Appendix G

Geotechnical Report

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

GEOTECHNICAL INVESTIGATION AND INFILTRATION ASSESSMENT

PROPOSED RETAIL DEVELOPMENT - LIBERTY BELL PLAZA

Valley Center Road
Valley Center, CA

Prepared By:
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Prepared For:
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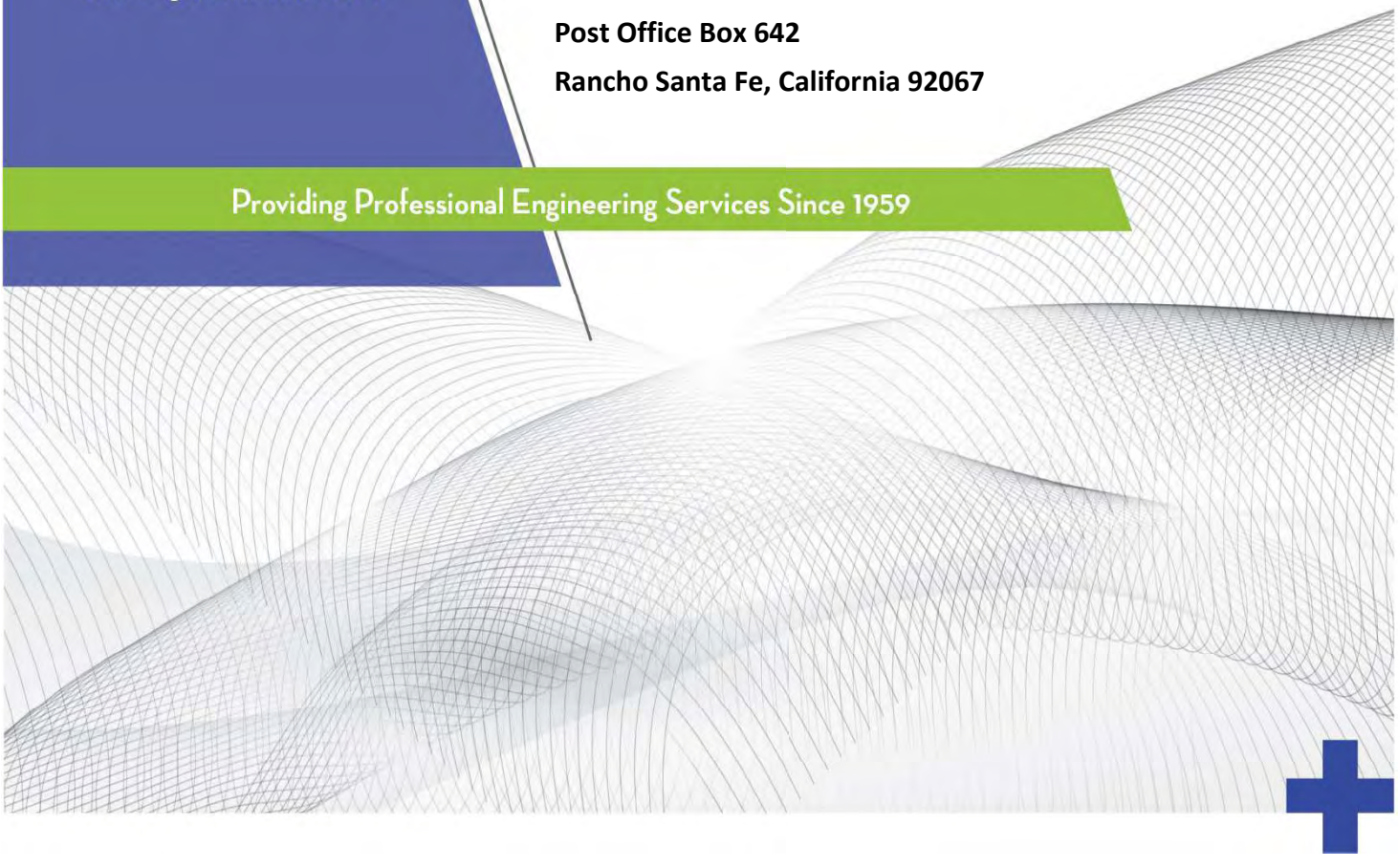

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December 21, 2018

SCST No. 180384N
Report No. 1

Mr. Steve Flynn
Bell Holdings, LLC
Post Office Box 642
Rancho Santa Fe, CA 92067

Subject: GEOTECHNICAL INVESTIGATION AND INFILTRATION ASSESSMENT
PROPOSED RETAIL DEVELOPMENT
LIBERTY BELL PLAZA
VALLEY CENTER ROAD
VALLEY CENTER, CALIFORNIA

Dear Mr. Flynn:

SCST, LLC (SCST) is pleased to present our report describing the geotechnical investigation and infiltration assessment performed for the subject project. We understand the project will consist of the design and construction of a retail center and its associated improvements at the site. The improvements will include seven structures, associated parking and hardscape areas.

SCST conducted the geotechnical investigation and infiltration assessment in general conformance with the scope of work presented in our proposal dated August 24, 2018. In addition, the infiltration characteristics of the existing soil conditions at the site were also evaluated.

Based on the results of our investigation, we consider the planned construction feasible from a geotechnical standpoint, provided the recommendations of this report are followed. If you have any questions, please call us at (619) 280-4321.

Respectfully Submitted,
SCST, LLC

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1 INTRODUCTION

SCST, LLC is pleased to present our report describing the geotechnical investigation and infiltration assessment performed for the subject project. We understand the project will consist of the design and construction of a retail center and its associated improvements at the subject site. The purpose of our work is to provide conclusions and recommendations regarding the geotechnical and infiltration aspects of the project. Figure 1 presents a site vicinity map.

2 SCOPE OF WORK

2.1 FIELD INVESTIGATION

We explored the subsurface conditions by drilling eight borings to depths ranging from approximately 2 to 35½ feet using a truck-mounted drill rig equipped with an 8-inch hollow stem auger. An SCST engineer logged the borings and collected samples of the materials encountered for examination and laboratory testing. Logs of the borings are presented in Appendix I. Soils are classified according to the Unified Soil Classification System illustrated on Figure I-1.

Additionally, SCST conducted an infiltration feasibility study at the site on November 9, 2018. Our infiltration feasibility study consisted of drilling nine borings with hand tools and converting borings to borehole percolation test holes. The borehole percolation testing was performed according to the San Diego Storm Water Standards BMP Design Manual. The data and results of the borehole percolation testing are presented in Appendix III. Figure 2 shows the approximate locations of the borings and percolation tests.

2.2 LABORATORY TESTING

Selected samples obtained from the borings were tested to evaluate pertinent soil classification and engineering properties and enable development of geotechnical conclusions and recommendations. The laboratory tests consisted of particle-size distribution, in-place density, optimum moisture content, Atterberg limits, shear strength, expansion index, resistance “R” value, corrosivity potential, and sand equivalent. The results of the laboratory tests and brief explanations of the test procedures are presented in Appendix II.

2.3 ANALYSIS AND REPORT

The results of the field and laboratory tests were evaluated to develop conclusions and recommendations regarding:

- Subsurface conditions beneath the site
- Criteria for seismic design in accordance with the 2016 California Building Code (CBC)
- Site preparation and grading

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- Pavement structural sections
- Geotechnical parameters for the design of retaining walls
- Estimated foundation settlements
- Support for concrete slabs-on-grade
- Soil corrosivity

3 SITE DESCRIPTION

The site is an irregular-shaped lot located east of Valley Center Road between Rinehart Lane and Charlan Road in Valley Center, California. The site is currently undeveloped. Site improvements include a storm drain that runs east to west through the center of the site and the remaining concrete flatwork and pavement from a former structure located directly east of Mirar De Valle Road. Also located at the site are two large piles of imported soil/fill material. The site gently slopes from the south to the north corner with site elevations ranging from about 1,298 to 1,301 feet.

4 PROPOSED DEVELOPMENT

We understand the project will consist of the design and construction of a retail center and its associated improvements including seven biofiltration basins, site retaining walls, and permeable pavements are planned for the project.

5 SUBSURFACE CONDITIONS

Based on published geologic mapping (Kennedy and Tan, 2007), the site is underlain by old alluvial flood-plain deposits. However. the materials encountered in our borings consist of fill, old alluvial flood-plain deposits, and granitic rock. Figure 3 presents the regional geology in the vicinity of the site. Descriptions of the materials are presented below.

Fill (Qf): Two distinct types of fill were encountered during our investigation. In the areas around B-1 and B-8, 10-foot-high stockpiles of soil were observed. We understand the stockpiled fill was generated from grading activities at the nearby Valley Center Tractor Supply Project. This fill material consists of clayey sand with trace gravel and does not extend beyond the existing ground surface.

The second type of fill encountered consists of clayey or silty sand. This fill material extends to depths between about 2 and 5 feet below the existing ground surface. Deeper fill materials may be encountered in areas not explored on the site.

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Old Alluvial Flood-plain Deposits (Qoa): The old alluvial flood-plain deposits consist of clayey sand and silty, clayey sand with variable amounts of gravel. The alluvial deposits extend to depths up to 16 feet below the existing ground surface.

Granitic Rock: The granitic rock underlies the old alluvial flood-plain deposits. The granitic rock ranges from moderately to very hard and is weathered.

Groundwater: Groundwater was encountered at a depth of 31 feet in boring B-2. Groundwater levels may fluctuate in the future due to rainfall, irrigation, broken pipes, or changes in site drainage.

6 CBC SEISMIC DESIGN PARAMETERS

A geologic hazard that could affect the project is ground shaking as a result of movement along an active fault in the vicinity of the site. Figure 4 presents the regional fault map. The seismic design parameters in accordance with the 2016 CBC are presented below:

Site Coordinates: Latitude 33.21127°
Longitude -117.03322°
Site Class: C
Site Coefficient F_a = 1.015
F_v = 1.538
Spectral Response Acceleration at Short Periods S_s = 1.211 g
Spectral Response Acceleration at 1-Second Period S_1 = 0.462 g
Design Spectral Acceleration at Short Period, S_{DS}= 0.820 g
Design Spectral Acceleration at 1-Second Period, S_{D1}= 0.474 g
PGA_M= 0.463 g

6.1 LIQUEFACTION AND DYNAMIC SETTLEMENT

Liquefaction occurs when loose, saturated sands and silts are subjected to strong ground shaking. The soils lose shear strength and become liquid, resulting in large total and differential ground surface settlements and possible lateral spreading during an earthquake. Due to the relatively dense nature of the materials beneath the site, the potential for liquefaction and dynamic settlement to occur is low.

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6.2 LANDSLIDES AND SLOPE STABILITY

Evidence of landslides or slope instabilities was not observed during our investigation. The potential for landslides or slope instabilities to occur at the site is considered low.

6.3 FLOODING, TSUNAMIS, AND SEICHES

The site is not located within a flood zone. The site is not located within a mapped area on the State of California Tsunami Inundation Maps (Cal EMA, 2009). Seiches are periodic oscillations in large bodies of water such as lakes, harbors, bays, or reservoirs. The site is not located adjacent to any lakes or confined bodies of water. Therefore, the potential for flooding, tsunamis, or seiches to affect the site is considered low.

6.4 SUBSIDENCE

The site is not located in an area of known subsidence associated with fluid withdrawal (groundwater or petroleum); therefore, the potential for subsidence due to the extraction of fluids is considered low.

6.5 HYDRO-CONSOLIDATION

Hydro-consolidation can occur in recently deposited sediments (less than 10,000 years old) that were deposited in a semi-arid environment. Examples of such sediments are aeolian sands, alluvial fan deposits, and mudflow sediments deposited during flash floods. The pore spaces between the particle grains can re-adjust when inundated by groundwater causing the material to consolidate. The relatively dense materials underlying the site are not considered susceptible to hydro-consolidation.

7 CONCLUSIONS

Based on the results of our investigation, we consider the proposed construction feasible from a geotechnical standpoint provided the recommendations of this report are followed. The main geotechnical considerations affecting the proposed construction are the presence of potentially compressible existing fill. Remedial grading will need to be performed to reduce the potential for distress to the proposed structure and improvements. Remedial grading recommendations are provided in the following sections of this report. The planned structures can be supported on spread footings with bottoms levels on compacted fills. The recommendations presented herein may need to be updated once final plans are developed.

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8 RECOMMENDATIONS

8.1 SITE PREPARATION AND GRADING

8.1.1 Site Preparation

Site preparation should begin with the removal of existing improvements, vegetation, and debris. Existing fill should be excavated in its entirety from beneath the planned structures and settlement sensitive improvements. Additionally, alluvium within 2 feet of the deepest planned footing bottom should be excavated. Horizontally, the excavation should extend approximately 5 feet outside the perimeter of planned improvements, or up to existing improvements, whichever is less. Footing bottoms should rest entirely on compacted fill.

In pavement or hardscape areas, fill also should be excavated 2 feet below planned subgrade elevations. Horizontally, the excavation should extend approximately 2 feet outside the perimeter of planned hardscape areas, or up to existing improvements, whichever is less. An SCST representative should observe conditions exposed in the bottom of the excavation to assess if additional excavation is recommended.

8.1.2 Earthwork

Excavated material, except for roots, debris and rocks greater than 6 inches, can be used as compacted fill but may not meet the recommended specifications for fill beneath improvements. Material within 1½ feet of finish grade of concrete pavements or slabs-on-grade should be underlain by material with an expansion index of 50 or less. It is expected that the on-site material will meet this criteria. The material exposed in the bottom of the excavation should be scarified to a depth of 12 inches, moisture conditioned to 2 to 3% above optimum moisture content and compacted to 90% relative compaction based on ASTM 1557 laboratory test procedure. All references to relative compaction and optimum moisture content in this report are based on this test procedure. Fill should be moisture conditioned to 2 to 3% above optimum moisture content and compacted to at least 90% relative compaction. Fill should be placed in horizontal lifts at a thickness appropriate for the equipment spreading, mixing, and compacting the material, but generally should not exceed 8 inches in loose thickness. Utility trench backfill beneath structures, pavements and hardscape should be compacted to at least 95% relative compaction. The top 12 inches of subgrade beneath pavements should be compacted to at least 95% relative compaction.

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8.1.3 Site Excavation Characteristics

It is anticipated that excavations can be achieved with conventional earthwork equipment in good working order. However, the contractor should be prepared to encounter very hard granitic rock and oversized material.

8.1.4 Oversized Material

Excavations may generate oversized material. Oversized material is defined as rocks or cemented clasts greater than 6 inches in dimension. Based on the planned construction, there does not appear to be suitable space onsite for disposal of oversized material within fills. Oversized material should be broken down to no greater than 6 inches in largest dimension for use in fill, used as landscape material, or disposed offsite.

8.1.5 Temporary Excavations

Temporary slopes in fill, alluvial deposits, or granitic rock should not be steeper than 1:1 (horizontal:vertical). The faces of temporary slopes should be inspected daily by the contractor's Competent Person before personnel are allowed to enter the excavation. Any zones of potential instability, sloughing or raveling should be brought to the attention of the Engineer and corrective action implemented before personnel begin working in the excavation. Excavated materials should not be stockpiled behind temporary excavations within a distance equal to the depth of the excavation. SCST should be notified if other surcharge loads are anticipated so that lateral load criteria can be developed for the specific situation. If temporary slopes are to be maintained during the rainy season, berms are recommended along the tops of the slopes to prevent runoff water from entering the excavation and eroding the slope faces.

8.1.6 Imported Soil

Imported soil should consist of predominately granular soil, free of organic matter and rocks greater than 6 inches. Imported soil should have an expansion index of 20 or less and should be observed and, if appropriate, tested by SCST prior to transport to the site.

8.1.7 Surface Drainage

Final surface grades around improvements should be designed to collect and direct surface water away from the structure and toward appropriate drainage facilities. The ground around the improvement should be graded so that surface water flows rapidly away from the structure without ponding. In general, we recommend that the ground adjacent to the improvement slope away at a gradient of at least 2%. Densely vegetated

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areas where runoff can be impaired should have a minimum gradient of at least 5% within the first 5 feet from the improvement. Site irrigation should be limited to the minimum necessary to sustain landscape growth. Should excessive irrigation, impaired drainage, or high rainfall occur, saturated zones of perched groundwater can develop.

8.1.8 Grading Plan Review

SCST should review the grading plans and earthwork specifications to ascertain whether the intent of the recommendations contained in this report have been implemented and that no revised recommendations are needed due to changes in the development.

8.2 FOUNDATIONS

8.2.1 Shallow Spread Footings

Footings should extend at least 18 inches below lowest adjacent finished grade. A minimum width of 12 inches is recommended for continuous footings and 24 inches for isolated or retaining wall footings. An allowable bearing capacity of 2,000 psf can be used. The allowable bearing capacity can be increased by 500 psf for each foot of depth below the minimum and 250 psf for each foot of width beyond the minimum up to a maximum of 3,000 psf. The bearing value can be increased by ⅓ when considering short-term loads, including wind or seismic forces.

Lateral loads will be resisted by friction between the bottoms of footings and passive pressure on the faces of footings and other structural elements below grade. An allowable coefficient of friction of 0.30 can be used. Passive pressure can be computed using an allowable lateral pressure of 200 psf per foot of depth below the ground surface for level ground conditions. Reductions for sloping ground should be made. The passive pressure can be increased by ⅓ when considering the total of all loads, including wind or seismic forces. The upper 1 foot of soil should not be relied on for passive support unless the ground is covered with pavements or slabs.

8.2.2 Settlement Characteristics

Total foundation settlements are estimated to be less than 1 inch. Differential settlements are estimated to be less than ½ inch over a distance of 40 feet. Settlements should be completed shortly after structural loads are applied.

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8.2.3 Foundation Plan Review

SCST should review the foundation plans to ascertain that the intent of the recommendations in this report has been implemented and that revised recommendations are not necessary as a result of changes after this report was completed.

8.2.4 Foundation Excavation Observations

A representative from SCST should observe the foundation excavations prior to forming or placing reinforcing steel.

8.3 SLABS-ON-GRADE

Interior concrete slabs-on-grade should be 5 inches thick with No. 4 reinforcing bar 18 inches on center each way. Slabs-on-grade should be underlain by a 4-inch-thick blanket of clean, poorly graded, coarse sand or crushed rock. A moisture vapor retarder/barrier should be placed beneath slabs where floor coverings will be installed. Typically, plastic is used as a vapor retardant. If plastic is used, a minimum 10-mil is recommended. The plastic should comply with ASTM E 1745. Plastic installation should comply with ASTM E 1643.

Current construction practice typically includes placement of a 2-inch-thick sand cushion between the bottom of the concrete slab and the moisture vapor retarder/barrier. This cushion can provide some protection to the vapor retarder/barrier during construction, and may assist in reducing the potential for edge curling in the slab during curing. However, the sand layer also provides a source of moisture vapor to the underside of the slab that can increase the time required to reduce moisture vapor emissions to limits acceptable for the type of floor covering placed on top of the slab. The floor covering manufacturer should be contacted to determine the volume of moisture vapor allowable and any treatment needed to reduce moisture vapor emissions to acceptable limits for the particular type of floor covering installed."

8.4 PAVEMENT SECTION RECOMMENDATIONS

The pavement support characteristics of the soils encountered during our investigation are considered poor to fair. Traffic Indices were assumed for design of preliminary pavement sections based on the traffic type. The actual R-value of the subgrade soils should be checked after grading and final pavement sections can be provided. Based on R-values of 19 and 21, the following pavement structural sections are recommended for the assumed Traffic Indices.

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Flexible Pavement Section Recommendations

Traffic Type	Traffic Index	Asphalt Concrete (inches)	Aggregate Base (inches)
Parking Stalls	4.5	3	6
Fire Lane	7.0	5	10

The top 12 inches of subgrade should be scarified, moisture conditioned to near optimum moisture content, and compacted to at least 95% relative compaction. All soft or yielding areas should be removed and replaced with compacted fill or aggregate base. Aggregate base and asphalt concrete should conform to the Caltrans Standard Specifications or "Greenbook" Standard Specifications for Public Works Construction and should be compacted to at least 95% relative compaction.

8.5 CONVENTIONAL RETAINING WALLS

8.5.1 Foundations

The recommendations provided in the foundation section of this report are also applicable to conventional retaining walls.

8.5.2 Lateral Earth Pressures

The active earth pressure for the design of unrestrained retaining walls with level backfill can be taken as equivalent to the pressure of a fluid weighing 35 pcf. The at-rest earth pressure for the design of restrained retaining walls with level backfills can be taken as equivalent to the pressure of a fluid weighing 55 pcf. These values assume a granular and drained backfill condition. An additional 20 pcf should be added to these values for walls with a 2:1 (horizontal:vertical) sloping backfill. An increase in earth pressure equivalent to an additional 2 feet of retained soil can be used to account for surcharge loads from light traffic. The above values do not include a factor of safety. Appropriate factors of safety should be incorporated into the design. If any other surcharge loads are anticipated, SCST should be contacted for the necessary increase in soil pressure. Retaining walls should be designed to resist hydrostatic pressures or be provided with a backdrain to reduce the accumulation of hydrostatic pressures. Backdrains may consist of a 2-foot-wide zone of ¾-inch crushed rock. The backdrain should be separated from the adjacent soils using a non-woven filter fabric, such as Mirafi 140N or equivalent. Weep holes should

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be provided, or a perforated pipe (Schedule 40 PVC) should be installed at the base of the backdrain and sloped to discharge to a suitable storm drain facility. As an alternative, a geocomposite drainage system such as Miradrain 6000 or equivalent placed behind the wall and connected to a suitable storm drain facility can be used. Figure 5 shows typical conventional retaining wall backdrain details.

8.5.3 Seismic Earth Pressure

If required, the seismic earth pressures can be taken as equivalent to the pressure of a fluid weighing 20 pcf for flexible walls or 39 pcf for stiff walls. These values are for level backfill conditions and do not include a factor of safety. Appropriate factors of safety should be incorporated into the design. This pressure is in addition to the un-factored static active pressures. The allowable passive pressure and bearing capacity can be increased by ⅓ in determining the seismic stability of the wall.

8.5.4 Backfill

Backfill should be compacted to at least 90% relative compaction. Backfill should consist of granular, free-draining material with an expansion index of 20 or less determined in accordance with ASTM D4829. Expansive or clayey soil should not be used. The onsite clayey sand will generally not meet the granular material criteria. Additionally, fill within 3 feet from the back of the wall should not contain rocks greater than 3 inches in dimension. Backfill should not be placed until walls have achieved adequate structural strength. Compaction of wall backfill will be necessary to minimize settlement of the backfill and overlying settlement sensitive improvements. However, some settlement should still be anticipated. Provisions should be made for some settlement of concrete slabs and pavements supported on backfill. Additionally, any utilities supported on backfill should be designed to tolerate differential settlement.

8.6 SOIL CORROSIVITY

A representative sample of the on-site soils was tested to evaluate corrosion potential. The test results are presented in Appendix II. The project design engineer can use the sulfate results in conjunction with ACI 318 to specify the water/cement ratio, compressive strength and cementitious material types for concrete exposed to soil. A corrosion engineer should be contacted to provide specific corrosion control recommendations.

8.7 INFILTRATION FEASIBILITY

We performed a total of nine borehole percolation tests at the project site. Appendix III presents the field data and test results. The table below presents the tested infiltration rates.

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TABLE 1 - Infiltration Rate Test Results

Test Location	Test Depth (feet)	Material Type at Test Depth (USCS Classification)	Infiltration Rate (inch/hour)
P-1	5	SILTY SAND (SM) to CLAYEY SAND (SC) with GRAVEL	2.6
P-2	5	SILTY SAND (SM) to CLAYEY SAND (SC)	0.3
P-3	4	SILTY SAND (SM) to CLAYEY SAND (SC)	0.7
P-4	2	SILTY SAND (SM) with GRAVEL	0.8
P-5	3½	SILTY SAND (SM) with GRAVEL	3.6
P-6	3	SILTY SAND (SM)	12.0
P-7	2	SILTY SAND (SM) with GRAVEL	0.3
P-8	4	SILTY SAND (SM)	2.1
P-9	3	SILTY SAND (SM)	4.5

Based on our test results, infiltration rates at some test locations were greater than 0.5 inches per hour. It is SCST's opinion that these results are reflective of infiltration rates at the end of a long, dry season, and historical groundwater depth in the area is as shallow as 1 foot below the existing ground surface. Despite the observed infiltration rates, infiltration in any appreciable quantity is not feasible at the site due to the reported historic high groundwater elevations. Presently, we recommend partial infiltration at the site.

9 GEOTECHNICAL ENGINEERING DURING CONSTRUCTION

The geotechnical engineer should review project plans and specifications prior to bidding and construction to check that the intent of the recommendations in this report has been incorporated. Observations and tests should be performed during construction. If the conditions encountered during construction differ from those anticipated based on the subsurface exploration program, the presence of the geotechnical engineer during construction will enable an evaluation of the

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exposed conditions and modifications of the recommendations in this report or development of additional recommendations in a timely manner.

10 CLOSURE

SCST should be advised of any changes in the project scope so that the recommendations contained in this report can be evaluated with respect to the revised plans. Changes in recommendations will be verified in writing. The findings in this report are valid as of the date of this report. Changes in the condition of the site can, however, occur with the passage of time, whether they are due to natural processes or work on this or adjacent areas. In addition, changes in the standards of practice and government regulations can occur. Thus, the findings in this report may be invalidated wholly or in part by changes beyond our control. This report should not be relied upon after a period of two years without a review by us verifying the suitability of the conclusions and recommendations to site conditions at that time.

In the performance of our professional services, we comply with that level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions and in the same locality. The client recognizes that subsurface conditions may vary from those encountered at the boring locations and that our data, interpretations, and recommendations are based solely on the information obtained by us. We will be responsible for those data, interpretations, and recommendations, but shall not be responsible for interpretations by others of the information developed. Our services consist of professional consultation and observation only, and no warranty of any kind whatsoever, express or implied, is made or intended in connection with the work performed or to be performed by us, or by our proposal for consulting or other services, or by our furnishing of oral or written reports or findings.

11 REFERENCES

American Concrete Institute (ACI) (2012), Building Code Requirements for Structural Concrete (ACI 318-11) and Commentary, August.

Caltrans (2010), Standard Specifications.

Caltrans (2014), Pervious Pavement Design Guide. California Department of Transportation, August.

FEMA (2012), Flood Insurance Rate Map, San Diego County, California and Incorporated Areas, Map No. 06073C0810G, dated May 16th.

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International Code Council (2015), 2016 California Building Code, California Code of Regulations, Title 24, Part 2, Volume 2 of 2, Based on the 2015 International Existing Building Code, Effective January 1, 2017.

Kennedy, M.P. and Tan, S.S. (2008), Geologic Map of Oceanside 30' x 60' Quadrangle, California, California Geological Survey, Scale 1:100,000.

Public Works Standards, Inc. (2018), "Greenbook" Standard Specifications for Public Works Construction, 2018 Edition.

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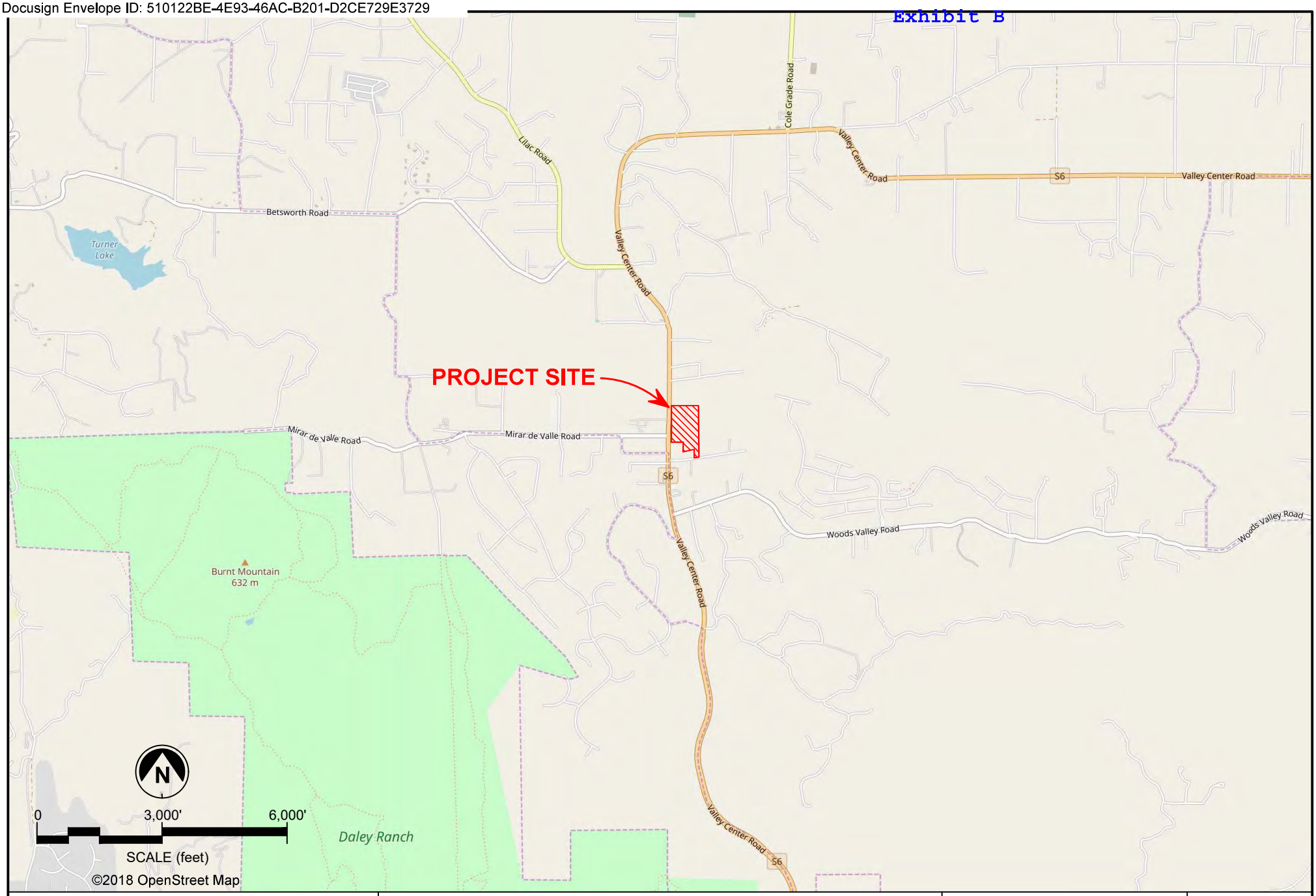
Exhibit B



SCST, LLC	**SITE VICINITY MAP** Liberty Bell Plaza Valley Center, California	Date: December, 2018 By: DTC Job No.: 180384N-1	Figure: 1

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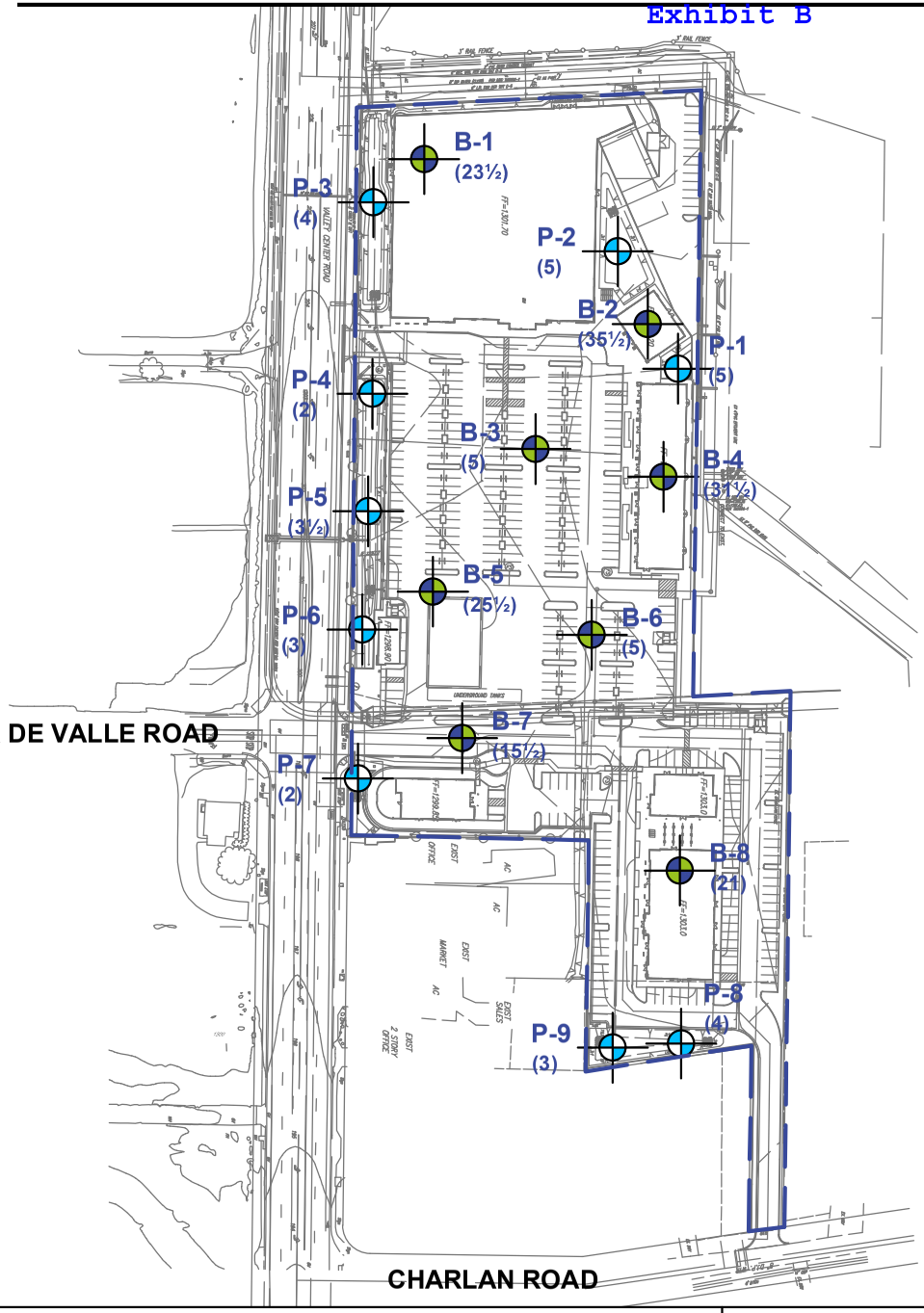
Exhibit B



N

0 200' 400'

SCALE (feet)

NOTE: All locations are approximate

SCST LEGEND:

- B-8 (21) — Location of Boring (Depth in Feet)
- P-9 (3) — Location of Percolation Test (Depth in Feet)
- Project Limits

SCST, LLC

SUBSURFACE EXPLORATION MAP

Liberty Bell Plaza
Valley Center, California

Date: December, 2018
By: DTC
Job No.: 180384N-1

Figure: 2

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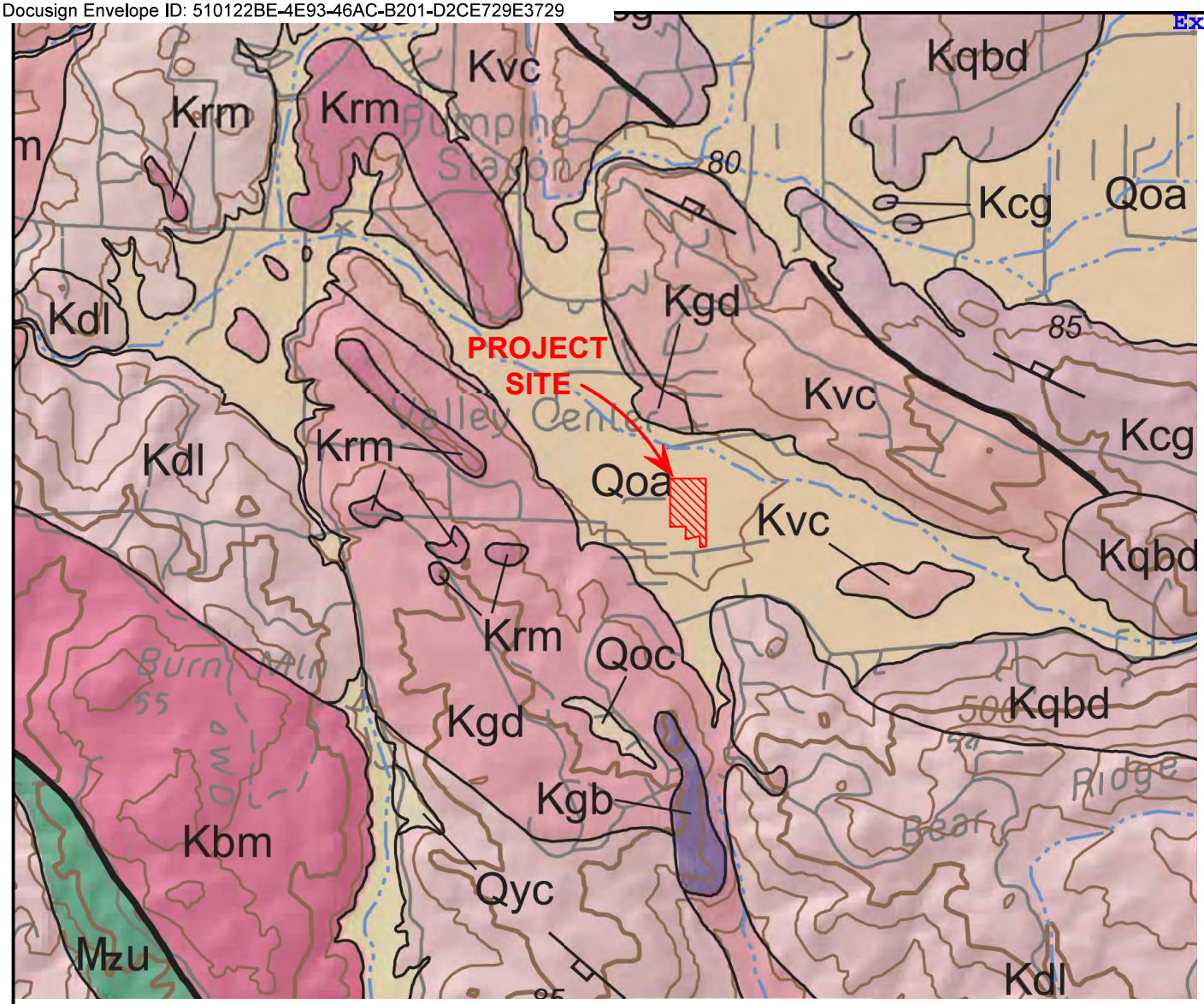


EXPLANATION:

Qyc	Young colluvial deposits
Qoa	Old alluvial flood-plain deposits
Qoc	Old colluvial deposits
Kgd	Granodiorite
Kqbd	Quartz-bearing diorite
Kdl	Granite of Dixon Lake
Kvc	Monzogranite of Valley Center
Kmm	Monzogranite of Merriam Mountain
Kcg	Tonalite of Cole Grade
Krm	Quartz-bearing diorite of Red Mountain
Mzu	Metasedimentary and metavolcanic rocks

N

0 3,000' 6,000'

SCALE (feet)

Reference:
Kennedy, M.P. and Tan, S.S. (2008), Geologic Map of the Oceanside 30' x 60' Quadrangle, California, California Geological Survey, Scale 1:100,000

70 U D

Fault - Solid where accurately located; dashed where approximately located; dotted where concealed. U = upthrown block, D = downthrown block. Arrow and number indicate direction and angle of dip of fault plane.

Inclined Strike and dip of beds

SCST, LLC

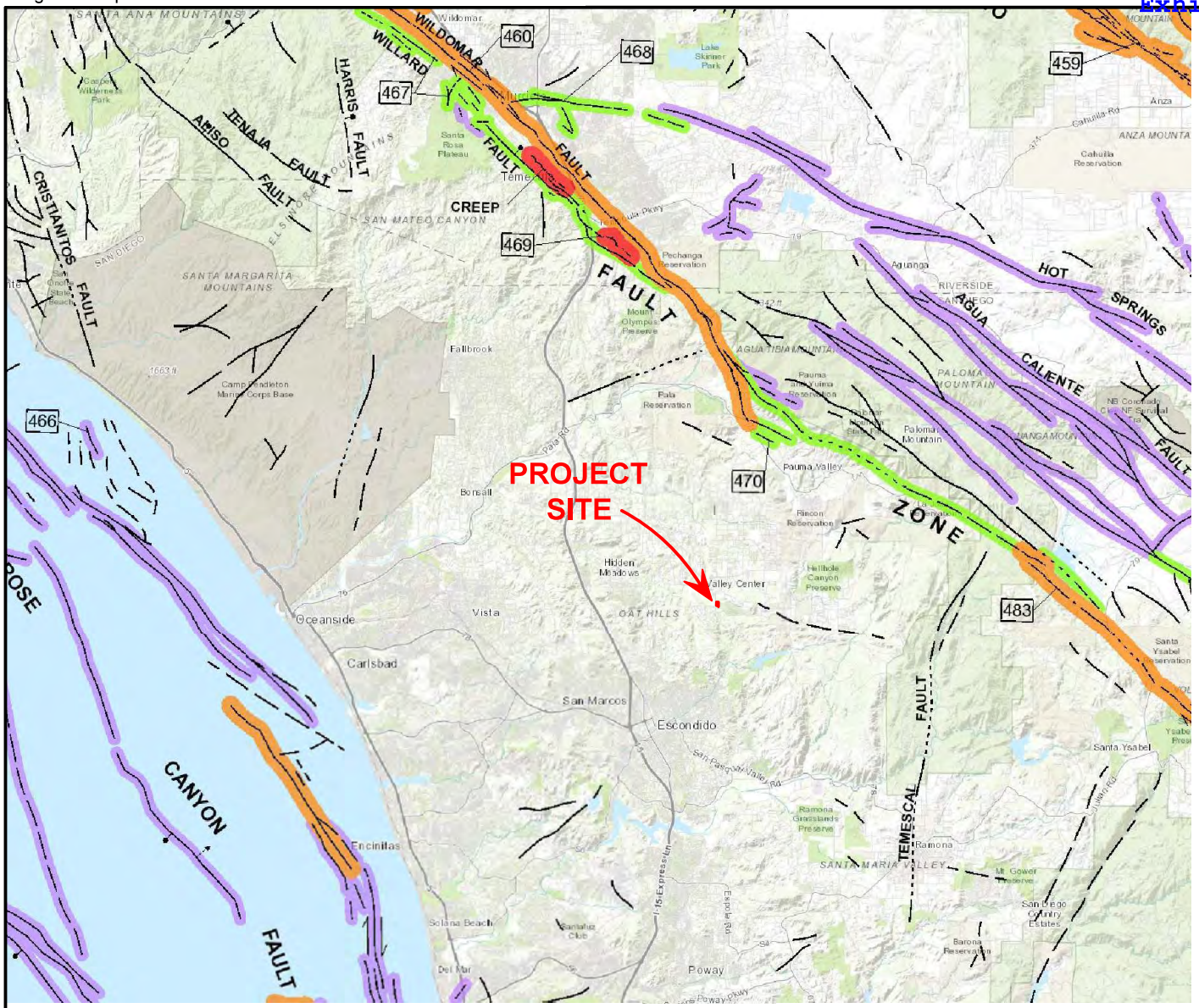
REGIONAL GEOLOGY MAP
Liberty Bell Plaza
Valley Center, California

Date: December, 2018
By: DTC
Job No.: 180384N-1

Figure: 3

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Exhibit B



EXPLANATION:

Fault along which historic (last 200 years) displacement has occurred

Holocene fault displacement (during past 11,700 years) without historic record.

Late Quaternary fault displacement (during past 700,000 years).

Quaternary fault (age undifferentiated).

Pre-Quaternary fault (older than 1.6 million years) or fault without recognized Quaternary displacement.

Low angle fault (barbs on upper plate).

459	Clark Fault - San Jacinto fault zone (certain)
460	Wildomar Fault - Elsinore Fault Zone (certain)
466	Willard Fault - Elsinore Fault Zone (certain)
468	Murrietta Hot Springs fault - Murrietta Hot Springs Fault Zone (certain)
469	Wolf Valley Fault - Elsinore Fault Zone (certain)
470	Unnamed faults flanking Aqua Tibia Mountain (certain)
483	Elsinore Fault - Elsinore Fault Zone (certain)

N

0 8 16

SCALE (miles)

Reference:
Jennings, C.W., Bryant W.A., Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, Fault Activity Map or California (2010)

SCST, LLC

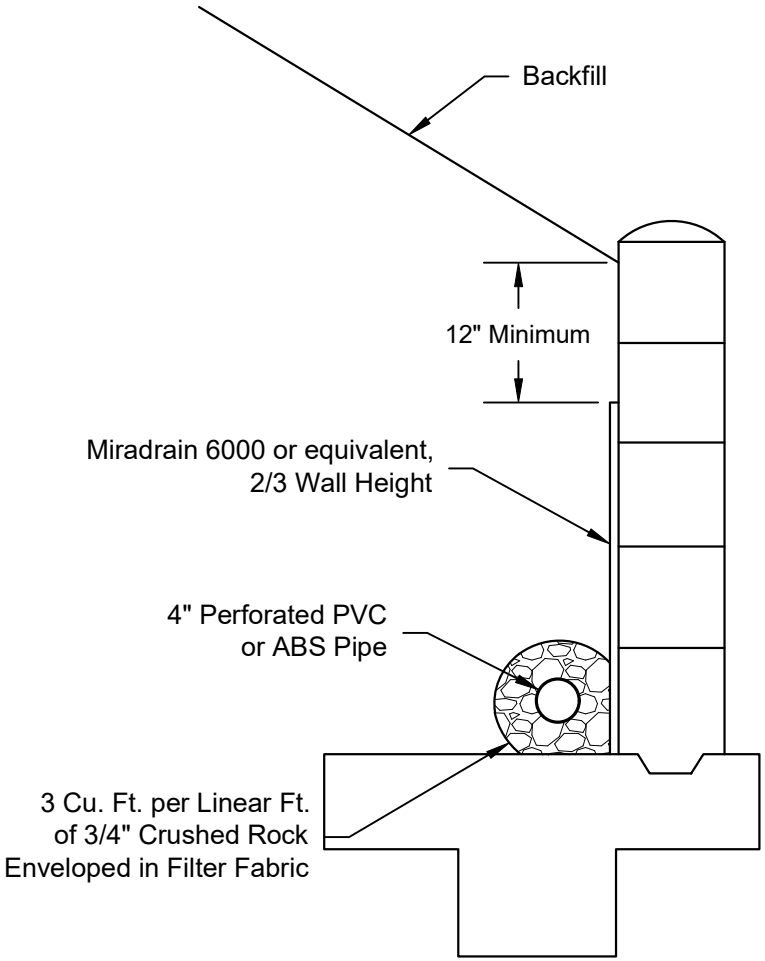
FAULT MAP
Liberty Bell Plaza
Valley Center, California

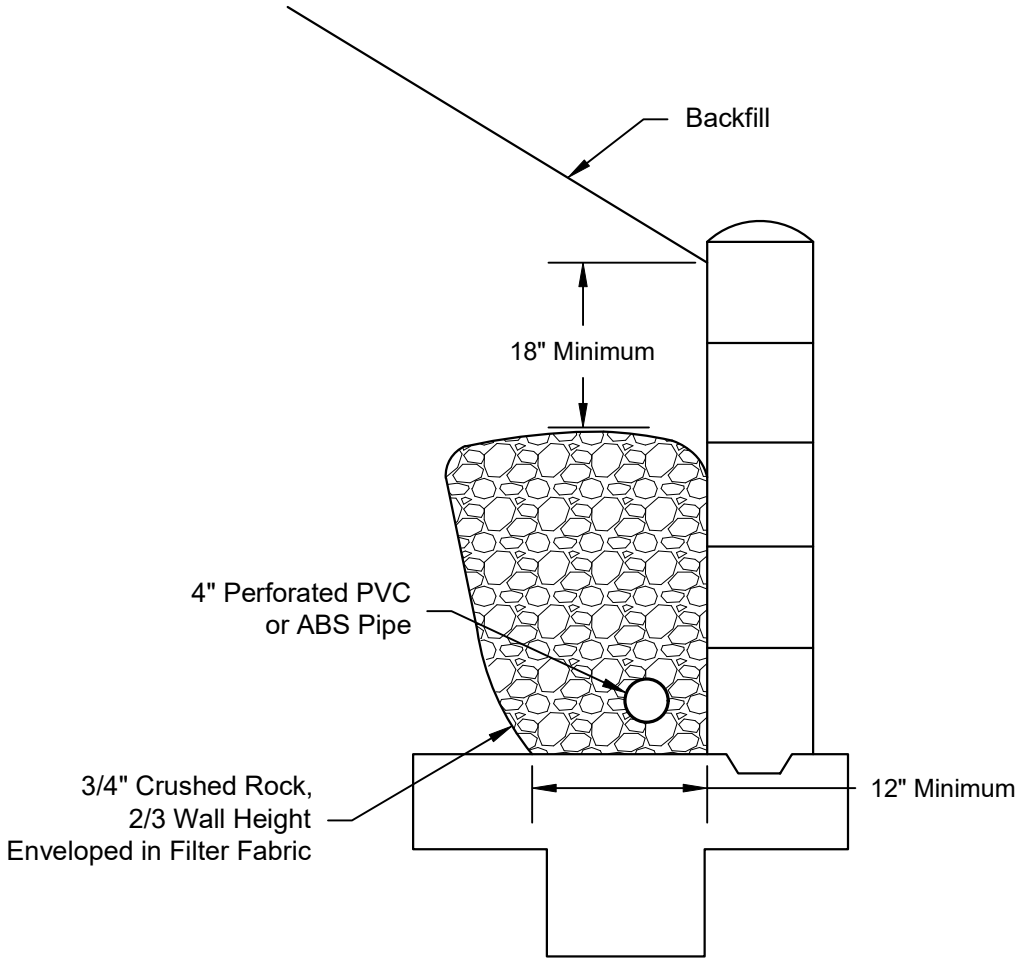
Date: December, 2018
By: DTC
Job No.: 180384N-1

Figure: 4

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Exhibit B





NOT TO SCALE

NOTES:

1) Dampproof or waterproof back of wall following architect's specifications.
2) 4" minimum perforated pipe, SDR35 or equivalent, holes down, 1% fall to outlet. Provide solid outlet pipe at suitable locations.
3) Drain installation and outlet connection should be observed by the geotechnical consultant.

SCST, LLC	**TYPICAL RETAINING WALL BACKDRAIN DETAILS** Liberty Bell Plaza Valley Center, California	Date: December, 2018 By: DTC Job No.: 180384N-1	Figure: 5

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

APPENDIX I
FIELD INVESTIGATION

Our field investigation consisted of drilling eight borings and nine percolation borehole tests at the site on November 8 and 21, 2018. Figure 2 shows the approximate locations of the borings and percolation tests. The field investigation was performed under the observation of an SCST geologist who also logged the borings and obtained samples of the materials encountered. Relatively undisturbed samples were obtained using a modified California (CAL) sampler, which is ring-lined split tube sampler with a 3-inch outer diameter and 2½-inch inner diameter. Standard Penetration Tests (SPT) were performed using a 2-inch outer diameter and 1⅜-inch inner diameter split tube sampler. The CAL and SPT samplers were driven with a 140-pound weight dropping 30 inches. The number of blows needed to drive the samplers the final 12 inches of an 18-inch drive is noted on the borings logs as “Driving Resistance (blows/ft of drive).” SPT and CAL sampler refusal was encountered when 50 blows were applied during any one of the three 6-inch intervals, a total of 100 blows was applied, or there was no discernible sampler advancement during the application of 10 successive blows. Because the SPT sampler was driven with a cathead and rope, the driving resistance is representative of a 60% energy transfer ratio (N60). Disturbed bulk samples were obtained from the SPT sampler and the drill cuttings.

The soils are classified in accordance with the Unified Soil Classification System as illustrated on Figure I-1. Logs of the borings are presented on Figures I-2 through I-23.

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

SUBSURFACE EXPLORATION LEGEND

UNIFIED SOIL CLASSIFICATION CHART

SOIL DESCRIPTION		GROUP SYMBOL	TYPICAL NAMES
I. COARSE GRAINED, more than 50% of material is larger than No. 200 sieve size.			
GRAVELS More than half of coarse fraction is larger than No. 4 sieve size but smaller than 3".	CLEAN GRAVELS	GW	Well graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly graded gravels, gravel sand mixtures, little or no fines.
	GRAVELS WITH FINES (Appreciable amount of fines)	GM	Silty gravels, poorly graded gravel-sand-silt mixtures.
		GC	Clayey gravels, poorly graded gravel-sand, clay mixtures.
SANDS More than half of coarse fraction is smaller than No. 4 sieve size.	CLEAN SANDS	SW	Well graded sand, gravelly sands, little or no fines.
		SP	Poorly graded sands, gravelly sands, little or no fines.
		SM	Silty sands, poorly graded sand and silty mixtures.
		SC	Clayey sands, poorly graded sand and clay mixtures.
II. FINE GRAINED, 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, sandy silt or clayey-silt-sand mixtures 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 or low plasticity.
	SILTS AND CLAYS (Liquid Limit greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		CH	Inorganic clays of high plasticity, fat clays.
		OH	Organic clays of medium to high plasticity.
III. HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils.

SAMPLE SYMBOLS

- ☒ - Bulk Sample
- CAL - Modified California Sampler
- CK - Undisturbed Chunk sample
- MS - Maximum Size of Particle
- ST - Shelby Tube
- SPT - Standard Penetration Test sampler

GROUNDWATER SYMBOLS

- ▽ - Water level at time of excavation or as indicated
- ≋ - Water seepage at time of excavation or as indicated

LABORATORY TEST SYMBOLS

- AL - Atterberg Limits
- CON - Consolidation
- COR - Corrosivity Tests (Resistivity, pH, Chloride, Sulfate)
- DS - Direct Shear
- EI - Expansion Index
- MAX - Maximum Density
- RV - R-Value
- SA - Sieve Analysis
- SE - Sand Equivalent

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-1

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING B-1

Date Drilled: 11/21/2018 | Logged by: EMW
Equipment: CME-75 w/8-inch HSA | Reviewed by: DS
Elevation (ft): Approx. 1310 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1	SC	**FILL (Qf):** CLAYEY SAND, loose to medium dense, dark brown, moist, fine to medium grained, trace gravel.							
2									
3									
4									
5									EI SE COR
6			CAL		27	23			
7									
8									
9									
10									
11		Yellowish brown, medium to coarse grained.	SPT		16	21			
12									
13									
14									
15			SPT		50/3	>50			
16		**GRANITIC ROCK:** light brown to orange brown, moist, weathered, hard to very hard.							
17									
18									
19									
20									

BORING CONTINUED ON I-3

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-2

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING B-1 (continued)

Date Drilled: 11/21/2018 | Logged by: EMW
Equipment: CME-75 w/8-inch HSA | Reviewed by: DS
Elevation (ft): Approx. 1310 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
21		**GRANITIC ROCK:** light brown to orange brown, moist, weathered, very hard.	CAL		50/1	>50	7.7	107.8	
22									
23			SPT		50/1	>50			
24		**AUGER REFUSAL AT 23½ FEET ON GRANITIC ROCK**							
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-3

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING B-2

Date Drilled: 11/21/2018 | Logged by: EMW
Equipment: CME-75 w/8-inch HSA | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): 31

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1–5	SM-SC	**FILL (Qf):** SILTY, CLAYEY SAND, loose, brown, moist, fine to medium grained, few gravel.		X					AL SA
6–9	SC	**OLD ALLUVIAL FLOOD-PLAIN DEPOSITS (Qoa):** CLAYEY SAND, medium dense, dark brown, moist, fine to medium grained, trace gravel.	CAL		34		16.2	114.9	
10–11			SPT		8	10			AL SA
12–15									
16			CAL		41	35	10.7	128.7	
17–20		**GRANITIC ROCK:** gray to brownish gray, moist, weathered, moderately hard.							

BORING CONTINUED ON I-5

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-4

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING B-2 (continued)

Date Drilled: 11/21/2018 | Logged by: EMW
Equipment: CME-75 w/8-inch HSA | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): 31

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
21		**GRANITIC ROCK:** gray to brownish gray, moist, weathered, hard.	SPT		50/5	>50			
22									
23									
24		Very hard.							
25		Grayish brown.	CAL		50/2	>50			
26									
27									
28									
29									
30									
31		▽ Groundwater at 31'	SPT		72	94			
32									
33									
34									
35			SPT		50/2	>50			
36		**AUGER REFUSAL AT 35½ FEET ON GRANTIC ROCK**							
37									
38									
39									
40									

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-5

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING B-3

Date Drilled: 11/21/2018 | Logged by: EMW
Equipment: CME-75 w/8-inch HSA | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1	SC	**FILL (Qf)**: CLAYEY SAND, loose, brown to orange brown, moist, fine to medium grained, trace gravel.		X					SA RV
2									
3									
4									
5		**BORING TERMINATED AT 5 FEET**							
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-6

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING B-4

Date Drilled: 11/21/2018 | Logged by: EMW
Equipment: CME-75 w/8-inch HSA | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1–5	SC	**FILL (Qf):** CLAYEY SAND, loose, brown, moist, fine to medium grained, trace gravel.		X					
5–10	SC	**OLD ALLUVIAL FLOOD-PLAIN DEPOSITS (Qoa):** CLAYEY SAND, medium dense, brown to reddish brown, moist, fine to coarse grained, trace gravel.	SPT		9	12			
11–20		**GRANITIC ROCK:** brown to light brown, moist, weathered, hard.	CAL		39	33	15.4	117.5	
16		Brown.							
19		Very hard.							

BORING CONTINUED ON I-8

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-7

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING B-4 (continued)

Date Drilled: 11/21/2018 | Logged by: EMW
Equipment: CME-75 w/8-inch HSA | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
21		**GRANITIC ROCK:** gray and white, moist, weathered, very hard.	SPT		50/2	>50	13.7	113.6	
22									
23									
24									
25		Gray with red.	SPT		50/2	>50			
26									
27									
28									
29									
30		Gray with orange.	SPT		50/1	>50			
31		**BORING TERMINATED AT 31½ FEET**							
32									
33									
34									
35									
36									
37									
38									
39									
40									

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-8

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING B-5

Date Drilled: 11/21/2018 | Logged by: EMW
Equipment: CME-75 w/8-inch HSA | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1–4	SC	**FILL (Qf):** CLAYEY SAND, loose, dark brown, moist, fine grained, trace gravel.		X					SA EI COR
5–10	SC	**OLD ALLUVIAL FLOOD-PLAIN DEPOSITS (Qoa):** CLAYEY SAND, medium dense, brown, moist, fine to coarse grained.	CAL		32	27	12.7	118.4	CON
10–14		**GRANITIC ROCK:** reddish brown, moist, weathered, moderately hard.	SPT		19	25			
14–15		Hard.	CAL		50/4	>50	5.2	115.6	
16–20									

BORING CONTINUED ON I-10

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-9

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING B-5 (continued)

Date Drilled: 11/21/2018 | Logged by: EMW
Equipment: CME-75 w/8-inch HSA | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
21		**GRANITIC ROCK:** gray, moist, weathered, very hard.	SPT		50/2	>50			
22									
23									
24									
25			SPT		50/3	>50			
26		**AUGER REFUSAL AT 25½ FEET ON GRANITIC ROCK**							
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-10

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING B-6

Date Drilled: 11/21/2018 | Logged by: EMW
Equipment: CME-75 w/8-inch HSA | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1	SC	**FILL (Qf):** CLAYEY SAND, loose, dark brown, moist, fine grained, trace gravel.		X					
2				X					
3				X					RV
4				X					
5		**BORING TERMINATED AT 5 FEET**							
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-11

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING B-7

Date Drilled: 11/21/2018 | Logged by: EMW
Equipment: CME-75 w/8-inch HSA | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1–4	SC	**FILL (Qf):** CLAYEY SAND, loose, brown, moist, fine to medium grained, trace gravel.		X					
5–9	SM-SC	**OLD ALLUVIAL FLOOD-PLAIN DEPOSITS (Qoa):** SILTY, CLAYEY SAND, medium dense, brown, moist, fine to coarse grained, trace gravel.	SPT		15	20			AL SA
9–10		**GRANITIC ROCK:** light tan, moist, weathered, very hard.	CAL		50/1	>50	1.8	107.8	
15			SPT		50/2	>50			
16–20		**AUGER REFUSAL AT 15½ FEET ON GRANITIC ROCK**							

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-12

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING B-8

Date Drilled: 11/21/2018 | Logged by: EMW
Equipment: CME-75 w/8-inch HSA | Reviewed by: DS
Elevation (ft): Approx. 1310 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1	SC	**FILL (Qf):** CLAYEY SAND, loose, brown, moist, fine grained, trace gravel.		X					EI SE COR
2									
3									
4									
5		Medium dense.							
6			CAL		33	28	10.2	123.6	
7									
8									
9									
10									
11		**GRANITIC ROCK:** brown to light grayish brown, moist, weathered, very hard.	SPT		67	87			
12									
13									
14									
15		Gray with orange.	CAL		50/2	>50	5.6	108.3	DS
16									
17									
18									
19									
20									

BORING CONTINUED ON I-14

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-13

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING B-8 (continued)

Date Drilled: 11/21/2018 | Logged by: EMW
Equipment: CME-75 w/8-inch HSA | Reviewed by: DS
Elevation (ft): Approx. 1310 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
21		**GRANITIC ROCK:** gray with orange, moist, weathered, very hard.	SPT		50/3	>50			
22		**AUGER REFUSAL AT 21 FEET ON GRANITIC ROCK**							
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-14

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Exhibit B

LOG OF BORING P-1

Date Drilled: 11/8/2018 | Logged by: DJM
Equipment: Power Auger and Hand Tools | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1	SM	**FILL (Qf):** SILTY SAND with GRAVEL, loose, brown to light brown, moist, fine to coarse grained, trace cobble, concrete pieces encountered							
2		Dark brown.							
3	SC	**OLD ALLUVIAL FLOOD-PLAIN DEPOSITS (Qoa):** CLAYEY SAND, medium dense to dense, dark brown, moist, fine to medium grained, trace gravel.							
4				X					
5		**BORING TERMINATED AT 5 FEET**							
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-15

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING P-2

Date Drilled: 11/8/2018 | Logged by: DJM
Equipment: Power Auger and Hand Tools | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1	SM	**FILL (Qf):** SILTY SAND, loose to medium dense, brown to light brown, moist, fine to coarse grained, some gravel.							
2									
3									
4	SC	**OLD ALLUVIAL FLOOD-PLAIN DEPOSITS (Qoa):** CLAYEY SAND, medium dense, dark brown, moist, fine to medium grained.		X					
5		**BORING TERMINATED AT 5 FEET**							
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-16

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Exhibit B

LOG OF BORING P-3

Date Drilled: 11/8/2018 | Logged by: DJM
Equipment: Power Auger and Hand Tools | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1	SM	**FILL (Qf):** SILTY SAND, loose to medium dense, brown to light brown, moist, fine to coarse grained, some gravel.							
2	SC	CLAYEY SAND, medium dense, light brown, moist, fine to coarse grained.							
3				X					
4		**AUGER REFUSAL AT 4 FEET ON FILL**							
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-17

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING P-4

Date Drilled: 11/8/2018 | Logged by: DJM
Equipment: Power Auger and Hand Tools | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1	SM	**FILL (Qf):** SILTY SAND with GRAVEL, medium dense to dense, brown, moist, fine to coarse grained, trace cobble.		X					
2		**AUGER REFUSAL AT 2 FEET ON FILL**							
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-18

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING P-5

Date Drilled: 11/8/2018 | Logged by: DJM
Equipment: Power Auger and Hand Tools | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1	SM	**FILL (Qf):** SILTY SAND with GRAVEL, medium dense to dense, light brown, moist, fine to coarse grained, some cobble.							
2									
3		Brown, fine to medium grained.		X					
4		**BORING TERMINATED AT 3½ FEET**							
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

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Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-19

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING P-6

Date Drilled: 11/8/2018 | Logged by: DJM
Equipment: Power Auger and Hand Tools | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1	SM	**FILL (Qf):** SILTY SAND, loose to medium dense, brown, moist, fine to coarse grained, some gravel.							
2		Dark brown, fine to medium grained.		X					
3		**BORING TERMINATED AT 3 FEET**							
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-20

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING P-7

Date Drilled: 11/8/2018 | Logged by: DJM
Equipment: Power Auger and Hand Tools | Reviewed by: DS
Elevation (ft): Approx. 1300 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1	SM	**FILL (Qf):** SILTY SAND with GRAVEL, dense, light brown, moist, fine to coarse grained, trace cobble.		X					
2		**AUGER REFUSAL AT 2 FEET ON FILL**							
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-21

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

LOG OF BORING P-8

Date Drilled: 11/8/2018 | Logged by: DJM
Equipment: Power Auger and Hand Tools | Reviewed by: DS
Elevation (ft): Approx. 1305 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1	SM	**FILL (Qf):** SILTY SAND, loose to medium dense, brown, moist, fine to coarse grained, some gravel.							
2									
3				X					
4		**BORING TERMINATED AT 4 FEET**							
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

SCST, LLC

Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-22

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Exhibit B

LOG OF BORING P-9

Date Drilled: 11/8/2018 | Logged by: DJM
Equipment: Power Auger and Hand Tools | Reviewed by: DS
Elevation (ft): Approx. 1305 | Depth to Groundwater (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVEN	SAMPLES: BULK	DRIVING RESISTANCE (blows/ft of drive)	N_{60}	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
1	SM	**FILL (Qf):** SILTY SAND, medium dense, brown, moist, fine to coarse grained, some gravel.							
2		Light brown, fine to medium grained.		X					
3		**AUGER REFUSAL AT 3 FEET ON FILL**							
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

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Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	I-23

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

APPENDIX II
LABORATORY TESTING

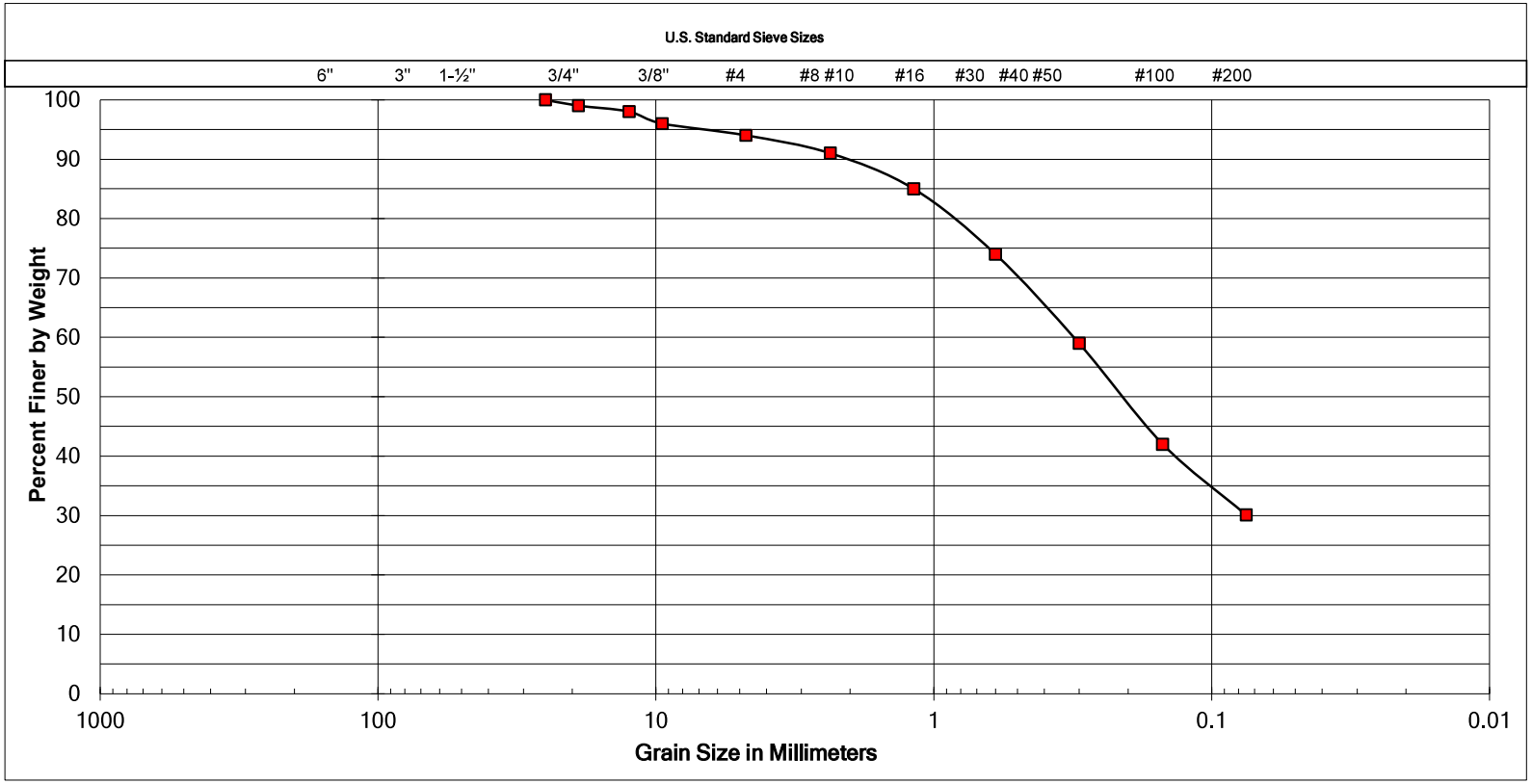
Laboratory tests were performed to provide geotechnical parameters for engineering analyses. The following tests were conducted:

- **CLASSIFICATION**: Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System
- **PARTICLE-SIZE DISTRIBUTION**: The particle-size distribution was determined on two soil samples in accordance with ASTM D422.
- **ATTERBERG LIMITS:** The Atterberg limits were determined on selected soil samples in accordance with ASTM D4318.
- **DIRECT SHEAR**: Direct shear tests were performed on selected samples in accordance with ASTM D3080. The shear stress was applied at a constant rate of strain of 0.003 inch per minute.
- **CONSOLIDATION:** Consolidation tests were performed on selected soil samples in accordance with ASTM D2435.
- **R-VALUE:** R-value tests were performed on selected soil samples in accordance with California Test Method 301.
- **EXPANSION INDEX:** The expansion index was determined on selected soil samples in accordance with ASTM D4829.
- **CORROSIVITY**: Corrosivity tests were performed on one soil sample. The pH and minimum resistivity were determined in general accordance with California Test 643. The soluble sulfate content was determined in accordance with California Test 417. The total chloride ion content was determined in accordance with California Test 422.
- **EXPANSION INDEX:** The expansion index was determined on selected soil samples in accordance with California Test 217.

Soil samples not tested are now stored in our laboratory for future reference and analysis, if needed. Unless notified to the contrary, all samples will be disposed of 30 days from the date of this report.

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Exhibit B



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-2 at 0 to 5 feet

UNIFIED SOIL CLASSIFICATION:	SM-SC
DESCRIPTION	SILTY, CLAYEY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	28
PLASTIC LIMIT	21
PLASTICITY INDEX	7

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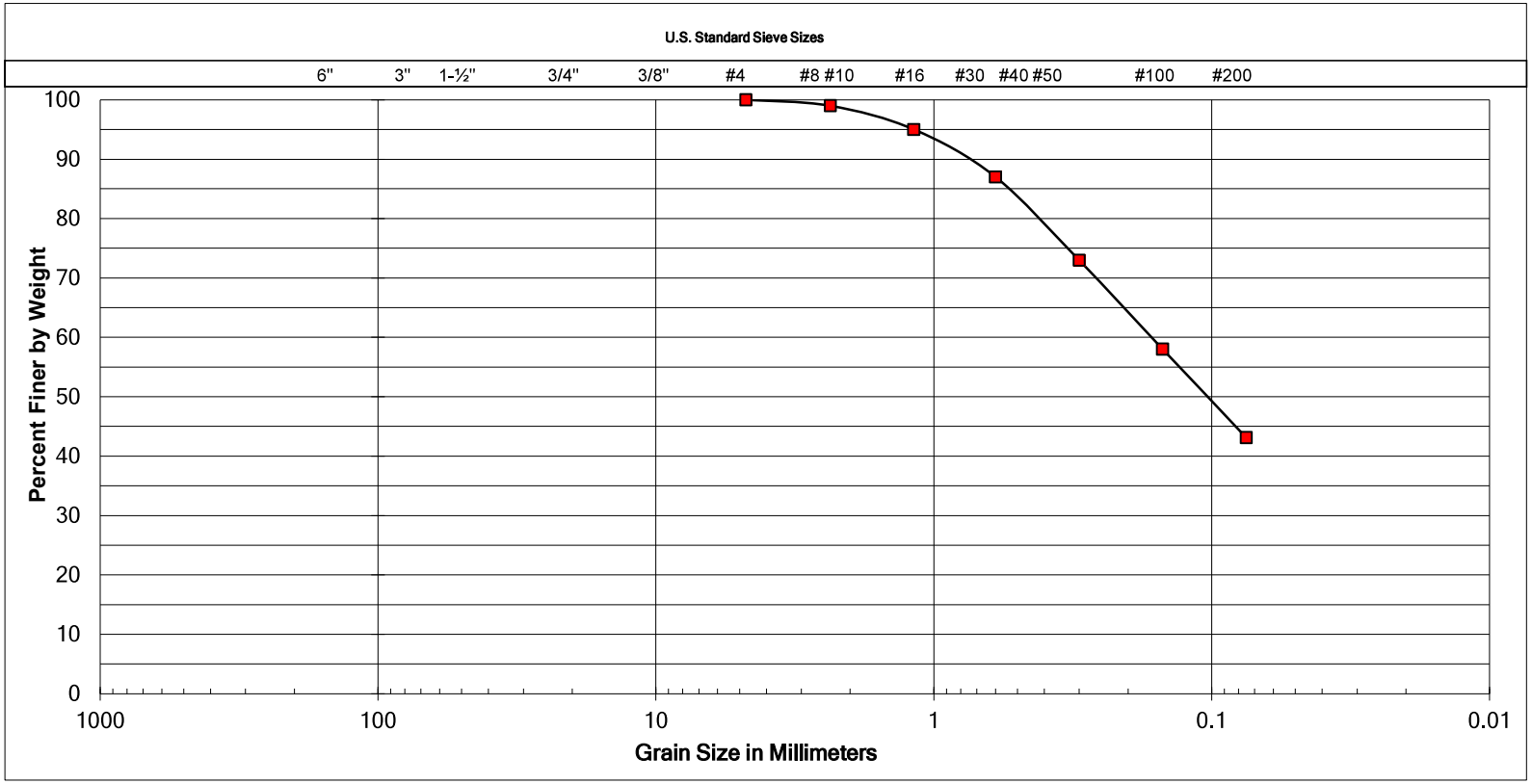
Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	II-1

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Exhibit B



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-2 at 10½ to 11½ feet

UNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION	CLAYEY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	32
PLASTIC LIMIT	21
PLASTICITY INDEX	11

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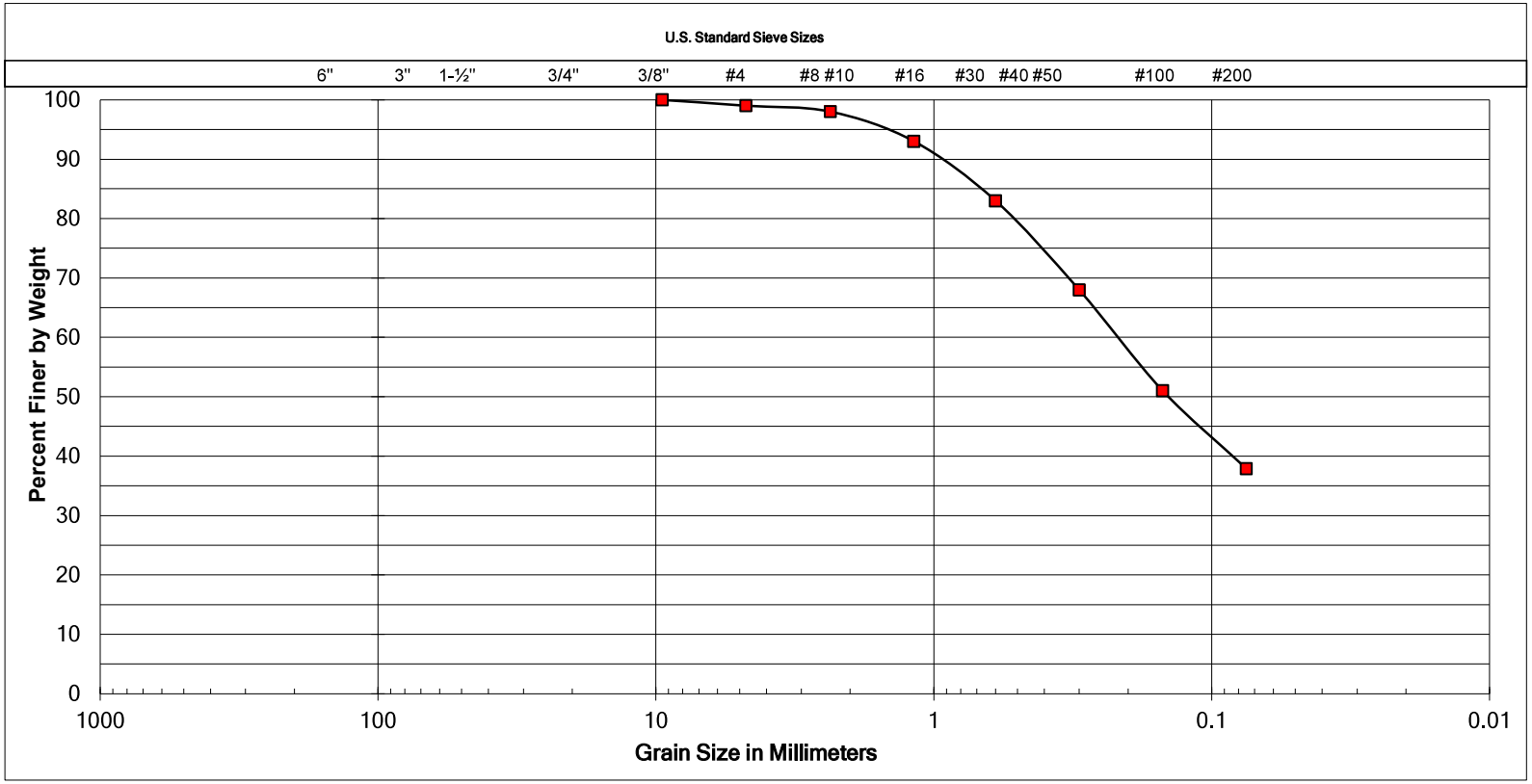
Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	II-2

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Exhibit B



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-3 at 0 to 5 feet

UNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION	CLAYEY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	--
PLASTIC LIMIT	--
PLASTICITY INDEX	--

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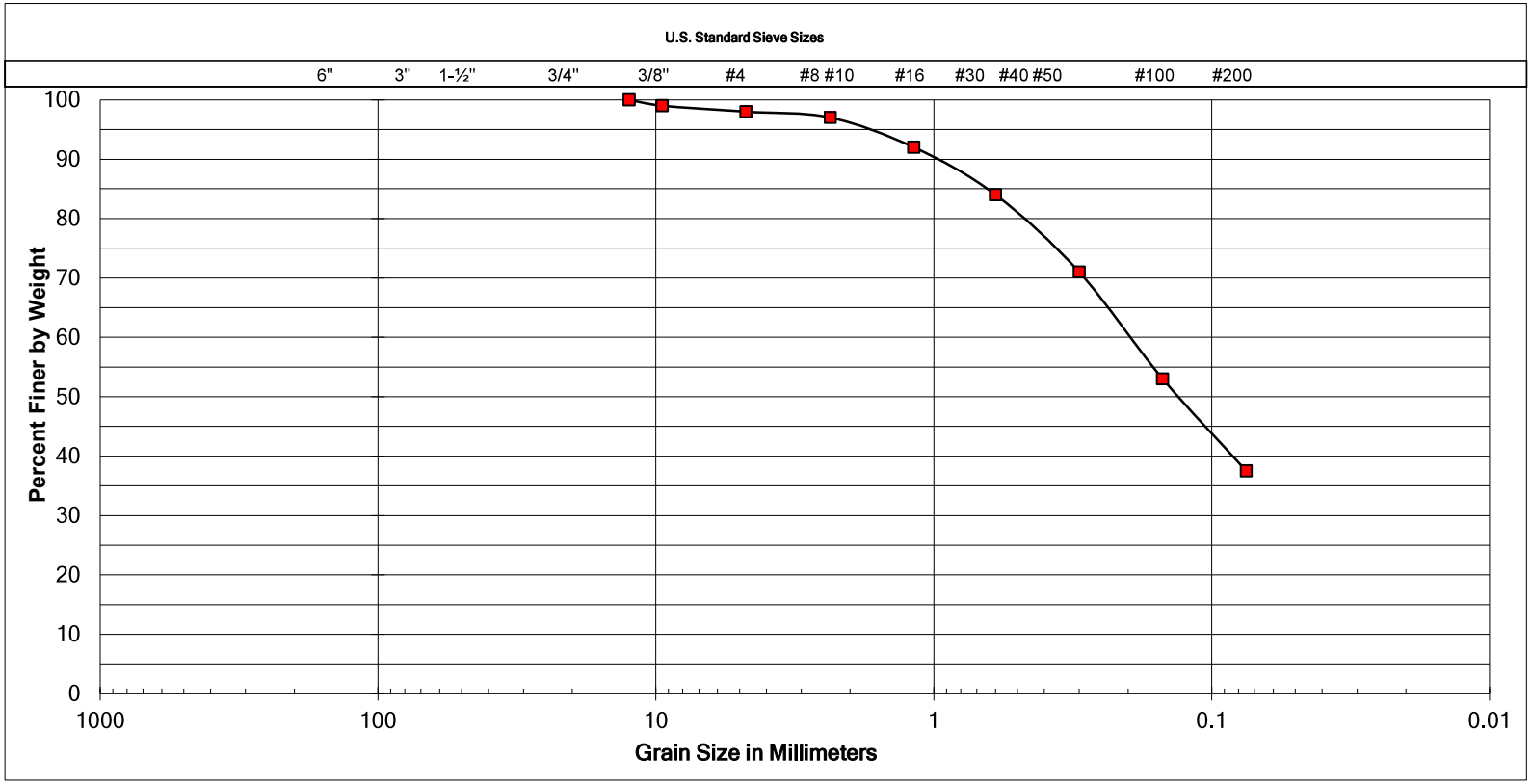
Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	II-3

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Exhibit B



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-5 at 0 to 5 feet

UNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION	CLAYEY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	--
PLASTIC LIMIT	--
PLASTICITY INDEX	--

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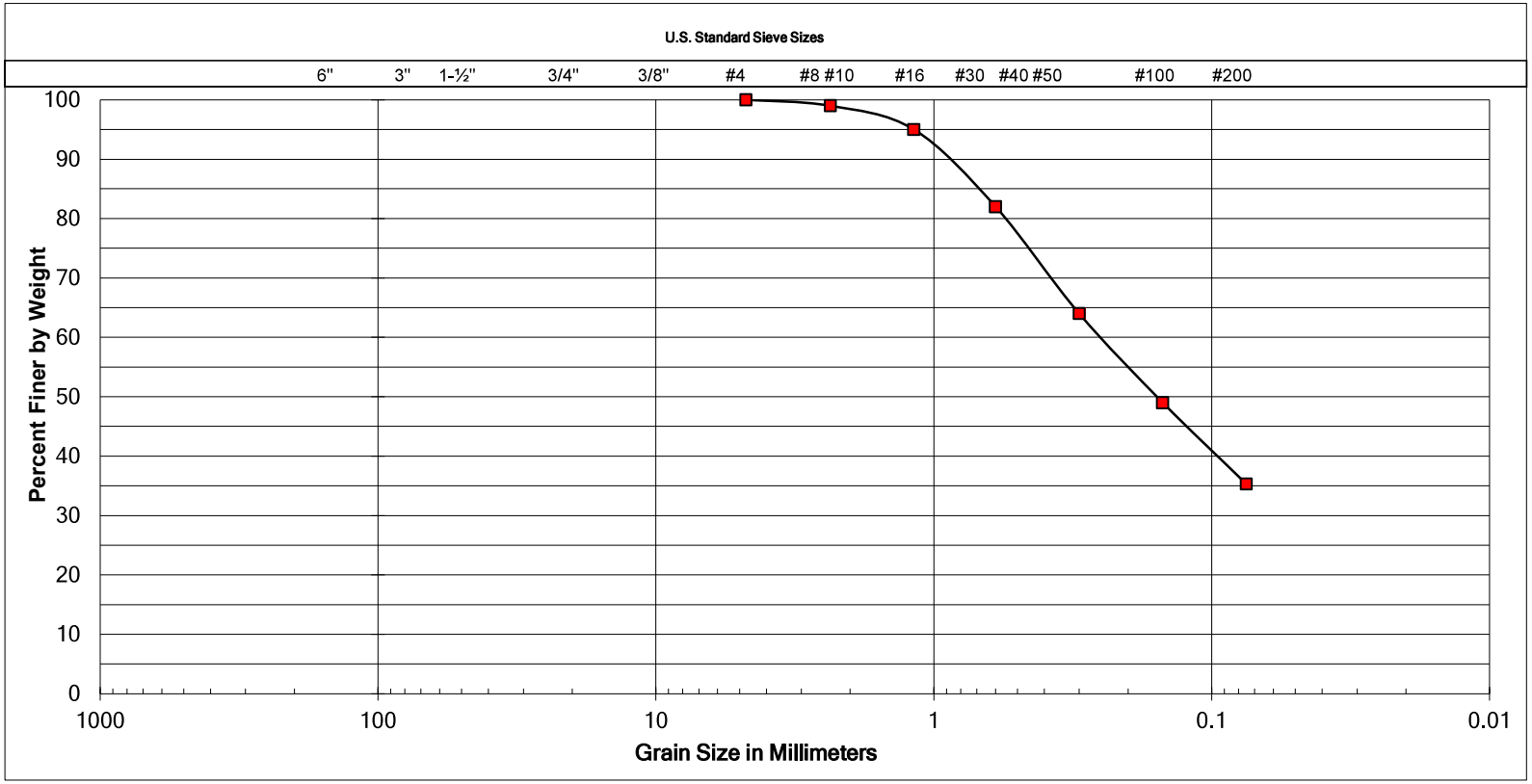
Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	II-4

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Exhibit B



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-7 at 5½ to 6½ feet

UNIFIED SOIL CLASSIFICATION:	SM-SC
DESCRIPTION	SILTY, CLAYEY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	27
PLASTIC LIMIT	20
PLASTICITY INDEX	7

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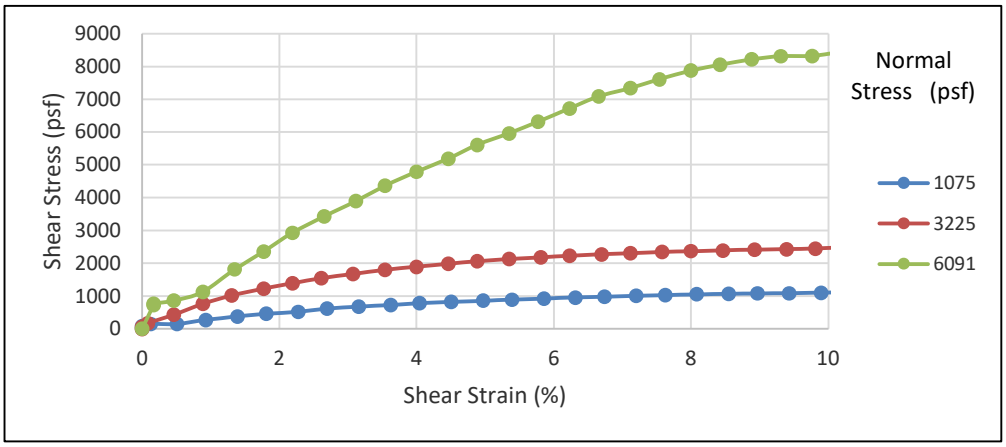
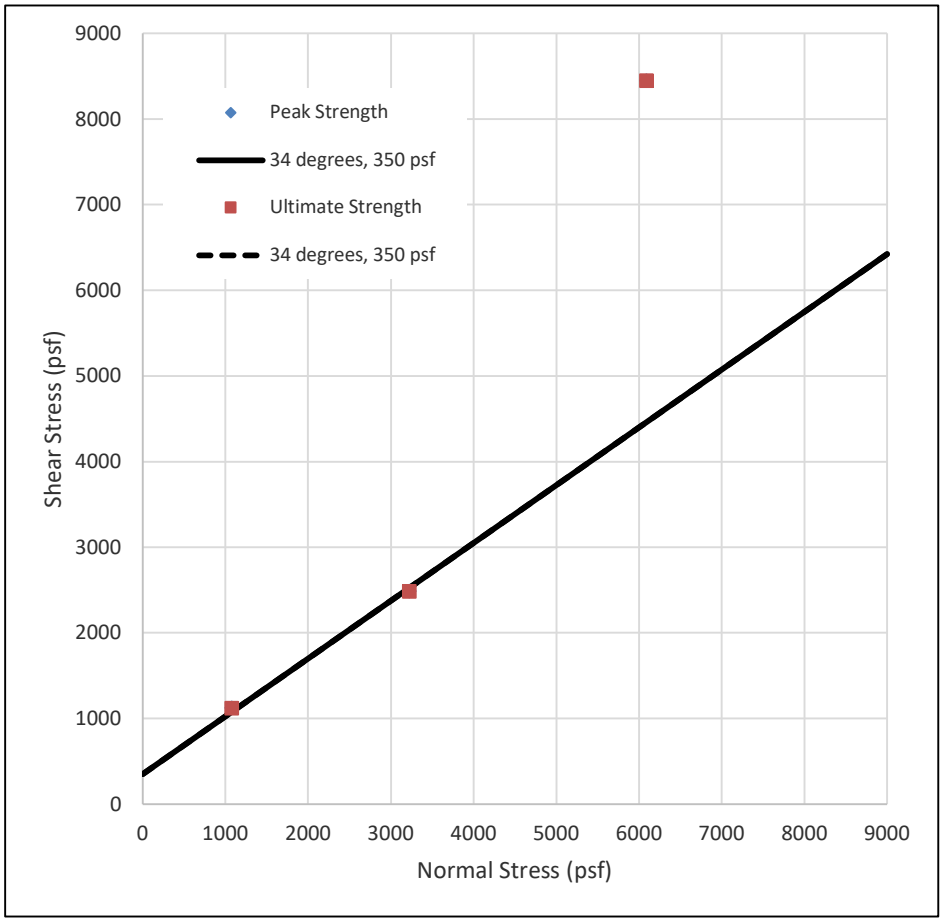
Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	II-5

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729





SAMPLE ID: B-8 at 15 to 15½ feet

CLAYEY SAND

NOTES: Insitu
Strain Rate: 0.003 in/min
Sample was consolidated and drained

	Peak	Ultimate
Φ	34 °	34 °
c	350 psf	350 psf

	Initial	Final
γ	108.9 pcf	108.9 pcf
w	5.9 %	17.8 %
Saturation	30 %	89 %

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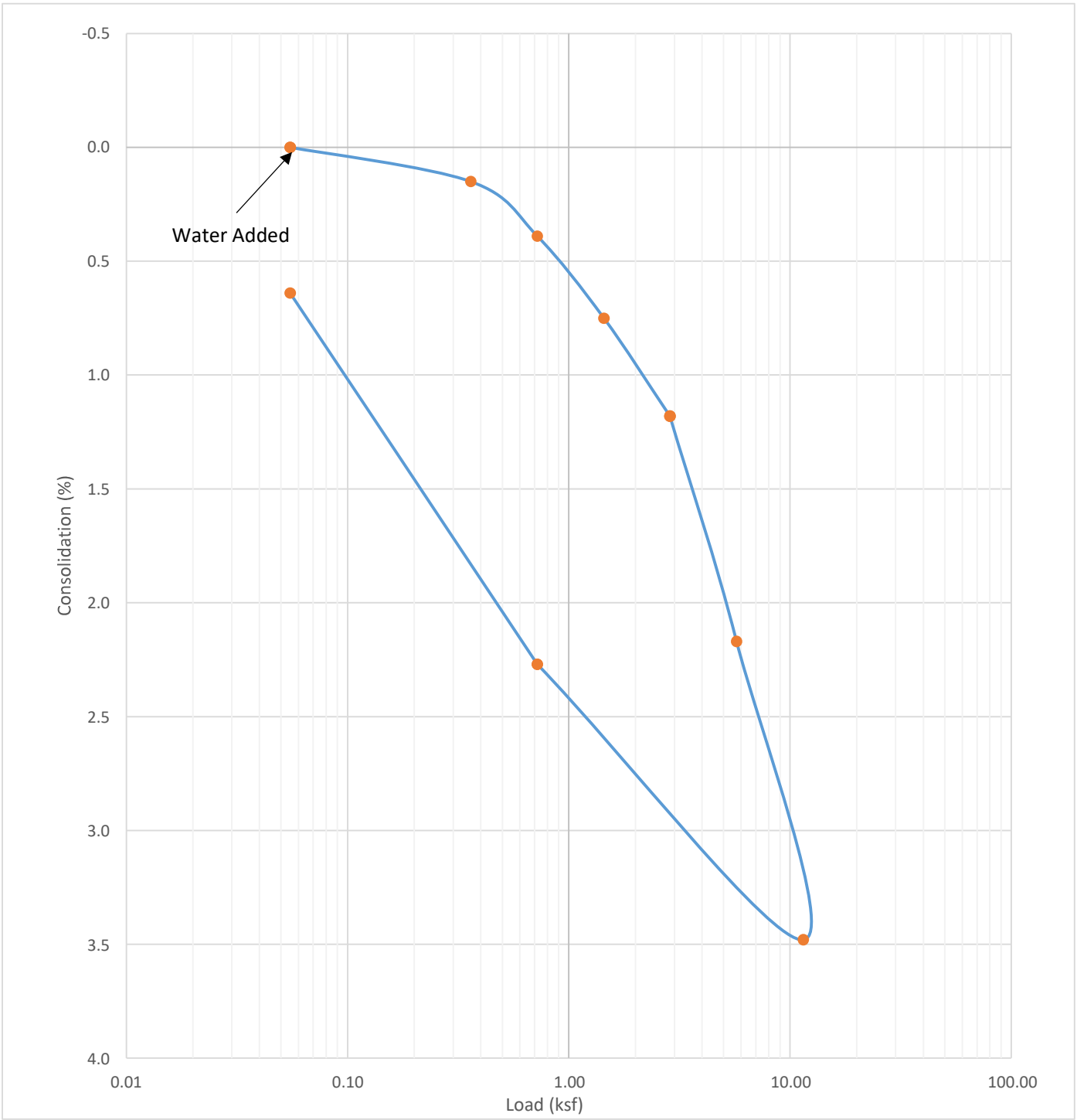
Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job Number:	180384N-1	Figure:	II-6

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Consolidation Test Results

ASTM D2435



Sample ID:	B-5 at 6 to 6½ feet	γ_d	118.4 pcf
Sample Description:	CLAYEY SAND	Pre-consolidation w_c	12.7 %
Sample Source:		Post-consolidation w_c	15.0 %

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Liberty Bell Plaza
Valley Center, California

By:	EMW	Date:	December, 2018
Job No:	180384N-1	Figure:	II-7

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

RESISTIVITY, pH, SOLUBLE CHLORIDE and SOLUBLE SULFATE

pH & Resistivity (Cal 643, ASTM G51)
Soluble Chlorides (Cal 422)
Soluble Sulfate (Cal 417)

SAMPLE	RESISTIVITY (Ω-cm)	pH	CHLORIDE (%)	SULFATE (%)
B-1 at 0 to 10 Feet	2770	7.50	0.001	0.001
B-5 at 0 to 5 Feet	3810	7.54	0.100	0.036
B-8 at 0 to 10 Feet	1290	8.65	0.038	0.016

Sulphate Exposure Classes [2]

CLASS	SEVERITY	WATER-SOLUBLE SULFATE (SO_4) IN SOIL, PERCENT BY MASS
S0	Not applicable	$SO_4 < 0.10$
S1	Moderate	$0.10 \le SO_4 < 0.20$
S2	Severe	$0.20 \le SO_4 \le 2.00$
S3	Very Severe	$SO_4 > 2.00$

2. ACI 318, Table 19.3.1.1

EXPANSION INDEX

ASTM D2489

SAMPLE	DESCRIPTION	EXPANSION INDEX
B-1 at 0 to 10 Feet	CLAYEY SAND	14
B-5 at 0 to 5 Feet	CLAYEY SAND	22
B-8 at 0 to 10 Feet	CLAYEY SAND	13

Classification of Expansive Soil [1]

EXPANSIVE INDEX	POTENTIAL EXPANSION
1-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Above 130	Very High

1. ASTM - D4829

R-VALUE

California Test 301

SAMPLE	DESCRIPTION	R-VALUE
B-3 at 0 to 5 Feet	CLAYEY SAND	22
B-6 at 0 to 5 Feet	CLAYEY SAND	19

SAND EQUIVALENT

California Test 217

SAMPLE	SAND EQUIVALENT
B-1 at 0 to 10 Feet	13
B-8 at 0 to 10 Feet	16

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APPENDIX III
INFILTRATION RATE TEST RESULTS

We performed falling head borehole percolation testing at nine locations (P-1 through P-9) in general conformance with Appendix C of the Model BMP Design Manual for San Diego Region. The borings were prepared for percolation testing by placing about 6 inches of ¾" gravel in the bottom of the test hole and then installing a 4-inch diameter solid PVC pipe from the top of the pea gravel (about 4½ feet below the existing ground surface) to about 2 feet above the ground surface. ¾" gravel was placed in the annular space between the PVC pipe and the boring sidewall between the depths of about 4½ feet and about 2½ feet below the ground surface; hydrated bentonite chips were placed above about 2½ feet. Prior to starting the percolation testing, the test holes were presoaked overnight (approximately 16 hours) by filling the holes with water. The percolation testing was performed immediately after presoaking by filling the test holes with clean potable water to the top of the PVC pipe and measuring the drop in the water level every 30 minutes until a constant rate was established. Figures III-1 through III-9 present the results of the testing.

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Report of Borehole Percolation Testing

Storm Water Infiltration

Project Name:	Liberty Bell Plaza	Test Number:	P-1
Job Number:	180384N	Tested By:	DJM
Date Drilled:	11/8/2018	Date Tested:	11/9/2018
Drilling Method:	Hand Auger	Presoak Time:	24 HR
Drilled Depth (feet):	5.0		
Test Hole Diameter (inches):	6		
Gravel Pack:	Y		
Pipe Diameter (inches):	4		

Trial No.	Time	Time Interval, ΔT (min)	Initial Water Height, H_o (ft)	Final Water Height, H_f (ft)	Change in Water Height, ΔH (in)	Percolation Rate (min/in)
1	9:34 9:44	0:10	1.50	1.08	5.00	2
2	9:46 9:56	0:10	1.50	1.08	5.00	2
3	9:59 10:09	0:10	1.50	1.08	5.00	2
4	10:10 10:20	0:10	1.50	1.08	5.00	2
5	10:30 10:40	0:10	1.50	1.08	5.00	2
6	10:41 10:51	0:10	1.50	1.08	5.00	2

Observed Percolation Rate:	2 min/in 30.0 in/hr
Gravel Correction Factor:	1.50
Corrected Percolation Rate:	3 min/in 20.0 in/hr
***Tested Infiltation Rate, I_t:**	**2.6 in/hr**

*Tested infiltration rate using the Porchet Method:

$$I_t = \frac{\Delta H(60r)}{\Delta T(r + 2H_{avg})}$$

ΔH = Change in water head height over the time interval [in] = 5.0

r = Test hole radius [in] = 3

ΔT = Time interval [min] = 10

H_{avg} = Average water height over time interval = $12(H_o + H_f)/2$ [in] = 15.5

SCST, LLC	Liberty Bell Plaza Valley Center, California			
	By:	NNW	Date:	November, 2018
	Job No:	180384N-1	Figure:	III-1

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Report of Borehole Percolation Testing

Storm Water Infiltration

Project Name:	Liberty Bell Plaza	Test Number:	P-2
Job Number:	180384N	Tested By:	DJM
Date Drilled:	11/8/2018	Date Tested:	11/9/2018
Drilling Method:	Hand Auger	Presoak Time:	24 HR
Drilled Depth (feet):	5.0		
Test Hole Diameter (inches):	6		
Gravel Pack:	Y		
Pipe Diameter (inches):	4		

Trial No.	Time	Time Interval, ΔT (min)	Initial Water Height, H_o (ft)	Final Water Height, H_f (ft)	Change in Water Height, ΔH (in)	Percolation Rate (min/in)
1	9:39 9:49	0:10	1.25	0.75	6.00	2
2	9:51 10:01	0:10	1.17	1.08	1.00	10
3	10:02 10:12	0:10	1.17	1.13	0.50	20
4	10:15 10:25	0:10	1.17	1.13	0.50	20
5	10:26 10:36	0:10	1.17	1.13	0.50	20
6	10:37 10:47	0:10	1.13	1.08	0.50	20

Observed Percolation Rate:	20 min/in 3.0 in/hr
Gravel Correction Factor:	1.50
Corrected Percolation Rate:	30 min/in 2.0 in/hr
***Tested Infiltation Rate, I_t:**	**0.3 in/hr**

*Tested infiltration rate using the Porchet Method:

$$I_t = \frac{\Delta H(60r)}{\Delta T(r + 2H_{avg})}$$

ΔH = Change in water head height over the time interval [in] = 0.5

r = Test hole radius [in] = 3

ΔT = Time interval [min] = 10

H_{avg} = Average water height over time interval = $12(H_o + H_f)/2$ [in] = 13.6

SCST, LLC	Liberty Bell Plaza Valley Center, California			
	By:	NNW	Date:	November, 2018
	Job No:	180384N-1	Figure:	III-2

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Exhibit B

Report of Borehole Percolation Testing

Storm Water Infiltration

Project Name:	Liberty Bell Plaza	Test Number:	P-3
Job Number:	180384N	Tested By:	DJM
Date Drilled:	11/8/2018	Date Tested:	11/9/2018
Drilling Method:	Hand Auger	Presoak Time:	24 HR
Drilled Depth (feet):	4.0		
Test Hole Diameter (inches):	6		
Gravel Pack:	Y		
Pipe Diameter (inches):	4		

Trial No.	Time	Time Interval, ΔT (min)	Initial Water Height, H_o (ft)	Final Water Height, H_f (ft)	Change in Water Height, ΔH (in)	Percolation Rate (min/in)
1	10:41 10:51	0:10	0.50	0.38	1.50	7
2	10:53 11:03	0:10	0.50	0.46	0.50	20
3	11:05 11:15	0:10	0.50	0.46	0.50	20
4	11:17 11:27	0:10	0.46	0.42	0.50	20
5	11:28 11:38	0:10	0.50	0.46	0.50	20
6	11:40 11:50	0:10	0.46	0.42	0.50	20

Observed Percolation Rate:	20 min/in 3.0 in/hr
Gravel Correction Factor:	1.50
Corrected Percolation Rate:	30 min/in 2.0 in/hr
***Tested Infiltation Rate, I_t:**	**0.7 in/hr**

*Tested infiltration rate using the Porchet Method:

$$I_t = \frac{\Delta H(60r)}{\Delta T(r + 2H_{avg})}$$

ΔH = Change in water head height over the time interval [in] = 0.5

r = Test hole radius [in] = 3

ΔT = Time interval [min] = 10

H_{avg} = Average water height over time interval = $12(H_o + H_f)/2$ [in] = 5.4

SCST, LLC	Liberty Bell Plaza Valley Center, California			
	By:	NNW	Date:	November, 2018
	Job No:	180384N-1	Figure:	III-3

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Report of Borehole Percolation Testing

Storm Water Infiltration

Project Name:	Liberty Bell Plaza	Test Number:	P-4
Job Number:	180384N	Tested By:	DJM
Date Drilled:	11/8/2018	Date Tested:	11/9/2018
Drilling Method:	Hand Auger	Presoak Time:	24 HR
Drilled Depth (feet):	2.0		
Test Hole Diameter (inches):	6		
Gravel Pack:	Y		
Pipe Diameter (inches):	4		

Trial No.	Time	Time Interval, ΔT (min)	Initial Water Height, H_o (ft)	Final Water Height, H_f (ft)	Change in Water Height, ΔH (in)	Percolation Rate (min/in)
1	10:44 10:54	0:10	0.42	0.38	0.50	20
2	10:56 11:06	0:10	0.38	0.33	0.50	20
3	11:07 11:17	0:10	0.42	0.38	0.50	20
4	11:18 11:28	0:10	0.38	0.33	0.50	20
5	11:29 11:39	0:10	0.42	0.38	0.50	20
6	11:40 11:50	0:10	0.38	0.33	0.50	20

Observed Percolation Rate:	20 min/in 3.0 in/hr
Gravel Correction Factor:	1.50
Corrected Percolation Rate:	30 min/in 2.0 in/hr
***Tested Infiltation Rate, I_t:**	**0.8 in/hr**

*Tested infiltration rate using the Porchet Method:

$$I_t = \frac{\Delta H(60r)}{\Delta T(r + 2H_{avg})}$$

ΔH = Change in water head height over the time interval [in] = 0.5

r = Test hole radius [in] = 3

ΔT = Time interval [min] = 10

H_{avg} = Average water height over time interval = $12(H_o + H_f)/2$ [in] = 4.4

SCST, LLC	Liberty Bell Plaza Valley Center, California			
	By:	NNW	Date:	November, 2018
	Job No:	180384N-1	Figure:	III-4

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Report of Borehole Percolation Testing

Storm Water Infiltration

Project Name:	Liberty Bell Plaza	Test Number:	P-5
Job Number:	180384N	Tested By:	DJM
Date Drilled:	11/8/2018	Date Tested:	11/9/2018
Drilling Method:	Hand Auger	Presoak Time:	24 HR
Drilled Depth (feet):	3.5		
Test Hole Diameter (inches):	6		
Gravel Pack:	Y		
Pipe Diameter (inches):	4		

Trial No.	Time	Time Interval, ΔT (min)	Initial Water Height, H_o (ft)	Final Water Height, H_f (ft)	Change in Water Height, ΔH (in)	Percolation Rate (min/in)
1	10:52 11:02	0:10	0.50	0.25	3.00	3
2	11:03 11:13	0:10	0.50	0.29	2.50	4
3	11:14 11:24	0:10	0.50	0.29	2.50	4
4	11:25 11:35	0:10	0.50	0.29	2.50	4
5	11:36 11:46	0:10	0.50	0.29	2.50	4
6	11:47 11:57	0:10	0.50	0.29	2.50	4

Observed Percolation Rate:	4 min/in 15.0 in/hr
Gravel Correction Factor:	1.50
Corrected Percolation Rate:	6 min/in 10.0 in/hr
***Tested Infiltation Rate, I_t:**	**3.6 in/hr**

*Tested infiltration rate using the Porchet Method:

$$I_t = \frac{\Delta H(60r)}{\Delta T(r + 2H_{avg})}$$

ΔH = Change in water head height over the time interval [in] = 2.5

r = Test hole radius [in] = 3

ΔT = Time interval [min] = 10

H_{avg} = Average water height over time interval = $12(H_o + H_f)/2$ [in] = 4.8

SCST, LLC	Liberty Bell Plaza Valley Center, California			
	By:	NNW	Date:	November, 2018
	Job No:	180384N-1	Figure:	III-5

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Exhibit B

Report of Borehole Percolation Testing

Storm Water Infiltration

Project Name:	Liberty Bell Plaza	Test Number:	P-6
Job Number:	180384N	Tested By:	DJM
Date Drilled:	11/8/2018	Date Tested:	11/9/2018
Drilling Method:	Hand Auger	Presoak Time:	24 HR
Drilled Depth (feet):	3.0		
Test Hole Diameter (inches):	6		
Gravel Pack:	Y		
Pipe Diameter (inches):	4		

Trial No.	Time	Time Interval, ΔT (min)	Initial Water Height, H_o (ft)	Final Water Height, H_f (ft)	Change in Water Height, ΔH (in)	Percolation Rate (min/in)
1	12:20 12:30	0:10	0.50	0.00	6.00	2
2	12:31 12:41	0:10	0.50	0.00	6.00	2
3	12:42 12:52	0:10	0.50	0.00	6.00	2
4	12:53 1:03	0:10	0.50	0.00	6.00	2
5	1:04 1:14	0:10	0.50	0.00	6.00	2
6	1:15 1:25	0:10	0.50	0.00	6.00	2

Observed Percolation Rate:	2 min/in 36.0 in/hr
Gravel Correction Factor:	1.50
Corrected Percolation Rate:	3 min/in 24.0 in/hr
***Tested Infiltation Rate, I_t:**	**12.0 in/hr**

*Tested infiltration rate using the Porchet Method:

$$I_t = \frac{\Delta H(60r)}{\Delta T(r + 2H_{avg})}$$

ΔH = Change in water head height over the time interval [in] = 6.0

r = Test hole radius [in] = 3

ΔT = Time interval [min] = 10

H_{avg} = Average water height over time interval = $12(H_o + H_f)/2$ [in] = 3.0

SCST, LLC	Liberty Bell Plaza Valley Center, California			
	By:	NNW	Date:	November, 2018
	Job No:	180384N-1	Figure:	III-6

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Report of Borehole Percolation Testing

Storm Water Infiltration

Project Name:	Liberty Bell Plaza	Test Number:	P-7
Job Number:	180384N	Tested By:	DJM
Date Drilled:	11/8/2018	Date Tested:	11/9/2018
Drilling Method:	Hand Auger	Presoak Time:	24 HR
Drilled Depth (feet):	2.0		
Test Hole Diameter (inches):	6		
Gravel Pack:	Y		
Pipe Diameter (inches):	4		

Trial No.	Time	Time Interval, ΔT (min)	Initial Water Height, H_o (ft)	Final Water Height, H_f (ft)	Change in Water Height, ΔH (in)	Percolation Rate (min/in)
1	12:25 12:35	0:10	0.50	0.42	1.00	10
2	12:36 12:46	0:10	0.50	0.46	0.50	20
3	12:47 12:57	0:10	0.50	0.48	0.25	40
4	12:58 1:08	0:10	0.50	0.48	0.25	40
5	1:09 1:19	0:10	0.50	0.48	0.25	40
6	1:20 1:30	0:10	0.50	0.48	0.25	40

Observed Percolation Rate:	40 min/in 1.5 in/hr
Gravel Correction Factor:	1.50
Corrected Percolation Rate:	60 min/in 1.0 in/hr
***Tested Infiltation Rate, I_t:**	**0.3 in/hr**

*Tested infiltration rate using the Porchet Method:

$$I_t = \frac{\Delta H(60r)}{\Delta T(r + 2H_{avg})}$$

ΔH = Change in water head height over the time interval [in] = 0.2

r = Test hole radius [in] = 3

ΔT = Time interval [min] = 10

H_{avg} = Average water height over time interval = $12(H_o + H_f)/2$ [in] = 5.9

SCST, LLC	Liberty Bell Plaza Valley Center, California		
	By: NNW	Date:	November, 2018
	Job No: 180384N-1	Figure:	III-7

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Exhibit B

Report of Borehole Percolation Testing

Storm Water Infiltration

Project Name:	Liberty Bell Plaza	Test Number:	P-8
Job Number:	180384N	Tested By:	DJM
Date Drilled:	11/8/2018	Date Tested:	11/9/2018
Drilling Method:	Hand Auger	Presoak Time:	24 HR
Drilled Depth (feet):	4.0		
Test Hole Diameter (inches):	6		
Gravel Pack:	Y		
Pipe Diameter (inches):	4		

Trial No.	Time	Time Interval, ΔT (min)	Initial Water Height, H_o (ft)	Final Water Height, H_f (ft)	Change in Water Height, ΔH (in)	Percolation Rate (min/in)
1	1:02 1:12	0:10	0.67	0.42	3.00	3
2	1:13 1:23	0:10	0.67	0.42	3.00	3
3	1:24 1:34	0:10	0.67	0.50	2.00	5
4	1:35 1:45	0:10	0.67	0.50	2.00	5
5	1:46 1:56	0:10	0.67	0.50	2.00	5
6	1:57 2:07	0:10	0.67	0.50	2.00	5

Observed Percolation Rate:	5 min/in 12.0 in/hr
Gravel Correction Factor:	1.50
Corrected Percolation Rate:	7 min/in 8.0 in/hr
***Tested Infiltation Rate, I_t:**	**2.1 in/hr**

*Tested infiltration rate using the Porchet Method:

$$I_t = \frac{\Delta H(60r)}{\Delta T(r + 2H_{avg})}$$

ΔH = Change in water head height over the time interval [in] = 2.0

r = Test hole radius [in] = 3

ΔT = Time interval [min] = 10

H_{avg} = Average water height over time interval = $12(H_o + H_f)/2$ [in] = 7.0

SCST, LLC	Liberty Bell Plaza Valley Center, California			
	By:	NNW	Date:	November, 2018
	Job No:	180384N-1	Figure:	III-8

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Report of Borehole Percolation Testing

Storm Water Infiltration

Project Name:	Liberty Bell Plaza	Test Number:	P-9
Job Number:	180384N	Tested By:	DJM
Date Drilled:	11/8/2018	Date Tested:	11/9/2018
Drilling Method:	Hand Auger	Presoak Time:	24 HR
Drilled Depth (feet):	3.0		
Test Hole Diameter (inches):	6		
Gravel Pack:	Y		
Pipe Diameter (inches):	4		

Trial No.	Time	Time Interval, ΔT (min)	Initial Water Height, H_o (ft)	Final Water Height, H_f (ft)	Change in Water Height, ΔH (in)	Percolation Rate (min/in)
1	1:05 1:15	0:10	0.50	0.17	4.00	3
2	1:17 1:27	0:10	0.50	0.25	3.00	3
3	1:28 1:38	0:10	0.50	0.25	3.00	3
4	1:39 1:49	0:10	0.50	0.25	3.00	3
5	1:50 2:00	0:10	0.50	0.25	3.00	3
6	2:01 2:11	0:10	0.50	0.25	3.00	3

Observed Percolation Rate:	3 min/in 18.0 in/hr
Gravel Correction Factor:	1.50
Corrected Percolation Rate:	5 min/in 12.0 in/hr
***Tested Infiltation Rate, I_t:**	**4.5 in/hr**

*Tested infiltration rate using the Porchet Method:

$$I_t = \frac{\Delta H(60r)}{\Delta T(r + 2H_{avg})}$$

ΔH = Change in water head height over the time interval [in] = 3.0

r = Test hole radius [in] = 3

ΔT = Time interval [min] = 10

H_{avg} = Average water height over time interval = $12(H_o + H_f)/2$ [in] = 4.5

SCST, LLC	Liberty Bell Plaza Valley Center, California			
	By:	NNW	Date:	November, 2018
	Job No:	180384N-1	Figure:	III-9

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

APPENDIX IV
WORKSHEET C.4-1

Docusign Envelope ID: 510122BE-4E93-46AC-B201-D2CE729E3729

Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

Categorization of Infiltration Feasibility Condition	Worksheet C.4-1

Part 1 - Full Infiltration Feasibility Screening Criteria

Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	☐	☑

Provide basis:

The tested infiltration rates are between 0.3 and 12.0 inch per hour. Therefore, an infiltration rate greater that 0.5 inch per hour is not reliable.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	☐	☑

Provide basis:

The tested infiltration rates are between 0.3 and 12.0 inch per hour, and an infiltration rate greater than 0.5 inch per hour is not reliable. Allowing infiltration greater than 0.5 inch per hour may increase the risk of geotechnical hazards. It is SCST's opinion that test results are reflective of infiltration rates at the end of a long dry season, and historic groundwater depth in the area is as shallow as 1-foor bgs. SCST does not recommend allowing infiltration greater than 0.5 inch/hour at the site.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

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Worksheet C.4-1 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☑	☐
Provide basis: Without pre-treatment, infiltration of stormwater pollutants could migrate laterally and adversely affect down-gradient sites. SCST would recommend pre-treatment of stormwater runoff. In SCST's opinion, allowing infiltration of pre-treated stormwater runoff in any appreciable quantity does not pose a significant risk to the regional groundwater table. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☐	☐
Provide basis: The project design engineer is responsible for completing criterion 4. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2	No	

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by [City Engineer] to substantiate findings.

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Worksheet C.4-1 Page 3 of 4

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	☑	☐

Provide basis:

The tested infiltration rates range from 0.3 to 12.0 inch per hour. The tested material is believed to be generally representative of the material that will be encountered below the proposed BMP locations.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	☑	☐

Provide basis:

To mitigate the increased risk associated with infiltration at the bottom of the proposed BMP basins to an acceptable level and reduce the potential for groundwater migration and adverse impacts to adjacent structures and improvements, cutoff walls or vertical cutoff membranes consisting of 30 mil HDPE or PVC should be installed along the sides of the BMPs, and a subdrain should be placed at the bottom of the basins and connected to a storm drain.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/ data source applicability and why it was not feasible to mitigate low infiltration rates.

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Worksheet C.4-1 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☑	☐
Provide basis: The tested infiltration rate at the site does support allowing infiltration less than or equal to 0.5 inch per hour. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☐	☐
Provide basis: The project design engineer is responsible for completing criterion 8. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**	Yes	

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

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April 16, 2019

SCST No. 180384N
Report No. 4

Mr. Steve Flynn
Bell Holdings, LLC
Post Office Box 642
Rancho Santa Fe, CA 92067

Subject: GEOTECHNICAL COMMENTARY ON BMP DESIGN
LIBERTY BELL PLAZA
VALLEY CENTER ROAD
VALLEY CENTER, CALIFORNIA

Reference:
1. SCST, LLC (2019), Infiltration Assessment, Liberty Bell Plaza, Valley Center Road, Valley Center, California, dated March 12.
2. County of San Diego Department of Public Works (2019), BMP Design Manual, Effective Date January 1.
3. SCST, LLC (2018), Geotechnical Investigation and Infiltration Assessment, Proposed Retail Development, Liberty Bell Plaza, Valley Center Road, Valley Center, California, dated December 21.

Dear Mr. Flynn:

In accordance with your request, SCST, LLC (SCST) has prepared this letter to comment on stormwater Best Managed Practice (BMP) facility design at the subject project. From a geotechnical standpoint, the BMPs can be designed without liners despite having an identified restriction related to historic high groundwater elevation. If the water table rises, a properly designed French Drain that both drains excess standing water as well as allows stormwater infiltration into the soil will mitigate this issue.

If you have any questions, please call us at (619) 280-4321.

Respectfully Submitted,
SCST, LLC

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