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Project No. T3006-99-01
December 13, 2022

Mr. Kevin Kim
IMEG Corporation
300 N. Lake Avenue, 12th Floor
Pasadena, California 91101

Subject: LIMITED GEOTECHNICAL INVESTIGATION
PROPOSED PAVEMENT
EMERGENCY VEHICLE OPERATION CENTER
SAN BERNARDINO COUNTY SHERIFF'S DEPARTMENT
SAN BERNARDINO, CALIFORNIA

Mr. Kim,

In accordance with the *Standard Form of Agreement Between Engineer and Consultant* (IMEG #22006394.00), dated September 7, 2022, between IMEG Corporation (IMEG) and Geocon West, Inc. (Geocon), we have prepared this limited geotechnical investigation report providing paving design recommendations for the proposed pavement at the San Bernardino County Sheriff's Emergency Vehicle Operation Center (EVOC), located at the northeast corner of the intersection of Verdemon Ranch Road and Institution Road, in the City of San Bernardino, California. The approximate location of the project is depicted on the attached *Vicinity Map* (Figure 1). This report presents a summary of the methods used to explore the subsurface conditions, measurements of the existing pavement section thicknesses, results of the field and laboratory testing, and geotechnical recommendations for design and construction of proposed pavement.

PROJECT UNDERSTANDING

The majority of existing asphalt concrete pavement within the EVOC facility is aged and distressed. Based on the *Scoping Markup for Pavement Rehabilitation Project*, prepared by IMEG and dated August 19, 2022, the proposed improvements will generally consist of the reconstruction of existing distressed asphalt concrete pavements throughout the EVOC facility, construction of new asphalt concrete pavements in southern areas of the site that are planned to be widened and at the existing southern gravel parking area, and the construction of new rigid PCC concrete pavement within specific areas of the EVOC facility. The *Core Location Map* (Figure 2) depicts the core locations. Furthermore, we anticipate new sign and striping improvements as part of this project. Earthwork is anticipated to consist of minor grading and subgrade reprocessing, with changes in grade of 3 feet or less.

SCOPE OF SERVICES

This investigation included a site reconnaissance and Underground Service Alert (USA) mark-out of the planned core locations, observation of the existing pavement conditions, advancement of twelve cores in distressed areas to measure the existing pavement section thicknesses, in-situ field testing to assess the subgrade condition, collection of in-situ and bulk samples of subgrade soil for laboratory testing, evaluation of new pavement section thicknesses, and geotechnical recommendations for the design and construction of proposed roadway improvements. The scope of services for this investigation included:

- Performing a site reconnaissance, observing the existing pavement conditions, and marking out and notifying USA of the proposed core locations to mark utilities in vicinity of the cores.
- Advancing twelve pavement cores in locations cleared of utilities, where roadway improvements are planned.
- Performing laboratory testing of the subgrade soil, which consisted of maximum dry density and optimum moisture content, soil resistance value (R-value), and in-situ moisture and density.
- Preparing this written limited investigation report presenting our findings, conclusions, and recommendations pertaining to the reconstruction of flexible asphalt concrete pavements and construction of new rigid PCC concrete pavements in distressed areas of the San Bernardino County Sheriff's EVOC facility.

FIELD EXPLORATION AND LABORATORY TESTING

We performed our site reconnaissance, observed the existing condition of asphalt concrete pavements, and marked out the planned core locations on October 21, 2022. Pavements at the EVOC facility were observed to exhibit medium to high severity distress in the form of longitudinal cracking, transverse cracking, block cracking, alligator cracking, spalling, and weathering. The highest severity distress was observed in the training vehicle parking lot in the central area of the site.

Our subsurface investigation was conducted on November 4, 2022 and consisted of the excavation of twelve pavement cores utilizing a truck-mounted hollow-stem auger drill rig. The approximate location of the pavement cores is depicted on the *Core Location Map* (Figure 2). The cores were advanced through the existing pavement and into the subgrade to depths of approximately 2 to 3 feet below the existing ground surface to observe the existing condition of the asphalt concrete pavement section and underlying subgrade soils, measure pavement section thicknesses, perform in-situ field testing consisting of a California Modified Split-Spoon Sampler test, and collection of in-situ and bulk samples of the subgrade soil for laboratory testing.

We encountered approximately 3 to 6 inches of asphalt-concrete at the core locations. An aggregate base section was not observed within the cores during this investigation.

The subgrade material encountered at the core locations generally consists of poorly-graded sand, with lesser amounts of well-graded sand and poorly-graded sand with silt, with varying amounts of gravel and cobbles. A boulder was encountered in C-10, which indicates boulders may be present throughout the site, and should be expected to be encountered within the limits of construction. The subgrade material is generally characterized as medium dense to very dense, moist to wet (locally wet in C-5 and C-8 at approximately 2 feet of depth), and varies in shades of olive and grayish brown. Groundwater was not encountered within the cores of this investigation. A summary of the encountered conditions is provided in Table 1.

**TABLE 1
EXISTING CONDITIONS ENCOUNTERED**

EVOC Facility Location	Core	Measured Asphalt Concrete Thickness (in)	Measured Aggregate Base Thickness (in)	Subgrade USCS Classification
Operations Building Parking Lot	C-1	5	0	Poorly-graded SAND (SP) with few gravel and cobbles, medium dense
Southern Training Area Straightaway	C-2	6	0	Poorly-graded SAND (SP) with few gravel and cobbles, dense
Southeastern Training Area Grid Streets	C-3	5	0	Well-graded SAND (SW) with little gravel and cobbles, dense
Eastern Training Area Grid Streets	C-4	5	0	Poorly-graded SAND (SP) with few gravel and cobbles, possible boulders, very dense
Northern Training Area L-Turn	C-5	6	0	Poorly-graded SAND (SP) with little gravel, dense
Training Vehicle Parking Lot	C-6	5	0	Poorly-graded SAND (SP) with some gravel and cobbles, dense
Northern Track Area	C-7	4	0	Poorly-graded SAND with silt (SP-SM) with little gravel and cobbles, dense
Northwestern Track Area	C-8	6	0	Well-graded SAND (SW) with little gravel, dense
Central Rectangular Paved Area Within Track	C-9	3	0	Poorly-graded SAND (SP) with few gravel, medium dense
Western Track Area	C-10	4	0	Poorly-graded SAND (SP) with little gravel and cobbles, boulders, medium dense
Southwestern Track Area	C-11	5	0	Poorly-graded SAND (SP) with few gravel and cobbles, very dense
Southern Track Area	C-12	5	0	Poorly-graded SAND (SP) with little gravel and cobbles, dense

The cores were backfilled with clean sand and capped with asphalt concrete cold patch, which was tamped with the drill rig. In-situ and bulk samples of the subgrade soil were collected from the excavations and were transported to our laboratory for testing. The bulk samples were tested in accordance with current, generally accepted test methods of ASTM International (ASTM) or other suggested procedures. The samples were tested for the subgrade material soil resistance value (R-value), maximum dry density and optimum moisture content, and in-situ density and moisture content. The results of our laboratory maximum dry density and optimum moisture content and R-value testing are summarized in Table 2. In-situ density and moisture content are provided on the logs in Appendix A. Copies of our laboratory testing reports for maximum dry density and optimum moisture content are provided in Appendix B.

**TABLE 2
LABORATORY TEST RESULTS**

Sample No.	Maximum Dry Density and Optimum Moisture Content	R-Value
C-1 @ SUB	130.0 pcf @ 6.5%	N/A
C-2 @ SUB	N/A	77
C-4 @ SUB	N/A	79
C-7 @ SUB	N/A	76
C-10 @ SUB	131.0 pcf @ 7.5%	N/A
C-12 @ SUB	N/A	77

CONCLUSIONS AND RECOMMENDATIONS

It is our opinion that no soil or geologic conditions were encountered during our field investigation that would prevent the construction of the proposed pavement improvements at the San Bernardino County Sheriff's Department EVOC facility, provided the recommendations presented herein are followed and implemented during construction.

Based on our observations, the asphalt concrete pavement distress generally consists of medium to high severity longitudinal cracking, transverse cracking, block cracking, alligator cracking, and spalling, which is primarily due to age, weathering, and heavy use of pavements.

The pavements may be reconstructed with new pavement structural sections. The subgrade soils where our cores were performed were encountered as medium dense to very dense. Remedial earthwork and subgrade preparation will need to be performed to address loose subgrade prior to pavement reconstruction. A Geocon field representative should be present during construction to delineate areas requiring subgrade remediation.

NEW PAVEMENTS

New conventional pavements should be constructed to meet the current minimum structural section thicknesses found in Article IX of the County of San Bernardino *Road Planning and Design Standards* (1993). For preliminary design purposes, we have evaluated flexible pavement structural section thicknesses for a range of Traffic Index (TI) values. Pavements have been evaluated with TI's of 5.0 to 9.0. It is within the purview of the civil engineer to select the appropriate TI for paved areas, and as such, Geocon should be contacted for additional recommendations if different TI's apply.

The following preliminary flexible pavement sections in Table 3 are recommended where new asphalt concrete pavements are planned. Pavement thicknesses were evaluated following procedures outlined in the referenced 2010 Caltrans *Highway Design Manual*. Laboratory test results indicated subgrade R-values of 77 through 79. For R-value test results exceeding 50, we evaluated the pavement sections using an R-value of 50, the maximum allowed by the 2010 *Highway Design Manual*. Final pavement sections should be evaluated based on R-value testing of the soils encountered at the pavement subgrade during construction.

**TABLE 3
RECOMMENDED CONVENTIONAL PAVEMENT DESIGN SECTIONS**

Traffic Index (TI)	Design Subgrade R-Value	Minimum Asphalt Concrete (inches)	Minimum Class 2 Aggregate Base (inches)	*Minimum Full Depth Asphalt Concrete (inches)
5.0	50	3	4½	4½
5.5	50	3	4½	5
6.0	50	3½	4½	5½
6.5	50	4	4½	6½
7.0	50	4	5	7
7.5	50	4½	5½	7½
8.0	50	5	6	8
8.5	50	5	6½	8½
9.0	50	5½	7	9

*Alternative full depth asphalt concrete pavement section (calculated value, not based on a county standard minimum)

Asphalt concrete should conform to Section 203-6 of the Greenbook. Class 2 aggregate base materials should conform to Section 26-1.02A of the “*Standard Specifications of the State of California, Department of Transportation*” (Caltrans).

A rigid Portland cement concrete (PCC) pavement section should be placed in roadway aprons and cross gutters. We calculated the rigid pavement section in general conformance with the procedure recommended by the American Concrete Institute report ACI 330-21 *Commercial Concrete Parking Lots and Site Paving Design and Construction – Guide*. Table 4 provides the traffic categories and design parameters used for the calculations for 20-year design life.

**TABLE 4
TRAFFIC CATEGORIES**

Traffic Category	Description	Reliability (%)	Slabs Cracked at End of Design Life (%)
A	Car Parking Areas and Access Lanes	60	15
B	Entrance and Truck Service Lanes	60	15
C	School or City Buses (Excluding Large Articulated Buses)	75	15
D	Heavy Duty Trucks (Gross Weight of 80 Kips)	75	15
E	Garbage or Fire Truck Lane	75	15

We used the parameters presented in Table 5 to calculate the pavement design sections. We should be contacted to provide updated design sections, if necessary.

**TABLE 5
RIGID PAVEMENT DESIGN PARAMETERS**

Design Parameter	Design Value
Modulus of subgrade reaction, k	100 pci
Modulus of rupture for concrete, M_R	500 psi
Concrete Compressive Strength	3,000 psi
Concrete Modulus of Elasticity, E	3,150,000

Based on the criteria presented herein, the PCC pavement sections should have a minimum thickness as presented in Table 6.

**TABLE 6
RIGID VEHICULAR PAVEMENT RECOMMENDATIONS**

Traffic Category	Trucks Per Day	Portland Cement Concrete, T (Inches)
A = Car Parking Areas and Access Lanes	10	5½
B = Entrance and Truck Service Lanes	10	6
B = Entrance and Truck Service Lanes	50	6½
B = Entrance and Truck Service Lanes	100	6½
C = School or City Buses	50	9½
C = School or City Buses	100	9½
D = Heavy Duty Trucks	50	6½
D = Heavy Duty Trucks	100	7
E = Garbage or Fire Truck Lanes	5	6½
E = Garbage or Fire Truck Lanes	10	7

The PCC vehicular pavement should be placed over subgrade soil that is compacted to a dry density of at least 95 percent of the laboratory maximum dry density (ASTM D1557) near to slightly above optimum moisture content.

Adequate joint spacing should be incorporated into the design and construction of the rigid pavement in accordance with Table 7.

**TABLE 7
MAXIMUM JOINT SPACING**

Pavement Thickness, T (Inches)	Maximum Joint Spacing (Feet)
$4 < T < 5$	10
$5 \leq T < 6$	12.5
$6 \leq T$	15

The rigid pavement should also be designed and constructed incorporating the parameters presented in Table 8.

**TABLE 8
ADDITIONAL RIGID PAVEMENT RECOMMENDATIONS**

Subject	Value
Thickened Edge	1.2 Times Slab Thickness Adjacent to Structures
	1.5 Times Slab Thickness Adjacent to Soil
	Minimum Increase of 2 Inches
	4 Feet Wide
Crack Control Joint Depth	Early Entry Sawn = $T/6$ to $T/5$, 1.25 Inch Minimum
	Conventional (Tooled or Conventional Sawing) = $T/4$ to $T/3$
Crack Control Joint Width	$1/4$ -Inch for Sealed Joints and Per Sealer Manufacturer's Recommendations
	$1/16$ - to $1/4$ -Inch is Common for Unsealed Joints

Reinforcing steel will not be necessary within the concrete for geotechnical purposes with the possible exception of dowels at construction joints as discussed herein.

To control the location and spread of concrete shrinkage cracks, crack-control joints (weakened plane joints) should be included in the design of the concrete pavement slab. Crack-control joints should be sealed with an appropriate sealant to prevent the migration of water through the control joint to the subgrade materials. The depth of the crack-control joints should be in accordance with the referenced ACI guide.

To provide load transfer between adjacent pavement slab sections, a butt-type construction joint should be constructed. The butt-type joint should be thickened by at least 20 percent at the edge and taper back at least 4 feet from the face of the slab.

Concrete curb/gutter should be placed on soil subgrade compacted to a dry density of at least 90 percent of the laboratory maximum dry density near to slightly above optimum moisture content. Cross-gutters that receive vehicular traffic should be placed on subgrade soil compacted to a dry density of at least 95 percent of the laboratory maximum dry density at or slightly above optimum moisture content. Base materials should not be placed below the curb/gutter, or cross-gutters so water is not able to migrate from the adjacent parkways to the pavement sections. Where flatwork is located directly adjacent to the curb/gutter, the concrete flatwork should be structurally connected to the curbs to help reduce the potential for offsets between the curbs and the flatwork.

REHABILITATION OF EXISTING PAVEMENTS

Based on our observations at the core locations, existing asphalt concrete pavements have thicknesses ranging between 3 and 6 inches. Roadway sections can be reconstructed with new pavement structural sections as recommended herein, or the existing pavement can be rehabilitated to reestablish the current pavement design thickness. If rehabilitation is selected, areas of existing roadway thickness that are less than the design TI thickness may not meet traffic demand requirements. Additionally, rehabilitation of existing roadway surfaces will not address deeper distress, and frequent maintenance may be required. Deeper methods of rehabilitation will replace more of the pavement, reducing the likelihood for propagation of existing pavement cracks to make it through the new wearing surface.

Mill and Overlay

To rehabilitate existing pavement, the existing asphalt concrete surface should be milled to a depth of at least 2 inches and replaced with a new asphalt concrete pavement wearing surface. The new overlay will provide a new pavement surface and extend pavement life; however, deeper distress within the pavement will likely propagate up through to the pavement surface. The mill and overlay option should be considered as part of a pavement preservation plan that will require future maintenance.

Milling should be performed in accordance with Section 404 of the current edition of the *Greenbook*. The asphalt concrete overlay should be placed in accordance with Section 302-5 of the current edition of the *Greenbook*, and as required by the County of San Bernardino.

Localized areas along the milled pavement surface that need deep patching may be encountered during remediation. The bottom of the milled asphalt should be observed by a representative of Geocon for voids or cracks in the paving and additional recommendations provided as needed. Proof rolling may be utilized in identifying soft areas. Areas of high severity distress areas should be dug out and replaced with new asphalt concrete. Cracks greater than 1/8 inch should be sealed with Crafcro Polyflex Type 3 (or equivalent). Prior to sealing, the cracks should be cleaned, and vegetation removed. The sealant should be installed in accordance with the manufacturer's recommendations.

At the base of the new 2-inch asphalt concrete pavement layer, the pavement can be reinforced with a paving mat, such as a Mirafi TruPave (or equivalent) interlayer to reinforce the pavement, to reduce the propagation of cracking, and extend the anticipated pavement life. If used, the paving mat should be installed in accordance with the manufacturer's guidelines and the Construction Guidelines in *Chapter 12, Interlayers*, of Volume 1 of the Caltrans *Maintenance Technical Advisory Guide (MTAG)*.

Asphalt concrete should conform to Section 203-6 of the Greenbook. Asphalt concrete should be compacted to at least 95 percent of the Hveem density as evaluated by ASTM D1561. Testing of the asphalt concrete should be performed during paving to verify relative compaction.

MATERIALS FOR FILL

Onsite soils are suitable for use as general fill provided they are examined and selectively placed during grading in accordance with the following recommendations:

- Deleterious material, material with greater than 3 percent organics, and debris should be exported from the site and not incorporated into the engineered fill.
- Engineered fill should be appropriately moisture conditioned at or slightly above optimum moisture content.

If required, import material should be primarily granular with a "very low" to "low" expansion potential (Expansion Index of 50 or less), a sand equivalent of at least 20, be free of organic material and construction debris, and not contain rock larger than 6 inches in greatest dimension. Environmental characteristics and corrosion potential of import soil materials should also be evaluated. Proposed import material should be sampled, tested, and its suitability evaluated by Geocon prior to its transportation to the site.

EARTHWORK AND GRADING

Earthwork for the roadway improvements should be performed in accordance with the grading ordinances of the County of San Bernardino.

Prior to commencing earthwork, a preconstruction conference should be held at the site with the county inspector and engineer, earthwork contractor, civil engineer, and geotechnical engineer in attendance. Special soil handling and/or the improvement plans can be discussed at that time.

To mitigate loose subgrade conditions within existing paved areas or where new pavements are planned, the subgrade should be over-excavated and replaced with compacted fill. The over excavation should extend least 1 foot below the planned subgrade elevation. A 1-foot scarification of the over-excavation bottom should be performed. Scarified ground surfaces and fill should be compacted to a dry density of at least 90 percent of the laboratory maximum dry density, at or slightly above optimum moisture content, as determined by ASTM D1557. The upper 1 foot of subgrade should be compacted to a dry density of at least 95 percent of the laboratory maximum dry density, at the recommended moisture content. The site should be brought to finish grade elevations with fill material compacted in layers. Layers of fill should be no thicker than will allow for adequate bonding and compaction. Fill material placed below the recommended moisture content may require additional moisture conditioning prior to placing additional fill.

The contractor should take precautionary measures not to damage the existing improvements, including underground utilities. Some of the site soils are anticipated to have little to no cohesion and caving in unshored excavations should be expected at the site. It is the responsibility of the contractor to ensure that excavations and trenches are properly shored and maintained in accordance with OSHA rules and regulations to maintain the stability of adjacent existing improvements. Once project plans have been developed, Geocon should be allowed to review the proposed construction and provide additional recommendations as necessary.

If perched groundwater, wet, or saturated materials are encountered, extensive drying and mixing with dryer soil will be required. The excavated materials should then be moisture conditioned as necessary to the recommended moisture content prior to placement as compacted fill.

The subgrade soils are anticipated to have varying moisture contents. Special handling of the soil should be anticipated to moisture condition the fill for placement, particularly if grading occurs during the rainy season, as drying back of the existing materials should be anticipated prior to their use as fill.

Where relatively loose, soft, or wet soils are encountered within site excavations, soil stabilization will be required prior to reconstruction of the roadway or the placement of new fill material. Where required, soil stabilization can be achieved by over-excavating the loose or soft soils and replacing it with compacted fill that has been moisture conditioned to the recommended moisture content, placing 3-inch diameter rock in the loose or soft bottom and working it into soil until it is stabilized, placement of triaxial non-woven geogrid (TX5 or higher) on the loose or soft bottom, or placing gravel wrapped in filter fabric at the bottom of the excavation. Recommendations for stabilizing excavation bottoms should be based on a field evaluation by Geocon during earthwork operations.

Site Drainage and Moisture Protection

Proper site drainage is critical to reduce the potential for differential soil movement, erosion and subsurface seepage. The site should be graded and maintained such that surface drainage is directed away from improvements in accordance with 2022 CBC 1804.4 or other applicable standards. In addition, surface drainage should be directed away from the top of slopes into swales or other controlled drainage devices.

Underground utilities should be leak free. Utility and irrigation lines should be checked periodically for leaks and detected leaks should be repaired promptly. Detrimental soil movement could occur if water can infiltrate the soil for prolonged periods of time.

Landscaping adjacent to paved areas have the potential for surface or irrigation water to infiltrate the pavement's subgrade and base course. Where landscaping is planned adjacent to the pavement, we recommend construction of a cut-off wall or the use of an impermeable geosynthetic along the edge of the pavement that extends at least 6 inches below the bottom of the base material section.

Plan Review

Geocon should be afforded the opportunity review the grading and construction plans for the project prior to final submittal, to verify that the plans have been prepared in substantial conformance with the recommendations of this report. Additional analyses may be required after review of the project plans.

Should you have any questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON WEST, INC.


Andrew T. Shoashekan
PE 93940




Lisa A. Battiatto
CEG 2316



ATS:LAB:HDD:hd

Distribution: Addressee (Email)

Attachments:

LIMITATIONS AND UNIFORMITY OF CONDITIONS
LIST OF REFERENCES

MAPS AND ILLUSTRATIONS

Figure 1, Vicinity Map
Figure 2, Core Location Map

APPENDIX A

FIELD INVESTIGATION
Figures A-1 through A-12, Logs of Cores

APPENDIX B

LABORATORY TESTING
Figures B-1 & B-2, Compaction Characteristics Using Modified Effort Test Results

LIMITATIONS AND UNIFORMITY OF CONDITIONS

The recommendations of this report pertain only to the sites investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon West, Inc. should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon West, Inc.

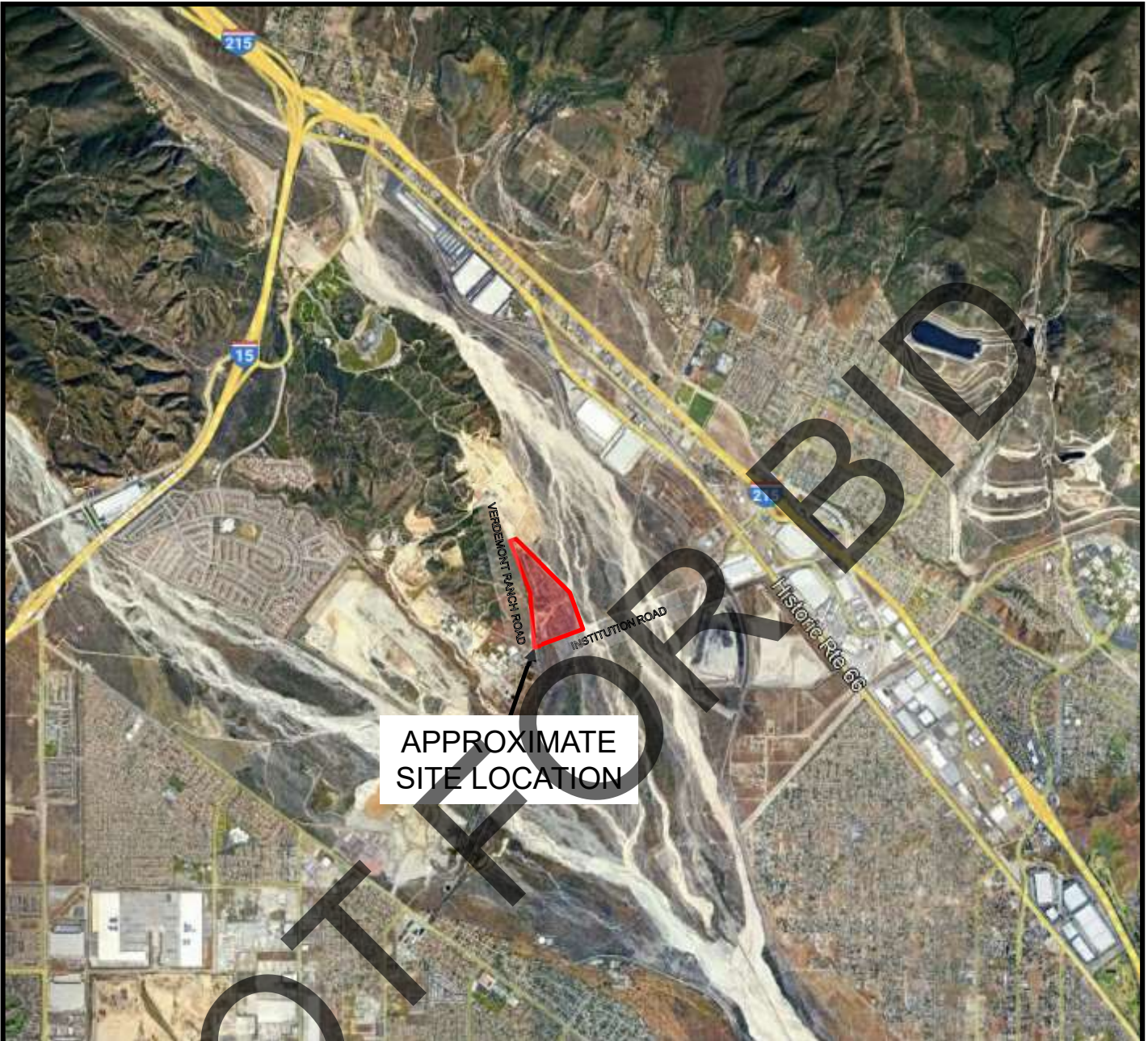
This report is issued with the understanding that it is the responsibility of the owner, or of their representative, to ensure that the information and recommendations contained herein are brought to the attention of the engineer and contractor for the project and incorporated into the plans, and the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

The findings of this report are valid as of the date of this report. However, changes in the conditions of a property can occur with the passage of time, whether they are 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 should not be relied upon after a period of three years.

The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. 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. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.

REFERENCES

1. American Concrete Institute, 2008, Report 330R-21, *Guide for the Design and Construction of Concrete Parking Lots*, undated.
2. California Building Standards Commission, 2022, *California Building Code (CBC)*, California Code of Regulations Title 24, Part 2.
3. California Department of Transportation (Caltrans), 2020, *Highway Design Manual*, dated July 1.
4. California Department of Transportation (Caltrans), 2018, *Standard Specifications*.
5. California Department of Transportation (Caltrans), 2008, *Maintenance Technical Advisory Guide, Volume I – Flexible Pavement Preservation*, Second Edition, dated March 7.
6. Google, Inc., 2021, *Google Earth Pro*, accessed November 2022.
7. IMEG Corporation, 2022, *Scoping Markup for Pavement Rehabilitation Project*, dated August 19.
8. Public Works Standards, Inc., 2021, “*Greenbook*” *Standard Specifications for Public Works Construction*, Published by BNI Building News.
9. County of San Bernardino, 1993, *Road Planning and Design Standards*, Article IX.



APPROXIMATE
SITE LOCATION



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SOURCE: Google, Inc., 2022, Google Earth Pro.

SCALE: 1" = 4,800'

VICINITY MAP

GEOCON
WEST, INC.



GEOTECHNICAL CONSULTANTS
41571 CORNING PLACE SUITE 101 MURRIETA, CA 92562-7065
PHONE 951-304-2300 FAX 951-304-2392

EMERGENCY VEHICLE OPERATION CENTER
SAN BERNARDINO COUNTY SHERIFF'S DEPARTMENT
SAN BERNARDINO, CALIFORNIA

ATS



DECEMBER 2022

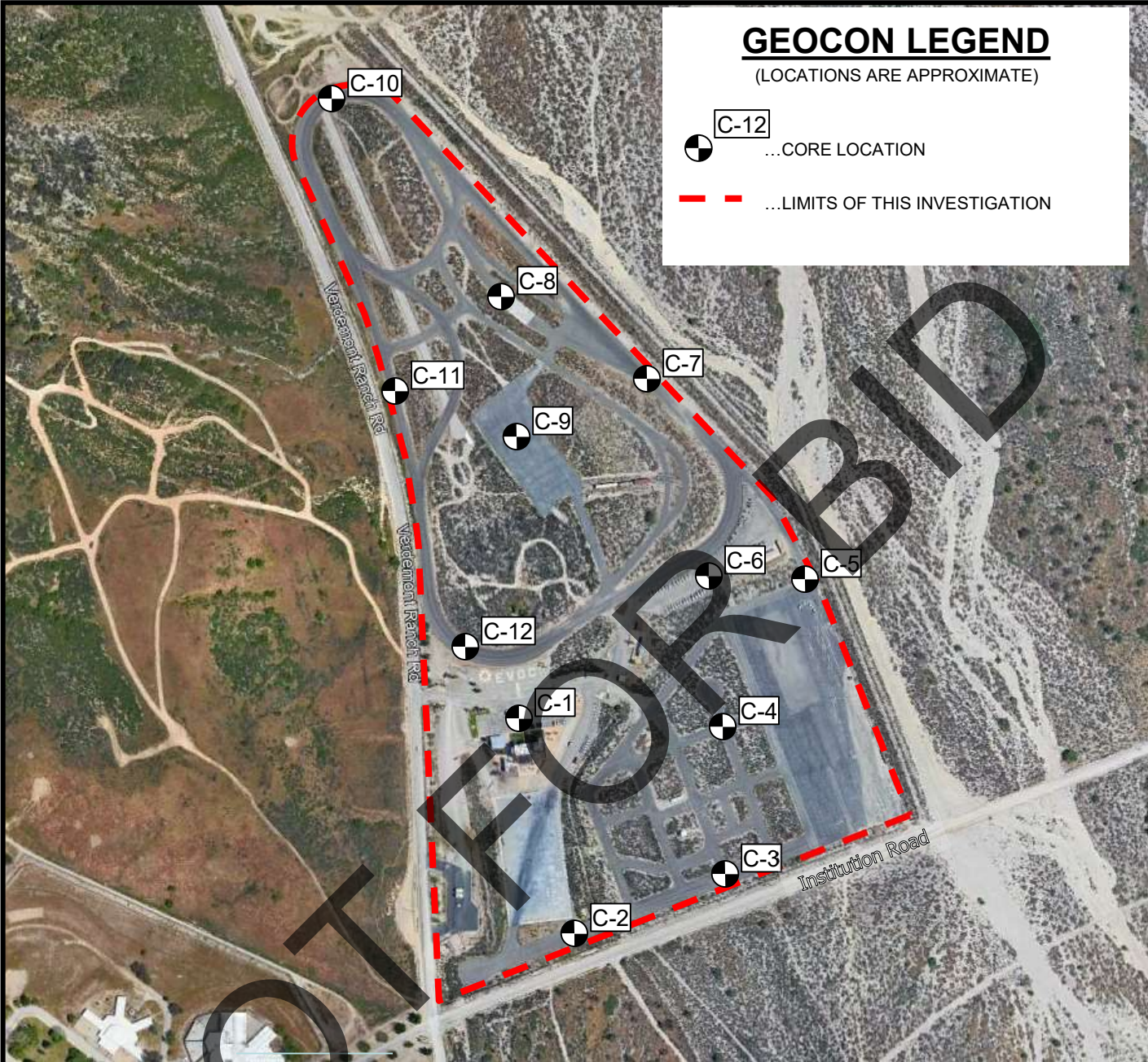
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FIG. 1

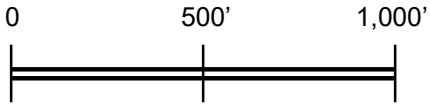
GEOCON LEGEND

(LOCATIONS ARE APPROXIMATE)

-  ...CORE LOCATION
-  ...LIMITS OF THIS INVESTIGATION



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SCALE 1" = 500'

SOURCE: Google, Inc., 2022, Google Earth Pro.

CORE LOCATION MAP

GEOCON
WEST, INC.



GEOTECHNICAL CONSULTANTS
41571 CORNING PLACE SUITE 101 MURRIETA, CA 92562-7065
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
EMERGENCY VEHICLE OPERATION CENTER
SAN BERNARDINO COUNTY SHERIFF'S DEPARTMENT
SAN BERNARDINO, CALIFORNIA

ATS

DECEMBER 2022

PROJECT NO. T3006-99-01

FIG. 2

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	CORE C-1 ELEV. (MSL.) <u>1727</u> DATE COMPLETED <u>11/4/2022</u> EQUIPMENT <u>CME 75</u> BY: <u>A. SHOASHEKAN</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
0	C-1@SUB			SP	ASPHALT PAVEMENT SECTION 5" Asphalt Concrete			
2	C-1@1'				SUBGRADE Poorly-graded SAND with little gravel, medium dense, moist, light olive brown; fine to medium sand; few coarse sand; cobbles encountered	46	114.3	5.5
Total Depth = 3' Groundwater not encountered Penetration resistance for 140-lb hammer falling 30 inches by auto hammer Backfilled with cuttings and capped with asphalt concrete cold patch on 11/4/2022								



NOT FOR BID

Figure A-1,
Log of Core C-1, Page 1 of 1

T3006-99-01 BORING LOGS.GPJ

SAMPLE SYMBOLS	<input type="checkbox"/> ... SAMPLING UNSUCCESSFUL	<input type="checkbox"/> ... STANDARD PENETRATION TEST	<input checked="" type="checkbox"/> ... DRIVE SAMPLE (UNDISTURBED)
	<input checked="" type="checkbox"/> ... DISTURBED OR BAG SAMPLE	<input checked="" type="checkbox"/> ... CHUNK SAMPLE	<input checked="" type="checkbox"/> ... WATER TABLE OR SEEPAGE







NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	CORE C-2 ELEV. (MSL.) <u>1709</u> DATE COMPLETED <u>11/4/2022</u> EQUIPMENT <u>CME 75</u> BY: <u>A. SHOASHEKAN</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
0	C-2@SUB			SP	ASPHALT PAVEMENT SECTION 6" Asphalt Concrete			
2	C-2@1'				SUBGRADE Poorly-graded SAND with few gravel, dense, moist, light olive brown; fine sand; few medium and coarse sand; cobbles encountered	59	108.4	7.6
					Total Depth = 3' Groundwater not encountered Penetration resistance for 140-lb hammer falling 30 inches by auto hammer Backfilled with cuttings and capped with asphalt concrete cold patch on 11/4/2022			

NOT FOR BID

Figure A-2,
Log of Core C-2, Page 1 of 1

T3006-99-01 BORING LOGS.GPJ

SAMPLE SYMBOLS	 ... SAMPLING UNSUCCESSFUL	 ... STANDARD PENETRATION TEST	 ... DRIVE SAMPLE (UNDISTURBED)
	 ... DISTURBED OR BAG SAMPLE	 ... CHUNK SAMPLE	 ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	CORE C-3 ELEV. (MSL.) <u>1704</u> DATE COMPLETED <u>11/4/2022</u> EQUIPMENT <u>CME 75</u> BY: <u>A. SHOASHEKAN</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
0	C-3@1'			SW	ASPHALT PAVEMENT SECTION 5" Asphalt Concrete	67	119.2	4.2
2					SUBGRADE Well-graded SAND with little gravel, dense, moist, olive brown; fine to coarse sand; cobbles encountered			
Total Depth = 3' Groundwater not encountered Penetration resistance for 140-lb hammer falling 30 inches by auto hammer Backfilled with cuttings and capped with asphalt concrete cold patch on 11/4/2022								

NOT FOR BID

Figure A-3,
Log of Core C-3, Page 1 of 1

T3006-99-01 BORING LOGS.GPJ

SAMPLE SYMBOLS	<input type="checkbox"/> ... SAMPLING UNSUCCESSFUL	<input type="checkbox"/> ... STANDARD PENETRATION TEST	<input checked="" type="checkbox"/> ... DRIVE SAMPLE (UNDISTURBED)
	<input checked="" type="checkbox"/> ... DISTURBED OR BAG SAMPLE	<input checked="" type="checkbox"/> ... CHUNK SAMPLE	<input checked="" type="checkbox"/> ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	CORE C-4 ELEV. (MSL.) <u>1707</u> DATE COMPLETED <u>11/4/2022</u> EQUIPMENT <u>CME 75</u> BY: <u>A. SHOASHEKAN</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
0	C-4@SUB			SP	ASPHALT PAVEMENT SECTION 5" Asphalt Concrete	71/10"		
2	C-4@1'				SUBGRADE Poorly-graded SAND with few gravel, very dense, moist, light olive brown; fine to medium sand with some coarse sand; cobbles encountered; NO RECOVERY			
<p>Total Depth = 3' Groundwater not encountered Penetration resistance for 140-lb hammer falling 30 inches by auto hammer Backfilled with cuttings and capped with asphalt concrete cold patch on 11/4/2022</p>								


NOT FOR BID

Figure A-4,
Log of Core C-4, Page 1 of 1

T3006-99-01 BORING LOGS.GPJ

SAMPLE SYMBOLS	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	CORE C-5 ELEV. (MSL.) <u>1700</u> DATE COMPLETED <u>11/4/2022</u> EQUIPMENT <u>CME 75</u> BY: <u>A. SHOASHEKAN</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
0	C-5@1'			SP	ASPHALT PAVEMENT SECTION 6" Asphalt Concrete	61	111.9	3.1
2					SUBGRADE Poorly-graded SAND with little gravel, dense, moist, grayish brown; fine to medium sand with some coarse sand -Becomes wet, light olive brown			
					Total Depth = 3' Groundwater not encountered Penetration resistance for 140-lb hammer falling 30 inches by auto hammer Backfilled with cuttings and capped with asphalt concrete cold patch on 11/4/2022			

NOT FOR BID

Figure A-5,
Log of Core C-5, Page 1 of 1

T3006-99-01 BORING LOGS.GPJ

SAMPLE SYMBOLS	<input type="checkbox"/> ... SAMPLING UNSUCCESSFUL	<input type="checkbox"/> ... STANDARD PENETRATION TEST	<input checked="" type="checkbox"/> ... DRIVE SAMPLE (UNDISTURBED)
	<input checked="" type="checkbox"/> ... DISTURBED OR BAG SAMPLE	<input checked="" type="checkbox"/> ... CHUNK SAMPLE	<input checked="" type="checkbox"/> ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	CORE C-6 ELEV. (MSL.) <u>1691</u> DATE COMPLETED <u>11/4/2022</u> EQUIPMENT <u>CME 75</u> BY: <u>A. SHOASHEKAN</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
0	C-6@1'			SP	ASPHALT PAVEMENT SECTION 5" Asphalt Concrete	74	126.1	3.0
2					SUBGRADE Poorly-graded SAND with some gravel, dense, moist, light olive brown; fine to medium sand with little coarse sand; cobbles encountered			
Total Depth = 3' Groundwater not encountered Penetration resistance for 140-lb hammer falling 30 inches by auto hammer Backfilled with cuttings and capped with asphalt concrete cold patch on 11/4/2022								

NOT FOR BID

Figure A-6,
Log of Core C-6, Page 1 of 1

T3006-99-01 BORING LOGS.GPJ

SAMPLE SYMBOLS	<input type="checkbox"/> ... SAMPLING UNSUCCESSFUL	<input type="checkbox"/> ... STANDARD PENETRATION TEST	<input checked="" type="checkbox"/> ... DRIVE SAMPLE (UNDISTURBED)
	<input checked="" type="checkbox"/> ... DISTURBED OR BAG SAMPLE	<input checked="" type="checkbox"/> ... CHUNK SAMPLE	<input checked="" type="checkbox"/> ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	CORE C-7 ELEV. (MSL.) <u>1684</u> DATE COMPLETED <u>11/4/2022</u> EQUIPMENT <u>CME 75</u> BY: <u>A. SHOASHEKAN</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
0	C-7@.5'			SP-SM	ASPHALT PAVEMENT SECTION 4" Asphalt Concrete	73	99.4	3.3
2	C-7@SUB				SUBGRADE Poorly-graded SAND with silt and little gravel, dense, moist, grayish brown; fine to medium sand with little coarse sand; cobbles encountered Total Depth = 2' Groundwater not encountered Penetration resistance for 140-lb hammer falling 30 inches by auto hammer Backfilled with cuttings and capped with asphalt concrete cold patch on 11/4/2022			



NOT FOR BID

Figure A-7,
Log of Core C-7, Page 1 of 1

T3006-99-01 BORING LOGS.GPJ

SAMPLE SYMBOLS	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	CORE C-8 ELEV. (MSL.) <u>1682</u> DATE COMPLETED <u>11/4/2022</u> EQUIPMENT <u>CME 75</u> BY: <u>A. SHOASHEKAN</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
0	C-8@1'			SW	ASPHALT PAVEMENT SECTION 6" Asphalt Concrete	62	114.5	2.8
2					SUBGRADE Well-graded SAND with little gravel, dense, moist, light gray brown; fine to coarse sand -Becomes wet			
<p>Total Depth = 3' Groundwater not encountered Penetration resistance for 140-lb hammer falling 30 inches by auto hammer Backfilled with cuttings and capped with asphalt concrete cold patch on 11/4/2022</p>								

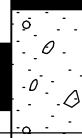
NOT FOR BID

Figure A-8,
Log of Core C-8, Page 1 of 1

T3006-99-01 BORING LOGS.GPJ

SAMPLE SYMBOLS	<input type="checkbox"/> ... SAMPLING UNSUCCESSFUL	<input type="checkbox"/> ... STANDARD PENETRATION TEST	<input checked="" type="checkbox"/> ... DRIVE SAMPLE (UNDISTURBED)
	<input checked="" type="checkbox"/> ... DISTURBED OR BAG SAMPLE	<input checked="" type="checkbox"/> ... CHUNK SAMPLE	<input checked="" type="checkbox"/> ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	CORE C-9 ELEV. (MSL.) <u>1672</u> DATE COMPLETED <u>11/4/2022</u> EQUIPMENT <u>CME 75</u> BY: <u>A. SHOASHEKAN</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
0	C-9@1'			SP	ASPHALT PAVEMENT SECTION 3" Asphalt Concrete	32	120.5	4.5
2					SUBGRADE Poorly-graded SAND with few gravel, medium dense, moist, light grayish brown; fine to medium sand with some coarse sand			
					Total Depth = 3' Groundwater not encountered Penetration resistance for 140-lb hammer falling 30 inches by auto hammer Backfilled with cuttings and capped with asphalt concrete cold patch on 11/4/2022			

NOT FOR BID

Figure A-9,
Log of Core C-9, Page 1 of 1

T3006-99-01 BORING LOGS.GPJ

SAMPLE SYMBOLS	<input type="checkbox"/> ... SAMPLING UNSUCCESSFUL	<input type="checkbox"/> ... STANDARD PENETRATION TEST	<input checked="" type="checkbox"/> ... DRIVE SAMPLE (UNDISTURBED)
	<input checked="" type="checkbox"/> ... DISTURBED OR BAG SAMPLE	<input checked="" type="checkbox"/> ... CHUNK SAMPLE	<input checked="" type="checkbox"/> ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	CORE C-10 ELEV. (MSL.) <u>1659</u> DATE COMPLETED <u>11/4/2022</u> EQUIPMENT <u>CME 75</u> BY: <u>A. SHOASHEKAN</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
0	C-10@.5'			SP	ASPHALT PAVEMENT SECTION 4" Asphalt Concrete	43	114.8	4.2
2	C-10@SUB				SUBGRADE Poorly-graded SAND with little gravel, medium dense, moist, olive brown; fine to medium sand with some coarse sand; cobbles encountered; boulder encountered immediately below asphalt concrete Total Depth = 2' Groundwater not encountered Penetration resistance for 140-lb hammer falling 30 inches by auto hammer Backfilled with cuttings and capped with asphalt concrete cold patch on 11/4/2022			

NOT FOR BID

Figure A-10,
Log of Core C-10, Page 1 of 1

T3006-99-01 BORING LOGS.GPJ

SAMPLE SYMBOLS	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	CORE C-11 ELEV. (MSL.) <u>1673</u> DATE COMPLETED <u>11/4/2022</u> EQUIPMENT <u>CME 75</u> BY: <u>A. SHOASHEKAN</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
0	C-11@SUB			SP	ASPHALT PAVEMENT SECTION 5" Asphalt Concrete			
2	C-11@1'				SUBGRADE Poorly-graded SAND with few gravel, very dense, moist, olive brown; fine to medium sand; cobbles encountered	90	114.3	3.5
					Total Depth = 3' Groundwater not encountered Penetration resistance for 140-lb hammer falling 30 inches by auto hammer Backfilled with cuttings and capped with asphalt concrete cold patch on 11/4/2022			

NOT FOR BID

Figure A-11,
Log of Core C-11, Page 1 of 1

T3006-99-01 BORING LOGS.GPJ

SAMPLE SYMBOLS	<input type="checkbox"/> ... SAMPLING UNSUCCESSFUL	<input type="checkbox"/> ... STANDARD PENETRATION TEST	<input checked="" type="checkbox"/> ... DRIVE SAMPLE (UNDISTURBED)
	<input checked="" type="checkbox"/> ... DISTURBED OR BAG SAMPLE	<input checked="" type="checkbox"/> ... CHUNK SAMPLE	<input checked="" type="checkbox"/> ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	CORE C-12 ELEV. (MSL.) <u>1657</u> DATE COMPLETED <u>11/4/2022</u> EQUIPMENT <u>CME 75</u> BY: <u>A. SHOASHEKAN</u>	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					MATERIAL DESCRIPTION			
0	C-12@SUB			SP	ASPHALT PAVEMENT SECTION 5" Asphalt Concrete			
2	C-12@1'				SUBGRADE Poorly-graded SAND with little gravel, dense, moist, olive brown; fine to medium sand with little coarse sand; cobbles encountered	56	110.4	3.9
					Total Depth = 3' Groundwater not encountered Penetration resistance for 140-lb hammer falling 30 inches by auto hammer Backfilled with cuttings and capped with asphalt concrete cold patch on 11/4/2022			

NOT FOR BID

Figure A-12,
Log of Core C-12, Page 1 of 1

T3006-99-01 BORING LOGS.GPJ

SAMPLE SYMBOLS	<input type="checkbox"/> ... SAMPLING UNSUCCESSFUL	<input type="checkbox"/> ... STANDARD PENETRATION TEST	<input checked="" type="checkbox"/> ... DRIVE SAMPLE (UNDISTURBED)
	<input checked="" type="checkbox"/> ... DISTURBED OR BAG SAMPLE	<input checked="" type="checkbox"/> ... CHUNK SAMPLE	<input checked="" type="checkbox"/> ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

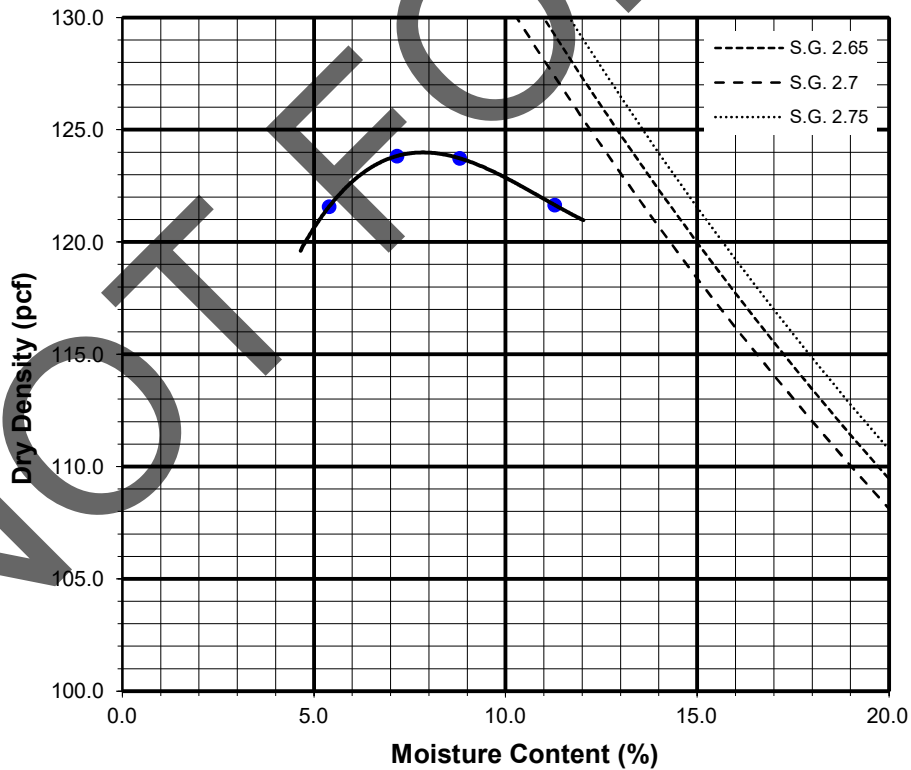
Sample No:

C-1 @ SUB	Poorly-graded SAND (SP) with little gravel, olive brown
------------------	---

TEST NO.		1	2	3	4	5	6
Wt. Compacted Soil + Mold	(g)	6195	6263	6292	6304		
Weight of Mold	(g)	4259	4259	4259	4259		
Net Weight of Soil	(g)	1936	2004	2033	2045		
Wet Weight of Soil + Cont.	(g)	693.9	825.3	828.0	705.1		
Dry Weight of Soil + Cont.	(g)	671.5	787.4	781.9	659.4		
Weight of Container	(g)	256.4	258.3	258.1	254.3		
Moisture Content	(%)	5.4	7.2	8.8	11.3		
Wet Density	(pcf)	128.1	132.7	134.6	135.4		
Dry Density	(pcf)	121.6	123.8	123.7	121.6		

Maximum Dry Density (pcf)	124.5
Bulk Specific Gravity (dry)	2.62
Corrected Maximum Dry Density (pcf)	130.0

Optimum Moisture Content (%)	8.0
Oversized Fraction (%)	18.0
Corrected Moisture Content (%)	6.5



Preparation Method: B



**COMPACTION CHARACTERISTICS USING
MODIFIED EFFORT TEST RESULTS**

ASTM D-1557

Checked by: ATS

Project No.: T3006-99-01
EMERGENCY VEHICLE OPERATION CENTER
SAN BERNARDINO COUNTY SHERIFF'S DEPARTMENT
SAN BERNARDINO, CALIFORNIA

DECEMBER 2022

Figure B-1

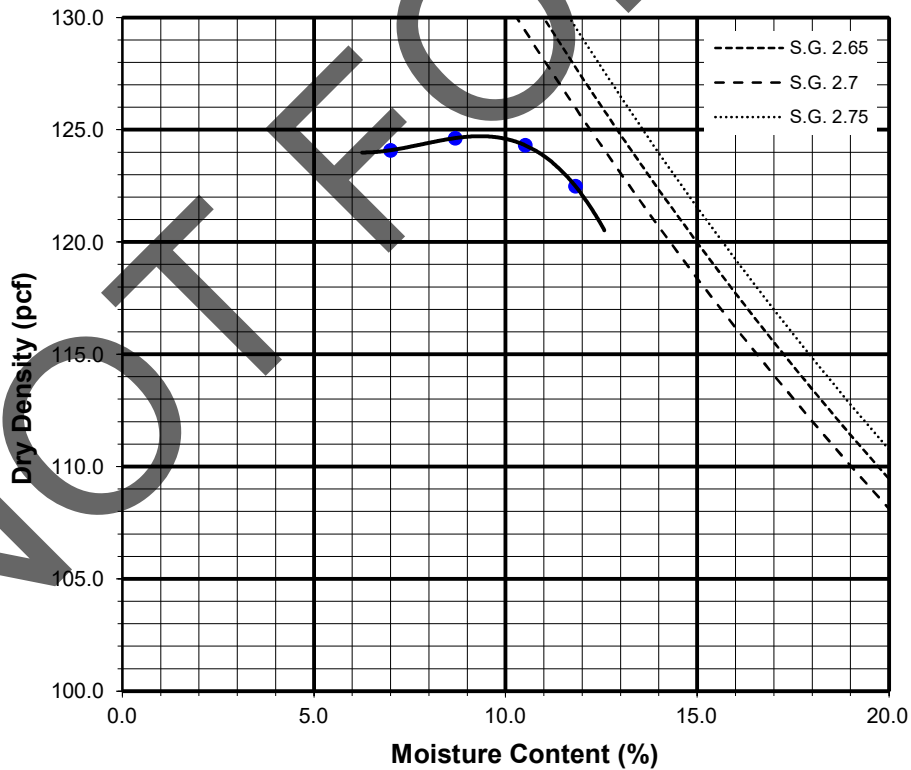
Sample No:

C-10 @ SUB	Poorly-graded SAND (SP) with little gravel, olive brown
-------------------	---

TEST NO.		1	2	3	4	5	6
Wt. Compacted Soil + Mold	(g)	6305	6334	6328	6265		
Weight of Mold	(g)	4259	4259	4259	4259		
Net Weight of Soil	(g)	2046	2075	2069	2006		
Wet Weight of Soil + Cont.	(g)	816.3	836.1	838.2	881.5		
Dry Weight of Soil + Cont.	(g)	771.4	780.9	777.0	840.8		
Weight of Container	(g)	254.5	255.7	259.4	259.3		
Moisture Content	(%)	8.7	10.5	11.8	7.0		
Wet Density	(pcf)	135.5	137.4	137.0	132.8		
Dry Density	(pcf)	124.6	124.3	122.5	124.1		

Maximum Dry Density (pcf)	125.0
Bulk Specific Gravity (dry)	2.59
Corrected Maximum Dry Density (pcf)	131.0

Optimum Moisture Content (%)	9.5
Oversized Fraction (%)	20.0
Corrected Moisture Content (%)	7.5



Preparation Method: B



**COMPACTION CHARACTERISTICS USING
MODIFIED EFFORT TEST RESULTS**

ASTM D-1557

Checked by: ATS

Project No.: T3006-99-01
EMERGENCY VEHICLE OPERATION CENTER
SAN BERNARDINO COUNTY SHERIFF'S DEPARTMENT
SAN BERNARDINO, CALIFORNIA

DECEMBER 2022

Figure B-2