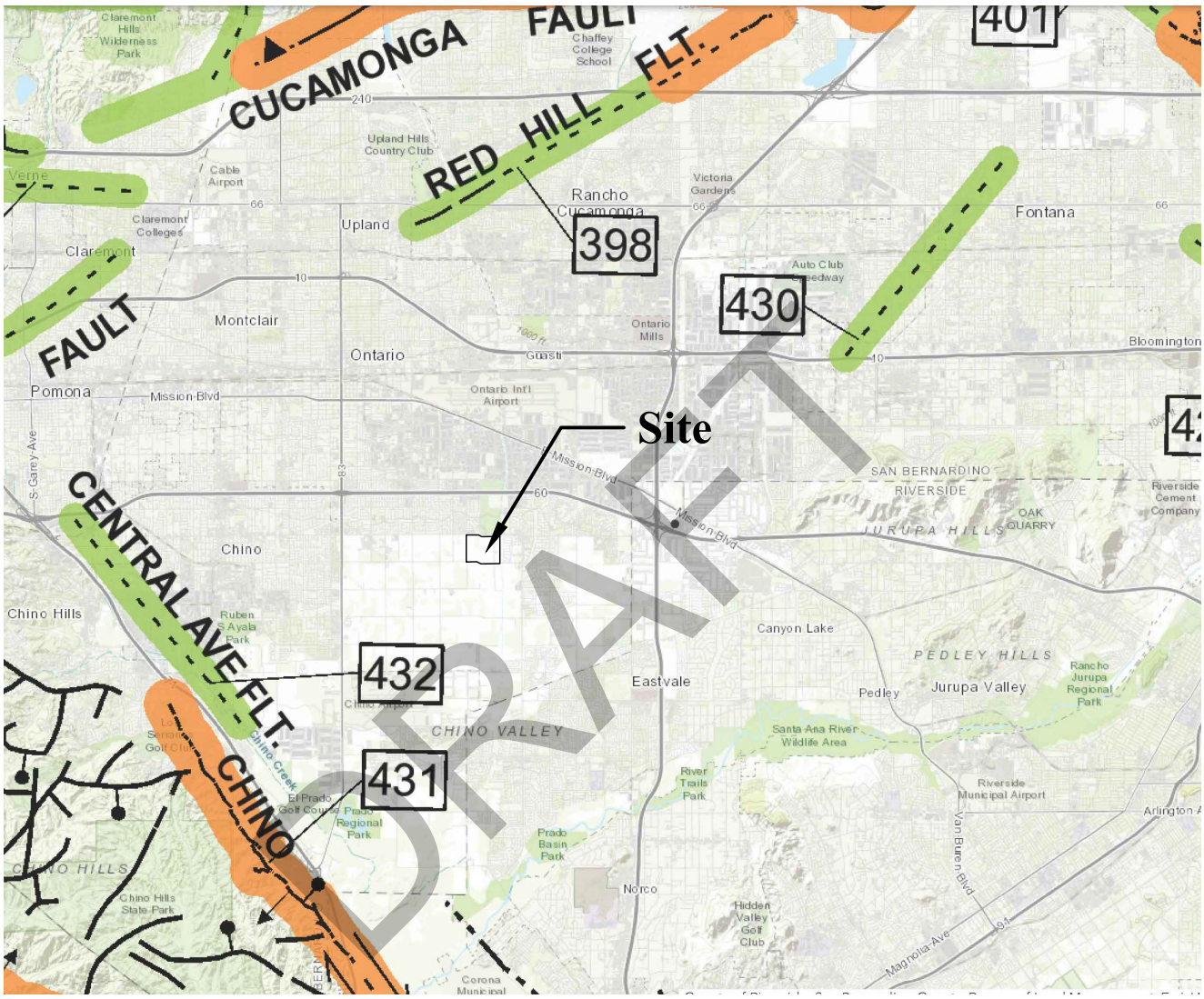
Qyf - Alluvium

- Boring Location

RMA Group
Every Project Matters | www.rmacompanies.com
GEOTECHNICAL ENGINEERING CONSTRUCTION INSPECTION MATERIALS TESTING

12130 SANTA MARGARITA COURT
RANCHO CUCAMONGA, CA 91730
909.989.1751 · FAX 909.989.4287
www.rmacompanies.com

DRAWN BY:	DKR
DATE:	October 2023
	Ontario Sports Park
RMA JOB NO.:	00-232255-01
SHEET NO.:	1 OF 1
FIGURE NO.:	3



REGIONAL FAULT MAP

Scale: 1" ≈ 3 miles

Partial Legend

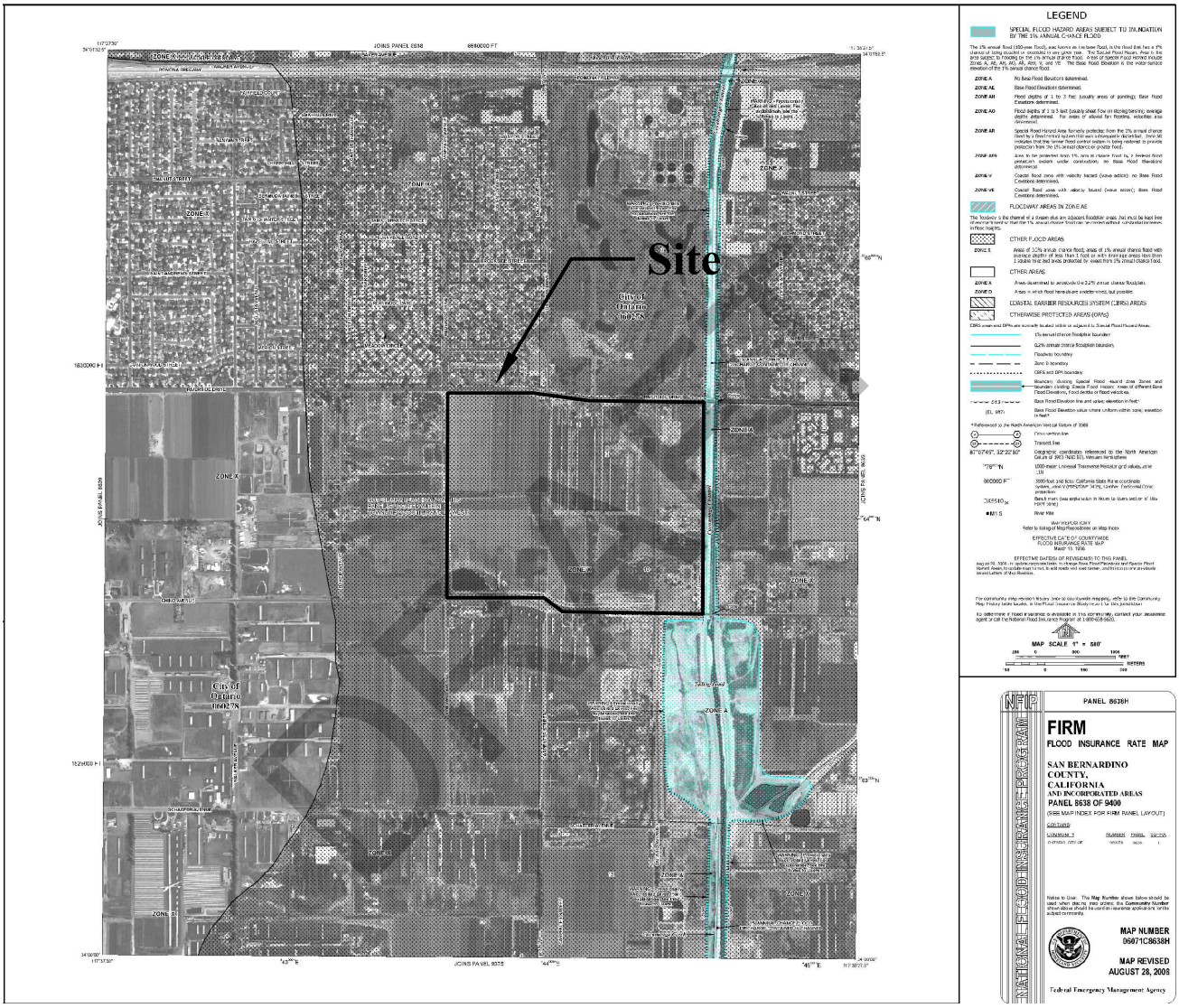
Orange - Holocene fault displacement

Green - Late Quaternary fault displacement

Purple - Quaternary fault

Black - Pre-Quaternary fault

Base Map: California Geological Survey Fault Activity Map of California, 2010



FEMA FLOOD ZONE MAP

RMA Group
Every Project Matters | www.rmacompanies.com

NOTABLE FAULTS WITHIN 100 KILOMETERS AND SEISMIC DATA

Fault Zone & geometry	Distance (km)	Distance (mi.)	Maximum Moment Magnitude	Slip Rate (mm/yr)
Anacapa-Dume (r-ll-o)	88	55	7.5	3.0
Chino-Central Ave. (rl-r-o)	11	7	6.7	1.0
Clamshell-Sawpit (r)	33	21	6.5	0.5
Cleghorn (ll-ss)	35	22	6.5	3.0
Coronado Bank (rl-ss)	86	53	7.4	3.0
Cucamonga (r)	15	9	6.9	5.0
Elsinore - Temecula (rl-ss)	44	27	6.8	5.0
Elsinore - Glen Ivy (rl-ss)	19	12	6.8	5.0
Helendale - S Lockhart (rl-ss)	76	47	7.3	0.6
Hollywood (ll-r-o)	59	37	6.4	1.0
Holser (r)	98	61	6.5	0.4
Lenwood-Lockhart - Old Woman Spring	96	60	7.5	0.6
Malibu Coast (ll-r-o)	85	53	6.7	0.3
Newport-Inglewood (rl-ss)	52	32	6.9	1.5
Newport-Inglewood - Offshore (rl-ss)	55	34	7.1	1.5
North Frontal - Western (r)	45	28	7.2	1.0
North Frontal - Eastern (r)	82	51	6.7	0.5
Northridge (r)	78	48	7.0	1.5
Palos Verde (rl-ss)	67	42	7.3	3.0
Pinto Mountain (ll-ss)	82	51	7.2	2.5
Puente Hills Blind Thrust (r)	28	17	7.1	0.7
Raymond (ll-r-o)	39	24	6.5	1.5
San Andreas - Coachella (rl-ss)	38	24	7.2	25.0
San Andreas (rl-ss)	31	19	7.5	24.0
San Gabriel (rl-ss)	71	44	7.2	1.0
San Jacinto - San Jacinto Valley (rl-ss)	34	21	6.9	12.0
San Jacinto - San Bernardino (rl-ss)	26	16	6.7	12.0
San Joaquin Hills (r)	42	26	6.6	0.5
San Jose (ll-r-o)	13	8	6.4	0.5
Santa Monica (ll-r-o)	64	40	6.6	1.0
Sierra Madre (r)	17	11	7.2	2.0
San Fernando (r)	70	43	6.7	2.0
Upper Elysian Park (r)	46	29	6.4	1.3
Verdugo (r)	52	32	6.9	0.5

DRAFT

Notes:

Fault geometry - (ss) strike slip, (r) reverse, (n) normal, (rl) right lateral, (ll) left lateral, (o) oblique

Fault and Seismic Data - California Geological Survey (Cao), 2003

RMA Group
Every Project Matters | www.rmacompanies.com

HISTORIC STRONG EARTHQUAKES IN SOUTHERN CALIFORNIA SINCE 1812

Date	Event	Causitive Fault	Magnitude	Epicentral Distance (miles)
Dec. 12, 1812	Wrightwood	San Andreas?	7.3	28
Jan. 9, 1857	Fort Tejon	San Andreas	7.9	242
Dec. 16, 1858	San Bernardino Area	uncertain	6.0	18
Feb. 9,1890	San Jacinto	uncertain	6.3	88
May 28, 1892	San Jacinto	uncertain	6.3	88
July 30, 1894	Lytle Creek	uncertain	6.0	20
July 22, 1899	Cajon Pass	uncertain	6.4	21
Dec.25, 1899	San Jacinto	San Jacinto	6.7	39
Sept. 20, 1907	San Bernardino Area	uncertain	5.3	32
May 15, 1910	Elsinore	Elsinore	6.0	25
April 21, 1918	Hemet	San Jacinto	6.8	40
July 23, 1923	San Bernardino	San Jacinto	6.0	18
March 11, 1933	Long Beach	Newport-Inglewood	6.4	32
April 10, 1947	Manix	Manix	6.4	92
Dec. 4, 1948	Desert Hot Springs	San Andreas or Banning	6.5	72
July 21, 1952	Wheeler Ridge	White Wolf	7.3	108
Feb. 9, 1971	San Fernando	San Fernando	6.6	54
July 8, 1986	North Palm Springs	Banning or Garnet Hills	5.6	59
Oct. 1, 1987	Whittier Narrows	Puente Hills Thrust	6.0	28
Feb. 28, 1990	Upland	San Jose	5.5	10
June 28, 1991	Sierra Madre	Clamshell Sawpit	5.8	29
April 22, 1992	Joshua Tree	Eureka Peak	6.1	76
June 28, 1992	Landers	Johnson Valley & others	7.3	70
June 28, 1992	Big Bear	uncertain	6.5	47
Jan. 17, 1994	Northridge	Northridge Thrust	6.7	57
Oct. 16, 1999	Hector Mine	Lavic Lake	7.1	89
July 4, 2019	Searles Valley	Eastern Calif. Shear Zone	6.4	117
July 5, 2019	Searles Valley	Eastern Calif. Shear Zone	7.1	122

DRAFT

Notes:

Earthquake data: U.S. Geological Survey P.P. 1515 & online data, Southern California Earthquake Center & California Geological Survey online data

Magnitudes prior to 1932 are estimated from intensity.

Magnitudes after 1932 are moment, local or surface wave magnitudes.

Site Location:

Site Longitude: - 117.604962

Site Latitude: 34.01789

APPENDIX A

FIELD INVESTIGATION

DRAFT

APPENDIX A

FIELD INVESTIGATION

A-1.00 FIELD EXPLORATION

A-1.01 Number of Borings

Our subsurface investigation consisted of 17 borings drilled with a CME-75 drill rig.

A-1.02 Location of Borings

A Site Geologic Map showing the approximate locations of the borings is presented as Figure 3.

A-1.03 Boring Logging

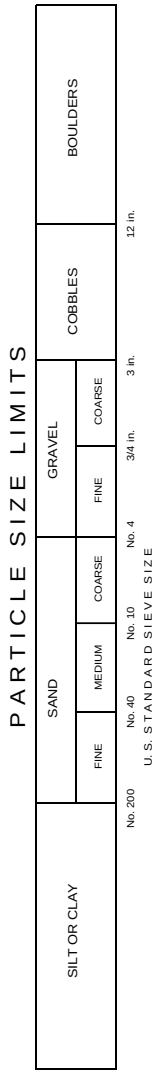
Logs of borings were prepared by one of our staff and are attached in this appendix. The logs contain factual information and interpretation of subsurface conditions between samples. The strata indicated on these logs represent the approximate boundary between earth units and the transition may be gradual. The logs show subsurface conditions at the dates and locations indicated, and may not be representative of subsurface conditions at other locations and times.

Identification of the soils encountered during the subsurface exploration was made using the field identification procedure of the Unified Soils Classification System (ASTM D2488). A legend indicating the symbols and definitions used in this classification system and a legend defining the terms used in describing the relative compaction, consistency or firmness of the soil are attached in this appendix. Bag samples of the major earth units were obtained for laboratory inspection and testing, and the in-place density of the various strata encountered in the exploration was determined

A-1.04 Soil Infiltration Testing

Two soil infiltration tests were performed using the boring percolation test procedure described in the San Bernardino County Stormwater Program Technical Guidance Document for Water Quality Management Plans (WQMP). Locations of the tests are shown on Figure 3.

DRAFT



MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size.	CLEAN GRAVELS (Little or no fines)	GW	Well graded gravel, gravel-sand mixtures. little or no fines.
			GP	Poorly graded gravel or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amt. of fines)	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size)	CLEAN SANDS (Little or no fines)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size)	SILTS AND CLAYS (Liquid limit LESS than 50)		ML	Inorganic silts and very fine sands, rock flour silty or clayey fine sands or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50)		MH	Inorganic silts, micaceous or diatamaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

DRAFT

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

UNIFIED SOIL CLASSIFICATION SYSTEM

RMA Group
Every Project Matters | www.rmacompanies.com

I. SOIL STRENGTH/DENSITY

BASED ON STANDARD PENETRATION TESTS

Apparent Density of sand		Consistency of clay	
Penetration Resistance N (blows/Ft)	Apparent Density	Penetration Resistance N (blows/ft)	Consistency
0-4	Very Loose	<2	Very Soft
4-10	Loose	2-4	Soft
10-30	Medium Dense	4-8	Medium Stiff
30-50	Dense	8-15	Stiff
>50	Very Dense	15-30	Very Stiff
		>30	Hard

N = Number of blows of 140 lb. weight falling 30 in. to drive 2-in OD sampler 1 ft.

BASED ON RELATIVE COMPACTION

Compactness of sand		Consistency of clay	
% Compaction	Compactness	% Compaction	Consistency
<75	Loose	<80	Soft
75-83	Medium Dense	80-85	Medium Stiff
83-90	Dense	85-90	Stiff
>90	Very Dense	>90	Very Stiff

II. SOIL MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but not visible water
Wet	Visible free water, usually soil is below water table

SOIL DESCRIPTION LEGEND

DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-1

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		12" Manure on surface then concrete 3" Artificial fill (af): Gray silty fine to coarse sand, moist ,dense.
						SM		Young alluvial fan deposits (Qyf): Light brown to gray brown silty fine to medium sand, moist, non-porous, medium dense
5	R	12						Becomes brown in color
10	R	23						
								Trace of gravel
15	S	30		3.9				
20	S	77		4.5				Light brown to brown silty fine to coarse sand, trace gravel
25	S	69		4				
								Total depth 26.5' No groundwater Hole backfilled

DRAFT

Sample Types:

R - Ring Sample | - Bulk Sample | - Groundwater

T - Tube Sample | S - SPT Sample | - End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-2

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		Young alluvial fan deposits (Qyf): Light brown to gray brown silty fine to medium sand, moist, non-porous, medium dense
5	R	17		5.0				Becomes brown in color
10	R	55		5.0				Trace of gravel
								Decrease in gravel
15	S	33		4.2				
20	S	50 for 6"		1.8				Trace to minor gravel
25	S	23		10.9				Gravel absent,silty fine to medium sand
								Trace of gravel, silty fine to coarse sand
	S	52		12.2				
								Total depth 31.5'
								No groundwater
								Hole backfilled

DRAFT

Sample Types:

R - Ring Sample | Bulk Sample | Groundwater

T - Tube Sample | S - SPT Sample | End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-2

Sheet 1 of 1

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Sample Type	Blows (blows/ft)	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		Young alluvial fan deposits (Qyf): Light brown to gray brown silty fine to medium sand, moist, non-porous, medium dense
5	R	50 for 6"		1.1				Becomes brown in color
10	R	58		8.4				Trace of gravel
								Decrease in gravel
15	S	45		5.0				
20	S	54		6.5				Gravel absent, silty fine to medium sand and trace clay
25	S	65		17.4				Trace to minor grave, silty fine to coarse sand
	S	85		6.8				Total depth 31.5'
								No groundwater
								Hole backfilled

This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

DRAFT

Sample Types:

R - Ring Sample | - Bulk Sample | - Groundwater

T - Tube Sample | S - SPT Sample | - End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-4

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		6 inches manure Young alluvial fan deposits (Qyf): Light brown to brown silty fine to medium sand, trace gravel, moist, non-porous, medium dense
5	R	72		1.7				
10	R	55		9..9				Increase in gravel
15	S	44		4.5				Trace to minor gravel
20	S	58		10.1				
25	S	42		17.6				Gravel decreases ,silty fine to medium sand
	S	41		N/A				Total depth 31.5' No groundwater

DRAFT

Sample Types:

R - Ring Sample | - Bulk Sample | - Groundwater

T - Tube Sample | S - SPT Sample | - End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-5

Date Drilled: 09/21/2023
Logged By: SL
Location: See Geologic Map
Elevation (ft):

Drilling Equipment: CME-75
Boring Hole Diameter: 8"
Drive Weights: 140 lbs.
Drop: 30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		6 inches manure Young alluvial fan deposits (Qyf): Light brown to brown silty fine to medium sand, trace gravel, moist, non-porous, dense
5	R	55		6.8				
10	R	45		4.8				Slight increase in gravel
15	S	34		4.4				Trace to minor gravel
20	S	32		7				
25	S	41		5.5				Gravel decreases ,silty fine to medium sand

This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

DRAFT

Sample Types:
R - Ring Sample
Bulk Sample
Groundwater
T - Tube Sample
S - SPT Sample
End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-5

Date Drilled: 09/21/2023
Logged By: SL
Location: See Geologic Map
Elevation (ft):

Drilling Equipment: CME-75
Boring Hole Diameter: 8"
Drive Weights: 140 lbs.
Drop: 30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
	S	73		5.0		CL		Brown sandy clay, moist, slightly plastic, hard 57.8% passing #200
35	S	50 for 6"		4.8		SM		Brown silty fine to cvoarse sand with trace gravel, moist, poorly sorted, dense to very dense
40	S	82		5.7				
45	S	50-6"		10.7				17.3% passing #200
						SP-SM		Poorly graded fine to coarse sand with silt with trace to minor gravel, fine to medium sand, very dense, poorly sorted 7.3% passing #200
50	S	50-6"		15.5				Total depth 50.5' No groundwater Hole backfilled
55								

DRAFT

Sample Types:
R - Ring Sample
Bulk Sample
Groundwater
T - Tube Sample
S - SPT Sample
End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-5

Date Drilled: 09/21/2023
Logged By: SL
Location: See Geologic Map
Elevation (ft):

Drilling Equipment: CME-75
Boring Hole Diameter: 8"
Drive Weights: 140 lbs.
Drop: 30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		Artificial fill (af): Gray silty fine to coarse sand with gravel, moist ,dense.
						SM		Young alluvial fan deposits (Qyf): Light brown to brown silty fine to medium sand, minor coarse sand, trace gravel, moist, non-porous, medium dense
5	R	21		3.8				
10	R	36		3.5				Increase in silt content and trace clay and gravel 24.1% passing #200
15	S	37		4.9				
20	S	36		N/A				Increase in gravel content, 32.0% (passing #200)
25	S	38		4.9				

DRAFT

Sample Types:
R - Ring Sample
Bulk Sample
Groundwater
T - Tube Sample
S - SPT Sample
End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-6

Date Drilled: 09/21/2023
Logged By: SL
Location: See Geologic Map
Elevation (ft):

Drilling Equipment: CME-75
Boring Hole Diameter: 8"
Drive Weights: 140 lbs.
Drop: 30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
	S	27		5.0		CL		Brown sandy clay, moist, slightly plastic, hard 60.3% passing #200
35	S	38		13.7		SM		Brown silty fine to cvoarse sand with trace gravel, moist, poorly sorted, dense to very dense
40	S	35		12.7				
45	S	43		10.5		CL		Brown sandy clay, moist, slightly plastic, hard 63.0% passing #200
50	S	28		21.5				
55	S	34		10.2		SM		Brown silty fine to cvoarse sand with trace gravel, moist, poorly sorted, dense to very dense

DRAFT

Sample Types:
R - Ring Sample
Bulk Sample
Groundwater
T - Tube Sample
S - SPT Sample
End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-6

Date Drilled: 09/21/2023
Logged By: SL
Location: See Geologic Map
Elevation (ft):

Drilling Equipment: CME -55
Boring Hole Diameter: 8"
Drive Weights: 140 lbs.
Drop: 30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
65	S	34		21.5		SM		Brown silty fine to cvoarse sand with trace gravel, moist, poorly sorted, dense to very dense
	S	41		10.2				
70	S	40		N/A				24.2% passing #200
75								Total depth 70.5' No groundwater Hole backfilled

This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

DRAFT

Sample Types:
R - Ring Sample
Bulk Sample
Groundwater
T - Tube Sample
S - SPT Sample
End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-7

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		Young alluvial fan deposits (Qyf): Light brown to brown silty fine to medium sand, trace gravel, moist, non-porous, medium dense
5	R	22		4.3				
10	R	21		10.2				
15	S	22		2.7				Increase in gravel, trace clay
20	S	26		11.2				
25	S	25		14.9				Gravel decreases ,silty fine to medium sand
	S	33						Total depth 31.5' No groundwater

DRAFT

Sample Types:

R - Ring Sample | Bulk Sample | Groundwater

T - Tube Sample | S - SPT Sample | End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-8

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		3 inches asphalt Young alluvial fan deposits (Qyf): Light brown to brown silty fine to coarse sand, trace gravel, moist, non-porous, medium dense
5	R	17		4.9				
10	R	24		12.1				Increase in gravel
15	S	24		2.9				
20	S	14		4.5				Gravel decreases ,silty fine to medium sand
25	S	29		12.3				
	S	24		11.2				Total depth 31.5' No groundwater

This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

DRAFT

Sample Types:

R - Ring Sample | - Bulk Sample | - Groundwater

T - Tube Sample | S - SPT Sample | - End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-9

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		3 inches asphalt Young alluvial fan deposits (Qyf): Light brown to brown silty fine to coarse sand, trace gravel, moist, non-porous, medium dense
5	R	13		4.9				
10	R	17		12.1				Increase in gravel
15	S	36		3.7				Dense
20	S	65		4.9				Gravel decreases ,silty fine to medium sand
25	S	15		13.0		ML		Brown sandy silt, moist, fine sand, stiff
								Total depth 26.5' No groundwater

DRAFT

Sample Types:

R - Ring Sample | Bulk Sample | Groundwater

T - Tube Sample | S - SPT Sample | End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-10

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		3 inches asphalt Young alluvial fan deposits (Qyf): Light brown to brown silty fine to medium sand, trace gravel, moist, non-porous, medium dense
5	R	17		4.7				
10	R	19		4.2				Silty fine to coarse sand
15	S	29		2.9				Coarse sand, dense
20	S	19		13.9				Trace to minor gravel
25	S	22		6.6		ML		Brown sandy silt, moist, fine sand, stiff Total depth 26.5' No groundwater

DRAFT

Sample Types:

R - Ring Sample | Bulk Sample | Groundwater

T - Tube Sample | S - SPT Sample | End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-11

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
5	R	12				SM		Young alluvial fan deposits (Qyf): Light brown to brown silty fine to medium sand, trace gravel, moist
10	R	18						Hit patch of gravel, pebble to cobble size, moist Total depth 10.5' No groundwater
15								
20								
25								

This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

DRAFT

Sample Types:

R - Ring Sample | - Bulk Sample | - Groundwater

T - Tube Sample | S - SPT Sample | - End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-12

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
5	R	12				SM		Young alluvial fan deposits (Qyf): Light brown to brown fine to medium sand, trace gravel, moist
10	R	15				SP-SM		Poorly graded fine to coarse sand with silt with trace gravel, fine to medium sand, medium dense, poorly sorted Total depth 10.5' No groundwater
15								
20								
25								

This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

DRAFT

Sample Types:

R - Ring Sample | - Bulk Sample | - Groundwater

T - Tube Sample | S - SPT Sample | - End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-13

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		Young alluvial fan deposits (Qyf): Light brown to brown fine to medium sand, trace gravel, moist
5	R	11						
10	R	32						Increase in medium to coarse sand
15	S	36						Sand with some pebble size gravel, course sand, moist, light brown to tan
20	S	47						Increase in silt and decrease in gravel
25	S	50-6"						Dark clay layer about 5' thick, Tan to brown, Moist
								Total depth 30.5' No groundwater

DRAFT

Sample Types:

R - Ring Sample | Bulk Sample | Groundwater

T - Tube Sample | S - SPT Sample | End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-14

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		Young alluvial fan deposits (Qyf): Light brown to brown fine to medium sand, trace gravel, moist
5	R	11						
								Increase in medium to coarse sand
10	R	29						
15	S	57						Sand with some pebble size gravel, course sand, moist, light brown to tan
20	S	72						
								Course sand with silt, moist, light brown to tan
25	S	45						Total depth 25.5' No groundwater

This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

DRAFT

Sample Types:

R - Ring Sample | - Bulk Sample | - Groundwater

T - Tube Sample | S - SPT Sample | - End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-15

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		Young alluvial fan deposits (Qyf): Light brown to brown fine to medium sand, trace gravel, moist
5	R	11						Increase in medium to coarse sand
10	R	22						Increase in clay content with course to fine sand, dark brown, moist
15	S	44						
20	S	54						
25	S	37						Total depth 25.5' No groundwater

DRAFT

Sample Types:

R - Ring Sample | Bulk Sample | Groundwater

T - Tube Sample | S - SPT Sample | End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-16

Sheet 1 of 1

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
0						SM		Young alluvial fan deposits (Qyf): Light brown to brown fine to medium sand, trace gravel, moist
5	S	14						
								Layer of 3'-4' with medium to coarse sand
10	S	27						
15	S	18						Increase in clay content with course to fine sand, dark brown, moist
20	S	29						Total depth 20.5' No groundwater
25								

This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

DRAFT

Sample Types:

R - Ring Sample | Bulk Sample | Groundwater

T - Tube Sample | S - SPT Sample | End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Exploratory Boring Log

Boring No. B-17

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
0						SM		Young alluvial fan deposits (Qyf): Light brown to brown fine to medium sand, trace gravel, moist
5	R	10						
10	R	18						Layer of 7-10' with medium to coarse sand
15	S	22						
20	S	37						Increase in clay content with course to fine sand, dark brown, moist
25	S	68						Total depth 25.5' No groundwater

DRAFT

Sample Types:

R - Ring Sample | Bulk Sample | Groundwater

T - Tube Sample | S - SPT Sample | End of Boring

RMA Group
Every Project Matters | www.rmacompanies.com

Percolation Test Data Sheet

Project:	Ontario MiLB Stadium	Project No.:	00-232255-0	Date:	10/16/2023
Test Hole No.:	P-1	Tested By:	SL		
Test Hole Depth (In.) , D_T:	120	USCS Soil Classification:	SM		
Test Hole Dimensions (inches)			Length	Width	
Diameter In.) if round=	8	Sides (if rectangular)=			

Sandy Soil Criteria*

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or equal to 6"? (y/n)
1	8:30 AM	9:00 AM	30	24.0	32.0	8.0	Y
2	9:00 AM	9:30 AM	30	24.0	30.4	6.4	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight.

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (In.)	D_f Final Depth to Water (In.)	ΔD Change in Water Level (In.)	Percolation Rate (min./in.)
1	9:40 AM	10:10 AM	30	12.0	48.2	36.2	0.829
2	10:10 AM	10:40 PM	30	48.2	72.1	23.9	1.258
3	10:40 AM	11:10 AM	30	72.1	84.2	12.2	2.469
4	11:10 AM	11:40 PM	30	84.2	94.8	10.6	2.830
5	11:50 AM	12:10 PM	30	84.3	94.7	10.4	2.885
6	12:10 PM	12:40:00 PM	30	84.6	94.7	10.1	2.970

Infiltration Rate (in/hr) = $(\Delta H*60min/hr*r)/\Delta t\ (r+2Havg)$

H avg = $(H_o - Hf)/2$

Infiltration Rate (in/hr): 1.25

DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

Percolation Test Data Sheet

Project:	Ontario MiLB Stadium	Project No.:	00-232576-2	Date:	10/13/2023
Test Hole No.:	P-2	Tested By:	SL		
Test Hole Depth (In.) , D_T:	120	USCS Soil Classification:	SP-SM		
Test Hole Dimensions (inches)			Length	Width	
Diameter In.) if round=	8	Sides (if rectangular)=			

Sandy Soil Criteria*

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or equal to 6"? (y/n)
1	12:10 PM	12:40 PM	30	16.0	120.0	104.0	Y
2	12:45 PM	1:15 PM	30	16.0	120.0	104.0	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight.

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (In.)	D_f Final Depth to Water (In.)	ΔD Change in Water Level (In.)	Percolation Rate (min./in.)
1	12:30 PM	12:40 PM	10	12.0	86.4	74.4	0.134
2	12:45 PM	12:55 PM	10	12.0	93.0	81.0	0.123
3	1:00 PM	1:10 PM	10	12.0	90.4	78.4	0.128
4	1:15 PM	1:25 PM	10	12.0	90.2	78.2	0.128
5	1:25 PM	1:35 PM	10	12.0	90.1	78.1	0.128
6	1:35 PM	1:45 PM	10	12.0	89.8	77.8	0.129

COMMEN Infiltration Rate (in/hr) = $(\Delta H*60min/hr*r)/\Delta t\ (r+2Havg)$

H avg = $(H_o - Hf)/2$

Infiltration Rate (in/hr): 13.24

DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

DRAFT

APPENDIX B

LABORATORY TESTS

RMA Group
Every Project Matters | www.rmacompanies.com

APPENDIX B

LABORATORY TESTS

B-1.00 LABORATORY TESTS

B-1.01 Maximum Density

Maximum density - optimum moisture relationships for the major soil types encountered during the field exploration were performed in the laboratory using the standard procedures of ASTM D1557.

B-1.02 Atterberg Limits

The liquid limit, plastic limit, and the plasticity index of the major soil types encountered in the test holes were determined using the standard test methods of ASTM D4318.

B-1.03 Expansion Tests

Expansion index tests were performed on representative samples of the major soil types encountered by the test methods outlined in ASTM D4829.

B-1.04 Soluble Sulfates and Chlorides

A test was performed on representative sample encountered during the investigation using the Caltrans Test Methods CTM 417 and CTM 422.

B-1.05 Sand Equivalence

Sand Equivalent tests were performed on representative samples of the major soil types encountered by the test methods of ASTM D2419.

B-1.06 Soil Reactivity (pH) and Electrical Resistivity

Representative soil sample was tested for soil reactivity (pH) and electrical resistivity using California Test Method 643. The pH measurement determines the degree of acidity or alkalinity in the soils.

B-1.07 Particle Size Analysis

Particle size analysis was performed on representative samples of the major soils types in accordance to the standard test methods of the ASTM D422. The hydrometer portion of the standard procedure was not performed and the material retained on the #200 screen was washed.

B-1.08 Direct Shear

Direct shear tests were performed on representative samples of the major soil types encountered in the test holes using the standard test method of ASTM D3080 (consolidated and drained). Tests were performed on remolded samples. Remolded samples were tested at 90 percent relative compaction.

Shear tests were performed on a direct shear machine of the strain-controlled type. To simulate possible adverse field conditions, the samples were saturated prior to shearing. Several samples were sheared at varying normal loads and the results plotted to establish the angle of the internal friction and cohesion of the tested samples.

DRAFT

B-1.09 Resistance Value (R-Value)

Resistance Value tests were performed on representative samples of the major soil types encountered by the test methods outlined in California 301.

B-1.10 Moisture Determination

Moisture content of the soil samples was performed in accordance to standard method for determination of water content of soil by drying oven, ASTM D2216. The mass of material remaining after oven drying is used as the mass of the solid particles.

B-1.11 Density of Split-Barrel Samples

Soil samples were obtained by using a split-barrel sampler in accordance to standard method of ASTM D1586.

B-1.12 Test Results

Test results for all laboratory tests performed on the subject project are presented in this appendix.

DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

SAMPLE INFORMATION

Sample Number	Sample Description	Sample Location	
		Boring No.	Depth (ft)
1	Light brown silty sand	B-1	2-5 feet
2	Light brown silty sand	B-2	2-5 feet
3	Light brown silty sand	B-3	12-15 feet
4	Light brown silty sand	B-4	2-5 feet
5	Light brown silty sand	B-5	12-16 feet
7	Light brown silty sand	B-7	2-5 feet

MAXIMUM DENSITY - OPTIMUM MOISTURE

Test Method: ASTM D1557

Sample Number	Optimum Moisture (Percent)	Maximum Density (lbs/ft^3)
1	9.9	129.9
2	9.2	130.3
5	8.5	133.7

ATTERBERG LIMITS

Test Method: ASTM D4318

Sample Location	Liquid Limit	Plastic Index	Soil Classification
B-6 @ 50 feet	34	16	CL

EXPANSION TEST

Test Method: ASTM D4829

Sample Number	Molding Moisture Content (Percent)	Final Moisture Content (Percent)	Initial Dry Density (lbs/ft^3)	Expansion Index	Expansion Classification
1	7.5	15.1	117.6	4	Very low
7	6.2	14.8	118.3	2	Very low

DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

SOLUBLE SULFATES AND CHLORIDES

Test Method: CTM 417 and CTM 422

Sample Number	Soluble Sulfate (% by weight)	Soluble Chloride (ppm)
3	0.0261	153

SOIL REACTIVITY (pH) AND ELECTRICAL RESISTIVITY

Test Method: CTM 643

Sample Number	pH	Resistivity (Ohm-cm)
3	6.8	770

SAND EQUIVALENT

Test Method: ASTM D2419

Sample Number	Sand Equivalent
2	19

PERCENT PASSING #200 SIEVE

Test Method: ASTM D422

Sample Location	Percent Passing #200 Sieve
B-1 @ 5 feet	37.6%
B-6 @10 feet	24.1%
B-6 @ 20 feet	32.0%
B-5 @ 30 feet	57.8%
B-5 @ 45 feet	17.3%
B-5 @ 50 feet	7.3%
B-6 @ 30 feet	60.3%
B-6 @ 50 feet	63.0%
B-6 @ 70 feet	24.2%

DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

PARTICLE SIZE ANALYSIS

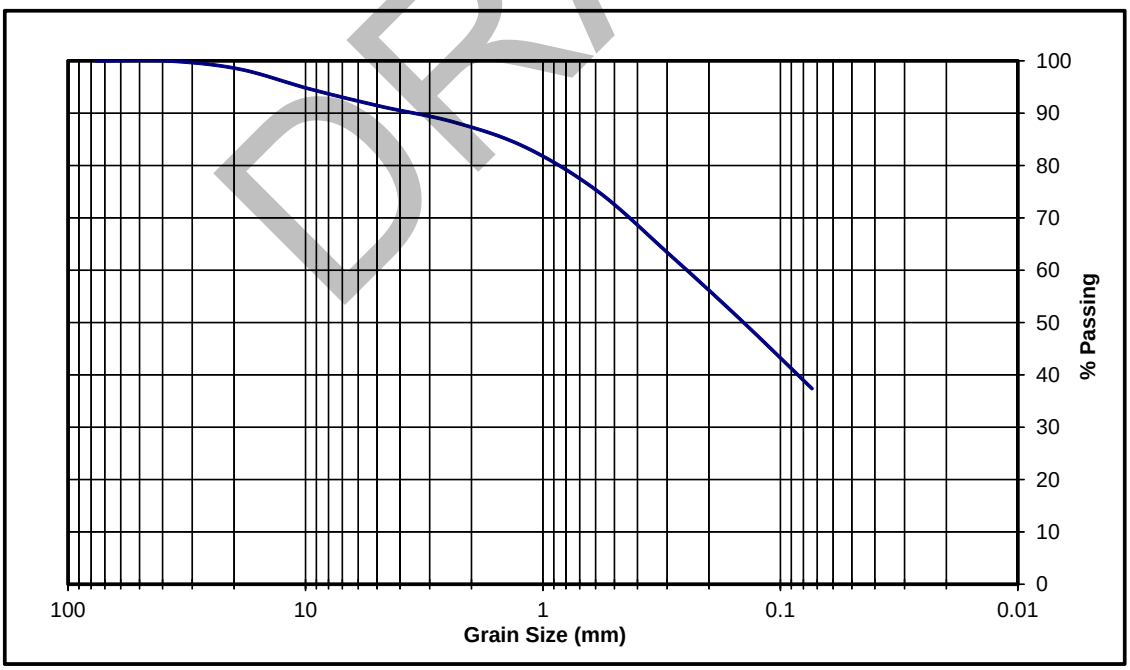
ASTM D422

Sample ID: 1
Location: B-1 @ 2-5 feet

Fraction A: Dry Net Weight (gms): 5,444
Fraction B: Dry Net Weight (gms): 486

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction A:	3"	0	5444	100
	1-1/2"	0	5444	100
	3/4"	85	5359	98
	3/8"	295	5149	95
	#4	477	4967	91

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction B:	#8	15.6	470.4	88
	#16	41.0	445.0	84
	#30	85.9	400.1	75
	#50	149.1	336.9	63
	#100	214.9	271.1	51
	#200	286.8	199.2	37



DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

PARTICLE SIZE ANALYSIS

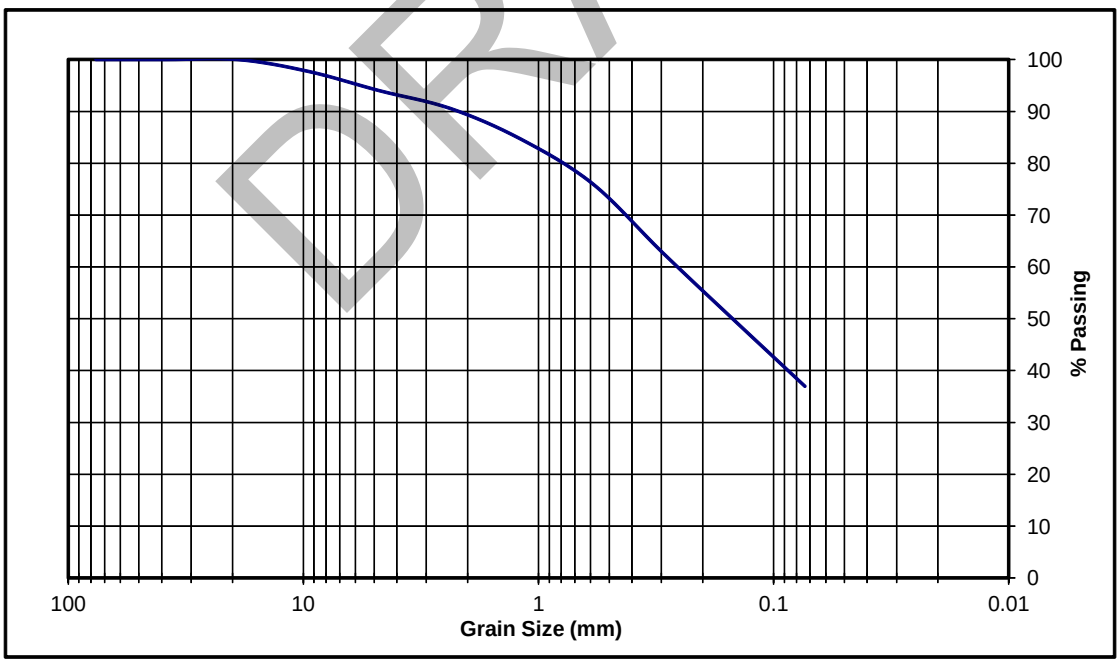
ASTM D422

Sample ID: 5
Location: B-5 @ 12-16 feet

Fraction A: Dry Net Weight (gms): 4,888
Fraction B: Dry Net Weight (gms): 523.8

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction A:	3"	0	4888	100
	1-1/2"	0	4888	100
	3/4"	0	4888	100
	3/8"	112	4776	98
	#4	294	4594	94

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction B:	#8	19.0	504.8	91
	#16	52.0	471.8	85
	#30	100.0	423.8	76
	#50	174.0	349.8	63
	#100	245.0	278.8	50
	#200	317.8	206.0	37



DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

PARTICLE SIZE ANALYSIS

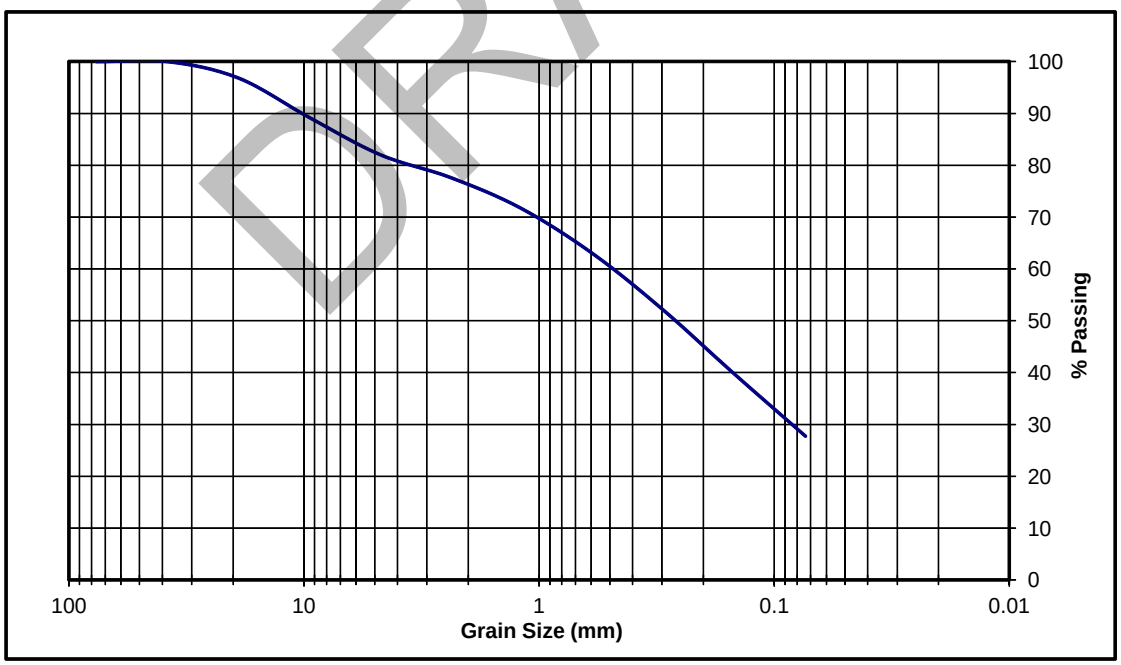
ASTM D422

Sample ID: 7
Location: B-7 @ 2-5 feet

Fraction A: Dry Net Weight (gms): 18,947
Fraction B: Dry Net Weight (gms): 508.4

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction A:	3"	0	18947	100
	1-1/2"	0	18947	100
	3/4"	597	18350	97
	3/8"	2036	16911	89
	#4	3400	15547	82

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction B:	#8	27.4	481.0	78
	#16	64.3	444.1	72
	#30	118.7	389.7	63
	#50	185.5	322.9	52
	#100	260.7	247.7	40
	#200	336.5	171.9	28



DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

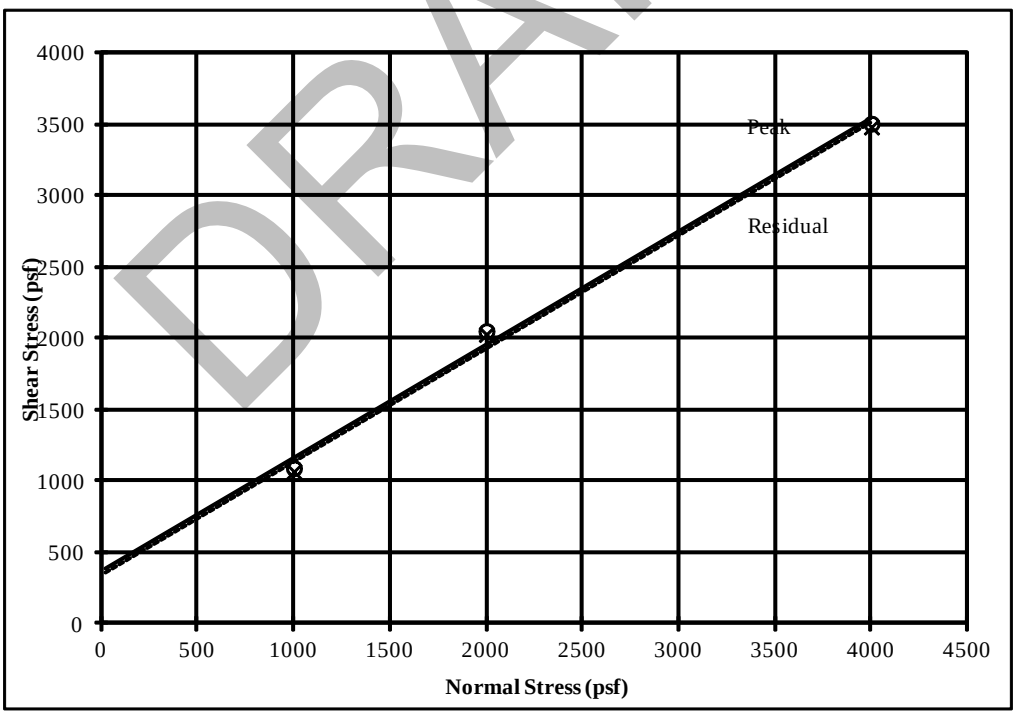
DIRECT SHEAR TEST
ASTM D3080

Sample ID: 1

Maximum Dry Density (pcf) =	130.3
Optimum Moisture Content (%) =	9.2
Initial Dry Density (pcf) =	117.3
Initial Moisture Content (%) =	9.9
Final Moisture Content (%) =	14.6

Normal Pressure	Peak Shear Resist	Residual Shear Resist
1000	1092	1068
2000	2052	2028
4000	3504	3480

	Peak	Residual
Cohesion (psf) =	370	340
Friction Angle (deg) =	38	38



DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

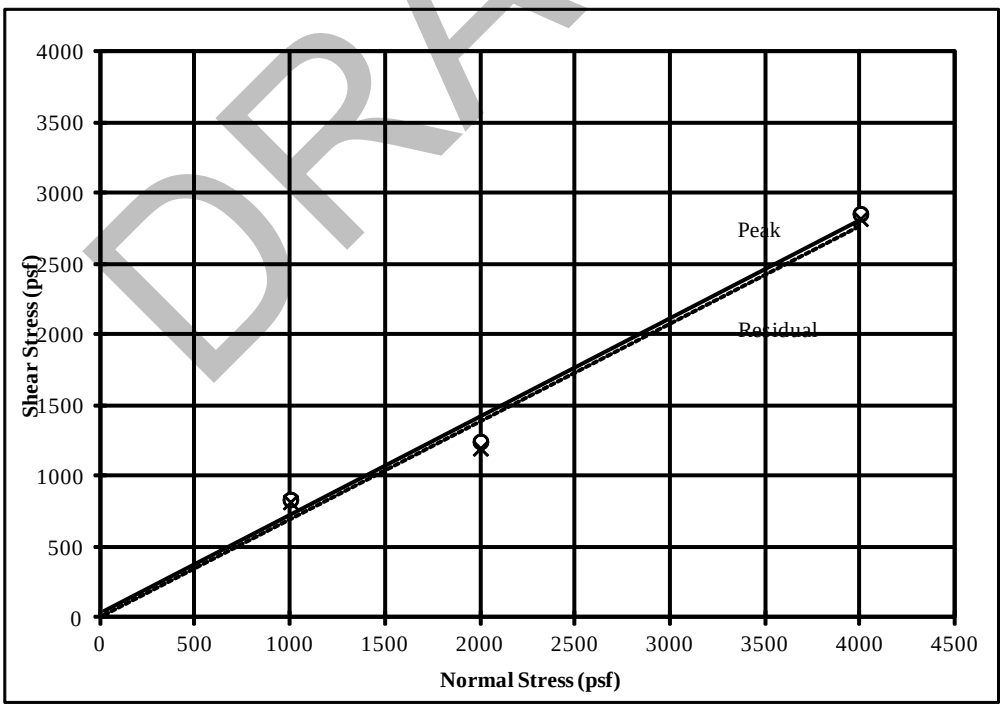
DIRECT SHEAR TEST
ASTM D3080

Sample ID: 5

Maximum Dry Density (pcf) =	133.7
Optimum Moisture Content (%) =	8.5
Initial Dry Density (pcf) =	120.3
Initial Moisture Content (%) =	8.6
Final Moisture Content (%) =	15.7

Normal Pressure	Peak Shear Resist	Residual Shear Resist
1000	838	820
2000	1248	1200
4000	2856	2820

	Peak	Residual
Cohesion (psf) =	30	10
Friction Angle (deg) =	35	34



DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

CTM 301 - DETERMINATION OF RESISTANCE "R" VALUE OF TREATED AND UNTREATED BASES, SUBBASES, AND BASEMENT SOILS BY THE STABILOMETER

Sample ID: 1

Specimen No	A	B	C
Moisture Content (%)	10.6	10.0	10.3
Dry Density (pcf)	120.0	120.0	119.5
Exudation Pressure (psi)	191	796	553
Stabilometer R Value	23	74	61
Expansion Pressure Dial	0	0	0

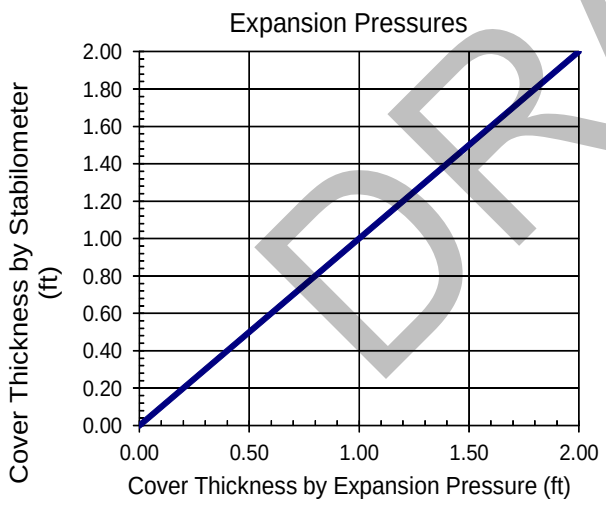
Use: Traffic Index = 6.0 Gravel Factor = 1.00

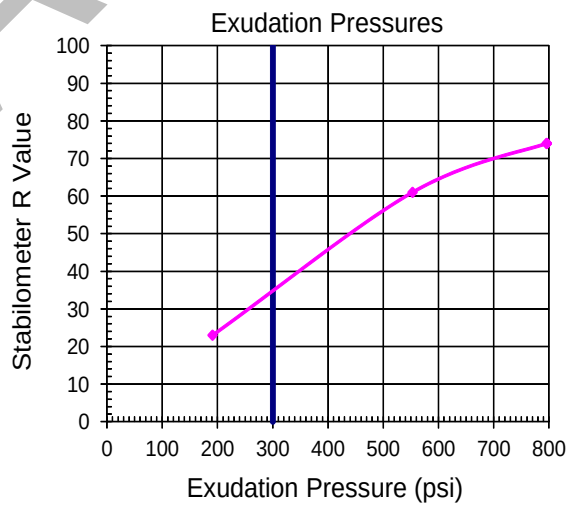
Thickness by Expansion (ft)			
Thickness by Stabilometer (ft)	1.48	0.50	0.75

Equilibrium Thick (ft) -

Equilibrium Pressure R Value **n/a**

Exudation Pressure R Value @ 300 psi **35** ***Use Exudation R Value***





DRAFT

Expansion Pressure R-Value is based on the following structural section:

Thickness of AC (ft)=	**0.42**	G_f(ac) =	2.31	W(ac) =	145
Thickness of Aggregate Base (ft)=	**0.50**	G_f(base) =	1.10	W(base) =	130
		G_f(avg) =	1.65	W(avg) =	137

RMA Group
Every Project Matters | www.rmacompanies.com

CTM 301 - DETERMINATION OF RESISTANCE "R" VALUE OF TREATED AND UNTREATED BASES, SUBBASES, AND BASEMENT SOILS BY THE STABILOMETER

Sample ID: 2

Specimen No	A	B	C
Moisture Content (%)	11.2	10.2	9.7
Dry Density (pcf)	119.7	121.6	122.3
Exudation Pressure (psi)	156	390	490
Stabilometer R Value	46	63	67
Expansion Pressure Dial	0	0	0

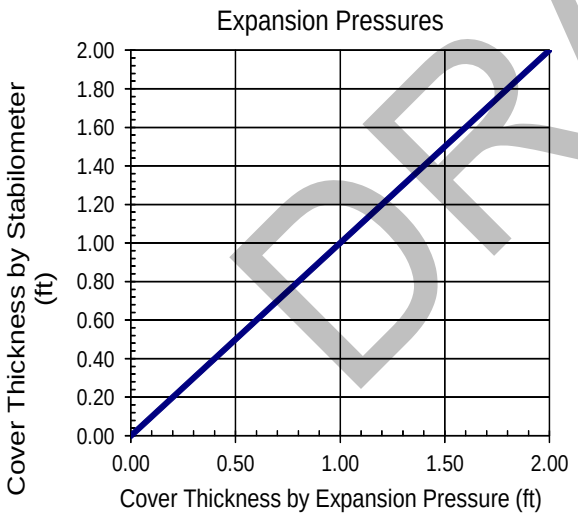
Use: Traffic Index = 6.0 Gravel Factor = 1.00

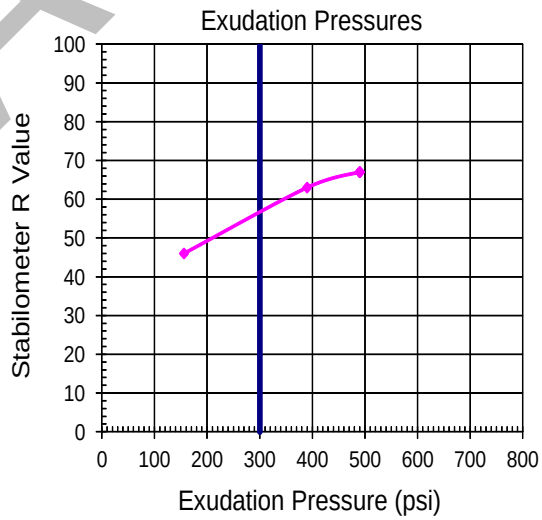
Thickness by Expansion (ft)			
Thickness by Stabilometer (ft)	1.04	0.71	0.63

Equilibrium Thick (ft) -

Equilibrium Pressure R Value **n/a**

Exudation Pressure R Value @ 300 psi **57** ***Use Exudation R Value***





DRAFT

Expansion Pressure R-Value is based on the following structural section:

Thickness of AC (ft)=	**0.42**	G_f(ac) =	2.31	W(ac) =	145
Thickness of Aggregate Base (ft)=	**0.50**	G_f(base) =	1.10	W(base) =	130
		G_f(avg) =	1.65	W(avg) =	137

RMA Group
Every Project Matters | www.rmacompanies.com

APPENDIX C

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

APPENDIX C

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

C-1.00 GENERAL DESCRIPTION

C-1.01 Introduction

These specifications present our general recommendations for earthwork and grading as shown on the approved grading plans for the subject project. These specifications shall cover all clearing and grubbing, removal of existing structures, preparation of land to be filled, filling of the land, spreading, compaction and control of the fill, and all subsidiary work necessary to complete the grading of the filled areas to conform with the lines, grades and slopes as shown on the approved plans.

The recommendations contained in the geotechnical report of which these general specifications are a part of shall supersede the provisions contained hereinafter in case of conflict.

C-1.02 Laboratory Standard and Field Test Methods

The laboratory standard used to establish the maximum density and optimum moisture shall be ASTM D1557.

The insitu density of earth materials (field compaction tests) shall be determined by the sand cone method (ASTM D1556), direct transmission nuclear method (ASTM D6938) or other test methods as considered appropriate by the geotechnical consultant.

Relative compaction is defined, for purposes of these specifications, as the ratio of the in-place density to the maximum density as determined in the previously mentioned laboratory standard.

DRAFT

C-2.00 CLEARING

C-2.01 Surface Clearing

All structures marked for removal, timber, logs, trees, brush and other rubbish shall be removed and disposed of off the site. Any trees to be removed shall be pulled in such a manner so as to remove as much of the root system as possible.

C-2.02 Subsurface Removals

A thorough search should be made for possible underground storage tanks and/or septic tanks and cesspools. If found, tanks should be removed and cesspools pumped dry.

Any concrete irrigation lines shall be crushed in place and all metal underground lines shall be removed from the site.

C-2.03 Backfill of Cavities

All cavities created or exposed during clearing and grubbing operations or by previous use of the site shall be cleared of deleterious material and backfilled with native soils or other materials approved by the soil engineer. Said backfill

shall be compacted to a minimum of 90% relative compaction.

C-3.00 ORIGINAL GROUND PREPARATION

C-3.01 Stripping of Vegetation

After the site has been properly cleared, all vegetation and topsoil containing the root systems of former vegetation shall be stripped from areas to be graded. Materials removed in this stripping process may be used as fill in areas designated by the soil engineer, provided the vegetation is mixed with a sufficient amount of soil to assure that no appreciable settlement or other detriment will occur due to decaying of the organic matter. Soil materials containing more than 3% organics shall not be used as structural fill.

C-3.02 Removals of Non-Engineered Fills

Any non-engineered fills encountered during grading shall be completely removed and the underlying ground shall be prepared in accordance to the recommendations for original ground preparation contained in this section. After cleansing of any organic matter the fill material may be used for engineered fill.

C-3.03 Overexcavation of Fill Areas

The existing ground in all areas determined to be satisfactory for the support of fills shall be scarified to a minimum depth of 6 inches. Scarification shall continue until the soils are broken down and free from lumps or clods and until the scarified zone is uniform. The moisture content of the scarified zone shall be adjusted to within 2% of optimum moisture. The scarified zone shall then be uniformly compacted to 90% relative compaction.

Where fill material is to be placed on ground with slopes steeper than 5:1 (H:V) the sloping ground shall be benched. The lowermost bench shall be a minimum of 15 feet wide, shall be a minimum of 2 feet deep, and shall expose firm material as determined by the geotechnical consultant. Other benches shall be excavated to firm material as determined by the geotechnical consultant and shall have a minimum width of 4 feet.

Existing ground that is determined to be unsatisfactory for the support of fills shall be overexcavated in accordance to the recommendations contained in the geotechnical report of which these general specifications are a part.

C-4.00 FILL MATERIALS

C-4.01 General

Materials for the fill shall be free from vegetable matter and other deleterious substances, shall not contain rocks or lumps of a greater dimension than is recommended by the geotechnical consultant, and shall be approved by the geotechnical consultant. Soils of poor gradation, expansion, or strength properties shall be placed in areas designated by the geotechnical consultant or shall be mixed with other soils providing satisfactory fill material.

C-4.02 Oversize Material

Oversize material, rock or other irreducible material with a maximum dimension greater than 12 inches, shall not be placed in fills, unless the location, materials, and disposal methods are specifically approved by the geotechnical

DRAFT

consultant. Oversize material shall be placed in such a manner that nesting of oversize material does not occur and in such a manner that the oversize material is completely surrounded by fill material compacted to a minimum of 90% relative compaction. Oversize material shall not be placed within 10 feet of finished grade without the approval of the geotechnical consultant.

C-4.03 Import

Material imported to the site shall conform to the requirements of Section 4.01 of these specifications. Potential import material shall be approved by the geotechnical consultant prior to importation to the subject site.

C-5.00 PLACING AND SPREADING OF FILL

C-5.01 Fill Lifts

The selected fill material shall be placed in nearly horizontal layers which when compacted will not exceed approximately 6 inches in thickness. Thicker lifts may be placed if testing indicates the compaction procedures are such that the required compaction is being achieved and the geotechnical consultant approves their use.
Each layer shall be spread evenly and shall be thoroughly blade mixed during the spreading to insure uniformity of material in each layer.

C-5.02 Fill Moisture

When the moisture content of the fill material is below that recommended by the soils engineer, water shall then be added until he moisture content is as specified to assure thorough bonding during the compacting process.

When the moisture content of the fill material is above that recommended by the soils engineer, the fill material shall be aerated by blading or other satisfactory methods until the moisture content is as specified.

C-5.03 Fill Compaction

After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted to not less than 90% relative compaction. Compaction shall be by sheepsfoot rollers, multiple-wheel pneumatic tired rollers, or other types approved by the soil engineer.

Rolling shall be accomplished while the fill material is at the specified moisture content. Rolling of each layer shall be continuous over its entire area and the roller shall make sufficient trips to insure that the desired density has been obtained.

C-5.04 Fill Slopes

Fill slopes shall be compacted by means of sheepsfoot rollers or other suitable equipment. Compacting of the slopes may be done progressively in increments of 3 to 4 feet in fill height. At the completion of grading, the slope face shall be compacted to a minimum of 90% relative compaction. This may require track rolling or rolling with a grid roller attached to a tractor mounted side-boom.

Slopes may be over filled and cut back in such a manner that the exposed slope faces are compacted to a minimum of 90% relative compaction.

DRAFT

The fill operation shall be continued in six inch (6") compacted layers, or as specified above, until the fill has been brought to the finished slopes and grades as shown on the accepted plans.

C-5.05 Compaction Testing

Field density tests shall be made by the geotechnical consultant of the compaction of each layer of fill. Density tests shall be made at locations selected by the geotechnical consultant.

Frequency of field density tests shall be not less than one test for each 2.0 feet of fill height and at least every one thousand cubic yards of fill. Where fill slopes exceed four feet in height their finished faces shall be tested at a frequency of one test for each 1000 square feet of slope face.

Where sheepsfoot rollers are used, the soil may be disturbed to a depth of several inches. Density reading shall be taken in the compacted material below the disturbed surface. When these readings indicate that the density of any layer of fill or portion thereof is below the required density, the particular layer or portion shall be reworked until the required density has been obtained.

DRAFT

C-6.00 SUBDRAINS

C-6.01 Subdrain Material

Subdrains shall be constructed of a minimum 4-inch diameter pipe encased in a suitable filter material. The subdrain pipe shall be Schedule 40 Acrylonitrile Butadiene Styrene (ABS) or Schedule 40 Polyvinyl Chloride Plastic (PVC) pipe or approved equivalent. Subdrain pipe shall be installed with perforations down. Filter material shall consist of 3/4" to 1 1/2" clean gravel wrapped in an envelope of filter fabric consisting of Mirafi 140N or approved equivalent.

C-6.02 Subdrain Installation

Subdrain systems, if required, shall be installed in approved ground to conform the approximate alignment and details shown on the plans or herein. The subdrain locations shall not be changed or modified without the approval of the geotechnical consultant. The geotechnical consultant may recommend and direct changes in the subdrain line, grade or material upon approval by the design civil engineer and the appropriate governmental agencies.

C-7.00 EXCAVATIONS

C-7.01 General

Excavations and cut slopes shall be examined by the geotechnical consultant. If determined necessary by the geotechnical consultant, further excavation or overexcavation and refilling of overexcavated areas shall be performed, and/or remedial grading of cut slopes shall be performed.

C-7.02 Fill-Over-Cut Slopes

Where fill-over-cut slopes are to be graded the cut portion of the slope shall be made and approved by the geotechnical consultant prior to placement of materials for construction of the fill portion of the slope.

C-8.00 TRENCH BACKFILL

C-.01 General

Trench backfill within street right of ways shall be compacted to 90% relative compaction as determined by the ASTM D1557 test method. Backfill may be jetted as a means of initial compaction; however, mechanical compaction will be required to obtain the required percentage of relative compaction. If trenches are jetted, there must be a suitable delay for drainage of excess water before mechanical compaction is applied.

C-9.00 SEASONAL LIMITS

C-9.01 General

No fill material shall be placed, spread or rolled while it is frozen or thawing or during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations shall not be resumed until field tests by the soils engineer indicate that the moisture content and density of the fill are as previously specified.

C-10.00 SUPERVISION

C-10.01 Prior to Grading

The site shall be observed by the geotechnical consultant upon completion of clearing and grubbing, prior to the preparation of any original ground for preparation of fill.

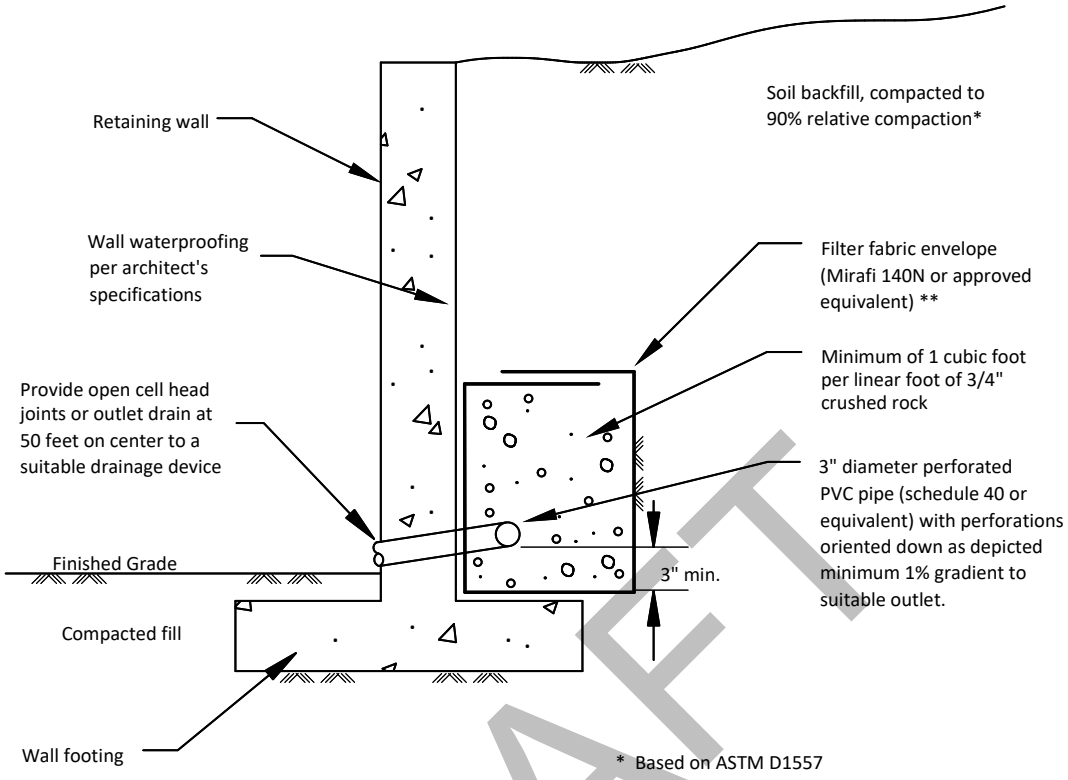
The supervisor of the grading contractor and the field representative of the geotechnical consultant shall have a meeting and discuss the geotechnical aspects of the earthwork prior to commencement of grading.

C-10.02 During Grading

Site preparation of all areas to receive fill shall be tested and approved by the geotechnical consultant prior to the placement of any fill.

The geotechnical consultant or his representative shall observe the fill and compaction operations so that he can provide an opinion regarding the conformance of the work to the recommendations contained in this report.

DRAFT



* Based on ASTM D1557

** If class 2 permeable material (See gradation to left) is used in place of 3/4" - 1 1/2" gravel. Filter fabric may be deleted. Class 2 permeable material compacted to 90% relative compaction. *

SPECIFICATIONS FOR CLASS 2 PERMEABLE MATERIAL (CAL TRANS SPECIFICATIONS)

Sieve Size	% Passing
1"	100
3/4"	90-100
3/8"	40-100
No.4	25-40
No.8	18-33
No.30	5-15
No.50	0-7
No.200	0-3

DRAFT

RETAINING WALL DRAINAGE DETAIL

RMA Group
Every Project Matters | www.rmacompanies.com

APPENDIX D

CALCULATIONS OF LIQUEFACTION POTENTIAL AND SEISMICALLY INDUCED SETTLEMENTS

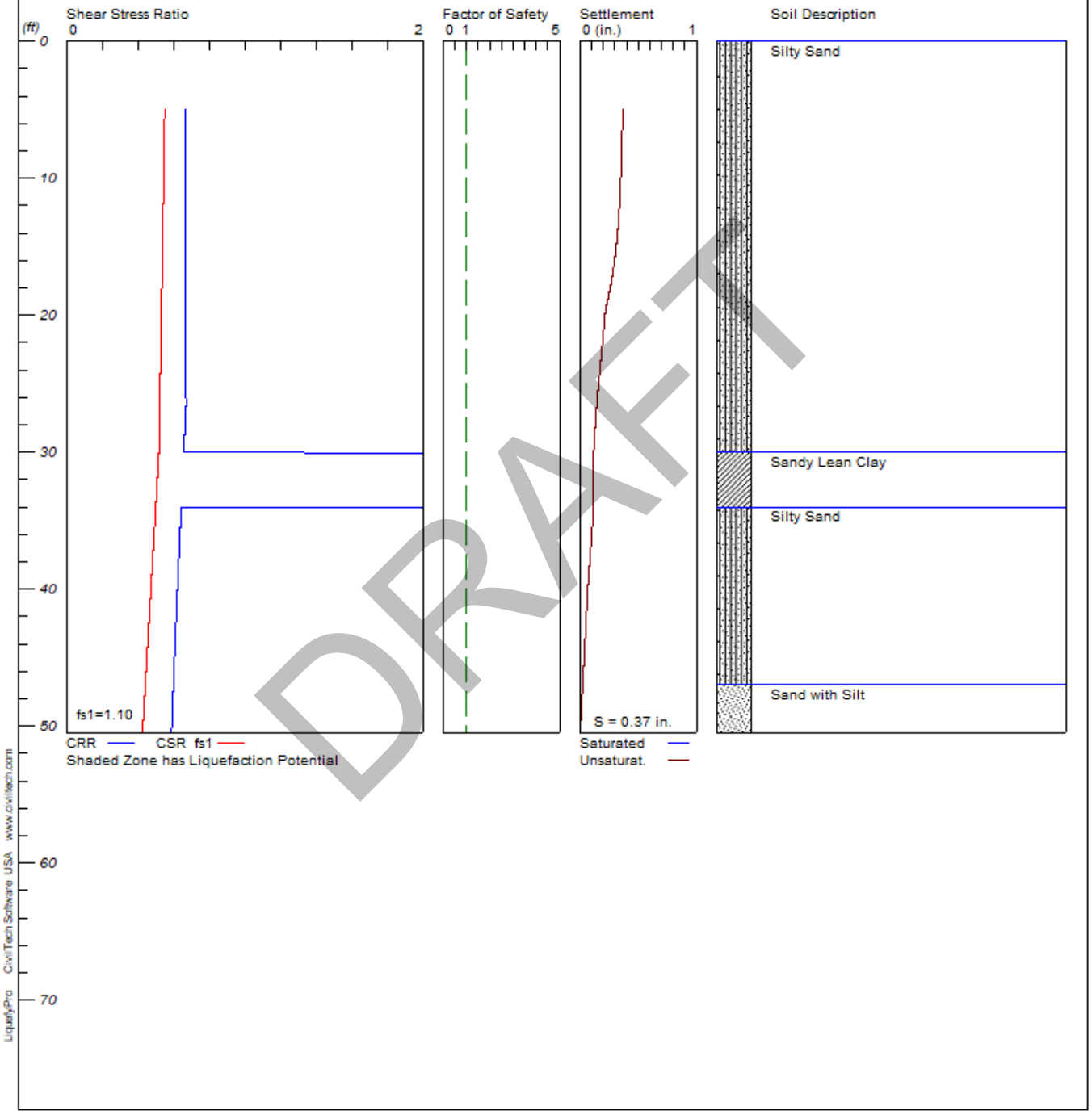
DRAFT

LIQUEFACTION ANALYSIS

Ontario Sports Park

Hole No.=BH05 Water Depth=130 ft

Magnitude=6.7
Acceleration=.778g



DRAFT

CivilTech Corporation

Plate A-1

****

LIQUEFACTION ANALYSIS SUMMARY

Copyright by CivilTech Software
www.civiltech.com

****

Font: Courier New, Regular, Size 8 is recommended for this report.
Licensed to ,   10/17/2023   4:55:06 PM

Input File Name: C:\Users\jmeneses\Desktop\HMD\00-23-2255--Ontario Sport Complex\Settlement\BH05.liq
Title: Ontario Sports Park
Subtitle:

Surface Elev.=
Hole No.=BH05
Depth of Hole= 50.50 ft
Water Table during Earthquake= 130.00 ft
Water Table during In-Situ Testing= 130.00 ft
Max. Acceleration= 0.78 g
Earthquake Magnitude= 6.70

Input Data:

Surface Elev.=
Hole No.=BH05
Depth of Hole=50.50 ft
Water Table during Earthquake= 130.00 ft
Water Table during In-Situ Testing= 130.00 ft
Max. Acceleration=0.78 g
Earthquake Magnitude=6.70
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Tokimatsu, M-correction
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 = 1.25
7. Borehole Diameter,   Cb= 1
8. Sampling Method,   Cs= 1.2
9. User request factor of safety (apply to CSR) ,   User= 1.1
   Plot one CSR curve (fs1=User)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
5.00	55.00	125.00	12.00
10.00	45.00	125.00	12.00
15.00	34.00	125.00	12.00
20.00	32.00	125.00	12.00
25.00	41.00	125.00	12.00
30.00	73.00	110.00	NoLiq
35.00	100.00	125.00	17.30
40.00	82.00	125.00	17.30
45.00	100.00	125.00	17.30
50.00	100.00	125.00	7.30

Output Results:

Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.37 in.
Total Settlement of Saturated and Unsaturated Sands=0.37 in.
Differential Settlement=0.183 to 0.241 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
5.00	0.67	0.55	5.00	0.00	0.37	0.37
5.05	0.67	0.55	5.00	0.00	0.36	0.36
5.10	0.67	0.55	5.00	0.00	0.36	0.36
5.15	0.67	0.55	5.00	0.00	0.36	0.36
5.20	0.67	0.55	5.00	0.00	0.36	0.36
5.25	0.67	0.55	5.00	0.00	0.36	0.36
5.30	0.67	0.55	5.00	0.00	0.36	0.36
5.35	0.67	0.55	5.00	0.00	0.36	0.36
5.40	0.67	0.55	5.00	0.00	0.36	0.36
5.45	0.67	0.55	5.00	0.00	0.36	0.36
5.50	0.67	0.55	5.00	0.00	0.36	0.36

DRAFT

5.55	0.67	0.55	5.00	0.00	0.36	0.36
5.60	0.67	0.55	5.00	0.00	0.36	0.36
5.65	0.67	0.55	5.00	0.00	0.36	0.36
5.70	0.67	0.55	5.00	0.00	0.36	0.36
5.75	0.67	0.55	5.00	0.00	0.36	0.36
5.80	0.67	0.55	5.00	0.00	0.36	0.36
5.85	0.67	0.55	5.00	0.00	0.36	0.36
5.90	0.67	0.55	5.00	0.00	0.36	0.36
5.95	0.67	0.55	5.00	0.00	0.36	0.36
6.00	0.67	0.55	5.00	0.00	0.36	0.36
6.05	0.67	0.55	5.00	0.00	0.36	0.36
6.10	0.67	0.55	5.00	0.00	0.36	0.36
6.15	0.67	0.55	5.00	0.00	0.36	0.36
6.20	0.67	0.55	5.00	0.00	0.36	0.36
6.25	0.67	0.55	5.00	0.00	0.36	0.36
6.30	0.67	0.55	5.00	0.00	0.36	0.36
6.35	0.67	0.55	5.00	0.00	0.36	0.36
6.40	0.67	0.55	5.00	0.00	0.36	0.36
6.45	0.67	0.55	5.00	0.00	0.36	0.36
6.50	0.67	0.55	5.00	0.00	0.36	0.36
6.55	0.67	0.55	5.00	0.00	0.36	0.36
6.60	0.67	0.55	5.00	0.00	0.36	0.36
6.65	0.67	0.55	5.00	0.00	0.36	0.36
6.70	0.67	0.55	5.00	0.00	0.36	0.36
6.75	0.67	0.55	5.00	0.00	0.36	0.36
6.80	0.67	0.55	5.00	0.00	0.36	0.36
6.85	0.67	0.55	5.00	0.00	0.36	0.36
6.90	0.67	0.55	5.00	0.00	0.36	0.36
6.95	0.67	0.55	5.00	0.00	0.36	0.36
7.00	0.67	0.55	5.00	0.00	0.36	0.36
7.05	0.67	0.55	5.00	0.00	0.36	0.36
7.10	0.67	0.55	5.00	0.00	0.36	0.36
7.15	0.67	0.55	5.00	0.00	0.36	0.36
7.20	0.67	0.55	5.00	0.00	0.36	0.36
7.25	0.67	0.55	5.00	0.00	0.36	0.36
7.30	0.67	0.55	5.00	0.00	0.36	0.36
7.35	0.67	0.55	5.00	0.00	0.36	0.36
7.40	0.67	0.55	5.00	0.00	0.36	0.36
7.45	0.67	0.55	5.00	0.00	0.36	0.36
7.50	0.67	0.55	5.00	0.00	0.36	0.36
7.55	0.67	0.55	5.00	0.00	0.36	0.36
7.60	0.67	0.55	5.00	0.00	0.36	0.36
7.65	0.67	0.55	5.00	0.00	0.36	0.36
7.70	0.67	0.55	5.00	0.00	0.36	0.36
7.75	0.67	0.55	5.00	0.00	0.36	0.36
7.80	0.67	0.55	5.00	0.00	0.36	0.36
7.85	0.67	0.55	5.00	0.00	0.36	0.36
7.90	0.67	0.55	5.00	0.00	0.36	0.36
7.95	0.67	0.55	5.00	0.00	0.36	0.36
8.00	0.67	0.55	5.00	0.00	0.36	0.36
8.05	0.67	0.55	5.00	0.00	0.36	0.36
8.10	0.67	0.55	5.00	0.00	0.36	0.36
8.15	0.67	0.55	5.00	0.00	0.36	0.36
8.20	0.67	0.55	5.00	0.00	0.36	0.36
8.25	0.67	0.55	5.00	0.00	0.36	0.36
8.30	0.67	0.55	5.00	0.00	0.36	0.36
8.35	0.67	0.55	5.00	0.00	0.36	0.36
8.40	0.67	0.55	5.00	0.00	0.36	0.36
8.45	0.67	0.55	5.00	0.00	0.36	0.36
8.50	0.67	0.55	5.00	0.00	0.36	0.36
8.55	0.67	0.55	5.00	0.00	0.35	0.35
8.60	0.67	0.55	5.00	0.00	0.35	0.35
8.65	0.67	0.55	5.00	0.00	0.35	0.35
8.70	0.67	0.54	5.00	0.00	0.35	0.35
8.75	0.67	0.54	5.00	0.00	0.35	0.35
8.80	0.67	0.54	5.00	0.00	0.35	0.35
8.85	0.67	0.54	5.00	0.00	0.35	0.35
8.90	0.67	0.54	5.00	0.00	0.35	0.35
8.95	0.67	0.54	5.00	0.00	0.35	0.35
9.00	0.67	0.54	5.00	0.00	0.35	0.35
9.05	0.67	0.54	5.00	0.00	0.35	0.35
9.10	0.67	0.54	5.00	0.00	0.35	0.35
9.15	0.67	0.54	5.00	0.00	0.35	0.35
9.20	0.67	0.54	5.00	0.00	0.35	0.35
9.25	0.67	0.54	5.00	0.00	0.35	0.35
9.30	0.67	0.54	5.00	0.00	0.35	0.35
9.35	0.67	0.54	5.00	0.00	0.35	0.35
9.40	0.67	0.54	5.00	0.00	0.35	0.35
9.45	0.67	0.54	5.00	0.00	0.35	0.35

DRAFT

9.50	0.67	0.54	5.00	0.00	0.35	0.35
9.55	0.67	0.54	5.00	0.00	0.35	0.35
9.60	0.67	0.54	5.00	0.00	0.35	0.35
9.65	0.67	0.54	5.00	0.00	0.35	0.35
9.70	0.67	0.54	5.00	0.00	0.35	0.35
9.75	0.67	0.54	5.00	0.00	0.35	0.35
9.80	0.67	0.54	5.00	0.00	0.35	0.35
9.85	0.67	0.54	5.00	0.00	0.35	0.35
9.90	0.67	0.54	5.00	0.00	0.35	0.35
9.95	0.67	0.54	5.00	0.00	0.35	0.35
10.00	0.67	0.54	5.00	0.00	0.35	0.35
10.05	0.67	0.54	5.00	0.00	0.35	0.35
10.10	0.67	0.54	5.00	0.00	0.35	0.35
10.15	0.67	0.54	5.00	0.00	0.35	0.35
10.20	0.67	0.54	5.00	0.00	0.35	0.35
10.25	0.67	0.54	5.00	0.00	0.35	0.35
10.30	0.67	0.54	5.00	0.00	0.35	0.35
10.35	0.67	0.54	5.00	0.00	0.35	0.35
10.40	0.67	0.54	5.00	0.00	0.35	0.35
10.45	0.67	0.54	5.00	0.00	0.35	0.35
10.50	0.67	0.54	5.00	0.00	0.35	0.35
10.55	0.67	0.54	5.00	0.00	0.35	0.35
10.60	0.67	0.54	5.00	0.00	0.35	0.35
10.65	0.67	0.54	5.00	0.00	0.35	0.35
10.70	0.67	0.54	5.00	0.00	0.35	0.35
10.75	0.67	0.54	5.00	0.00	0.35	0.35
10.80	0.67	0.54	5.00	0.00	0.35	0.35
10.85	0.67	0.54	5.00	0.00	0.35	0.35
10.90	0.67	0.54	5.00	0.00	0.34	0.34
10.95	0.67	0.54	5.00	0.00	0.34	0.34
11.00	0.67	0.54	5.00	0.00	0.34	0.34
11.05	0.67	0.54	5.00	0.00	0.34	0.34
11.10	0.67	0.54	5.00	0.00	0.34	0.34
11.15	0.67	0.54	5.00	0.00	0.34	0.34
11.20	0.67	0.54	5.00	0.00	0.34	0.34
11.25	0.67	0.54	5.00	0.00	0.34	0.34
11.30	0.67	0.54	5.00	0.00	0.34	0.34
11.35	0.67	0.54	5.00	0.00	0.34	0.34
11.40	0.67	0.54	5.00	0.00	0.34	0.34
11.45	0.67	0.54	5.00	0.00	0.34	0.34
11.50	0.67	0.54	5.00	0.00	0.34	0.34
11.55	0.67	0.54	5.00	0.00	0.34	0.34
11.60	0.67	0.54	5.00	0.00	0.34	0.34
11.65	0.67	0.54	5.00	0.00	0.34	0.34
11.70	0.67	0.54	5.00	0.00	0.34	0.34
11.75	0.67	0.54	5.00	0.00	0.34	0.34
11.80	0.67	0.54	5.00	0.00	0.34	0.34
11.85	0.67	0.54	5.00	0.00	0.34	0.34
11.90	0.67	0.54	5.00	0.00	0.34	0.34
11.95	0.67	0.54	5.00	0.00	0.34	0.34
12.00	0.67	0.54	5.00	0.00	0.34	0.34
12.05	0.67	0.54	5.00	0.00	0.34	0.34
12.10	0.67	0.54	5.00	0.00	0.34	0.34
12.15	0.67	0.54	5.00	0.00	0.34	0.34
12.20	0.67	0.54	5.00	0.00	0.34	0.34
12.25	0.67	0.54	5.00	0.00	0.34	0.34
12.30	0.67	0.54	5.00	0.00	0.34	0.34
12.35	0.67	0.54	5.00	0.00	0.34	0.34
12.40	0.67	0.54	5.00	0.00	0.34	0.34
12.45	0.67	0.54	5.00	0.00	0.34	0.34
12.50	0.67	0.54	5.00	0.00	0.34	0.34
12.55	0.67	0.54	5.00	0.00	0.33	0.33
12.60	0.67	0.54	5.00	0.00	0.33	0.33
12.65	0.67	0.54	5.00	0.00	0.33	0.33
12.70	0.67	0.54	5.00	0.00	0.33	0.33
12.75	0.67	0.54	5.00	0.00	0.33	0.33
12.80	0.67	0.54	5.00	0.00	0.33	0.33
12.85	0.67	0.54	5.00	0.00	0.33	0.33
12.90	0.67	0.54	5.00	0.00	0.33	0.33
12.95	0.67	0.54	5.00	0.00	0.33	0.33
13.00	0.67	0.54	5.00	0.00	0.33	0.33
13.05	0.67	0.54	5.00	0.00	0.33	0.33
13.10	0.67	0.54	5.00	0.00	0.33	0.33
13.15	0.67	0.54	5.00	0.00	0.33	0.33
13.20	0.67	0.54	5.00	0.00	0.33	0.33
13.25	0.67	0.54	5.00	0.00	0.33	0.33
13.30	0.67	0.54	5.00	0.00	0.33	0.33
13.35	0.67	0.54	5.00	0.00	0.33	0.33
13.40	0.67	0.54	5.00	0.00	0.33	0.33

DRAFT

13.45	0.67	0.54	5.00	0.00	0.33	0.33
13.50	0.67	0.54	5.00	0.00	0.33	0.33
13.55	0.67	0.54	5.00	0.00	0.33	0.33
13.60	0.67	0.54	5.00	0.00	0.33	0.33
13.65	0.67	0.54	5.00	0.00	0.33	0.33
13.70	0.67	0.54	5.00	0.00	0.32	0.32
13.75	0.67	0.54	5.00	0.00	0.32	0.32
13.80	0.67	0.54	5.00	0.00	0.32	0.32
13.85	0.67	0.54	5.00	0.00	0.32	0.32
13.90	0.67	0.54	5.00	0.00	0.32	0.32
13.95	0.67	0.54	5.00	0.00	0.32	0.32
14.00	0.67	0.54	5.00	0.00	0.32	0.32
14.05	0.67	0.54	5.00	0.00	0.32	0.32
14.10	0.67	0.54	5.00	0.00	0.32	0.32
14.15	0.67	0.54	5.00	0.00	0.32	0.32
14.20	0.67	0.54	5.00	0.00	0.32	0.32
14.25	0.67	0.54	5.00	0.00	0.32	0.32
14.30	0.67	0.54	5.00	0.00	0.32	0.32
14.35	0.67	0.54	5.00	0.00	0.32	0.32
14.40	0.67	0.54	5.00	0.00	0.32	0.32
14.45	0.67	0.54	5.00	0.00	0.32	0.32
14.50	0.67	0.54	5.00	0.00	0.32	0.32
14.55	0.67	0.54	5.00	0.00	0.32	0.32
14.60	0.67	0.54	5.00	0.00	0.31	0.31
14.65	0.67	0.54	5.00	0.00	0.31	0.31
14.70	0.67	0.54	5.00	0.00	0.31	0.31
14.75	0.67	0.54	5.00	0.00	0.31	0.31
14.80	0.67	0.54	5.00	0.00	0.31	0.31
14.85	0.67	0.54	5.00	0.00	0.31	0.31
14.90	0.67	0.54	5.00	0.00	0.31	0.31
14.95	0.67	0.54	5.00	0.00	0.31	0.31
15.00	0.67	0.54	5.00	0.00	0.31	0.31
15.05	0.67	0.54	5.00	0.00	0.31	0.31
15.10	0.67	0.54	5.00	0.00	0.31	0.31
15.15	0.67	0.54	5.00	0.00	0.31	0.31
15.20	0.67	0.54	5.00	0.00	0.31	0.31
15.25	0.67	0.54	5.00	0.00	0.31	0.31
15.30	0.67	0.54	5.00	0.00	0.31	0.31
15.35	0.67	0.54	5.00	0.00	0.31	0.31
15.40	0.67	0.54	5.00	0.00	0.30	0.30
15.45	0.67	0.54	5.00	0.00	0.30	0.30
15.50	0.67	0.54	5.00	0.00	0.30	0.30
15.55	0.67	0.54	5.00	0.00	0.30	0.30
15.60	0.67	0.54	5.00	0.00	0.30	0.30
15.65	0.67	0.54	5.00	0.00	0.30	0.30
15.70	0.67	0.54	5.00	0.00	0.30	0.30
15.75	0.67	0.54	5.00	0.00	0.30	0.30
15.80	0.67	0.54	5.00	0.00	0.30	0.30
15.85	0.67	0.54	5.00	0.00	0.30	0.30
15.90	0.67	0.54	5.00	0.00	0.30	0.30
15.95	0.67	0.54	5.00	0.00	0.30	0.30
16.00	0.67	0.54	5.00	0.00	0.30	0.30
16.05	0.67	0.54	5.00	0.00	0.30	0.30
16.10	0.67	0.54	5.00	0.00	0.29	0.29
16.15	0.67	0.54	5.00	0.00	0.29	0.29
16.20	0.67	0.54	5.00	0.00	0.29	0.29
16.25	0.67	0.54	5.00	0.00	0.29	0.29
16.30	0.67	0.54	5.00	0.00	0.29	0.29
16.35	0.67	0.54	5.00	0.00	0.29	0.29
16.40	0.67	0.53	5.00	0.00	0.29	0.29
16.45	0.67	0.53	5.00	0.00	0.29	0.29
16.50	0.67	0.53	5.00	0.00	0.29	0.29
16.55	0.67	0.53	5.00	0.00	0.29	0.29
16.60	0.67	0.53	5.00	0.00	0.29	0.29
16.65	0.67	0.53	5.00	0.00	0.29	0.29
16.70	0.67	0.53	5.00	0.00	0.28	0.28
16.75	0.67	0.53	5.00	0.00	0.28	0.28
16.80	0.67	0.53	5.00	0.00	0.28	0.28
16.85	0.67	0.53	5.00	0.00	0.28	0.28
16.90	0.67	0.53	5.00	0.00	0.28	0.28
16.95	0.67	0.53	5.00	0.00	0.28	0.28
17.00	0.67	0.53	5.00	0.00	0.28	0.28
17.05	0.67	0.53	5.00	0.00	0.28	0.28
17.10	0.67	0.53	5.00	0.00	0.28	0.28
17.15	0.67	0.53	5.00	0.00	0.28	0.28
17.20	0.67	0.53	5.00	0.00	0.28	0.28
17.25	0.67	0.53	5.00	0.00	0.27	0.27
17.30	0.67	0.53	5.00	0.00	0.27	0.27
17.35	0.67	0.53	5.00	0.00	0.27	0.27

DRAFT

17.40	0.67	0.53	5.00	0.00	0.27	0.27
17.45	0.67	0.53	5.00	0.00	0.27	0.27
17.50	0.67	0.53	5.00	0.00	0.27	0.27
17.55	0.67	0.53	5.00	0.00	0.27	0.27
17.60	0.67	0.53	5.00	0.00	0.27	0.27
17.65	0.67	0.53	5.00	0.00	0.27	0.27
17.70	0.67	0.53	5.00	0.00	0.27	0.27
17.75	0.67	0.53	5.00	0.00	0.26	0.26
17.80	0.67	0.53	5.00	0.00	0.26	0.26
17.85	0.67	0.53	5.00	0.00	0.26	0.26
17.90	0.67	0.53	5.00	0.00	0.26	0.26
17.95	0.67	0.53	5.00	0.00	0.26	0.26
18.00	0.67	0.53	5.00	0.00	0.26	0.26
18.05	0.67	0.53	5.00	0.00	0.26	0.26
18.10	0.67	0.53	5.00	0.00	0.26	0.26
18.15	0.67	0.53	5.00	0.00	0.26	0.26
18.20	0.67	0.53	5.00	0.00	0.25	0.25
18.25	0.67	0.53	5.00	0.00	0.25	0.25
18.30	0.67	0.53	5.00	0.00	0.25	0.25
18.35	0.67	0.53	5.00	0.00	0.25	0.25
18.40	0.67	0.53	5.00	0.00	0.25	0.25
18.45	0.67	0.53	5.00	0.00	0.25	0.25
18.50	0.67	0.53	5.00	0.00	0.25	0.25
18.55	0.67	0.53	5.00	0.00	0.25	0.25
18.60	0.67	0.53	5.00	0.00	0.24	0.24
18.65	0.67	0.53	5.00	0.00	0.24	0.24
18.70	0.67	0.53	5.00	0.00	0.24	0.24
18.75	0.67	0.53	5.00	0.00	0.24	0.24
18.80	0.67	0.53	5.00	0.00	0.24	0.24
18.85	0.67	0.53	5.00	0.00	0.24	0.24
18.90	0.67	0.53	5.00	0.00	0.24	0.24
18.95	0.67	0.53	5.00	0.00	0.23	0.23
19.00	0.67	0.53	5.00	0.00	0.23	0.23
19.05	0.67	0.53	5.00	0.00	0.23	0.23
19.10	0.67	0.53	5.00	0.00	0.23	0.23
19.15	0.67	0.53	5.00	0.00	0.23	0.23
19.20	0.67	0.53	5.00	0.00	0.23	0.23
19.25	0.67	0.53	5.00	0.00	0.23	0.23
19.30	0.67	0.53	5.00	0.00	0.22	0.22
19.35	0.67	0.53	5.00	0.00	0.22	0.22
19.40	0.67	0.53	5.00	0.00	0.22	0.22
19.45	0.67	0.53	5.00	0.00	0.22	0.22
19.50	0.67	0.53	5.00	0.00	0.22	0.22
19.55	0.67	0.53	5.00	0.00	0.22	0.22
19.60	0.67	0.53	5.00	0.00	0.22	0.22
19.65	0.67	0.53	5.00	0.00	0.22	0.22
19.70	0.67	0.53	5.00	0.00	0.22	0.22
19.75	0.67	0.53	5.00	0.00	0.22	0.22
19.80	0.67	0.53	5.00	0.00	0.22	0.22
19.85	0.67	0.53	5.00	0.00	0.21	0.21
19.90	0.67	0.53	5.00	0.00	0.21	0.21
19.95	0.67	0.53	5.00	0.00	0.21	0.21
20.00	0.67	0.53	5.00	0.00	0.21	0.21
20.05	0.67	0.53	5.00	0.00	0.21	0.21
20.10	0.67	0.53	5.00	0.00	0.21	0.21
20.15	0.67	0.53	5.00	0.00	0.21	0.21
20.20	0.67	0.53	5.00	0.00	0.21	0.21
20.25	0.67	0.53	5.00	0.00	0.21	0.21
20.30	0.67	0.53	5.00	0.00	0.21	0.21
20.35	0.67	0.53	5.00	0.00	0.21	0.21
20.40	0.67	0.53	5.00	0.00	0.21	0.21
20.45	0.67	0.53	5.00	0.00	0.21	0.21
20.50	0.67	0.53	5.00	0.00	0.21	0.21
20.55	0.67	0.53	5.00	0.00	0.21	0.21
20.60	0.67	0.53	5.00	0.00	0.21	0.21
20.65	0.67	0.53	5.00	0.00	0.21	0.21
20.70	0.67	0.53	5.00	0.00	0.21	0.21
20.75	0.67	0.53	5.00	0.00	0.21	0.21
20.80	0.67	0.53	5.00	0.00	0.20	0.20
20.85	0.67	0.53	5.00	0.00	0.20	0.20
20.90	0.67	0.53	5.00	0.00	0.20	0.20
20.95	0.67	0.53	5.00	0.00	0.20	0.20
21.00	0.67	0.53	5.00	0.00	0.20	0.20
21.05	0.67	0.53	5.00	0.00	0.20	0.20
21.10	0.67	0.53	5.00	0.00	0.20	0.20
21.15	0.67	0.53	5.00	0.00	0.20	0.20
21.20	0.67	0.53	5.00	0.00	0.20	0.20
21.25	0.67	0.53	5.00	0.00	0.20	0.20
21.30	0.67	0.53	5.00	0.00	0.20	0.20

DRAFT

21.35	0.67	0.53	5.00	0.00	0.20	0.20
21.40	0.67	0.53	5.00	0.00	0.20	0.20
21.45	0.67	0.53	5.00	0.00	0.20	0.20
21.50	0.67	0.53	5.00	0.00	0.20	0.20
21.55	0.67	0.53	5.00	0.00	0.20	0.20
21.60	0.67	0.53	5.00	0.00	0.20	0.20
21.65	0.67	0.53	5.00	0.00	0.20	0.20
21.70	0.67	0.53	5.00	0.00	0.20	0.20
21.75	0.67	0.53	5.00	0.00	0.19	0.19
21.80	0.67	0.53	5.00	0.00	0.19	0.19
21.85	0.67	0.53	5.00	0.00	0.19	0.19
21.90	0.67	0.53	5.00	0.00	0.19	0.19
21.95	0.67	0.53	5.00	0.00	0.19	0.19
22.00	0.67	0.53	5.00	0.00	0.19	0.19
22.05	0.67	0.53	5.00	0.00	0.19	0.19
22.10	0.67	0.53	5.00	0.00	0.19	0.19
22.15	0.67	0.53	5.00	0.00	0.19	0.19
22.20	0.67	0.53	5.00	0.00	0.19	0.19
22.25	0.67	0.53	5.00	0.00	0.19	0.19
22.30	0.67	0.53	5.00	0.00	0.19	0.19
22.35	0.67	0.53	5.00	0.00	0.19	0.19
22.40	0.67	0.53	5.00	0.00	0.19	0.19
22.45	0.67	0.53	5.00	0.00	0.19	0.19
22.50	0.67	0.53	5.00	0.00	0.19	0.19
22.55	0.67	0.53	5.00	0.00	0.19	0.19
22.60	0.67	0.53	5.00	0.00	0.19	0.19
22.65	0.67	0.53	5.00	0.00	0.19	0.19
22.70	0.67	0.53	5.00	0.00	0.18	0.18
22.75	0.67	0.53	5.00	0.00	0.18	0.18
22.80	0.67	0.53	5.00	0.00	0.18	0.18
22.85	0.67	0.53	5.00	0.00	0.18	0.18
22.90	0.67	0.53	5.00	0.00	0.18	0.18
22.95	0.67	0.53	5.00	0.00	0.18	0.18
23.00	0.67	0.53	5.00	0.00	0.18	0.18
23.05	0.67	0.53	5.00	0.00	0.18	0.18
23.10	0.67	0.53	5.00	0.00	0.18	0.18
23.15	0.67	0.53	5.00	0.00	0.18	0.18
23.20	0.67	0.53	5.00	0.00	0.18	0.18
23.25	0.67	0.53	5.00	0.00	0.18	0.18
23.30	0.67	0.53	5.00	0.00	0.18	0.18
23.35	0.67	0.53	5.00	0.00	0.18	0.18
23.40	0.67	0.53	5.00	0.00	0.18	0.18
23.45	0.67	0.53	5.00	0.00	0.18	0.18
23.50	0.67	0.53	5.00	0.00	0.18	0.18
23.55	0.67	0.53	5.00	0.00	0.18	0.18
23.60	0.67	0.53	5.00	0.00	0.17	0.17
23.65	0.67	0.53	5.00	0.00	0.17	0.17
23.70	0.67	0.53	5.00	0.00	0.17	0.17
23.75	0.67	0.53	5.00	0.00	0.17	0.17
23.80	0.67	0.53	5.00	0.00	0.17	0.17
23.85	0.67	0.53	5.00	0.00	0.17	0.17
23.90	0.67	0.53	5.00	0.00	0.17	0.17
23.95	0.67	0.53	5.00	0.00	0.17	0.17
24.00	0.67	0.53	5.00	0.00	0.17	0.17
24.05	0.67	0.53	5.00	0.00	0.17	0.17
24.10	0.67	0.53	5.00	0.00	0.17	0.17
24.15	0.67	0.52	5.00	0.00	0.17	0.17
24.20	0.67	0.52	5.00	0.00	0.17	0.17
24.25	0.67	0.52	5.00	0.00	0.17	0.17
24.30	0.67	0.52	5.00	0.00	0.17	0.17
24.35	0.67	0.52	5.00	0.00	0.17	0.17
24.40	0.67	0.52	5.00	0.00	0.17	0.17
24.45	0.67	0.52	5.00	0.00	0.16	0.16
24.50	0.67	0.52	5.00	0.00	0.16	0.16
24.55	0.67	0.52	5.00	0.00	0.16	0.16
24.60	0.67	0.52	5.00	0.00	0.16	0.16
24.65	0.67	0.52	5.00	0.00	0.16	0.16
24.70	0.67	0.52	5.00	0.00	0.16	0.16
24.75	0.67	0.52	5.00	0.00	0.16	0.16
24.80	0.67	0.52	5.00	0.00	0.16	0.16
24.85	0.67	0.52	5.00	0.00	0.16	0.16
24.90	0.67	0.52	5.00	0.00	0.16	0.16
24.95	0.67	0.52	5.00	0.00	0.16	0.16
25.00	0.67	0.52	5.00	0.00	0.16	0.16
25.05	0.67	0.52	5.00	0.00	0.16	0.16
25.10	0.67	0.52	5.00	0.00	0.16	0.16
25.15	0.67	0.52	5.00	0.00	0.16	0.16
25.20	0.67	0.52	5.00	0.00	0.16	0.16
25.25	0.67	0.52	5.00	0.00	0.16	0.16

DRAFT

25.30	0.67	0.52	5.00	0.00	0.15	0.15
25.35	0.67	0.52	5.00	0.00	0.15	0.15
25.40	0.67	0.52	5.00	0.00	0.15	0.15
25.45	0.67	0.52	5.00	0.00	0.15	0.15
25.50	0.67	0.52	5.00	0.00	0.15	0.15
25.55	0.67	0.52	5.00	0.00	0.15	0.15
25.60	0.67	0.52	5.00	0.00	0.15	0.15
25.65	0.67	0.52	5.00	0.00	0.15	0.15
25.70	0.67	0.52	5.00	0.00	0.15	0.15
25.75	0.67	0.52	5.00	0.00	0.15	0.15
25.80	0.67	0.52	5.00	0.00	0.15	0.15
25.85	0.67	0.52	5.00	0.00	0.15	0.15
25.90	0.67	0.52	5.00	0.00	0.15	0.15
25.95	0.67	0.52	5.00	0.00	0.15	0.15
26.00	0.67	0.52	5.00	0.00	0.15	0.15
26.05	0.67	0.52	5.00	0.00	0.15	0.15
26.10	0.67	0.52	5.00	0.00	0.15	0.15
26.15	0.67	0.52	5.00	0.00	0.15	0.15
26.20	0.67	0.52	5.00	0.00	0.15	0.15
26.25	0.67	0.52	5.00	0.00	0.15	0.15
26.30	0.67	0.52	5.00	0.00	0.15	0.15
26.35	0.67	0.52	5.00	0.00	0.14	0.14
26.40	0.67	0.52	5.00	0.00	0.14	0.14
26.45	0.67	0.52	5.00	0.00	0.14	0.14
26.50	0.67	0.52	5.00	0.00	0.14	0.14
26.55	0.67	0.52	5.00	0.00	0.14	0.14
26.60	0.67	0.52	5.00	0.00	0.14	0.14
26.65	0.67	0.52	5.00	0.00	0.14	0.14
26.70	0.67	0.52	5.00	0.00	0.14	0.14
26.75	0.67	0.52	5.00	0.00	0.14	0.14
26.80	0.67	0.52	5.00	0.00	0.14	0.14
26.85	0.67	0.52	5.00	0.00	0.14	0.14
26.90	0.67	0.52	5.00	0.00	0.14	0.14
26.95	0.67	0.52	5.00	0.00	0.14	0.14
27.00	0.67	0.52	5.00	0.00	0.14	0.14
27.05	0.67	0.52	5.00	0.00	0.14	0.14
27.10	0.67	0.52	5.00	0.00	0.14	0.14
27.15	0.67	0.52	5.00	0.00	0.14	0.14
27.20	0.67	0.52	5.00	0.00	0.14	0.14
27.25	0.67	0.52	5.00	0.00	0.14	0.14
27.30	0.67	0.52	5.00	0.00	0.14	0.14
27.35	0.67	0.52	5.00	0.00	0.14	0.14
27.40	0.67	0.52	5.00	0.00	0.14	0.14
27.45	0.67	0.52	5.00	0.00	0.14	0.14
27.50	0.67	0.52	5.00	0.00	0.13	0.13
27.55	0.67	0.52	5.00	0.00	0.13	0.13
27.60	0.67	0.52	5.00	0.00	0.13	0.13
27.65	0.67	0.52	5.00	0.00	0.13	0.13
27.70	0.66	0.52	5.00	0.00	0.13	0.13
27.75	0.66	0.52	5.00	0.00	0.13	0.13
27.80	0.66	0.52	5.00	0.00	0.13	0.13
27.85	0.66	0.52	5.00	0.00	0.13	0.13
27.90	0.66	0.52	5.00	0.00	0.13	0.13
27.95	0.66	0.52	5.00	0.00	0.13	0.13
28.00	0.66	0.52	5.00	0.00	0.13	0.13
28.05	0.66	0.52	5.00	0.00	0.13	0.13
28.10	0.66	0.52	5.00	0.00	0.13	0.13
28.15	0.66	0.52	5.00	0.00	0.13	0.13
28.20	0.66	0.52	5.00	0.00	0.13	0.13
28.25	0.66	0.52	5.00	0.00	0.13	0.13
28.30	0.66	0.52	5.00	0.00	0.13	0.13
28.35	0.66	0.52	5.00	0.00	0.13	0.13
28.40	0.66	0.52	5.00	0.00	0.13	0.13
28.45	0.66	0.52	5.00	0.00	0.13	0.13
28.50	0.66	0.52	5.00	0.00	0.13	0.13
28.55	0.66	0.52	5.00	0.00	0.13	0.13
28.60	0.66	0.52	5.00	0.00	0.13	0.13
28.65	0.66	0.52	5.00	0.00	0.13	0.13
28.70	0.66	0.52	5.00	0.00	0.13	0.13
28.75	0.66	0.52	5.00	0.00	0.12	0.12
28.80	0.66	0.52	5.00	0.00	0.12	0.12
28.85	0.66	0.52	5.00	0.00	0.12	0.12
28.90	0.66	0.52	5.00	0.00	0.12	0.12
28.95	0.66	0.52	5.00	0.00	0.12	0.12
29.00	0.66	0.52	5.00	0.00	0.12	0.12
29.05	0.66	0.52	5.00	0.00	0.12	0.12
29.10	0.66	0.52	5.00	0.00	0.12	0.12
29.15	0.66	0.52	5.00	0.00	0.12	0.12
29.20	0.66	0.52	5.00	0.00	0.12	0.12

DRAFT

29.25	0.66	0.52	5.00	0.00	0.12	0.12
29.30	0.66	0.52	5.00	0.00	0.12	0.12
29.35	0.66	0.52	5.00	0.00	0.12	0.12
29.40	0.66	0.52	5.00	0.00	0.12	0.12
29.45	0.66	0.52	5.00	0.00	0.12	0.12
29.50	0.66	0.52	5.00	0.00	0.12	0.12
29.55	0.66	0.52	5.00	0.00	0.12	0.12
29.60	0.66	0.52	5.00	0.00	0.12	0.12
29.65	0.66	0.52	5.00	0.00	0.12	0.12
29.70	0.66	0.52	5.00	0.00	0.12	0.12
29.75	0.66	0.52	5.00	0.00	0.12	0.12
29.80	0.66	0.52	5.00	0.00	0.12	0.12
29.85	0.66	0.52	5.00	0.00	0.12	0.12
29.90	0.66	0.52	5.00	0.00	0.12	0.12
29.95	0.66	0.52	5.00	0.00	0.12	0.12
30.00	0.66	0.52	5.00	0.00	0.12	0.12
30.05	2.00	0.52	5.00	0.00	0.12	0.12
30.10	2.00	0.52	5.00	0.00	0.12	0.12
30.15	2.00	0.52	5.00	0.00	0.12	0.12
30.20	2.00	0.52	5.00	0.00	0.12	0.12
30.25	2.00	0.52	5.00	0.00	0.12	0.12
30.30	2.00	0.52	5.00	0.00	0.12	0.12
30.35	2.00	0.52	5.00	0.00	0.12	0.12
30.40	2.00	0.52	5.00	0.00	0.12	0.12
30.45	2.00	0.52	5.00	0.00	0.12	0.12
30.50	2.00	0.51	5.00	0.00	0.12	0.12
30.55	2.00	0.51	5.00	0.00	0.12	0.12
30.60	2.00	0.51	5.00	0.00	0.12	0.12
30.65	2.00	0.51	5.00	0.00	0.12	0.12
30.70	2.00	0.51	5.00	0.00	0.12	0.12
30.75	2.00	0.51	5.00	0.00	0.12	0.12
30.80	2.00	0.51	5.00	0.00	0.12	0.12
30.85	2.00	0.51	5.00	0.00	0.12	0.12
30.90	2.00	0.51	5.00	0.00	0.12	0.12
30.95	2.00	0.51	5.00	0.00	0.12	0.12
31.00	2.00	0.51	5.00	0.00	0.12	0.12
31.05	2.00	0.51	5.00	0.00	0.12	0.12
31.10	2.00	0.51	5.00	0.00	0.12	0.12
31.15	2.00	0.51	5.00	0.00	0.12	0.12
31.20	2.00	0.51	5.00	0.00	0.12	0.12
31.25	2.00	0.51	5.00	0.00	0.12	0.12
31.30	2.00	0.51	5.00	0.00	0.12	0.12
31.35	2.00	0.51	5.00	0.00	0.12	0.12
31.40	2.00	0.51	5.00	0.00	0.12	0.12
31.45	2.00	0.51	5.00	0.00	0.12	0.12
31.50	2.00	0.51	5.00	0.00	0.12	0.12
31.55	2.00	0.51	5.00	0.00	0.12	0.12
31.60	2.00	0.51	5.00	0.00	0.12	0.12
31.65	2.00	0.51	5.00	0.00	0.12	0.12
31.70	2.00	0.51	5.00	0.00	0.12	0.12
31.75	2.00	0.51	5.00	0.00	0.12	0.12
31.80	2.00	0.51	5.00	0.00	0.12	0.12
31.85	2.00	0.51	5.00	0.00	0.12	0.12
31.90	2.00	0.51	5.00	0.00	0.12	0.12
31.95	2.00	0.51	5.00	0.00	0.12	0.12
32.00	2.00	0.51	5.00	0.00	0.12	0.12
32.05	2.00	0.51	5.00	0.00	0.12	0.12
32.10	2.00	0.51	5.00	0.00	0.12	0.12
32.15	2.00	0.51	5.00	0.00	0.12	0.12
32.20	2.00	0.51	5.00	0.00	0.12	0.12
32.25	2.00	0.51	5.00	0.00	0.12	0.12
32.30	2.00	0.51	5.00	0.00	0.12	0.12
32.35	2.00	0.51	5.00	0.00	0.12	0.12
32.40	2.00	0.51	5.00	0.00	0.12	0.12
32.45	2.00	0.51	5.00	0.00	0.12	0.12
32.50	2.00	0.51	5.00	0.00	0.12	0.12
32.55	2.00	0.51	5.00	0.00	0.12	0.12
32.60	2.00	0.51	5.00	0.00	0.12	0.12
32.65	2.00	0.51	5.00	0.00	0.12	0.12
32.70	2.00	0.51	5.00	0.00	0.12	0.12
32.75	2.00	0.50	5.00	0.00	0.12	0.12
32.80	2.00	0.50	5.00	0.00	0.12	0.12
32.85	2.00	0.50	5.00	0.00	0.12	0.12
32.90	2.00	0.50	5.00	0.00	0.12	0.12
32.95	2.00	0.50	5.00	0.00	0.12	0.12
33.00	2.00	0.50	5.00	0.00	0.12	0.12
33.05	2.00	0.50	5.00	0.00	0.12	0.12
33.10	2.00	0.50	5.00	0.00	0.12	0.12
33.15	2.00	0.50	5.00	0.00	0.12	0.12

DRAFT

33.20	2.00	0.50	5.00	0.00	0.12	0.12
33.25	2.00	0.50	5.00	0.00	0.12	0.12
33.30	2.00	0.50	5.00	0.00	0.12	0.12
33.35	2.00	0.50	5.00	0.00	0.12	0.12
33.40	2.00	0.50	5.00	0.00	0.12	0.12
33.45	2.00	0.50	5.00	0.00	0.12	0.12
33.50	2.00	0.50	5.00	0.00	0.12	0.12
33.55	2.00	0.50	5.00	0.00	0.12	0.12
33.60	2.00	0.50	5.00	0.00	0.12	0.12
33.65	2.00	0.50	5.00	0.00	0.12	0.12
33.70	2.00	0.50	5.00	0.00	0.12	0.12
33.75	2.00	0.50	5.00	0.00	0.12	0.12
33.80	2.00	0.50	5.00	0.00	0.12	0.12
33.85	2.00	0.50	5.00	0.00	0.12	0.12
33.90	2.00	0.50	5.00	0.00	0.12	0.12
33.95	2.00	0.50	5.00	0.00	0.12	0.12
34.00	2.00	0.50	5.00	0.00	0.12	0.12
34.05	0.64	0.50	5.00	0.00	0.12	0.12
34.10	0.64	0.50	5.00	0.00	0.12	0.12
34.15	0.64	0.50	5.00	0.00	0.11	0.11
34.20	0.64	0.50	5.00	0.00	0.11	0.11
34.25	0.64	0.50	5.00	0.00	0.11	0.11
34.30	0.64	0.50	5.00	0.00	0.11	0.11
34.35	0.64	0.50	5.00	0.00	0.11	0.11
34.40	0.64	0.50	5.00	0.00	0.11	0.11
34.45	0.64	0.50	5.00	0.00	0.11	0.11
34.50	0.64	0.50	5.00	0.00	0.11	0.11
34.55	0.64	0.50	5.00	0.00	0.11	0.11
34.60	0.64	0.50	5.00	0.00	0.11	0.11
34.65	0.64	0.50	5.00	0.00	0.11	0.11
34.70	0.64	0.50	5.00	0.00	0.11	0.11
34.75	0.64	0.50	5.00	0.00	0.11	0.11
34.80	0.64	0.50	5.00	0.00	0.11	0.11
34.85	0.64	0.50	5.00	0.00	0.11	0.11
34.90	0.64	0.50	5.00	0.00	0.11	0.11
34.95	0.64	0.49	5.00	0.00	0.11	0.11
35.00	0.64	0.49	5.00	0.00	0.11	0.11
35.05	0.64	0.49	5.00	0.00	0.11	0.11
35.10	0.64	0.49	5.00	0.00	0.11	0.11
35.15	0.64	0.49	5.00	0.00	0.11	0.11
35.20	0.64	0.49	5.00	0.00	0.11	0.11
35.25	0.64	0.49	5.00	0.00	0.11	0.11
35.30	0.64	0.49	5.00	0.00	0.11	0.11
35.35	0.64	0.49	5.00	0.00	0.10	0.10
35.40	0.64	0.49	5.00	0.00	0.10	0.10
35.45	0.64	0.49	5.00	0.00	0.10	0.10
35.50	0.64	0.49	5.00	0.00	0.10	0.10
35.55	0.64	0.49	5.00	0.00	0.10	0.10
35.60	0.64	0.49	5.00	0.00	0.10	0.10
35.65	0.64	0.49	5.00	0.00	0.10	0.10
35.70	0.64	0.49	5.00	0.00	0.10	0.10
35.75	0.64	0.49	5.00	0.00	0.10	0.10
35.80	0.64	0.49	5.00	0.00	0.10	0.10
35.85	0.64	0.49	5.00	0.00	0.10	0.10
35.90	0.64	0.49	5.00	0.00	0.10	0.10
35.95	0.64	0.49	5.00	0.00	0.10	0.10
36.00	0.64	0.49	5.00	0.00	0.10	0.10
36.05	0.64	0.49	5.00	0.00	0.10	0.10
36.10	0.63	0.49	5.00	0.00	0.10	0.10
36.15	0.63	0.49	5.00	0.00	0.10	0.10
36.20	0.63	0.49	5.00	0.00	0.10	0.10
36.25	0.63	0.49	5.00	0.00	0.10	0.10
36.30	0.63	0.49	5.00	0.00	0.10	0.10
36.35	0.63	0.49	5.00	0.00	0.10	0.10
36.40	0.63	0.49	5.00	0.00	0.10	0.10
36.45	0.63	0.49	5.00	0.00	0.10	0.10
36.50	0.63	0.49	5.00	0.00	0.10	0.10
36.55	0.63	0.49	5.00	0.00	0.09	0.09
36.60	0.63	0.49	5.00	0.00	0.09	0.09
36.65	0.63	0.49	5.00	0.00	0.09	0.09
36.70	0.63	0.49	5.00	0.00	0.09	0.09
36.75	0.63	0.49	5.00	0.00	0.09	0.09
36.80	0.63	0.49	5.00	0.00	0.09	0.09
36.85	0.63	0.49	5.00	0.00	0.09	0.09
36.90	0.63	0.49	5.00	0.00	0.09	0.09
36.95	0.63	0.49	5.00	0.00	0.09	0.09
37.00	0.63	0.49	5.00	0.00	0.09	0.09
37.05	0.63	0.49	5.00	0.00	0.09	0.09
37.10	0.63	0.49	5.00	0.00	0.09	0.09

DRAFT

37.15	0.63	0.48	5.00	0.00	0.09	0.09
37.20	0.63	0.48	5.00	0.00	0.09	0.09
37.25	0.63	0.48	5.00	0.00	0.09	0.09
37.30	0.63	0.48	5.00	0.00	0.09	0.09
37.35	0.63	0.48	5.00	0.00	0.09	0.09
37.40	0.63	0.48	5.00	0.00	0.09	0.09
37.45	0.63	0.48	5.00	0.00	0.09	0.09
37.50	0.63	0.48	5.00	0.00	0.09	0.09
37.55	0.63	0.48	5.00	0.00	0.09	0.09
37.60	0.63	0.48	5.00	0.00	0.09	0.09
37.65	0.63	0.48	5.00	0.00	0.09	0.09
37.70	0.63	0.48	5.00	0.00	0.09	0.09
37.75	0.63	0.48	5.00	0.00	0.08	0.08
37.80	0.63	0.48	5.00	0.00	0.08	0.08
37.85	0.63	0.48	5.00	0.00	0.08	0.08
37.90	0.63	0.48	5.00	0.00	0.08	0.08
37.95	0.63	0.48	5.00	0.00	0.08	0.08
38.00	0.63	0.48	5.00	0.00	0.08	0.08
38.05	0.63	0.48	5.00	0.00	0.08	0.08
38.10	0.63	0.48	5.00	0.00	0.08	0.08
38.15	0.63	0.48	5.00	0.00	0.08	0.08
38.20	0.63	0.48	5.00	0.00	0.08	0.08
38.25	0.63	0.48	5.00	0.00	0.08	0.08
38.30	0.63	0.48	5.00	0.00	0.08	0.08
38.35	0.63	0.48	5.00	0.00	0.08	0.08
38.40	0.63	0.48	5.00	0.00	0.08	0.08
38.45	0.63	0.48	5.00	0.00	0.08	0.08
38.50	0.63	0.48	5.00	0.00	0.08	0.08
38.55	0.63	0.48	5.00	0.00	0.08	0.08
38.60	0.63	0.48	5.00	0.00	0.08	0.08
38.65	0.63	0.48	5.00	0.00	0.08	0.08
38.70	0.63	0.48	5.00	0.00	0.08	0.08
38.75	0.63	0.48	5.00	0.00	0.08	0.08
38.80	0.63	0.48	5.00	0.00	0.08	0.08
38.85	0.63	0.48	5.00	0.00	0.07	0.07
38.90	0.62	0.48	5.00	0.00	0.07	0.07
38.95	0.62	0.48	5.00	0.00	0.07	0.07
39.00	0.62	0.48	5.00	0.00	0.07	0.07
39.05	0.62	0.48	5.00	0.00	0.07	0.07
39.10	0.62	0.48	5.00	0.00	0.07	0.07
39.15	0.62	0.48	5.00	0.00	0.07	0.07
39.20	0.62	0.48	5.00	0.00	0.07	0.07
39.25	0.62	0.48	5.00	0.00	0.07	0.07
39.30	0.62	0.48	5.00	0.00	0.07	0.07
39.35	0.62	0.47	5.00	0.00	0.07	0.07
39.40	0.62	0.47	5.00	0.00	0.07	0.07
39.45	0.62	0.47	5.00	0.00	0.07	0.07
39.50	0.62	0.47	5.00	0.00	0.07	0.07
39.55	0.62	0.47	5.00	0.00	0.07	0.07
39.60	0.62	0.47	5.00	0.00	0.07	0.07
39.65	0.62	0.47	5.00	0.00	0.07	0.07
39.70	0.62	0.47	5.00	0.00	0.07	0.07
39.75	0.62	0.47	5.00	0.00	0.07	0.07
39.80	0.62	0.47	5.00	0.00	0.07	0.07
39.85	0.62	0.47	5.00	0.00	0.07	0.07
39.90	0.62	0.47	5.00	0.00	0.07	0.07
39.95	0.62	0.47	5.00	0.00	0.07	0.07
40.00	0.62	0.47	5.00	0.00	0.07	0.07
40.05	0.62	0.47	5.00	0.00	0.06	0.06
40.10	0.62	0.47	5.00	0.00	0.06	0.06
40.15	0.62	0.47	5.00	0.00	0.06	0.06
40.20	0.62	0.47	5.00	0.00	0.06	0.06
40.25	0.62	0.47	5.00	0.00	0.06	0.06
40.30	0.62	0.47	5.00	0.00	0.06	0.06
40.35	0.62	0.47	5.00	0.00	0.06	0.06
40.40	0.62	0.47	5.00	0.00	0.06	0.06
40.45	0.62	0.47	5.00	0.00	0.06	0.06
40.50	0.62	0.47	5.00	0.00	0.06	0.06
40.55	0.62	0.47	5.00	0.00	0.06	0.06
40.60	0.62	0.47	5.00	0.00	0.06	0.06
40.65	0.62	0.47	5.00	0.00	0.06	0.06
40.70	0.62	0.47	5.00	0.00	0.06	0.06
40.75	0.62	0.47	5.00	0.00	0.06	0.06
40.80	0.62	0.47	5.00	0.00	0.06	0.06
40.85	0.62	0.47	5.00	0.00	0.06	0.06
40.90	0.62	0.47	5.00	0.00	0.06	0.06
40.95	0.62	0.47	5.00	0.00	0.06	0.06
41.00	0.62	0.47	5.00	0.00	0.06	0.06
41.05	0.62	0.47	5.00	0.00	0.06	0.06

DRAFT

41.10	0.62	0.47	5.00	0.00	0.06	0.06
41.15	0.62	0.47	5.00	0.00	0.06	0.06
41.20	0.62	0.47	5.00	0.00	0.06	0.06
41.25	0.62	0.47	5.00	0.00	0.06	0.06
41.30	0.62	0.47	5.00	0.00	0.06	0.06
41.35	0.62	0.47	5.00	0.00	0.06	0.06
41.40	0.62	0.47	5.00	0.00	0.06	0.06
41.45	0.62	0.47	5.00	0.00	0.06	0.06
41.50	0.62	0.47	5.00	0.00	0.06	0.06
41.55	0.62	0.46	5.00	0.00	0.06	0.06
41.60	0.62	0.46	5.00	0.00	0.05	0.05
41.65	0.62	0.46	5.00	0.00	0.05	0.05
41.70	0.62	0.46	5.00	0.00	0.05	0.05
41.75	0.62	0.46	5.00	0.00	0.05	0.05
41.80	0.62	0.46	5.00	0.00	0.05	0.05
41.85	0.61	0.46	5.00	0.00	0.05	0.05
41.90	0.61	0.46	5.00	0.00	0.05	0.05
41.95	0.61	0.46	5.00	0.00	0.05	0.05
42.00	0.61	0.46	5.00	0.00	0.05	0.05
42.05	0.61	0.46	5.00	0.00	0.05	0.05
42.10	0.61	0.46	5.00	0.00	0.05	0.05
42.15	0.61	0.46	5.00	0.00	0.05	0.05
42.20	0.61	0.46	5.00	0.00	0.05	0.05
42.25	0.61	0.46	5.00	0.00	0.05	0.05
42.30	0.61	0.46	5.00	0.00	0.05	0.05
42.35	0.61	0.46	5.00	0.00	0.05	0.05
42.40	0.61	0.46	5.00	0.00	0.05	0.05
42.45	0.61	0.46	5.00	0.00	0.05	0.05
42.50	0.61	0.46	5.00	0.00	0.05	0.05
42.55	0.61	0.46	5.00	0.00	0.05	0.05
42.60	0.61	0.46	5.00	0.00	0.05	0.05
42.65	0.61	0.46	5.00	0.00	0.05	0.05
42.70	0.61	0.46	5.00	0.00	0.05	0.05
42.75	0.61	0.46	5.00	0.00	0.05	0.05
42.80	0.61	0.46	5.00	0.00	0.05	0.05
42.85	0.61	0.46	5.00	0.00	0.05	0.05
42.90	0.61	0.46	5.00	0.00	0.05	0.05
42.95	0.61	0.46	5.00	0.00	0.05	0.05
43.00	0.61	0.46	5.00	0.00	0.05	0.05
43.05	0.61	0.46	5.00	0.00	0.05	0.05
43.10	0.61	0.46	5.00	0.00	0.05	0.05
43.15	0.61	0.46	5.00	0.00	0.05	0.05
43.20	0.61	0.46	5.00	0.00	0.05	0.05
43.25	0.61	0.46	5.00	0.00	0.04	0.04
43.30	0.61	0.46	5.00	0.00	0.04	0.04
43.35	0.61	0.46	5.00	0.00	0.04	0.04
43.40	0.61	0.46	5.00	0.00	0.04	0.04
43.45	0.61	0.46	5.00	0.00	0.04	0.04
43.50	0.61	0.46	5.00	0.00	0.04	0.04
43.55	0.61	0.46	5.00	0.00	0.04	0.04
43.60	0.61	0.46	5.00	0.00	0.04	0.04
43.65	0.61	0.46	5.00	0.00	0.04	0.04
43.70	0.61	0.46	5.00	0.00	0.04	0.04
43.75	0.61	0.46	5.00	0.00	0.04	0.04
43.80	0.61	0.45	5.00	0.00	0.04	0.04
43.85	0.61	0.45	5.00	0.00	0.04	0.04
43.90	0.61	0.45	5.00	0.00	0.04	0.04
43.95	0.61	0.45	5.00	0.00	0.04	0.04
44.00	0.61	0.45	5.00	0.00	0.04	0.04
44.05	0.61	0.45	5.00	0.00	0.04	0.04
44.10	0.61	0.45	5.00	0.00	0.04	0.04
44.15	0.61	0.45	5.00	0.00	0.04	0.04
44.20	0.61	0.45	5.00	0.00	0.04	0.04
44.25	0.61	0.45	5.00	0.00	0.04	0.04
44.30	0.61	0.45	5.00	0.00	0.04	0.04
44.35	0.61	0.45	5.00	0.00	0.04	0.04
44.40	0.61	0.45	5.00	0.00	0.04	0.04
44.45	0.61	0.45	5.00	0.00	0.04	0.04
44.50	0.61	0.45	5.00	0.00	0.04	0.04
44.55	0.61	0.45	5.00	0.00	0.04	0.04
44.60	0.61	0.45	5.00	0.00	0.04	0.04
44.65	0.61	0.45	5.00	0.00	0.04	0.04
44.70	0.61	0.45	5.00	0.00	0.04	0.04
44.75	0.61	0.45	5.00	0.00	0.04	0.04
44.80	0.61	0.45	5.00	0.00	0.04	0.04
44.85	0.61	0.45	5.00	0.00	0.04	0.04
44.90	0.61	0.45	5.00	0.00	0.03	0.03
44.95	0.60	0.45	5.00	0.00	0.03	0.03
45.00	0.60	0.45	5.00	0.00	0.03	0.03

DRAFT

45.05	0.60	0.45	5.00	0.00	0.03	0.03
45.10	0.60	0.45	5.00	0.00	0.03	0.03
45.15	0.60	0.45	5.00	0.00	0.03	0.03
45.20	0.60	0.45	5.00	0.00	0.03	0.03
45.25	0.60	0.45	5.00	0.00	0.03	0.03
45.30	0.60	0.45	5.00	0.00	0.03	0.03
45.35	0.60	0.45	5.00	0.00	0.03	0.03
45.40	0.60	0.45	5.00	0.00	0.03	0.03
45.45	0.60	0.45	5.00	0.00	0.03	0.03
45.50	0.60	0.45	5.00	0.00	0.03	0.03
45.55	0.60	0.45	5.00	0.00	0.03	0.03
45.60	0.60	0.45	5.00	0.00	0.03	0.03
45.65	0.60	0.45	5.00	0.00	0.03	0.03
45.70	0.60	0.45	5.00	0.00	0.03	0.03
45.75	0.60	0.45	5.00	0.00	0.03	0.03
45.80	0.60	0.45	5.00	0.00	0.03	0.03
45.85	0.60	0.45	5.00	0.00	0.03	0.03
45.90	0.60	0.45	5.00	0.00	0.03	0.03
45.95	0.60	0.45	5.00	0.00	0.03	0.03
46.00	0.60	0.44	5.00	0.00	0.03	0.03
46.05	0.60	0.44	5.00	0.00	0.03	0.03
46.10	0.60	0.44	5.00	0.00	0.03	0.03
46.15	0.60	0.44	5.00	0.00	0.03	0.03
46.20	0.60	0.44	5.00	0.00	0.03	0.03
46.25	0.60	0.44	5.00	0.00	0.03	0.03
46.30	0.60	0.44	5.00	0.00	0.03	0.03
46.35	0.60	0.44	5.00	0.00	0.03	0.03
46.40	0.60	0.44	5.00	0.00	0.03	0.03
46.45	0.60	0.44	5.00	0.00	0.03	0.03
46.50	0.60	0.44	5.00	0.00	0.03	0.03
46.55	0.60	0.44	5.00	0.00	0.03	0.03
46.60	0.60	0.44	5.00	0.00	0.02	0.02
46.65	0.60	0.44	5.00	0.00	0.02	0.02
46.70	0.60	0.44	5.00	0.00	0.02	0.02
46.75	0.60	0.44	5.00	0.00	0.02	0.02
46.80	0.60	0.44	5.00	0.00	0.02	0.02
46.85	0.60	0.44	5.00	0.00	0.02	0.02
46.90	0.60	0.44	5.00	0.00	0.02	0.02
46.95	0.60	0.44	5.00	0.00	0.02	0.02
47.00	0.60	0.44	5.00	0.00	0.02	0.02
47.05	0.60	0.44	5.00	0.00	0.02	0.02
47.10	0.60	0.44	5.00	0.00	0.02	0.02
47.15	0.60	0.44	5.00	0.00	0.02	0.02
47.20	0.60	0.44	5.00	0.00	0.02	0.02
47.25	0.60	0.44	5.00	0.00	0.02	0.02
47.30	0.60	0.44	5.00	0.00	0.02	0.02
47.35	0.60	0.44	5.00	0.00	0.02	0.02
47.40	0.60	0.44	5.00	0.00	0.02	0.02
47.45	0.60	0.44	5.00	0.00	0.02	0.02
47.50	0.60	0.44	5.00	0.00	0.02	0.02
47.55	0.60	0.44	5.00	0.00	0.02	0.02
47.60	0.60	0.44	5.00	0.00	0.02	0.02
47.65	0.60	0.44	5.00	0.00	0.02	0.02
47.70	0.60	0.44	5.00	0.00	0.02	0.02
47.75	0.60	0.44	5.00	0.00	0.02	0.02
47.80	0.60	0.44	5.00	0.00	0.02	0.02
47.85	0.60	0.44	5.00	0.00	0.02	0.02
47.90	0.60	0.44	5.00	0.00	0.02	0.02
47.95	0.60	0.44	5.00	0.00	0.02	0.02
48.00	0.60	0.44	5.00	0.00	0.02	0.02
48.05	0.60	0.44	5.00	0.00	0.02	0.02
48.10	0.60	0.44	5.00	0.00	0.02	0.02
48.15	0.59	0.44	5.00	0.00	0.02	0.02
48.20	0.59	0.43	5.00	0.00	0.01	0.01
48.25	0.59	0.43	5.00	0.00	0.01	0.01
48.30	0.59	0.43	5.00	0.00	0.01	0.01
48.35	0.59	0.43	5.00	0.00	0.01	0.01
48.40	0.59	0.43	5.00	0.00	0.01	0.01
48.45	0.59	0.43	5.00	0.00	0.01	0.01
48.50	0.59	0.43	5.00	0.00	0.01	0.01
48.55	0.59	0.43	5.00	0.00	0.01	0.01
48.60	0.59	0.43	5.00	0.00	0.01	0.01
48.65	0.59	0.43	5.00	0.00	0.01	0.01
48.70	0.59	0.43	5.00	0.00	0.01	0.01
48.75	0.59	0.43	5.00	0.00	0.01	0.01
48.80	0.59	0.43	5.00	0.00	0.01	0.01
48.85	0.59	0.43	5.00	0.00	0.01	0.01
48.90	0.59	0.43	5.00	0.00	0.01	0.01
48.95	0.59	0.43	5.00	0.00	0.01	0.01

DRAFT

49.00	0.59	0.43	5.00	0.00	0.01	0.01
49.05	0.59	0.43	5.00	0.00	0.01	0.01
49.10	0.59	0.43	5.00	0.00	0.01	0.01
49.15	0.59	0.43	5.00	0.00	0.01	0.01
49.20	0.59	0.43	5.00	0.00	0.01	0.01
49.25	0.59	0.43	5.00	0.00	0.01	0.01
49.30	0.59	0.43	5.00	0.00	0.01	0.01
49.35	0.59	0.43	5.00	0.00	0.01	0.01
49.40	0.59	0.43	5.00	0.00	0.01	0.01
49.45	0.59	0.43	5.00	0.00	0.01	0.01
49.50	0.59	0.43	5.00	0.00	0.01	0.01
49.55	0.59	0.43	5.00	0.00	0.01	0.01
49.60	0.59	0.43	5.00	0.00	0.01	0.01
49.65	0.59	0.43	5.00	0.00	0.01	0.01
49.70	0.59	0.43	5.00	0.00	0.01	0.01
49.75	0.59	0.43	5.00	0.00	0.00	0.00
49.80	0.59	0.43	5.00	0.00	0.00	0.00
49.85	0.59	0.43	5.00	0.00	0.00	0.00
49.90	0.59	0.43	5.00	0.00	0.00	0.00
49.95	0.59	0.43	5.00	0.00	0.00	0.00
50.00	0.59	0.43	5.00	0.00	0.00	0.00
50.05	0.59	0.43	5.00	0.00	0.00	0.00
50.10	0.59	0.43	5.00	0.00	0.00	0.00
50.15	0.59	0.43	5.00	0.00	0.00	0.00
50.20	0.59	0.43	5.00	0.00	0.00	0.00
50.25	0.59	0.43	5.00	0.00	0.00	0.00
50.30	0.59	0.43	5.00	0.00	0.00	0.00
50.35	0.59	0.43	5.00	0.00	0.00	0.00
50.40	0.59	0.42	5.00	0.00	0.00	0.00
50.45	0.59	0.42	5.00	0.00	0.00	0.00
50.50	0.59	0.42	5.00	0.00	0.00	0.00

---

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

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

---

1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm Cyclic resistance ratio from soils
CSRsf Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat Settlement from saturated sands
S_dry Settlement from Unsaturated Sands
S_all Total Settlement from Saturated and Unsaturated Sands
NoLiq No-Liquefy Soils

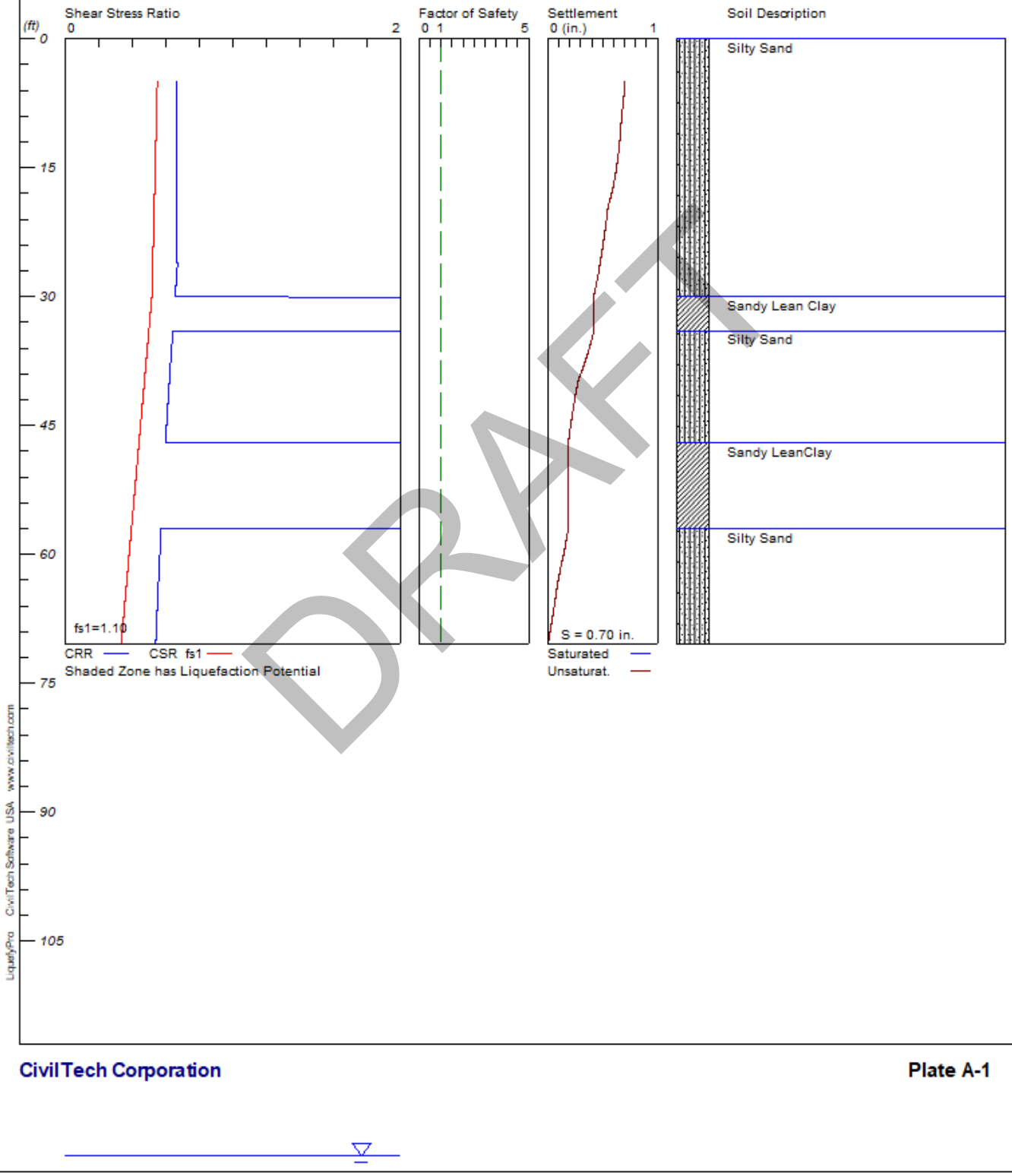
DRAFT

LIQUEFACTION ANALYSIS

Ontario Sports Park

Hole No.=BH06 Water Depth=130 ft

Magnitude=6.7
Acceleration=.778g



DRAFT

LiquefyPro CivilTech Software USA www.civiltech.com

CivilTech Corporation

Plate A-1

****

LIQUEFACTION ANALYSIS SUMMARY
Copyright by CivilTech Software
www.civiltech.com

****

Font: Courier New, Regular, Size 8 is recommended for this report.
Licensed to , 10/17/2023 4:53:45 PM

Input File Name: C:\Users\jmeneses\Desktop\HMD\00-23-2255--Ontario Sport Complex\Settlement\BH06.liq
Title: Ontario Sports Park
Subtitle:

Surface Elev.=
Hole No.=BH06
Depth of Hole= 70.50 ft
Water Table during Earthquake= 130.00 ft
Water Table during In-Situ Testing= 130.00 ft
Max. Acceleration= 0.78 g
Earthquake Magnitude= 6.70

Input Data:
Surface Elev.=
Hole No.=BH06
Depth of Hole=70.50 ft
Water Table during Earthquake= 130.00 ft
Water Table during In-Situ Testing= 130.00 ft
Max. Acceleration=0.78 g
Earthquake Magnitude=6.70
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Tokimatsu, M-correction
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 = 1.25
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR) , User= 1.1
Plot one CSR curve (fs1=User)
10. Use Curve Smoothing: Yes*
* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
5.00	21.00	125.00	12.00
10.00	36.00	125.00	12.00
15.00	37.00	125.00	12.00
20.00	36.00	125.00	12.00
25.00	38.00	125.00	12.00
30.00	27.00	110.00	NoLiq
35.00	38.00	125.00	12.00
40.00	35.00	125.00	12.00
45.00	43.00	125.00	12.00
50.00	28.00	110.00	NoLiq
55.00	34.00	110.00	NoLiq
60.00	34.00	125.00	24.20
65.00	41.00	125.00	24.20
70.00	40.00	125.00	24.20

Output Results:
Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.70 in.
Total Settlement of Saturated and Unsaturated Sands=0.70 in.
Differential Settlement=0.350 to 0.462 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
5.00	0.67	0.55	5.00	0.00	0.70	0.70
5.05	0.67	0.55	5.00	0.00	0.70	0.70
5.10	0.67	0.55	5.00	0.00	0.70	0.70
5.15	0.67	0.55	5.00	0.00	0.70	0.70
5.20	0.67	0.55	5.00	0.00	0.70	0.70
5.25	0.67	0.55	5.00	0.00	0.70	0.70
5.30	0.67	0.55	5.00	0.00	0.70	0.70

DRAFT

5.35	0.67	0.55	5.00	0.00	0.70	0.70
5.40	0.67	0.55	5.00	0.00	0.70	0.70
5.45	0.67	0.55	5.00	0.00	0.70	0.70
5.50	0.67	0.55	5.00	0.00	0.70	0.70
5.55	0.67	0.55	5.00	0.00	0.70	0.70
5.60	0.67	0.55	5.00	0.00	0.70	0.70
5.65	0.67	0.55	5.00	0.00	0.70	0.70
5.70	0.67	0.55	5.00	0.00	0.70	0.70
5.75	0.67	0.55	5.00	0.00	0.70	0.70
5.80	0.67	0.55	5.00	0.00	0.70	0.70
5.85	0.67	0.55	5.00	0.00	0.70	0.70
5.90	0.67	0.55	5.00	0.00	0.70	0.70
5.95	0.67	0.55	5.00	0.00	0.70	0.70
6.00	0.67	0.55	5.00	0.00	0.70	0.70
6.05	0.67	0.55	5.00	0.00	0.70	0.70
6.10	0.67	0.55	5.00	0.00	0.70	0.70
6.15	0.67	0.55	5.00	0.00	0.70	0.70
6.20	0.67	0.55	5.00	0.00	0.70	0.70
6.25	0.67	0.55	5.00	0.00	0.69	0.69
6.30	0.67	0.55	5.00	0.00	0.69	0.69
6.35	0.67	0.55	5.00	0.00	0.69	0.69
6.40	0.67	0.55	5.00	0.00	0.69	0.69
6.45	0.67	0.55	5.00	0.00	0.69	0.69
6.50	0.67	0.55	5.00	0.00	0.69	0.69
6.55	0.67	0.55	5.00	0.00	0.69	0.69
6.60	0.67	0.55	5.00	0.00	0.69	0.69
6.65	0.67	0.55	5.00	0.00	0.69	0.69
6.70	0.67	0.55	5.00	0.00	0.69	0.69
6.75	0.67	0.55	5.00	0.00	0.69	0.69
6.80	0.67	0.55	5.00	0.00	0.69	0.69
6.85	0.67	0.55	5.00	0.00	0.69	0.69
6.90	0.67	0.55	5.00	0.00	0.69	0.69
6.95	0.67	0.55	5.00	0.00	0.69	0.69
7.00	0.67	0.55	5.00	0.00	0.69	0.69
7.05	0.67	0.55	5.00	0.00	0.69	0.69
7.10	0.67	0.55	5.00	0.00	0.69	0.69
7.15	0.67	0.55	5.00	0.00	0.69	0.69
7.20	0.67	0.55	5.00	0.00	0.69	0.69
7.25	0.67	0.55	5.00	0.00	0.69	0.69
7.30	0.67	0.55	5.00	0.00	0.69	0.69
7.35	0.67	0.55	5.00	0.00	0.69	0.69
7.40	0.67	0.55	5.00	0.00	0.69	0.69
7.45	0.67	0.55	5.00	0.00	0.69	0.69
7.50	0.67	0.55	5.00	0.00	0.69	0.69
7.55	0.67	0.55	5.00	0.00	0.69	0.69
7.60	0.67	0.55	5.00	0.00	0.69	0.69
7.65	0.67	0.55	5.00	0.00	0.69	0.69
7.70	0.67	0.55	5.00	0.00	0.69	0.69
7.75	0.67	0.55	5.00	0.00	0.68	0.68
7.80	0.67	0.55	5.00	0.00	0.68	0.68
7.85	0.67	0.55	5.00	0.00	0.68	0.68
7.90	0.67	0.55	5.00	0.00	0.68	0.68
7.95	0.67	0.55	5.00	0.00	0.68	0.68
8.00	0.67	0.55	5.00	0.00	0.68	0.68
8.05	0.67	0.55	5.00	0.00	0.68	0.68
8.10	0.67	0.55	5.00	0.00	0.68	0.68
8.15	0.67	0.55	5.00	0.00	0.68	0.68
8.20	0.67	0.55	5.00	0.00	0.68	0.68
8.25	0.67	0.55	5.00	0.00	0.68	0.68
8.30	0.67	0.55	5.00	0.00	0.68	0.68
8.35	0.67	0.55	5.00	0.00	0.68	0.68
8.40	0.67	0.55	5.00	0.00	0.68	0.68
8.45	0.67	0.55	5.00	0.00	0.68	0.68
8.50	0.67	0.55	5.00	0.00	0.68	0.68
8.55	0.67	0.55	5.00	0.00	0.68	0.68
8.60	0.67	0.55	5.00	0.00	0.68	0.68
8.65	0.67	0.55	5.00	0.00	0.68	0.68
8.70	0.67	0.54	5.00	0.00	0.68	0.68
8.75	0.67	0.54	5.00	0.00	0.68	0.68
8.80	0.67	0.54	5.00	0.00	0.67	0.67
8.85	0.67	0.54	5.00	0.00	0.67	0.67
8.90	0.67	0.54	5.00	0.00	0.67	0.67
8.95	0.67	0.54	5.00	0.00	0.67	0.67
9.00	0.67	0.54	5.00	0.00	0.67	0.67
9.05	0.67	0.54	5.00	0.00	0.67	0.67
9.10	0.67	0.54	5.00	0.00	0.67	0.67
9.15	0.67	0.54	5.00	0.00	0.67	0.67
9.20	0.67	0.54	5.00	0.00	0.67	0.67
9.25	0.67	0.54	5.00	0.00	0.67	0.67

DRAFT

9.30	0.67	0.54	5.00	0.00	0.67	0.67
9.35	0.67	0.54	5.00	0.00	0.67	0.67
9.40	0.67	0.54	5.00	0.00	0.67	0.67
9.45	0.67	0.54	5.00	0.00	0.67	0.67
9.50	0.67	0.54	5.00	0.00	0.67	0.67
9.55	0.67	0.54	5.00	0.00	0.67	0.67
9.60	0.67	0.54	5.00	0.00	0.67	0.67
9.65	0.67	0.54	5.00	0.00	0.67	0.67
9.70	0.67	0.54	5.00	0.00	0.67	0.67
9.75	0.67	0.54	5.00	0.00	0.67	0.67
9.80	0.67	0.54	5.00	0.00	0.67	0.67
9.85	0.67	0.54	5.00	0.00	0.67	0.67
9.90	0.67	0.54	5.00	0.00	0.67	0.67
9.95	0.67	0.54	5.00	0.00	0.67	0.67
10.00	0.67	0.54	5.00	0.00	0.67	0.67
10.05	0.67	0.54	5.00	0.00	0.67	0.67
10.10	0.67	0.54	5.00	0.00	0.67	0.67
10.15	0.67	0.54	5.00	0.00	0.67	0.67
10.20	0.67	0.54	5.00	0.00	0.67	0.67
10.25	0.67	0.54	5.00	0.00	0.67	0.67
10.30	0.67	0.54	5.00	0.00	0.67	0.67
10.35	0.67	0.54	5.00	0.00	0.67	0.67
10.40	0.67	0.54	5.00	0.00	0.66	0.66
10.45	0.67	0.54	5.00	0.00	0.66	0.66
10.50	0.67	0.54	5.00	0.00	0.66	0.66
10.55	0.67	0.54	5.00	0.00	0.66	0.66
10.60	0.67	0.54	5.00	0.00	0.66	0.66
10.65	0.67	0.54	5.00	0.00	0.66	0.66
10.70	0.67	0.54	5.00	0.00	0.66	0.66
10.75	0.67	0.54	5.00	0.00	0.66	0.66
10.80	0.67	0.54	5.00	0.00	0.66	0.66
10.85	0.67	0.54	5.00	0.00	0.66	0.66
10.90	0.67	0.54	5.00	0.00	0.66	0.66
10.95	0.67	0.54	5.00	0.00	0.66	0.66
11.00	0.67	0.54	5.00	0.00	0.66	0.66
11.05	0.67	0.54	5.00	0.00	0.66	0.66
11.10	0.67	0.54	5.00	0.00	0.66	0.66
11.15	0.67	0.54	5.00	0.00	0.66	0.66
11.20	0.67	0.54	5.00	0.00	0.66	0.66
11.25	0.67	0.54	5.00	0.00	0.66	0.66
11.30	0.67	0.54	5.00	0.00	0.66	0.66
11.35	0.67	0.54	5.00	0.00	0.66	0.66
11.40	0.67	0.54	5.00	0.00	0.66	0.66
11.45	0.67	0.54	5.00	0.00	0.66	0.66
11.50	0.67	0.54	5.00	0.00	0.66	0.66
11.55	0.67	0.54	5.00	0.00	0.66	0.66
11.60	0.67	0.54	5.00	0.00	0.66	0.66
11.65	0.67	0.54	5.00	0.00	0.66	0.66
11.70	0.67	0.54	5.00	0.00	0.66	0.66
11.75	0.67	0.54	5.00	0.00	0.66	0.66
11.80	0.67	0.54	5.00	0.00	0.66	0.66
11.85	0.67	0.54	5.00	0.00	0.66	0.66
11.90	0.67	0.54	5.00	0.00	0.66	0.66
11.95	0.67	0.54	5.00	0.00	0.65	0.65
12.00	0.67	0.54	5.00	0.00	0.65	0.65
12.05	0.67	0.54	5.00	0.00	0.65	0.65
12.10	0.67	0.54	5.00	0.00	0.65	0.65
12.15	0.67	0.54	5.00	0.00	0.65	0.65
12.20	0.67	0.54	5.00	0.00	0.65	0.65
12.25	0.67	0.54	5.00	0.00	0.65	0.65
12.30	0.67	0.54	5.00	0.00	0.65	0.65
12.35	0.67	0.54	5.00	0.00	0.65	0.65
12.40	0.67	0.54	5.00	0.00	0.65	0.65
12.45	0.67	0.54	5.00	0.00	0.65	0.65
12.50	0.67	0.54	5.00	0.00	0.65	0.65
12.55	0.67	0.54	5.00	0.00	0.65	0.65
12.60	0.67	0.54	5.00	0.00	0.65	0.65
12.65	0.67	0.54	5.00	0.00	0.65	0.65
12.70	0.67	0.54	5.00	0.00	0.65	0.65
12.75	0.67	0.54	5.00	0.00	0.65	0.65
12.80	0.67	0.54	5.00	0.00	0.65	0.65
12.85	0.67	0.54	5.00	0.00	0.65	0.65
12.90	0.67	0.54	5.00	0.00	0.65	0.65
12.95	0.67	0.54	5.00	0.00	0.65	0.65
13.00	0.67	0.54	5.00	0.00	0.65	0.65
13.05	0.67	0.54	5.00	0.00	0.65	0.65
13.10	0.67	0.54	5.00	0.00	0.65	0.65
13.15	0.67	0.54	5.00	0.00	0.65	0.65
13.20	0.67	0.54	5.00	0.00	0.64	0.64

DRAFT

13.25	0.67	0.54	5.00	0.00	0.64	0.64
13.30	0.67	0.54	5.00	0.00	0.64	0.64
13.35	0.67	0.54	5.00	0.00	0.64	0.64
13.40	0.67	0.54	5.00	0.00	0.64	0.64
13.45	0.67	0.54	5.00	0.00	0.64	0.64
13.50	0.67	0.54	5.00	0.00	0.64	0.64
13.55	0.67	0.54	5.00	0.00	0.64	0.64
13.60	0.67	0.54	5.00	0.00	0.64	0.64
13.65	0.67	0.54	5.00	0.00	0.64	0.64
13.70	0.67	0.54	5.00	0.00	0.64	0.64
13.75	0.67	0.54	5.00	0.00	0.64	0.64
13.80	0.67	0.54	5.00	0.00	0.64	0.64
13.85	0.67	0.54	5.00	0.00	0.64	0.64
13.90	0.67	0.54	5.00	0.00	0.64	0.64
13.95	0.67	0.54	5.00	0.00	0.64	0.64
14.00	0.67	0.54	5.00	0.00	0.64	0.64
14.05	0.67	0.54	5.00	0.00	0.64	0.64
14.10	0.67	0.54	5.00	0.00	0.64	0.64
14.15	0.67	0.54	5.00	0.00	0.64	0.64
14.20	0.67	0.54	5.00	0.00	0.63	0.63
14.25	0.67	0.54	5.00	0.00	0.63	0.63
14.30	0.67	0.54	5.00	0.00	0.63	0.63
14.35	0.67	0.54	5.00	0.00	0.63	0.63
14.40	0.67	0.54	5.00	0.00	0.63	0.63
14.45	0.67	0.54	5.00	0.00	0.63	0.63
14.50	0.67	0.54	5.00	0.00	0.63	0.63
14.55	0.67	0.54	5.00	0.00	0.63	0.63
14.60	0.67	0.54	5.00	0.00	0.63	0.63
14.65	0.67	0.54	5.00	0.00	0.63	0.63
14.70	0.67	0.54	5.00	0.00	0.63	0.63
14.75	0.67	0.54	5.00	0.00	0.63	0.63
14.80	0.67	0.54	5.00	0.00	0.63	0.63
14.85	0.67	0.54	5.00	0.00	0.63	0.63
14.90	0.67	0.54	5.00	0.00	0.63	0.63
14.95	0.67	0.54	5.00	0.00	0.63	0.63
15.00	0.67	0.54	5.00	0.00	0.63	0.63
15.05	0.67	0.54	5.00	0.00	0.62	0.62
15.10	0.67	0.54	5.00	0.00	0.62	0.62
15.15	0.67	0.54	5.00	0.00	0.62	0.62
15.20	0.67	0.54	5.00	0.00	0.62	0.62
15.25	0.67	0.54	5.00	0.00	0.62	0.62
15.30	0.67	0.54	5.00	0.00	0.62	0.62
15.35	0.67	0.54	5.00	0.00	0.62	0.62
15.40	0.67	0.54	5.00	0.00	0.62	0.62
15.45	0.67	0.54	5.00	0.00	0.62	0.62
15.50	0.67	0.54	5.00	0.00	0.62	0.62
15.55	0.67	0.54	5.00	0.00	0.62	0.62
15.60	0.67	0.54	5.00	0.00	0.62	0.62
15.65	0.67	0.54	5.00	0.00	0.62	0.62
15.70	0.67	0.54	5.00	0.00	0.62	0.62
15.75	0.67	0.54	5.00	0.00	0.62	0.62
15.80	0.67	0.54	5.00	0.00	0.62	0.62
15.85	0.67	0.54	5.00	0.00	0.62	0.62
15.90	0.67	0.54	5.00	0.00	0.61	0.61
15.95	0.67	0.54	5.00	0.00	0.61	0.61
16.00	0.67	0.54	5.00	0.00	0.61	0.61
16.05	0.67	0.54	5.00	0.00	0.61	0.61
16.10	0.67	0.54	5.00	0.00	0.61	0.61
16.15	0.67	0.54	5.00	0.00	0.61	0.61
16.20	0.67	0.54	5.00	0.00	0.61	0.61
16.25	0.67	0.54	5.00	0.00	0.61	0.61
16.30	0.67	0.54	5.00	0.00	0.61	0.61
16.35	0.67	0.54	5.00	0.00	0.61	0.61
16.40	0.67	0.53	5.00	0.00	0.61	0.61
16.45	0.67	0.53	5.00	0.00	0.61	0.61
16.50	0.67	0.53	5.00	0.00	0.61	0.61
16.55	0.67	0.53	5.00	0.00	0.61	0.61
16.60	0.67	0.53	5.00	0.00	0.60	0.60
16.65	0.67	0.53	5.00	0.00	0.60	0.60
16.70	0.67	0.53	5.00	0.00	0.60	0.60
16.75	0.67	0.53	5.00	0.00	0.60	0.60
16.80	0.67	0.53	5.00	0.00	0.60	0.60
16.85	0.67	0.53	5.00	0.00	0.60	0.60
16.90	0.67	0.53	5.00	0.00	0.60	0.60
16.95	0.67	0.53	5.00	0.00	0.60	0.60
17.00	0.67	0.53	5.00	0.00	0.60	0.60
17.05	0.67	0.53	5.00	0.00	0.60	0.60
17.10	0.67	0.53	5.00	0.00	0.60	0.60
17.15	0.67	0.53	5.00	0.00	0.60	0.60

DRAFT

17.20	0.67	0.53	5.00	0.00	0.60	0.60
17.25	0.67	0.53	5.00	0.00	0.59	0.59
17.30	0.67	0.53	5.00	0.00	0.59	0.59
17.35	0.67	0.53	5.00	0.00	0.59	0.59
17.40	0.67	0.53	5.00	0.00	0.59	0.59
17.45	0.67	0.53	5.00	0.00	0.59	0.59
17.50	0.67	0.53	5.00	0.00	0.59	0.59
17.55	0.67	0.53	5.00	0.00	0.59	0.59
17.60	0.67	0.53	5.00	0.00	0.59	0.59
17.65	0.67	0.53	5.00	0.00	0.59	0.59
17.70	0.67	0.53	5.00	0.00	0.59	0.59
17.75	0.67	0.53	5.00	0.00	0.59	0.59
17.80	0.67	0.53	5.00	0.00	0.59	0.59
17.85	0.67	0.53	5.00	0.00	0.58	0.58
17.90	0.67	0.53	5.00	0.00	0.58	0.58
17.95	0.67	0.53	5.00	0.00	0.58	0.58
18.00	0.67	0.53	5.00	0.00	0.58	0.58
18.05	0.67	0.53	5.00	0.00	0.58	0.58
18.10	0.67	0.53	5.00	0.00	0.58	0.58
18.15	0.67	0.53	5.00	0.00	0.58	0.58
18.20	0.67	0.53	5.00	0.00	0.58	0.58
18.25	0.67	0.53	5.00	0.00	0.58	0.58
18.30	0.67	0.53	5.00	0.00	0.58	0.58
18.35	0.67	0.53	5.00	0.00	0.57	0.57
18.40	0.67	0.53	5.00	0.00	0.57	0.57
18.45	0.67	0.53	5.00	0.00	0.57	0.57
18.50	0.67	0.53	5.00	0.00	0.57	0.57
18.55	0.67	0.53	5.00	0.00	0.57	0.57
18.60	0.67	0.53	5.00	0.00	0.57	0.57
18.65	0.67	0.53	5.00	0.00	0.57	0.57
18.70	0.67	0.53	5.00	0.00	0.57	0.57
18.75	0.67	0.53	5.00	0.00	0.57	0.57
18.80	0.67	0.53	5.00	0.00	0.57	0.57
18.85	0.67	0.53	5.00	0.00	0.56	0.56
18.90	0.67	0.53	5.00	0.00	0.56	0.56
18.95	0.67	0.53	5.00	0.00	0.56	0.56
19.00	0.67	0.53	5.00	0.00	0.56	0.56
19.05	0.67	0.53	5.00	0.00	0.56	0.56
19.10	0.67	0.53	5.00	0.00	0.56	0.56
19.15	0.67	0.53	5.00	0.00	0.56	0.56
19.20	0.67	0.53	5.00	0.00	0.56	0.56
19.25	0.67	0.53	5.00	0.00	0.55	0.55
19.30	0.67	0.53	5.00	0.00	0.55	0.55
19.35	0.67	0.53	5.00	0.00	0.55	0.55
19.40	0.67	0.53	5.00	0.00	0.55	0.55
19.45	0.67	0.53	5.00	0.00	0.55	0.55
19.50	0.67	0.53	5.00	0.00	0.55	0.55
19.55	0.67	0.53	5.00	0.00	0.55	0.55
19.60	0.67	0.53	5.00	0.00	0.55	0.55
19.65	0.67	0.53	5.00	0.00	0.55	0.55
19.70	0.67	0.53	5.00	0.00	0.55	0.55
19.75	0.67	0.53	5.00	0.00	0.55	0.55
19.80	0.67	0.53	5.00	0.00	0.55	0.55
19.85	0.67	0.53	5.00	0.00	0.54	0.54
19.90	0.67	0.53	5.00	0.00	0.54	0.54
19.95	0.67	0.53	5.00	0.00	0.54	0.54
20.00	0.67	0.53	5.00	0.00	0.54	0.54
20.05	0.67	0.53	5.00	0.00	0.54	0.54
20.10	0.67	0.53	5.00	0.00	0.54	0.54
20.15	0.67	0.53	5.00	0.00	0.54	0.54
20.20	0.67	0.53	5.00	0.00	0.54	0.54
20.25	0.67	0.53	5.00	0.00	0.54	0.54
20.30	0.67	0.53	5.00	0.00	0.54	0.54
20.35	0.67	0.53	5.00	0.00	0.54	0.54
20.40	0.67	0.53	5.00	0.00	0.54	0.54
20.45	0.67	0.53	5.00	0.00	0.54	0.54
20.50	0.67	0.53	5.00	0.00	0.54	0.54
20.55	0.67	0.53	5.00	0.00	0.54	0.54
20.60	0.67	0.53	5.00	0.00	0.54	0.54
20.65	0.67	0.53	5.00	0.00	0.54	0.54
20.70	0.67	0.53	5.00	0.00	0.54	0.54
20.75	0.67	0.53	5.00	0.00	0.54	0.54
20.80	0.67	0.53	5.00	0.00	0.54	0.54
20.85	0.67	0.53	5.00	0.00	0.54	0.54
20.90	0.67	0.53	5.00	0.00	0.54	0.54
20.95	0.67	0.53	5.00	0.00	0.53	0.53
21.00	0.67	0.53	5.00	0.00	0.53	0.53
21.05	0.67	0.53	5.00	0.00	0.53	0.53
21.10	0.67	0.53	5.00	0.00	0.53	0.53

DRAFT

21.15	0.67	0.53	5.00	0.00	0.53	0.53
21.20	0.67	0.53	5.00	0.00	0.53	0.53
21.25	0.67	0.53	5.00	0.00	0.53	0.53
21.30	0.67	0.53	5.00	0.00	0.53	0.53
21.35	0.67	0.53	5.00	0.00	0.53	0.53
21.40	0.67	0.53	5.00	0.00	0.53	0.53
21.45	0.67	0.53	5.00	0.00	0.53	0.53
21.50	0.67	0.53	5.00	0.00	0.53	0.53
21.55	0.67	0.53	5.00	0.00	0.53	0.53
21.60	0.67	0.53	5.00	0.00	0.53	0.53
21.65	0.67	0.53	5.00	0.00	0.53	0.53
21.70	0.67	0.53	5.00	0.00	0.53	0.53
21.75	0.67	0.53	5.00	0.00	0.53	0.53
21.80	0.67	0.53	5.00	0.00	0.53	0.53
21.85	0.67	0.53	5.00	0.00	0.53	0.53
21.90	0.67	0.53	5.00	0.00	0.53	0.53
21.95	0.67	0.53	5.00	0.00	0.52	0.52
22.00	0.67	0.53	5.00	0.00	0.52	0.52
22.05	0.67	0.53	5.00	0.00	0.52	0.52
22.10	0.67	0.53	5.00	0.00	0.52	0.52
22.15	0.67	0.53	5.00	0.00	0.52	0.52
22.20	0.67	0.53	5.00	0.00	0.52	0.52
22.25	0.67	0.53	5.00	0.00	0.52	0.52
22.30	0.67	0.53	5.00	0.00	0.52	0.52
22.35	0.67	0.53	5.00	0.00	0.52	0.52
22.40	0.67	0.53	5.00	0.00	0.52	0.52
22.45	0.67	0.53	5.00	0.00	0.52	0.52
22.50	0.67	0.53	5.00	0.00	0.52	0.52
22.55	0.67	0.53	5.00	0.00	0.52	0.52
22.60	0.67	0.53	5.00	0.00	0.52	0.52
22.65	0.67	0.53	5.00	0.00	0.52	0.52
22.70	0.67	0.53	5.00	0.00	0.52	0.52
22.75	0.67	0.53	5.00	0.00	0.52	0.52
22.80	0.67	0.53	5.00	0.00	0.52	0.52
22.85	0.67	0.53	5.00	0.00	0.52	0.52
22.90	0.67	0.53	5.00	0.00	0.51	0.51
22.95	0.67	0.53	5.00	0.00	0.51	0.51
23.00	0.67	0.53	5.00	0.00	0.51	0.51
23.05	0.67	0.53	5.00	0.00	0.51	0.51
23.10	0.67	0.53	5.00	0.00	0.51	0.51
23.15	0.67	0.53	5.00	0.00	0.51	0.51
23.20	0.67	0.53	5.00	0.00	0.51	0.51
23.25	0.67	0.53	5.00	0.00	0.51	0.51
23.30	0.67	0.53	5.00	0.00	0.51	0.51
23.35	0.67	0.53	5.00	0.00	0.51	0.51
23.40	0.67	0.53	5.00	0.00	0.51	0.51
23.45	0.67	0.53	5.00	0.00	0.51	0.51
23.50	0.67	0.53	5.00	0.00	0.51	0.51
23.55	0.67	0.53	5.00	0.00	0.51	0.51
23.60	0.67	0.53	5.00	0.00	0.51	0.51
23.65	0.67	0.53	5.00	0.00	0.51	0.51
23.70	0.67	0.53	5.00	0.00	0.51	0.51
23.75	0.67	0.53	5.00	0.00	0.50	0.50
23.80	0.67	0.53	5.00	0.00	0.50	0.50
23.85	0.67	0.53	5.00	0.00	0.50	0.50
23.90	0.67	0.53	5.00	0.00	0.50	0.50
23.95	0.67	0.53	5.00	0.00	0.50	0.50
24.00	0.67	0.53	5.00	0.00	0.50	0.50
24.05	0.67	0.53	5.00	0.00	0.50	0.50
24.10	0.67	0.53	5.00	0.00	0.50	0.50
24.15	0.67	0.52	5.00	0.00	0.50	0.50
24.20	0.67	0.52	5.00	0.00	0.50	0.50
24.25	0.67	0.52	5.00	0.00	0.50	0.50
24.30	0.67	0.52	5.00	0.00	0.50	0.50
24.35	0.67	0.52	5.00	0.00	0.50	0.50
24.40	0.67	0.52	5.00	0.00	0.50	0.50
24.45	0.67	0.52	5.00	0.00	0.50	0.50
24.50	0.67	0.52	5.00	0.00	0.50	0.50
24.55	0.67	0.52	5.00	0.00	0.50	0.50
24.60	0.67	0.52	5.00	0.00	0.49	0.49
24.65	0.67	0.52	5.00	0.00	0.49	0.49
24.70	0.67	0.52	5.00	0.00	0.49	0.49
24.75	0.67	0.52	5.00	0.00	0.49	0.49
24.80	0.67	0.52	5.00	0.00	0.49	0.49
24.85	0.67	0.52	5.00	0.00	0.49	0.49
24.90	0.67	0.52	5.00	0.00	0.49	0.49
24.95	0.67	0.52	5.00	0.00	0.49	0.49
25.00	0.67	0.52	5.00	0.00	0.49	0.49
25.05	0.67	0.52	5.00	0.00	0.49	0.49

DRAFT

25.10	0.67	0.52	5.00	0.00	0.49	0.49
25.15	0.67	0.52	5.00	0.00	0.49	0.49
25.20	0.67	0.52	5.00	0.00	0.49	0.49
25.25	0.67	0.52	5.00	0.00	0.49	0.49
25.30	0.67	0.52	5.00	0.00	0.49	0.49
25.35	0.67	0.52	5.00	0.00	0.49	0.49
25.40	0.67	0.52	5.00	0.00	0.48	0.48
25.45	0.67	0.52	5.00	0.00	0.48	0.48
25.50	0.67	0.52	5.00	0.00	0.48	0.48
25.55	0.67	0.52	5.00	0.00	0.48	0.48
25.60	0.67	0.52	5.00	0.00	0.48	0.48
25.65	0.67	0.52	5.00	0.00	0.48	0.48
25.70	0.67	0.52	5.00	0.00	0.48	0.48
25.75	0.67	0.52	5.00	0.00	0.48	0.48
25.80	0.67	0.52	5.00	0.00	0.48	0.48
25.85	0.67	0.52	5.00	0.00	0.48	0.48
25.90	0.67	0.52	5.00	0.00	0.48	0.48
25.95	0.67	0.52	5.00	0.00	0.48	0.48
26.00	0.67	0.52	5.00	0.00	0.48	0.48
26.05	0.67	0.52	5.00	0.00	0.48	0.48
26.10	0.67	0.52	5.00	0.00	0.48	0.48
26.15	0.67	0.52	5.00	0.00	0.48	0.48
26.20	0.67	0.52	5.00	0.00	0.47	0.47
26.25	0.67	0.52	5.00	0.00	0.47	0.47
26.30	0.67	0.52	5.00	0.00	0.47	0.47
26.35	0.67	0.52	5.00	0.00	0.47	0.47
26.40	0.67	0.52	5.00	0.00	0.47	0.47
26.45	0.67	0.52	5.00	0.00	0.47	0.47
26.50	0.67	0.52	5.00	0.00	0.47	0.47
26.55	0.67	0.52	5.00	0.00	0.47	0.47
26.60	0.67	0.52	5.00	0.00	0.47	0.47
26.65	0.67	0.52	5.00	0.00	0.47	0.47
26.70	0.67	0.52	5.00	0.00	0.47	0.47
26.75	0.67	0.52	5.00	0.00	0.47	0.47
26.80	0.67	0.52	5.00	0.00	0.47	0.47
26.85	0.67	0.52	5.00	0.00	0.47	0.47
26.90	0.67	0.52	5.00	0.00	0.47	0.47
26.95	0.67	0.52	5.00	0.00	0.47	0.47
27.00	0.67	0.52	5.00	0.00	0.46	0.46
27.05	0.67	0.52	5.00	0.00	0.46	0.46
27.10	0.67	0.52	5.00	0.00	0.46	0.46
27.15	0.67	0.52	5.00	0.00	0.46	0.46
27.20	0.67	0.52	5.00	0.00	0.46	0.46
27.25	0.67	0.52	5.00	0.00	0.46	0.46
27.30	0.67	0.52	5.00	0.00	0.46	0.46
27.35	0.67	0.52	5.00	0.00	0.46	0.46
27.40	0.67	0.52	5.00	0.00	0.46	0.46
27.45	0.67	0.52	5.00	0.00	0.46	0.46
27.50	0.67	0.52	5.00	0.00	0.46	0.46
27.55	0.67	0.52	5.00	0.00	0.46	0.46
27.60	0.67	0.52	5.00	0.00	0.46	0.46
27.65	0.67	0.52	5.00	0.00	0.46	0.46
27.70	0.66	0.52	5.00	0.00	0.45	0.45
27.75	0.66	0.52	5.00	0.00	0.45	0.45
27.80	0.66	0.52	5.00	0.00	0.45	0.45
27.85	0.66	0.52	5.00	0.00	0.45	0.45
27.90	0.66	0.52	5.00	0.00	0.45	0.45
27.95	0.66	0.52	5.00	0.00	0.45	0.45
28.00	0.66	0.52	5.00	0.00	0.45	0.45
28.05	0.66	0.52	5.00	0.00	0.45	0.45
28.10	0.66	0.52	5.00	0.00	0.45	0.45
28.15	0.66	0.52	5.00	0.00	0.45	0.45
28.20	0.66	0.52	5.00	0.00	0.45	0.45
28.25	0.66	0.52	5.00	0.00	0.45	0.45
28.30	0.66	0.52	5.00	0.00	0.45	0.45
28.35	0.66	0.52	5.00	0.00	0.44	0.44
28.40	0.66	0.52	5.00	0.00	0.44	0.44
28.45	0.66	0.52	5.00	0.00	0.44	0.44
28.50	0.66	0.52	5.00	0.00	0.44	0.44
28.55	0.66	0.52	5.00	0.00	0.44	0.44
28.60	0.66	0.52	5.00	0.00	0.44	0.44
28.65	0.66	0.52	5.00	0.00	0.44	0.44
28.70	0.66	0.52	5.00	0.00	0.44	0.44
28.75	0.66	0.52	5.00	0.00	0.44	0.44
28.80	0.66	0.52	5.00	0.00	0.44	0.44
28.85	0.66	0.52	5.00	0.00	0.44	0.44
28.90	0.66	0.52	5.00	0.00	0.44	0.44
28.95	0.66	0.52	5.00	0.00	0.44	0.44
29.00	0.66	0.52	5.00	0.00	0.43	0.43

DRAFT

29.05	0.66	0.52	5.00	0.00	0.43	0.43
29.10	0.66	0.52	5.00	0.00	0.43	0.43
29.15	0.66	0.52	5.00	0.00	0.43	0.43
29.20	0.66	0.52	5.00	0.00	0.43	0.43
29.25	0.66	0.52	5.00	0.00	0.43	0.43
29.30	0.66	0.52	5.00	0.00	0.43	0.43
29.35	0.66	0.52	5.00	0.00	0.43	0.43
29.40	0.66	0.52	5.00	0.00	0.43	0.43
29.45	0.66	0.52	5.00	0.00	0.43	0.43
29.50	0.66	0.52	5.00	0.00	0.43	0.43
29.55	0.66	0.52	5.00	0.00	0.42	0.42
29.60	0.66	0.52	5.00	0.00	0.42	0.42
29.65	0.66	0.52	5.00	0.00	0.42	0.42
29.70	0.66	0.52	5.00	0.00	0.42	0.42
29.75	0.66	0.52	5.00	0.00	0.42	0.42
29.80	0.66	0.52	5.00	0.00	0.42	0.42
29.85	0.66	0.52	5.00	0.00	0.42	0.42
29.90	0.66	0.52	5.00	0.00	0.42	0.42
29.95	0.66	0.52	5.00	0.00	0.42	0.42
30.00	0.66	0.52	5.00	0.00	0.42	0.42
30.05	2.00	0.52	5.00	0.00	0.42	0.42
30.10	2.00	0.52	5.00	0.00	0.42	0.42
30.15	2.00	0.52	5.00	0.00	0.42	0.42
30.20	2.00	0.52	5.00	0.00	0.42	0.42
30.25	2.00	0.52	5.00	0.00	0.42	0.42
30.30	2.00	0.52	5.00	0.00	0.42	0.42
30.35	2.00	0.52	5.00	0.00	0.42	0.42
30.40	2.00	0.52	5.00	0.00	0.42	0.42
30.45	2.00	0.52	5.00	0.00	0.42	0.42
30.50	2.00	0.51	5.00	0.00	0.42	0.42
30.55	2.00	0.51	5.00	0.00	0.42	0.42
30.60	2.00	0.51	5.00	0.00	0.42	0.42
30.65	2.00	0.51	5.00	0.00	0.42	0.42
30.70	2.00	0.51	5.00	0.00	0.42	0.42
30.75	2.00	0.51	5.00	0.00	0.42	0.42
30.80	2.00	0.51	5.00	0.00	0.42	0.42
30.85	2.00	0.51	5.00	0.00	0.42	0.42
30.90	2.00	0.51	5.00	0.00	0.42	0.42
30.95	2.00	0.51	5.00	0.00	0.42	0.42
31.00	2.00	0.51	5.00	0.00	0.42	0.42
31.05	2.00	0.51	5.00	0.00	0.42	0.42
31.10	2.00	0.51	5.00	0.00	0.42	0.42
31.15	2.00	0.51	5.00	0.00	0.42	0.42
31.20	2.00	0.51	5.00	0.00	0.42	0.42
31.25	2.00	0.51	5.00	0.00	0.42	0.42
31.30	2.00	0.51	5.00	0.00	0.42	0.42
31.35	2.00	0.51	5.00	0.00	0.42	0.42
31.40	2.00	0.51	5.00	0.00	0.42	0.42
31.45	2.00	0.51	5.00	0.00	0.42	0.42
31.50	2.00	0.51	5.00	0.00	0.42	0.42
31.55	2.00	0.51	5.00	0.00	0.42	0.42
31.60	2.00	0.51	5.00	0.00	0.42	0.42
31.65	2.00	0.51	5.00	0.00	0.42	0.42
31.70	2.00	0.51	5.00	0.00	0.42	0.42
31.75	2.00	0.51	5.00	0.00	0.42	0.42
31.80	2.00	0.51	5.00	0.00	0.42	0.42
31.85	2.00	0.51	5.00	0.00	0.42	0.42
31.90	2.00	0.51	5.00	0.00	0.42	0.42
31.95	2.00	0.51	5.00	0.00	0.42	0.42
32.00	2.00	0.51	5.00	0.00	0.42	0.42
32.05	2.00	0.51	5.00	0.00	0.42	0.42
32.10	2.00	0.51	5.00	0.00	0.42	0.42
32.15	2.00	0.51	5.00	0.00	0.42	0.42
32.20	2.00	0.51	5.00	0.00	0.42	0.42
32.25	2.00	0.51	5.00	0.00	0.42	0.42
32.30	2.00	0.51	5.00	0.00	0.42	0.42
32.35	2.00	0.51	5.00	0.00	0.42	0.42
32.40	2.00	0.51	5.00	0.00	0.42	0.42
32.45	2.00	0.51	5.00	0.00	0.42	0.42
32.50	2.00	0.51	5.00	0.00	0.42	0.42
32.55	2.00	0.51	5.00	0.00	0.42	0.42
32.60	2.00	0.51	5.00	0.00	0.42	0.42
32.65	2.00	0.51	5.00	0.00	0.42	0.42
32.70	2.00	0.51	5.00	0.00	0.42	0.42
32.75	2.00	0.50	5.00	0.00	0.42	0.42
32.80	2.00	0.50	5.00	0.00	0.42	0.42
32.85	2.00	0.50	5.00	0.00	0.42	0.42
32.90	2.00	0.50	5.00	0.00	0.42	0.42
32.95	2.00	0.50	5.00	0.00	0.42	0.42

DRAFT

33.00	2.00	0.50	5.00	0.00	0.42	0.42
33.05	2.00	0.50	5.00	0.00	0.42	0.42
33.10	2.00	0.50	5.00	0.00	0.42	0.42
33.15	2.00	0.50	5.00	0.00	0.42	0.42
33.20	2.00	0.50	5.00	0.00	0.42	0.42
33.25	2.00	0.50	5.00	0.00	0.42	0.42
33.30	2.00	0.50	5.00	0.00	0.42	0.42
33.35	2.00	0.50	5.00	0.00	0.42	0.42
33.40	2.00	0.50	5.00	0.00	0.42	0.42
33.45	2.00	0.50	5.00	0.00	0.42	0.42
33.50	2.00	0.50	5.00	0.00	0.42	0.42
33.55	2.00	0.50	5.00	0.00	0.42	0.42
33.60	2.00	0.50	5.00	0.00	0.42	0.42
33.65	2.00	0.50	5.00	0.00	0.42	0.42
33.70	2.00	0.50	5.00	0.00	0.42	0.42
33.75	2.00	0.50	5.00	0.00	0.42	0.42
33.80	2.00	0.50	5.00	0.00	0.42	0.42
33.85	2.00	0.50	5.00	0.00	0.42	0.42
33.90	2.00	0.50	5.00	0.00	0.42	0.42
33.95	2.00	0.50	5.00	0.00	0.42	0.42
34.00	2.00	0.50	5.00	0.00	0.42	0.42
34.05	0.64	0.50	5.00	0.00	0.42	0.42
34.10	0.64	0.50	5.00	0.00	0.42	0.42
34.15	0.64	0.50	5.00	0.00	0.42	0.42
34.20	0.64	0.50	5.00	0.00	0.41	0.41
34.25	0.64	0.50	5.00	0.00	0.41	0.41
34.30	0.64	0.50	5.00	0.00	0.41	0.41
34.35	0.64	0.50	5.00	0.00	0.41	0.41
34.40	0.64	0.50	5.00	0.00	0.41	0.41
34.45	0.64	0.50	5.00	0.00	0.41	0.41
34.50	0.64	0.50	5.00	0.00	0.41	0.41
34.55	0.64	0.50	5.00	0.00	0.41	0.41
34.60	0.64	0.50	5.00	0.00	0.41	0.41
34.65	0.64	0.50	5.00	0.00	0.41	0.41
34.70	0.64	0.50	5.00	0.00	0.41	0.41
34.75	0.64	0.50	5.00	0.00	0.40	0.40
34.80	0.64	0.50	5.00	0.00	0.40	0.40
34.85	0.64	0.50	5.00	0.00	0.40	0.40
34.90	0.64	0.50	5.00	0.00	0.40	0.40
34.95	0.64	0.49	5.00	0.00	0.40	0.40
35.00	0.64	0.49	5.00	0.00	0.40	0.40
35.05	0.64	0.49	5.00	0.00	0.40	0.40
35.10	0.64	0.49	5.00	0.00	0.40	0.40
35.15	0.64	0.49	5.00	0.00	0.40	0.40
35.20	0.64	0.49	5.00	0.00	0.39	0.39
35.25	0.64	0.49	5.00	0.00	0.39	0.39
35.30	0.64	0.49	5.00	0.00	0.39	0.39
35.35	0.64	0.49	5.00	0.00	0.39	0.39
35.40	0.64	0.49	5.00	0.00	0.39	0.39
35.45	0.64	0.49	5.00	0.00	0.39	0.39
35.50	0.64	0.49	5.00	0.00	0.39	0.39
35.55	0.64	0.49	5.00	0.00	0.39	0.39
35.60	0.64	0.49	5.00	0.00	0.39	0.39
35.65	0.64	0.49	5.00	0.00	0.39	0.39
35.70	0.64	0.49	5.00	0.00	0.38	0.38
35.75	0.64	0.49	5.00	0.00	0.38	0.38
35.80	0.64	0.49	5.00	0.00	0.38	0.38
35.85	0.64	0.49	5.00	0.00	0.38	0.38
35.90	0.64	0.49	5.00	0.00	0.38	0.38
35.95	0.64	0.49	5.00	0.00	0.38	0.38
36.00	0.64	0.49	5.00	0.00	0.38	0.38
36.05	0.64	0.49	5.00	0.00	0.38	0.38
36.10	0.63	0.49	5.00	0.00	0.37	0.37
36.15	0.63	0.49	5.00	0.00	0.37	0.37
36.20	0.63	0.49	5.00	0.00	0.37	0.37
36.25	0.63	0.49	5.00	0.00	0.37	0.37
36.30	0.63	0.49	5.00	0.00	0.37	0.37
36.35	0.63	0.49	5.00	0.00	0.37	0.37
36.40	0.63	0.49	5.00	0.00	0.37	0.37
36.45	0.63	0.49	5.00	0.00	0.37	0.37
36.50	0.63	0.49	5.00	0.00	0.37	0.37
36.55	0.63	0.49	5.00	0.00	0.36	0.36
36.60	0.63	0.49	5.00	0.00	0.36	0.36
36.65	0.63	0.49	5.00	0.00	0.36	0.36
36.70	0.63	0.49	5.00	0.00	0.36	0.36
36.75	0.63	0.49	5.00	0.00	0.36	0.36
36.80	0.63	0.49	5.00	0.00	0.36	0.36
36.85	0.63	0.49	5.00	0.00	0.36	0.36
36.90	0.63	0.49	5.00	0.00	0.36	0.36

DRAFT

36.95	0.63	0.49	5.00	0.00	0.36	0.36
37.00	0.63	0.49	5.00	0.00	0.35	0.35
37.05	0.63	0.49	5.00	0.00	0.35	0.35
37.10	0.63	0.49	5.00	0.00	0.35	0.35
37.15	0.63	0.48	5.00	0.00	0.35	0.35
37.20	0.63	0.48	5.00	0.00	0.35	0.35
37.25	0.63	0.48	5.00	0.00	0.35	0.35
37.30	0.63	0.48	5.00	0.00	0.35	0.35
37.35	0.63	0.48	5.00	0.00	0.35	0.35
37.40	0.63	0.48	5.00	0.00	0.34	0.34
37.45	0.63	0.48	5.00	0.00	0.34	0.34
37.50	0.63	0.48	5.00	0.00	0.34	0.34
37.55	0.63	0.48	5.00	0.00	0.34	0.34
37.60	0.63	0.48	5.00	0.00	0.34	0.34
37.65	0.63	0.48	5.00	0.00	0.34	0.34
37.70	0.63	0.48	5.00	0.00	0.34	0.34
37.75	0.63	0.48	5.00	0.00	0.34	0.34
37.80	0.63	0.48	5.00	0.00	0.33	0.33
37.85	0.63	0.48	5.00	0.00	0.33	0.33
37.90	0.63	0.48	5.00	0.00	0.33	0.33
37.95	0.63	0.48	5.00	0.00	0.33	0.33
38.00	0.63	0.48	5.00	0.00	0.33	0.33
38.05	0.63	0.48	5.00	0.00	0.33	0.33
38.10	0.63	0.48	5.00	0.00	0.33	0.33
38.15	0.63	0.48	5.00	0.00	0.32	0.32
38.20	0.63	0.48	5.00	0.00	0.32	0.32
38.25	0.63	0.48	5.00	0.00	0.32	0.32
38.30	0.63	0.48	5.00	0.00	0.32	0.32
38.35	0.63	0.48	5.00	0.00	0.32	0.32
38.40	0.63	0.48	5.00	0.00	0.32	0.32
38.45	0.63	0.48	5.00	0.00	0.32	0.32
38.50	0.63	0.48	5.00	0.00	0.31	0.31
38.55	0.63	0.48	5.00	0.00	0.31	0.31
38.60	0.63	0.48	5.00	0.00	0.31	0.31
38.65	0.63	0.48	5.00	0.00	0.31	0.31
38.70	0.63	0.48	5.00	0.00	0.31	0.31
38.75	0.63	0.48	5.00	0.00	0.31	0.31
38.80	0.63	0.48	5.00	0.00	0.31	0.31
38.85	0.63	0.48	5.00	0.00	0.30	0.30
38.90	0.62	0.48	5.00	0.00	0.30	0.30
38.95	0.62	0.48	5.00	0.00	0.30	0.30
39.00	0.62	0.48	5.00	0.00	0.30	0.30
39.05	0.62	0.48	5.00	0.00	0.30	0.30
39.10	0.62	0.48	5.00	0.00	0.30	0.30
39.15	0.62	0.48	5.00	0.00	0.30	0.30
39.20	0.62	0.48	5.00	0.00	0.29	0.29
39.25	0.62	0.48	5.00	0.00	0.29	0.29
39.30	0.62	0.48	5.00	0.00	0.29	0.29
39.35	0.62	0.47	5.00	0.00	0.29	0.29
39.40	0.62	0.47	5.00	0.00	0.29	0.29
39.45	0.62	0.47	5.00	0.00	0.29	0.29
39.50	0.62	0.47	5.00	0.00	0.28	0.28
39.55	0.62	0.47	5.00	0.00	0.28	0.28
39.60	0.62	0.47	5.00	0.00	0.28	0.28
39.65	0.62	0.47	5.00	0.00	0.28	0.28
39.70	0.62	0.47	5.00	0.00	0.28	0.28
39.75	0.62	0.47	5.00	0.00	0.28	0.28
39.80	0.62	0.47	5.00	0.00	0.28	0.28
39.85	0.62	0.47	5.00	0.00	0.28	0.28
39.90	0.62	0.47	5.00	0.00	0.27	0.27
39.95	0.62	0.47	5.00	0.00	0.27	0.27
40.00	0.62	0.47	5.00	0.00	0.27	0.27
40.05	0.62	0.47	5.00	0.00	0.27	0.27
40.10	0.62	0.47	5.00	0.00	0.27	0.27
40.15	0.62	0.47	5.00	0.00	0.27	0.27
40.20	0.62	0.47	5.00	0.00	0.27	0.27
40.25	0.62	0.47	5.00	0.00	0.27	0.27
40.30	0.62	0.47	5.00	0.00	0.27	0.27
40.35	0.62	0.47	5.00	0.00	0.27	0.27
40.40	0.62	0.47	5.00	0.00	0.27	0.27
40.45	0.62	0.47	5.00	0.00	0.27	0.27
40.50	0.62	0.47	5.00	0.00	0.26	0.26
40.55	0.62	0.47	5.00	0.00	0.26	0.26
40.60	0.62	0.47	5.00	0.00	0.26	0.26
40.65	0.62	0.47	5.00	0.00	0.26	0.26
40.70	0.62	0.47	5.00	0.00	0.26	0.26
40.75	0.62	0.47	5.00	0.00	0.26	0.26
40.80	0.62	0.47	5.00	0.00	0.26	0.26
40.85	0.62	0.47	5.00	0.00	0.26	0.26

DRAFT

40.90	0.62	0.47	5.00	0.00	0.26	0.26
40.95	0.62	0.47	5.00	0.00	0.26	0.26
41.00	0.62	0.47	5.00	0.00	0.26	0.26
41.05	0.62	0.47	5.00	0.00	0.26	0.26
41.10	0.62	0.47	5.00	0.00	0.26	0.26
41.15	0.62	0.47	5.00	0.00	0.26	0.26
41.20	0.62	0.47	5.00	0.00	0.25	0.25
41.25	0.62	0.47	5.00	0.00	0.25	0.25
41.30	0.62	0.47	5.00	0.00	0.25	0.25
41.35	0.62	0.47	5.00	0.00	0.25	0.25
41.40	0.62	0.47	5.00	0.00	0.25	0.25
41.45	0.62	0.47	5.00	0.00	0.25	0.25
41.50	0.62	0.47	5.00	0.00	0.25	0.25
41.55	0.62	0.46	5.00	0.00	0.25	0.25
41.60	0.62	0.46	5.00	0.00	0.25	0.25
41.65	0.62	0.46	5.00	0.00	0.25	0.25
41.70	0.62	0.46	5.00	0.00	0.25	0.25
41.75	0.62	0.46	5.00	0.00	0.25	0.25
41.80	0.62	0.46	5.00	0.00	0.25	0.25
41.85	0.61	0.46	5.00	0.00	0.25	0.25
41.90	0.61	0.46	5.00	0.00	0.24	0.24
41.95	0.61	0.46	5.00	0.00	0.24	0.24
42.00	0.61	0.46	5.00	0.00	0.24	0.24
42.05	0.61	0.46	5.00	0.00	0.24	0.24
42.10	0.61	0.46	5.00	0.00	0.24	0.24
42.15	0.61	0.46	5.00	0.00	0.24	0.24
42.20	0.61	0.46	5.00	0.00	0.24	0.24
42.25	0.61	0.46	5.00	0.00	0.24	0.24
42.30	0.61	0.46	5.00	0.00	0.24	0.24
42.35	0.61	0.46	5.00	0.00	0.24	0.24
42.40	0.61	0.46	5.00	0.00	0.24	0.24
42.45	0.61	0.46	5.00	0.00	0.24	0.24
42.50	0.61	0.46	5.00	0.00	0.24	0.24
42.55	0.61	0.46	5.00	0.00	0.24	0.24
42.60	0.61	0.46	5.00	0.00	0.24	0.24
42.65	0.61	0.46	5.00	0.00	0.24	0.24
42.70	0.61	0.46	5.00	0.00	0.23	0.23
42.75	0.61	0.46	5.00	0.00	0.23	0.23
42.80	0.61	0.46	5.00	0.00	0.23	0.23
42.85	0.61	0.46	5.00	0.00	0.23	0.23
42.90	0.61	0.46	5.00	0.00	0.23	0.23
42.95	0.61	0.46	5.00	0.00	0.23	0.23
43.00	0.61	0.46	5.00	0.00	0.23	0.23
43.05	0.61	0.46	5.00	0.00	0.23	0.23
43.10	0.61	0.46	5.00	0.00	0.23	0.23
43.15	0.61	0.46	5.00	0.00	0.23	0.23
43.20	0.61	0.46	5.00	0.00	0.23	0.23
43.25	0.61	0.46	5.00	0.00	0.23	0.23
43.30	0.61	0.46	5.00	0.00	0.23	0.23
43.35	0.61	0.46	5.00	0.00	0.23	0.23
43.40	0.61	0.46	5.00	0.00	0.23	0.23
43.45	0.61	0.46	5.00	0.00	0.23	0.23
43.50	0.61	0.46	5.00	0.00	0.22	0.22
43.55	0.61	0.46	5.00	0.00	0.22	0.22
43.60	0.61	0.46	5.00	0.00	0.22	0.22
43.65	0.61	0.46	5.00	0.00	0.22	0.22
43.70	0.61	0.46	5.00	0.00	0.22	0.22
43.75	0.61	0.46	5.00	0.00	0.22	0.22
43.80	0.61	0.45	5.00	0.00	0.22	0.22
43.85	0.61	0.45	5.00	0.00	0.22	0.22
43.90	0.61	0.45	5.00	0.00	0.22	0.22
43.95	0.61	0.45	5.00	0.00	0.22	0.22
44.00	0.61	0.45	5.00	0.00	0.22	0.22
44.05	0.61	0.45	5.00	0.00	0.22	0.22
44.10	0.61	0.45	5.00	0.00	0.22	0.22
44.15	0.61	0.45	5.00	0.00	0.22	0.22
44.20	0.61	0.45	5.00	0.00	0.22	0.22
44.25	0.61	0.45	5.00	0.00	0.22	0.22
44.30	0.61	0.45	5.00	0.00	0.22	0.22
44.35	0.61	0.45	5.00	0.00	0.21	0.21
44.40	0.61	0.45	5.00	0.00	0.21	0.21
44.45	0.61	0.45	5.00	0.00	0.21	0.21
44.50	0.61	0.45	5.00	0.00	0.21	0.21
44.55	0.61	0.45	5.00	0.00	0.21	0.21
44.60	0.61	0.45	5.00	0.00	0.21	0.21
44.65	0.61	0.45	5.00	0.00	0.21	0.21
44.70	0.61	0.45	5.00	0.00	0.21	0.21
44.75	0.61	0.45	5.00	0.00	0.21	0.21
44.80	0.61	0.45	5.00	0.00	0.21	0.21

DRAFT

44.85	0.61	0.45	5.00	0.00	0.21	0.21
44.90	0.61	0.45	5.00	0.00	0.21	0.21
44.95	0.60	0.45	5.00	0.00	0.21	0.21
45.00	0.60	0.45	5.00	0.00	0.21	0.21
45.05	0.60	0.45	5.00	0.00	0.21	0.21
45.10	0.60	0.45	5.00	0.00	0.21	0.21
45.15	0.60	0.45	5.00	0.00	0.21	0.21
45.20	0.60	0.45	5.00	0.00	0.20	0.20
45.25	0.60	0.45	5.00	0.00	0.20	0.20
45.30	0.60	0.45	5.00	0.00	0.20	0.20
45.35	0.60	0.45	5.00	0.00	0.20	0.20
45.40	0.60	0.45	5.00	0.00	0.20	0.20
45.45	0.60	0.45	5.00	0.00	0.20	0.20
45.50	0.60	0.45	5.00	0.00	0.20	0.20
45.55	0.60	0.45	5.00	0.00	0.20	0.20
45.60	0.60	0.45	5.00	0.00	0.20	0.20
45.65	0.60	0.45	5.00	0.00	0.20	0.20
45.70	0.60	0.45	5.00	0.00	0.20	0.20
45.75	0.60	0.45	5.00	0.00	0.20	0.20
45.80	0.60	0.45	5.00	0.00	0.20	0.20
45.85	0.60	0.45	5.00	0.00	0.20	0.20
45.90	0.60	0.45	5.00	0.00	0.20	0.20
45.95	0.60	0.45	5.00	0.00	0.20	0.20
46.00	0.60	0.44	5.00	0.00	0.20	0.20
46.05	0.60	0.44	5.00	0.00	0.19	0.19
46.10	0.60	0.44	5.00	0.00	0.19	0.19
46.15	0.60	0.44	5.00	0.00	0.19	0.19
46.20	0.60	0.44	5.00	0.00	0.19	0.19
46.25	0.60	0.44	5.00	0.00	0.19	0.19
46.30	0.60	0.44	5.00	0.00	0.19	0.19
46.35	0.60	0.44	5.00	0.00	0.19	0.19
46.40	0.60	0.44	5.00	0.00	0.19	0.19
46.45	0.60	0.44	5.00	0.00	0.19	0.19
46.50	0.60	0.44	5.00	0.00	0.19	0.19
46.55	0.60	0.44	5.00	0.00	0.19	0.19
46.60	0.60	0.44	5.00	0.00	0.19	0.19
46.65	0.60	0.44	5.00	0.00	0.19	0.19
46.70	0.60	0.44	5.00	0.00	0.19	0.19
46.75	0.60	0.44	5.00	0.00	0.19	0.19
46.80	0.60	0.44	5.00	0.00	0.19	0.19
46.85	0.60	0.44	5.00	0.00	0.19	0.19
46.90	0.60	0.44	5.00	0.00	0.19	0.19
46.95	0.60	0.44	5.00	0.00	0.19	0.19
47.00	0.60	0.44	5.00	0.00	0.18	0.18
47.05	2.00	0.44	5.00	0.00	0.18	0.18
47.10	2.00	0.44	5.00	0.00	0.18	0.18
47.15	2.00	0.44	5.00	0.00	0.18	0.18
47.20	2.00	0.44	5.00	0.00	0.18	0.18
47.25	2.00	0.44	5.00	0.00	0.18	0.18
47.30	2.00	0.44	5.00	0.00	0.18	0.18
47.35	2.00	0.44	5.00	0.00	0.18	0.18
47.40	2.00	0.44	5.00	0.00	0.18	0.18
47.45	2.00	0.44	5.00	0.00	0.18	0.18
47.50	2.00	0.44	5.00	0.00	0.18	0.18
47.55	2.00	0.44	5.00	0.00	0.18	0.18
47.60	2.00	0.44	5.00	0.00	0.18	0.18
47.65	2.00	0.44	5.00	0.00	0.18	0.18
47.70	2.00	0.44	5.00	0.00	0.18	0.18
47.75	2.00	0.44	5.00	0.00	0.18	0.18
47.80	2.00	0.44	5.00	0.00	0.18	0.18
47.85	2.00	0.44	5.00	0.00	0.18	0.18
47.90	2.00	0.44	5.00	0.00	0.18	0.18
47.95	2.00	0.44	5.00	0.00	0.18	0.18
48.00	2.00	0.44	5.00	0.00	0.18	0.18
48.05	2.00	0.44	5.00	0.00	0.18	0.18
48.10	2.00	0.44	5.00	0.00	0.18	0.18
48.15	2.00	0.44	5.00	0.00	0.18	0.18
48.20	2.00	0.43	5.00	0.00	0.18	0.18
48.25	2.00	0.43	5.00	0.00	0.18	0.18
48.30	2.00	0.43	5.00	0.00	0.18	0.18
48.35	2.00	0.43	5.00	0.00	0.18	0.18
48.40	2.00	0.43	5.00	0.00	0.18	0.18
48.45	2.00	0.43	5.00	0.00	0.18	0.18
48.50	2.00	0.43	5.00	0.00	0.18	0.18
48.55	2.00	0.43	5.00	0.00	0.18	0.18
48.60	2.00	0.43	5.00	0.00	0.18	0.18
48.65	2.00	0.43	5.00	0.00	0.18	0.18
48.70	2.00	0.43	5.00	0.00	0.18	0.18
48.75	2.00	0.43	5.00	0.00	0.18	0.18

DRAFT

48.80	2.00	0.43	5.00	0.00	0.18	0.18
48.85	2.00	0.43	5.00	0.00	0.18	0.18
48.90	2.00	0.43	5.00	0.00	0.18	0.18
48.95	2.00	0.43	5.00	0.00	0.18	0.18
49.00	2.00	0.43	5.00	0.00	0.18	0.18
49.05	2.00	0.43	5.00	0.00	0.18	0.18
49.10	2.00	0.43	5.00	0.00	0.18	0.18
49.15	2.00	0.43	5.00	0.00	0.18	0.18
49.20	2.00	0.43	5.00	0.00	0.18	0.18
49.25	2.00	0.43	5.00	0.00	0.18	0.18
49.30	2.00	0.43	5.00	0.00	0.18	0.18
49.35	2.00	0.43	5.00	0.00	0.18	0.18
49.40	2.00	0.43	5.00	0.00	0.18	0.18
49.45	2.00	0.43	5.00	0.00	0.18	0.18
49.50	2.00	0.43	5.00	0.00	0.18	0.18
49.55	2.00	0.43	5.00	0.00	0.18	0.18
49.60	2.00	0.43	5.00	0.00	0.18	0.18
49.65	2.00	0.43	5.00	0.00	0.18	0.18
49.70	2.00	0.43	5.00	0.00	0.18	0.18
49.75	2.00	0.43	5.00	0.00	0.18	0.18
49.80	2.00	0.43	5.00	0.00	0.18	0.18
49.85	2.00	0.43	5.00	0.00	0.18	0.18
49.90	2.00	0.43	5.00	0.00	0.18	0.18
49.95	2.00	0.43	5.00	0.00	0.18	0.18
50.00	2.00	0.43	5.00	0.00	0.18	0.18
50.05	2.00	0.43	5.00	0.00	0.18	0.18
50.10	2.00	0.43	5.00	0.00	0.18	0.18
50.15	2.00	0.43	5.00	0.00	0.18	0.18
50.20	2.00	0.43	5.00	0.00	0.18	0.18
50.25	2.00	0.43	5.00	0.00	0.18	0.18
50.30	2.00	0.43	5.00	0.00	0.18	0.18
50.35	2.00	0.43	5.00	0.00	0.18	0.18
50.40	2.00	0.42	5.00	0.00	0.18	0.18
50.45	2.00	0.42	5.00	0.00	0.18	0.18
50.50	2.00	0.42	5.00	0.00	0.18	0.18
50.55	2.00	0.42	5.00	0.00	0.18	0.18
50.60	2.00	0.42	5.00	0.00	0.18	0.18
50.65	2.00	0.42	5.00	0.00	0.18	0.18
50.70	2.00	0.42	5.00	0.00	0.18	0.18
50.75	2.00	0.42	5.00	0.00	0.18	0.18
50.80	2.00	0.42	5.00	0.00	0.18	0.18
50.85	2.00	0.42	5.00	0.00	0.18	0.18
50.90	2.00	0.42	5.00	0.00	0.18	0.18
50.95	2.00	0.42	5.00	0.00	0.18	0.18
51.00	2.00	0.42	5.00	0.00	0.18	0.18
51.05	2.00	0.42	5.00	0.00	0.18	0.18
51.10	2.00	0.42	5.00	0.00	0.18	0.18
51.15	2.00	0.42	5.00	0.00	0.18	0.18
51.20	2.00	0.42	5.00	0.00	0.18	0.18
51.25	2.00	0.42	5.00	0.00	0.18	0.18
51.30	2.00	0.42	5.00	0.00	0.18	0.18
51.35	2.00	0.42	5.00	0.00	0.18	0.18
51.40	2.00	0.42	5.00	0.00	0.18	0.18
51.45	2.00	0.42	5.00	0.00	0.18	0.18
51.50	2.00	0.42	5.00	0.00	0.18	0.18
51.55	2.00	0.42	5.00	0.00	0.18	0.18
51.60	2.00	0.42	5.00	0.00	0.18	0.18
51.65	2.00	0.42	5.00	0.00	0.18	0.18
51.70	2.00	0.42	5.00	0.00	0.18	0.18
51.75	2.00	0.42	5.00	0.00	0.18	0.18
51.80	2.00	0.42	5.00	0.00	0.18	0.18
51.85	2.00	0.42	5.00	0.00	0.18	0.18
51.90	2.00	0.42	5.00	0.00	0.18	0.18
51.95	2.00	0.42	5.00	0.00	0.18	0.18
52.00	2.00	0.42	5.00	0.00	0.18	0.18
52.05	2.00	0.42	5.00	0.00	0.18	0.18
52.10	2.00	0.42	5.00	0.00	0.18	0.18
52.15	2.00	0.42	5.00	0.00	0.18	0.18
52.20	2.00	0.42	5.00	0.00	0.18	0.18
52.25	2.00	0.42	5.00	0.00	0.18	0.18
52.30	2.00	0.42	5.00	0.00	0.18	0.18
52.35	2.00	0.42	5.00	0.00	0.18	0.18
52.40	2.00	0.42	5.00	0.00	0.18	0.18
52.45	2.00	0.42	5.00	0.00	0.18	0.18
52.50	2.00	0.42	5.00	0.00	0.18	0.18
52.55	2.00	0.42	5.00	0.00	0.18	0.18
52.60	2.00	0.41	5.00	0.00	0.18	0.18
52.65	2.00	0.41	5.00	0.00	0.18	0.18
52.70	2.00	0.41	5.00	0.00	0.18	0.18

DRAFT

52.75	2.00	0.41	5.00	0.00	0.18	0.18
52.80	2.00	0.41	5.00	0.00	0.18	0.18
52.85	2.00	0.41	5.00	0.00	0.18	0.18
52.90	2.00	0.41	5.00	0.00	0.18	0.18
52.95	2.00	0.41	5.00	0.00	0.18	0.18
53.00	2.00	0.41	5.00	0.00	0.18	0.18
53.05	2.00	0.41	5.00	0.00	0.18	0.18
53.10	2.00	0.41	5.00	0.00	0.18	0.18
53.15	2.00	0.41	5.00	0.00	0.18	0.18
53.20	2.00	0.41	5.00	0.00	0.18	0.18
53.25	2.00	0.41	5.00	0.00	0.18	0.18
53.30	2.00	0.41	5.00	0.00	0.18	0.18
53.35	2.00	0.41	5.00	0.00	0.18	0.18
53.40	2.00	0.41	5.00	0.00	0.18	0.18
53.45	2.00	0.41	5.00	0.00	0.18	0.18
53.50	2.00	0.41	5.00	0.00	0.18	0.18
53.55	2.00	0.41	5.00	0.00	0.18	0.18
53.60	2.00	0.41	5.00	0.00	0.18	0.18
53.65	2.00	0.41	5.00	0.00	0.18	0.18
53.70	2.00	0.41	5.00	0.00	0.18	0.18
53.75	2.00	0.41	5.00	0.00	0.18	0.18
53.80	2.00	0.41	5.00	0.00	0.18	0.18
53.85	2.00	0.41	5.00	0.00	0.18	0.18
53.90	2.00	0.41	5.00	0.00	0.18	0.18
53.95	2.00	0.41	5.00	0.00	0.18	0.18
54.00	2.00	0.41	5.00	0.00	0.18	0.18
54.05	2.00	0.41	5.00	0.00	0.18	0.18
54.10	2.00	0.41	5.00	0.00	0.18	0.18
54.15	2.00	0.41	5.00	0.00	0.18	0.18
54.20	2.00	0.41	5.00	0.00	0.18	0.18
54.25	2.00	0.41	5.00	0.00	0.18	0.18
54.30	2.00	0.41	5.00	0.00	0.18	0.18
54.35	2.00	0.41	5.00	0.00	0.18	0.18
54.40	2.00	0.41	5.00	0.00	0.18	0.18
54.45	2.00	0.41	5.00	0.00	0.18	0.18
54.50	2.00	0.41	5.00	0.00	0.18	0.18
54.55	2.00	0.41	5.00	0.00	0.18	0.18
54.60	2.00	0.41	5.00	0.00	0.18	0.18
54.65	2.00	0.41	5.00	0.00	0.18	0.18
54.70	2.00	0.41	5.00	0.00	0.18	0.18
54.75	2.00	0.41	5.00	0.00	0.18	0.18
54.80	2.00	0.40	5.00	0.00	0.18	0.18
54.85	2.00	0.40	5.00	0.00	0.18	0.18
54.90	2.00	0.40	5.00	0.00	0.18	0.18
54.95	2.00	0.40	5.00	0.00	0.18	0.18
55.00	2.00	0.40	5.00	0.00	0.18	0.18
55.05	2.00	0.40	5.00	0.00	0.18	0.18
55.10	2.00	0.40	5.00	0.00	0.18	0.18
55.15	2.00	0.40	5.00	0.00	0.18	0.18
55.20	2.00	0.40	5.00	0.00	0.18	0.18
55.25	2.00	0.40	5.00	0.00	0.18	0.18
55.30	2.00	0.40	5.00	0.00	0.18	0.18
55.35	2.00	0.40	5.00	0.00	0.18	0.18
55.40	2.00	0.40	5.00	0.00	0.18	0.18
55.45	2.00	0.40	5.00	0.00	0.18	0.18
55.50	2.00	0.40	5.00	0.00	0.18	0.18
55.55	2.00	0.40	5.00	0.00	0.18	0.18
55.60	2.00	0.40	5.00	0.00	0.18	0.18
55.65	2.00	0.40	5.00	0.00	0.18	0.18
55.70	2.00	0.40	5.00	0.00	0.18	0.18
55.75	2.00	0.40	5.00	0.00	0.18	0.18
55.80	2.00	0.40	5.00	0.00	0.18	0.18
55.85	2.00	0.40	5.00	0.00	0.18	0.18
55.90	2.00	0.40	5.00	0.00	0.18	0.18
55.95	2.00	0.40	5.00	0.00	0.18	0.18
56.00	2.00	0.40	5.00	0.00	0.18	0.18
56.05	2.00	0.40	5.00	0.00	0.18	0.18
56.10	2.00	0.40	5.00	0.00	0.18	0.18
56.15	2.00	0.40	5.00	0.00	0.18	0.18
56.20	2.00	0.40	5.00	0.00	0.18	0.18
56.25	2.00	0.40	5.00	0.00	0.18	0.18
56.30	2.00	0.40	5.00	0.00	0.18	0.18
56.35	2.00	0.40	5.00	0.00	0.18	0.18
56.40	2.00	0.40	5.00	0.00	0.18	0.18
56.45	2.00	0.40	5.00	0.00	0.18	0.18
56.50	2.00	0.40	5.00	0.00	0.18	0.18
56.55	2.00	0.40	5.00	0.00	0.18	0.18
56.60	2.00	0.40	5.00	0.00	0.18	0.18
56.65	2.00	0.40	5.00	0.00	0.18	0.18

DRAFT

56.70	2.00	0.40	5.00	0.00	0.18	0.18
56.75	2.00	0.40	5.00	0.00	0.18	0.18
56.80	2.00	0.40	5.00	0.00	0.18	0.18
56.85	2.00	0.40	5.00	0.00	0.18	0.18
56.90	2.00	0.40	5.00	0.00	0.18	0.18
56.95	2.00	0.40	5.00	0.00	0.18	0.18
57.00	2.00	0.40	5.00	0.00	0.18	0.18
57.05	0.57	0.39	5.00	0.00	0.18	0.18
57.10	0.57	0.39	5.00	0.00	0.18	0.18
57.15	0.57	0.39	5.00	0.00	0.18	0.18
57.20	0.57	0.39	5.00	0.00	0.18	0.18
57.25	0.57	0.39	5.00	0.00	0.18	0.18
57.30	0.57	0.39	5.00	0.00	0.18	0.18
57.35	0.57	0.39	5.00	0.00	0.18	0.18
57.40	0.57	0.39	5.00	0.00	0.18	0.18
57.45	0.57	0.39	5.00	0.00	0.18	0.18
57.50	0.57	0.39	5.00	0.00	0.18	0.18
57.55	0.57	0.39	5.00	0.00	0.18	0.18
57.60	0.57	0.39	5.00	0.00	0.18	0.18
57.65	0.57	0.39	5.00	0.00	0.18	0.18
57.70	0.57	0.39	5.00	0.00	0.18	0.18
57.75	0.57	0.39	5.00	0.00	0.17	0.17
57.80	0.57	0.39	5.00	0.00	0.17	0.17
57.85	0.57	0.39	5.00	0.00	0.17	0.17
57.90	0.57	0.39	5.00	0.00	0.17	0.17
57.95	0.57	0.39	5.00	0.00	0.17	0.17
58.00	0.57	0.39	5.00	0.00	0.17	0.17
58.05	0.57	0.39	5.00	0.00	0.17	0.17
58.10	0.57	0.39	5.00	0.00	0.17	0.17
58.15	0.57	0.39	5.00	0.00	0.17	0.17
58.20	0.57	0.39	5.00	0.00	0.17	0.17
58.25	0.57	0.39	5.00	0.00	0.17	0.17
58.30	0.57	0.39	5.00	0.00	0.17	0.17
58.35	0.57	0.39	5.00	0.00	0.17	0.17
58.40	0.57	0.39	5.00	0.00	0.17	0.17
58.45	0.57	0.39	5.00	0.00	0.17	0.17
58.50	0.57	0.39	5.00	0.00	0.16	0.16
58.55	0.57	0.39	5.00	0.00	0.16	0.16
58.60	0.57	0.39	5.00	0.00	0.16	0.16
58.65	0.57	0.39	5.00	0.00	0.16	0.16
58.70	0.57	0.39	5.00	0.00	0.16	0.16
58.75	0.57	0.39	5.00	0.00	0.16	0.16
58.80	0.57	0.39	5.00	0.00	0.16	0.16
58.85	0.57	0.39	5.00	0.00	0.16	0.16
58.90	0.57	0.39	5.00	0.00	0.16	0.16
58.95	0.57	0.39	5.00	0.00	0.16	0.16
59.00	0.57	0.39	5.00	0.00	0.16	0.16
59.05	0.57	0.39	5.00	0.00	0.16	0.16
59.10	0.57	0.39	5.00	0.00	0.16	0.16
59.15	0.57	0.39	5.00	0.00	0.16	0.16
59.20	0.57	0.39	5.00	0.00	0.15	0.15
59.25	0.57	0.38	5.00	0.00	0.15	0.15
59.30	0.57	0.38	5.00	0.00	0.15	0.15
59.35	0.57	0.38	5.00	0.00	0.15	0.15
59.40	0.57	0.38	5.00	0.00	0.15	0.15
59.45	0.57	0.38	5.00	0.00	0.15	0.15
59.50	0.57	0.38	5.00	0.00	0.15	0.15
59.55	0.57	0.38	5.00	0.00	0.15	0.15
59.60	0.57	0.38	5.00	0.00	0.15	0.15
59.65	0.57	0.38	5.00	0.00	0.15	0.15
59.70	0.57	0.38	5.00	0.00	0.15	0.15
59.75	0.57	0.38	5.00	0.00	0.15	0.15
59.80	0.57	0.38	5.00	0.00	0.15	0.15
59.85	0.57	0.38	5.00	0.00	0.14	0.14
59.90	0.57	0.38	5.00	0.00	0.14	0.14
59.95	0.57	0.38	5.00	0.00	0.14	0.14
60.00	0.56	0.38	5.00	0.00	0.14	0.14
60.05	0.56	0.38	5.00	0.00	0.14	0.14
60.10	0.56	0.38	5.00	0.00	0.14	0.14
60.15	0.56	0.38	5.00	0.00	0.14	0.14
60.20	0.56	0.38	5.00	0.00	0.14	0.14
60.25	0.56	0.38	5.00	0.00	0.14	0.14
60.30	0.56	0.38	5.00	0.00	0.14	0.14
60.35	0.56	0.38	5.00	0.00	0.14	0.14
60.40	0.56	0.38	5.00	0.00	0.13	0.13
60.45	0.56	0.38	5.00	0.00	0.13	0.13
60.50	0.56	0.38	5.00	0.00	0.13	0.13
60.55	0.56	0.38	5.00	0.00	0.13	0.13
60.60	0.56	0.38	5.00	0.00	0.13	0.13

DRAFT

60.65	0.56	0.38	5.00	0.00	0.13	0.13
60.70	0.56	0.38	5.00	0.00	0.13	0.13
60.75	0.56	0.38	5.00	0.00	0.13	0.13
60.80	0.56	0.38	5.00	0.00	0.13	0.13
60.85	0.56	0.38	5.00	0.00	0.13	0.13
60.90	0.56	0.38	5.00	0.00	0.13	0.13
60.95	0.56	0.38	5.00	0.00	0.13	0.13
61.00	0.56	0.38	5.00	0.00	0.12	0.12
61.05	0.56	0.38	5.00	0.00	0.12	0.12
61.10	0.56	0.38	5.00	0.00	0.12	0.12
61.15	0.56	0.38	5.00	0.00	0.12	0.12
61.20	0.56	0.38	5.00	0.00	0.12	0.12
61.25	0.56	0.38	5.00	0.00	0.12	0.12
61.30	0.56	0.38	5.00	0.00	0.12	0.12
61.35	0.56	0.38	5.00	0.00	0.12	0.12
61.40	0.56	0.38	5.00	0.00	0.12	0.12
61.45	0.56	0.37	5.00	0.00	0.12	0.12
61.50	0.56	0.37	5.00	0.00	0.12	0.12
61.55	0.56	0.37	5.00	0.00	0.12	0.12
61.60	0.56	0.37	5.00	0.00	0.11	0.11
61.65	0.56	0.37	5.00	0.00	0.11	0.11
61.70	0.56	0.37	5.00	0.00	0.11	0.11
61.75	0.56	0.37	5.00	0.00	0.11	0.11
61.80	0.56	0.37	5.00	0.00	0.11	0.11
61.85	0.56	0.37	5.00	0.00	0.11	0.11
61.90	0.56	0.37	5.00	0.00	0.11	0.11
61.95	0.56	0.37	5.00	0.00	0.11	0.11
62.00	0.56	0.37	5.00	0.00	0.11	0.11
62.05	0.56	0.37	5.00	0.00	0.11	0.11
62.10	0.56	0.37	5.00	0.00	0.11	0.11
62.15	0.56	0.37	5.00	0.00	0.11	0.11
62.20	0.56	0.37	5.00	0.00	0.11	0.11
62.25	0.56	0.37	5.00	0.00	0.10	0.10
62.30	0.56	0.37	5.00	0.00	0.10	0.10
62.35	0.56	0.37	5.00	0.00	0.10	0.10
62.40	0.56	0.37	5.00	0.00	0.10	0.10
62.45	0.56	0.37	5.00	0.00	0.10	0.10
62.50	0.56	0.37	5.00	0.00	0.10	0.10
62.55	0.56	0.37	5.00	0.00	0.10	0.10
62.60	0.56	0.37	5.00	0.00	0.10	0.10
62.65	0.56	0.37	5.00	0.00	0.10	0.10
62.70	0.56	0.37	5.00	0.00	0.10	0.10
62.75	0.56	0.37	5.00	0.00	0.10	0.10
62.80	0.56	0.37	5.00	0.00	0.10	0.10
62.85	0.56	0.37	5.00	0.00	0.10	0.10
62.90	0.56	0.37	5.00	0.00	0.10	0.10
62.95	0.56	0.37	5.00	0.00	0.09	0.09
63.00	0.56	0.37	5.00	0.00	0.09	0.09
63.05	0.56	0.37	5.00	0.00	0.09	0.09
63.10	0.56	0.37	5.00	0.00	0.09	0.09
63.15	0.56	0.37	5.00	0.00	0.09	0.09
63.20	0.56	0.37	5.00	0.00	0.09	0.09
63.25	0.56	0.37	5.00	0.00	0.09	0.09
63.30	0.56	0.37	5.00	0.00	0.09	0.09
63.35	0.56	0.37	5.00	0.00	0.09	0.09
63.40	0.56	0.37	5.00	0.00	0.09	0.09
63.45	0.56	0.37	5.00	0.00	0.09	0.09
63.50	0.56	0.37	5.00	0.00	0.09	0.09
63.55	0.56	0.37	5.00	0.00	0.09	0.09
63.60	0.56	0.37	5.00	0.00	0.09	0.09
63.65	0.56	0.36	5.00	0.00	0.08	0.08
63.70	0.56	0.36	5.00	0.00	0.08	0.08
63.75	0.56	0.36	5.00	0.00	0.08	0.08
63.80	0.56	0.36	5.00	0.00	0.08	0.08
63.85	0.56	0.36	5.00	0.00	0.08	0.08
63.90	0.56	0.36	5.00	0.00	0.08	0.08
63.95	0.56	0.36	5.00	0.00	0.08	0.08
64.00	0.55	0.36	5.00	0.00	0.08	0.08
64.05	0.55	0.36	5.00	0.00	0.08	0.08
64.10	0.55	0.36	5.00	0.00	0.08	0.08
64.15	0.55	0.36	5.00	0.00	0.08	0.08
64.20	0.55	0.36	5.00	0.00	0.08	0.08
64.25	0.55	0.36	5.00	0.00	0.08	0.08
64.30	0.55	0.36	5.00	0.00	0.08	0.08
64.35	0.55	0.36	5.00	0.00	0.08	0.08
64.40	0.55	0.36	5.00	0.00	0.08	0.08
64.45	0.55	0.36	5.00	0.00	0.07	0.07
64.50	0.55	0.36	5.00	0.00	0.07	0.07
64.55	0.55	0.36	5.00	0.00	0.07	0.07

DRAFT

64.60	0.55	0.36	5.00	0.00	0.07	0.07
64.65	0.55	0.36	5.00	0.00	0.07	0.07
64.70	0.55	0.36	5.00	0.00	0.07	0.07
64.75	0.55	0.36	5.00	0.00	0.07	0.07
64.80	0.55	0.36	5.00	0.00	0.07	0.07
64.85	0.55	0.36	5.00	0.00	0.07	0.07
64.90	0.55	0.36	5.00	0.00	0.07	0.07
64.95	0.55	0.36	5.00	0.00	0.07	0.07
65.00	0.55	0.36	5.00	0.00	0.07	0.07
65.05	0.55	0.36	5.00	0.00	0.07	0.07
65.10	0.55	0.36	5.00	0.00	0.07	0.07
65.15	0.55	0.36	5.00	0.00	0.07	0.07
65.20	0.55	0.36	5.00	0.00	0.07	0.07
65.25	0.55	0.36	5.00	0.00	0.07	0.07
65.30	0.55	0.36	5.00	0.00	0.06	0.06
65.35	0.55	0.36	5.00	0.00	0.06	0.06
65.40	0.55	0.36	5.00	0.00	0.06	0.06
65.45	0.55	0.36	5.00	0.00	0.06	0.06
65.50	0.55	0.36	5.00	0.00	0.06	0.06
65.55	0.55	0.36	5.00	0.00	0.06	0.06
65.60	0.55	0.36	5.00	0.00	0.06	0.06
65.65	0.55	0.36	5.00	0.00	0.06	0.06
65.70	0.55	0.36	5.00	0.00	0.06	0.06
65.75	0.55	0.36	5.00	0.00	0.06	0.06
65.80	0.55	0.36	5.00	0.00	0.06	0.06
65.85	0.55	0.35	5.00	0.00	0.06	0.06
65.90	0.55	0.35	5.00	0.00	0.06	0.06
65.95	0.55	0.35	5.00	0.00	0.06	0.06
66.00	0.55	0.35	5.00	0.00	0.06	0.06
66.05	0.55	0.35	5.00	0.00	0.06	0.06
66.10	0.55	0.35	5.00	0.00	0.06	0.06
66.15	0.55	0.35	5.00	0.00	0.05	0.05
66.20	0.55	0.35	5.00	0.00	0.05	0.05
66.25	0.55	0.35	5.00	0.00	0.05	0.05
66.30	0.55	0.35	5.00	0.00	0.05	0.05
66.35	0.55	0.35	5.00	0.00	0.05	0.05
66.40	0.55	0.35	5.00	0.00	0.05	0.05
66.45	0.55	0.35	5.00	0.00	0.05	0.05
66.50	0.55	0.35	5.00	0.00	0.05	0.05
66.55	0.55	0.35	5.00	0.00	0.05	0.05
66.60	0.55	0.35	5.00	0.00	0.05	0.05
66.65	0.55	0.35	5.00	0.00	0.05	0.05
66.70	0.55	0.35	5.00	0.00	0.05	0.05
66.75	0.55	0.35	5.00	0.00	0.05	0.05
66.80	0.55	0.35	5.00	0.00	0.05	0.05
66.85	0.55	0.35	5.00	0.00	0.05	0.05
66.90	0.55	0.35	5.00	0.00	0.05	0.05
66.95	0.55	0.35	5.00	0.00	0.04	0.04
67.00	0.55	0.35	5.00	0.00	0.04	0.04
67.05	0.55	0.35	5.00	0.00	0.04	0.04
67.10	0.55	0.35	5.00	0.00	0.04	0.04
67.15	0.55	0.35	5.00	0.00	0.04	0.04
67.20	0.55	0.35	5.00	0.00	0.04	0.04
67.25	0.55	0.35	5.00	0.00	0.04	0.04
67.30	0.55	0.35	5.00	0.00	0.04	0.04
67.35	0.55	0.35	5.00	0.00	0.04	0.04
67.40	0.55	0.35	5.00	0.00	0.04	0.04
67.45	0.55	0.35	5.00	0.00	0.04	0.04
67.50	0.55	0.35	5.00	0.00	0.04	0.04
67.55	0.55	0.35	5.00	0.00	0.04	0.04
67.60	0.55	0.35	5.00	0.00	0.04	0.04
67.65	0.55	0.35	5.00	0.00	0.04	0.04
67.70	0.55	0.35	5.00	0.00	0.04	0.04
67.75	0.55	0.35	5.00	0.00	0.04	0.04
67.80	0.55	0.35	5.00	0.00	0.03	0.03
67.85	0.55	0.35	5.00	0.00	0.03	0.03
67.90	0.55	0.35	5.00	0.00	0.03	0.03
67.95	0.55	0.35	5.00	0.00	0.03	0.03
68.00	0.55	0.35	5.00	0.00	0.03	0.03
68.05	0.55	0.35	5.00	0.00	0.03	0.03
68.10	0.55	0.34	5.00	0.00	0.03	0.03
68.15	0.55	0.34	5.00	0.00	0.03	0.03
68.20	0.54	0.34	5.00	0.00	0.03	0.03
68.25	0.54	0.34	5.00	0.00	0.03	0.03
68.30	0.54	0.34	5.00	0.00	0.03	0.03
68.35	0.54	0.34	5.00	0.00	0.03	0.03
68.40	0.54	0.34	5.00	0.00	0.03	0.03
68.45	0.54	0.34	5.00	0.00	0.03	0.03
68.50	0.54	0.34	5.00	0.00	0.03	0.03

DRAFT

68.55	0.54	0.34	5.00	0.00	0.03	0.03
68.60	0.54	0.34	5.00	0.00	0.02	0.02
68.65	0.54	0.34	5.00	0.00	0.02	0.02
68.70	0.54	0.34	5.00	0.00	0.02	0.02
68.75	0.54	0.34	5.00	0.00	0.02	0.02
68.80	0.54	0.34	5.00	0.00	0.02	0.02
68.85	0.54	0.34	5.00	0.00	0.02	0.02
68.90	0.54	0.34	5.00	0.00	0.02	0.02
68.95	0.54	0.34	5.00	0.00	0.02	0.02
69.00	0.54	0.34	5.00	0.00	0.02	0.02
69.05	0.54	0.34	5.00	0.00	0.02	0.02
69.10	0.54	0.34	5.00	0.00	0.02	0.02
69.15	0.54	0.34	5.00	0.00	0.02	0.02
69.20	0.54	0.34	5.00	0.00	0.02	0.02
69.25	0.54	0.34	5.00	0.00	0.02	0.02
69.30	0.54	0.34	5.00	0.00	0.02	0.02
69.35	0.54	0.34	5.00	0.00	0.01	0.01
69.40	0.54	0.34	5.00	0.00	0.01	0.01
69.45	0.54	0.34	5.00	0.00	0.01	0.01
69.50	0.54	0.34	5.00	0.00	0.01	0.01
69.55	0.54	0.34	5.00	0.00	0.01	0.01
69.60	0.54	0.34	5.00	0.00	0.01	0.01
69.65	0.54	0.34	5.00	0.00	0.01	0.01
69.70	0.54	0.34	5.00	0.00	0.01	0.01
69.75	0.54	0.34	5.00	0.00	0.01	0.01
69.80	0.54	0.34	5.00	0.00	0.01	0.01
69.85	0.54	0.34	5.00	0.00	0.01	0.01
69.90	0.54	0.34	5.00	0.00	0.01	0.01
69.95	0.54	0.34	5.00	0.00	0.01	0.01
70.00	0.54	0.34	5.00	0.00	0.01	0.01
70.05	0.54	0.34	5.00	0.00	0.01	0.01
70.10	0.54	0.34	5.00	0.00	0.01	0.01
70.15	0.54	0.34	5.00	0.00	0.00	0.00
70.20	0.54	0.34	5.00	0.00	0.00	0.00
70.25	0.54	0.34	5.00	0.00	0.00	0.00
70.30	0.54	0.33	5.00	0.00	0.00	0.00
70.35	0.54	0.33	5.00	0.00	0.00	0.00
70.40	0.54	0.33	5.00	0.00	0.00	0.00
70.45	0.54	0.33	5.00	0.00	0.00	0.00
70.50	0.54	0.33	5.00	0.00	0.00	0.00

---

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

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

---

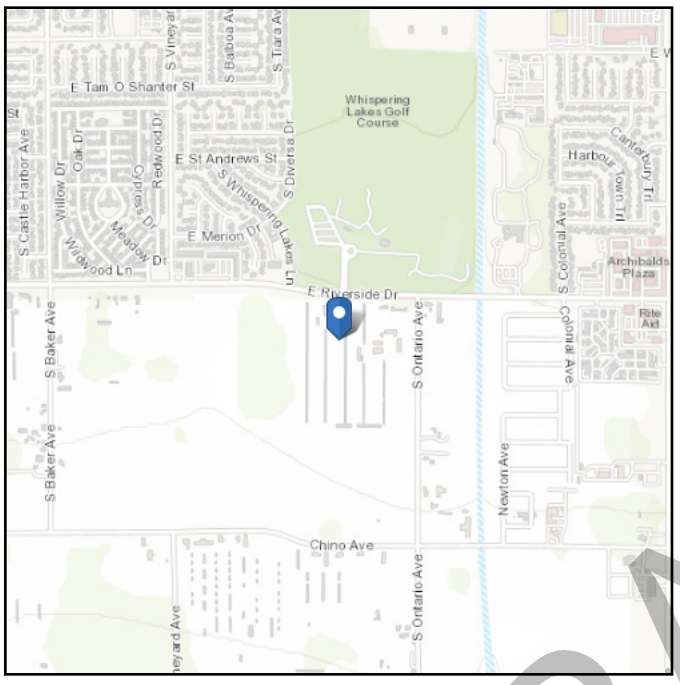
1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm Cyclic resistance ratio from soils
CSRsf Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat Settlement from saturated sands
S_dry Settlement from Unsaturated Sands
S_all Total Settlement from Saturated and Unsaturated Sands
NoLiq No-Liquefy Soils

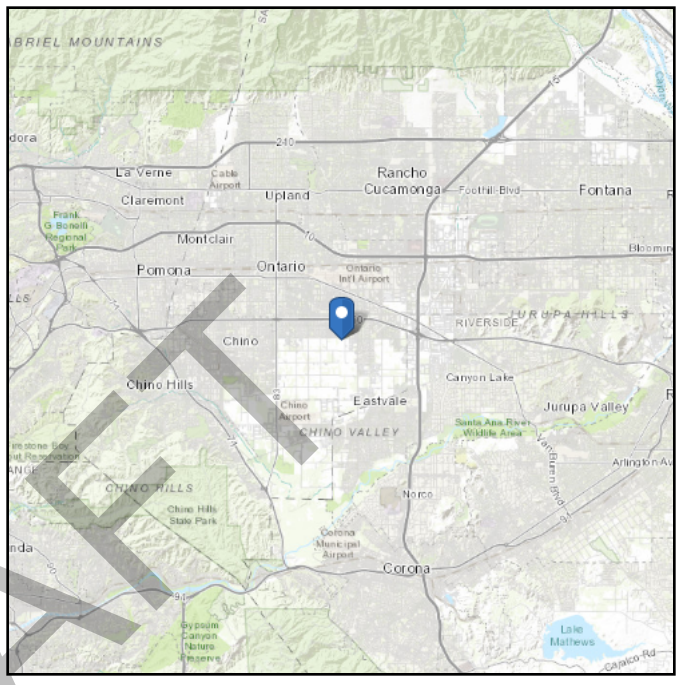
DRAFT

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	34.01789
Risk Category:	I	**Longitude:**	-117.604962
Soil Class:	D - Stiff Soil	**Elevation:**	768.6973176987071 ft (NAVD 88)





DRAFT

Seismic

Site Soil Class: D - Stiff Soil

Results:

S_S :	1.607	S_{D1} :	N/A
S_1 :	0.581	T_L :	8
F_a :	1	PGA :	0.669
F_v :	N/A	PGA_M :	0.736
S_{MS} :	1.607	F_{PGA} :	1.1
S_{M1} :	N/A	I_e :	1
S_{DS} :	1.071	C_v :	1.421

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Tue Oct 17 2023

Date Source: USGS Seismic Design Maps

DRAFT

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

DRAFT

U.S. Geological Survey - Earthquake Hazards Program

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Please also see the new USGS Earthquake Hazard Toolbox for access to the most recent NSHMs for the conterminous U.S. and Hawaii.

DRAFT

Input

Edition

Dynamic: Conterminous U.S. 2014 (u…

Spectral Period

Peak Ground Acceleration

Latitude

Decimal degrees

34.01789

Time Horizon

Return period in years

2475

Longitude

Decimal degrees, negative values for western longitudes

-117.604962

Site Class

259 m/s (Site class D)

Hazard Curve

Please select “Edition”, “Location” & “Site Class” above to compute a hazard curve.

Compute Hazard Curve

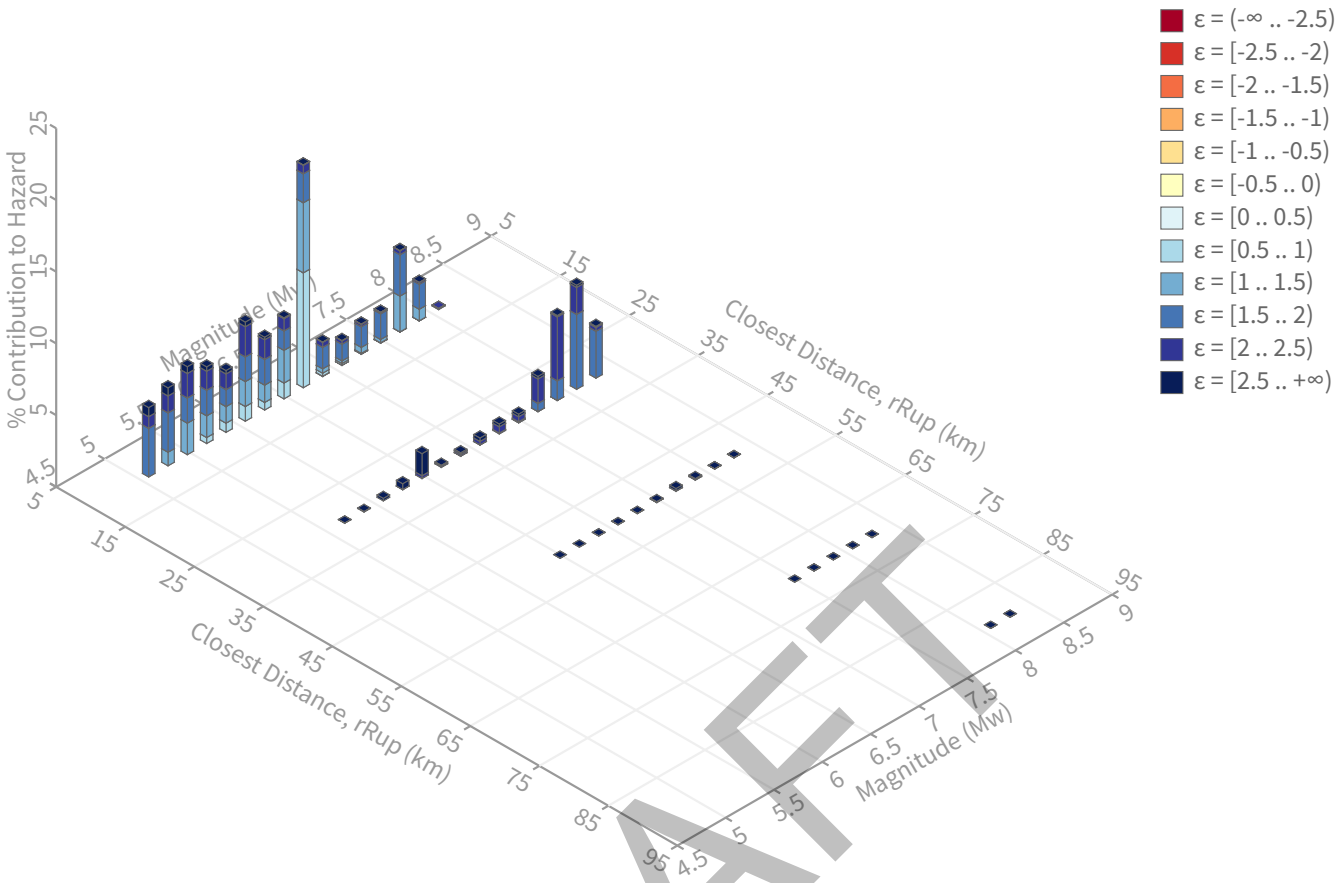
DRAFT

Deaggregation

Component

Total

DRAFT


ε = (-∞ .. -2.5)
ε = [-2.5 .. -2)
ε = [-2 .. -1.5)
ε = [-1.5 .. -1)
ε = [-1 .. -0.5)
ε = [-0.5 .. 0)
ε = [0 .. 0.5)
ε = [0.5 .. 1)
ε = [1 .. 1.5)
ε = [1.5 .. 2)
ε = [2 .. 2.5)
ε = [2.5 .. +∞)
% Contribution to Hazard
Magnitude (Mw)
Closest Distance, rRup (km)
Closest Distance, rRup (km)
Magnitude (Mw)

DRAFT

Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 0.75789666 g

Recovered targets

Return period: 3042.2855 yrs
Exceedance rate: 0.00032870025 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.06 %

Mean (over all sources)

m: 6.7
r: 13.84 km
ε_0: 1.7 σ

Mode (largest m-r bin)

m: 6.65
r: 5.33 km
ε_0: 1.1 σ
Contribution: 15.52 %

Mode (largest m-r-ε_0 bin)

m: 6.64
r: 3.79 km
ε_0: 0.8 σ
Contribution: 8.01 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

DRAFT

Deaggregation Contributors

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
UC33brAvg_FM31	System							31.62
Fontana (Seismicity) [2]		3.84	6.61	0.93	117.580°W	33.995°N	137.58	7.68
San Andreas (San Bernardino N) [2]		31.05	7.97	2.10	117.404°W	34.242°N	36.53	4.27
San Jacinto (San Bernardino) [2]		26.98	8.09	1.91	117.353°W	34.141°N	59.26	3.50
Whittier alt 1 [1]		17.41	7.49	1.70	117.663°W	33.863°N	197.20	3.07
Chino alt 1 [1]		11.79	6.48	2.01	117.703°W	33.950°N	230.32	2.83
Cucamonga [3]		16.79	7.73	1.65	117.671°W	34.158°N	338.85	1.82
Elsinore (Glen Ivy) rev [0]		21.10	6.63	2.51	117.590°W	33.829°N	176.24	1.18
Chino alt 1 [2]		11.79	6.69	1.91	117.703°W	33.950°N	230.32	1.13
San Jacinto (Lytle Creek connector) [1]		23.54	8.06	1.81	117.438°W	34.178°N	40.76	1.01
UC33brAvg_FM32	System							28.88
Fontana (Seismicity) [2]		3.84	6.61	0.93	117.580°W	33.995°N	137.58	6.29
San Andreas (San Bernardino N) [2]		31.05	7.97	2.10	117.404°W	34.242°N	36.53	4.36
San Jacinto (San Bernardino) [2]		26.98	8.08	1.91	117.353°W	34.141°N	59.26	3.44
Whittier alt 2 [1]		17.89	7.57	1.70	117.671°W	33.864°N	199.71	2.83
Chino alt 2 [1]		11.47	6.84	1.81	117.700°W	33.952°N	230.28	2.77
Cucamonga [3]		16.79	7.75	1.64	117.671°W	34.158°N	338.85	1.86
Elsinore (Glen Ivy) rev [0]		21.10	6.61	2.52	117.590°W	33.829°N	176.24	1.19
UC33brAvg_FM31 (opt)	Grid							19.97
PointSourceFinite: -117.605, 34.040		5.64	5.66	1.38	117.605°W	34.040°N	0.00	5.44
PointSourceFinite: -117.605, 34.040		5.64	5.66	1.38	117.605°W	34.040°N	0.00	5.44
PointSourceFinite: -117.605, 34.103		9.89	5.87	1.93	117.605°W	34.103°N	0.00	2.07
PointSourceFinite: -117.605, 34.103		9.89	5.87	1.93	117.605°W	34.103°N	0.00	2.07
UC33brAvg_FM32 (opt)	Grid							19.53
PointSourceFinite: -117.605, 34.040		5.64	5.66	1.38	117.605°W	34.040°N	0.00	5.34
PointSourceFinite: -117.605, 34.040		5.64	5.66	1.38	117.605°W	34.040°N	0.00	5.34
PointSourceFinite: -117.605, 34.103		9.89	5.87	1.93	117.605°W	34.103°N	0.00	2.07
PointSourceFinite: -117.605, 34.103		9.89	5.87	1.93	117.605°W	34.103°N	0.00	2.07

DRAFT

APPENDIX E

REFERENCES

DRAFT

RMA Group
Every Project Matters | www.rmacompanies.com

APPENDIX E

REFERENCES

1. California Building Standards Commission, 2022 California Building Code.

2. California Department of Conservation, Division of Mines and Geology, 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A.

3. California Geological Survey, 2020, Online Data Viewer: Landslide Inventory, Seismic Hazards Program (Alquist-Priolo Fault Zones and Traces, Landslide Zones, Liquefaction Zones), Historic Earthquakes 1769 to 2015 (Map Sheet 48) and Fault Activity Map of California.

4. California Geological Survey, 2018, Earthquake Fault Zones, A Guide for Governmental Agencies, Property Owners, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California, Special Publication 42.

5. California Geological Survey, 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A.

6. Cao, Y. and others, 2003, The Revised 2002 California Probabilistic Seismic Hazard Maps, June 2003.

7. Carson, S.E. and Matti, J.C., 1985, Contour Map Showing Minimum Depth to Ground Water, Upper Santa Ana River Valley, California, 1973-1979: U.S. Geological Survey Map MF – 1802.

8. City of Ontario, 2010, General Plan Safety Element.

9. Federal Emergency Management Agency, 2008, Flood Insurance Rate Map (FIRM) 06071C8638H, August 28, 2008.

10. Google Earth, Aerial Photographs, 2023, 2022, 2021, 2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013, 2012, 2011, 2009, 2008, 2007, 2006, 2005, 2004, 2003, 2002, 1994, .

11. Fife, D.L. and others, 1976, Geologic Hazards in Southwestern San Bernardino County, California: California Division of Mines and Geology Special Report 113.

12. Historicaerials.com, Aerial Photographs, 2020, 2018, 2016, 2014, 2012, 2010, 2009, 2005, 2002, 1999, 1994, 1985, 1980, 1966, 1959, 1948, 1938.

13. Ishihara, K., 1985, Stability of Natural Deposits during Earthquakes, Proceedings of the Eleventh International Conference on Soil Mechanics and Foundation Engineering, San Francisco, CA.

14. Jennings, C.W., and Bryant, W.A, 2010, Fault Activity Map of California, California Geological Survey, Geologic Data Map No. 6.

15. Martin, G.R. and Lew, M., 1999, Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California, Southern California Earthquake Center publication.

DRAFT

16. Morton, D.M. and Miller, F., 2006, Geologic Map of the Santa Ana and San Bernardino 30' x 60' Quadrangles, Southern California: U.S. Geological Survey OFR 2006-1217.

17. SEAOC Seismology Committee, 2019, "Seismically Induced Lateral Earth Pressures on Retaining Structures and Basement Walls," August 2019, *The SEAOC Blue Book: Seismic Design Recommendations*, Structural Engineers Association of California, Sacramento, CA.

18. Seed, H.B. and Whitman, R.V., 1970, Design of Earth Structures for Dynamic Loads *in* American Society of Civil Engineers Specialty Conference State-of-the Art Paper, Lateral Stresses in the Ground and Design of Earth-Retaining Structures.

19. Tokimatsu, K. and Seed, H.B., 1987, Evaluation of Settlements in Sands Due to Earthquake Shaking, Journal of Soil Mechanics and Foundation Engineering, Vol. 113, No. 8.

20. U.S. Army Corps of Engineers, 2003, Engineering and Design - Stability Analysis of Concrete Structures, Publication CECW-E, Circular No. 1110-2-6058, Appendix G, http://www.usace.army.mil/publications/eng-circulars/ec1110-2-6058/

DRAFT