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October 11, 2016

Bel-Air Swap Meet, Inc.
P.O. Box 780
Bloomington, California 92316
Attention: Mr. Hae Park

Job No. 16452-3

Dear Mr. Park:

This letter transmits six copies of the Geotechnical Investigation report prepared for the proposed warehouse building to be located at 17805 and 17783 Taylor Avenue in Bloomington, California.

We appreciate this opportunity to provide geotechnical services for this project. If you have questions or comments concerning this report, please contact us at your convenience.

Respectfully submitted,
CHJ CONSULTANTS

Maihan Noorzay, G.E.
Project Engineer

MN:lb

Distribution: Bel-Air Swap Meet, Inc. (6 and electronic)

GEOTECHNICAL INVESTIGATION
PROPOSED WAREHOUSE BUILDING
17805 AND 17783 TAYLOR AVENUE
BLOOMINGTON, CALIFORNIA
PREPARED FOR
BEL-AIR SWAP MEET, INC.
JOB NO. 16452-3

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October 11, 2016

Bel-Air Swap Meet, Inc. Job No. 16452-3
P.O. Box 780
Bloomington, California 92316
Attention: Mr. Hae Park

Dear Mr. Park:

Attached herewith is the Geotechnical Investigation report prepared for the proposed warehouse building to be located at 17805 and 17783 Taylor Avenue in Bloomington, California.

This report was based upon a scope of services generally outlined in our proposal, dated September 23, 2016, and other written and verbal communications.

We appreciate this opportunity to provide geotechnical services for this project. If you have questions or comments concerning this report, please contact this firm at your convenience.

Respectfully submitted,
CHJ CONSULTANTS

Maihan Noorzay, G.E.
Project Engineer

MN:lb

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BEL-AIR SWAP MEET, INC.
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INTRODUCTION

During September and October of 2016, a geotechnical investigation for the proposed warehouse building to be located at 17805 and 17783 Taylor Avenue in Bloomington, California, was performed by this firm. The purposes of the geotechnical investigation were to explore and evaluate the geotechnical engineering conditions at the subject site and to provide appropriate geotechnical engineering recommendations for design and construction of the proposed structure and associated improvements.

The approximate location of the site is shown on the attached Index Map (Enclosure "A-1"). To orient our investigation, a layout plan was provided by the client. The layout plan was reviewed and details were incorporated onto Google Earth imagery for our Site Plan (Enclosure "A-2").

The results of our investigation, together with our conclusions and recommendations, are presented in this report.

SCOPE OF SERVICES

The scope of services provided during this geotechnical investigation included the following:

- Review of published and unpublished literature and maps
- Examination of aerial images flown between 1938 and 2016
- Field reconnaissance of the site and surrounding area
- Logging and sampling of exploratory borings for testing and evaluation

- Laboratory testing on selected samples
- Evaluation of the geotechnical engineering/geologic data to develop site-specific recommendations for site grading, foundation design and mitigation of potential geologic constraints, if encountered
- Preparation of this report summarizing our findings, professional opinions and recommendations for the geotechnical aspects of project design and construction

PROJECT CONSIDERATIONS

Information furnished to this office indicates that a new approximately 100,000-square-foot warehouse building will be developed on the site. The site consists of two adjacent parcels approximately 3-1/3 acres in total area. A wood frame and stucco, reinforced masonry or concrete tilt-up, two-story structure imposing light to moderate foundation loads on the supporting soils is anticipated. Septic tanks are proposed in two areas north of the warehouse. The percolation report for septic system design is provided under separate cover.

Further information for the project had not been provided to us at the time of preparation of this report.

The project grading plan was not available at the time of our investigation. However, observation of site topography and of adjacent improvements indicates that development of this site will entail minimal cuts and fills. The final project grading plan should be reviewed by the geotechnical engineer in order to confirm that recommendations provided in this report have been implemented.

SITE DESCRIPTION

The site is located in Bloomington, California, at the addresses of 17783 and 17805 Taylor Avenue. At the time of our investigation 17783 Taylor Avenue was in use as a commercial truck storage area. The address was covered with gravel paving and contained a sparse growth of annual grasses and weeds. A residential structure was present in the center portion of the address. The parcel at 17805 Taylor Avenue was developed in the northwest portion with two residential structures. Areas of this address were covered with a mix of asphalt and gravel paving. The southern portion was undeveloped land covered with wood chips. The entire site was relatively flat and planar, with a slight slope to the southeast.

Buried utilities are anticipated within the site, especially near residential structures.

Examination of aerial imagery indicates that the entire site was developed for agriculture at the time of the 1938 aerial image. After this time the two sites were developed differently. At the time of the 1948 aerial image, the parcel located at 17783 Taylor Avenue was a mix of undeveloped land, agricultural fields and residential structures. In the 1959 aerial image, the site consisted of undeveloped land except for a residential structure located in the center portion of the parcel. The area remained this way until the time of the 2004 aerial image when the site was used for commercial truck parking and was in its current condition. The parcel at 17805 Taylor Avenue was developed agriculturally until the time of the 1980 aerial image when it was developed with several residential structures. These structures remained until the time of the 2004 aerial image when the site was in its current configuration.

No evidence of faulting or flooding was observed on the aerial images examined.

FIELD INVESTIGATION

The soil conditions underlying the subject site were explored by means of five exploratory borings drilled to a maximum depth of 51-1/2 feet below the existing ground surface (bgs) with a truck-mounted CME 75 drill rig equipped for soil sampling. The approximate locations of our exploratory borings are indicated on the attached Site Plan (Enclosure"A-2").

Continuous logs of the subsurface conditions, as encountered within the exploratory borings, were recorded at the time of drilling by a staff geologist from this firm. Both a standard penetration test (SPT) sampler (2-inch outer diameter and 1-3/8-inch inner diameter) and a ring sampler (3-1/4-inch outer diameter and 2-3/8-inch inner diameter) were utilized in our investigation. The penetration resistance was recorded on the boring logs as the number of hammer blows used to advance the sampler in 6-inch increments (or less if noted). The samplers were driven with an automatic hammer that drops a 140-pound weight 30 inches for each blow. After the required seating, samplers are advanced up to 18 inches, providing up to three sets of blowcounts at each sampling interval. The recorded blows are raw numbers without any corrections for hammer type (automatic vs. manual cathead) or sampler size (ring sampler vs. standard penetration test sampler). Both relatively undisturbed and bulk samples of typical soil types obtained were returned to the laboratory in sealed containers for testing and evaluation.

The exploratory boring logs, together with the uncorrected blowcount data and in-place density data, are presented in Appendix "B". The stratification lines presented on the boring logs represent approximate boundaries between soil types, which may include gradual transitions.

At the completion of drilling, all exploratory borings were backfilled to the initial grade of the excavation with soils derived from the excavation and tamped using the drilling equipment augers. This backfilling operation is expected to compact the excavation to a density approximating that of the existing soils. If additional material was necessary to complete the backfill, then such material was secured and utilized in the backfilling operation. It is possible that some settlement of the backfilled material may occur. Our firm does not monitor excavation locations for settlement. This is deemed to be, and is accepted to be, the responsibility of our client. If the client observes settlement, then this firm should be notified.

LABORATORY INVESTIGATION

Included in our laboratory testing program were field moisture content tests on all samples returned to the laboratory and field dry density tests on all relatively undisturbed samples. The results are included on the boring logs.

An optimum moisture content - maximum dry density relationship was established for a typical soil types in order for the relative compaction of the subsoils to be evaluated during construction. Remolded direct shear testing was performed to provide shear strength parameters for bearing capacity and earth pressure evaluations. Sieve analysis and No. 200 wash were performed for soil classification purposes. A selected sample of material was delivered to HDR Inc. for preliminary corrosivity analysis.

Laboratory test results appear in Appendix "C". Soil classifications provided in our geotechnical investigation are in general accordance with the Unified Soil Classification System (USCS).

SITE GEOLOGY AND SUBSURFACE SOIL CONDITIONS

The site is located on the Perris Block, a mass of relatively high land composed of crystalline bedrock of the Southern California Batholith that is thinly and discontinuously mantled by sedimentary material (Woodford and others, 1971).

Based on regional geologic mapping, the site is underlain by young alluvial fan deposits of Lytle Creek that are of Holocene and late-Pleistocene age (Morton, 2003). As encountered in our exploratory borings, the subsurface soils generally consisted of medium dense to very dense silty, sandy gravel and gravel with silt and sand (GM, GP-GM), loose to very dense silty sand and sand with gravel (SM, SP-SM) and stiff to hard interbeds of sandy silt (ML). The gravel encountered was on the order of 2 to 3 inches in largest diameter with cobbles to 5 inches encountered in Exploratory Boring No. 2 at 35 feet bgs.

Neither bedrock nor groundwater was encountered within the exploratory borings to the maximum depth of approximately 51-1/2 feet bgs. Slight caving was experienced in all of the exploratory borings upon removal of the augers.

Other than surficial wood chips and debris that was encountered in Exploratory Boring No. 4, fill was not observed in the exploratory borings; however, localized areas of fill may be encountered during grading.

More detailed descriptions of the subsurface soil conditions encountered are included in our exploratory boring logs (Appendix "B").

FAULT RUPTURE HAZARD

The site is not located within an Alquist-Priolo (AP) Earthquake Fault Zone established by the State of California to mitigate fault rupture hazard to human-occupancy structures. The closest AP zone, established for the San Jacinto fault zone, is located approximately 5-1/2 miles northeast of the site. The Rialto-Colton fault is located approximately 3-1/4 miles northeast of the site. The Rialto-Colton fault is a groundwater barrier in the subsurface but is characterized as non-Holocene-active. Faults or fault-related features are not known to traverse or project into the site. The potential for surface faulting to occur within the site is considered low.

2013 CALIFORNIA BUILDING CODE - SEISMIC PARAMETERS

Based on the geologic setting of the proposed project, the soils underlying the site are classified as Site Class "D", according to the 2013 California Building Code (CBC). The design acceleration parameters are summarized in the following table.

2013 CBC - Seismic Parameters	
Mapped Spectral Acceleration Parameters	S_S = 1.50 and S_1 = 0.62
Site Coefficients	F_a = 1.0 and F_V = 1.5
Adjusted Maximum Considered Earthquake Spectral Response Parameters	S_{MS} = 1.50 and S_{M1} = 0.93
Design Spectral Acceleration Parameters	S_{DS} = 1.00 and S_{D1} = 0.62
Geometric Mean Peak Ground Acceleration	0.57g
De-aggregated Magnitude	7.61

GROUNDWATER

The site is located in Section 21 of Township 1 South, Range 5 West in the Chino Sub-basin of the Upper Santa Ana Valley Groundwater Basin. Groundwater data were reviewed in order to estimate the historic groundwater conditions for the site. Depth-to-groundwater data from the California Department of Water Resources (2016) and historic water elevation contour maps are summarized in the following table:

Summary of Groundwater Data				
Data ID	**Surface Elevation (feet)**	**Date**	**Depth to Water (feet)**	**Location**
01S05W22N001S	1,102	10/1/1989	310	1/2 mile SW
		10/1/1996	334	
		1/1/2001	362	
		10/1/2008	358	
		6/1/2016	369	
01S05W22M001S	1,090	2/29/1956	248	1-1/2 miles NE
		1/4/1972	268	
		12/3/1984	250	
Gosling (1967)	Contour	1964	300	Contour
Carson & Matti (1985)		1973-79	300	

Groundwater was not encountered within the current borings. The historic high groundwater level is estimated to be 248 feet bgs.

LIQUEFACTION POTENTIAL AND SEISMIC SETTLEMENT

According to the County of San Bernardino General Plan (2010), the site is not located within an area identified as having a potential for liquefaction.

Liquefaction is a process in which strong ground shaking causes saturated soils to lose shear strength and behave as a fluid, potentially resulting in near-surface and surface ground failure. Ground failure associated with liquefaction can result in severe damage to structures. The geologic conditions for increased susceptibility to liquefaction are: 1) the presence of shallow groundwater (generally less than 50 feet in depth), 2) the presence of unconsolidated sandy alluvium, typically Holocene age, and

3) strong ground shaking. All three of these conditions must be present for liquefaction to occur. Based on our preliminary analysis, the potential for liquefaction to occur at the site is considered low. Further evaluation of the potential for liquefaction at the site is not warranted.

Severe seismic shaking may cause dry and non-saturated sands to densify, resulting in settlement expressed at the ground surface. Seismic settlement in dry soils generally occurs in loose sands and silty sands, with cohesive soils being less prone to significant settlement.

The underlying soils at the site generally consist of medium dense to very dense silty, sandy gravel and gravel with silt and sand (GM, GP-GM), loose to very dense silty sand and sand with gravel (SM, SP-SM) and stiff to hard interbeds of sandy silt (ML) to the maximum depth of the borings.

The seismic settlement was evaluated for the soil profile in Exploratory Boring No. 4. Using the method outlined by Pradel (1998), calculations were performed to estimate the maximum and the differential settlement to be anticipated as a result of a major seismic event. As input into our calculations, a deaggregated modal magnitude of 7.61 and an acceleration of 0.57g were utilized. The results indicate that a maximum seismic settlement of less than 1/4 inch can be anticipated. Based on the relative uniformity of soil materials encountered, differential settlement is anticipated to be approximately one-half of the total settlement. The settlement calculated is accumulated from soil layers to a maximum depth of 51-1/2 feet. The results of our seismic settlement analysis are provided in Enclosure "D-1".

HYDROCONSOLIDATION

Based on the relatively dense nature of the underlying near-surface soils encountered in our investigation, the anticipated removal and replacement operations, and the low potential for full saturation of the soil layers, it is our opinion that the potential for hydrocollapse settlement at the site is low.

STATIC SETTLEMENT

Potential static settlement was evaluated utilizing field and laboratory data and foundation load assumptions. The calculations indicate total static settlement of less than 1 inch beneath foundations. Based on the uniformity of the materials encountered, differential settlement is anticipated to be on the order of 1/2 inch in 40 feet. Static settlement is expected to occur during construction or shortly after.

FLOODING AND EROSION

The site is not located in an area designated by the County of San Bernardino (2010) or the Federal Emergency Management Agency (2008) as a 100-year flood hazard zone. A more accurate determination of the flood hazard to the site and the adequacy of existing flood and drainage improvements near the site is not within the scope of this investigation.

SLOPE STABILITY

Significant slopes are not planned or existing at the site. The site is relatively level with little topographic relief; therefore, slope stability is not considered to pose a hazard at this site.

EXPANSION POTENTIAL

Materials encountered during this investigation were generally granular and considered to be non-critically expansive. Specialized construction procedures to specifically resist expansive soil forces are not anticipated at this time. Requirements for reinforcing steel to satisfy structural criteria are not affected by this recommendation. Additional evaluation of soils for expansion potential should be conducted by the geotechnical engineer during the grading operation.

CONCLUSIONS

On the basis of our research and field and laboratory investigations, it is the opinion of this firm that the proposed project is feasible from geological and geotechnical engineering standpoints, provided the recommendations contained in this report are implemented during design and construction.

The subsurface soils generally consisted of medium dense to very dense silty, sandy gravel and gravel with silt and sand (GM, GP-GM), loose to very dense silty sand and sand with gravel (SM, SP-SM) and stiff to hard interbeds of sandy silt (ML). The gravel encountered was on the order of 2 to 3 inches in largest diameter with cobbles to 5 inches encountered in Exploratory Boring No. 2 at 35 feet bgs.

Neither bedrock nor groundwater was encountered within the exploratory borings to the maximum depth of approximately 51-1/2 feet bgs. Fill soils were not encountered in our exploratory borings; however, localized areas of fill may be encountered during grading.

Slight caving was experienced within the exploratory borings upon removal of the augers. Trenches, larger-diameter borings or excavations that remain open for longer periods of time may be subject to more significant caving.

No evidence of active faulting was observed on or adjacent to the site. The site does not lie within or immediately adjacent to an Alquist-Priolo Earthquake Fault Zone designated by the State of California to include traces of suspected active faulting.

Severe seismic shaking of the site can be expected during the lifetime of the proposed project.

Groundwater was not encountered in our exploratory borings. Based on available groundwater data, a historic high groundwater of 248 feet bgs is estimated for the project.

The potential for liquefaction at the site is considered low. Our analysis indicates that seismic settlement can be considered to be less than 1/4-inch.

Based on the relatively dense nature of the underlying near-surface soils encountered in our investigation, the anticipated removal and replacement operations, and the low potential for full saturation of the soil layers, it is our opinion that the potential for hydrocollapse settlement at the site is low. Static settlement on the order of 1 inch can be expected.

The relatively flat-lying topography of the site precludes the potential for slope instability or landslides.

Materials encountered during this investigation were generally granular and considered to be non-critically expansive. Specialized construction procedures to specifically resist expansive soil forces are not anticipated at this time. Additional evaluation of soils for expansion potential should be conducted by the geotechnical engineer during the grading operation.

Based upon our field investigation and test data, it is our opinion that the upper existing soils will not, in their present condition, provide uniform or adequate support for the proposed structures. Loose, native soils, undocumented fill and/or variable in situ conditions may be present in the upper subsurface soils. These conditions may cause unacceptable differential and/or overall settlement upon application of the anticipated foundation loads.

Because of site conditions, it will be necessary to remove a minimum of 36 inches of the existing soils in all building areas to be graded. To provide adequate support for the proposed structure, it is our recommendation that the building area be subexcavated as necessary and recompacted with a compacted fill mat beneath footings and slabs. A compacted fill mat will provide a dense, uniform, high-strength soil layer to distribute the foundation loads over the underlying soils. Conventional spread foundations, either individual spread footings and/or continuous wall footings, may be utilized in conjunction with such compacted fill mat.

RECOMMENDATIONS

GENERAL SITE GRADING:

It is imperative that no clearing and/or grading operations be performed without the presence of a representative of the geotechnical engineer. An on-site, pre-job meeting with the developer, the contractor and the geotechnical engineer should occur prior to all grading-related operations. Operations undertaken at the site without the geotechnical engineer present may result in exclusions of affected areas from the final compaction report for the project.

Grading of the subject site should be performed, at a minimum, in accordance with these recommendations and with applicable portions of the CBC. The following recommendations are presented for your assistance in establishing proper grading criteria.

INITIAL SITE PREPARATION:

All areas to be graded should be stripped or cleaned of significant vegetation, rocks greater than 8 inches in largest dimension and other deleterious materials. These materials should be removed from the site for disposal. The cleaned soils may be reused as properly compacted fill. If encountered, existing utility lines should be traced, removed and rerouted from areas to be graded.

MINIMUM MANDATORY REMOVAL AND RECOMPACTION OF EXISTING SOILS:

All building areas to be graded should have at least the upper 36 inches of existing soils removed and the open excavation bottoms observed by our engineering geologist to verify and document in writing that all loose, native soils or undocumented fill is removed prior to refilling with properly tested and documented compacted fill. The required overexcavation should extend at least 5 feet beyond the footing lines, where possible. The removed soils may be cleaned and reused as properly compacted fill.

Further subexcavation may be necessary depending on the conditions of the underlying soils. The actual depth of removal should be determined at the time of grading by the project geotechnical engineer/geologist. The determination will be based on soil conditions exposed within the excavations.

Compaction tests may be taken in the removal bottom areas where appropriate to provide in-place moisture/density data for potential relative compaction evaluations and to help support and document the engineering geologist's decision. As such, all building pad areas should have any undocumented fill, topsoil or other unsuitable materials removed and replaced with properly compacted fill.

PREPARATION OF FILL AREAS:

Prior to placing fill, and after the mandatory subexcavation operation with all loose native soils and/or undocumented fill removed, the surfaces of all areas to receive fill should be scarified to a depth of 6 inches or more. The scarified soils should be brought to near optimum moisture content and recompacted to a minimum relative compaction of 90 percent in accordance with ASTM D1557.

PREPARATION OF FOOTING AREAS:

All footings should rest upon at least 12 inches of properly compacted fill material. In areas where the required thickness of compacted fill is not accomplished by the mandatory removal operation, the footing areas should be overexcavated to a depth of 12 inches or more below the lowest proposed footing base grade, with the overexcavation extending at least 5 feet beyond the footing lines, where possible. The bottom of this excavation should then be scarified to a depth of at least 6 inches, brought to near optimum moisture content and recompacted to a minimum of 90 percent relative compaction in accordance with ASTM D1557 prior to refilling the excavation to the required grade as properly compacted fill.

COMPACTED FILLS:

The on-site soils should provide adequate quality fill material provided they are free from organic matter and other deleterious materials. Rocks or similar irreducible material with a maximum dimension greater than 8 inches should not be buried or placed in fills.

If utilized, import fill should be inorganic, non-expansive granular soils free from rocks or lumps greater than 6 inches in maximum dimension. The contractor shall notify the geotechnical engineer of import sources sufficiently ahead of their use so that the sources can be observed and approved as to the physical characteristic of the import material. For all import material, the contractor shall also submit current verified reports from a recognized analytical laboratory indicating that the import has a "not applicable" potential for sulfate attack based upon current American Concrete Institute (ACI) criteria and is "mildly corrosive" to ferrous metal and copper. The reports shall be accompanied by a written statement from the contractor that the laboratory test results are representative of all import material that will be brought to the job.

Fill should be spread in near-horizontal layers, approximately 8 inches thick. Thicker lifts may be approved by the geotechnical engineer if testing indicates that the grading procedures are adequate to achieve the required compaction. Each lift should be spread evenly, thoroughly mixed during spreading to attain uniformity of the material and moisture in each layer, brought to near optimum moisture content and compacted to a minimum relative compaction of 90 percent in accordance with ASTM D1557.

FOUNDATION DESIGN:

If the site is prepared as recommended, the proposed structure may be safely founded on conventional spread foundations, either individual spread footings and/or continuous wall footings, bearing on a minimum of 12 inches of compacted fill. Footings should be a minimum of 12 inches wide and should be established at a minimum depth of 12 inches below lowest adjacent final subgrade level. For the minimum width and depth, footings may be designed for a maximum safe soil bearing pressure of 1,600 pounds per square foot (psf) for dead plus live loads. This allowable bearing pressure may be increased by 600 psf for each additional foot of width and by 800 psf for each additional foot of depth to a maximum safe soil bearing pressure of 4,000 psf for dead plus live loads. These bearing values may be increased by one-third for wind or seismic loading.

For footings thus designed and constructed, we would anticipate a maximum static settlement of less than 1 inch. Differential static settlement between similarly loaded adjacent footings is expected to be approximately half the total settlement. Static settlement is expected to occur during construction or shortly after.

LATERAL LOADING AND RETAINING WALL DESIGN:

Resistance to lateral loads will be provided by passive earth pressure and base friction. For footings bearing against compacted fill, passive earth pressure may be considered to be developed at a rate of 400 psf per foot of depth. Base friction may be computed at 0.39 times the normal load. Base friction and passive earth pressure may be combined without reduction. Other than conservative soil modeling, the lateral passive earth pressure and base friction values recommended do not include factors of safety. If the design is to be based on allowable lateral resistance values, we recommend that minimum factors of safety of 1.5 and 2.0 be applied to the friction coefficient and passive lateral earth pressure, respectively. The resulting allowable lateral resistance values follow:

Allowable Lateral Resistance Values			
	Ultimate	**Allowable**	**Factor of Safety**
Passive Lateral Earth Pressure (psf/ft)	400	200	2.0
Base Friction Coefficient	0.39	0.26	1.5

For preliminary retaining wall design, a lateral active earth pressure developed at a rate of 40 psf per foot of depth should be utilized for unrestrained conditions.

For restrained conditions, an at-rest earth pressure of 60 psf per foot of depth should be utilized.

The "at-rest" condition applies toward braced walls that are not free to tilt. The "active" condition applies toward unrestrained cantilevered walls where wall movement is anticipated. The structural designer should use judgment in determining the wall fixity and may utilize values interpolated between the "at-rest" and "active" conditions where appropriate.

These values are applicable only to level, properly drained backfill with no additional surcharge loadings and do not include a factor of safety other than conservative modeling of the soil strength parameters. *If inclined backfills are proposed, this firm should be contacted to develop appropriate active earth pressure parameters*.

Backfill behind retaining walls should consist of a soil of sufficient granularity that the backfill will properly drain. The granular soil should be classified per the USCS as GW, GP, SW, SP, SW-SM or SP-SM. Surface drainage should be provided to prevent ponding of water behind walls. A drainage system should be installed behind all retaining walls consisting of either of the following:

1. A 4-inch-diameter perforated PVC (Schedule 40) pipe or equivalent at the base of the stem encased in 2 cubic feet of granular drain material per linear foot of pipe or

2. Synthetic drains such as Enkadrain, Miradrain, Hydraway 300 or equivalent.

Perforations in the PVC pipe should be 3/8 inch in diameter and facing down. Granular drain material should be wrapped with filter cloth such as Mirafi 140 or equivalent to prevent clogging of the drains with fines. Walls should be waterproofed to prevent nuisance seepage. Water should outlet to an approved drain.

TRENCH EXCAVATION:

The soils encountered within our exploratory borings are generally classified as a Type "C" soil in accordance with the CAL/OSHA excavation standards. Unless specifically evaluated by our engineering geologist, all the trench excavations should be performed following the recommendation of CAL/OSHA (State of California, 2013) for Type "C" soil. Based upon a soil classification of Type "C", the temporary excavation should not be inclined steeper than 1.5 horizontal to 1 vertical for maximum trench depth of less than 20 feet. For trench excavation deeper than 20 feet or for conditions that differ from those described for Type "C" in the CAL/OSHA excavation standards, this firm should be contacted.

TRENCH BEDDING AND BACKFILLS:

Trench Bedding - Pipe bedding material should meet and be placed according to the current edition of the Standard Specifications for Public Works Construction "Greenbook" or other project specifications. Pipe bedding should be uniform, free-draining, granular material with a sand equivalent of at least 30. Prior to its use, the pipe bedding material should be evaluated by this firm to confirm sand equivalent values.

Backfill - The on-site soils should provide quality backfill material provided they are free from organic matter and other deleterious materials. Rock or similar irreducible material with a maximum dimension greater than 8 inches should not be buried or placed in backfills.

Fill to be compacted by heavy equipment should be spread in near-horizontal layers, approximately 8 inches in thickness. For fill to be compacted by hand-operated equipment, thinner lifts, 4 to 6 inches in thickness, should be utilized. Each lift should be spread evenly, brought to near optimum moisture content and compacted to a minimum relative compaction of 90 percent in accordance with ASTM D1557. To avoid pumping, backfill material should be mixed and moisture treated outside of the excavation prior to lift placement in the trench.

Soils required to be compacted to at least 95 percent relative compaction, such as pavement subgrade, should be moisture treated to near optimum moisture content not exceeding 2 percent above optimum.

A controlled low-strength material could be considered to fill any cavities, such as voids created by caving or undermining of soils beneath existing improvements or pavement to remain, or any other areas that would be difficult to properly backfill.

SLABS-ON-GRADE:

To provide adequate support, concrete slabs-on-grade should bear on a minimum of 12 inches of compacted soil. Concrete slabs-on-grade should be a minimum of 4 inches in thickness. The soil should be compacted to 90 percent relative compaction. The final pad surfaces should be rolled to provide smooth, dense surfaces.

Slabs to receive moisture-sensitive coverings should be provided with a moisture vapor retarder. We recommend that a vapor retarder be designed and constructed according to the American Concrete Institute (ACI) 302.1R, "Concrete Floor and Slab Construction", which addresses moisture vapor retarder construction. At a minimum, the vapor retarder should comply with ASTM E1745 and have a nominal thickness of at least 10 mils. The vapor retarder should be properly sealed per the manufacturer's recommendations and protected from punctures and other damages. Per the Portland Cement Association (www.cement.org/tech/cct_con_vapor_retarders.asp), for slabs with vapor-sensitive coverings, a layer of dry, granular material (sand) should be placed under the vapor retarder/barrier. For slabs in humidity-controlled areas, a layer of dry, granular material (sand) should be placed above the vapor retarder/barrier.

Concrete building slabs subjected to heavy loads, such as materials storage and/or forklift traffic, should be designed by a registered civil engineer competent in concrete design. A modulus of vertical subgrade reaction of 250 kips per cubic foot can be utilized in the design of slabs-on-grade for the proposed project.

POTENTIAL EROSION AND DRAINAGE:

The potential for erosion should be mitigated by proper drainage design. The site should be graded so that surface water flows away from structures. Water should not be allowed to flow over graded areas or natural areas so as to cause erosion. Graded areas should be planted or otherwise protected from erosion by wind or water.

CHEMICAL/CORROSIVITY TESTING:

Selected samples of materials were delivered to HDR, Inc. for soil corrosivity testing. Laboratory testing consisted of pH, resistivity and major soluble salts commonly found in soils. The results of the laboratory tests performed by HDR, Inc. appear in Appendix "C".

These tests have been performed to screen the site for potentially corrosive soils. Values from the soil tested are considered potentially "mildly corrosive" to ferrous metals at as-received condition and saturated condition. Specific corrosion control measures, such as coating of the pipe with non-corrosive material or alternative non-metallic pipe material, are not considered necessary.

Ammonium and nitrate levels did not indicate a concern as to corrosion of buried copper.

Results of the soluble sulfate testing indicate a "not applicable" (Class S0) anticipated exposure to sulfate attack. Based on the criteria from Table 4.3.1. of the American Concrete Institute Manual of Concrete Practice (2011), special measures, such as specific cement types or water-cement ratios, will not be needed for this "not applicable" exposure to sulfate attack.

The soluble chloride content of the soils tested was not at levels high enough to be of concern with respect to corrosion of reinforcing steel. The results should be considered in combination with the soluble chloride content of the hardened concrete in determining the effect of chloride on the corrosion of reinforcing steel.

CHJ Consultants does not practice corrosion engineering. If further information concerning the corrosion characteristics, or interpretation of the results submitted herein, is required, then a competent corrosion engineer could be consulted.

CONSTRUCTION OBSERVATION:

All grading operations, including site clearing and stripping, should be observed by a representative of the geotechnical engineer. The geotechnical engineer's field representative will be present to provide observation and field testing and will not supervise or direct any of the actual work of the contractor, his employees or agents. Neither the presence of the geotechnical engineer's field representative nor the observations and testing by the geotechnical engineer shall excuse the contractor in any way for defects discovered in his work. It is understood that the geotechnical engineer will not be responsible for job or site safety on this project, which will be the sole responsibility of the contractor.

LIMITATIONS

CHJ Consultants has striven to perform our services within the limits prescribed by our client, and in a manner consistent with the usual thoroughness and competence of reputable geotechnical engineers and engineering geologists practicing under similar circumstances. No other representation, express or implied, and no warranty or guarantee is included or intended by virtue of the services performed or reports, opinion, documents, or otherwise supplied.

This report reflects the testing conducted on the site as the site existed during the investigation, which is the subject of this report. However, changes in the conditions of a property can occur with the passage of time, due to natural processes or the works of man on this or adjacent properties. Changes in applicable or appropriate standards may also occur whether as a result of legislation, application or the broadening of knowledge. Therefore, this report is indicative of only those conditions tested at the time of the subject investigation, and the findings of this report may be invalidated fully or partially by changes outside of the control of CHJ Consultants. This report is therefore subject to review and should not be relied upon after a period of one year.

The conclusions and recommendations in this report are based upon observations performed and data collected at separate locations, and interpolation between these locations, carried out for the project and the scope of services described. It is assumed and expected that the conditions between locations observed and/or sampled are similar to those encountered at the individual locations where observation and sampling was performed. However, conditions between these locations may vary significantly. Should conditions that appear different than those described herein be encountered in the field by the client or any firm performing services for the client or the client's assign, this firm should be contacted immediately in order that we might evaluate their effect.

If this report or portions thereof are provided to contractors or included in specifications, it should be understood by all parties that they are provided for information only and should be used as such.

The report and its contents resulting from this investigation are not intended or represented to be suitable for reuse on extensions or modifications of the project, or for use on any other project.

CLOSURE

We appreciate this opportunity to be of service and trust this report provides the information desired at this time. Should questions arise, please do not hesitate to contact this office.

Respectfully submitted,
CHJ CONSULTANTS

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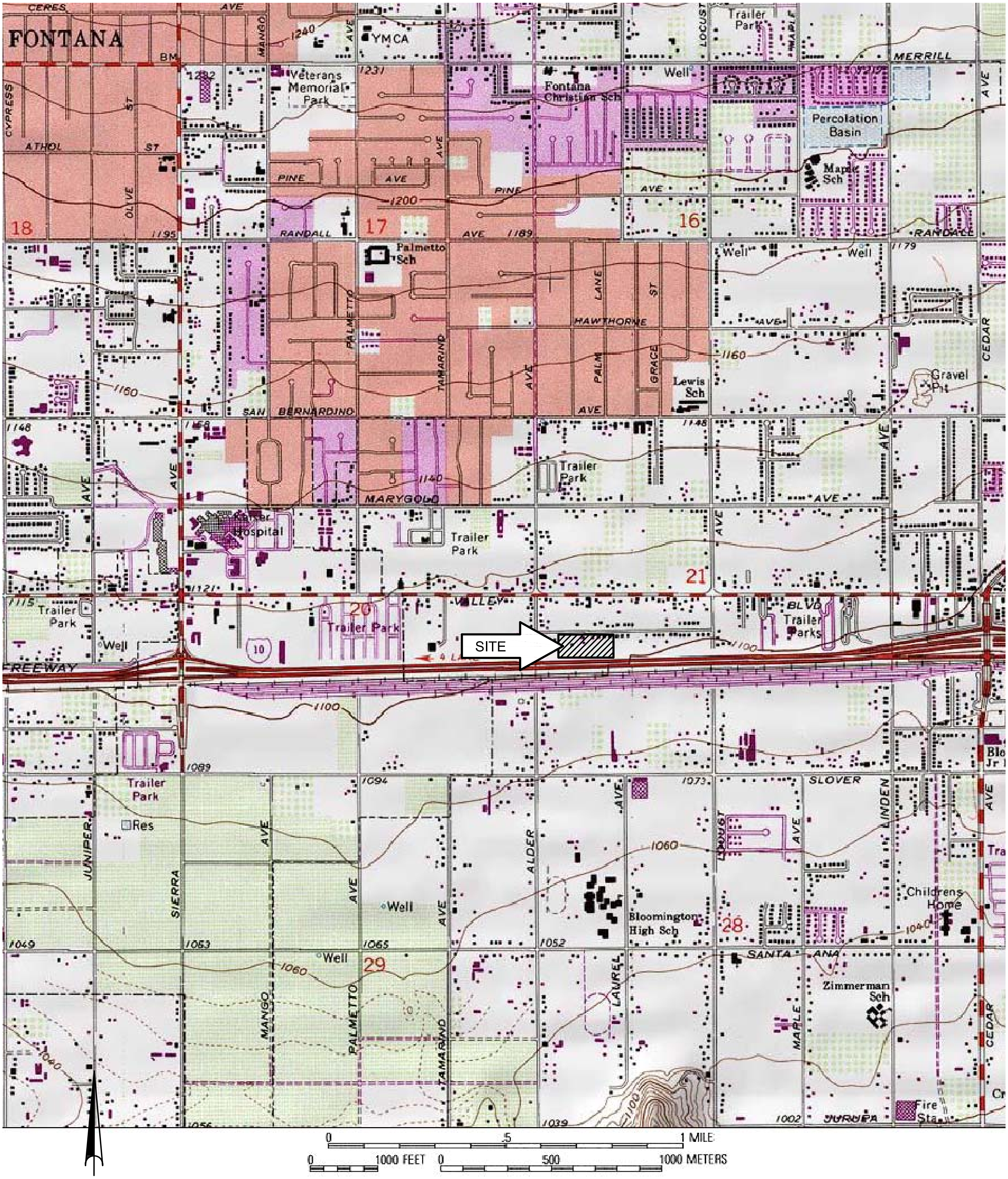
APPENDIX "A"

MAPS



-N-

SCALE: 1" = 2000'

INDEX MAP

FOR:
BEL-AIR SWAP MEET, INC.

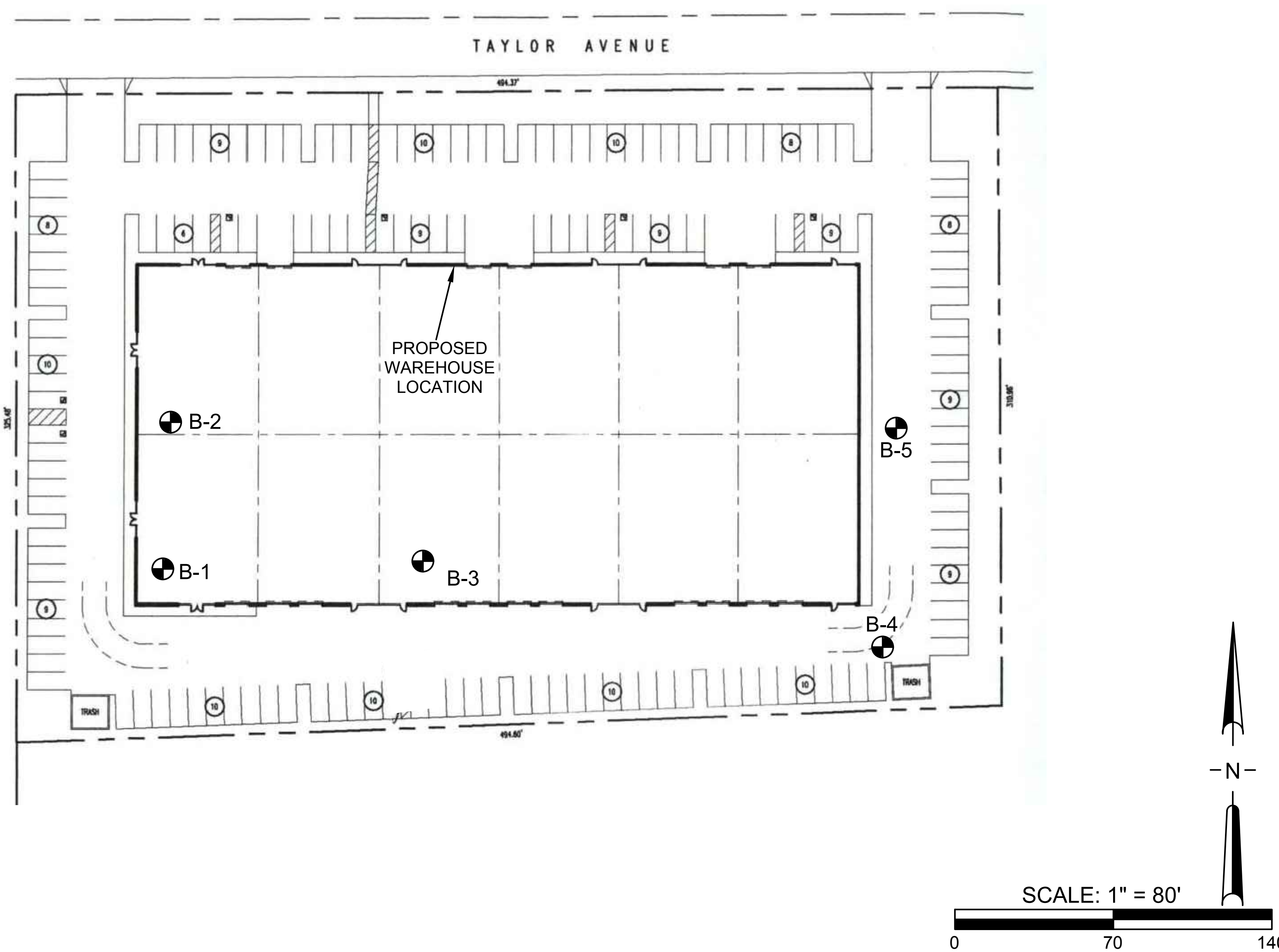
DATE:
OCTOBER 2016

GEOTECHNICAL INVESTIGATION
PROPOSED WAREHOUSE BUILDING
17805 AND 17783 TAYLOR AVENUE
BLOOMINGTON, CALIFORNIA

ENCLOSURE
"A-1"

JOB NUMBER
16452-3

CHJ Consultants



LEGEND:

B-5 EXPLORATORY BORING

SITE PLAN

FOR: BEL-AIR SWAP MEET, INC.

DATE: OCTOBER 2016

GEOTECHNICAL INVESTIGATION
PROPOSED WAREHOUSE BUILDING
17805 AND 17783 TAYLOR AVENUE
BLOOMINGTON, CALIFORNIA

ENCLOSURE "A-2"

JOB NUMBER 16452-3

CHJ Consultants

APPENDIX "B"

EXPLORATORY LOGS

KEY TO LOGS

LEGEND OF LAB/FIELD TESTS:

Blows	A measure of the penetration resistance of soil expressed as the number of hammer blows required to advance the indicated sampler 6 inches (or less if noted). Samplers are driven with an automatic hammer that drops a 140-pound weight 30 inches for each blow. After the required seating, samplers are advanced up to 18 inches ahead of the boring, providing up to three sets of blows per drive.
Bulk	Indicates Disturbed or Bulk Sample
Cor.	Chemical/Corrosivity Tests (ASTM G187, D4327, D4972)
Dist.	Indicates Disturbed Sample
DS	Direct Shear Test (ASTM D3080)
MDC	Maximum Density Optimum Moisture Test (ASTM D1557)
N.R.	Indicates No Recovery of Sample
Pass #200	Washed through No. 200 Screen (ASTM D422)
Ring	Indicates Relatively Undisturbed Ring Sample. The number of blows per 6 inches required to drive a "California Sampler" (3-1/4" O.D. and 2-3/8" I.D.) 18 inches using a 140-pound weight falling 30 inches was recorded.
SA	Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis (ASTM D6913)
SPT	Indicates Standard Penetration Test. The number of blows per 6 inches required to drive an unlined SPT sampler (2" O.D. and 1-3/8" I.D). 18 inches using a 140-pound weight falling 30 inches was recorded.

UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

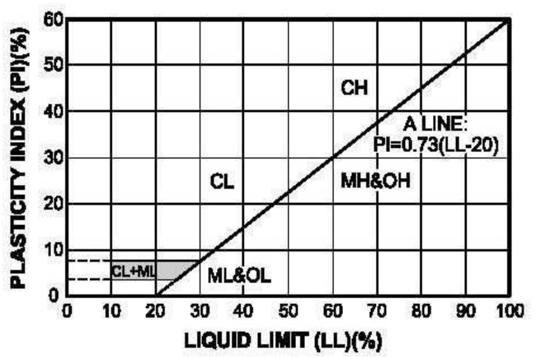
COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size)		
GRAVELS More than 50% of coarse fraction larger than No.4 sieve size — Clean Gravels (Less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
	GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
Gravels with fines (More than 12% fines)	GM	Silty gravels, gravel-sand-silt mixtures
	GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No.4 sieve size — Clean Sands (Less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
Sands with fines (More than 12% fines)	SM	Silty sands, sand-silt mixtures
	SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size)		
SILTS AND CLAYS Liquid limit less than 50%	ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater	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, organic silts
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils

LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}^2}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{D_{30}^2}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for SW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size).
Coarse-grained soils are classified as follows:
Less than 5 percent.....................GW, GP, SW, SP
More than 12 percent.....................GM, GC, SM, SC
5 to 12 percent.....................Borderline cases requiring dual symbols

PLASTICITY CHART



EXPLORATORY BORING NO. 1

Date Drilled: 9/27/16

Client: Bel-Air Swap Meet, Inc.

Equipment: CME75 Truck Rig

Driving Weight / Drop / Sampler Size: 140lbs./30in./3.25" O.D.

Surface Elevation(ft): N/A

Logged by: GA

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(GM) Silty Sandy Gravel, fine to coarse, gravel to 3", light brown	Native						
			Auger Chatter	X		22 24 20			Ring
					X				
5				X		23 37 37	N.R.	N.R.	Ring
10				X		17 28 27		Dist.	Ring
					X				
15		(SM) Silty Sand, fine to coarse, with gravel to 2", brown	Less Chatter	X		19 27 19			Ring
20		(SM) Silty Sand, fine with medium to coarse, with gravel to 2", brown		X		20 50			Ring
25		(SM) Silty Sand, fine, few gravel to 1/4", brown		X		19 32 40			Ring
		END OF BORING NO REFUSAL, NO BEDROCK NO GROUNDWATER SLIGHT CAVING, NO FILL							
30									

10331-3 16452-3.GPJ CHJ.GDT 10/12/16

EXPLORATORY BORING NO. 2

Date Drilled: 9/27/16

Client: Bel-Air Swap Meet, Inc.

Equipment: CME75 Truck Rig

Driving Weight / Drop / Sampler Size: 140lbs./30in./2.0" O.D.

Surface Elevation(ft): N/A

Logged by: GA

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine with medium to coarse and gravel to 2", light brown	Native	X	X	4 5 6			SPT
4 / 5		(GP-GM) Poorly-Graded Gravel with silt and sand, fine to coarse, gravel to 2", light grayish brown	Auger Chatter	X	X	7 7 14			SPT SA
10				X		16 30 28			SPT
15		(SM) Silty Sand, fine, few gravel to 3", olive brown		X	X	6 8 9			SPT Pass #200
20		(ML) Sandy Silt, fine, with clay and gravel to 1", dark olive brown		X		4 5 9			SPT
25				X		9 8 11			SPT
30		(SM) Silty Sand, fine to coarse, with gravel to 2", brown		X		8 19 31			SPT

10331-3 16452-3.GPJ CHJ.GDT 10/12/16

CHJ

PROPOSED WAREHOUSE BUILDING
17805 & 17783 TAYLOR AVENUE, BLOOMINGTON, CA

Job No. 16452-3

Enclosure B-2a

EXPLORATORY BORING NO. 2

Date Drilled: 9/27/16

Client: Bel-Air Swap Meet, Inc.

Equipment: CME75 Truck Rig

Driving Weight / Drop / Sampler Size: 140lbs./30in./2.0" O.D.

Surface Elevation(ft): N/A

Logged by: GA

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP-SM) Sand, fine to coarse, with silt, gravel, and few cobbles to 5", grayish brown	Auger Chatter	X		19 31 37			SPT
40				X		31 50			SPT
		(SM) Silty Sand, fine with medium to coarse, few gravel to 1/2", light grayish brown	Less Chatter						
45				X		14 15 26			SPT
50		(SM) Silty Sand, fine to coarse, with gravel to 2", grayish brown		X		20 37 30			SPT
		END OF BORING NO REFUSAL, NO BEDROCK NO GROUNDWATER SLIGHT CAVING, NO FILL							
55									
60									
65									

10331-3 16452-3.GPJ CHJ.GDT 10/12/16

EXPLORATORY BORING NO. 3

Date Drilled: 9/27/16

Client: Bel-Air Swap Meet, Inc.

Equipment: CME75 Truck Rig

Driving Weight / Drop / Sampler Size: 140lbs./30in./3.25" O.D.

Surface Elevation(ft): N/A

Logged by: GA

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SP-SM) Poorly-Graded Gravelly Sand, fine to coarse, with silt, gravel to 3", light grayish brown	Native Auger Chatter	X		10 8 10	N.R.	N.R.	Ring
					X				SA
5				X		8 11 11	N.R.	N.R.	Ring
				X		23 34 50			SPT
10		(SM) Silty Sand, fine with medium to coarse, with clay and gravel to 1/4", light olive brown	Less Chatter	X		16 20 25			Ring
		(SM) Gravelly Silty Sand, fine to coarse, gravel to 3", light grayish brown	Auger Chatter						
					X				
15				X		26 50			Ring
20				X		50	N.R.	N.R.	Ring
				X		40 22 16	N.R.	N.R.	SPT
25				X		50/4"	N.R.	N.R.	Ring
				X		38 50			SPT
30		END OF BORING NO REFUSAL, NO BEDROCK NO GROUNDWATER SLIGHT CAVING, NO FILL							

10331-3 16452-3.GPJ CHJ.GDT 10/12/16

CHJ

PROPOSED WAREHOUSE BUILDING
17805 & 17783 TAYLOR AVENUE, BLOOMINGTON, CA

Job No. 16452-3

Enclosure B-3

EXPLORATORY BORING NO. 4

Date Drilled: 9/27/16

Client: Bel-Air Swap Meet, Inc.

Equipment: CME75 Truck Rig

Driving Weight / Drop / Sampler Size: 140lbs./30in./2.0" O.D.

Surface Elevation(ft): N/A

Logged by: GA

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		Wood Chips and debris							
		(SM) Silty Sand, fine, with gravel to 2", brown	Native	X		10 9 8			SPT
					X				Pass #200
5		(SP-SM) Sand, fine to coarse, with silt and gravel to 2", grayish brown	Auger Chatter	X		10 8 10			Pass #200, SPT
10		(SM) Silty Sand, fine, few gravel to 2", dark olive brown		X		4 5 7			Pass #200, SPT
					X				
15		(ML) Sandy Silt, fine, with clay, dark olive brown		X		6 7 8			Pass #200, SPT
20				X		4 6 11			SPT
25				X		7 10 28			SPT
30		(SP-SM) Sand, fine to coarse, with silt and gravel to 2", dark yellowish brown		X		24 25 35			Pass #200, SPT

10331-3 16452-3.GPJ CHJ.GDT 10/12/16

EXPLORATORY BORING NO. 4

Date Drilled: 9/27/16

Client: Bel-Air Swap Meet, Inc.

Equipment: CME75 Truck Rig

Driving Weight / Drop / Sampler Size: 140lbs./30in./2.0" O.D.

Surface Elevation(ft): N/A

Logged by: GA

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP-SM) Sand, fine to coarse, with silt and gravel to 2", grayish brown		X		10 9 18			SPT
40		(SP-SM) Sand, fine to medium with coarse, with silt and gravel to 1/4", grayish brown		X		12 16 20			SPT
45		(SM) Silty Sand, fine to coarse, with gravel to 2", grayish brown		X		27 33 35			SPT
50		(SP-SM) Sand, fine to coarse, with silt and gravel to 1", grayish brown		X		22 13 16			SPT
		END OF BORING NO REFUSAL, NO BEDROCK NO GROUNDWATER SLIGHT CAVING, NO FILL							
55									
60									
65									

10331-3 16452-3.GPJ CHJ.GDT 10/12/16

EXPLORATORY BORING NO. 5

Date Drilled: 9/27/16

Client: Bel-Air Swap Meet, Inc.

Equipment: CME75 Truck Rig

Driving Weight / Drop / Sampler Size: 140lbs./30in./3.25" O.D.

Surface Elevation(ft): N/A

Logged by: GA

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine with medium to coarse, with gravel to 2", brown	Native	X	X	3 3 4			Ring DS, MDC
5		(GM) Silty Sandy Gravel, fine to coarse, gravel to 2", brown		X		12 13 23			Ring
10		(ML) Sandy Silt, fine, with gravel to 1", brown		X	X	5 7 10			Ring
15		(SM) Silty Sand, fine, few gravel to 1", olive brown		X		12 15 16			Ring
		(ML) Sandy Silt, fine, with clay, olive brown							
20				X		12 23 32			Ring
25		(SM) Gravelly Silty Sand, fine to coarse, gravel to 2", dark grayish brown		X		17 50			Ring

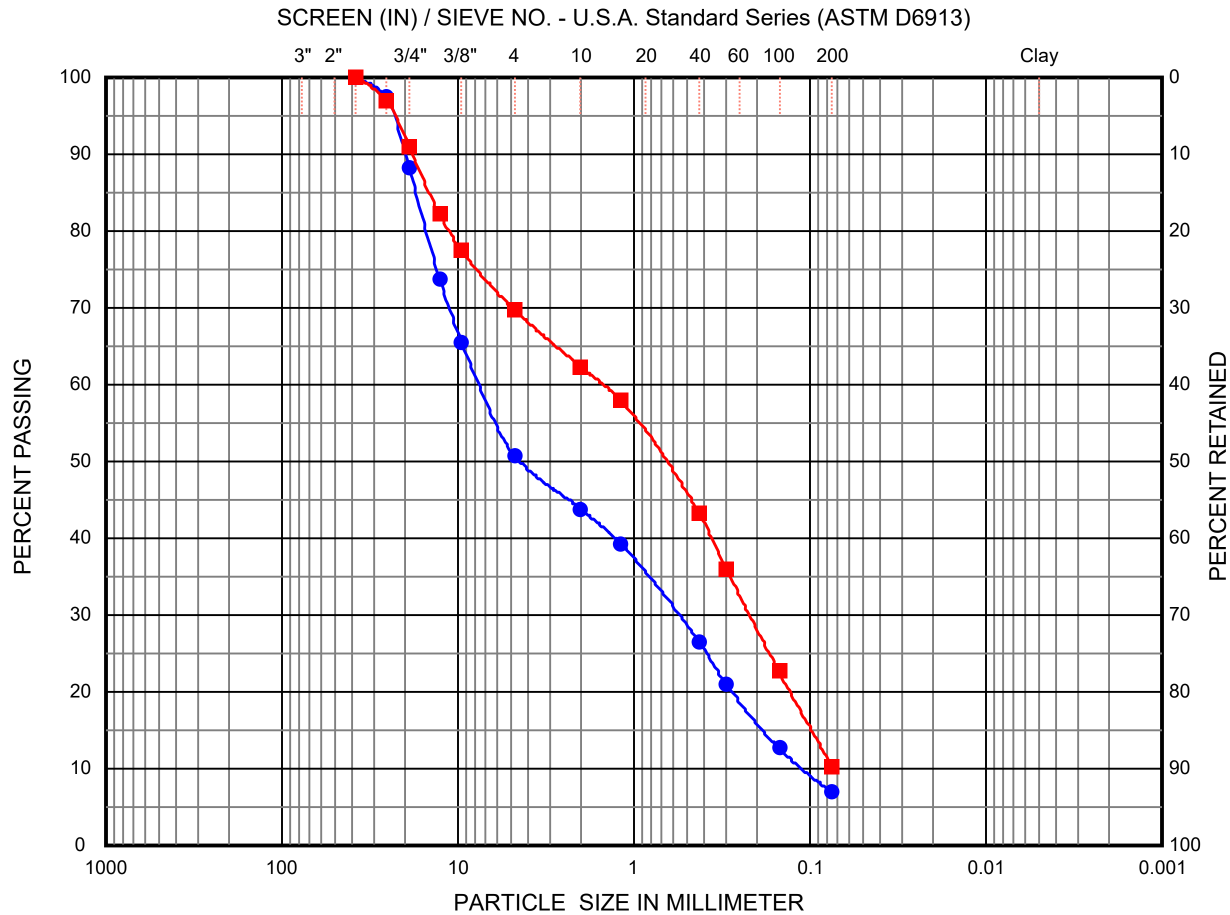
END OF BORING

NO REFUSAL, NO BEDROCK
NO GROUNDWATER
SLIGHT CAVING, NO FILL

10331-3 16452-3.GPJ CHJ.GDT 10/12/16

APPENDIX "C"

LABORATORY TESTING



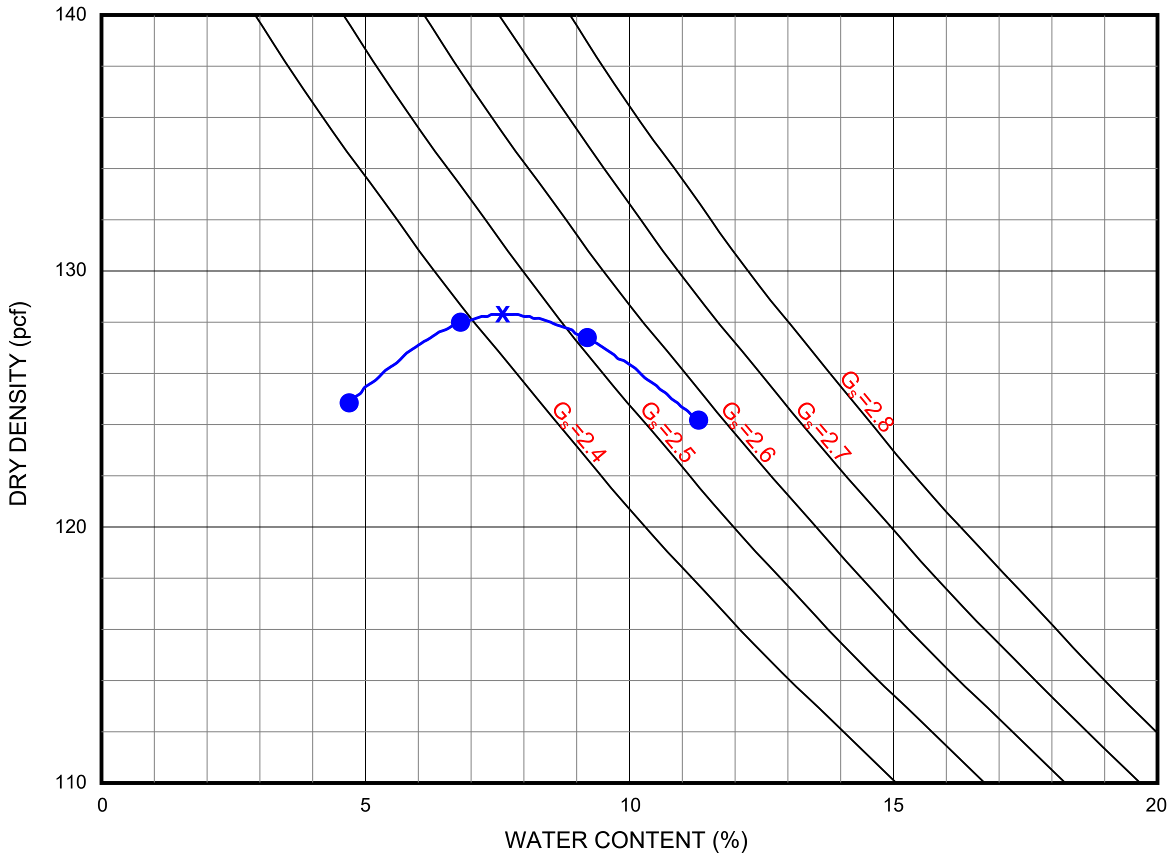
Cobbles & Boulders	Gravel		Sand			Silt	Clay
	Coarse	Fine	Coarse	Medium	Fine		

	Boring No.	Depth	Gravel	Sand	Fines	Clay	D_{10}	D_{30}	D_{50}	D_{60}	C_u	C_c
●	2	6	49.3	43.8	6.9		0.1119	0.549	4.489	7.670	68.5	0.4
	(GP-GM) Poorly-graded gravel with silt and sand											
■	3	3	30.3	59.4	10.3		0.0738	0.221	0.643	1.488	20.1	0.4
	(SP-SM) Poorly-graded sand with silt and gravel											

N:\Projects\Geotechnical\2016\16452- 2&3 Bel-Air Swapmeet, INC\Labsuite\LabSuite_16452-3.csv

PARTICLE SIZE DISTRIBUTION (ASTM D6913)

Project:	Proposed Warehouse Building				
Location:	17805 and 17783 Taylor Avenue, Bloomington, California				
Job Number:	16452-3	Engineer:	M.Noorzay	Enclosure:	C-1

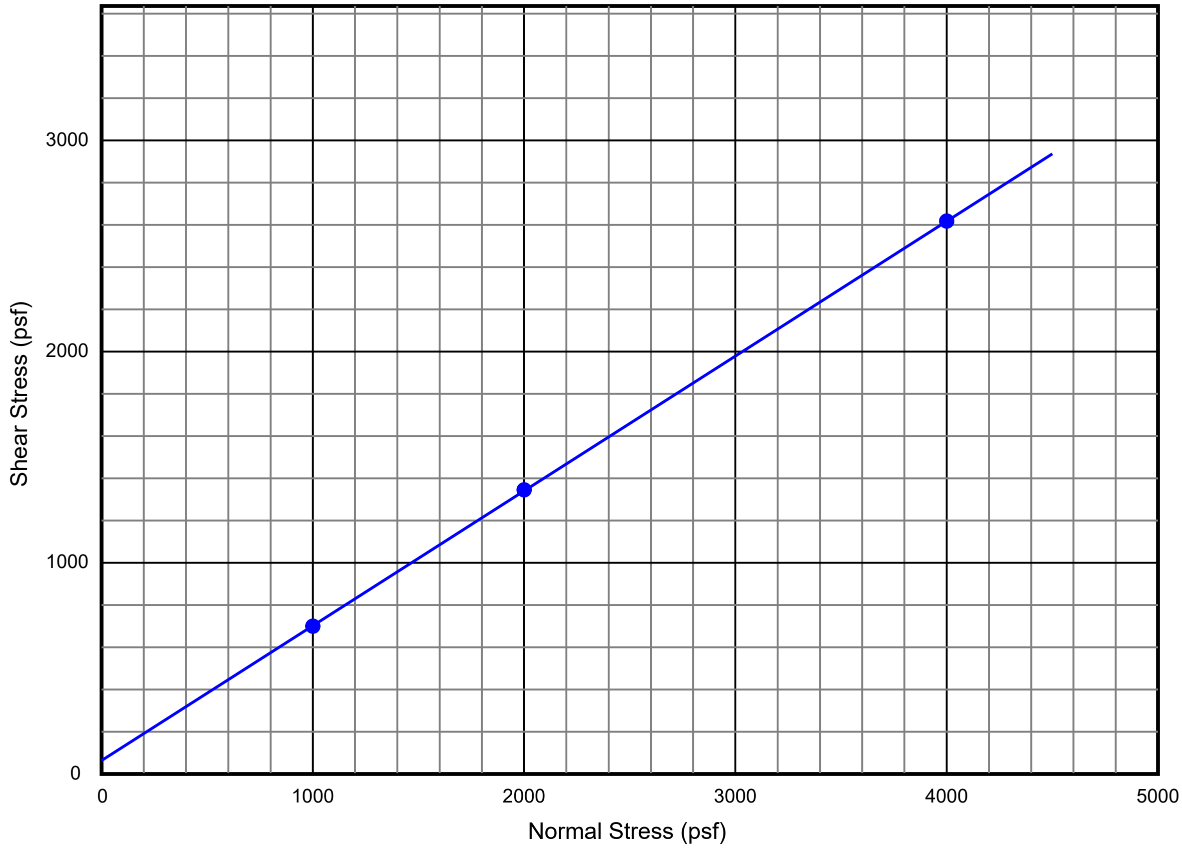


	Boring No.	Depth (ft)	USCS Classification	γ_{dmax} (pcf)	w_o (%)
●	5	2	(SM) Silty sand, fine with medium to coarse, with gravel to 2 inches	128.0	7.5

N:\Projects\Geotechnical\2016\16452- 2&3 Bel-Air Swapmeet, INC\Labsuite\LabSuite_16452-3.csv

COMPACTION CURVES (ASTM D1557)

Project:	Proposed Warehouse Building		
Location:	17805 and 17783 Taylor Avenue, Bloomington, California		
Job Number:	16452-3	Engineer:	M.Noorzay
Enclosure:	C-2		



	Boring No.	Depth (ft)	γ_d (pcf)	w (%)	C_{pk} (psf)	ϕ_{pk} (°)	C_{rs} (psf)	ϕ_{rs} (°)
●	5A	2	115.0	7.5	0.0	36.6	59.8	32.6
	(SM) Silty sand, fine with medium to coarse, with gravel to 2 inches / Remolded (RC=90%)							

N:\Projects\Geotechnical\2016\16452- 2&3 Bel-Air Swapmeet, INC\Labsuite\LabSuite_16452-3.csv

DIRECT SHEAR TESTS (ASTM D3080)

Project:	Proposed Warehouse Building		
Location:	17805 and 17783 Taylor Avenue, Bloomington, California		
Job Number:	16452-3	Engineer:	M.Noorzay
Enclosure:	C-3		

FINES CONTENT (ASTM D1140)

Boring No.	2	4	4	4	4	4
Depth (ft)	15	3	5	10	15	30
Original Dry Mass	139.6	270.7	287.9	162	154.2	200
Dry Mass after Washing	84.2	215.8	270.3	98.3	72.6	184.6
Fine Contents (%)	39.7	20.3	6.1	39.3	52.9	7.7
Classification	SM	SM	SP-SM	SM	ML	SP-SM

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TEST DATA SUMMARY

Project:	Proposed Warehouse Building				
Location:	17805 and 17783 Taylor Avenue, Bloomington, California				
Job Number:	16452-3	Engineer:	M.Noorzay	Enclosure:	C-4

Table 1 - Laboratory Tests on Soil Samples

CHJ Consultants
Proposed Warehouse/Bel Air Swapmeet
Your #16452-3, HDR Lab #16-0732LAB
11-Oct-16

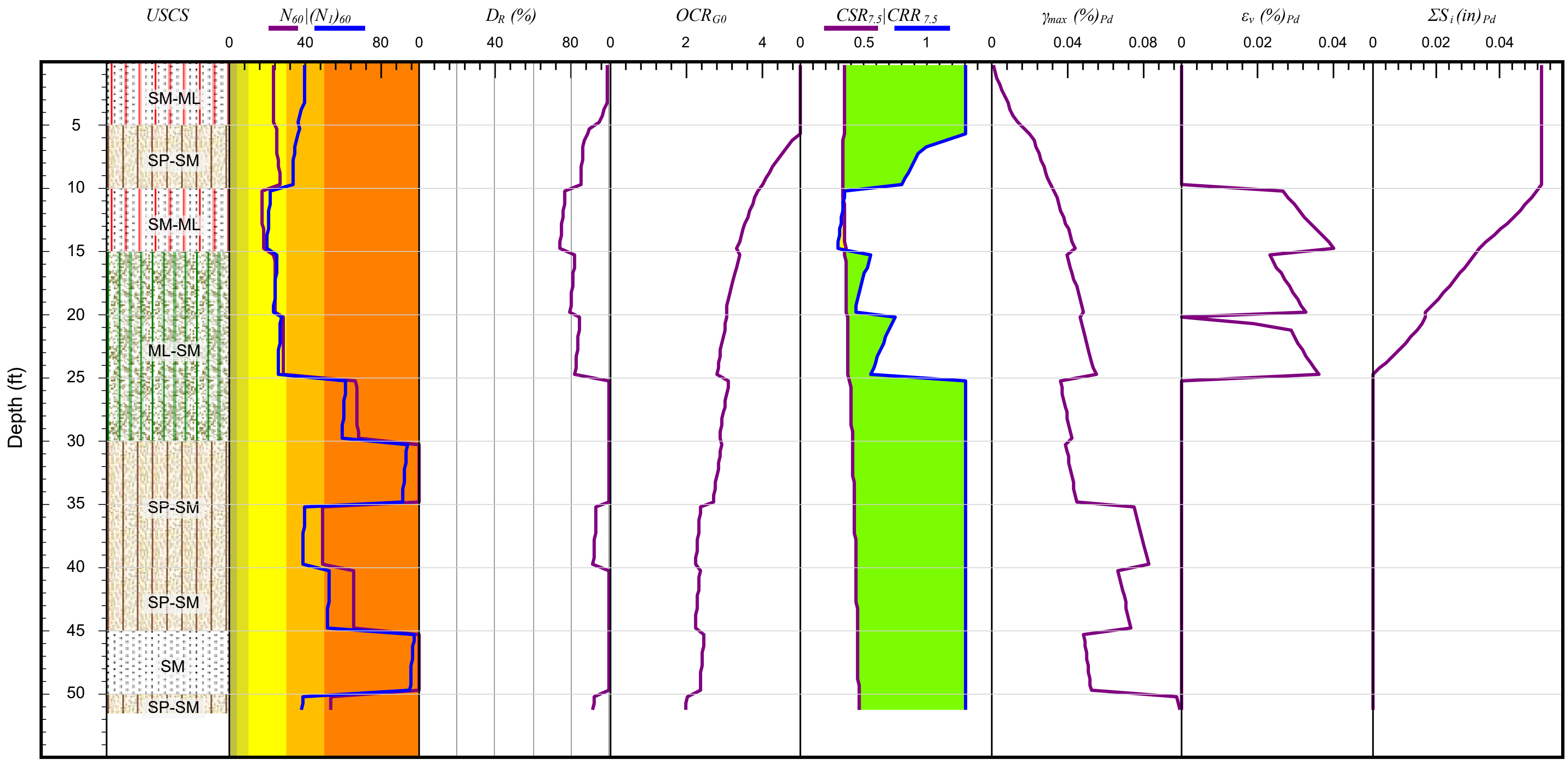
Sample ID			
			2A
Resistivity		**Units**	
as-received		ohm-cm	316,000
saturated		ohm-cm	20,000
pH			7.2
Electrical Conductivity		mS/cm	0.02
Chemical Analyses			
Cations			
calcium	Ca^{2+}	mg/kg	11
magnesium	Mg^{2+}	mg/kg	ND
sodium	Na^{1+}	mg/kg	2.8
potassium	K^{1+}	mg/kg	7.7
Anions			
carbonate	CO_3^{2-}	mg/kg	ND
bicarbonate	HCO_3^{1-}	mg/kg	79
fluoride	F^{1-}	mg/kg	0.9
chloride	Cl^{1-}	mg/kg	3.4
sulfate	SO_4^{2-}	mg/kg	8.3
phosphate	PO_4^{3-}	mg/kg	7.1
Other Tests			
ammonium	NH_4^{1+}	mg/kg	ND
nitrate	NO_3^{1-}	mg/kg	16
sulfide	S^{2-}	qual	na
Redox		mV	na

Resistivity per ASTM G187, Cations per ASTM D6919, Anions per ASTM D4327, and Alkalinity per APHA 2320-B.
Electrical conductivity in millisiemens/cm and chemical analyses were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

431 West Baseline Road · Claremont, CA 91711
Phone: 909.962.5485 · Fax: 909.626.3316

APPENDIX "D"

GEOTECHNICAL CALCULATIONS



SM-ML
ML-SM
SP-SM
SM

Earthquake & Groundwater Information:
Magnitude = 7.61
Max. Acceleration = 0.57 g
Project GW = 248 ft
Maximum Settlement = 0.05 in
Settlement at Bottom of Footing = 0.05 in

Liquefaction: Idriss & Boulanger (2008)
Settl.: [dry] Pradel (1998)
Lateral spreading: Idriss & Boulanger (2008)
M correction: [Sand] Boulanger & Idriss(2004)
σv correction: Idriss & Boulanger (2008)
Stress reduction: Idriss & Boulanger (2008)

CHJ Consultants

Seismic Settlement Potential - SPT Data

Project:	Proposed Warehouse Building				
Location:	17805 and 17783 Taylor Avenue, Bloomington, California				
Job Number:	16452-3	Boring No.:	B-4	Enclosure:	D-1

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