Appendix G

Report of Mass Grade Compaction Testing, South Shore Testing & Environmental, May 3, 2018

South Shore Testing & Environmental

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Phone: (951) 239-3008 FAX: (951) 239-3122

May 3, 2018

Mr. Ron Clark
Avocado Groves, LLC
2279 Eagle Glenn Parkway, Suite 112-470
Corona, California 92883

SUBJECT: **REPORT OF MASS GRADE COMPACTION TESTING**
Proposed Commercial Development - Former Wyroc Quarry
31000 Lake Street
City of Lake Elsinore, Riverside County, California
Work Order No. 3411701.22

Dear Mr. Clark:

In accordance with your request, we have prepared this "Report of Mass Grade Compaction Testing" presenting the results of our testing of the mass commercial pads at the above referenced site. The 60-scale colored "As-Built Grading Plans" was provided for our use and utilized to locate our field density tests. A not-to-scale reduced copy of the 60-scale plan was utilized as a base map for our Compaction Test Location Map presented as **Plate 1**.

Scope of Work

The scope of work performed for this report included the following:

1. Onsite observation and documentation of existing site geometry and grading that has taken place with respect to the location of the proposed tilt-up building and proposed gas station/mini-market.

2. Compilation of data obtained from laboratory testing.

3. Compilation of data obtained from field observations and testing.

4. Preparation of this report containing the results of laboratory and field testing, engineering analyses, and final foundation design minimums.

Executive Summary

This report has been prepared partially resulting from a 2016 California Building Code Chapter 18 requirement for geotechnical investigation being conducted for all projects in Seismic Category D. This report will address geotechnical conditions existing on the site as they pertain to final foundation design minimums for any proposed structures that will be constructed on the subject site.

Site Description

The subject commercial/retail/industrial buildings are planned for the westerly, central and easterly portions of the subject site, an approximately 19.29-acre irregular-shaped parcel of land. The subject site is located on the southeast corner of Lake Street (31000) and Interstate 15 in Lake Elsinore, Riverside County, California. The site is bounded on the north by the southbound on-ramp to Interstate I-15, to the east and south by Temescal Wash, and to the west by Lake Street and vacant land.

SUMMARY OF EARTHWORK

General

Contained herein are the results of compaction testing and observations made during mass grade operations for the subject commercial pads. Test locations are plotted on the **Compaction Test Location Map, Plate 1**, attached to this report. The results of laboratory and field density testing are contained in the attached **Appendixes B & C**, respectively.

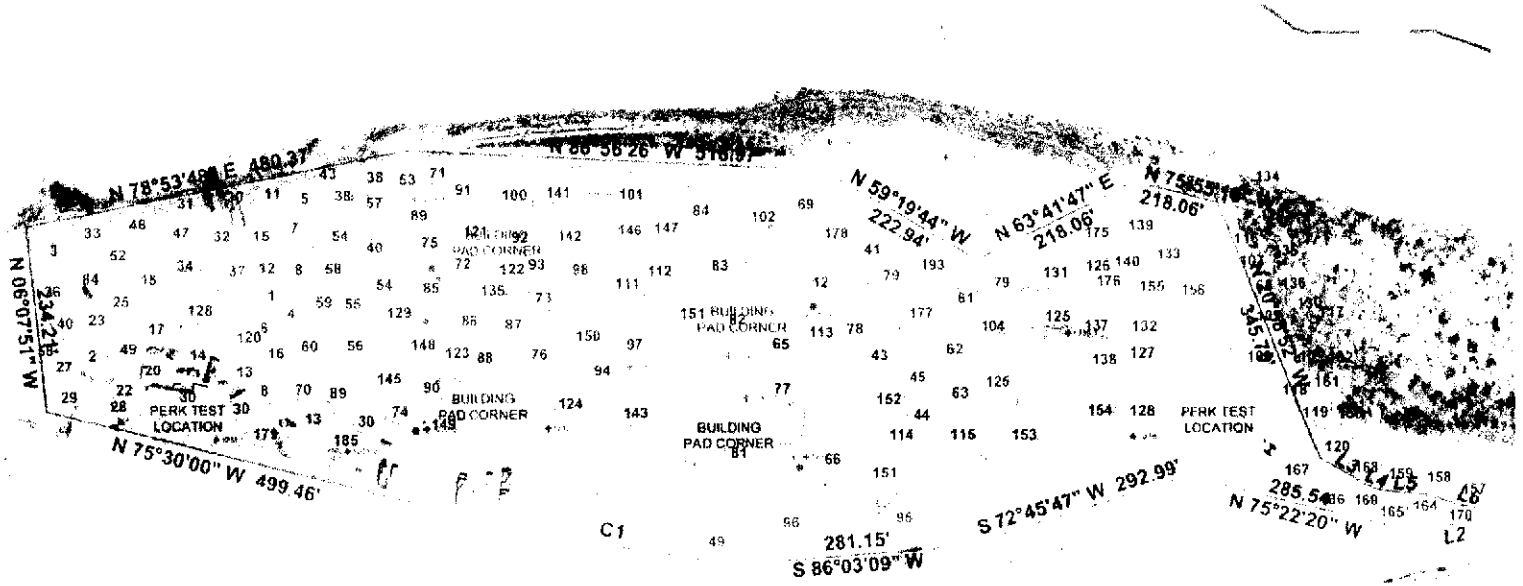
Site grading was conducted between July 28, 2017 and March 19, 2018, by the contractor, Silua's Construction. It should be noted that observation and testing for the mass graded pad was performed on a periodic basis when excavating and semi-continuous during fill placement, and information relative to procedures used was obtained by direct observation.

Rough Grading

Grading was achieved with the use of two CAT 623 scrapers, a CAT D6 and a CAT D8 dozers, a Volvo excavator, and a Ratch vibrating steel drum compactor. Moisture conditioning was accomplished when necessary utilizing a water truck. Compaction was achieved by wheel rolling with the compactor over each lift of fill and incidental contact from the scrapers and water truck.

At this time, proposed development includes a gas station/mini-market on the westerly portion of the site adjacent to Lake Street, a large commercial/industrial tilt-up on the central portion, and a commercial storage facility on the easterly portion of site with planned access from Lake Street.

LAKE STREET PROPERTY



EMP WER

VERTICAL DATUM: NAVD88 (Computed using GEOID12B)
CONTOUR INTERVAL: MAJOR= 5', MINOR= 1

Lake Elsinore, California

SOUTH SHORE TESTING & ENVIRONMENTAL

GEOTECHNICAL MAP
PROPOSED COMMERCIAL DEV. - FORMER WYROC QUARRY
3100 LAKE STREET
CITY OF LAKE ELSINORE, RIVERSIDE COUNTY, CALIFORNIA

WORK ORDER: 241120-22 DATE: MAY 2025 PLATE 1 OF 1

195 - APPROXIMATE LOCATION OF COMPACTION TESTS

Building pad areas were overexcavated a minimum of 5-ft below finish grade elevation and extended across proposed building areas, as measured by the contractor, and exposed either old alluvial deposits or volcanic bedrock units of the Santiago Peak volcanic (So Cal Geotech, 2017 & Greenwood, 1992).

A keyway was established along the toe of any 2:1 (h v) fill slopes. The outside edge of the keyway was founded a minimum of 2-ft into observed and competent older alluvial or bedrock units and inclined into the hillside at a minimum 2% gradient for a minimum width of 12-ft. The keyway excavation exposed both older alluvial soils and -volcanic bedrock units (Greenwood,1992) that were free of pinpoint pores and fine roots throughout the bottom area and up a minimum of 2 feet on all sides. Any loose soils or weathered bedrock were completely removed by benching during rough grade operation. Fill slopes were constructed to finish grade elevation and track walked after each lift and compacted to the minimum requirement of 90% of the maximum dry density as determined by ASTM test designation D 1557-12, Method A. At the completion of grading rip-rap boulders were placed along the slopes.

Keyway and overexcavation bottoms were observed by a representative of this firm, approved for fill placement, then processed in place to a depth of 12-inches by scarifying, moisture conditioning to near optimum moisture content, then compacted to the minimum requirement of 90% of the maximum dry density as determined by ASTM test designation D 1557-12, Methods A and C.

Field density testing was conducted in accordance with ASTM test designation D 6938-06e1 (nuclear gauge) for every 2 vertical feet of fill placement. Pursuant to standard practices, earth material suitable and used for fill was brought to and maintained at a uniform near optimum moisture content and placed in 6 to 8-inch lifts, spread and leveled, then compacted to the minimum requirements.

All earth materials utilized in creating the commercial/retail pads were tested for maximum density, corrosivity and expansion characteristics during and after grading. A total of 195 field density tests were conducted during rough grading of the major and future pads. Density test results are contained in **Appendix C** and the approximate locations are shown on enclosed **Plate 1, Geotechnical Map** (attached)

Laboratory Testing

Testing of recovered soil samples (representative of the area and import soils) consisted of laboratory maximum density test (ASTM D1557-12), Expansion Index (ASTM D 482 9-11). The results of our laboratory testing are indicated in Appendix **B**.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

General

The development of the site as proposed is both feasible and safe from a geotechnical standpoint if the recommendations contained herein are implemented during design and construction. The overall recommendations are presented herein.

1. Per the available as-built mass-grading plan and our conversations with you, proposed structures will be constructed along the west, central, and easterly portions of the subject site.

2. Observation, classification, and our expansion testing indicate that the near surface soils placed within the pads are **Non-Expansive** (Expansion Index $\geq$20 – 2016 CBC Section 1803.5.3) with an EI's of 1 to 5 consisting of gravelly silty Sands (SM).

3. Fill slopes were constructed as part of current grading operations. Future fill slopes, constructed at a 2:1 (h:v) slope ratio to a maximum height of approximately 5-ft, are proposed along the westerly entrance to the site off of Collier Avenue.

Recommendations

General

Foundation design criteria presented in the "Feasibility Study" report (So Cal Geotechnical, 2017), as modified by test results and analyses, are iterated herein for clarification and convenience.

Allowable Safe Bearing Capacity

A safe allowable bearing value of 2,500 psf for foundations embedded into observed competent engineered fill soils. Continuous footings, for single-story or equivalent structures, should have a minimum width of 12 inches and depth of 15 inches and conform to the minimum criteria of the 2016 CBC for low expansive soils (EI = 5). The use of isolated column footings is not discouraged, however, where utilized, should have a minimum embedment of 18-inches below lowest soil grade. The minimum distance of the bottom outside edge of all footings and any slope face shall be 5-ft. All footings should be embedded a minimum of 12-inches into observed competent native materials, regardless of depth below the adjacent ground surface.

Settlement

The bearing value recommended above reflects a total settlement of 0.5-inches and a differential settlement of 0.5-inches within a horizontal distance of 20-ft (L/480). Most of this settlement is expected to occur during construction and as the loads are being applied.

Concrete Slabs

All concrete slabs on grade should be 5 to 6-inches thick, minimum. They should be underlain by 2-inches of sand or approved non-expansive onsite materials. Imported or approved onsite materials may be utilized for this purpose. Contractors should be advised that when pouring during hot or windy weather conditions, they should provide large slabs with sufficiently deep weakened plane joints to inhibit the development of irregular or unsightly cracks. Also, 5 to 6-inch thick slabs should be jointed in panels not exceeding 8-ft in both directions to augment proper crack direction and development. The slab area and footing excavations and any concrete flatwork should be pre-moistened to prior to placement of concrete.

Moisture Barrier

When the intrusion of moisture through concrete slabs is objectionable, particularly with interior slabs where flooring is moisture sensitive, a vapor barrier should be installed onto the subgrade prior to the pouring of concrete. It should consist of a minimum 10 mil visqueen, protected from puncture with 2 inches of sand above and 2 inches of sand below. This is considered a minimum recommendation as there are other devices that provide as good as or better moisture protection. The project architect and or structural engineer may recommend alternative devices for moisture protection.

Reinforcement

From a Geotechnical standpoint, continuous footings should be reinforced with a minimum of two number 4 steel bar placed at the top and bottom. In no case should the content of steel in concrete footings be less than the recommended minimums of the appropriate sections of the A.C.I. standards. Slabs should be reinforced with a minimum of number 3 steel bars placed at the center of thickness at 16-inch centers both ways (CBC 2016). These are considered minimums and additional requirements may be imposed by other structural engineering design requirements. In addition, at the completion of grading, testing of the near surface soils may indicate that different or more stringent reinforcing schedule minimums may be appropriate. Careful consideration should be given to the recommendations that will be contained in the final report of compaction test results and foundation design requirements.

Concrete

Based on previous soluble sulfate content testing (So Cal Geo, 2017), it is anticipated that, from a corrosivity standpoint, Type II Portland Cement can be used for construction. Previous laboratory analysis results reported that the percentage by weight of soluble sulfates were reported as **0.033 & 0.005**, which equates to a **Negligible** sulfate exposure per American Concrete Institute (ACI), 318, Table 4.3.1 (2005).

Lateral Load Resistance

The bearing value of the soil may be increased by one third for short duration loading (wind, seismic). Lateral loads may be resisted by passive forces developed along the sides of concrete footings or by friction along the bottom of concrete footings. The value of the passive resistance for level ground may be computed using an equivalent fluid density of 300 pcf for level ground. The total force should not exceed 3,000 psf. A coefficient of friction of .30 may be used for the horizontal soil/concrete interface for resistance of lateral forces. If friction and passive forces are combined, then the passive values should be reduced by one third.

Observation of Foundation Excavations

In accordance with the 2016 CBC and prior to the placement of forms, concrete, or steel, all foundation excavations should be observed by the geologist, engineer, or his representative to verify that they have been excavated into competent bearing materials. The excavations should be per the approved plans, moistened, cleaned of all loose materials, trimmed neat, level, and square. Any moisture softened earth materials should be removed prior to steel or concrete placement.

Earth materials from foundation excavations should not be placed in slab on grade areas unless the materials are tested for expansion potential and compacted to a minimum of 90 percent of the maximum dry density.

Fine Grading and Site Drainage

Fine grading of areas outside of the proposed structures should be accomplished such that positive drainage exists away from all footings in accordance with 2016 CBC and local governing agency requirements. Runoff should be conducted in a non-erosive manner toward approved drainage devices per approved plans. No runoff should be allowed to concentrate and flow over the tops of slopes.

Utility Trench Backfill

All trench excavations should be conducted in accordance with Cal-OSHA standards as a minimum. The soils encountered within our exploratory trenches are generally classified as Type "C" soil in accordance with the CAL/OSHA (2013) excavation standards. Based upon a soil classification of Type "C", the temporary excavations should not be inclined steeper than 1.5:1 (horizontal : vertical) for a maximum depth of 20-ft. For temporary excavations deeper than 20-ft or for conditions that differ from those described for Type "C" in the CAL/OSHA excavation standards, the project geotechnical engineer should be contacted.

Utility trench backfill should be compacted to a minimum of 90 percent of the maximum dry density determined in laboratory testing by the ASTM D 1557-12 test method. It is our opinion that utility trench backfill consisting of onsite or approved sandy soils can best be placed by mechanical compaction to a minimum of 90 percent of the maximum dry density. The upper 1-ft of utility trench excavations located within pavement areas should be compacted to a minimum of 95 percent of the maximum dry density.

Post-Earthwork Construction

South Shore Testing & Environmental, or a duly designated representative, should be present to test and or confirm the conditions encountered during site development. In addition, post-earthwork construction monitoring should be conducted at the following stages:

- Moisture content near optimum will necessarily need to be maintained, both to maintain proper compaction and to prevent wind erosion of the pad.

- At the completion of foundation excavations, but prior to the placement of steel and or other construction materials in them. As a requirement of this report, the undersigned must, in writing, certify that the foundations meet the minimum requirements of this report and the building plans for depth and width along with the earth materials being the appropriate moisture content and compaction. Backfilling of over deepened footings with earth materials will not be allowed and must be poured with concrete. Consequential changes and differences may exist throughout the earth materials on the site. It may be possible that certain excavations may have to be deepened slightly if earth materials are found to be loose or weak during these observations.

- Any other pertinent post construction activity where soils are excavated or manipulated or relied upon in any way for the performance of buildings or hardscape features. This would necessarily include preparation of exterior slab subgrades

Cuts to 5-ft, or slightly more will stand vertical for normal time periods associated with construction of retaining walls. Time periods for unsupported cuts 5-ft or greater vertical should be limited to 60 days in the non-rainy season and 30 days in the rainy season.

CONSTRUCTION MONITORING SUMMARY

These supplemental services are necessary and required during project development and construction. They are summarized here as follows:

- Foundation plan review.
- Observation of foundation excavations prior to placement of forms and construction materials.
- During the placement of utility trench backfill
- During preparation of subgrades for hardscape and concrete flatwork.
- At any time when earth materials are manipulated and or relied upon for the support of structural loads or within the vicinity of where structural loads are already applied to soils.

LIMITATIONS

Our professional services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable Geotechnical Engineers and Geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

This report is issued with the understanding that it is used only by the owner and it is the sole responsibility of the owner or their representative to ensure that the information and recommendations contained herein are brought to the attention of the architect, engineer, and appropriate jurisdictional agency for the project and incorporated into the plans; and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations contained herein during construction and in the field.

The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and revision as changed conditions are identified.

The firm that performed the geotechnical investigation for this project should be retained to provide testing observation services during construction to maintain continuity of geotechnical interpretation and to check that the recommendations presented herein are implemented during site grading, excavation of foundations and construction of improvements.

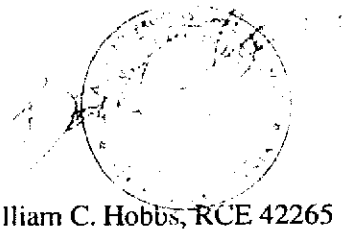
If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. Selection of another firm to perform any of the recommended activities or failure to retain the undersigned to perform the recommended activities wholly absolves **South Shore Testing & Environmental**, the undersigned, and its assigns from all liability arising directly or indirectly from any aspects of this project.

CLOSURE

We appreciate the opportunity to be of service. Limitations and conditions contained in reference documents are considered in full force and applicable. If you have any questions, please do not hesitate to call our office.

Respectfully Submitted,

South Shore Testing and Environmental



John P. Frey
Project Manager

William C. Hobbs, RCE 42265
Civil Engineer

ATTACHMENTS

Plate 1 - Compaction Test Location Map (not-to-scale)
Appendix A - References
Appendix B - Laboratory Test Results
Appendix C - Results of Compaction Tests

APPENDIX A

References

REFERENCES

California Building Standards Commission, 2016, "2016 California Building Code", California Code of Regulations, Title 24, Part 2, Volumes 1 and 2 of 2.

California Division of Mines and Geology, 1992, "Geologic Map of the Alberhill 7 1/2' Quadrangle", DMG Open-File Report 92-10, Scale: 1" = 2,000'.

Department of Water Resources, August 1971, "Water Wells and Springs in the Western Part of the Upper Santa Margarita River Watershed, Riverside and San Diego Counties, California", Bulletin No. 91-20.

Kennedy, Michael P, 1977, "Recency and Character of Faulting Along the Elsinore Fault Zone in Southern Riverside County, California", California Division of Mines and Geology, Special Report 131, Scale: 1" = 2,000'.

Morton, D.M., 2004, "Preliminary Digital Geologic Map of the Santa Ana 30' x 60' Quadrangle, Southern California (Version 2.0)", U.S. Geological Survey in Cooperation with the California Geologic Survey, Open-File Report 99-172, Scale: 1"=100,000'.

Morton, D.M. and Weber H.F., Jr., 2003, "Preliminary Geologic Map of the Elsinore 7.5' Quadrangle, Riverside County, California", U.S. Geological Survey in Cooperation with the California Geologic Survey, Open-File Report 03-281, Scale: 1"=2,000'.

Southern California Geotechnical, 2017, "Feasibility Study, Proposed RV Storage Facility, 31000 Lake Street, Lake Elsinore, California", Project No. 16G227-1R, Dated January 5, 2016.

APPENDIX B

Laboratory Test Results

TABLE I Maximum Density/Optimum Moisture			
	Description	**Lbs/Ft^3**	**% Moisture**
1	Gray Brown Clayey Silty Sand (SM-SC)	128.0	10.5
2	Brown Silty Sand (SM)	133.5	7.5
3	Gray Brown Clayey Silty Sand (SM)	127.3	12.5

TABLE II EXPANSION INDEX		
TEST LOCATION	EXPANSION INDEX	EXPANSION POTENTIAL
Gas Station Pad	2	Non-Expansive
Industrial Bldg Pad	1	Non-Expansive
RV Storage Pad	5	Non-Expansive

APPENDIX C

Results of Compaction Tests

TABLE I
RESULTS OF COMPACTION TESTS

Job No.: 3411701.22 Name: Ron Clark- 31000 Lake Street Date: May 2018

Test No.	Test Date	Elevation Depth (Feet)	Moisture Content (%)	Unit Dry Density (PCF)	Relative Compaction (%)	Soil Type	Test Location See Plate 1
1	07/28/17	1212	8.1	120	94N	1	Segment A
2	"	1212	8.7	119.0	93N	1	"
3	"	1212	9.2	118.7	93N	1	"
4	07/31/17	1213	11.0	119.7	94N	1	"
5	"	1213	121.2	119.1	93N	1	"
6	"	1214	12.5	120.1	94N	1	"
7	"	1214	13.1	118.0	92N	1	"
8	"	1214	14.2	117.7	92N	1	"
9	"	1213	11.8	122.0	95N	1	"
10	"	1213	11.1	122.7	96N	1	"
11	08/1/17	1214	12.8	116.8	91N	1	"
12	"	1214	13.0	116.0	91N	1	"
13	08/4/17	1215	12.5	117.0	91N	1	"
14	"	1212	12.1	117.3	92N	1	Segment A-2
15	08/5/17	1226	11.2	119.3	93N	1	Segment A
16	"	1227	13.0	118.5	93N	1	"
17	"	1225	11.6	119.7	94N	1	Segment A-2
18	"	1226	9.8	120.6	95N	1	"
19	"	1227	9.0	121.3	95N	1	"
20	"	1228	8.7	121.5	95N	1	"

SEE PLAN FOR TEST LOCATIONS
SC - Sand Cone ASTM D1556-64; DC-Drive Cylinder ASTM D2937-71; N-Nuclear ASTM 6938-06e1;
NG-Natural Ground + 85% = Passing Test **TEST FAILED, SEE RETEST

TABLE I
RESULTS OF COMPACTION TESTS

Job No.: 3411701.22 Name: Ron Clark – 31000 Lake Street Date: May 2018

Test No.	Test Date	Elevation Depth (Feet)	Moisture Content (%)	Unit Dry Density (PCF)	Relative Compaction (%)	Soil Type	Test Location See Plate 1
21	08/7/17	1214	13.8	118.1	96N	1	Segment A-3
22	"	1217	12.0	119.9	97N	1	"
23	"	1219	11.1	122.1	96N	1	"
24	"	1222	9.6	124.0	95N	1	"
25	08/08/17	1224	12.0	115.7	97N	1	"
26	"	1226	8.0	120.1	96N	1	"
27	"	1228	7.5	119.3	96N	1	"
28	"	1216	8.9	115.9	97N	1	Segment A-5
29	"	1218	9.7	116.9	96N	1	"
30	"	1220	11.1	116.0	96N	1	Fill slope Segment A
31	08/10/17	1212	11.6	115.2	90N	1	"
32	"	1213	12.1	115.0	90N	1	"
33	"	1214	9.9	116.4	91N	1	"
34	"	1215	8.9	117.0	91N	1	"
35	"	1216	8.2	117.9	92N	1	"
36	08/11/17	1218	9.6	123.1	96N	1	"
37	"	1220	9.9	121.1	95N	1	"
38	"	1222	8.9	122.0	95N	1	"
39	"	1225	7.6	125.1	98N	1	Segment A
40	"	1227	7.4	125.6	98N	1	"

SEE PLAN FOR TEST LOCATIONS
SC - Sand Coné ASTM D1556-64; DC-Drive Cylinder ASTM D2937-71; N-Nuclear ASTM 6938-06e1;
NG-Natural Ground + 85% = Passing Test **TEST FAILED, SEE RETEST

TABLE I
RESULTS OF COMPACTION TESTS

Job No.: 3411701.22 Name: Ron Clark – 31000 Lake Street Date: May 2018

Test No.	Test Date	Elevation Depth (Feet)	Moisture Content (%)	Unit Dry Density (PCF)	Relative Compaction (%)	Soil Type	Test Location See Plate 1
41	08/11/17	1223	11.3	116.1	91N	1	Segment C
42	"	1224	9.9	111.3	92N	1	"
43	"	1225	9.2	118.0	92N	1	"
44	"	1226	8.9	118.4	92N	1	"
45	"	1226	8.4	117.3	92N	1	"
46	08/15/17	1223	7.5	121.7	95N	1	Segment A Eastside
47	"	1224	8.9	118.7	93N	1	"
48	"	1227	9.1	119.3	93N	1	"
49	"	1220	10.1	118.8	93N	1	Segment A North end
50	"	1223	11.3	117.0	91N	1	"
51	08/16/17	1225	11.1	118.3	93N	1	Segment A Eastside
52	"	1227	9.9	120.2	94N	1	"
53	08/17/17	1214	11.0	119.1	93N	1	Segment B
54	"	1216	12.2	117.3	92N	1	"
55	"	1217	13.0	118.0	92N	1	"
56	"	1218	11.5	117.3	92N	1	"
57	"	1218	10.7	120.1	94N	1	"
58	"	1215	9.8	121.1	95N	1	"
59	"	1216	9.9	120.6	94N	1	"
60	"	1217	8.9	120.5	94N	1	"

SEE PLAN FOR TEST LOCATIONS
SC – Sand Cone ASTM D1556-64; DC-Drive Cylinder ASTM D2937-71; N-Nuclear ASTM 6938-06e1;
NG-Natural Ground + 85% = Passing Test **TEST FAILED, SEE RETEST

TABLE I
RESULTS OF COMPACTION TESTS

Job No.: 3411701.22 Name: Ron Clark – 31000 Lake Street Date: May 2018

Test No.	Test Date	Elevation Depth (Feet)	Moisture Content (%)	Unit Dry Density (PCF)	Relative Compaction (%)	Soil Type	Test Location See Plate 1
61	08/17/17	1227	7.7	124.5	98N	1	Segment C
62	"	1228	8.0	122.0	95N	1	"
63	"	1225	8.3	121.1	95N	1	"
64	"	1222	11.2	118.2	92N	1	"
65	"	1223	13.1	117.0	91N	1	"
66	"	1225	12.5	117.7	92N	1	"
67	08/21/17	1220	11.0	120.0	94N	1	Segment B
68	"	1222	9.5	121.3	95N	1	"
69	"	1224	9.0	122.1	95N	1	"
70	"	1225	8.7	123.1	96N	1	"
71	08/22/17	1228	9.5	122.0	95N	1	"
72	"	1228	8.9	121.7	95N	1	"
73	"	1228	9.2	120.0	94N	1	"
74	"	1229	9.9	118.3	93N	1	"
75	"	1230	11.1	116.9	91N	1	"
76	"	1229	12.0	117.3	92N	1	"
77	08/23/17	1227	11.3	116.9	91N	1	Segment C
78	"	1227	10.7	117.3	92N	1	"
79	"	1226	9.9	118.1	92N	1	"
80	"	1223	9.3	117.8	92N	1	"

SEE PLAN FOR TEST LOCATIONS
SC - Sand Cone ASTM D1556-64; DC-Drive Cylinder ASTM D2937-71; N-Nuclear ASTM 6938-06e1;
NG-Natural Ground + 85% = Passing Test **TEST FAILED, SEE RETEST

TABLE I
RESULTS OF COMPACTION TESTS

Job No.: 3411701.22 **Name:** Ron Clark – 31000 Lake Steet **Date:** May 2018

Test No.	Test Date	Elevation Depth (Feet)	Moisture Content (%)	Unit Dry Density (PCF)	Relative Compaction (%)	Soil Type	Test Location See Plate 1
81	08/24/17	1223	7.8	120.9	94N	1	Segment C
82	"	1224	9.3	118.8	93N	1	"
83	"	1226	8.8	119.3	93N	1	"
84	"	1226	8.6	119.7	94N	1	"
85	"	1227	11.3	118.5	93N	1	Segment B
86	"	1228	12.8	116.6	91N	1	"
87	"	1229	12.1	117.0	91N	1	"
88	"	1228	11.9	118.0	92N	1	"
89	"	1228	10.3	120.6	94N	1	"
90	"	1228	9.8	121.3	95N	1	"
91	08/28/17	1225	9.9	120.7	94N	1	Segment B South End
92	"	1225	9.2	121.6	95N	1	"
93	"	1226	9.0	120.0	94N	1	"
94	"	1227	10.5	119.6	93N	1	"
95	"	1228	11.6	118.7	93N	1	Parking B Westside
96	"	1227	12.7	116.7	91N	1	"
97	"	1228	9.1	122.3	96N	1	"
98	"	1229	12.3	119.9	94N	1	Segment B Fill
99	"	1229	11.7	121.7	95N	1	"
100	"	1229	10.1	123.6	97N	1	"

SEE PLAN FOR TEST LOCATIONS
SC - Sand Cone ASTM D1556-64; DC-Drive Cylinder ASTM D2937-71; N-Nuclear ASTM 6938-06e1;
NG-Natural Ground + 85% = Passing Test ****TEST FAILED, SEE RETEST**

TABLE I
RESULTS OF COMPACTION TESTS

Job No.: 3411701.22 Name: Ron Clark – 31000 Lake Street Date: May 2018

Test No.	Test Date	Elevation Depth (Feet)	Moisture Content (%)	Unit Dry Density (PCF)	Relative Compaction (%)	Soil Type	Test Location See Plate 1
101	09/4/17	1228	8.7	123.6	93N	2	Segment C
102	"	1228	9.9	1223.3	92N	2	"
103	"	1229	10.0	122.9	92N	2	"
104	"	1229	11.1	121.1	91N	2	"
105	"	1227	10.1	120.7	90N	2	"
106	"	1220	9.1	121.3	91N	2	Segment E
107	"	1222	7.8	124.1	93N	2	Far South Keyway Fill
108	"	1225	7.0	125.3	94N	2	"
109	"	1224	6.6	126.7	95N	2	"
110	"	1224	6.8	125.6	94N	2	"
111	09/8/17	1229	6.6	125.1	94N	2	Segment C
112	"	1229	7.3	123.8	93N	2	"
113	"	1229	6.5	124.3	93N	2	"
114	"	1228	5.8	126.6	95N	2	"
115	"	1225	6.1	125.6	94N	2	"
116	09/12/17	1225	8.9	123.0	92N	2	Keyway Slope
117	"	1225	11.0	122.6	92N	2	"
118	"	1225	9.3	124.0	93N	2	"
119	"	1225	9.1	123.8	93N	2	"
120	"	1225	10.0	122.9	92N	2	"

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NG-Natural Ground + 85% = Passing Test **TEST FAILED, SEE RETEST

TABLE I
RESULTS OF COMPACTION TESTS

Job No.: 3411701.22 Name: Ron Clark – 31000 Lake Street Date: May 2018

Test No.	Test Date	Elevation Depth (Feet)	Moisture Content (%)	Unit Dry Density (PCF)	Relative Compaction (%)	Soil Type	Test Location See Plate 1
121	09/14/17	1227	10	126.0	94N	2	Segment B
122	"	1228	11	125.8	94N	2	"
123	"	1230	9.9	127.3	95N	2	"
124	"	1230	10.9	125.6	94N	2	"
125	"	1228	9.6	127.7	96N	2	Segment D
126	"	1229	8.5	129.0	97N	2	"
127	"	1230	8.0	128.9	97N	2	"
128	"	1230	9.1	126.9	95N	2	"
129	"	1221	9.6	127.9	96N	2	Far Fill Slope
130	"	1226	10.1	128.7	96N	2	"
131	09/19/17	1229	8.9	126.2	95N	2	Segment D
132	"	1229	9.8	125.5	94N	2	"
133	"	1229	9.6	124.8	93N	2	"
134	"	1227	10.5	122.7	92N	2	Far South Fill Slope
135	"	1227	12.0	121.0	91N	2	"
136	"	1227	11.0	121.6	91N	2	"
137	09/27/17	1229	9.0	122.3	92N	2	Segment D
138	"	1229	7.8	126.5	95N	2	"
139	"	1230	8.1	125.5	94N	2	"
140	"	1230	8.3	124.0	93N	2	"
141	09/29/17	1232	8.0	121.8	91N	2	Segment B

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TABLE I
RESULTS OF COMPACTION TESTS

Job No.: 3411701.22 Name: Ron Clark – 31000 Lake Street Date: May 2018

Test No.	Test Date	Elevation Depth (Feet)	Moisture Content (%)	Unit Dry Density (PCF)	Relative Compaction (%)	Soil Type	Test Location See Plate 1
142	09/29/17	1232	8.0	121.8	91N	2	Segment B
143	"	1232	6.7	123.6	93N	2	"
144	"	1232	9.1	122.0	91N	2	"
145	"	1232	10.3	121.4	91N	2	"
146	09/31/17	1232	11.2	122.0	91N	2	Segment C
147	"	1231	13.1	121.3	91N	2	"
148	"	1234	10.8	123.6	93N	2	Segment B
149	"	1233	9.7	124.5	93N	2	"
150	"	1234	9.3	125.6	94N	2	"
151	11/27/17	1232	8.5	123.1	92N	2	Segment C
152	"	1233	9.6	122.6	92N	2	"
153	"	1235	10.1	122.0	91N	2	"
154	"	1232	10.6	121.9	91N	2	Segment D
155	"	1233	9.3	123.7	93N	2	"
156	"	1235	9.1	124.5	93N	2	"
157	12/4/17	1225	6.6	125.5	94N	2	South End Fill Slope
158	"	1227	6.0	125.7	94N	2	"
159	"	1229	7.0	124.6	93N	2	"
160	"	1229	7.1	123.8	94N	2	"
161	"	1227	6.6	123.3	92N	2	"
162	"	1229	5.8	126.1	94N	2	"

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TABLE I
RESULTS OF COMPACTION TESTS

Job No.: 3411701.22 **Name:** Ron Clark – 31000 Lake Street **Date:** May 2018

Test No.	Test Date	Elevation Depth (Feet)	Moisture Content (%)	Unit Dry Density (PCF)	Relative Compaction (%)	Soil Type	Test Location See Plate 1
163	12/4/17	1229	6.0	125.3	94N	2	South End Fill Slope
164	12/6/17	1229	8.0	128.7	96N	2	"
165	"	1229	9.0	127.7	96N	2	"
166	"	1230	10.0	126.3	95N	2	"
167	"	1230	11.0	125.0	94N	2	"
168	12/8/17	1231	6.7	128.0	96N	2	"
169	"	1232	8.9	127.3	95N	2	"
170	"	1232	8.7	128.2	95N	2	"
171	12/11/17	1228	9.6	127.8	96N	2	Eastside Fill Slope
172	"	1229	9.0	128.3	96N	2	"
173	"	1230	9.9	127.1	95N	2	"
174	"	1231	11.8	126.0	94N	2	"
175	12/26/17	1229	10.8	125.9	94N	2	Segment C
176	"	1229	11.3	126.1	95N	2	"
177	"	1230	11.6	126.3	95N	2	Segment D
178	"	1232	10.5	128.0	96N	2	"
179	1/26/18	1232	10.3	129.3	97N	2	Parking NW Side
180	"	1232	10.6	128.5	96N	2	"
181	1/30/18	1329	9.0	128.0	96N	2	RV Storage Area
182	"	1330	8.5	128.2	96N	2	"
183	"	1330	9.3	127.3	95N	2	"

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NG-Natural Ground + 85% = Passing Test ****TEST FAILED, SEE RETEST**

TABLE I
RESULTS OF COMPACTION TESTS

Job No.: 3411701.22 Name: Ron Clark – 31000 Lake Street Date: May 2018

Test No.	Test Date	Elevation Depth (Feet)	Moisture Content (%)	Unit Dry Density (PCF)	Relative Compaction (%)	Soil Type	Test Location See Plate 1
184	1/30/18	1329	11.5	126.8	95N	2	RV Storage Area
185	"	1329	8.0	128.6	96N	2	"
186	3/19/18	1330	11.0	127.0	95N	2	"
187	"	1332	7.6	129.1	97N	2	"
188	"	1333	9.9	127.3	95N	2	"
189	"	1333	9.3	128.2	96N	2	"
190	"	1333	9.8	127.7	96N	2	"
191	"	FG	7.7	125.8	94N	2	North End By Water Tank
192	"	FG	7.8	126.6	95N	2	"
193	"	FG	8.3	128.4	96N	2	"
194	"	FG	8.8	128.1	96N	2	"
195	"	FG	9.1	127.0	95N	2	"

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NG-Natural Ground + 85% = Passing Test ****TEST FAILED, SEE RETEST**