PRELIMINARY GEOTECHNICAL AND INFILTRATION FEASIBILITY INVESTIGATION PROPOSED INDUSTRIAL DEVELOPMENT APNs 263-190-012, -014, -015, -016, -017, -018, -019 AND -036 MORENO VALLEY, CALIFORNIA

PROJECT NO. 23756.1
SEPTEMBER 21, 2021

Prepared For:

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Attention: Mr. Mark Bachli

September 21, 2021

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Project No. 23756.1

Attention: Mr. Mark Bachli

Subject: Preliminary Geotechnical and Infiltration Feasibility Investigation, Proposed Industrial Development, APNs 263-190-012, -014, -015, -016, -017, -018, -019, and -036, Moreno Valley, California.

LOR Geotechnical Group, Inc., is pleased to present this report of our geotechnical investigation for the subject project. In summary, it is our opinion that the proposed development is feasible from a geotechnical perspective, provided the recommendations presented in the attached report are incorporated into design and construction. However, the contents of this summary should not be solely relied upon.

To provide adequate support for the proposed structure, we recommend that a compacted fill mat be constructed beneath footings and slabs. The compacted fill mat will provide a dense, high-strength soil layer to uniformly distribute the anticipated foundation loads over the underlying soils. Any undocumented fill material and any loose alluvial materials should be removed from structural areas and areas to receive engineered compacted fills. The data developed during this investigation indicates that removals on the order of approximately 2 to 5 feet will be required from currently planned development areas. The given removal depths are preliminary and the actual depths of the removals should be determined during the grading operation by observation and/or in-place density testing.

Very low expansion potential, good R-value quality, and negligible soluble sulfate content generally characterize the onsite materials tested. Near completion and/or at the completion of site grading, additional foundation and subgrade soils should be tested as necessary, to verify their expansion potential, soluble sulfate content, and R-value quality.

Non-conducive infiltration rates were obtained for the soils tested.

LOR Geotechnical Group, Inc.

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INTRODUCTION

During September of 2021, a Preliminary Geotechnical and Infiltration Feasibility Investigation was performed by LOR Geotechnical Group, Inc., for the proposed industrial development of Assessor's Parcel Numbers (APNs) 263-190-012, -014, -015, -016, -017, -018, -019, and -036, Moreno Valley, California. The purpose of this investigation was to provide a technical evaluation of the geologic setting of the site and to provide geotechnical design recommendations for the proposed development. The scope of our services included:

- Review of available geotechnical literature, reports, maps, and agency information pertinent to the study area;
- Interpretation of aerial photographs of the site and surrounding regions dated 1966 through 2020;
- Geologic field reconnaissance mapping to verify the areal distribution of earth units and significance of surficial features as compiled from documents, literature, and reports reviewed;
- A subsurface field investigation to determine the physical soil conditions pertinent to the proposed development;
- Percolation testing via the borehole test method;
- Laboratory testing of selected soil samples obtained during the field investigation;
- Development of geotechnical recommendations for site grading and foundation design; and
- Preparation of this report summarizing our findings, and providing conclusions and recommendations for site development.

The approximate location of the site is shown on the attached Index Map, Enclosure A-1, within Appendix A.

PROJECT CONSIDERATIONS

To orient our investigation at the site, a Site Plan prepared by HPA Architecture, dated August 12, 2021, was furnished for our use. The current site conditions and proposed building configuration and associated driveways, parking, and landscape areas were indicated on this plan. The Site Plan was utilized as a base map for our field investigation and is presented as Enclosure A-2, within Appendix A.

As noted on the site plan, development of the site will include a 84,388 ± square foot industrial type structure, with the remainder of the property used for driveways, parking, and landscape areas. The building is anticipated to be of concrete, masonry or similar type construction and light to moderate foundation loads are anticipated with this structure.

An infiltration location exhibit was provided for our use and was prepared by CASC Engineering & Consulting, dated August 18, 2021. This plan shows the current site conditions and the desired depths and locations of the requested infiltration testing. A copy of this plan is provided as Enclosure A-3 within Appendix A.

Grading plans have not yet been developed. However, based on the current topography of the site and adjacent areas, minor cuts and fills are anticipated to create level surfaces for the proposed development.

AERIAL PHOTO ANALYSIS

The aerial photographs reviewed consisted of vertical aerial photograph images of varying scales. We reviewed imagery available from Google Earth Pro (2021) computer software and from online Historic Aerials (2021).

To summarize briefly, the site was used for residential purposes since prior to 1948, through the early 1990's, the earliest photograph available. Numerous residences were present across the site at that time, primarily within the northwest, south, and northeast portions. Up to approximately 18 small residences were present. In 1966, a slightly larger, perhaps commercial structure was present along Old I-215. By 1994, all of the structures were no longer present. Some fill materials were placed in the far northwest corner in 2009. A roughly ‘L’ shaped area along Edgemont Street appears to have been created through the removal of soil (borrow) to a depth of approximately 5 feet. The previously noted fill in the far northwest corner has since been extended eastward approximately 150 feet. End dumped fill piles were present along Edgemont Street in 2018. No evidence for the presence of faults traversing the site area or mass movement features was noted during our review of the photographs covering the site and nearby vicinity.

EXISTING SITE CONDITIONS

The approximate 7-acre site is vacant land located between Edgemont Street on the east and Old I-215 on the west, approximately 300 feet south of Cottonwood Avenue in the northwest portion of the city of Moreno Valley. The northern portion of the site was being used as a storage yard for vehicles. End dumped piles of fill were present along Edgemont Street in the eastern portion of the site, along the east side of Old I-215 in the western portion of the site, and in the center portion of the site. Some landscape and concrete debris was intermixed with these end dumped piles. The remainder of the site was vacant, contained very sparse weeds and portions of the site were recently disced. Power lines were present along the east side of Old I-215 and another parallel set was present approximately 100 feet east of Old I-215. Topographically, the site is planar with a gentle fall to the north.

Old I-215, an asphalt-paved roadway, borders the site to the west, with commercial/industrial properties beyond. Edgemont Street, an asphalt-paved roadway, borders the site on the east with residential properties beyond. A commercial property and vacant land lie adjacent to the site on the south. A small earthen drainage channel and single family residences lie north of the site.

SUBSURFACE FIELD INVESTIGATION

Our subsurface field exploration program was conducted on September 7, 2021. The work consisted of advancing a total of 5 exploratory borings using a truck-mounted drill rig equipped with 8-inch diameter hollow stem augers. The approximate locations of our exploratory borings are presented on Enclosures A-2 and A-3, within Appendix A.

The subsurface conditions encountered in the exploratory borings were logged by a geologist from this firm. The borings were drilled to maximum depths of 21.5 to 51.5 feet below the existing ground surface. Relatively undisturbed and bulk samples were obtained at a maximum depth interval of 5 feet, and returned to our geotechnical laboratory in sealed containers for further testing and evaluation.

A detailed description of the subsurface field exploration program and the boring logs is presented in Appendix B.

LABORATORY TESTING PROGRAM

Selected soil samples obtained during the field investigation were subjected to geotechnical laboratory testing to evaluate their physical and engineering properties. Laboratory testing included in-place moisture content and dry density, laboratory compaction characteristics, direct shear, expansion index, sieve analysis, sand equivalent, R-value, expansion index, and soluble sulfate content. A detailed description of the geotechnical laboratory testing program and the test results are presented in Appendix C.

GEOLOGIC CONDITIONS

Regional Geologic Setting

The site is located within the northwestern portion of Moreno Valley which in turn lies within the northern end of the Perris Valley just south of the base of the Box Springs Mountains. This area is located on the Perris block within the northern Peninsular Ranges geologic province of southern California. While the Perris block is considered to be a relatively stable structural block, it is bounded by active faults. These include the Elsinore fault zone on the southwest, the San Jacinto fault zone on the east and the Cucamonga fault zone on the north. The Perris block is underlain predominately by a very large mass of crystalline igneous rocks of Cretaceous age and older metasedimentary and metavolcanic rocks.

The Perris block has a series of erosional surfaces, marked by low topographic relief and capped with unconsolidated alluvial sediments stripped from the surrounding highlands, such as the Box Springs Mountains. The Perris Valley is a long and narrow alluviated valley which drains to the southeast. This region of and around the site was mapped by the California Division of Mines and Geology as being underlain by deposits of slightly to well consolidated to indurated older alluvium (Morton and Matti, 2001).

The nearest known active fault zone is the San Jacinto fault zone located approximately 11.0 kilometers (7.0 miles) to the northeast. Other major faults within the region include the San Andreas fault zone located approximately 25 kilometers (15.5 miles) to the northeast, and the Elsinore fault zone located approximately 25.5 kilometers (16.0 miles) to the southwest.

The site and the regional geologic setting are shown on Enclosure A-3 within Appendix A.

Site Geologic Conditions

Fill: Fill materials were encountered within all of our exploratory borings to depths of approximately 1 to 5 feet. These materials are believed to be associated with past site development and current and past weed abatement (discing) practices at the site. As encountered, the fill materials were comprised of silty sand which was predominantly brown, dry, and in a loose state. Some asphalt grindings, concrete debris, and plastic was encountered within the fill. Locally, deeper fills are anticipated primarily associated with the past development in the various areas of the site noted during our aerial photograph review. Expansion index testing of these materials indicates a very low expansion potential.

Older Alluvium: Older alluvial materials were encountered underlying the fill materials described above within all of our exploratory borings to the maximum depths explored. These units were noted to mainly consist of silty sand with a minor unit of well graded sand with silt. These materials were typically red brown in color, damp to moist, and micaceous. The older alluvial materials were in a relatively medium dense to very dense state upon first encounter, becoming dense to very dense quickly with depth based on our equivalent Standard Penetration Test (SPT) data and in-place density testing.

A detailed description of the subsurface soil conditions as encountered within our exploratory borings, is presented on the Boring Logs within Appendix B.

Groundwater Hydrology

Groundwater was encountered within four of our exploratory borings, B-1, B-2, B-3, and B-5, at depths of approximately 18, 34, 19, and 18 feet below the existing ground surface, respectively.

In order to estimate the approximate depth to groundwater in the site area, a search was conducted for local groundwater (well) level measurements within the Cooperative Well Measuring Program, Spring 2021 (Watermaster Support Services et al., 2021). This database contains depth to groundwater measurements dating back to 1993. The closest well found is owned and/or operated by Box Springs Mutual Water Company, and are listed as the Local Well ID Box Springs Mutual #17, located approximately 0.7 kilometers (0.4 miles) to the northeast of the site. In this well, designated by the State Well Numbering System as 03S/04W-10A, groundwater was last measured at a depth of approximately 17 feet below the ground surface in March of 2021. Groundwater has risen over the time period for which data was available from a depth of approximately 116 feet in March of 1993 to a depth of approximately 17 feet in the latest measurement in the database.

We conducted a search of the water well database information provided in the California Department of Water Resources (CDWR) Water Library Data website (CDWR, 2021). This search did not indicate any wells nearby the project site.

Based on the information above, groundwater at the site appears to be at depths on the order of 17 to 19 feet below the ground surface.

Mass Movement

The site lies on a relatively flat surface. The occurrence of mass movement failures such as landslides, rockfalls, or debris flows within such areas is generally not considered common, and no evidence of mass movement was observed on the site.

Faulting

No active or potentially active faults are known to exist at the subject site. In addition, the subject site does not lie within a current State of California Earthquake Fault Zone (Hart and Bryant, 2003) nor does the site lie within a County of Riverside fault zone (CRTLMA, 2021). No evidence of faulting projecting into or crossing the site was noted during our aerial photograph review or our review of published geologic maps.

As previously mentioned, the closest known active earthquake fault with a documented location is the San Jacinto fault located approximately 11.0 kilometers (7.0 miles) to the northeast. In addition, other relatively close active faults include the San Andreas fault located approximately 25.0 kilometers (15.5 miles) to the northeast, and the Elsinore fault located approximately 25.5 kilometers (16.0 miles) to the southwest.

The San Jacinto fault zone is a sub-parallel branch of the San Andreas fault zone, extending from the northwestern San Bernardino area, southward into the El Centro region. This fault has been active in recent times with several large magnitude events. It is believed that the San Jacinto fault is capable of producing an earthquake magnitude on the order of 6.5 or larger.

The San Andreas fault is considered to be the major tectonic feature of California, separating the Pacific Plate and the North American Plate. While estimates vary, the San Andreas fault is generally thought to have an average slip rate on the order of 24mm/yr and capable of generating large magnitude events on the order of 7.5.

The Elsinore fault zone is one of the largest in southern California. At its northern end it splays into two segments and at its southern end it is cut by the Yuba Wells fault. The primary sense of slip along the Elsinore fault is right lateral strike-slip. It is believed that the Elsinore fault zone is capable of producing an earthquake magnitude on the order of 6.5 to 7.5.

Current standards of practice included a discussion of all potential earthquake sources within a 100 kilometer (62 mile) radius. However, while there are other large earthquake faults within a 100 kilometer (62-mile) radius of the site, none of these are considered as relevant to the site as the faults described above, due to their closer distance and larger anticipated magnitudes.

Historical Seismicity

In order to obtain a general perspective of the historical seismicity of the site and surrounding region a search was conducted for seismic events at and around the area within various radii. This search was conducted utilizing the historical seismic search website of the U.S.G.S. (2021). This website conducts a search of a user selected cataloged seismic events database, within a specified radius and selected magnitudes, and then plots the events onto a map. At the time of our search, the database contained data from January 1, 1932 through September 15, 2021.

In our first search, the general seismicity of the region was analyzed by selecting an epicenter map listing all events of magnitude 4.0 and greater, recorded since 1932, within a 100 kilometer (62 mile) radius of the site, in accordance with guidelines of the California Division of Mines and Geology. This map illustrates the regional seismic history of moderate to large events. As depicted on Enclosure A-5, within Appendix A, the site lies within a relatively active region associated with the San Jacinto fault to the northeast.

In the second search, the micro seismicity of the area lying within a 10 kilometer (6.2 miles) radius of the site was examined by selecting an epicenter map listing events on the order of 1.0 and greater since 1978. The results of this search is a map that presents the seismic history around the area of the site with much greater detail, not permitted on the larger map. The reason for limiting the time period for the events on the detail map is to enhance the accuracy of the map. Events recorded prior to the mid to late1970's are generally considered to be less accurate due to advancements in technology. As depicted on this map, Enclosure A-6, the San Jacinto fault zone to the northeast appears to be the source of numerous events.

In summary, the historical seismicity of the site entails numerous small to medium magnitude earthquake events occurring in the region around the subject site. Any future developments at the subject site should anticipate that moderate to large seismic events could occur very near the site.

Secondary Seismic Hazards

Other secondary seismic hazards generally associated with severe ground shaking during an earthquake include liquefaction, seismic-induced settlement, seiches and tsunamis, earthquake induced flooding, landsliding, and rockfalls.

Liquefaction: The site lies within an area mapped by the County of Riverside has having a very low potential for liquefaction (CRTLMA, 2021). The potential for liquefaction generally occurs during strong ground shaking within granular loose sediments where the groundwater is usually less than 50 feet below the ground surface. Although groundwater lies less than 50 feet beneath the site, as found during this investigation, the site is underlain by relatively dense to very dense older alluvial materials. Therefore, the possibility of liquefaction at the site is considered very low.

Seiches/Tsunamis: The potential for the site to be affected by a seiche or tsunami (earthquake generated wave) is considered nil due to absence of any large bodies of water near the site.

Flooding (Water Storage Facility Failure): There are no large water storage facilities located on or near the site which could possibly rupture during in earthquake and affect the site by flooding.

Seismically-Induced Landsliding: Due to the low relief of the site and surrounding region, the potential for landslides to occur at the site is considered nil.

Rockfalls: No large, exposed, loose or unrooted boulders are present above the site that could affect the integrity of the site.

Seismically-Induced Settlement: Settlement generally occurs within areas of loose, granular soils with relatively low density. Since the site is underlain by relatively dense to very dense older alluvial materials, the potential for settlement is considered very low. In addition, the recommended earthwork operations to be conducted during the development of the site should mitigate any near surface loose soil conditions.

SOILS AND SEISMIC DESIGN CRITERIA (California Building Code 2019)

Design requirements for structures can be found within Chapter 16 of the 2019 California Building Code (CBC) based on building type, use, and/or occupancy. The classification of use and occupancy of all proposed structures at the site, shall be the responsibility of the building official.

Site Classification

Chapter 20 of the ASCE 7-16 defines six possible site classes for earth materials that underlie any given site. Bedrock is assigned one of three of these six site classes and these are: A, B, or C. Soil is assigned as C, D, E, or F. Per ASCE 7-16, Site Class A and Site Class B shall be measured on-site or estimated by a geotechnical engineer, engineering geologist or seismologist for competent rock with moderate fracturing and weathering. Site Class A and Site Class B shall not be used if more than 10 feet of soil is between the rock surface and bottom of the spread footing or mat foundation. Site Class C can be used for very dense soil and soft rock with Ñ values greater than 50 blows per foot. Site Class D can be used for stiff soil with Ñ values ranging from 15 to 50 blows per foot. Site Class E is for soft clay soils with Ñ values less than 15 blows per foot. Our investigation, mapping by others, and our experience in the site region indicates that the materials beneath the site are considered Site Class D stiff soils.

CBC Earthquake Design Summary

Earthquake design criteria have been formulated in accordance with the 2019 CBC and ASCE 7-16 for the site based on the results of our investigation to determine the Site Class and an assumed Risk Category II. However, these values should be reviewed and the final design should be performed by a qualified structural engineer familiar with the region. In addition, the building official should confirm the Risk Category utilized in our design (Risk Category II). Our design values are provided within Appendix D.

INFILTRATION TESTING AND TEST RESULTS

Infiltration Testing

Four borehole infiltration tests were conducted in general accordance with the Shallow Percolation Test procedure as outlined in the Design Handbook for Low Impact Development Best Management Practices (CRFCWCD, 2011). The general locations of our tests are illustrated on Enclosures A-2 and A-3 and were conducted at the requested locations. Test borings were drilled to depths of approximately 7 feet below the existing ground surface on September 7, 2021 due to the presence of groundwater in order to maintain the required separation of 10 feet below the proposed infiltration system and groundwater. Subsequent to drilling, a 3-inch diameter, perforated PVC pipe wrapped in filter fabric was placed within each test hole and 3/4-inch gravel was placed between the outside of the pipe and the hole wall. Test holes were pre-soaked the same day as drilling. Testing took place the next day, September 8, 2021, within 26 hours but not before 15 hours, of the pre-soak. The holes were filled using water from a 200 gallon water tank. Test periods consisted of allowing the water to drop in 30-minute intervals. After each reading, the hole was refilled. Testing was terminated after a total of 12 readings were recorded.

Infiltration test results are summarized in the following table:

Test No.	**Depth***	**Infiltration Rate** (in/hr)**
P-1	7	0.03
P-2	7	0.05
* depth measured below existing ground surface ** Porchet Method determined rate		

The results of this testing are presented as Enclosures E-1 and E-2 in Appendix E. The test results indicate non-conducive infiltration characteristics for the soils tested.

CONCLUSIONS

This investigation provides a broad overview of the geotechnical and geologic factors which are expected to influence future site planning and development. On the basis of our field investigation and testing program, it is the opinion of LOR Geotechnical Group, Inc., that the proposed development of the site for the proposed use is feasible from a geotechnical standpoint, provided the recommendations presented in this report are incorporated into design and implemented during grading and construction.

It should be noted that the subsurface conditions encountered in our exploratory borings are indicative of the locations explored and the subsurface conditions may vary. If conditions are encountered during the construction of the project that differ significantly from those presented in this report, this firm should be notified immediately so we may assess the impact to the recommendations provided.

Foundation Support

To provide adequate support for the proposed structure, we recommend that a compacted fill mat be constructed beneath footings and slabs. The compacted fill mat will provide a dense, high-strength soil layer to uniformly distribute the anticipated foundation loads over the underlying soils. The construction of this compacted fill mat will allow for the removal of the existing fill material which was loose and any current subsurface improvements, such as utilities, foundations, etc., that may be present locally.

Conventional foundation systems utilizing either individual spread footings and/or continuous wall footings will provide adequate support for the anticipated downward and lateral loads when utilized in conjunction with the recommended fill mat.

Soil Expansiveness

Our expansion index testing of a representative sample of the on-site soils indicates a very low expansion potential. For very low expansive soils, no specialized construction procedures to resist expansive soil activity are necessary.

Careful evaluation of onsite soils and any import fill for their expansion potential should be conducted during the grading operation.

Sulfate Protection

The results of the soluble sulfate tests conducted on selected subgrade soils expected to be encountered at foundation levels indicate that there is a negligible sulfate exposure to concrete elements in contact with the on site soils per the 2019 CBC. Therefore, no specific recommendations are given for concrete elements to be in contact with the onsite soils.

Infiltration

The results of our field investigation and test data indicates the site soils at the depths tested are not conducive to infiltration. Based on the results of this investigation, infiltration may not occur at deeper depths to the presence of groundwater. Shallow depth infiltration rates are anticipated to be similar to those found at the depths tested.

Geologic Mitigations

No special mitigation methods are deemed necessary at this time, other than the geotechnical recommendations provided in the following sections.

Seismicity

Seismic ground rupture is generally considered most likely to occur along pre-existing active faults. Since no known faults are known to exist at, or project into the site, the probability of ground surface rupture occurring at the site is considered nil.

Due to the site's close proximity to the faults described above, it is reasonable to expect a relatively strong ground motion seismic event to occur during the lifetime of the proposed development on the site. Large earthquakes could occur on other faults in the general area, but because of their lesser anticipated magnitude and/or greater distance, they are considered less significant than the faults described above from a ground motion standpoint.

The effects of ground shaking anticipated at the subject site should be mitigated by the seismic design requirements and procedures outlined in Chapter 16 of the California Building Code. However, it should be noted that the current building code requires the minimum design to allow a structure to remain standing after a seismic event, in order to allow for safe evacuation. A structure built to code may still sustain damage which might ultimately result in the demolishing of the structure (Larson and Slosson, 1992).

No secondary seismic hazards are anticipated to impact the proposed development.

RECOMMENDATIONS

Geologic Recommendations

No special geologic recommendations are deemed necessary at this time, other than the geotechnical recommendations provided in the following sections.

General Site Grading

It is imperative that no clearing and/or grading operations be performed without the presence of a qualified geotechnical engineer. An onsite, pre-job meeting with the developer, the contractor, the jurisdictional agency, 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 in accordance with the following recommendations as well as applicable portions of the California Building Code, and/or applicable local ordinances.

All areas to be graded should be stripped of significant vegetation and other deleterious materials.

Any undocumented fill encountered during grading should be completely removed, cleaned of significant deleterious materials, and may be reused as compacted fill. It is our recommendation that any existing fills under any proposed flatwork and paved areas be removed and replaced with engineered compacted fill. If this is not done, premature structural distress (settlement) of the flatwork and pavement may occur.

Cavities created by removal of subsurface obstructions, which are anticipated in areas of the site which were previously developed, should be thoroughly cleaned of loose soil, organic matter and other deleterious materials, shaped to provide access for construction equipment, and backfilled as recommended in the following Engineered Compacted Fill section of this report.

Initial Site Preparation

The existing fill material and any loose older alluvial soils, if encountered, should be removed from all proposed structural and/or fill areas. The data developed during this investigation indicates that removals on the order of 2 to 5 feet deep, exclusive of the end dump stockpiles, will be required from proposed development areas in order to encounter competent older alluvium upon which engineered compacted fill can be placed. The given removal depths are preliminary. Deeper fills are anticipated to be present, locally, primarily in areas of previous improvements. Removals should expose alluvial materials with an in-situ relative compaction of at least 85 percent (ASTM D 1557) or engineered compacted fill with an in-situ relative compaction of at least 90 percent (ASTM D 1557). The actual depths of the removals should be determined during the grading operation by observation and/or in-place density testing.

Preparation of Fill Areas

Prior to placing fill, the surfaces of all areas to receive fill should be scarified to a minimum depth of 12 inches. The scarified soil should be brought to near optimum moisture content and compacted to a relative compaction of at least 90 percent (ASTM D 1557).

Engineered Compacted Fill

The onsite soils should provide adequate quality fill material, provided they are free from oversized and/or organic matter and other deleterious materials. Unless approved by the geotechnical engineer, rock or similar irreducible material with a maximum dimension greater than 6 inches should not be buried or placed in fills.

If required, import fill should be inorganic, non-expansive granular soils free from rocks or lumps greater than 6 inches in maximum dimension. Sources for import fill should be approved by the geotechnical engineer prior to their use. Fill should be spread in maximum 8-inch uniform, loose lifts, each lift brought to near optimum moisture content, and compacted to a relative compaction of at least 90 percent in accordance with ASTM D 1557.

Preparation of Foundation Areas

All footings should rest upon at least 24 inches of properly compacted fill material placed over competent alluvium. In areas where the required fill thickness is not accomplished by the recommended removals or by site rough grading, the footing areas should be further subexcavated to a depth of at least 24 inches below the proposed footing base grade, with the subexcavation extending at least 5 feet beyond the footing lines. The bottom of all excavations should be scarified to a depth of 12 inches, brought to near optimum moisture content, and recompacted to at least 90 percent relative compaction (ASTM D 1557) prior to the placement of compacted fill.

Concrete floor slabs should bear on a minimum of 24 inches of compacted soil. This should be accomplished by the recommendations provided above. The final pad surfaces should be rolled to provide smooth, dense surfaces upon which to place the concrete.

Short-Term Excavations

Following the California Occupational and Safety Health Act (CAL-OSHA) requirements, excavations 5 feet deep and greater should be sloped or shored. All excavations and shoring should conform to CAL-OSHA requirements. Short-term excavations of 5 feet deep and greater shall conform to Title 8 of the California Code of Regulations, Construction Safety Orders, Section 1504 and 1539 through 1547. Based on our exploratory borings, it appears that Type C soils are the predominant type of soil on the project and all short-term excavations should be based on this type of soil.

Deviation from the standard short-term slopes are permitted using option 4, Design by a Registered Professional Engineer (Section 1541.1).

Short-term excavation construction and maintenance are the responsibility of the contractor and should be a consideration of his methods of operation and the actual soil conditions encountered.

Slope Construction

Preliminary data indicates that cut and fill slopes should be constructed no steeper than two horizontal to one vertical. Fill slopes should be overfilled during construction and then cut back to expose fully compacted soil. A suitable alternative would be to compact the slopes during construction, then roll the final slopes to provide dense, erosion-resistant surfaces.

Slope Protection

Since the site soil materials are susceptible to erosion by running water, measures should be provided to prevent surface water from flowing over slope faces. Slopes at the project should be planted with a deep rooted ground cover as soon as possible after completion. The use of succulent ground covers such as iceplant or sedum is not recommended. If watering is necessary to sustain plant growth on slopes, then the watering operation should be monitored to assure proper operation of the irrigation system and to prevent over watering.

Soil Expansiveness

The upper materials encountered during this investigation were tested and found to have a very low expansion potential. Therefore, specialized construction procedures to specifically resist expansive soil activity are not anticipated at this time.

Additional evaluation of on-site and any imported soils for their expansion potential should be conducted following completion of the grading operation.

Foundation Design

If the site is prepared as recommended, the proposed structure may be safely founded on conventional shallow foundations, either individual spread footings and/or continuous wall footings, bearing on a minimum of 24 inches of engineered compacted fill placed over competent older alluvial materials. Foundations should have a minimum width of 12 inches and should be established a minimum of 12 inches below lowest adjacent grade.

For the minimum width and depth, footings may be designed using a maximum soil bearing pressure of 1,800 pounds per square foot (psf) for dead plus live loads. Footings at least 15 inches wide, placed at least 18 inches below the lowest adjacent final grade, may be designed for a maximum soil bearing pressure of 2,100 psf for dead plus live loads.

The above values are net pressures; therefore, the weight of the foundations and the backfill over the foundations may be neglected when computing dead loads. The values apply to the maximum edge pressure for foundations subjected to eccentric loads or overturning. The recommended pressures apply for the total of dead plus frequently applied live loads, and incorporate a factor of safety of at least 3.0. The allowable bearing pressures may be increased by one-third for temporary wind or seismic loading. The resultant of the combined vertical and lateral seismic loads should act within the middle one-third of the footing width. The maximum calculated edge pressure under the toe of foundations subjected to eccentric loads or overturning should not exceed the increased allowable pressure. The buildings should be setback from slopes as indicted within the California Building Code (2019).

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 300 pounds per square foot per foot of depth. Base friction may be computed at 0.30 times the normal load. Base friction and passive earth pressure may be combined without reduction. These values are for dead load plus live load and may be increased by one-third for wind or seismic loading.

Settlement

Total settlement of individual foundations will vary depending on the width of the foundation and the actual load supported. Maximum settlement of shallow foundations designed and constructed in accordance with the preceding recommendations are estimated to be on the order of 0.5 inch. Differential settlements between adjacent footings should be about one-half of the total settlement. Settlement of all foundations is expected to occur rapidly, primarily as a result of elastic compression of supporting soils as the loads are applied, and should be essentially completed shortly after initial application of the loads.

Building Area Slab-on-Grade

To provide adequate support, concrete floor slabs-on-grade should bear on a minimum of 24 inches of engineered fill compacted soil. 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/barrier. We recommend that a vapor retarder/barrier be designed and constructed according to the American Concrete Institute 302.1R, Concrete Floor and Slab Construction, which addresses moisture vapor retarder/barrier construction. At a minimum, the vapor retarder/barrier should comply with ASTM E1745 and have a nominal thickness of at least 10 mils. The vapor retarder/barrier should be properly sealed, per the manufacturer's recommendations, and protected from punctures and other damage. Per the Portland Cement Association, 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.

The slabs should be protected from rapid and excessive moisture loss which could result in slab curling. Careful attention should be given to slab curing procedures, as the site area is subject to large temperature extremes, humidity, and strong winds.

Exterior Flatwork

To provide adequate support, exterior flatwork improvements should rest on a minimum of 12 inches of soil compacted to at least 90 percent (ASTM D 1557).

Flatwork surface should be sloped a minimum of 1 percent away from buildings and slopes, to approved drainage structures.

Wall Pressures

The design of footings for retaining walls should be performed in accordance with the recommendations described earlier under Preparation of Foundation Areas and Foundation Design. For design of retaining wall footings, the resultant of the applied loads should act in the middle one-third of the footing, and the maximum edge pressure should not exceed the basic allowable value without increase.

For design of retaining walls unrestrained against movement at the top, we recommend an active pressure of 49 pounds per square foot (psf) per foot of depth be used.

This assumes level backfill consisting of compacted, non-expansive, on-site soils placed against the structures and within the back cut slope extending upward from the base of the stem at 35 degrees from the vertical or flatter.

Retaining structures subject to uniform surcharge loads within a horizontal distance behind the structures equal to the structural height should be designed to resist additional lateral loads equal to 0.47 times the surcharge load. Any isolated or line loads from adjacent foundations or vehicular loading will impose additional wall loads and should be considered individually.

To avoid over stressing or excessive tilting during placement of backfill behind walls, heavy compaction equipment should not be allowed within the zone delineated by a 45 degree line extending from the base of the wall to the fill surface. The backfill directly behind the walls should be compacted using light equipment such as hand operated vibrating plates and rollers. No material larger than three inches in diameter should be placed in direct contact with the wall.

Wall pressures should be verified prior to construction, when the actual backfill materials and conditions have been determined. Recommended pressures are applicable only to level, non-expansive, properly drained backfill with no additional surcharge loadings. If inclined backfills are proposed, this firm should be contacted to develop appropriate active earth pressure parameters.

Preliminary Pavement Design

Testing and design for preliminary onsite pavement was conducted in accordance with the California Highway Design Manual.

Based upon our preliminary sampling and testing, and upon an assumed Traffic Index generally used for similar projects, it appears that the structural sections tabulated below should provide satisfactory pavements for the subject on-site pavement improvements:

AREA	T.I.	DESIGN R-VALUE	PRELIMINARY SECTION
On site vehicular parking with occasional truck traffic (ADTT=10)	6.0	40	0.25’ AC / 0.50' AB or 5" JPCP / 4" AB
Light to moderate truck traffic (ADTT=25)	7.0	40	0.30'AC / 0.65'AB or 6" JPCP / 4" AB
AC - Asphalt Concrete AB - Class 2 Aggregate Base JPCP - Jointed Plain Concrete Pavement with MR $\geq$ 550 psi			

The above structural sections are predicated upon 90 percent relative compaction (ASTM D 1557) of all utility trench backfills and 95 percent relative compaction (ASTM D 1557) of the upper 12 inches of pavement subgrade soils and of any aggregate base utilized. In addition, the aggregate base should meet Caltrans specifications for Class 2 Aggregate Base.

In areas of the pavement which will receive high abrasion loads due to start-ups and stops, or where trucks will move on a tight turning radius, consideration should be given to installing concrete pads. Such pads should be a minimum of 5 inch thick concrete, with a 6 inch thick aggregate base. Concrete pads are also recommended in areas adjacent to trash storage areas where heavier loads will occur due to operation of trucks lifting trash dumpsters.

The recommended concrete pavement sections should have a minimum modulus of rupture (MR) of 550 pounds per square inch (psi). Transverse joints should be sawcut in the pavement at approximately 12 to 15-foot intervals within 4 to 6 hours of concrete placement, or preferably sooner. Sawcut depth should be equal to approximately one quarter of slab thickness. Construction joints should be constructed such that adjacent sections butt directly against each other and are keyed into each other. Parallel pavement sections should also be keyed into each other.

It should be noted that all of the above pavement design was based upon the results of preliminary sampling and testing, and should be verified by additional sampling and testing during construction when the actual subgrade soils are exposed.

Infiltration

The results of our field investigation and test data indicates the site soils at the depths tested are not conducive to infiltration. Therefore, shallow water quality storm water systems should not incorporate on-site infiltration when determining storm water treatment capacity.

Construction Monitoring

Post investigative services are an important and necessary continuation of this investigation. Project plans and specifications should be reviewed by the project geotechnical consultant prior to construction to confirm that the intent of the recommendations presented in this report have been incorporated into the design. Additional R-value, expansion, and soluble sulfate content testing may be needed after/during site rough grading.

During construction, sufficient and timely geotechnical observation and testing should be provided to correlate the findings of this investigation with the actual subsurface conditions exposed during construction. Items requiring observation and testing include, but are not necessarily limited to, the following:

1. Site preparation-stripping and removals.

2. Excavations, including approval of the bottom of excavations prior to the processing and preparation of the bottom areas for fill placement.

3. Scarifying and recompacting prior to fill placement.

4. Foundation excavations.

5. Subgrade preparation for pavements and slabs-on-grade.

6. Placement of engineered compacted fill and backfill, including approval of fill materials and the performance of sufficient density tests to evaluate the degree of compaction being achieved.

LIMITATIONS

This report contains geotechnical conclusions and recommendations developed solely for use by Compass Danbe Real Estate Partners, LLC and their design consultants for the purposes described earlier. It may not contain sufficient information for other uses or the purposes of other parties. The contents should not be extrapolated to other areas or used for other facilities without consulting LOR Geotechnical Group, Inc.

The recommendations are based on interpretations of the subsurface conditions concluded from information gained from subsurface explorations and a surficial site reconnaissance. The interpretations may differ from actual subsurface conditions, which can vary horizontally and vertically across the site. If conditions are encountered during the construction of the project, which differ significantly from those presented in this report, this firm should be notified immediately so we may assess the impact to the recommendations provided. Due to possible subsurface variations, all aspects of field construction addressed in this report should be observed and tested by the project geotechnical consultant.

If parties other than LOR Geotechnical Group, Inc., provide construction monitoring services, they must be notified that they will be required to assume responsibility for the geotechnical phase of the project being completed by concurring with the recommendations provided in this report or by providing alternative recommendations.

The report was prepared using generally accepted geotechnical engineering practices under the direction of a state licensed geotechnical engineer. No warranty, expressed or implied, is made as to conclusions and professional advice included in this report. Any persons using this report for bidding or construction purposes should perform such independent investigations as deemed necessary to satisfy themselves as to the surface and subsurface conditions to be encountered and the procedures to be used in the performance of work on this project.

TIME LIMITATIONS

The findings of this report are valid as of this date. Changes in the condition of a property can, however, occur with the passage of time, whether they be due to natural processes or the work of man on this or adjacent properties. In addition, changes in the Standards-of-Practice and/or Governmental Codes may occur. Due to such changes, the findings of this report may be invalidated wholly or in part by changes beyond our control. Therefore, this report should not be relied upon after a significant amount of time without a review by LOR Geotechnical Group, Inc., verifying the suitability of the conclusions and recommendations.

CLOSURE

It has been a pleasure to assist you with this project. We look forward to being of further assistance to you as construction begins. Should conditions be encountered during construction that appear to be different than indicated by this report, please contact this office immediately in order that we might evaluate their effect.

Should you have any questions regarding this report, please do not hesitate to contact our office at your convenience.

Respectfully submitted,
LOR Geotechnical Group, Inc.

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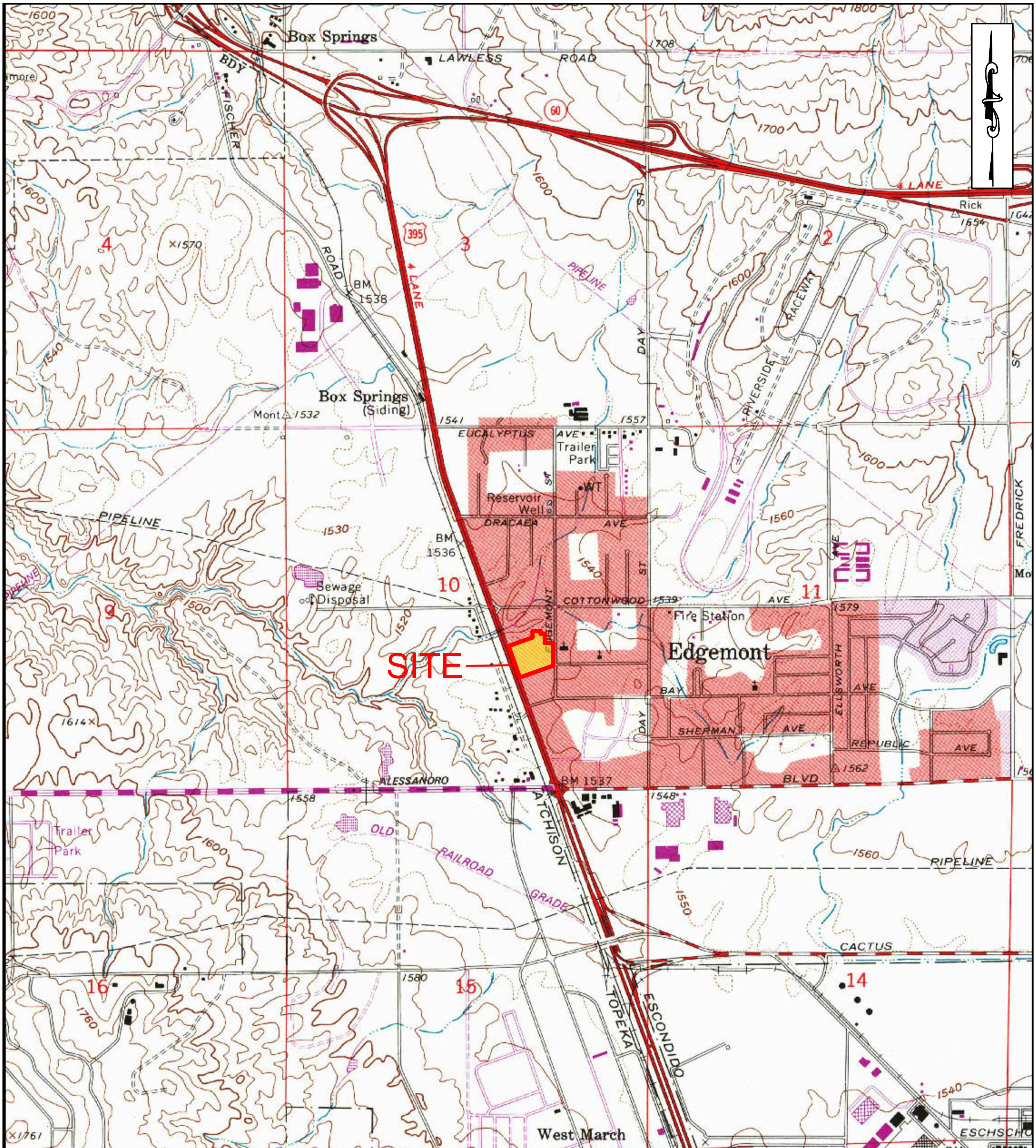
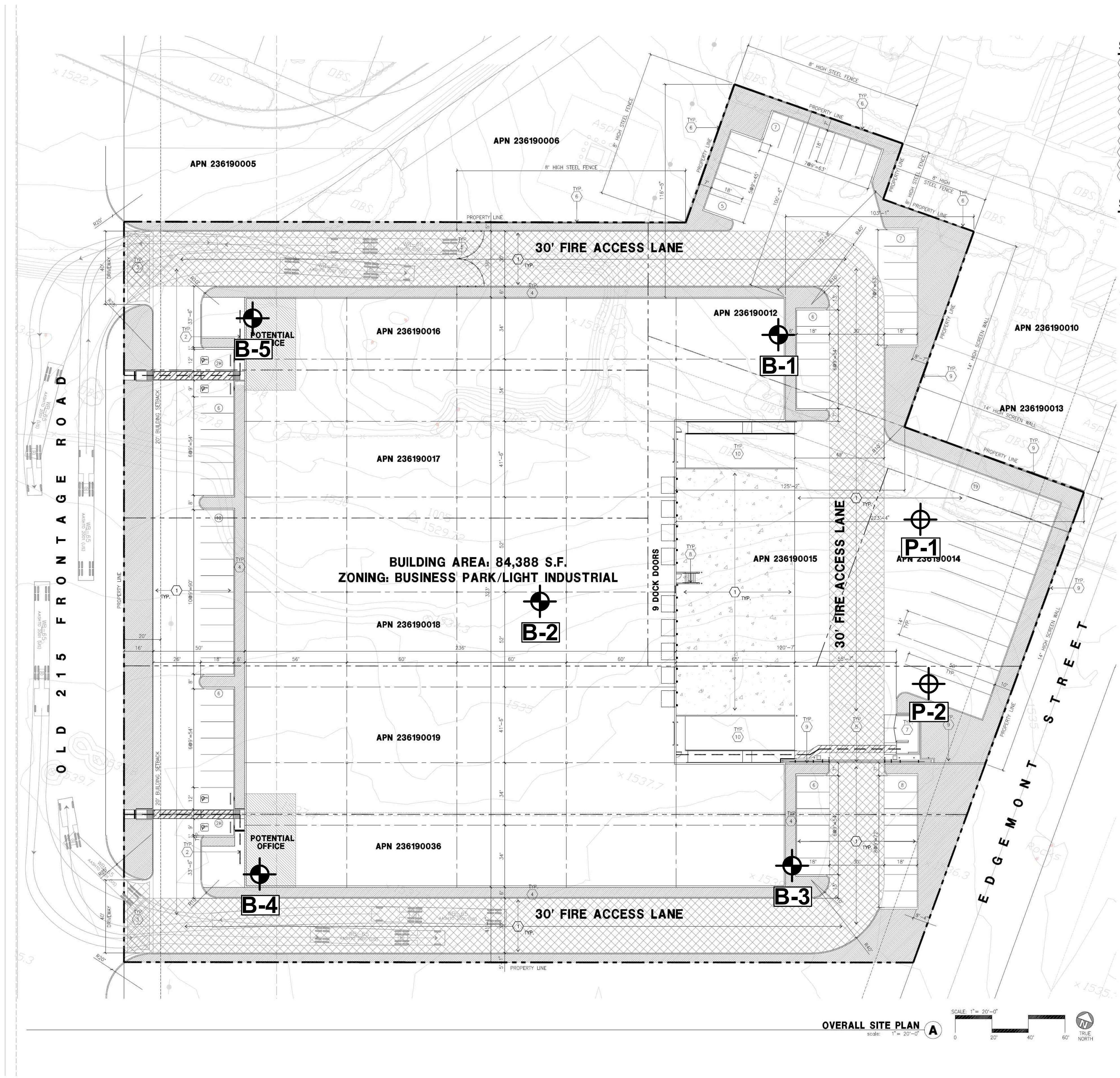
APPENDIX A

Index Map, Site Plan, Infiltration Location Map, Regional Geologic Map, and Historical Seismicity Maps



INDEX MAP

PROJECT: APNS 263-190-012, –014 THROUGH –019, AND –036, MORENO VALLEY, CALIFORNIA	**PROJECT NO:** 23756.1
CLIENT: COMPASS DANBE REAL ESTATE PARTNERS LLC	**ENCLOSURE:** A-1
LOR Geotechnical Group, Inc.	**DATE:** SEPTEMBER 2021
	SCALE: 1" ≈ 2,000'



SITE PLAN KEYNOTES

1. HEAVY BROOM FINISH CONC. PAVEMENT,
2. CONCRETE WALKWAY
3. DECORATIVE DRIVEWAY APRONS MIN. 20' DEPTH
4. CONCRETE EXTERIOR LANDING PAD TYP. AT ALL EXTERIOR MAN DOORS TO LANDSCAPE AREAS.
5. PROVIDE 8' H METAL TUBULAR MANUALLY OPERATED GATES W/ KNOX-PAD LOCK PER FIRE DEPARTMENT STANDARDS.
6. 8'H TUBE STEEL FENCE
7. TRASH ENCLOSURE
8. EXTERIOR CONC. STAIR.
9. CONCRETE TILT-UP SCREEN WALL.
10. DRIVE THRU CONCRETE RAMP.

SITE LEGEND

- LANDSCAPED AREA
- SITE PAVEMENT
- FIRE LANE
- PROPERTY LINE
- LOT LINE
- PARKING STALL (9' X 18')
- HANDICAP PARKING STALL (9' X 18')
- PATH OF TRAVEL

Legend

(Locations Approximate)

Map Symbols

- B-5 - Exploratory Boring
- P-2 - Percolation Test

HPA architecture

hpa, inc.
18831 bardeen avenue, - ste. #100
irvine, ca
92612
tel: 949•863•1770
fax: 949•863•0851
email: hpa@hparchs.com

Owner:

COMPASS DANBE REAL ESTATE PARTNERS, LLC
523 MAIN STREET
EL SEGUNDO, CA 90245
PHONE: 310.428.3302

Project:

COTTONWOOD & EDGEMONT

MORENO VALLEY CA

Consultants:

CIVIL	-
STRUCTURAL	-
MECHANICAL	-
PLUMBING	-
ELECTRICAL	-
LANDSCAPE	-
FIRE PROTECTION	-
SOILS ENGINEER	-

Title: OVERALL SITE PLAN

Project Number: 21419
Drawn by: CC
Date: 08/12/21
Revision:

SITE PLAN

PROJECT: APNS 263-190-012, –014 THROUGH –019, AND –036, MORENO VALLEY, CALIFORNIA

CLIENT: COMPASS DANBE REAL ESTATE PARTNERS LLC

PROJECT NO: 23756.1

ENCLOSURE: A-2

DATE: SEPTEMBER 2021

SCALE: 1" ≈ 60'

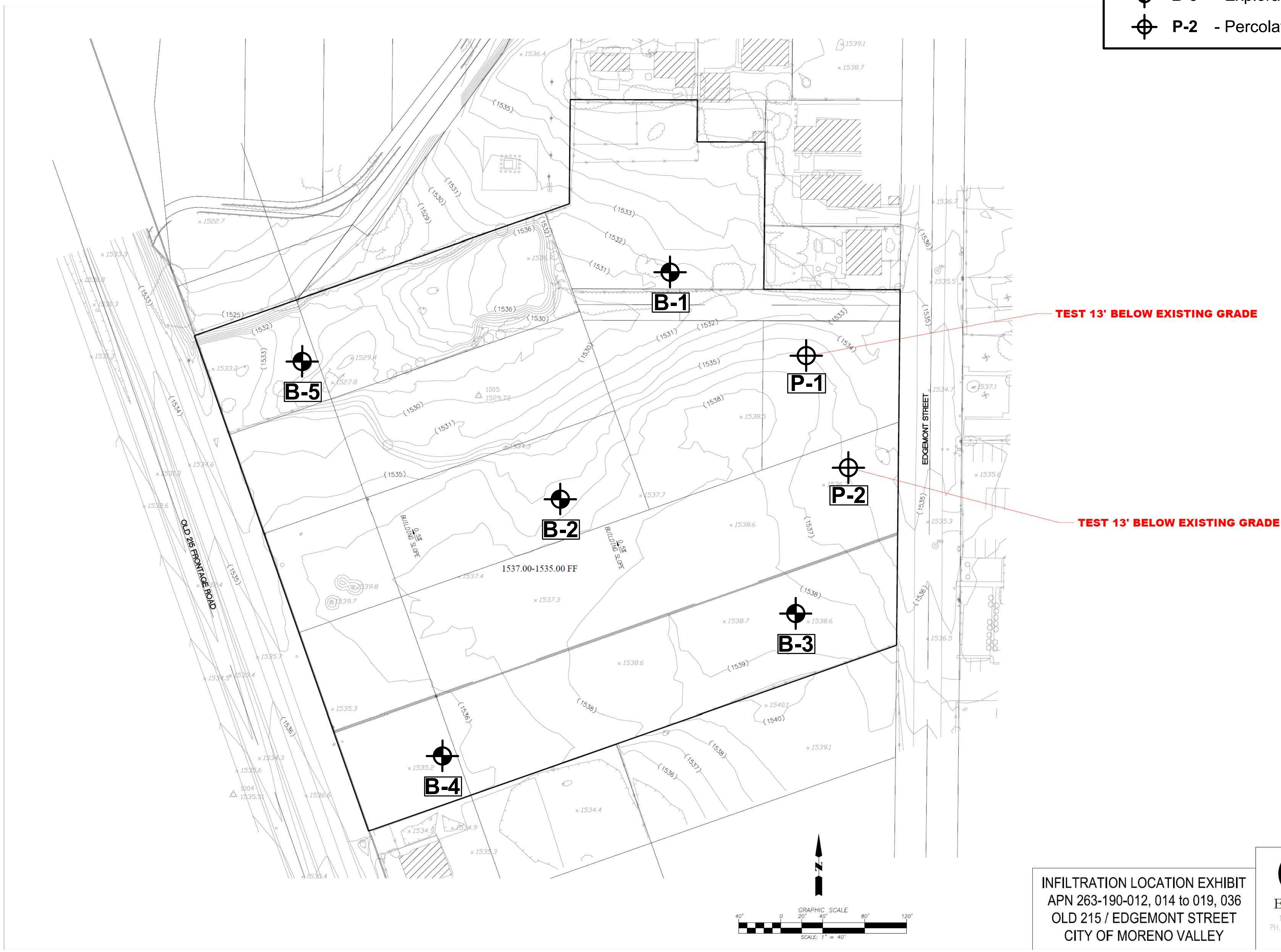
LOR Geotechnical Group, Inc.

Legend

(Locations Approximate)

Map Symbols

- B-5 - Exploratory Boring
- P-2 - Percolation Test



8/18/2021

INFILTRATION LOCATION EXHIBIT
APN 263-190-012, 014 to 019, 036
OLD 215 / EDGEMONT STREET
CITY OF MORENO VALLEY

CASC Engineering and Consulting
1470 EAST COOLEY DRIVE, COLTON, CA 92324
PH. (909) 783-0101 FAX (909) 783-0108
www.cel-casc.com

INFILTRATION LOCATION

PROJECT: APNS 263-190-012, –014 THROUGH –019, AND –036, MORENO VALLEY, CALIFORNIA

CLIENT: COMPASS DANBE REAL ESTATE PARTNERS LLC

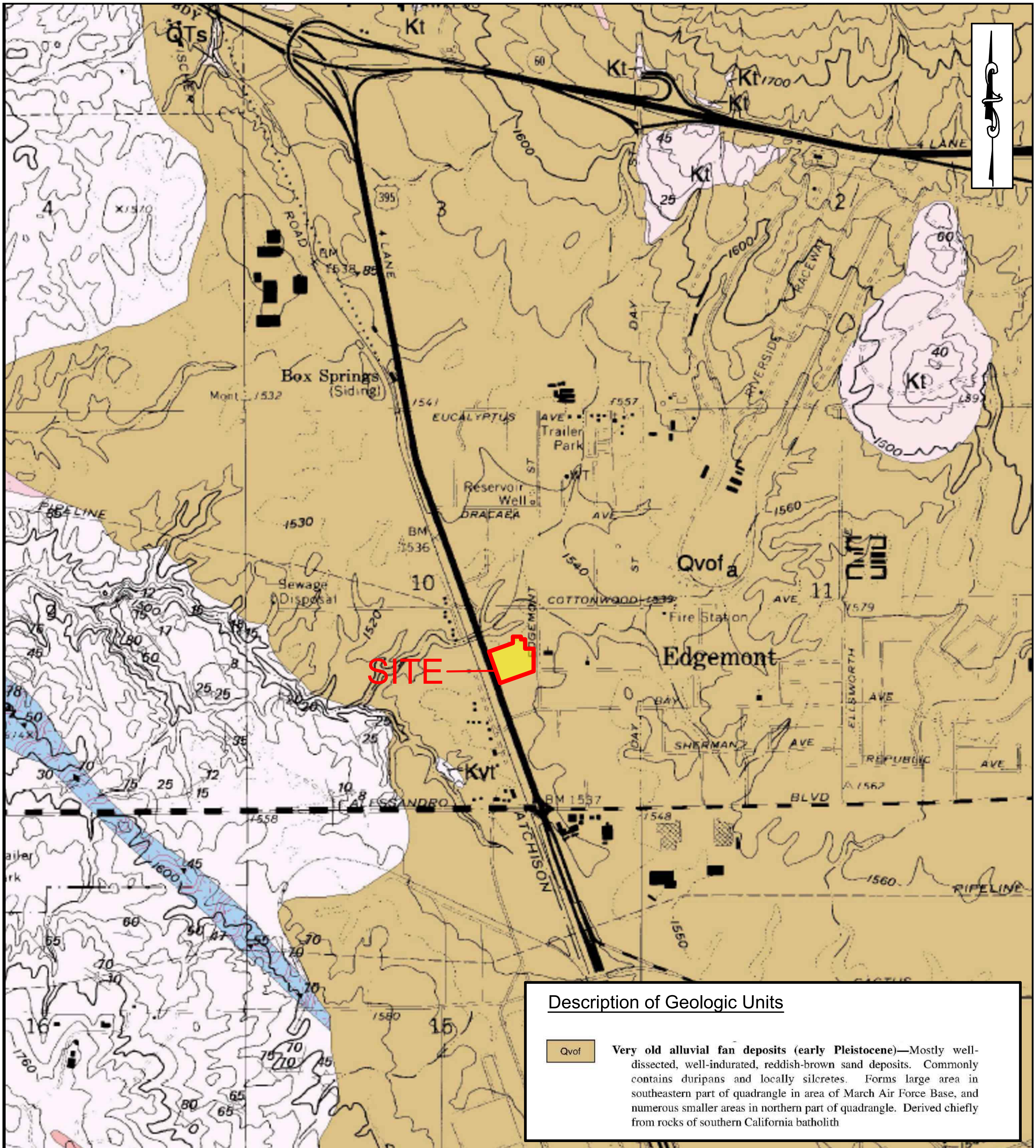
PROJECT NO: 23756.1

ENCLOSURE: A-3

DATE: SEPTEMBER 2021

SCALE: 1" ≈ 100'

LOR Geotechnical Group, Inc.



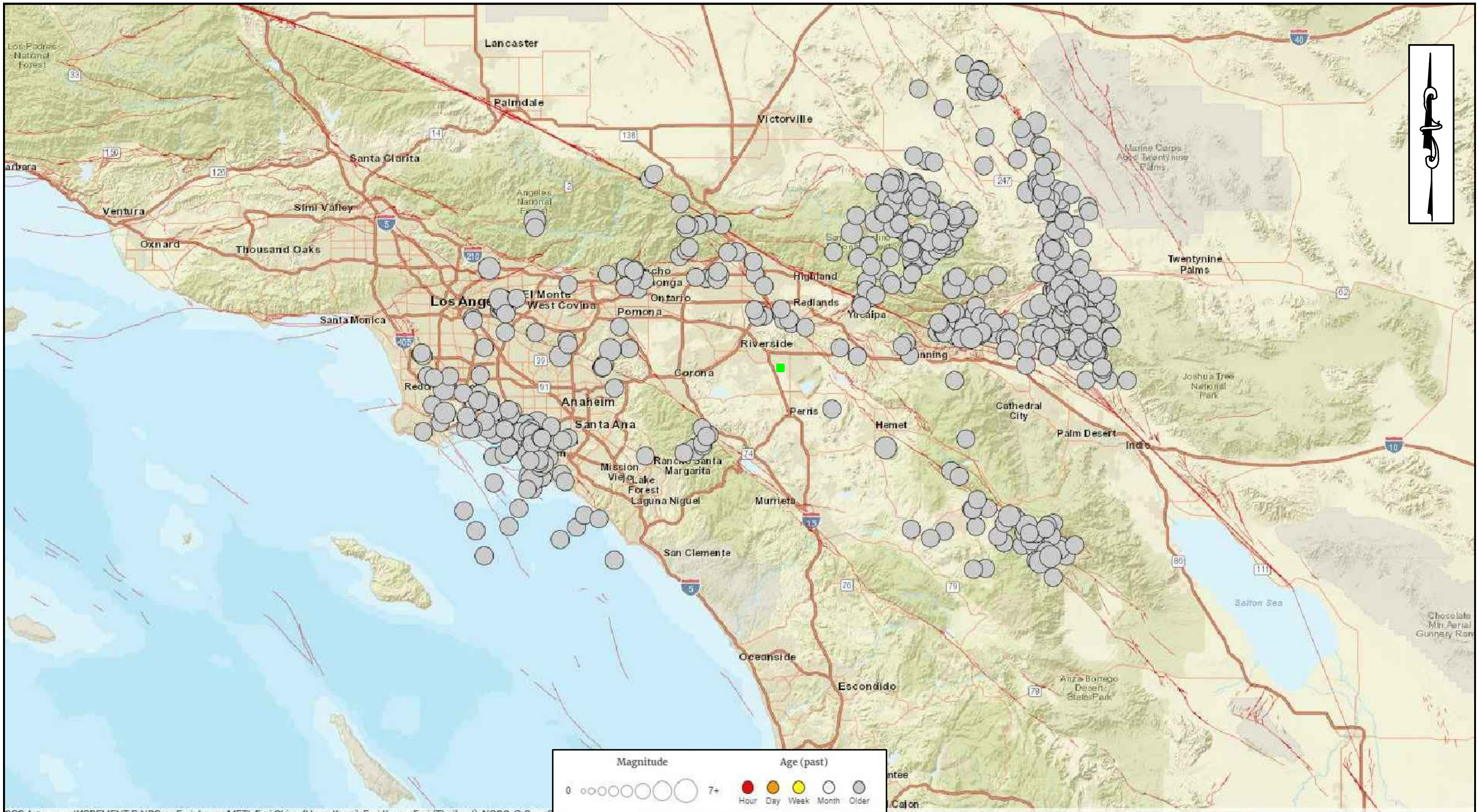
Description of Geologic Units

Qvof	**Very old alluvial fan deposits (early Pleistocene)**—Mostly well-dissected, well-indurated, reddish-brown sand deposits. Commonly contains duripans and locally silcretes. Forms large area in southeastern part of quadrangle in area of March Air Force Base, and numerous smaller areas in northern part of quadrangle. Derived chiefly from rocks of southern California batholith

REGIONAL GEOLOGIC MAP

(Morton and Cox, 2001)

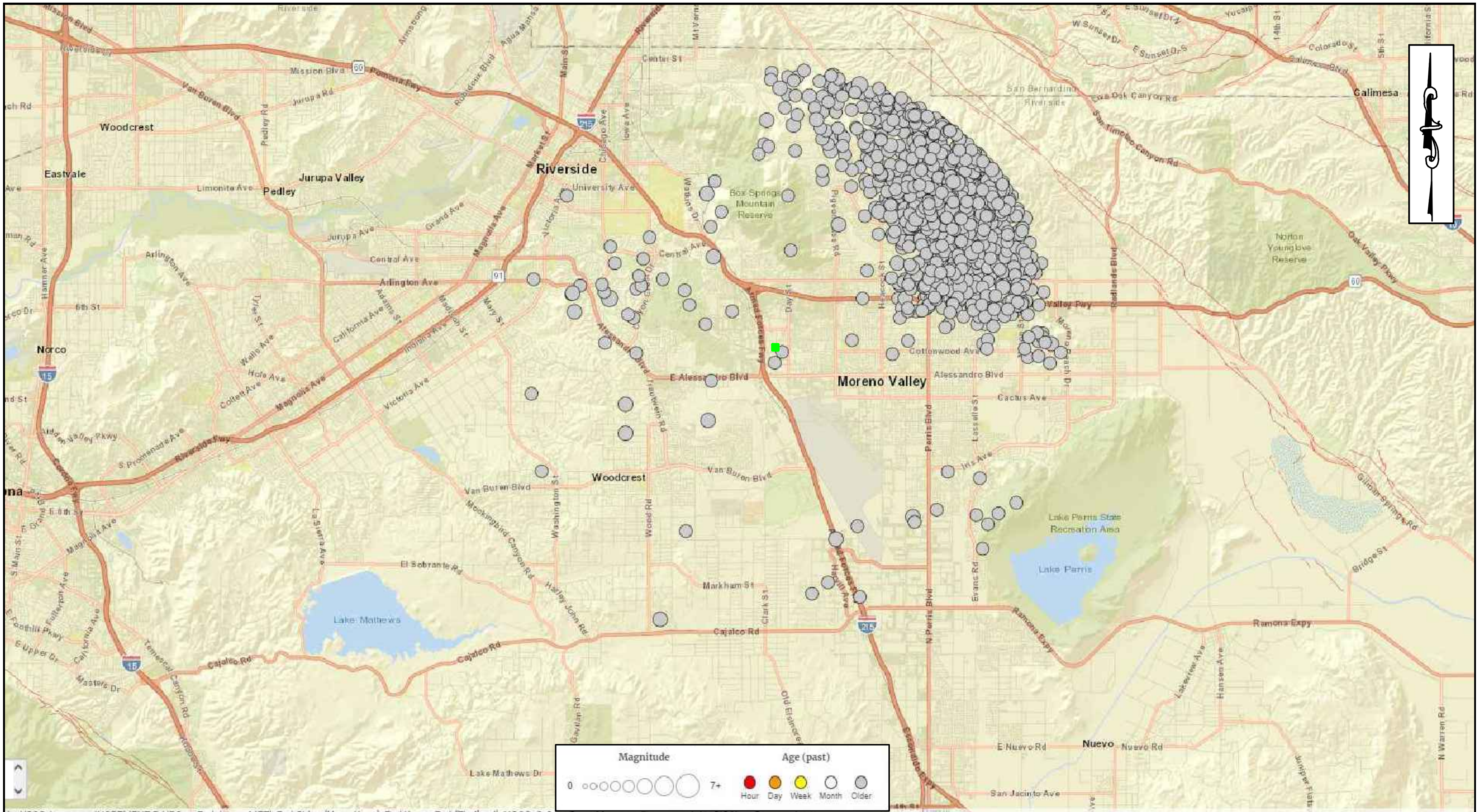
PROJECT: APNS 263-190-012, –014 THROUGH –019, AND –036, MORENO VALLEY, CALIFORNIA	**PROJECT NO:** 23756.1
CLIENT: COMPASS DANBE REAL ESTATE PARTNERS LLC	**ENCLOSURE:** A-4
LOR Geotechnical Group, Inc.	**DATE:** SEPTEMBER 2021
	SCALE: 1" ≈ 2,000'



U.S. Geologic Survey (2021) real-time earthquake epicenter map. Plotted are 535 epicenters of instrument-recorded events from 1932 to present (09/15/21) of local magnitude of M4.0 and greater within a radius of ~62 miles (100 kilometers) of the site. Location accuracy varies. The site is indicated by the green square. The selected magnitude corresponds to a threshold intensity value where very light damage potential begins. These evens are also generally widely felt by persons. Red lines mark the surface traces of known Quaternary-age faults.

HISTORICAL SEISMICITY MAP - 100km Radius

PROJECT:	APNS 263-190-012, –014 THROUGH –019, AND –036, MORENO VALLEY, CALIFORNIA	**PROJECT NO:**	23756.1
CLIENT:	COMPASS DANBE REAL ESTATE PARTNERS LLC	**ENCLOSURE:**	A-5
LOR Geotechnical Group, Inc.		**DATE:**	SEPTEMBER 2021
		SCALE:	1" ≈ 40km



U.S. Geologic Survey (2021) real-time earthquake epicenter map. Plotted are 1096 epicenters of instrument-recorded events from 1978 to present (09/15/21) of local magnitude of M1.0 and greater within a radius of ~6.2 miles (10 kilometers) of the site. Location accuracy varies. The site is indicated by the green square. The selected magnitude corresponds to a threshold intensity value where very light damage potential begins. These evens are also generally widely felt by persons. Red lines mark the surface traces of known Quaternary-age faults.

HISTORICAL SEISMICITY MAP - 10km Radius

PROJECT:	APNS 263-190-012, –014 THROUGH –019, AND –036, MORENO VALLEY, CALIFORNIA	**PROJECT NO:**	23756.1
CLIENT:	COMPASS DANBE REAL ESTATE PARTNERS LLC	**ENCLOSURE:**	A-6
LOR Geotechnical Group, Inc.		**DATE:**	SEPTEMBER 2021
		SCALE:	1" ≈ 6km

APPENDIX B

Field Investigation Program and Boring Logs

APPENDIX B
FIELD INVESTIGATION

Subsurface Exploration

Our subsurface exploration of the site consisted of drilling 5 exploratory borings to depths between approximately 21.5 and 51.5 feet below the existing ground surface using a Mobile B-61 drill rig on September 7, 2021. The approximate locations of the borings are shown on Enclosures A-2 and A-3 within Appendix A.

The drilling exploration was conducted using a Mobile B-61 drill rig equipped with 8-inch diameter hollow stem augers. The soils were continuously logged by a geologist from this firm who inspected the site, created detailed logs of the borings, obtained undisturbed, as well as disturbed, soil samples for evaluation and testing, and classified the soils by visual examination in accordance with the Unified Soil Classification System.

Relatively undisturbed samples of the subsoils were obtained at a maximum interval of 5 feet. The samples were recovered by using a California split barrel sampler of 2.50 inch inside diameter and 3.25 inch outside diameter or a Standard Penetration Sampler (SPT) from the ground surface to the total depth explored. The samplers were driven by a 140 pound automatic trip hammer dropped from a height of 30 inches. The number of hammer blows required to drive the sampler into the ground the final 12 inches were recorded and further converted to an equivalent SPT N-value. Factors such as efficiency of the automatic trip hammer used during this investigation (80%), borehole diameter (8"), and rod length at the test depth were considered for further computing of equivalent SPT N-values corrected for field procedures (N60) which are included in the boring logs, Enclosures B-1 through B-5.

The undisturbed soil samples were retained in brass sample rings of 2.42 inches in diameter and 1.00 inch in height, and placed in sealed plastic containers. Disturbed soil samples were obtained at selected levels within the borings and placed in sealed containers for transport to our geotechnical laboratory.

All samples obtained were taken to our geotechnical laboratory for storage and testing. Detailed logs of the borings are presented on the enclosed Boring Logs, Enclosures B-1 through B-5. A Boring Log Legend is presented on Enclosure B-i. A Soil Classification Chart is presented as Enclosure B-ii.

CONSISTENCY OF SOIL

SANDS

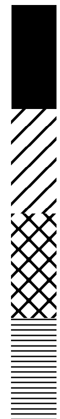
SPT BLOWS	CONSISTENCY
0-4	Very Loose
4-10	Loose
10-30	Medium Dense
30-50	Dense
Over 50	Very Dense

COHESIVE SOILS

SPT BLOWS	CONSISTENCY
0-2	Very Soft
2-4	Soft
4-8	Medium
8-15	Stiff
15-30	Very Stiff
30-60	Hard
Over 60	Very Hard

SAMPLE KEY

Symbol **Description**



INDICATES CALIFORNIA SPLIT SPOON SOIL SAMPLE

INDICATES BULK SAMPLE

INDICATES SAND CONE OR NUCLEAR DENSITY TEST

INDICATES STANDARD PENETRATION TEST (SPT) SOIL SAMPLE

TYPES OF LABORATORY TESTS

1	Atterberg Limits
2	Consolidation
3	Direct Shear (undisturbed or remolded)
4	Expansion Index
5	Hydrometer
6	Organic Content
7	Proctor (4", 6", or Cal216)
8	R-value
9	Sand Equivalent
10	Sieve Analysis
11	Soluble Sulfate Content
12	Swell
13	Wash 200 Sieve

BORING LOG LEGEND

PROJECT: PROPOSED INDUSTRIAL BUILDING, MORENO VALLEY, CALIFORNIA	PROJECT NO.: 23756.1
CLIENT: COMPASS DANBE REAL ESTATE PARTNERS, LLC	ENCLOSURE: B-i
LOR Geotechnical Group, Inc.	DATE: SEPTEMBER 2021

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO 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 (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

PARTICLE SIZE LIMITS

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

12" 3" 3/4" No. 4 No. 10 No. 40 200
(U.S. STANDARD SIEVE SIZE)

SOIL CLASSIFICATION CHART

PROJECT	PROPOSED INDUSTRIAL BUILDING, MORENO VALLEY, CALIFORNIA	PROJECT NO.	23756.1
CLIENT:	COMPASS DANBE REAL ESTATE PARTNERS, LLC	ENCLOSURE:	B-ii
LOR Geotechnical Group, Inc.		DATE:	SEPTEMBER 2021

LOG OF BORING B-1

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0								SM	@ 0 feet, FILL: **SILTY SAND, trace gravel to 3/4", approximately 10% coarse grained sand, 30% medium grained sand, 40% fine grained sand, 20% silty fines, brown, dry.**
	14		6.9		118.4				@ 2 feet, ALLUVIUM: **SILTY SAND, approximately 10% coarse grained sand, 25% medium grained sand, 35% fine grained sand, 30% silty fines with trace of clay, brown, damp, trace pinhole porosity.**
5	15		5.3		112.5				@ 5 feet, trace root hairs, trace pinhole porosity remains.
	43		11.6		120.7				@ 7 feet, OLDER ALLUVIUM: **SILTY SAND, approximately 20% coarse grained sand, 25% medium grained sand, 30% fine grained sand, 25% silty fines with trace of clay, red brown, damp to moist, micaceous.**
10	60		9.9		126.0				@ 10 feet, slightly coarser grained.
15	51		12.4		120.7				
						∇			@ 18 feet, groundwater.
20	85		10.5		122.1				
25	47		10.8		123.5				@ 25 feet, **SILTY SAND, approximately 15% coarse grained sand, 20% medium grained sand, 40% fine grained sand, 25% silty fines with trace of clay, red, moist, micaceous.**
30									

END OF BORING @ 26.5'

Fill to 2'
Groundwater @ 18'
No bedrock

PROJECT:	**Proposed Industrial Building**	PROJECT NUMBER:	**23756.1**
CLIENT:	**Compass Danbe Real Estate Partners, LLC**	ELEVATION:	**1532**
		DATE DRILLED:	**September 7, 2021**
LOR GEOTECHNICAL GROUP INC.		EQUIPMENT:	**Mobile B-61**
		HOLE DIA.: **8"**	ENCLOSURE: **B-1**

LOG OF BORING B-2

TEST DATA

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.
0	22	3, 4, 7 8, 9, 10 11	9.2		124.3			SM
5	19		9.0		125.7			SC
	75 for 11"		9.9		121.7			SM
10	83 for 10"		10.2		121.8			
15	62		10.6		122.6			
20	61		11.6					
25	52		12.2					
30	57		15.5					
35	71		14.2					
40	90		14.3					SW SM
45	84		15.1					
50	64		14.3					SM
55								

DESCRIPTION

@ 0 feet, FILL: SILTY SAND, approximately 5% gravel to 3/4", 15% coarse grained sand, 15% medium grained sand, 25% fine grained sand, 40% silty fines, light brown, dry, loose.

@ 2 feet, some asphalt concrete (AC) grindings, damp.

@ 3 feet, OLDER ALLUVIUM: SILTY SAND, approximately 10% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 30% silty fines with trace of clay, red brown, damp.

@ 5 feet, CLAYEY SAND, approximately 5% coarse grained sand, 25% medium grained sand, 30% fine grained sand, 40% clayey fines of low plasticity, red brown, damp.

@ 7 feet, SILTY SAND, approximately 20% coarse grained sand, 25% medium grained sand, 35% fine grained sand, 20% silty fines with trace of clay, red brown, moist, slightly micaceous.

@ 10 feet, becomes slightly coarser grained, yellow brown.

@ 15 feet, SILTY SAND, approximately 15% coarse grained sand, 25% medium grained sand, 35% fine grained sand, 25% silty fines with trace of clay, red brown, moist, micaceous.

@ 20 feet, becomes slightly finer grained.

@ 34 feet, groundwater.

@ 35 feet, SILTY SAND, approximately 15% coarse grained sand, 30% medium grained sand, 35% fine grained sand, 20% silty fines, strong brown, moist, micaceous.

@ 40 feet, WELL GRADED SAND WITH SILT, approximately 25% coarse grained sand, 30% medium grained sand, 35% fine grained sand, 10% silty fines, brown, wet.

@ 50 feet, SILTY SAND, approximately 15% coarse grained sand, 25% medium grained sand, 35% fine grained sand, 25% silty fines, red brown, moist, micaceous.

END OF BORING @ 51.5'

Fill to 3'
Groundwater @ 34'
No bedrock

PROJECT:	**Proposed Industrial Building**	PROJECT NUMBER:	**23756.1**
CLIENT:	**Compass Danbe Real Estate Partners, LLC**	ELEVATION:	**1535**
		DATE DRILLED:	**September 7, 2021**
		EQUIPMENT:	**Mobile B-61**
		HOLE DIA.: **8"**	ENCLOSURE: **B-2**

LOR GEOTECHNICAL GROUP INC.

LOG OF BORING B-3

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0		9, 10 11						SM	@ 0 feet, FILL: SILTY SAND, approximately 5% gravel to 3/4", 15% coarse grained sand, 25% medium grained sand, 30% fine grained sand, 25% silty fines with trace of clay, red brown, dry, loose.
	56 for 11"		11.1		110.6				@ 1 foot, OLDER ALLUVIUM: SILTY SAND, approximately 5% gravel to 3/4", 25% coarse grained sand, 25% medium grained sand, 30% fine grained sand, 15% silty fines, yellow brown, moist.
5	56 for 11"		12.4		111.6				@ 5 feet, becomes red brown, slightly micaceous.
10	71		8.7		125.2				@ 10 feet, SILTY SAND, approximately 10% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 30% silty fines with trace of clay, red brown, damp, micaceous.
15	59		11.0		125.3				@ 15 feet, increase in moisture.
						∇			@ 19 feet, groundwater.
20	63		11.2		121.2				
									END OF BORING @ 21.5' Fill to 1' Groundwater @ 19' No bedrock

PROJECT:	Proposed Industrial Building	PROJECT NUMBER:	23756.1
CLIENT:	Compass Danbe Real Estate Partners, LLC	ELEVATION:	1538
LOR GEOTECHNICAL GROUP INC.		DATE DRILLED:	September 7, 2021
		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	ENCLOSURE: B-3

LOG OF BORING B-4

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0								SM	@ 0 feet, FILL: **SILTY SAND, approximately 15% coarse grained sand, 25% medium grained sand, 35% fine grained sand, 25% silty fines with trace of clay, red brown, dry, loose.** **@ 1 foot, some concrete debris present to 4' (no sample driven at 2').**
									@ 4 feet, OLDER ALLUVIUM: **SILTY SAND, approximately 10% coarse grained sand, 30% medium grained sand, 40% fine grained sand, 20% silty fines, red brown, moist.**
5	62		10.1		114.7				
10	72		8.2		125.0				**@ 10 feet, SILTY SAND, approximately 15% coarse grained sand, 30% medium grained sand, 40% fine grained sand, 15% silty fines, strong brown, damp, micaceous.**
15	74		12.2		123.3				**@ 15 feet, becomes moist.**
20	65		13.8		118.8				

END OF BORING @ 21.5'

Fill to 4'
No groundwater
No bedrock

PROJECT:	**Proposed Industrial Building**	PROJECT NUMBER:	**23756.1**
CLIENT:	**Compass Danbe Real Estate Partners, LLC**	ELEVATION:	**1536**
		DATE DRILLED:	**September 7, 2021**
		EQUIPMENT:	**Mobile B-61**
		HOLE DIA.: **8"**	ENCLOSURE: **B-4**

LOR GEOTECHNICAL GROUP INC.

LOG OF BORING B-5

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	U.S.C.S.	DESCRIPTION
0		9, 10 11				SM	@ 0 feet, FILL: **SILTY SAND with GRAVEL, approximately 15% gravel to 1", 10% coarse grained sand, 20% medium grained sand, 25% fine grained sand, 30% silty fines, brown, dry, loose.**
	27		4.2		119.1		**@ 1 foot, some debris (plastic).**
5	29		8.2		125.1		@ 5 feet, OLDER ALLUVIUM: **SILTY SAND, approximately 5% coarse grained sand, 15% medium grained sand, 45% fine grained sand, 35% silty fines with trace of clay, brown, damp, trace pinhole porosity, some thin calcite stringers.**
10	78		9.6		125.4		**@ 10 feet, SILTY SAND, approximately 5% coarse grained sand, 25% medium grained sand, 40% fine grained sand, 30% silty fines with trace of clay, red brown, damp, micaceous.**
15	62		10.9		124.8		
							@ 18 feet, groundwater.
20	60		10.9		122.0		

END OF BORING @ 21.5'

Fill to 5'
Groundwater @ 18'
No bedrock

PROJECT:	**Proposed Industrial Building**	PROJECT NUMBER:	**23756.1**
CLIENT:	**Compass Danbe Real Estate Partners, LLC**	ELEVATION:	**1531**
		DATE DRILLED:	**September 7, 2021**
		EQUIPMENT:	**Mobile B-61**
		HOLE DIA.: **8"**	ENCLOSURE: **B-5**

LOR GEOTECHNICAL GROUP INC.

APPENDIX C

Laboratory Testing Program and Test Results

APPENDIX C
LABORATORY TESTING

General

Selected soil samples obtained from the borings were tested in our geotechnical laboratory to evaluate the physical properties of the soils affecting foundation design and construction procedures. The laboratory testing program performed in conjunction with our investigation included moisture content, dry density, laboratory compaction characteristics, direct shear, sieve analysis, sand equivalent, R-value, expansion index, and soluble sulfate content. Descriptions of the laboratory tests are presented in the following paragraphs:

Moisture Density Tests

The moisture content and dry density information provides an indirect measure of soil consistency for each stratum, and can also provide a correlation between soils on this site. The dry unit weight and field moisture content were determined for selected undisturbed samples, in accordance with ASTM D 2921 and ASTM D 2216, respectively, and the results are shown on the boring logs, Enclosures B-1 through B-9 for convenient correlation with the soil profile.

Laboratory Compaction

A selected soil sample was tested in the laboratory to determine compaction characteristics using the ASTM D 1557 compaction test method. The results are presented in the following table:

LABORATORY COMPACTION

Boring Number	Sample Depth (feet)	Soil Description (U.S.C.S.)	Maximum Dry Density (pcf)	Optimum Moisture Content (percent)
B-2	0-3	(SM) Silty Sand	136.5	6.5

Direct Shear Test

Shear tests are performed in general accordance with ASTM D 3080 with a direct shear machine at a constant rate-of-strain (0.04 inches/minute). The machine is designed to test a sample partially extruded from a sample ring in single shear. Samples are tested at varying normal loads in order to evaluate the shear strength parameters, angle of internal friction and cohesion. Samples are tested in remolded condition (90 percent relative compaction per ASTM D 1557) and soaked, to represent the worse case conditions expected in the field.

The results of the shear test on a selected soil sample is presented in the following table:

DIRECT SHEAR TEST				
Boring Number	**Sample Depth (feet)**	**Soil Description (U.S.C.S.)**	**Apparent Cohesion (psf)**	**Angle of Internal Friction (degrees)**
B-2	0-3	(SM) Silty Sand	500	22

Sieve Analysis

A quantitative determination of the grain size distribution was performed for selected samples in accordance with the ASTM D 422 laboratory test procedure. The determination is performed by passing the soil through a series of sieves, and recording the weights of retained particles on each screen. The results of the grain size distribution analyses are presented graphically on Enclosure C-1.

Sand Equivalent

The sand equivalent of selected soils were evaluated using the California Sand Equivalent Test Method, Caltrans Number 217. The results of the sand equivalent tests are presented with the grain size distribution analyses on Enclosure C-1.

R-Value Test

A soil sample was obtained at probable pavement subgrade level, and was tested to determine its R-value using the California R-Value Test Method, Caltrans Number 301. The results of the R-value test is presented on Enclosure C-1.

Expansion Index Test

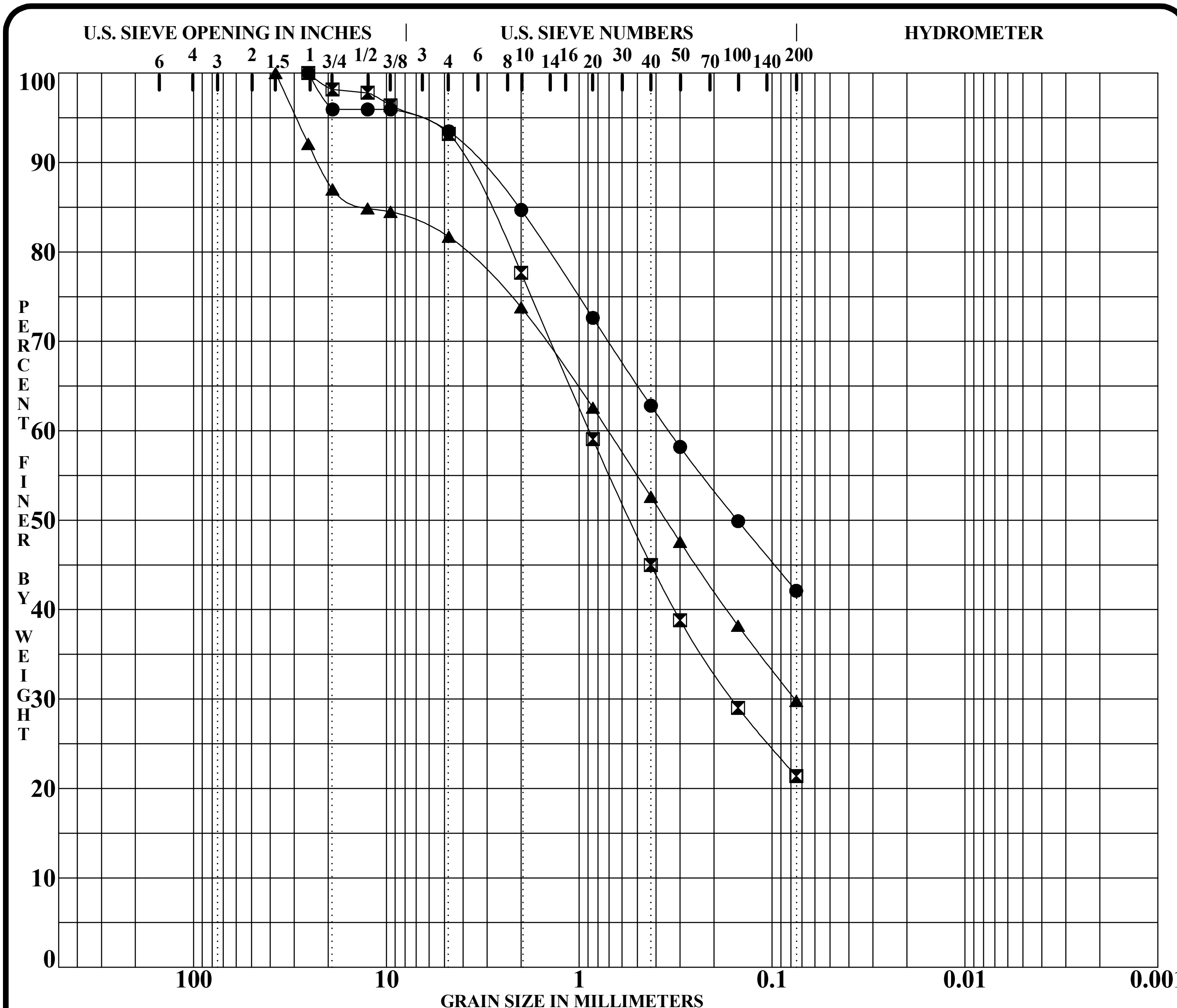
Remolded samples are tested to determine their expansion potential in accordance with the Expansion Index (EI) test. The test is performed in accordance with the Uniform Building Code Standard 18-2. The test result for a select soil sample is presented in the following table:

EXPANSION INDEX TEST				
Boring Number	**Sample Depth (feet)**	**Soil Description (U.S.C.S.)**	**Expansion Index (EI)**	**Expansion Potential**
B-2	0-3	(SM) Silty Sand	9	Very Low
Expansion Index:	0-20 Very low	21-50 Low	51-90 Medium	91-130 High

Soluble Sulfate Content Test

The soluble sulfate content of a selected subgrade soil was evaluated. The concentration of soluble sulfates in the soil was determined by measuring the optical density of a barium sulfate precipitate. The precipitate results from a reaction of barium chloride with water extractions from the soil sample. The measured optical density is correlated with readings on precipitates of known sulfate concentrations. The test result is presented in the following table:

SOLUBLE SULFATE CONTENT TEST			
Boring Number	**Sample Depth (feet)**	**Soil Description (U.S.C.S.)**	**Sulfate Content (% by weight)**
B-2	0-3	(SM) Silty Sand	< 0.005
B-3	0-3	(SM) Silty Sand	< 0.005
B-5	0-3	(SM) Silty Sand	0.015



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Soil Classification	SE	RV	PL	PI	Cc	Cu
●	*B-2*	*@ 0-3'*	*(SM) Silty Sand*	*15*	*39*				
⧗	*B-3*	*@ 0-3'*	*(SM) Silty Sand*	*28*	*--*				
▲	*B-5*	*@ 0-3'*	*(SM) Silty Sand with Gravel*	*18*	*--*				

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	*B-2*	*@ 0-3'*	*25.40*	*0.34*			*6.5*	*51.4*	*42.1*	
⧗	*B-3*	*@ 0-3'*	*25.40*	*0.89*	*0.161*		*6.8*	*71.8*	*21.4*	
▲	*B-5*	*@ 0-3'*	*37.50*	*0.71*	*0.076*		*18.3*	*51.9*	*29.8*	

PROJECT: *Proposed Industrial Building*

PROJECT NO.: *23756.1*
DATE: *9/17/21*

GRADATION CURVES
LOR Geotechnical Group, Inc.
Riverside, CA 92507

ENCLOSURE C-1

APPENDIX D

Seismic Design Spectra

Project: Old 215 Industrial Development, Moreno Valley, California
Project Number: 23756.1
Client: Compass Danbe Real Estate Partners LP
Site Lat/Long: 33.92270 / -117.28452
Controlling Seismic Source: San Jacinto

REFERENCE	NOTATION	VALUE	REFERENCE	NOTATION	VALUE
Site Class	C, D, D default, or E	D measured	Fv (Table 11.4-2)[Used for General Spectrum]	F_v	1.7
Site Class D - Table 11.4-1	F_a	1.0	Design Maps	S_s	1.500
Site Class D - 21.3(ii)	F_v	2.5	Design Maps	S_1	0.600
0.2*(S_{D1}/S_{DS})	T_0	0.136	Equation 11.4-1 - F_A*S_S	S_{MS}	1.500*
S_{D1}/S_{DS}	T_S	0.680	Equation 11.4-3 - 2/3*S_{MS}	S_{DS}	1.00*
Fundamental Period (12.8.2)	T	Period	Design Maps	PGA	0.574
Seismic Design Maps or Fig 22-14	T_L	8	Table 11.8-1	F_{PGA}	1.1
Equation 11.4-4 - 2/3*S_{M1}	S_{D1}	0.680*	Equation 11.8-1 - F_{PGA}*PGA	PGA_M	0.631*
Equation 11.4-2 - F_V*S_1	S_{M1}	1.020*	Section 21.5.3	80% of PGA_M	0.505
			Design Maps	C_{RS}	0.932
			Design Maps	C_{R1}	9.08

RISK COEFFICIENT

Cr - At Perods <=0.2, Cr=C_{RS}	C_{RS}	0.932	Cr - At Periods between 0.2 and 1.0	Period	Cr
Cr - At Periods >=1.0, Cr=C_{R1}	C_{R1}	9.08	use trendline formula to complete	0.200	0.932
				0.300	1.951
				0.400	2.969
				0.500	3.988
				0.600	5.006
				0.680	5.821
				1.000	9.08

* **Code based design value.** See accompanying data for Site Specific Design values.

Mapped values from https://seismicmaps.org/

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PROBABILISTIC SPECTRA[1]
2% in 50 year Exceedence

Project No: 23756.1

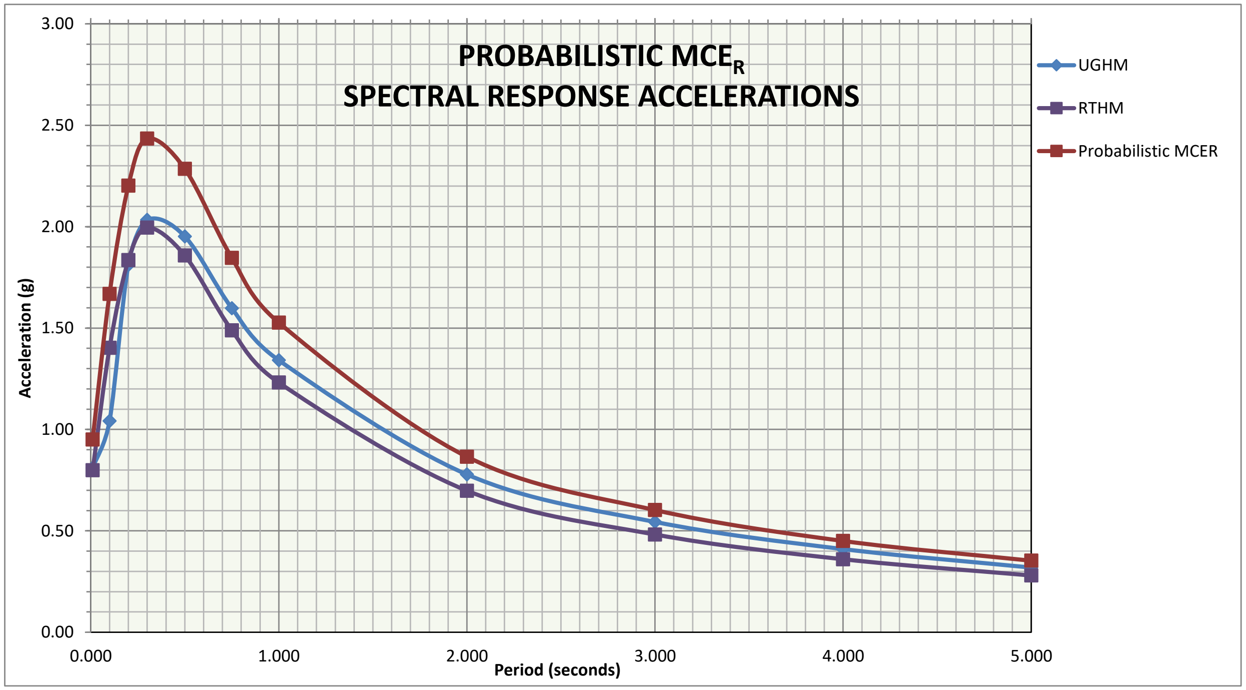
Period	UGHM	RTHM	Max Directional Scale Factor[2]	Probabilistic MCE
0.010	0.810	0.799	1.19	0.951
0.100	1.042	1.402	1.19	1.668
0.200	1.811	1.835	1.20	2.202
0.300	2.033	1.995	1.22	2.434
0.500	1.952	1.858	1.23	2.285
0.750	1.598	1.489	1.24	1.846
1.000	1.341	1.231	1.24	1.526
2.000	0.778	0.698	1.24	0.866
3.000	0.544	0.482	1.25	0.603
4.000	0.410	0.360	1.25	0.450
5.000	0.319	0.280	1.26	0.353

Probabilistic PGA: 0.810

Is Probabilistic $Sa_{(max)}<1.2F_a$? NO

[1] Data Sources:
https://earthquake.usgs.gov/hazards/interactive/
https://earthquake.usgs.gov/designmaps/rtgm/

[2] Shahi-Baker RotD100/RotD50 Factors (2014)



DETERMINISTIC SPECTRUM

Largest Amplitudes of Ground Motions Considering All Sources Calculated using Weighted Mean of Attenuation Equations[1]

Controlling Source: San Jacinto

Is Probabilistic $Sa_{(max)}$<1.2Fa? NO

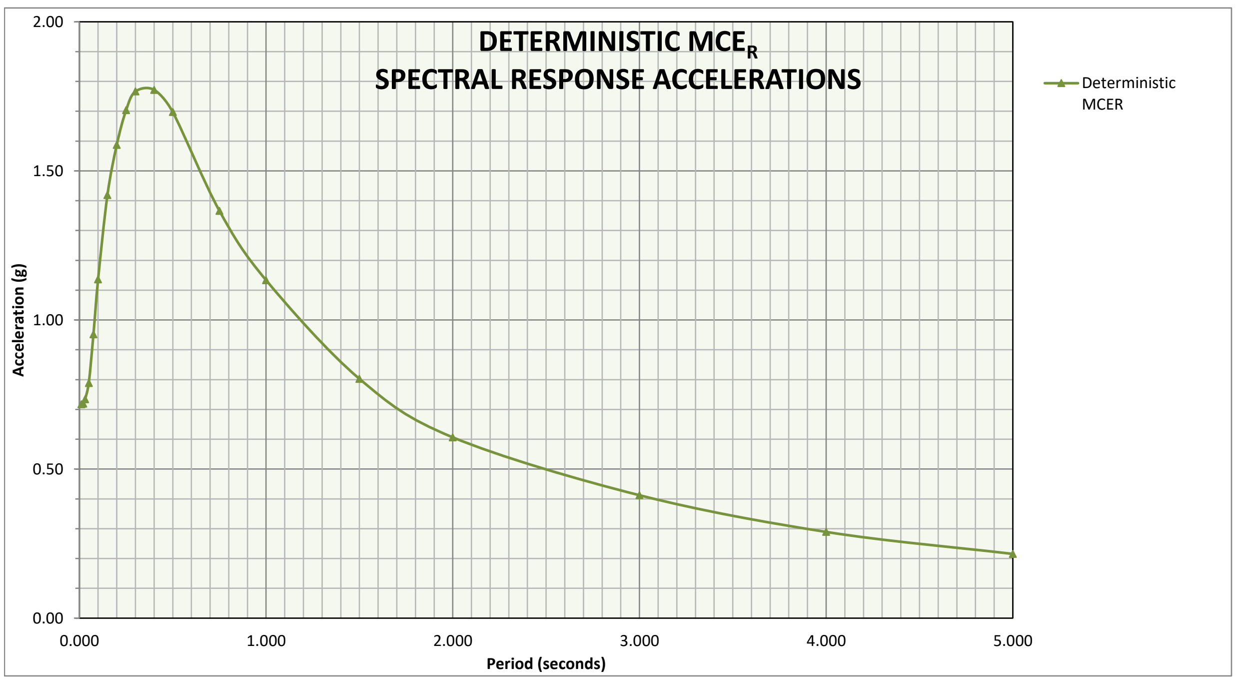
Project No: 23756.1

Period	Deterministic PSa Median + 1.σ for 5% Damping	Max Directional Scale Factor[2]	Deterministic MCE	Section 21.2.2 Scaling Factor Applied
0.010	0.603	1.19	0.717	0.717
0.020	0.605	1.19	0.720	0.720
0.030	0.617	1.19	0.734	0.734
0.050	0.663	1.19	0.788	0.788
0.075	0.800	1.19	0.952	0.952
0.100	0.955	1.19	1.136	1.136
0.150	1.182	1.20	1.419	1.419
0.200	1.323	1.20	1.587	1.587
0.250	1.408	1.21	1.704	1.704
0.300	1.448	1.22	1.766	1.766
0.400	1.441	1.23	1.772	1.772
0.500	1.380	1.23	1.697	1.697
0.750	1.102	1.24	1.366	1.366
1.000	0.914	1.24	1.133	1.133
1.500	0.647	1.24	0.802	0.802
2.000	0.489	1.24	0.606	0.606
3.000	0.330	1.25	0.412	0.412
4.000	0.231	1.25	0.289	0.289
5.000	0.171	1.26	0.215	0.215

Is Determinstic $Sa_{(max)}$<1.5*Fa?	NO
Section 21.2.2 Scaling Factor:	N/A
Deterministic PGA:	0.603
Is Deterministic PGA >=F_{PGA}*0.5?	YES

[1] NGAWest 2 GMPE worksheet and Uniform California Earthquake Rupture Forecast, Version 3 (UCERF3) - Time Dependent Model

[2] Shahi-Baker RotD100/RotD50 Factors (2014)



SITE SPECIFIC SPECTRA

Period	Probabilistic MCE	Deterministic MCE	Site-Specific MCE	Design Response Spectrum (Sa)
0.010	0.951	0.717	0.717	0.478
0.100	1.668	1.136	1.136	0.758
0.200	2.202	1.587	1.587	1.058
0.300	2.434	1.766	1.766	1.178
0.500	2.285	1.697	1.697	1.131
0.750	1.846	1.366	1.366	0.911
1.000	1.526	1.133	1.133	0.756
2.000	0.866	0.606	0.606	0.404
3.000	0.603	0.412	0.412	0.275
4.000	0.450	0.289	0.289	0.193
5.000	0.353	0.215	0.215	0.144

Period	ASCE 7 SECTION 11.4.6 General Spectrum	80% General Response Spectrum
0.005	0.422	0.338
0.010	0.444	0.355
0.020	0.488	0.391
0.030	0.532	0.426
0.050	0.621	0.496
0.060	0.665	0.532
0.075	0.731	0.585
0.090	0.797	0.638
0.100	0.841	0.673
0.110	0.885	0.708
0.120	0.929	0.744
0.136	1.000	0.800
0.150	1.000	0.800
0.160	1.000	0.800
0.170	1.000	0.800
0.180	1.000	0.800
0.200	1.000	0.800
0.250	1.000	0.800
0.300	1.000	0.800
0.400	1.000	0.800
0.500	1.000	0.800
0.600	1.000	0.800
0.640	1.000	0.800
0.750	0.907	0.725
0.850	0.800	0.640
0.900	0.756	0.604
0.950	0.716	0.573
1.000	0.680	0.544
1.500	0.453	0.363
2.000	0.340	0.272
3.000	0.227	0.181
4.000	0.170	0.136
5.000	0.136	0.109

ASCE 7-16: Section 21.4

Site Specific

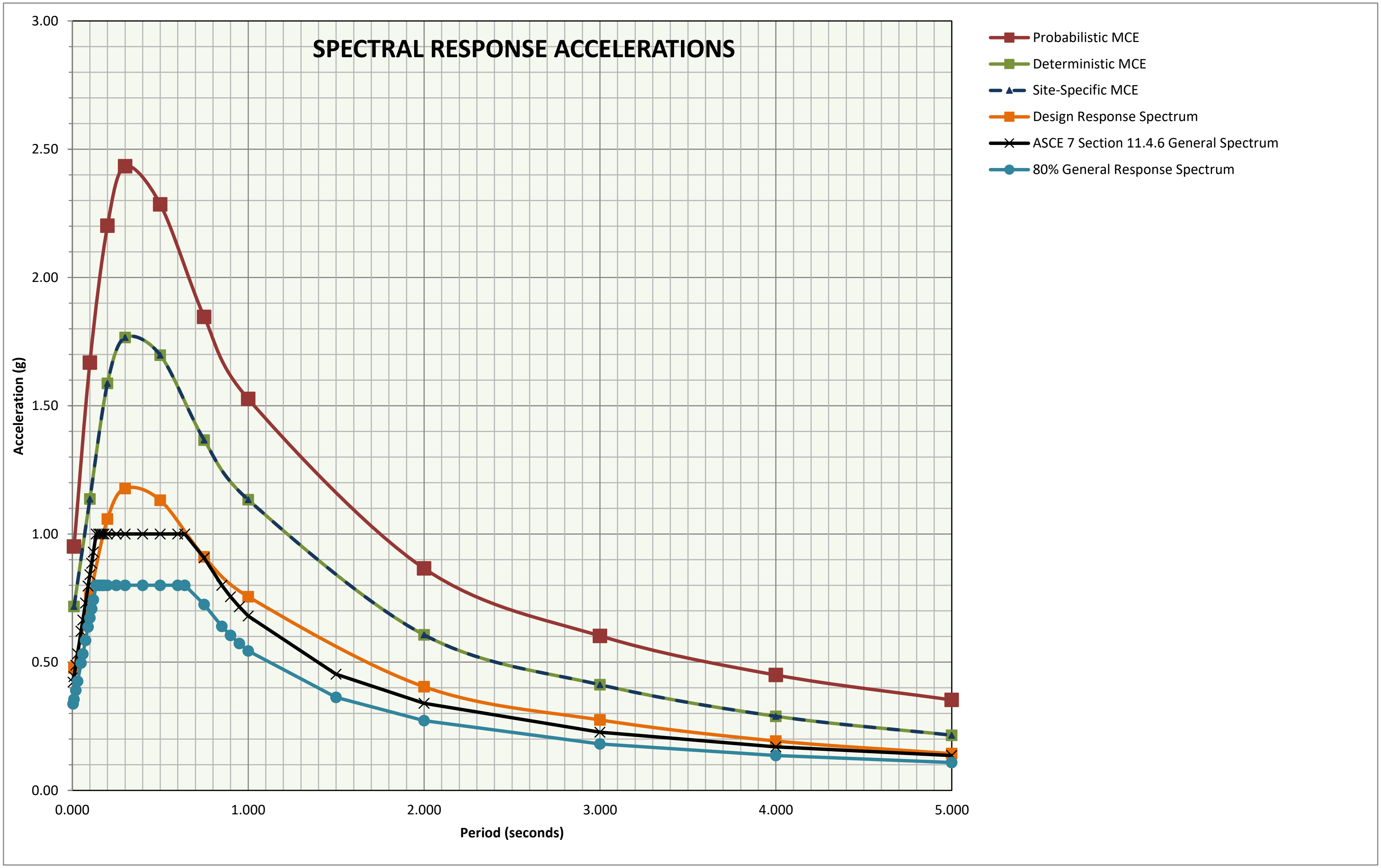
	Calculated Value	**Design Value**
SDS:	1.060	1.060
SD1:	0.824	0.824
SMS:	1.590	1.590
SM1:	1.237	1.237
Site Specific PGAm:	0.603	0.603
Site Class:	D measured	

Seismic Design Category - Short* D

Seismic Design Category - 1s* D

* Risk Categories I, II, or III

Project No: 23756.1



Project No: 23756.1

LOR GEOTECHNICAL GROUP, INC.

APPENDIX E

Infiltration Test Results

BOREHOLE METHOD PERCOLATION TEST RESULTS

Project:	Old 215, Moreno Valley	Test Date:	September 8, 2021
Project No.:	23756.1	Test Hole No.:	P-1
Soil Classificaiton:	(SM) Silty sand	Test Hole Diameter:	8.0 in.
Depth of Test Hole:	7.0 ft.	Date Excavated:	September 7, 2021
Tested By:	A.L.		

READING	TIME START	TIME STOP	TIME INTERVAL		TOTAL TIME	INITIAL WATER LEVEL	FINAL WATER LEVEL	INITIAL HOLE DEPTH	FINAL HOLE DEPTH	CHANGE IN WATER LEVEL	AVERAGE WETTED DEPTH	PERCOLATION RATE
			min	hr.	hr.	in.	in.	in.	in.	in.	in.	in/hr
1	9:10 AM	9:40 AM	30	0.50	0.50	23.00	23.50	84.00	84.00	0.50	60.75	1.0
2	9:40 AM	10:10 AM	30	0.50	1.00	23.50	23.50	84.00	84.00	0.00	60.50	0.0
3	10:10 AM	10:40 AM	30	0.50	1.50	23.50	24.00	84.00	84.00	0.50	60.25	1.0
4	10:40 AM	11:10 AM	30	0.50	2.00	24.00	24.50	84.00	84.00	0.50	59.75	1.0
5	11:10 AM	11:40 AM	30	0.50	2.50	24.50	25.00	84.00	84.00	0.50	59.25	1.0
6	11:40 AM	12:10 PM	30	0.50	3.00	25.00	25.50	84.00	84.00	0.50	58.75	1.0
7	12:10 PM	12:40 PM	30	0.50	3.50	25.50	26.00	84.00	84.00	0.50	58.25	1.0
8	12:40 PM	1:10 PM	30	0.50	4.00	26.00	26.50	84.00	84.00	0.50	57.75	1.0
9	1:10 PM	1:40 PM	30	0.50	4.50	26.50	27.00	84.00	84.00	0.50	57.25	1.0
10	1:40 PM	2:10 PM	30	0.50	5.00	27.00	27.50	84.00	84.00	0.50	56.75	1.0
11	2:10 PM	2:40 PM	30	0.50	5.50	27.50	28.00	84.00	84.00	0.50	56.25	1.0
12	2:40 PM	3:10 PM	30	0.50	6.00	28.00	28.50	84.00	84.00	0.50	55.75	1.0

PERCOLATION RATE CONVERSION (Porchet Method):

H_O	56.00	
H_f	55.50	
ΔH	0.50	
H_{avg}	55.75	
I_t	**0.03**	in/hr (clear water rate)

BOREHOLE METHOD PERCOLATION TEST RESULTS

Project:	Old 215, Moreno Valley	Test Date:	September 8, 2021
Project No.:	23756.1	Test Hole No.:	P-2
Soil Classificaiton:	(SM) Silty sand	Test Hole Diameter:	8.0 in.
Depth of Test Hole:	7.0 ft.	Date Excavated:	September 7, 2021
Tested By:	A.L.		

READING	TIME START	TIME STOP	TIME INTERVAL		TOTAL TIME	INITIAL WATER LEVEL	FINAL WATER LEVEL	INITIAL HOLE DEPTH	FINAL HOLE DEPTH	CHANGE IN WATER LEVEL	AVERAGE WETTED DEPTH	PERCOLATION RATE
			min	hr.	hr.	in.	in.	in.	in.	in.	in.	in/hr
1	9:12 AM	9:42 AM	30	0.50	0.50	38.00	38.50	84.00	84.00	0.50	45.75	1.0
2	9:42 AM	10:12 AM	30	0.50	1.00	38.50	38.50	84.00	84.00	0.00	45.50	0.0
3	10:12 AM	10:42 AM	30	0.50	1.50	38.50	39.00	84.00	84.00	0.50	45.25	1.0
4	10:42 AM	11:12 AM	30	0.50	2.00	39.00	40.00	84.00	84.00	1.00	44.50	2.0
5	11:12 AM	11:42 AM	30	0.50	2.50	40.00	41.00	84.00	84.00	1.00	43.50	2.0
6	11:42 AM	12:12 PM	30	0.50	3.00	41.00	41.50	84.00	84.00	0.50	42.75	1.0
7	12:12 PM	12:42 PM	30	0.50	3.50	41.50	42.00	84.00	84.00	0.50	42.25	1.0
8	12:42 PM	1:12 PM	30	0.50	4.00	42.00	42.50	84.00	84.00	0.50	41.75	1.0
9	1:12 PM	1:42 PM	30	0.50	4.50	42.50	43.00	84.00	84.00	0.50	41.25	1.0
10	1:42 PM	2:12 PM	30	0.50	5.00	43.00	43.50	84.00	84.00	0.50	40.75	1.0
11	2:12 PM	2:42 PM	30	0.50	5.50	43.50	44.00	84.00	84.00	0.50	40.25	1.0
12	2:42 PM	3:12 PM	30	0.50	6.00	44.00	44.50	84.00	84.00	0.50	39.75	1.0

PERCOLATION RATE CONVERSION (Porchet Method):

H_O	40.00	
H_f	39.50	
ΔH	0.50	
H_{avg}	39.75	
I_t	**0.05**	in/hr (clear water rate)