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Consulting Engineers and Scientists

425 ROLAND WAY
OAKLAND, CALIFORNIA 94621
510-568-4001
FAX: 510-568-2205

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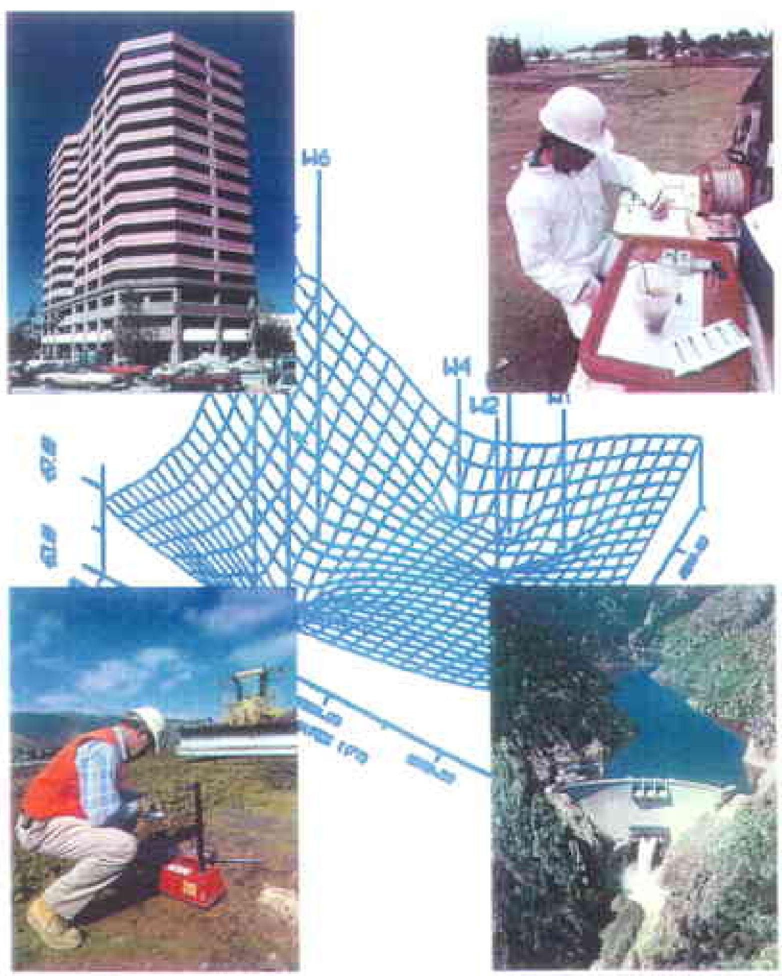

Geotechnical Investigation

Andante Emeryville Mixed-Use Development
Emeryville, California
Harza Project No.: 17752-CA

December 6, 2000

Prepared for:

SNK Development
185 Berry Street
San Francisco, CA 94107

Prepared by:

Harza Engineering Company, Inc.
425 Roland Way
Oakland, CA 95621

REGISTERED PROFESSIONAL ENGINEER
RONALD L. BAJUNIEMI
No. 112
Exp. 12-31-01
GEOTECHNICAL
STATE OF CALIFORNIA

Leonard J. Sansone, P.E.
Project Engineer

Ronald L. Bajuniemi, P.E., G.E.
Chief Geotechnical Engineer

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1.0 INTRODUCTION

This report presents the results of our geotechnical investigation for the proposed Andante Emeryville Mixed-Use Development. The proposed Andante Emeryville Mixed-Use Development will be located south of 40th Street between San Pablo Avenue and Adeline Street in Emeryville, California, as shown on the Site Location Map, Figure 1. The purpose of our investigation was to evaluate the foundation soils and provide recommendations concerning the geotechnical engineering aspects of the project.

The locations of the various building structures and site features proposed for the mixed-use development are shown on the Site Plan, Figure 2. Based on the information indicated on the Site Plan, as well as on our conversations with Mr. Randy Harris of HDO Architects and Planners, it is our understanding that the development will consist of a 4-story office building, two 4-story residential buildings, two mixed-use commercial/ residential buildings, and a 4 ½-level parking garage structure. The two mixed-use buildings will contain retail shops, a fitness center, and a restaurant at grade and four stories of residential space above grade. A public paseo will be located between the two mixed-use buildings at the ground level and a series of pedestrian bridges and walkways will connect the mixed-use buildings on the residential levels above grade. The bottom level of the garage will be located approximately 6 feet below grade. Underground utilities also are proposed and areas containing asphalt concrete drive aisles may also be developed. Minor grading of the site will be required to develop the site for the subject project.

Based on our discussion with Mr. Greg Mason of LS Mason and Associates, the project structural engineer for the office and residential buildings, the maximum anticipated interior column and perimeter wall dead plus live loads for the 4-story residential buildings will be 35 kips and 3 kips per lineal foot, respectively. For the 4-story office building, the maximum anticipated dead plus live column loads will be 120 kips. Based on our discussion with Walid Naja of FBA Consulting Engineers, the project structural engineer for the garage and mixed-use buildings, the maximum anticipated building dead plus live column loads will be about 250 kips for the mixed-use residential buildings and parking garage structure.

2.0 SCOPE OF WORK

The scope of work of this investigation included a site reconnaissance, subsurface exploration, laboratory testing, engineering analysis of the field and laboratory data, and preparation of this report. The data obtained and the analyses performed were for the purpose of providing design and construction criteria for site earthwork, building foundations, slab-on-grade floors, below grade walls and slab, and pavements.

This report has been prepared in accordance with generally accepted geotechnical engineering practices, and with our agreement with SNK Development Inc., for the exclusive use of SNK Development Inc. and their consultants for specific application to the proposed Andante Emeryville Mixed-Use Development as described herein. In the event that there are any changes in the ownership, nature, design or location of the proposed Andante Emeryville Mixed-Use Development or if any future additions are planned, the conclusions and recommendations contained in this report shall not be considered valid unless 1) the project changes are reviewed by Harza and 2) conclusions and recommendations presented in this report are modified or verified in writing. Reliance on this report by parties other than those described above must be at their risk unless, of course, we are consulted on the use or limitations. We cannot be responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services without our further consultation. We can neither vouch for the accuracy of information supplied by others, nor accept consequences for unconsulted use of segregated portions of this report.

3.0 SITE INVESTIGATION

Subsurface exploration was performed using a truck-mounted drill rig equipped with 8-inch diameter continuous flight hollow stem augers. Twelve exploratory borings were drilled on July 28, August 1, and August 2, 2000, to a maximum depth of about 81 feet. In addition, three cone penetration tests (CPTs) were performed on September 25, 2000, to a maximum depth of about 50 feet. The approximate locations of the borings and the CPTs are shown on the Site Plan, Figure 2. Logs of the borings and details regarding the field investigation are included in Appendix A. The results of our laboratory tests are discussed in Appendix B.

3.1 Surface

The site was pentagonal in shape, essentially level, and had maximum plan area of approximately 2 acres. At the time of our field investigation, there were existing single-story buildings on the west side and the remaining area was covered by asphalt concrete pavement and concrete slabs. The perimeter of the site was bordered by sidewalk and landscaping trees.

The site was bounded by 40th Street on the north, Avalon Senior Housing on the south, Adeline Street on the east, and San Pablo Avenue on the west.

3.2 Subsurface

The surface materials encountered in our exploratory borings consisted of fill material that extended to depths of about 2 to 7 feet. The fill material generally consisted of firm to very stiff silty clays, sandy and clayey silts, and isolated areas of loose to medium dense sands and gravels. The fill materials comprised of firm clays and silts and loose sands and gravels are weak and potentially compressible. In addition, the silty clay materials in the fill exhibit a moderate to high plasticity and a high expansion potential.

Below the surface fill materials, we encountered interbedded layers of firm to hard silty clays, sandy silts, and clayey silts, and medium dense to dense clayey sands to the maximum depth explored of 80 feet. The firm clay and silt layers were generally encountered at depths of 20 to 40 feet and were approximately 2 to 4 feet thick. The silty clay material located within 10 feet of the ground surface exhibits a high plasticity and high expansion potential.

It should be noted that hydrocarbon and chemical odors were detected in the soils during the drilling of Borings EB-5, EB-6, EB-8, and EB-9 at depths of 4 to 10 feet.

The attached boring logs and related information depict location specific subsurface conditions encountered during our field investigation. The approximate locations of the borings were determined by pacing and should be considered accurate only to the degree implied by the method used. The passage of time could result in changes in the subsurface conditions due to environmental changes.

3.3 Ground Water

Free ground water was encountered in Borings EB-2, EB-3, EB-7, EB-10, EB-11 and EB-12 at depths of about 13 to 35 feet at the time of drilling. The borings were backfilled with a lean cement grout in accordance with Alameda County Public Works Agency requirements. It should be noted that the borings might not have been left open for a sufficient period of time to establish equilibrium ground water conditions. In addition, fluctuations in the ground water level could occur due to change in seasons, variations in rainfall, and other factors.

3.4 Geology and Seismicity

The site is underlain by Quaternary alluvial fan deposits of the Temescal Formation. These materials generally are comprised of interbedded layers of clayey gravel, sandy to silty clays, and sand-clay-silt mixtures.

The project site is located in the San Francisco Bay Area, which is considered one of the most seismically active regions in the United States. Significant earthquakes have occurred in the San Francisco Bay Area and are believed to be associated with crustal movements along a system of subparallel fault zones that generally trend in a northwesterly direction. The site is located approximately 2¾ miles southwest, 12⅞ miles northeast, and 13¼ miles southwest, respectively, of the active Hayward, San Andreas, and Calaveras fault zones.

For seismic design using the 1997 Uniform Building Code (UBC), the Hayward and San Andreas faults have been identified as Type A faults, according to the Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada, prepared by California Department of Conservation, Division of Mines and Geology (1998). In addition, the Calaveras fault has been designated as a Type B fault. The site is located in Seismic Zone 4.

We recommend that the site be categorized under Soil Profile Type S_D, as defined in Table 16-J of the 1997 UBC. Near-Source Factors $N_a = 1.25$ (per Table 16-S) and $N_v = 1.67$ (per Table 16-T) are appropriate for the site with respect to the Hayward fault, considered to be the controlling seismic source. Seismic Coefficients $C_a = 0.44\ N_a$ (per Table 16-Q) and $C_v = 0.64\ N_v$ (per Table 16-R) should be used in structural design.

Earthquake intensities will vary throughout the Bay Area, depending upon the magnitude of earthquake, the distance of the site from the causative fault, and the type of materials underlying the site. The site will probably be subjected to at least one moderate to severe earthquake that will cause strong ground shaking. However, during such an earthquake, the hazard associated with surface fault rupture is considered to be low.

3.5 Liquefaction

Soil liquefaction is a phenomenon primarily associated with saturated cohesionless soil layers located close to the ground surface. These soils lose strength during cyclic loading, such as imposed by earthquakes. During the loss of strength, the soil acquires a "mobility" sufficient to permit both horizontal and vertical movements. Soils that are most susceptible to liquefaction are clean, loose, uniformly graded, saturated, fine-grained sands that lie close to the ground surface, a depth usually considered to be less than 50 feet.

Based on our borings and CPTs, the near surface soils generally consist of silty clays, clayey to sandy silts, and clayey sands. Therefore, the liquefaction potential on-site is considered to be low.

4.0 CONCLUSION OF RECOMMENDATIONS

It is our opinion that the Andante Emeryville Development is suitable for the proposed residential and commercial development from a geotechnical engineering standpoint. The primary considerations for foundation design are 1) the existing fill materials, and 2) the high expansion potential of the underlying clayey soils. The near surface firm silty clays and loose clayey sand fill materials are weak and potentially compressible. In addition, the near surface silty clay materials could be subjected to volume changes during seasonal fluctuations in moisture content.

To minimize possible damage to the proposed buildings resulting from differential settlements that could occur and to provide for uniform bearing across the foundations, we recommend that the subgrade materials in the foundation areas be removed and reworked as engineered fill. Since the near surface subgrade materials will be predominately silty clays with high expansion potential, we also recommend that the buildings be supported on deepened footings within the reworked material in order to minimize damage resulting from shrinking and swelling of these materials. As an alternative to reworking the subgrade soils, the footings can be extended below the weaker surficial subgrade materials to more competent bearing materials. If this alternative is selected, additional deepening of the footings will not be required to minimize potential damage from the shrinking and swelling of near surface the expansive clay materials.

The recommendations above will also apply for portions of the parking garage foundation that are supported at or near the existing grade. Other portions of the garage foundation such as the bottom level fronting along 40th street will be approximately 6 feet below the existing grade, and below the weaker near surface fills. In areas where the garage foundation will be 6 feet or greater below the existing grade, the garage structure may be supported directly on undisturbed native subgrade materials. However, the native subgrade materials at 6 feet or greater below the existing grade will also be predominately silty clays with a high expansion potential. Therefore, the garage structure footings in these areas will still need to be deepened in order to minimize damage resulting from the shrinking and swelling of these materials.

In addition, we recommend that all interior slabs-on-grade be supported on a layer of imported non-expansive fill. The amount of required non-expansive fill can be reduced if reinforcement is provided in the slab to minimize the impact of expansion pressures. It should be noted that special design considerations will be required for exterior slabs.

The conclusions and recommendations presented in this report should be incorporated in the design and construction of the project to minimize any possible soil and/or foundation related problems. Detailed earthwork and foundation recommendations for use in design and construction of the project are presented below. We recommend that our firm reviews the final design and specifications to check that the earthwork and foundation recommendations presented in this report have been properly interpreted and implemented in the design and specifications. We can assume no responsibility for misinterpretation of our recommendations if we do not review the plans and specifications.

4.1 Earthwork

4.1.1 Clearing and Site Preparation

The site should be cleared of all obstructions including existing buildings and their foundations and slabs, pavements, concrete slabs, abandoned utilities, trees and associated root systems, and debris. The presence of hydrocarbon odors at the northwestern portion of the site may be indicative of additional underground obstructions such as buried gasoline and diesel storage tanks and associated appurtenances. We recommend that the environmental assessment reports for this site be reviewed prior to construction to determine if underground storage tanks or any other buried structures exist at the site. If such structures exist, they should be removed in accordance with Alameda County Health Department and Regional Water Quality Control Board regulations.

Removed concrete, asphalt concrete, and baserock may be reused as fill provided it is broken up to meet the requirements in Section 4.1.4, *Fill Material*. Holes resulting from the removal of root systems of larger trees could extend to depths of 3 feet, and laterally to the drip line of each tree. Holes resulting from the removal of underground obstructions extending below the proposed finish grade should be cleared and backfilled with suitable material compacted to the requirements given below under Section 4.1.5, *Compaction*. We recommend backfilling operations for any excavations to remove deleterious material be carried out under the observation of the Geotechnical Engineer.

After clearing, portions of the site containing surface vegetation or organic laden topsoil should be stripped to an appropriate depth to remove these materials. At the time of our field investigation, we estimated that a stripping depth of approximately 3 inches would be required in landscaped areas that will be removed during construction.

4.1.2 Subgrade Preparation

After the completion of clearing, soil exposed in areas to receive structural fill, slabs-on-grade, or pavements should be scarified to a depth of 6 inches, moisture conditioned to slightly above optimum water content, and compacted to the requirements for structural fill.

In order to achieve satisfactory compaction in the subgrade and fill materials, it may be necessary to adjust the water content at the time of construction. This may require that water be added to soils that are too dry, or that scarification and aeration be performed in any soils that are too wet. Some of the subgrade materials encountered in the exploratory borings had relatively high water contents at the time of our field investigation and may require a "drying out' period prior to compaction, depending on the time of year construction occurs.

After the removal of existing buildings and pavements, the exposed subgrade materials may be above their optimum moisture content, and may be unstable. If required, we recommend areas of unstable soils be overexcavated a minimum of 18 inches below finished subgrade elevation. The bottom of the excavation should then be completely covered with a ground stabilization geotextile fabric such as Mirafi 500X, or equivalent, and backfilled with Class 2 aggregate base. Alternative stabilization methods such as lime treatment may also be considered at the time of construction.

The subgrade stabilization procedure presented above is preliminary, and for cost estimating only. Final detailed stabilization recommendations should be developed by the geotechnical engineer when the actual subgrade materials are exposed during construction. We recommend that the soil stabilization procedure be included as an alternate bid item on a unit price basis as part of the construction contract.

4.1.3 Engineered Fill

If footing foundations are supported at conventional depths, the near-surface soils supporting the footings should be overexcavated and reworked as engineered fill to provide adequate foundation support. Overexcavation and reworking should extend to a depth of 5 feet below the existing ground surface. In addition, the materials should be removed laterally at least 5 feet beyond the limits of the footing, as measured from the base of the excavation. Excavated on-site soils that meet the requirements as set under Section 4.1.4, *Fill Material,* can be reused as engineered fill. The exposed excavation subgrade should be scarified to a minimum depth of 12 inches; moisture conditioned to slightly above the optimum moisture content, and compacted to the requirements for fill material. The 12-inch thickness of scarified subgrade soil is in addition to the recommended 5 feet of overexcavation. The on-site soils and/or imported fill should be compacted to the requirements given under Section 4.1.5, *Compaction.*

4.1.4 Fill Material

On-site soil below the stripped layer and having an organic content of less than 3 percent by volume can be used as fill. All fill placed at the site, including on-site soils, should not contain rocks or lumps larger than 6 inches in greatest dimension, with not more than 15 percent larger than 2.5 inches. In addition, any imported fill should be predominantly granular, with a plasticity index of 12 or less.

4.1.5 Compaction

Structural fill less than 5 feet thick should be compacted to at least 90 percent relative compaction as determined by ASTM Designation D1557 (latest edition). The upper 6 inches of subgrade soils beneath pavements should be compacted to at least 95 percent relative compaction. Structural fill or wall backfill greater than 5 feet deep should be entirely compacted to at least 95 percent relative compaction. Fill material should be spread and compacted in lifts not exceeding 8 inches in uncompacted thickness. The moisture content of the natural on-site clayey soils utilized as fill should be slightly above the optimum moisture content for the soil at the time of compaction.

4.1.6 Trench Backfill

Pipeline trenches should be backfilled with fill placed in lifts of approximately 8 inches in uncompacted thickness. However, thicker lifts can be used provided the method of compaction is approved by the Geotechnical Engineer and the required minimum degree of compaction is achieved. Backfill should be placed by mechanical means only. Jetting is not permitted.

On-site trench backfill should be compacted to at least 90 percent relative compaction. The upper 3 feet of on-site trench backfill in slab and pavement areas should be compacted to at least 95 percent relative compaction. Imported sand trench backfill should be compacted to at least 95 percent relative compaction and sufficient water is added during backfilling operations to prevent the soil from "bulking" during compaction.

Where utility trenches backfilled with sand enter building pads, they should be backfilled by an impermeable soil plug that extends to at least two feet beyond both sides of exterior foundations. This should help to minimize moisture change in the moderate to high expansive clays beneath the slabs. Where sand backfilled utility trenches cross planter areas and pass below pavements or concrete sidewalks, they should be sealed as described above to minimize soil volume change below asphalt and concrete areas.

4.1.7 Temporary Shoring and Construction Slopes

Temporary shoring or construction slopes may be required in order to construct the engineered fill for foundation areas requiring over-excavation and reworking. The Owner and the Contractor should be familiar with applicable, local, state, and federal regulations for both temporary construction slopes, and shoring, including the current OSHA Excavation and Trench Safety Standards. The Contractor should be solely responsible for the design, construction, and performance of temporary shoring.

4.1.8 Surface Drainage

Positive surface gradients of at least 2 percent should be provided adjacent to the building to direct surface water away from foundations and slabs toward suitable discharge facilities. Similarly, roof downspouts should be connected to suitable discharge facilities. Ponding of surface water should not be allowed adjacent to the structure or on pavements.

4.1.9 Construction during Wet Weather Conditions

If construction proceeds during or shortly after wet weather conditions, the moisture content of the on-site soils could be appreciably above optimum. Consequently, subgrade preparation, placement and/or reworking of on-site soil as structural fill might not be possible. Alternative wet weather construction recommendations can be provided by the Geotechnical Engineer in the field at the time of construction, if appropriate.

4.1.10 Guide Specifications

All earthwork should be performed in accordance with the Guide Specifications - Site Earthwork presented in Appendix C. These specifications are general in nature and the final specifications should incorporate all recommendations presented in this report.

4.2 Foundation Support

4.2.1 Spread Footings

We recommend that building foundations within 6 feet of the existing grade be supported on conventional continuous and isolated spread footings. If the footings are bearing on engineered fill prepared in accordance with Section 4.1.3, *Engineered Fill*, they should be at least 12 inches wide and founded at least 24 inches below the lowest adjacent finished grade.

As an alternative to overexcavation as described in Section 4.1.3, the footings may be deepened through the softer clay and loose sand materials, and founded on the stiffer and denser underlying soils. If this alternative is selected, we recommend a minimum footing depth of 6 feet below the existing grade. The deepened portion of the footing (i.e. below a depth of 24 inches below grade) may consist of non-structural concrete. The minimum width of the deepened footings should be 12 inches.

Foundation areas and below grade retaining walls for the parking garage structure that are 6 feet or deeper below the existing grade may be supported on conventional continuous and isolated spread footings bearing on undisturbed native soil materials. The footings should be at least 12 inches wide and founded at least 24 inches below the lowest adjacent finish grade.

All footings bearing on engineered fill or on the deeper native soils may be designed for an allowable bearing pressure of 2,000 pounds per square foot due to dead loads, 3,000 pounds per square foot due to dead plus live loads, and 4,000 pounds per square foot for all loads, including wind or seismic. These allowable bearing pressures are net values; therefore, the weight of the footing can be neglected for design purposes.

Footings should be designed with adequate reinforcing to provide structural continuity and permit spanning of local irregularities. Footings located adjacent to utility trenches should bear below an imaginary 1.5 to 1 (horizontal to vertical) plane projected upward from the bottom edge of the adjacent utility trenches.

Any visible cracks in the bottoms of the footing excavations should be closed by wetting prior to construction of the foundations. We recommend that we observe the footing excavations prior to placing reinforcing steel or concrete, to check that footings are founded on appropriate material.

Settlement of spread footing foundations under the proposed building loads is anticipated to be within tolerable limits for the proposed building structures if the recommendations of this section are followed.

4.2.2 Interior Slabs-on-Grade

We recommend that interior slabs-on-grade be supported on a minimum of 12 inches of imported non-expansive compacted fill due to the highly expansive nature of the on-site clayey subsurface soils. Alternatively, if the slab is reinforced with a minimum of #4 bars on 18-inch centers, both ways, to minimize the impact of expansion pressures, the slab could be supported on 6 inches of non-expansive fill. However, for either alternative, slab reinforcing should be provided in accordance with the anticipated use and loading of the slab. Slab-on-grade subgrade surfaces should be proof-rolled to provide a smooth, unyielding surface for slab support.

If migration of moisture through the slab is undesirable, a moisture barrier should be provided between the slab and subgrade. We recommend that the moisture barrier consist of 4 inches of free-draining gravel, such as ¾-inch, clean, crushed, uniformly graded gravel or equivalent overlain by a minimum 10-mil thick, impermeable membrane that is placed between the subgrade soil and the slab. The membrane should be covered with 2 inches of sand for protection during construction and for concrete curing purposes. The sand should be lightly moistened just prior to placing the concrete. Alternatively, a capillary break consisting of 6 inches of free draining gravel could be used. The moisture barrier or capillary break can be used in lieu of the uppermost 6 inches of non-expansive fill.

4.2.3 Below- Grade Slabs

In order to provide additional bearing support for the garage slab, we recommend that the slab be supported on a minimum 6-inch thick layer of Caltrans Class 2 aggregate base material, compacted according to the requirements presented in Section 4.1.5, *Compaction*. In addition, we recommend the below-grade slabs be reinforced with a minimum of #4 bars with a spacing of 18 inches each way to span any local soil irregularities underneath the compacted aggregate base layer. However, slab reinforcing should be provided in accordance with the anticipated use and loading of the slabs. The slab subgrade surfaces should be proof-rolled to provide a smooth, unyielding surface for slab support.

Ground water was encountered at a depth of about 13 to 35 feet in our borings at the time of drilling. The finish basement floor for the garage structure will be about 6 feet below the ground surface. Therefore, the below-grade slabs for the garage will be above the design ground water table. However, we recommend that below-grade slabs be designed with a subdrain system to catch any trapped water under the slabs. In addition, the slabs should be appropriately moisture proofed.

The floor subdrain system should consist of a 6-inch thick layer of Caltrans Class 2 permeable material underneath the below-grade slabs. The Caltrans Class 2 permeable material should be compacted according to the requirements presented in Section 4.1.5, *Compaction*. The floor subdrain system should include at least one perforated collector pipe imbedded in the permeable material running across the building. The collector pipe should drain the collected water to a sump from which the water would need to be pumped to a suitable discharge facility.

Typical below-grade slab moisture proofing layers consist of the following:

a. Prefabricated panels of a bentonite clay based product installed directly on the soil subgrade for the concrete slab protection. For additional waterproofing, the prefabricated panel should consist of an additional impermeable membrane layer. We recommend that these panels consist of Paraseal by Tremco or Voltex by Cetco, a division of American Colloid, or equivalent.

b. Sprayed-on bentonite applied directly onto the soil subgrade. With this system, bentonite granules are mixed with a resin and sprayed.

c. Hot mopped layer, applied to a mud slab poured onto the soil subgrade.

The floor slab may be constructed directly on the moisture proofing layer.

4.2.4 Below-Grade Walls

Below-grade walls for the garage structure must be designed to resist both lateral earth pressures and any additional lateral loads caused by surcharging.

We recommend that unrestrained walls be designed to resist an equivalent fluid pressure of 40 pounds per cubic foot. This assumes a level backfill. Restrained walls should be designed to resist an equivalent fluid pressure of 40 pounds per cubic foot plus an additional uniform lateral pressure of 10H pounds per square foot, where H = height of backfill above the top of the wall footing in feet. In addition, walls with inclined backfill should be designed for an additional equivalent fluid pressure of 1 pound per cubic foot for every 2 degrees of slope inclination, up to a maximum inclination of 2:1. Inclined backfill steeper than 2:1 should be evaluated on a location-specific basis.

Wall subjected to surcharge loads should be designed for an additional uniform lateral pressure equal to one-third or one-half the anticipated surcharge load for unrestrained or restrained walls, respectively.

The recommended lateral pressures assume walls are fully-backdrained to prevent the build-up of hydrostatic pressures. Adequate drainage should be provided by means of a subdrain system. In addition, the below-grade retaining walls should be appropriately moisture proofed.

The below-grade wall subdrain system may consist of drainage panels connected to a collection system at the base of the walls. Since the below-grade walls will generally be above the groundwater table, it is our opinion that the full wall coverage with drainage panels will not be necessary. We recommend that 1-foot wide drainage panels such as those produced by Mirafi, or equivalent, placed vertically ever 4 feet on-center are used. Drainage panels may be installed either against temporary shoring, excavated soil faces, or wall backfill. In all cases, the drainage panels should be installed behind the moisture proofing layer for the below grade wall in order to intercept water behind the wall.

As an alternative to the drainage panels described above, the wall drainage system may consist of a permeable backfill material such as ¾- inch crushed rock or Caltrans Class 2 permeable base. However, if crushed rock is used as permeable backfill against native soils, a geotextile filter material such as Mirafi 140 N, or equivalent, should be placed between the soil and the crushed drain rock to prevent the migration of fine grained soil particles into the backfill material.

Water from the drainage panels or permeable backfill should be drained to perforated collector pipes, which in turn drain to a sump. The water may be directed to the same sump that receives water from the floor subdrain system as described in Section 4.2.3 *Below Grade Slabs*. The tops of the perforated collector pipes should be situated below the bottom of the lowest level floor slab.

The moisture proofing layer should be placed in front of the drainage panel or permeable backfill components of the subdrain system. This layer may consist of one of the following:

- Prefabricated panels of bentonite clay based product affixed onto the below-grade wall. To provide for an additional moisture proofing layer, we recommend that this prefabricated panel consist of the two-layer type which has an additional layer, such as an impermeable membrane, affixed onto the bentonite layer. We recommend that these panels consist of Paraseal by Tremco or Voltex by Cetco, a division of American Colloid, or equivalent. We do not recommend that panels with only the bentonite layer such as Volclay by Cetco be used.

- Sprayed-on bentonite applied directly onto the below-grade wall. With this system, bentonite granules are mixed with a resin and sprayed onto the wall.

- Hot mopped layer, applied to the below-grade wall

Below-grade wall backfill less than 5 feet deep should be compacted to at least 90 percent relative compaction using light compaction equipment. Backfill greater than 5 feet deep should be entirely compacted to at least 95 percent relative compaction. If heavy compaction equipment is used, the walls should be appropriately designed to withstand loads exerted by the heavy equipment, and/or temporarily braced.

Below-grade walls should be supported on spread footing foundations designed in accordance with the recommendations presented previously under Section 4.2.1, *Spread Footings*. Lateral load resistance for the walls can be developed in accordance with the recommendations presented below under Section 4.2.5, *Lateral Load Resistance*.

4.2.5 Lateral Load Resistance

Lateral load resistance for the proposed building and retaining walls can be developed by friction between the foundation bottom and the supporting subgrade. A friction coefficient of 0.35 is considered applicable. As an alternative, a passive resistance equal to an equivalent fluid weighing 350 pounds per cubic foot acting against the vertical face of the foundations could be used. If foundations are poured neat against the soil, the friction and passive resistance can be used in combination.

4.2.6 Special Consideration – Exterior Slabs

As previously discussed, the onsite highly expansive clayey surface soils could be subjected to volume changes during fluctuations in moisture content. As a result of these volume changes, some vertical movement of exterior slabs, sidewalks, and pavements should be anticipated. This movement could result in damage to the slabs, sidewalks, and pavements, and might require periodic maintenance or replacement. Adequate clearance should be provided between the exterior slabs and building elements that overhang these slabs, such as window sills or doors that open outward. Exterior slabs such as sidewalks could be reinforced with steel reinforcing bars in lieu of wire mesh to minimize the impact of expansion pressures.

Walkways and pavement curbs and gutters should be supported directly on properly prepared native soils. Eliminating rock base beneath slabs will minimize the potential for migration of landscape irrigation water into pavement and walkway subgrade. Curbs should extend to the bottom of the pavement and baserock layer. One to two days prior to placing concrete, subgrade soils should be soaked to increase their moisture content to at least 3 to 5 percent above laboratory optimum moisture (ASTM D-1557-91). The water content of subgrade soils should be verified by field testing by the Geotechnical Engineer prior to placing concrete.

To minimize moisture changes in the natural soils and fills in landscaped areas, we recommend that drought resistant plants and/or a "drip" irrigation watering system be used. If landscaping plans include trees, they should be planted a minimum distance of one-half the anticipated mature height of the tree from slabs or pavements to minimize the effects of tree roots on these improvements.

4.3 Pavements

One R-value (resistance) test was performed on a representative bulk sample of the onsite surface materials. The results of this test are presented in Appendix B and indicate an R-value of 9. We developed the following alternative preliminary pavement sections using Topic 608 of the State of California Department of Transportation Highway Design Manual, R-value test results, and assumed traffic indices. Pavement designs for pavement lives of 1 to 5 years, 6 to 10 years, and 11 to 20 years are presented below.

RECOMMENDED PAVEMENT DESIGN ALTERNATIVES				
Location	Anticipated Pavement Life (years)	Pavement Components		Total Thickness (inches)
		Asphalt Concrete (inches)	Caltrans Class 2 Aggregate Base (inches)	
Automobile Parking & Access Areas (T.I. = 4.0)	11-20	2.0	8.0	10.0
	6-10	2.0	7.0	9.0
	1-5	2.0	6.0	8.0
Truck Access (T.I. = 5.5)	11-20	3.0	11.0	14.0
	6-10	3.0	10.0	13.0
	1-5	3.0	8.0	11.0

The traffic indices used in our design were established assuming a typical mix of automobile and "delivery or garbage" truck type of use in the proposed development once construction has been completed. However, if the pavements are planned to be placed prior to, or during construction, the traffic indices and pavement sections may not be adequate for support of what is typically more frequent and heavier construction traffic. Therefore, if the pavement sections will be used for construction access, our firm should be consulted to provide recommendations for alternative pavement sections capable of supporting the heavier use. If requested, we could provide recommendations for a phased placement of the asphalt concrete to minimize the potential for mechanical scars caused by construction traffic on the finished grade.

The traffic indices should provide the indicated pavement lives with only a normal amount of pavement maintenance. Selection of the design traffic parameters, however, was based on engineering judgment, and not on an equivalent wheel load analysis developed from a traffic study or furnished to us.

Asphalt concrete, aggregate base and preparation of the pavement subgrade should conform to and be placed in accordance with the Guide Specifications - Asphalt Paving presented in Appendix D.

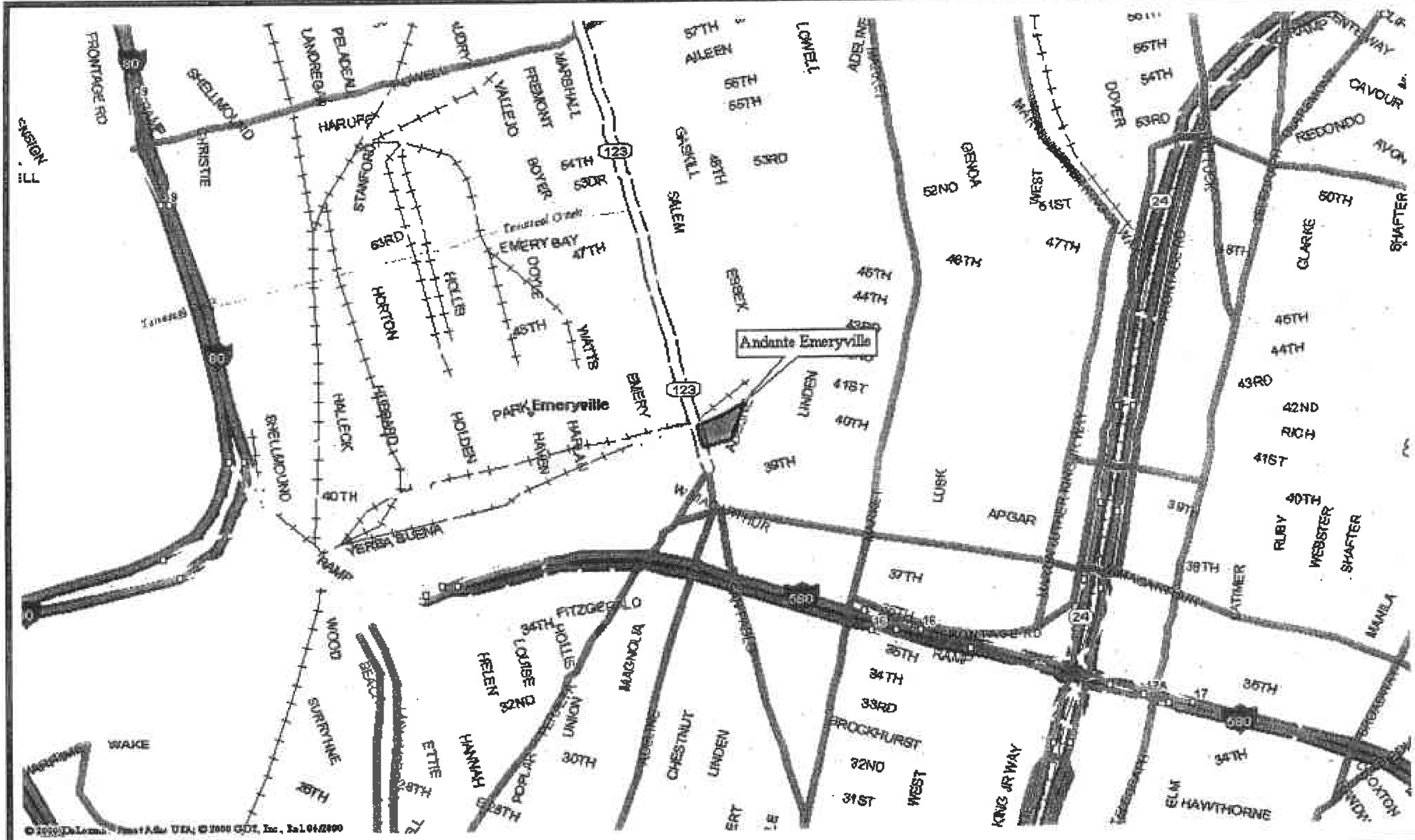
In areas where pavements will abut planted areas, the pavement baserock layer, pavement section subgrade soils and trench backfill should be protected against saturation. Planned concrete sidewalks, driveways, and curb and gutters should be supported directly on the properly compacted native soils. In addition, a compacted impermeable soil plug should be constructed within any lateral or other trench backfill which runs beneath the curb and gutter and under the pavements, as described in Section 4.1.6, *Trench Backfill*. In addition, water should never be allowed to pond behind the curb and gutter during or after the completion of construction.

4.4 Construction Observation

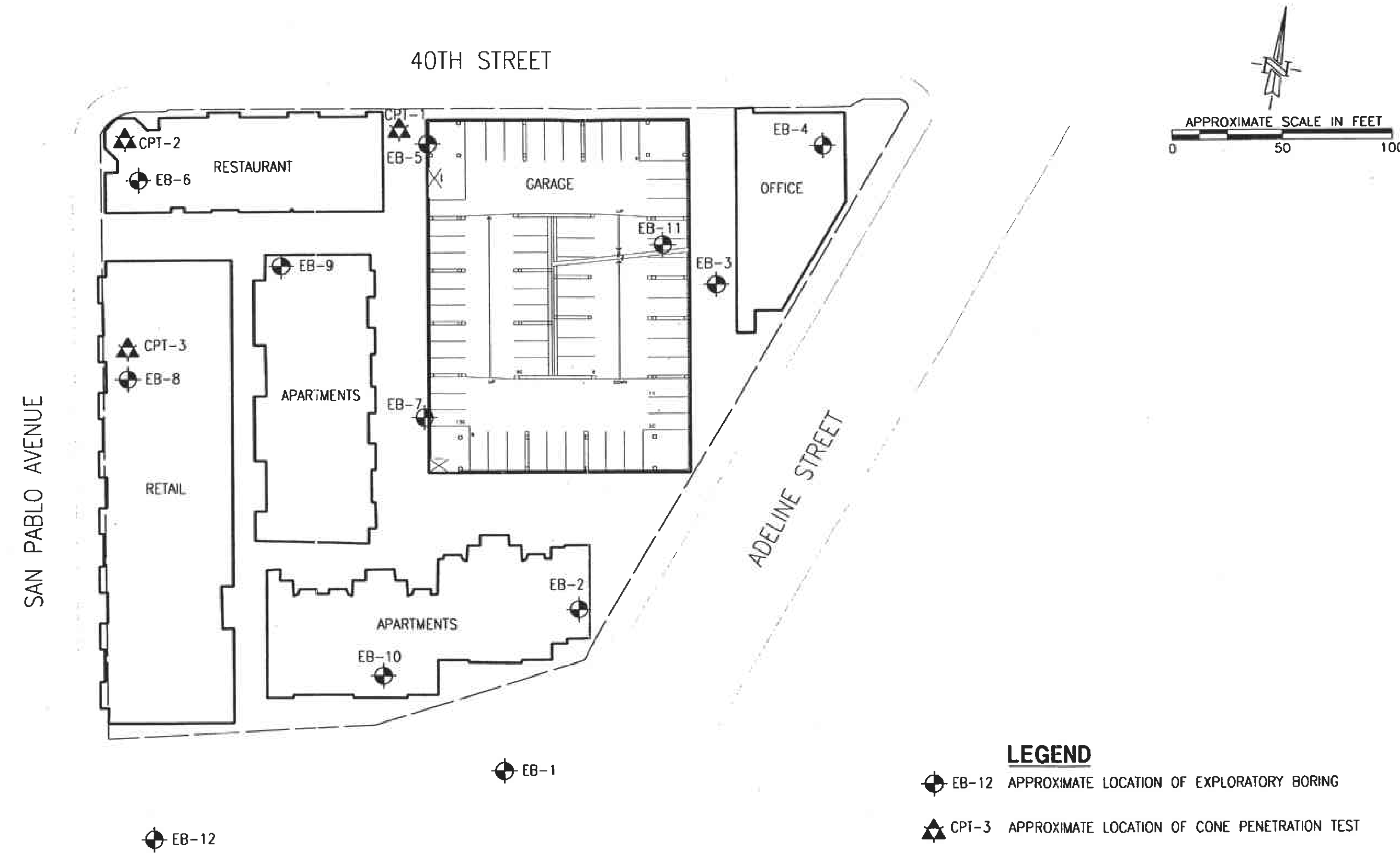
The analysis, designs, opinions, and recommendations submitted in this report are based in part upon the data obtained from the 12 soil borings and 3 cone penetration tests, and upon the conditions existing when services were performed. Subsurface conditions varying from those analyzed or characterized in this report are possible and may become evident during construction. If variations are encountered during construction, it may be advisable to re-evaluate certain analyses or assumptions.

We recommend that our firm be retained to provide geotechnical services during site grading and foundation installation, to observe compliance with the design concepts, specifications, and recommendations presented in this report. Our presence will also allow us to modify design if unanticipated subsurface conditions are encountered. If we are not retained to provide geotechnical services during site grading and foundation installation, we cannot be held liable for geotechnical-related problems.

FIGURES



HARZA *Engineering Company* 425 Roland Way Oakland, California 94621 Tel: (510) 568-4001 - Fax:(510)568-2205	Drawn by: JD Prepared By: JD Approved By: CD Scale: 1" = 1750 feet Date: 04OCT00 Drawing File:	**Site Vicinity Map** Andante Emeryville Emeryville, CA	**FIGURE** **1** PROJECT NO. **17752-CA**



BASE MAP PROVIDED BY: HDO ARCHITECTS, WALNUT CREEK, CA

K:\Projects\17752ca\17752ca-0a1.dwg, 12:01 04DEC00 PLOTTED BY: MMoyes

HARZA
Engineering Company Inc.
425 Roland Way.
Oakland, California. 94621
Tel:(510)568-4001 Fax:(510)568-2205

DRAWN BY:	ROC
PREP'D BY:	FDH
APP'D BY:	AW
SCALE:	1" = 50'
DATE:	4DEC00
DWG FILE:	17752CA-01

SITE PLAN

ANDANTE EMERYVILLE
EMERYVILLE, CALIFORNIA

FIGURE
2

PROJECT No.
17752-CA

APPENDIX A
Field Investigation

APPENDIX A

Field Investigation

The field investigation for the Andante Emeryville Development consisted of a surface reconnaissance and a subsurface exploration program using a truck-mounted drill rig equipped with continuous flight hollow stem augers and a truck-mounted cone penetration test (CPT) rig. Twelve 8-inch diameter exploratory borings were drilled on July 28, August 1, and August 2, 2000 to a maximum depth of 81 feet. Three cone penetration tests were performed on September 25, 2000 to a maximum depth of 50 feet. The CPTs were performed by VBI Insitu Testing, Inc (VBI) using a piezocone that was advanced by a hydraulic system mounted on an enclosed flat bed truck. The locations of the exploratory borings and cone penetration tests are shown on the Site Plan, Figure 2. The soils encountered in the borings were continuously logged in the field by our representative. The CPTs were continuously recorded by VBI as the piezocone was advanced. The soils are described in accordance with the Unified Soil Classification System (ASTM D-2487, latest edition). The logs of the borings and CPTs as well keys for the classification of the soil (Figure A-1) and the CPT logs (Figure A-2) are included as part of this appendix.

Representative soil samples were obtained from the exploratory borings at selected depths appropriate to the soil investigation. Undisturbed samples were obtained using a 3-inch O.D. Modified California sampler and disturbed samples were obtained using the 2-inch O.D. split spoon sampler. All samples were transmitted to our laboratory for evaluation and appropriate testing. Both sampler types are indicated in the "Sampler" column of the boring logs as designated in Figure A-1.

Resistance blow counts were obtained with the samplers by dropping a 140-pound hammer through a 30-inch free fall. The sampler was driven 18 inches, or shorter distances where hard resistance was encountered, and the number of blows were recorded for each 6 inches of penetration. The blows per foot recorded on the boring logs represent the accumulated number of blows that were required to drive the last 12 inches, or the number of inches indicated where hard resistance was encountered. When the split spoon sampler was used, these blow counts are the standard penetration resistance values. However, due to the large diameter of the Modified California sampler, the blow counts recorded for this sampler are not standard penetration resistance values. In order to convert these values to approximate standard penetration resistance values, the indicated blow counts should be multiplied by a factor of 0.6.

The attached boring logs and related information show our interpretation of the subsurface conditions at the dates and locations indicated, and it is not warranted that they are representative of subsurface conditions at other locations and times.

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions		grf	ltr	Description
Coarse Grained Soils	Gravel And Gravelly Soils		GW	Well-graded gravels or gravel sand mixtures, little or no fines
			GP	Poorly-graded gravels or gravel sand mixture, little or no fines
			GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	Sand And Sandy Soils		SW	Well-graded sands or gravelly sands, little or no fines
			SP	Poorly-graded sands or gravelly sands, little or no fines
			SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, and-clay mixtures

Major Divisions		grf	ltr	Description
Fine Grained Soils	Silts And Clays LL < 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 silt-clays of low plasticity
	Silts And Clays LL > 50		MH	Inorganic silts, micaceous or diatomaceous fine or silty soils, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat and other highly organic soils

GRAIN SIZES

U.S. STANDARD SERIES SIEVE: 200 — 40 — 10 — 4

CLEAR SQUARE SIEVE OPENINGS: 3/4" — 3" — 12"

Silts and Clays	Sand			Gravel		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

RELATIVE DENSITY

Sands and Gravels	Blows/Foot*
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Over 50

CONSISTENCY

Silts and Clays	Blows/Foot*	Strength (tsf)**
Very Soft	0 - 2	0 - 1/4
Soft	2 - 4	1/4 - 1/2
Firm	4 - 8	1/2 - 1
Stiff	8 - 16	1 - 2
Very Stiff	16 - 32	2 - 4
Hard	Over 32	Over 4

*Number of Blows for a 140-pound hammer falling 30 inches, driving a 2-inch O.D. (1-3/8" I.D.) split spoon sampler.

**Unconfined compressive strength.

SYMBOLS

- Standard Penetration sample
- Modified California sample
- Shelby Tube sample
- Ground Water level during drilling
- Stabilized Ground Water level

Increasing Visual Moisture Content

Dry
Damp
Moist
Wet
Saturated

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KEY TO EXPLORATORY BORING LOGS

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	FIGURE NO.
17752-CA	December 2000	A-1

File Name: G:\ENGINEER\GINTW\PROJECTS\17752-CA.GPJ Report Template: KEY A Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	Not Encountered	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION: DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
CLAY (CL), continued	Hard								
SAND (SC), rusted brown, mottled black, fine- to coarse-grained, with clay, trace gravel (fine, subangular), wet to saturated	Medium Dense				24				
			30						
interbedded layers of fine-grained sand and clay within this sample					50	25	99		Gradation Test Passing No.200 Sieve = 78%
			35						
					15				
			40						

Bottom of Boring = 40 Feet

Notes:

1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was not encountered during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet

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EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-1

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	18.5 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION: DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
PAVEMENT: 3 inches of AC over 8 inches of AB									
FILL: CLAY (CL), black, silty, moist	Very Stiff				39	25	96		PP = 2.5 tsf LL=40, PI=21, Passing No.200 Sieve = 75%
					38				PP = 2.5 tsf
CLAY (CL), light brown, some sand (fine- to coarse-grained), trace gravel (fine, angular), moist	Very Stiff		5		20				
mottled orange & black, some gravel (fine, angular to subangular) below 8 ½ feet					44	19	111		PP = 3.25 tsf
			10						
brown, mottled black below 13½ feet	Hard				90				PP > 4.5 tsf
			15			∇			
SAND (SC), rusted brown, fine- to coarse-grained, with clay, trace gravel (fine, angular to subangular)	Dense				52				
			20						
mottled black below 23½ feet					50				

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EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-2

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	18.5 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
SAND (SC), continued	Dense								
clayey below 28½ feet	Medium Dense				24				
			30						
CLAY (CL), brown, mottled red	Hard				36				
			35						

Bottom of Boring = 35 Feet

Notes:

1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was encountered at 18 ½ feet during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet
7. LL = Liquid Limit, PI = Plasticity Index.

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EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-2

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	20 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION: DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
PAVEMENT: 4 inches of AC over 8 inches of AB									
FILL: CLAY (CL), black, mottled dark brown, trace sand (fine-grained), moist	Stiff				20				PP = 0.75 tsf
					24				
					22	26	98	2.3	
SAND (SC), light brown, mottled orange, fine- to coarse-grained, with clay, moist	Medium Dense		5						
some clay, trace gravel (fine, angular to subangular), wet below 8½ feet					32	22	103		
			10						
					22				
CLAY (CL), light brown, mottled orange, some sand (fine- to coarse-grained), moist	Very Stiff		15						
SAND (SC), rusted brown, mottled black, fine- to coarse-grained, with clay, moist	Medium Dense				31	∇			
			20						
	Dense				43				

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

HARZA Engineering Company

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-3

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	20 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
SAND (SC), continued	Dense								
CLAY (CL), rusted brown, some sand (fine- to coarse-grained)	Very Stiff				22				
			30						
trace sand below 33½ feet					26				
			35						

Bottom of Boring = 35 Feet

Notes:

1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was encountered at 20 feet during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	Not Encountered	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION: DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
PAVEMENT: 2 inches AC over 10 inches AB									
FILL: CLAY (CL), mottled black and orange, with sand (fine- to coarse-grained), some silt, damp	Very Stiff				46				
	Stiff				13				
FILL: CLAY (CL), dark brown, mottled orange, some sand (fine- to coarse-grained), damp	Very Stiff		5		26				
CLAY (CL), mottled light brown and orange, some sand (fine- to coarse-grained), trace roots, moist	Hard		10		57				
(rusted brown, with fine- to coarse-grained sand below 13½ feet)			15		33				
(rusted brown, some fine-grained sand below 18½ feet)	Stiff		20		41	28	93		PP = 2.0 tsf
	Hard				33				

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EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-4

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	Not Encountered	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
CLAY (CL), continued	Hard								
(trace fine-grained sand, wet below 28½ feet)	Stiff		30		25				

Bottom of Boring = 30 Feet
Notes:
1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was not encountered during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet

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EXPLORATORY BORING LOG		
ANDANTE EMERYVILLE DEVELOPMENT Emeryville, California		
PROJECT NO. 17752-CA	DATE December 2000	BORING NO. EB-4

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	Not Encountered	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION: DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
PAVEMENT: 1 inches of AC over 6 inches of AB									
FILL: CLAY (CL), dark gray & brown, sandy (fine- to coarse-grained), trace gravel (fine, subangular), moist	Hard				50/6"				
gravelly below 2 feet	Very Stiff				19				
FILL: CLAY (CL), dark gray, mottled brown, some silt, moist	Stiff		5		12				
CLAY (CL), greenish gray, mottled orange, moist	Very Stiff								
gasoline and other contaminants present below 8½ feet			10		30				

Bottom of Boring = 10 Feet

Notes:

1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was not encountered during drilling.
5. The boring was grouted with neat cement immediately upon completion.

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EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-5

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	---	LOGGED BY	VWC
DEPTH TO GROUND WATER	Not Encountered	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
PAVEMENT: 2 inches of AC over 10 inches of AB									
FILL: SAND (SC), brown, fine- to coarse-grained, some clay, trace gravel (fine, angular), moist	Loose				14				
CLAY (CL), dark gray, mottled brown, trace gravel (fine, angular), moist	Stiff				14				PP = 1.0 tsf
	Very Stiff		5		19	28	94	1.7	
CLAY (CL), greenish gray, mottled brown, some silt, trace sand (fine-grained), trace gravel (fine, subangular), with gasoline smell, moist	Very Stiff				44				PP =3.75 tsf
			10						

Bottom of Boring = 10 Feet

Notes:

1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was not encountered during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-6

DRILL RIG	**Mobile B-53, HSA**	SURFACE ELEVATION	—	LOGGED BY	**VWC**
DEPTH TO GROUND WATER	**35 feet**	BORING DIAMETER	**8-inch**	DATE DRILLED	**8/2/00**

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
CLAY (CL), continued	Very Stiff								PP = 2.75 tsf
(silty at 29 feet)			30		47		—		—
	Hard		35		33	▽			
SAND (SW-SC), brown, fine- to coarse-grained, trace clay	Dense		40		41				Gradation Test Passing No.200 Sieve = 16%

Bottom of Boring = 40 Feet

Notes:

1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was encountered at 35 feet during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-7

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	Not Encountered	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION: DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
PAVEMENT: 3 inches of AC over 9 inches of AB									
FILL: CLAY (CL), dark gray,trace sand (fine- to coarse-grained), wet	Soft				3	36	85	0.2	
	Firm				12				
FILL: BRICKS, with chemical contaminants present	Dense				50/5"				
clay at 5 feet	Stiff		5		25				

Bottom of Boring = 6 Feet

Notes:

1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was not encountered during drilling.
5. The boring was grouted with neat cement immediately upon completion.

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-8

File Name: G:\ENGINEERING\INTW\PROJECTS\17752-CA.GPJ Report Template: H: Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	---	LOGGED BY	VWC
DEPTH TO GROUND WATER	Not Encountered	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
PAVEMENT: 3 inches of AC over 9 inches of AB									
FILL: BRICKS, red									
concrete debris at 4½ feet			5		18				
CLAY (CL), dark gray, some silt, moist	Very Stiff								
CLAY (CL), greenish gray, some silt, with ch[redacted]l, moist	Very Stiff				29				
			10						

Bottom of Boring = 10 Feet

Notes:

1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was not encountered during drilling.
5. The boring was grouted with neat cement immediately upon completion.

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HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-9

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	15 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION: DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
PAVEMENT: 3 inches of AC over 10 inches of AB									
FILL: CLAY (CL), dark grey, mottled brown, some silt, moist	Very Stiff				39				
					30				
CLAY (CL), grey-brown, some silt, moist	Stiff		5		12				
(dark brown at 9 feet)	Very Stiff				34				
SAND (SC), brown, fine- to coarse-grained, with clay, moist	Dense		10						
					75	19 ∇	112		
CLAY (CL), brown, some silt, trace sand (fine- to coarse-grained), trace gravel (fine, subangular), wet	Stiff		15						
			20		14				
	Hard				55	21	109		

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-10

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	---	LOGGED BY	VWC
DEPTH TO GROUND WATER	15 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
CLAY (CL), continued	Hard								
(some sand below 28½ feet)	Very Stiff				24				
			30						
					24				
			35						

Bottom of Boring = 35 Feet
Notes:
1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was encountered at 15 feet during drilling.
5. The boring was grouted with neat cement immediately upon completion.

File Name: G:\ENGINEER\GINT\W\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-10

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	13.5 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
PAVEMENT: 2 inches of AC									
FILL: GRAVEL (GC), gray, fine to coarse, angular, some sand (fine- to coarse-grained), some clay and silt, damp	Medium Dense			X	28				
	Loose			X	15				
CLAY (CL) dark brown, mottled orange, some silt, trace sand (fine-grained), moist to wet	Firm		5		6				
CLAY (CL), dark brown and orange, with sand (fine- to coarse-grained), trace gravel (fine, angular to subangular), moist	Very Stiff		10	X	42				PP = 3.0 tsf
CLAY (CL), light brown, mottled orange, some silt, trace fine-grained sand)	Very Stiff		15	X	34	▽ 20	110	7.7	PP = 2.75 tsf
CLAY (CL), rusted brown, with sand (fine- to coarse-grained sand)	Very Stiff		20	X	29				
(some sand below 23½ feet)				X	58				

File Name: G:\ENGINEER\GINTW\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

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Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-11

DRILL RIG **Mobile B-53, HSA**	SURFACE ELEVATION —	LOGGED BY **VWC**
DEPTH TO GROUND WATER **13.5 feet**	BORING DIAMETER **8-inch**	DATE DRILLED **8/2/00**

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
CLAY (CL), continued	Very Stiff								PP = 2.25 tsf
			30		35	24	104		PP = 3.50 tsf
(trace fine-grained sand below 33½ feet)	Stiff				14				
			35						
(silty at 39 feet)					45				PP = 2.0 tsf
(sandy, fine- to coarse-grained, at 40 feet)			40						
			45						
(mottled black, trace fine-grained sand below 48½ feet)					35	24			

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EXPLORATORY BORING LOG		
ANDANTE EMERYVILLE DEVELOPMENT **Emeryville, California**		
PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	**EB-11**

File Name: G:\ENGINEER\GINTW\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	13.5 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
CLAY (CL), continued	Stiff								
			55						
(sandy at 59 feet)					53				
			60						
SAND (SC), rusted brown, fine- to coarse-grained, with clay	Very Dense		65		53				
CLAY (CL), mottled brown and black, some sand (fine-grained)	Hard		70		52				

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Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-11

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	13.5 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
CLAY (CL), continued	Hard								
			80		85/11"				

Bottom of Boring = 80 Feet

Notes:

1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was encountered at 13 ½ feet during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	30 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION: DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
FILL: GRAVEL (GM), grey, fine to coarse, angular, some sand (fine- to coarse-grained), trace silt, damp									
FILL: CLAY (CL), black, mottled brown, some silt, moist to wet	Very Stiff				31	26	97	3.4	PP = 1.0 tsf LL=48, PI=31, Passing No.200 Sieve = 96%
(dark gray, trace coarse-grained sand below 4 feet)					18				
			5						
SILT (ML), gray-brown, some clay, some sand (fine- to coarse-grained), moist	Very Stiff								
					45	16	116		
			10						
CLAY (CL), brown, mottled black, some silt, trace sand (fine-grained), moist	Very Stiff				33				PP = 4.0 tsf
			15						
(rusted brown below 18½ feet)					26				
			20						
(some fine-grained sand, trace fine and subangular gravel below 23½ feet)	Hard				60				

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EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-12

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	30 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
CLAY (CL), continued	Hard								
			30			∇			
SAND (SW-SC), brown, fine- to coarse-grained, trace grvel (fine, subangular), trace clay	Very Dense				59				

Bottom of Boring = 31½ Feet

Notes:

1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was encountered at 30 feet during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet
7. LL = Liquid Limit, PI = Plasticity Index

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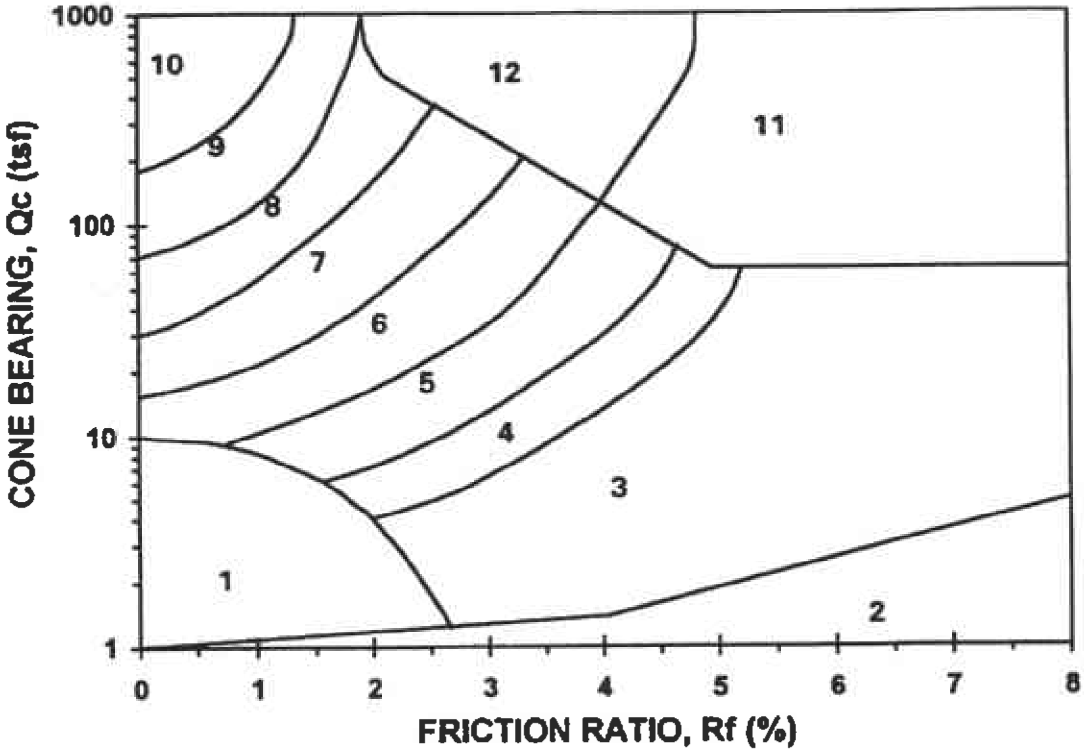
EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-12

CONE PENETRATION TESTS
CPT-1 THROUGH CPT-3

SIMPLIFIED SOIL BEHAVIOR TYPE CLASSIFICATION FOR STANDARD ELECTRONIC CONE PENETROMETER



ZONE	Qc/N[1]	Su Factor (Nk)[2]	SOIL BEHAVIOR TYPE[1]
1	2	15 (10 for Qc < = 9 tsf)	Sensitive Fine Grained
2	1	15 (10 for Qc < = 9 tsf)	Organic Material
3	1	15 (10 for Qc < = 9 tsf)	CLAY
4	1.5	15	Silty CLAY to CLAY
5	2	15	Clayey SILT to Silty CLAY
6	2.5	15	Sandy SILT to Clayey SILT
7	3	---	Silty SAND to Sandy SILT
8	4	---	SAND to Silty SAND
9	5	---	SAND
10	6	---	Gravelly SAND to SAND
11	1	15	Very Stiff Fine Grained (*)
12	2	---	SAND to Clayey SAND (*)

(*) Overconsolidated or Cemented

Qc = Tip Bearing
Fs = Sleeve Friction
Rf = Fs/Qc*100 = Friction Ratio

References: [1]Robertson, 1986, Olsen, 1988
[2]Bonaparte & Mitchell, 1979 (young bay mud Qc < = 9)
[2]Estimated from local experience (fine grained soils Qc > 9)

Note: Testing performed in accordance with ASTM D3441

HARZA
Engineering Company Inc.
425 Roland Way.
Oakland, California. 94621
Tel:(510)568-4001 Fax:(510)568-2205

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17752CA-A-3

KEY TO CONE PENETRATION TEST

ANDANTE EMERYVILLE
EMERYVILLE, CALIFORNIA

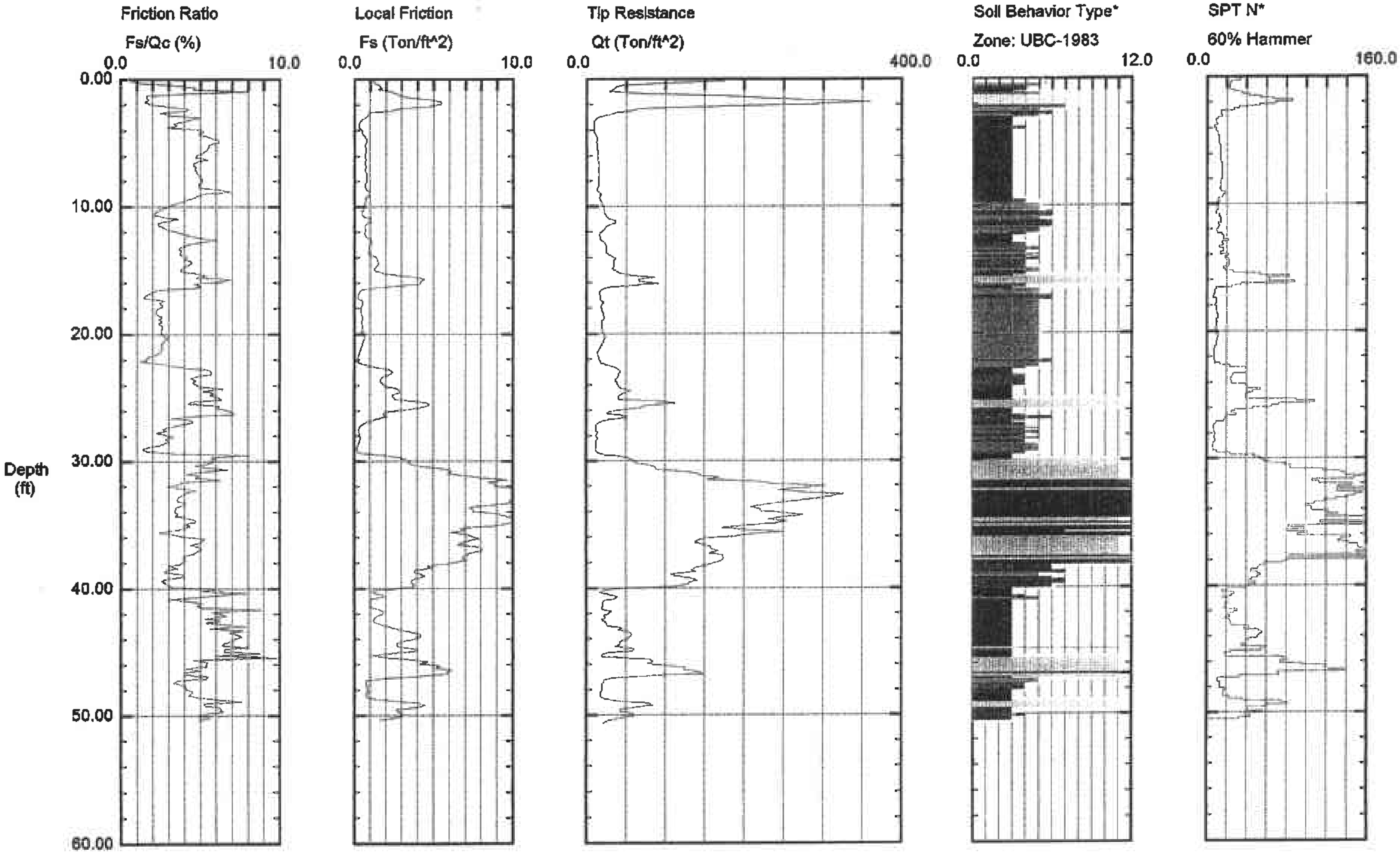
FIGURE
A-2
PROJECT No.
17752-CA

*Soil behavior type and SPT based on data from UBC-1983

VBI In-Situ Testing

Operator: VIRGIL A. BAKER
Sounding: 00Z266
Cone Used: HO 738 TC - U2

CPT Date/Time: 09-25-00 10:13
Location: CPT-1
Job Number:



Maximum Depth = 50.69 feet

Depth Increment = 0.16 feet

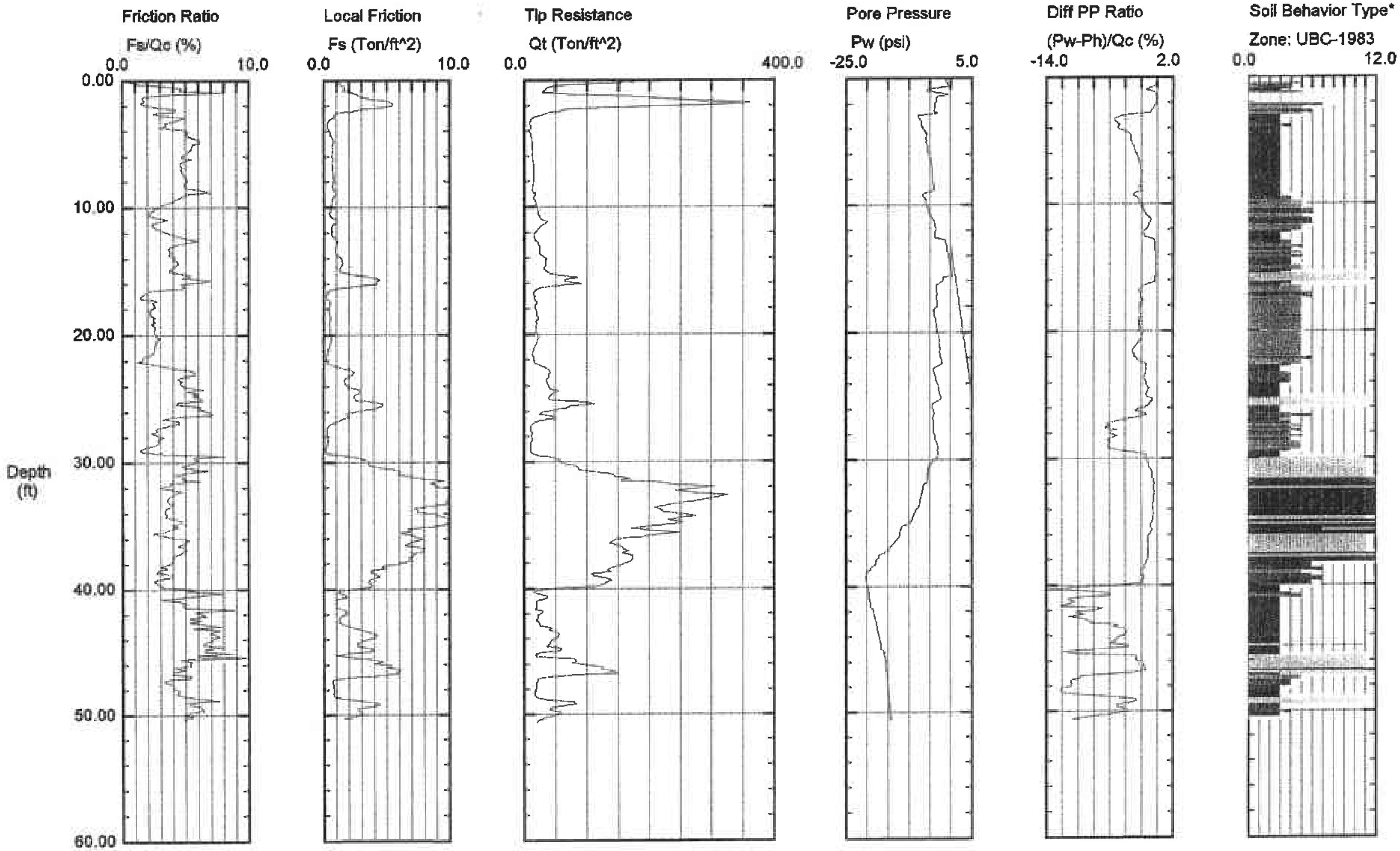
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

VBI In-Situ Testing

Operator: VIRGIL A. BAKER
Sounding: 00Z266
Cone Used: HO 738 TC - U2

CPT Date/Time: 09-25-00 10:13
Location: CPT-1
Job Number:



Maximum Depth = 50.69 feet

Depth Increment = 0.16 feet

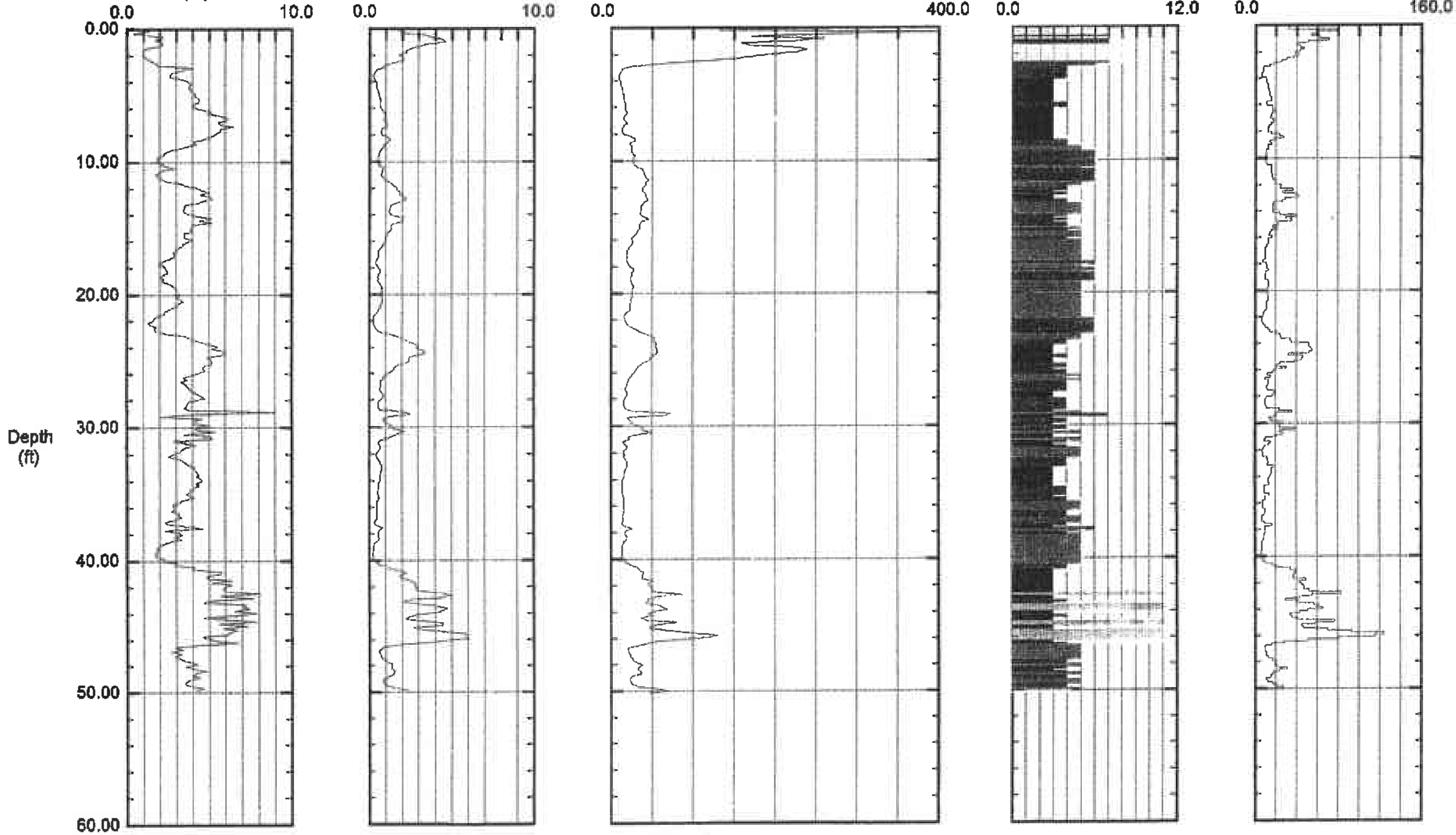
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

Soil behavior type and SPT based on data from UBC-1983

VBI In-Situ Testing

Operator: VIRGIL A. BAKER
Sounding: 00Z267
Cone Used: HO 738 TC - U2

CPT Date/Time: 09-25-00 11:47
Location: CPT-2
Job Number:



Maximum Depth = 50.20 feet

Depth Increment = 0.16 feet

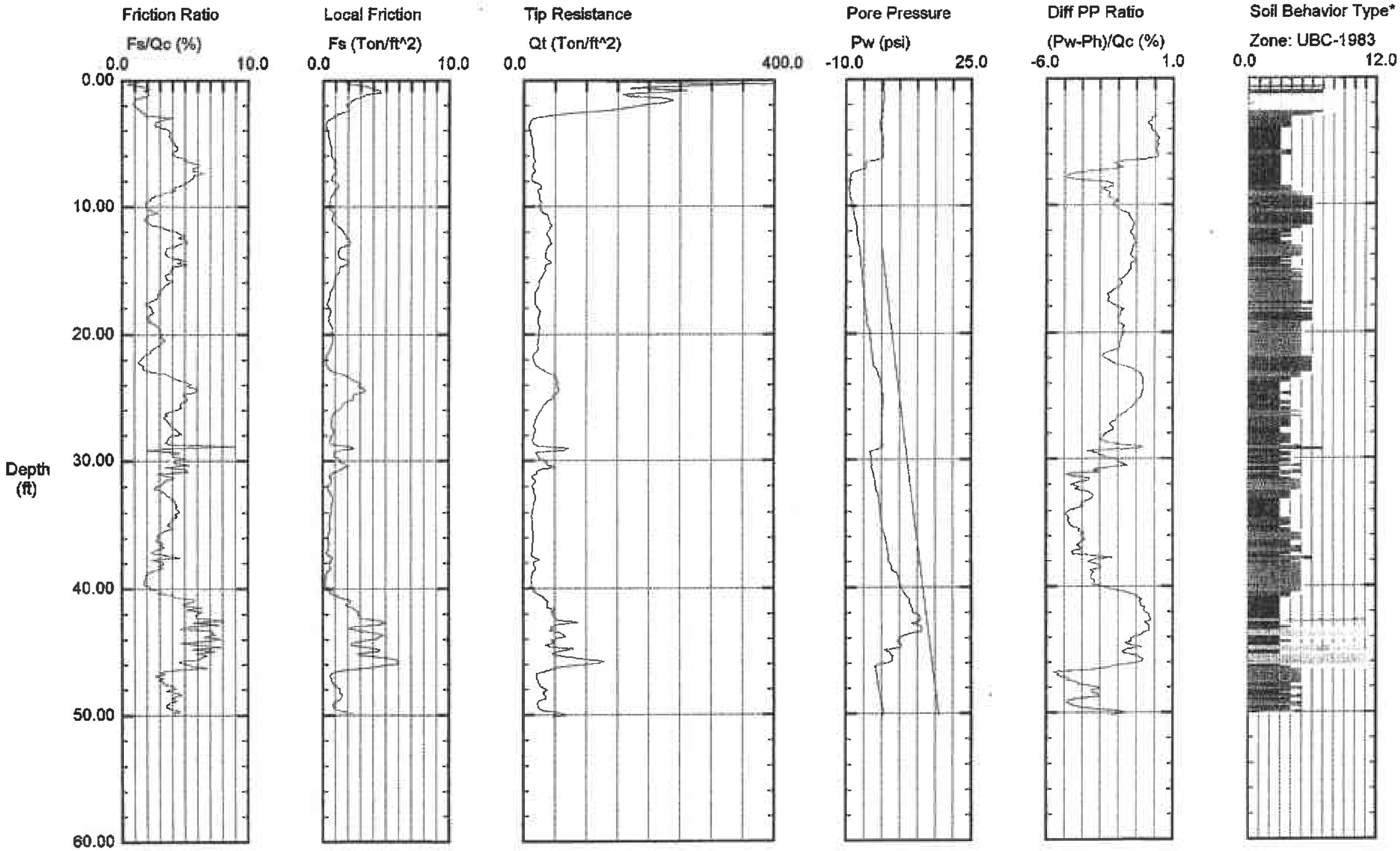
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

VBI In-Situ Testing

Operator: VIRGIL A. BAKER
Sounding: 00Z267
Cone Used: HO 738 TC - U2

CPT Date/Time: 09-25-00 11:47
Location: CPT-2
Job Number:



Maximum Depth = 50.20 feet

Depth Increment = 0.16 feet

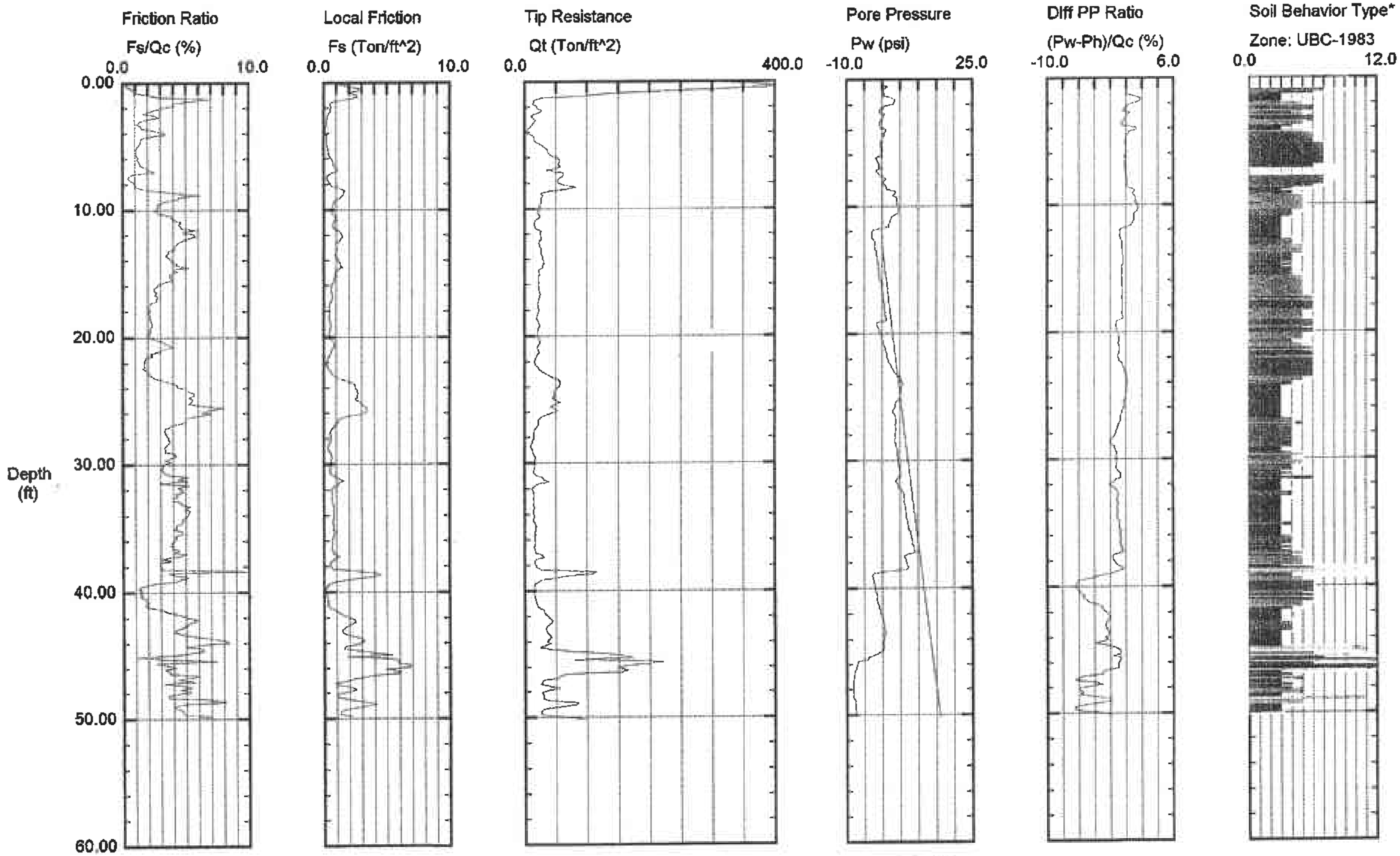
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

VBI In-Situ Testing

Operator: VIRGIL A. BAKER
Sounding: 00Z268
Cone Used: HO 738 TC - U2

CPT Date/Time: 09-25-00 14:21
Location: CPT-3
Job Number:



Maximum Depth = 50.20 feet

Depth Increment = 0.16 feet

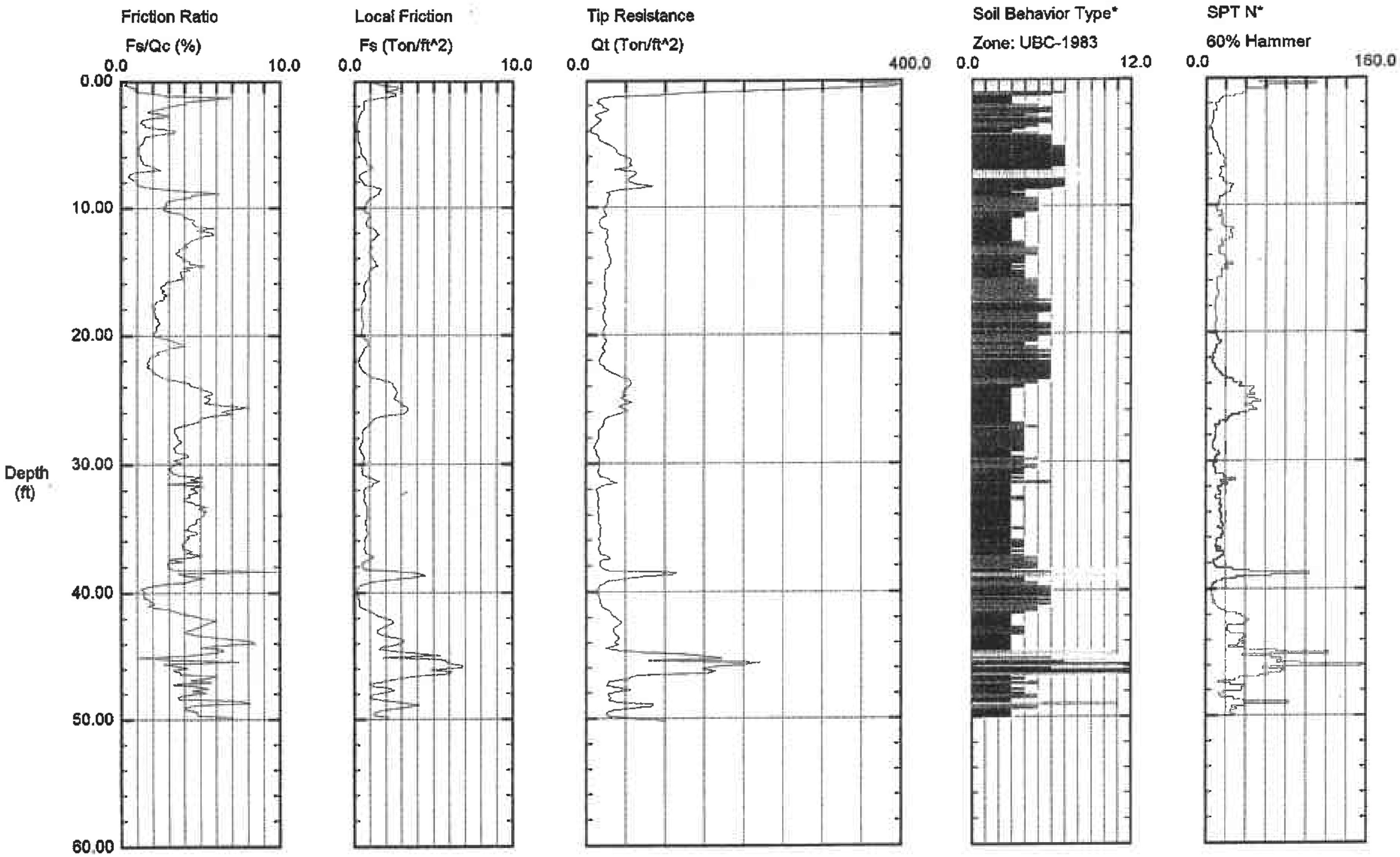
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

VBI In-Situ Testing

Operator: VIRGIL A. BAKER
Sounding: 00Z268
Cone Used: HO 738 TC - U2

CPT Date/Time: 09-25-00 14:21
Location: CPT-3
Job Number:



Maximum Depth = 50.20 feet

Depth Increment = 0.16 feet

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

SOUNDING DATA IN FILE 00Z266 09-25-00 10:13

OPERATOR : VIRGIL A. BAKER LOCATION : CPT-1

CONE ID : HO 738 TC - U2 JOB No. : .

V B I Insitu Testing Inc.

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qt tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Pn)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
Baseline		-76.1		-0.44		-21.2		0.0		
0.05	0.2	174.9	174.9	1.16	0.66	-1.2	-0.05	0.3		7
0.10	0.3	101.4	101.4	1.31	1.29	-0.8	-0.05	0.3	sand to silty sand	22
0.15	0.5	46.4	46.3	1.58	3.40	-0.8	-0.12	0.3	sandy silt to clayey silt	24
0.20	0.7	36.5	36.5	1.71	4.70	-2.0	-0.06	0.3	silty clay to clay	25
0.25	0.8	33.9	33.9	1.54	4.55	-4.0	-0.64	0.3	clay	22
0.30	1.0	28.8	28.7	2.28	7.94	-5.7	-1.42	0.3	silty clay to clay	29
0.35	1.1	73.0	72.9	2.70	3.70	-3.4	-0.34	0.3	sandy silt to clayey silt	32
0.40	1.3	175.5	175.2	2.93	1.63	-0.8	-0.02	0.3	silty sand to sandy silt	51
0.45	1.5	224.6	224.5	3.65	1.62	-3.4	-0.11	0.3	sand to silty sand	55
0.50	1.6	279.7	279.7	5.03	1.80	-3.4	-0.09	0.3	sand to silty sand	69
0.55	1.8	358.6	358.7	5.46	1.52	-3.3	-0.07	0.3	sand to silty sand	74
0.60	2.0	287.5	287.5	5.50	1.91	-3.8	-0.10	0.4	sand to silty sand	65
0.65	2.1	188.2	188.1	4.72	2.54	-3.6	-0.18	0.3	silty sand to sandy silt	55
0.70	2.3	67.3	67.2	2.84	4.23	-3.8	-0.41	0.3	sandy silt to clayey silt	37
0.75	2.5	56.4	56.3	2.28	4.08	-3.9	-0.50	0.3	clayey silt to silty clay	26
0.80	2.6	36.5	36.5	0.92	2.50	-4.0	-0.75	0.3	clayey silt to silty clay	15
0.85	2.8	26.2	26.2	0.83	3.13	-5.1	-1.76	0.4	clayey silt to silty clay	12
0.90	3.0	15.5	15.4	0.76	4.92	-6.0	-3.65	0.4	silty clay to clay	12
0.95	3.1	11.9	11.8	0.52	4.33	-7.8	-4.65	0.4	clay	12
1.00	3.3	9.7	9.6	0.38	3.93	-7.3	-5.37	0.4	clay	10
1.05	3.4	9.6	9.5	0.32	3.32	-7.0	-5.28	0.4	clay	8
1.10	3.6	10.2	10.1	0.36	3.50	-7.2	-4.95	0.4	silty clay to clay	7
1.15	3.8	10.7	10.7	0.31	2.87	-6.5	-4.62	0.4	clay	10
1.20	3.9	9.8	9.8	0.46	4.57	-6.7	-5.21	0.4	clay	10
1.25	4.1	9.7	9.6	0.51	5.20	-6.4	-4.74	0.4	clay	10
1.30	4.3	11.3	11.2	0.55	4.85	-5.9	-3.77	0.4	clay	11
1.35	4.4	12.0	11.9	0.63	5.25	-5.8	-3.40	0.4	clay	12
1.40	4.6	13.1	13.0	0.74	5.65	-5.5	-3.22	0.4	clay	12
1.45	4.8	13.0	12.9	0.80	6.12	-5.9	-3.21	0.4	clay	12
1.50	4.9	12.7	12.7	0.78	6.11	-5.7	-3.24	0.4	clay	12
1.55	5.1	13.0	12.9	0.72	5.54	-5.8	-3.31	0.4	clay	12
1.60	5.2	13.2	13.1	0.72	5.46	-5.7	-3.11	0.4	clay	13
1.65	5.4	13.6	13.5	0.74	5.46	-5.6	-2.95	0.4	clay	13
1.70	5.6	14.1	14.1	0.74	5.26	-5.6	-2.85	0.4	clay	13
1.75	5.7	14.2	14.1	0.72	5.07	-5.6	-2.86	0.4	clay	13
1.80	5.9	13.9	13.8	0.66	4.76	-5.4	-2.81	0.4	clay	14
1.85	6.1	14.3	14.2	0.66	4.65	-4.9	-2.46	0.4	clay	14
1.90	6.2	14.1	14.1	0.77	5.45	-4.9	-2.56	0.4	clay	14
1.95	6.4	14.3	14.2	0.69	4.86	-4.7	-2.39	0.4	clay	14
2.00	6.6	15.1	15.1	0.65	4.33	-4.5	-2.32	0.4	clay	14

Soil interpretation reference: Robertson & Campanella-1983. based on 60% hammer efficiency and .15 m sliding data average

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qt tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Ph)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
2.05	6.7	15.7	15.7	0.72	4.57	-4.7	-2.15	0.4	clay	15
2.10	6.9	15.6	15.6	0.74	4.74	-4.6	-2.13	0.4	clay	15
2.15	7.1	15.5	15.4	0.72	4.63	-4.4	-2.06	0.4	clay	15
2.20	7.2	15.5	15.4	0.73	4.73	-4.4	-2.02	0.4	clay	15
2.25	7.4	16.0	16.0	0.77	4.79	-4.5	-2.01	0.4	clay	15
2.30	7.5	15.8	15.7	0.78	4.92	-4.3	-1.96	0.4	clay	15
2.35	7.7	15.9	15.9	0.80	5.01	-4.4	-1.97	0.4	clay	15
2.40	7.9	15.6	15.5	0.80	5.14	-4.3	-1.97	0.4	clay	15
2.45	8.0	15.1	15.1	0.77	5.08	-4.2	-2.01	0.4	clay	15
2.50	8.2	14.9	14.5	0.73	4.91	-4.2	-2.02	0.4	clay	14
2.55	8.4	14.6	14.6	0.71	4.86	-4.2	-2.04	0.4	clay	14
2.60	8.5	14.2	14.2	0.73	5.12	-4.0	-2.05	0.4	clay	13
2.65	8.7	13.0	13.0	0.82	5.31	-4.0	-2.23	0.4	clay	14
2.70	8.9	15.0	15.0	1.04	6.92	-4.0	-1.91	0.4	clay	15
2.75	9.0	19.0	18.9	0.96	5.05	-5.0	-1.51	0.4	clay	16
2.80	9.2	16.8	16.7	0.79	4.73	-6.7	-2.85	0.4	clay	16
2.85	9.4	15.8	15.8	0.71	4.47	-6.8	-3.07	0.4	clay	16
2.90	9.5	17.7	17.6	0.75	4.24	-5.2	-2.52	0.4	silty clay to clay	11
2.95	9.7	18.6	18.5	0.69	3.69	-6.0	-2.54	0.4	silty clay to clay	12
3.00	9.8	20.0	19.9	0.65	3.23	-5.9	-2.14	0.4	clayey silt to silty clay	10
3.05	10.0	21.7	21.6	0.63	2.90	-5.6	-1.92	0.4	clayey silt to silty clay	10
3.10	10.2	22.3	22.2	0.58	2.60	-5.7	-1.83	0.4	clayey silt to silty clay	11
3.15	10.3	22.1	22.0	0.52	2.34	-5.4	-1.76	0.5	clayey silt to silty clay	11
3.20	10.5	22.4	22.4	0.45	2.12	-5.4	-1.72	0.5	sandy silt to clayey silt	9
3.25	10.7	23.7	23.6	0.50	2.09	-5.1	-1.35	0.5	sandy silt to clayey silt	9
3.30	10.8	25.5	25.4	0.68	2.69	-5.0	-1.40	0.5	clayey silt to silty clay	12
3.35	[illegible]	27.9	27.8	1.01	3.61	-4.2	-1.20	0.5	clayey silt to silty clay	14
3.40	[illegible]	37.1	37.1	1.04	2.81	-4.3	-0.84	0.5	sandy silt to clayey silt	13
3.45	[illegible]	35.9	35.8	0.83	2.32	-3.9	-0.75	0.5	sandy silt to clayey silt	13
3.50	[illegible]	28.3	28.3	0.65	2.41	-3.9	-1.00	0.5	sandy silt to clayey silt	11
3.55	[illegible]	24.1	24.0	0.64	2.65	-3.7	-1.11	0.5	clayey silt to silty clay	12
3.60	[illegible]	23.1	23.0	0.69	2.98	-3.6	-1.14	0.5	clayey silt to silty clay	11
3.65	[illegible]	15.7	15.6	0.68	3.43	-3.6	-1.30	0.5	clayey silt to silty clay	9
3.70	12.1	16.4	16.4	0.64	3.89	-3.8	-1.65	0.5	silty clay to clay	11
3.75	12.3	18.2	18.1	0.78	4.33	-3.6	-1.66	0.5	clay	15
3.80	12.5	17.3	17.2	0.88	5.09	-3.6	-1.56	0.5	clay	16
3.85	12.6	17.6	17.5	1.05	6.02	-3.6	-1.54	0.5	clay	16
3.90	12.8	21.7	21.7	1.09	5.03	-1.4	-0.45	0.5	clay	20
3.95	13.0	23.9	23.8	1.01	4.25	-1.2	-0.36	0.5	silty clay to clay	15
4.00	13.1	24.8	24.8	0.96	3.85	-1.1	-0.31	0.5	silty clay to clay	16
4.05	13.3	25.5	25.4	0.93	3.64	-1.0	-0.31	0.5	silty clay to clay	15
4.10	13.5	24.8	24.8	0.94	3.80	-1.0	-0.34	0.5	silty clay to clay	15
4.15	13.6	24.5	24.5	0.92	3.77	-0.9	-0.34	0.5	silty clay to clay	16
4.20	13.8	27.5	27.8	1.03	3.69	-0.7	-0.25	0.5	silty clay to clay	18
4.25	13.9	32.5	32.5	1.36	4.19	-0.5	-0.12	0.5	silty clay to clay	21
4.30	14.1	36.8	36.8	1.45	3.94	-0.6	-0.19	0.5	silty clay to clay	22
4.35	14.3	34.0	34.0	1.50	4.41	-0.4	-0.13	0.5	silty clay to clay	22
4.40	14.4	34.6	34.6	1.54	4.46	-0.2	-0.16	0.5	silty clay to clay	22
4.45	14.6	35.0	35.0	1.47	4.22	-0.1	-0.16	0.5	silty clay to clay	22
4.50	14.8	33.9	33.9	1.33	3.97	-0.1	-0.17	0.5	silty clay to clay	22

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .15 m sliding data average

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qt tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Pn)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
4.55	14.9	32.5	32.5	1.23	3.76	0.0	-0.17	0.5	clayey silt to silty clay	16
4.60	15.1	36.9	36.9	1.38	3.74	0.2	-0.13	0.5	silty clay to clay	24
4.65	15.3	41.1	41.1	1.95	4.74	0.2	-0.13	0.5	silty clay to clay	28
4.70	15.4	55.2	55.2	2.97	5.39	2.1	-0.11	0.4	silty clay to clay	35
4.75	15.6	86.2	86.2	4.11	4.77	0.4	-0.05	0.4	very stiff fine grained (*)	66
4.80	15.7	65.1	65.1	4.47	6.85	-1.6	-0.33	0.4	very stiff fine grained (*)	63
4.85	15.9	66.3	66.3	4.20	6.33	-1.9	-0.33	0.4	very stiff fine grained (*)	71
4.90	16.1	91.5	91.5	4.21	4.61	-2.1	-0.26	0.4	very stiff fine grained (*)	67
4.95	16.2	53.0	52.9	2.66	5.05	-2.8	-0.57	0.4	silty clay to clay	36
5.00	16.4	26.6	26.5	1.22	4.61	-3.7	-1.36	0.4	silty clay to clay	21
5.05	16.6	15.0	16.3	0.42	2.63	-3.4	-1.66	0.4	clayey silt to silty clay	10
5.10	16.7	16.4	16.4	0.32	1.95	-3.4	-2.16	0.4	clayey silt to silty clay	8
5.15	16.9	15.6	15.6	0.27	1.69	-3.3	-2.26	0.4	clayey silt to silty clay	6
5.20	17.1	17.4	17.4	0.25	1.43	-3.2	-2.23	0.4	sandy silt to clayey silt	6
5.25	17.2	15.8	15.7	0.23	1.45	-3.4	-2.21	0.4	clayey silt to silty clay	5
5.30	17.4	17.9	17.8	0.49	2.75	-3.3	-2.07	0.4	clayey silt to silty clay	9
5.35	17.6	21.9	21.8	0.52	2.41	-3.2	-1.76	0.5	clayey silt to silty clay	9
5.40	17.7	19.7	19.6	0.50	2.57	-3.3	-1.91	0.5	clayey silt to silty clay	9
5.45	17.9	17.3	17.2	0.45	2.61	-3.2	-2.13	0.5	clayey silt to silty clay	8
5.50	18.0	18.3	18.2	0.41	2.28	-3.2	-2.02	0.5	clayey silt to silty clay	9
5.55	18.2	19.3	19.4	0.43	2.22	-3.9	-2.25	0.5	clayey silt to silty clay	9
5.60	18.4	22.0	22.0	0.48	2.20	-4.1	-2.20	0.5	clayey silt to silty clay	10
5.65	18.5	21.3	21.3	0.50	2.33	-3.9	-2.13	0.5	clayey silt to silty clay	10
5.70	18.7	22.3	22.2	0.55	2.55	-4.1	-2.03	0.5	clayey silt to silty clay	11
5.75	18.9	22.7	22.6	0.54	2.39	-3.7	-1.95	0.5	clayey silt to silty clay	10
5.80	19.0	16.7	16.7	0.43	2.59	-3.5	-2.34	0.5	clayey silt to silty clay	12
5.85	19.2	20.4	20.3	0.48	2.34	-3.6	-2.21	0.6	clayey silt to silty clay	9
5.90	19.4	19.4	19.3	0.50	2.59	-3.4	-2.26	0.6	clayey silt to silty clay	9
5.95	19.5	19.5	19.5	0.51	2.61	-3.4	-2.27	0.5	clayey silt to silty clay	9
6.00	19.7	19.6	19.7	0.52	2.65	-3.3	-2.25	0.6	clayey silt to silty clay	9
6.05	19.8	20.1	20.0	0.51	2.52	-3.3	-2.23	0.6	clayey silt to silty clay	10
6.10	20.0	21.5	21.5	0.57	2.63	-3.1	-2.02	0.5	clayey silt to silty clay	10
6.15	20.2	23.4	23.3	0.64	2.72	-2.9	-1.83	0.6	clayey silt to silty clay	11
6.20	20.3	22.7	22.6	0.55	2.39	-2.9	-1.91	0.6	clayey silt to silty clay	11
6.25	20.5	21.9	21.8	0.59	2.71	-2.8	-1.88	0.6	clayey silt to silty clay	11
6.30	20.7	21.5	21.4	0.56	2.58	-2.7	-2.01	0.6	clayey silt to silty clay	10
6.35	20.8	19.5	19.5	0.50	2.52	-2.7	-2.13	0.5	clayey silt to silty clay	9
6.40	21.0	17.8	17.8	0.47	2.62	-2.7	-2.42	0.5	clayey silt to silty clay	8
6.45	21.2	16.7	16.7	0.43	2.54	-2.7	-2.62	0.6	clayey silt to silty clay	8
6.50	21.3	15.0	15.0	0.35	2.35	-2.5	-2.88	0.6	clayey silt to silty clay	7
6.55	21.5	14.4	14.4	0.34	2.36	-2.5	-3.03	0.6	clayey silt to silty clay	7
6.60	21.7	14.4	14.4	0.31	2.17	-2.6	-3.14	0.6	clayey silt to silty clay	7
6.65	21.8	15.4	15.3	0.25	1.65	-2.4	-2.91	0.6	clayey silt to silty clay	7
6.70	22.0	15.5	15.5	0.26	1.65	-2.3	-2.94	0.6	sandy silt to clayey silt	5
6.75	22.1	17.4	17.4	0.21	1.23	-2.2	-2.51	0.6	clayey silt to silty clay	6
6.80	22.3	17.6	17.7	0.43	2.43	-2.1	-2.4	0.6	clayey silt to silty clay	12
6.85	22.5	22.7	22.7	0.72	3.24	-2.0	-1.82	0.6	clayey silt to silty clay	12
6.90	22.6	35.9	35.9	1.48	4.10	-2.5	-1.39	0.6	silty clay to clay	22
6.95	22.8	40.3	40.2	2.24	5.57	-4.0	-1.42	0.6	clay	32
7.00	23.0	43.3	43.2	2.48	5.72	-4.1	-1.46	0.7	clay	40

Soil interpretation reference: Robertson & Campanella-1988. based on 60% hammer efficiency and .15 m sliding data average

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qt tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Ph)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
7.05	23.1	40.3	40.2	2.23	5.53	-3.9	-1.47	0.7	clay	40
7.10	23.3	40.5	40.4	1.96	4.85	-3.8	-1.46	0.7	clay	38
7.15	23.5	38.6	38.6	1.70	4.40	-3.5	-1.50	0.7	silty clay to clay	24
7.20	23.6	35.6	35.6	1.69	4.73	-3.5	-1.62	0.7	silty clay to clay	24
7.25	23.8	37.5	37.4	1.76	4.53	-3.4	-1.54	0.7	silty clay to clay	24
7.30	23.9	39.1	39.1	1.86	4.75	-3.2	-1.45	0.7	silty clay to clay	25
7.35	24.1	41.0	41.0	2.42	5.82	-3.0	-1.25	0.7	clay	33
7.40	24.3	43.1	43.0	2.76	6.41	-2.6	-1.26	0.7	clay	45
7.45	24.4	56.1	56.0	2.91	5.15	-2.8	-0.99	0.7	clay	47
7.50	24.6	47.8	47.7	2.82	5.91	-2.7	-1.16	0.7	clay	47
7.55	24.8	43.3	43.2	2.44	5.62	-2.6	-1.27	0.7	clay	42
7.60	24.9	40.5	40.5	2.45	6.11	-2.5	-1.35	0.7	clay	42
7.65	25.1	40.5	40.5	2.61	6.37	-2.3	-1.31	0.7	clay	56
7.70	25.3	93.6	93.6	4.14	4.42	-2.4	-0.59	0.7	very stiff fine grained (*)	73
7.75	25.4	112.2	112.6	4.73	4.22	-3.2	-0.55	0.7	very stiff fine grained (*)	[illegible]
7.80	25.6	75.4	75.3	4.67	6.20	-4.2	-0.92	0.7	very stiff fine grained (*)	86
7.85	25.8	67.5	67.4	4.07	6.02	-4.3	-1.05	0.7	very stiff fine grained (*)	[illegible]
7.90	25.9	47.9	47.8	3.12	6.64	-4.3	-1.49	0.7	clay	45
7.95	26.1	25.3	25.2	2.04	8.35	-4.1	-2.42	0.7	clay	33
8.00	26.2	25.6	25.7	1.84	7.13	-3.9	-2.66	0.7	clay	32
8.05	26.4	45.6	45.5	2.06	4.56	-3.3	-1.51	0.7	silty clay to clay	22
8.10	26.6	51.8	51.7	1.63	3.19	-4.1	-1.35	0.6	clayey silt to silty clay	20
8.15	26.7	27.9	27.8	1.23	4.42	-4.0	-2.64	0.6	clayey silt to silty clay	12
8.20	26.9	17.7	17.5	0.82	4.63	-4.1	-4.11	0.6	clay	[illegible]
8.25	27.1	14.0	14.2	0.54	3.82	-4.1	-5.22	0.6	clay	[illegible]
8.30	27.2	11.4	11.4	0.21	1.81	[illegible]	-5.34	0.6	silty clay to clay	6
8.35	27.4	12.4	12.4	0.32	2.61	[illegible]	-5.56	0.6	silty clay to clay	7
8.40	27.6	11.2	11.1	0.32	1.85	-3.3	-6.26	0.6	clayey silt to silty clay	[illegible]
8.45	27.7	14.7	14.7	0.33	2.26	[illegible]	-4.52	0.6	clayey silt to silty clay	[illegible]
8.50	27.9	12.4	12.4	0.32	2.62	[illegible]	-5.60	0.6	clayey silt to silty clay	[illegible]
8.55	28.1	12.7	12.8	0.42	3.29	-3.8	-5.54	0.7	silty clay to clay	[illegible]
8.60	28.2	14.6	14.6	0.41	2.79	-3.3	-4.37	0.7	silty clay to clay	[illegible]
8.65	28.4	12.5	12.5	0.33	3.01	-3.6	-5.74	0.7	silty clay to clay	[illegible]
8.70	28.5	11.8	11.8	0.32	2.75	-3.5	-5.81	0.7	silty clay to clay	[illegible]
8.75	28.7	12.2	12.2	0.30	2.45	-3.2	-5.24	0.7	clayey silt to silty cla	[illegible]
8.80	28.9	12.0	11.9	0.22	1.82	-3.1	-5.57	0.7	clayey silt to silty cla	[illegible]
8.85	29.0	11.6	11.6	0.16	1.39	-3.0	-6.13	0.7	clayey silt to silty cla	[illegible]
8.90	29.2	12.0	11.9	0.22	1.85	-3.1	-5.85	0.7	clayey silt to silty cla	[illegible]
8.95	29.4	15.0	14.9	0.51	3.39	-3.0	-4.21	0.7	clay	12
9.00	29.5	23.6	23.6	1.91	8.06	-2.2	-1.62	0.7	clay	23
9.05	29.7	49.7	49.6	2.82	5.69	[illegible]	-1.45	0.7	clay	[illegible]
9.10	29.9	59.5	58.6	3.34	5.85	-3.0	-1.31	0.7	clay	53
9.15	30.0	59.7	59.6	2.49	3.85	-3.6	-1.32	0.7	very stiff fine grained (*)	[illegible]
9.20	30.2	65.6	65.5	3.56	5.45	-4.1	-1.26	0.7	very stiff fine grained (*)	65
9.25	30.3	82.0	81.9	3.83	4.67	-4.2	-1.02	0.6	very stiff fine grained (*)	72
9.30	30.5	88.2	88.1	4.86	5.51	-5.0	-1.02	0.6	very stiff fine grained (*)	82
9.35	30.7	88.3	88.2	5.95	6.77	-5.2	-1.04	0.6	very stiff fine grained (*)	[illegible]
9.40	30.8	122.1	122.0	6.12	5.05	-5.4	-0.77	0.6	very stiff fine grained (*)	[illegible]
9.45	31.0	141.3	141.2	5.92	4.20	-5.2	-0.57	0.6	very stiff fine grained (*)	[illegible]
9.50	31.2	146.0	145.9	7.14	4.89	-5.5	-0.65	0.6	very stiff fine grained (*)	[illegible]

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .15 m sliding data average

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qt tsf	FRICTION Fs tsf	FF RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Pn)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
9.55	31.3	166.9	166.8	7.99	4.73	-5.5	-0.57	0.6	very stiff fine grained (*)	150
9.60	31.5	155.0	154.9	9.67	6.24	-5.5	-0.62	0.6	very stiff fine grained (*)	174
9.65	31.7	221.5	221.5	8.48	3.83	-5.7	-0.45	0.6	very stiff fine grained (*)	198
9.70	31.8	236.9	236.8	8.91	3.76	-5.6	-0.42	0.8	sand to clayey sand (*)	122
9.75	32.0	304.1	304.0	8.92	2.93	-6.4	-0.35	0.8	sand to clayey sand (*)	131

QUIT for Fs

9.80		319.5		11.02	-6.4	0.8

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qt tsf	FRICTION Fs tsf	FF RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Pn)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
9.80	32.2	276.6	276.6	10.53	3.81	-6.6	-0.39	0.6	sand to clayey sand (*)	132
9.85	32.3	243.6	243.5	11.57	4.75	-6.7	-0.44	0.8	sand to clayey sand (*)	127
9.90	32.5	274.7	274.6	11.20	4.08	-6.7	-0.40	0.6	sand to clayey sand (*)	135
9.95	32.6	327.0	326.9	11.93	3.65	-6.8	-0.34	0.8	sand to clayey sand (*)	145
10.00	32.8	311.1	311.0	11.31	3.63	-7.0	-0.36	0.6	sand to clayey sand (*)	143
10.05	33.0	294.0	293.9	10.45	3.55	-7.0	-0.38	0.6	sand to clayey sand (*)	140
10.10	33.1	272.1	272.0	9.60	3.60	-7.2	-0.42	0.6	sand to clayey sand (*)	130
10.15	33.3	247.3	247.2	10.07	4.07	-7.4	-0.47	0.8	sand to clayey sand (*)	119
10.20	33.5	224.8	224.7	8.71	3.87	-7.3	-0.52	0.8	sand to clayey sand (*)	109
10.25	33.6	205.0	204.9	7.14	3.47	-7.5	-0.56	0.8	sand to clayey sand (*)	104
10.30	33.8	220.1	220.0	7.52	3.42	-7.6	-0.55	0.6	sand to clayey sand (*)	104
10.35	34.0	222.4	222.3	7.53	3.38	-8.3	-0.55	0.7	sand to clayey sand (*)	111
10.40	34.1	254.7	254.6	9.07	3.56	-8.4	-0.50	0.7	sand to clayey sand (*)	122
10.45	34.3	276.3	276.1	9.38	3.39	-8.7	-0.47	0.7	sand to clayey sand (*)	125
10.50	34.4	251.4	251.2	10.27	4.09	-9.0	-0.52	0.7	sand to clayey sand (*)	121
10.55	34.6	230.8	230.7	10.83	4.69	-9.1	-0.57	0.7	very stiff fine grained (*)	205
10.60	34.8	254.6	254.5	11.85	4.65	-9.3	-0.53	0.6	very stiff fine grained (*)	221
10.65	34.9	237.8	237.6	9.57	4.27	-9.7	-0.56	0.6	very stiff fine grained (*)	221
10.70	35.1	200.6	200.4	8.81	4.39	-10.1	-0.70	0.6	sand to clayey sand (*)	97
10.75	35.3	172.3	172.1	6.71	3.89	-11.6	-0.85	0.6	sand to clayey sand (*)	82
10.80	35.4	204.0	203.8	6.97	3.42	-11.8	-0.78	0.6	silty sand to sandy silt	67
10.85	35.6	250.1	249.9	8.15	3.45	-12.0	-0.63	0.6	silty sand to sandy silt	71
10.90	35.8	211.3	211.2	7.02	3.34	-12.2	-0.75	0.5	sand to clayey sand (*)	104
10.95	35.9	190.6	190.4	7.42	3.91	-11.9	-0.82	0.7	sand to clayey sand (*)	88
11.00	36.1	150.1	149.9	7.92	5.27	-12.3	-1.07	0.7	very stiff fine grained (*)	134
11.05	36.2	141.4	141.2	7.22	5.11	-12.7	-1.16	0.6	very stiff fine grained (*)	127
11.10	36.4	137.9	137.7	6.01	4.34	-13.1	-1.21	0.6	very stiff fine grained (*)	127
11.15	36.6	148.7	148.5	6.58	4.35	-13.5	-1.14	0.6	very stiff fine grained (*)	142
11.20	36.7	158.1	158.1	7.62	4.35	-14.1	-1.11	0.6	very stiff fine grained (*)	143
11.25	36.9	153.5	153.3	8.08	5.28	-14.3	-1.12	0.6	very stiff fine grained (*)	155
11.30	37.1	167.4	167.2	7.99	4.78	-14.6	-1.08	0.6	very stiff fine grained (*)	154
11.35	37.2	158.8	158.6	7.21	4.50	-15.0	-1.17	0.6	very stiff fine grained (*)	155
11.40	37.4	172.8	172.7	7.03	4.12	-16.0	-1.16	0.6	very stiff fine grained (*)	161
11.45	37.6	174.4	174.2	6.83	3.91	-17.1	-1.15	0.6	sand to clayey sand (*)	83
11.50	37.7	173.6	173.5	7.13	4.12	-17.4	-1.13	0.6	sand to clayey sand (*)	83
11.55	37.9	170.3	170.0	6.63	3.89	-17.8	-1.22	0.5	sand to clayey sand (*)	80
11.60	38.1	160.1	160.0	5.92	3.70	-17.5	-1.29	0.6	sand to clayey sand (*)	77
11.65	38.2	152.1	151.9	4.63	3.04	-17.5	-1.36	0.6	sandy silt to clayey silt	58
11.70	38.4	135.5	135.2	4.38	3.57	-18.2	-1.51	0.6	sandy silt to clayey silt	54
11.75	38.5	133.1	132.8	3.84	2.89	-18.9	-1.62	0.5	sandy silt to clayey silt	53
11.80	38.7	135.7	135.4	3.61	2.71	-19.2	-1.56	0.6	sandy silt to clayey silt	49

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency, and .15 m sliding data average

SOUNDING DATA IN FILE 00Z267   09-25-00 11:47

OPERATOR : VIRGIL A. BAKER   LOCATION : CPT-2

CONE ID : HO 738 TC - U2   JOB No. :

V B I Insitu Testing Inc.

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP [illegible] tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Ph)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
Baseline		-76.8		-0.49		-26.4		0.0		
0.05	0.2	132.1	132.1	1.73	1.31	0.6	0.03	0.1	[illegible]	[illegible]
0.10	0.3	466.2	466.0	2.21	0.45	0.5	0.01	0.2	sand	[illegible]
0.15	0.5	247.7	247.7	3.46	1.40	0.5	0.02	0.2	sand	[illegible]
0.22	0.7	170.6	170.6	3.76	2.20	0.3	0.01	0.2	sand to silty sand	[illegible]
0.25	0.8	255.6	255.6	4.43	1.73	0.3	0.01	0.2	sand to silty sand	[illegible]
0.30	1.0	222.8	222.8	4.61	2.27	0.7	0.02	0.2	sand to silty sand	[illegible]
0.35	1.1	152.3	152.3	3.43	2.17	0.6	0.03	0.2	silty sand to sandy silt	[illegible]
0.42	1.3	166.7	166.7	3.13	1.88	0.5	0.02	0.3	sand to silty sand	44
0.45	1.5	227.1	227.2	2.55	1.13	0.6	0.02	0.3	sand	[illegible]
0.50	1.6	236.9	236.5	2.29	0.96	0.6	0.02	0.3	sand	44
0.55	1.8	226.2	226.2	2.20	0.97	0.6	0.02	0.3	sand	[illegible]
0.60	2.0	156.6	156.6	1.61	0.92	0.4	0.01	0.3	sand	[illegible]
0.65	2.1	170.3	170.3	1.95	1.14	0.4	0.02	0.3	sand to silty sand	[illegible]
0.70	2.3	134.1	134.1	2.10	1.56	0.2	0.01	0.4	sand to silty sand	[illegible]
0.75	2.5	123.5	123.5	1.91	1.55	0.5	0.02	0.4	sand to silty sand	[illegible]
0.80	2.6	78.9	78.9	1.42	1.80	-0.1	-0.01	0.4	silty sand to sandy silt	[illegible]
0.85	2.8	47.7	47.7	0.92	1.93	-0.0	-0.01	0.4	sandy silt to clayey silt	[illegible]
0.90	3.0	21.4	21.4	0.86	4.01	0.2	0.06	0.4	clayey silt to silty clay	[illegible]
0.95	3.1	13.3	13.3	0.45	3.38	-0.3	-0.16	0.4	silty clay to clay	[illegible]
1.00	3.3	11.9	11.9	0.34	2.81	-0.3	[illegible]	0.4	silty clay to clay	[illegible]
1.05	3.4	10.4	10.4	0.28	2.67	-0.5	-0.33	0.4	silty clay to clay	[illegible]
1.10	3.6	9.1	9.2	0.24	2.62	-0.4	-0.32	0.4	silty clay to clay	[illegible]
1.15	3.8	9.3	9.3	0.30	3.19	-0.2	[illegible]	0.4	silty clay to clay	[illegible]
1.20	3.9	10.2	10.2	0.33	3.58	-0.3	-0.22	0.4	clay	[illegible]
1.25	4.1	11.3	11.3	0.44	3.88	-0.2	-0.17	0.4	clay	[illegible]
1.30	4.3	11.3	11.3	0.44	3.92	0.2	0.21	0.4	clay	[illegible]
1.35	4.4	12.1	12.1	0.45	3.75	0.1	[illegible]	[illegible]	clay	[illegible]
1.40	4.6	13.0	13.0	0.50	3.87	0.2	[illegible]	0.4	clay	[illegible]
1.45	4.8	13.7	13.7	0.54	3.95	0.4	[illegible]	0.4	clay	[illegible]
1.50	4.9	13.9	13.9	0.58	4.18	0.3	0.14	0.4	clay	[illegible]
1.55	5.1	14.5	14.5	0.60	4.13	0.2	[illegible]	0.5	clay	[illegible]
1.60	5.2	14.9	14.9	0.66	4.41	0.4	0.21	0.5	clay	[illegible]
1.65	5.4	15.6	15.6	0.69	4.43	0.2	[illegible]	0.5	clay	[illegible]
1.72	5.6	15.7	15.7	0.68	4.33	0.2	[illegible]	0.5	clay	[illegible]
1.75	5.7	16.9	16.9	0.67	3.97	0.1	[illegible]	0.5	clay	[illegible]
1.80	5.9	16.8	16.8	0.57	4.25	0.3	0.13	0.5	clay	[illegible]
1.85	6.1	16.6	16.6	0.73	4.39	0.4	0.16	0.5	clay	[illegible]
1.90	6.2	16.7	16.7	0.85	5.10	0.2	0.05	0.5	clay	[illegible]
1.95	6.4	19.4	19.4	0.35	4.69	-1.4	[illegible]	0.5	clay	[illegible]
2.00	6.6	17.3	17.2	0.97	5.62	-4.3	[illegible]	0.6	clay	[illegible]

[illegible]

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qt tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Ph)/Qt %	INC I deg	INTERPRETED SOIL TYPE	N SPT
2.05	6.7	15.5	15.4	0.34	6.18	-4.7	-2.21	0.6	clay	15
2.10	6.9	15.1	15.0	0.50	5.99	-4.3	-2.05	0.6	clay	15
2.15	7.1	17.7	17.7	0.99	5.57	-4.3	-1.74	0.6	clay	17
2.20	7.2	19.1	19.0	1.09	5.65	-6.3	-2.38	0.6	clay	17
2.25	7.4	15.6	15.5	[illegible]	6.45	-8.2	-3.77	0.6	clay	15
2.30	7.5	13.8	13.8	0.78	5.66	-6.7	-4.54	0.6	clay	14
2.35	7.7	13.1	13.0	0.74	5.63	-6.7	-4.68	0.6	clay	13
2.40	7.9	13.1	13.0	0.71	5.41	-8.9	-4.65	0.6	clay	13
2.45	8.0	15.6	15.5	1.00	3.20	-6.2	-4.60	0.7	clay	17
2.50	8.2	24.2	24.1	1.18	4.90	-6.7	-2.61	0.7	clay	22
2.55	8.4	23.1	23.0	1.05	4.56	-6.9	-2.25	0.7	silty clay to clay	17
2.60	8.5	23.0	22.8	[illegible]	3.55	-5.2	-2.26	0.7	silty clay to clay	17
2.65	8.7	22.6	22.5	0.96	4.23	-5.2	-2.07	0.7	* silty clay to clay ——	16
2.70	8.9	22.9	22.8	0.87	3.88	-3.8	-2.59	0.7	silty clay to clay	15
2.75	9.0	25.4	25.2	0.79	3.13	-6.7	-2.47	0.7	clayey silt to silty clay	12
2.80	9.2	25.5	25.4	0.67	2.61	-5.5	-2.32	0.7	clayey silt to silty clay	11
2.85	9.4	25.0	24.9	0.58	2.31	-6.9	-2.06	0.7	sandy silt to clayey silt	10
2.90	9.5	26.3	26.2	0.59	2.23	-5.5	-2.22	0.7	sandy silt to clayey silt	10
2.95	9.7	29.7	29.5	0.55	1.85	-6.3	-2.02	0.7	sandy silt to clayey silt	11
3.00	9.8	26.5	26.4	0.50	1.90	-6.3	-2.25	0.7	sandy silt to clayey silt	10
3.05	10.0	25.3	25.2	0.42	1.65	-6.2	-2.26	0.7	sandy silt to clayey silt	10
3.10	10.2	27.3	27.2	0.55	2.03	-6.1	-2.14	0.7	sandy silt to clayey silt	10
3.15	10.3	28.7	28.6	0.67	2.35	-6.6	-2.01	0.6	sandy silt to clayey silt	11
3.20	10.5	31.2	31.1	0.83	2.65	-7.8	-1.80	0.6	sandy silt to clayey silt	13
3.25	10.7	35.3	35.2	0.80	2.26	-7.7	-1.44	0.6	sandy silt to clayey silt	14
3.30	10.8	39.5	39.4	0.76	1.97	-7.7	-1.40	0.6	sandy silt to clayey silt	15
3.35	11.0	40.3	40.2	0.71	1.75	-7.5	-1.32	0.6	sandy silt to clayey silt	15
3.40	11.2	41.5	41.3	0.64	1.55	-7.3	-1.27	0.6	sandy silt to clayey silt	15
3.45	11.3	42.4	42.3	0.92	2.18	[illegible]	[illegible]	0.6	sandy silt to clayey silt	[illegible]
3.50	11.5	42.3	42.2	[illegible]	2.43	-7.1	-1.12	0.5	sandy silt to clayey silt	17
3.55	11.6	[illegible]	41.9	1.36	3.27	-7.6	-1.22	0.5	clayey silt to silty clay	21
3.60	11.8	42.0	41.9	1.50	3.55	-7.8	-1.20	0.5	clayey silt to silty clay	20
3.65	12.0	39.0	39.1	1.66	4.25	-6.9	-1.27	0.5	silty clay to clay	22
3.70	12.1	37.0	36.9	1.66	4.54	-6.8	[illegible]	0.5	silty clay to clay	24
3.75	12.3	36.2	36.1	1.60	4.50	-6.9	[illegible]	0.5	silty clay to clay	22
3.80	12.5	41.5	41.2	1.85	4.46	-6.7	[illegible]	0.5	silty clay to clay	23
3.85	12.6	41.2	41.2	2.03	4.95	-6.1	[illegible]	0.5	silty clay to clay	21
3.90	12.8	43.4	43.3	2.25	5.20	-6.7	[illegible]	0.5	silty clay to clay	25
3.95	13.0	45.1	45.0	2.06	4.58	-6.3	[illegible]	0.5	silty clay to clay	27
4.00	13.1	42.4	42.3	[illegible]	4.24	-6.3	[illegible]	0.5	silty clay to clay	22
4.05	13.3	38.1	38.0	1.34	3.52	-6.3	-1.22	0.5	clayey silt to silty clay	16
4.10	13.5	36.0	36.2	1.28	3.53	-6.0	-1.22	0.5	clayey silt to silty clay	[illegible]
4.15	13.6	36.5	36.4	1.25	3.42	-6.1	-1.23	0.5	clayey silt to silty clay	[illegible]
4.20	13.8	35.4	35.3	1.23	3.46	-6.2	-1.29	0.5	clayey silt to silty clay	[illegible]
4.25	13.9	35.0	34.9	[illegible]	3.66	-6.0	-1.30	0.5	clayey silt to silty clay	[illegible]
4.30	14.1	35.5	35.5	1.51	4.23	-6.3	-1.27	0.5	silty clay to clay	24
4.35	14.3	40.7	40.6	2.08	5.12	-5.8	-1.06	0.5	silty clay to clay	26
4.42	14.4	45.8	45.7	2.01	4.39	-5.7	-0.95	0.6	silty clay to clay	26
4.45	14.6	36.5	36.5	[illegible]	5.15	-5.5	-1.30	0.5	silty clay to clay	22
4.50	14.8	34.7	34.6	1.40	4.03	-5.7	-1.32	0.6	silty clay to clay	22

Soil interpretation reference: Robertson & Campanella-1988, based on 60% hammer efficiency, and 0.5 m sliding data average

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qt tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Ph)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
7.05	23.1	43.3	43.3	1.52	3.51	-0.6	-0.62	1.4	clayey silt to silty clay	21
7.10	23.3	51.2	51.0	1.85	3.63	-0.5	-0.73	1.4	clayey silt to silty clay	24
7.15	23.5	53.1	53.1	2.21	4.16	-0.6	-0.63	1.4	clayey silt to silty clay	25
7.20	23.6	53.2	53.2	2.46	4.61	-0.2	-0.64	1.4	silty clay to clay	34
7.25	23.8	55.4	55.4	2.82	5.09	-0.2	-0.62	1.4	silty clay to clay	35
7.30	23.9	54.2	54.2	3.00	5.54	-0.1	-0.64	1.4	clay	52
7.35	24.1	54.7	54.7	2.83	5.17	0.1	-0.62	1.4	clay	53
7.40	24.3	56.1	56.1	3.29	5.87	0.1	-0.60	1.4	clay	54
7.45	24.4	57.2	57.2	3.42	5.98	0.2	-0.60	1.4	clay	54
7.50	24.6	54.6	54.6	3.12	5.73	0.1	-0.65	1.4	clay	52
7.55	24.8	53.2	53.7	2.46	4.55	0.3	-0.65	1.4	clay	43
7.60	24.9	47.6	47.6	2.42	5.08	0.5	-0.72	1.4	clay	46
7.65	25.1	46.5	46.5	2.42	5.21	0.5	-0.73	1.3	clay	43
7.70	25.3	39.3	39.4	2.03	5.15	0.4	-0.50	1.3	clay	39
7.75	25.4	36.9	36.9	1.74	4.72	0.3	-0.37	1.2	clay	35
7.80	25.6	33.2	33.2	1.54	4.65	0.4	-1.03	1.2	clay	32
7.85	25.8	31.3	31.3	1.49	4.77	0.3	-1.22	1.2	silty clay to clay	28
7.90	25.9	29.9	29.9	1.32	4.40	0.3	-1.27	1.2	silty clay to clay	19
7.95	26.1	27.2	27.2	0.96	3.51	0.1	-1.48	1.1	silty clay to clay	17
8.00	26.2	25.6	25.6	0.88	3.43	0.3	-1.53	1.1	clayey silt to silty clay	12
8.05	26.4	23.1	23.1	0.85	3.68	0.2	-1.72	1.1	clayey silt to silty clay	11
8.10	26.6	21.4	21.4	0.71	3.31	0.2	-1.80	1.1	clayey silt to silty clay	10
8.15	26.7	20.1	20.1	0.71	3.55	0.1	-2.03	1.1	clayey silt to silty clay	10
8.20	26.9	20.4	20.4	0.73	3.58	0.1	-2.03	1.1	silty clay to clay	13
8.25	27.1	19.7	19.7	0.71	3.62	0.1	-2.30	1.1	silty clay to clay	12
8.30	27.2	17.3	17.3	0.67	3.87	0.2	-2.47	1.1	silty clay to clay	12
8.35	27.4	16.5	16.5	0.70	4.25	0.1	-2.37	1.1	silty clay to clay	12
8.40	27.6	15.7	15.7	0.69	4.37	0.1	-2.55	1.1	clay	15
8.45	27.7	15.3	15.3	0.61	[illegible]	0.1	-2.61	1.1	clay	15
8.50	27.9	17.5	17.5	0.83	4.76	0.1	-2.50	1.1	clay	17
8.55	28.1	16.7	16.7	0.60	3.57	0.1	-2.72	1.1	clay	16
8.60	28.2	16.0	16.0	0.59	3.72	0.1	-2.63	1.1	silty clay to clay	10
8.65	28.4	15.6	15.6	0.57	3.64	0.1	-2.58	1.1	silty clay to clay	10
8.70	28.5	16.3	16.3	0.57	3.51	0.2	-2.67	1.1	silty clay to clay	11
8.75	28.7	18.2	18.0	0.63	3.54	0.2	-2.29	1.2	clay	15
8.80	28.9	24.8	24.8	1.38	5.58	0.3	-1.50	1.2	silty clay to clay	24
8.85	29.0	72.5	72.5	2.50	3.45	0.5	-0.65	1.2	clayey silt to silty clay	28
8.90	29.2	66.2	66.2	1.50	2.25	-1.2	-0.65	1.2	sandy silt to clayey silt	24
8.95	29.4	20.1	20.1	0.92	4.55	-3.3	-2.76	1.3	sandy silt to clayey silt	17
9.00	29.5	22.6	22.6	0.90	3.99	-3.0	-3.22	1.3	silty clay to clay	17
9.05	29.7	25.1	25.1	1.03	4.10	-2.9	-2.63	1.3	silty clay to clay	12
9.10	29.9	26.7	26.6	1.35	5.05	-2.7	-2.63	1.3	silty clay to clay	13
9.15	30.0	35.4	35.3	1.45	4.13	-2.7	-2.03	1.3	silty clay to clay	21
9.20	30.2	37.1	37.1	1.59	4.29	-2.8	-1.58	1.3	silty clay to clay	24
9.25	30.3	40.2	40.2	2.15	5.35	-2.5	-1.73	1.3	silty clay to clay	27
9.30	30.5	50.5	50.6	1.76	3.47	-2.8	-1.47	1.3	silty clay to clay	22
9.35	30.7	28.4	28.4	1.44	5.08	-2.8	-2.05	1.3	silty clay to clay	[illegible]
9.40	30.8	21.5	21.5	1.12	5.22	-2.4	-3.32	1.3	silty clay to clay	12
9.45	31.0	23.5	23.5	0.67	2.86	-2.3	-3.07	1.2	silty clay to clay	12
9.50	31.2	14.6	14.6	0.52	3.61	-2.1	-4.55	1.3	silty clay to clay	[illegible]

Soil interpretation reference: Robertson & Campanella-1988, based on 60% hammer efficiency and 0.15 m sliding data average

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qt tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Ph)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
12.05	39.5	13.9	14.0	0.24	1.76	5.1	-3.30	2.3	clayey silt to silty clay	7
12.10	39.7	13.5	13.5	0.22	1.65	5.3	-3.32	2.4	clayey silt to silty clay	6
12.15	39.9	12.6	12.9	0.30	2.33	5.5	-3.41	2.4	clayey silt to silty clay	7
12.20	40.0	16.1	16.2	0.36	2.21	5.6	-2.70	2.4	clayey silt to silty clay	7
12.25	40.2	17.3	17.4	0.54	3.12	5.8	-2.45	2.4	clayey silt to silty clay	9
12.30	40.4	21.0	21.1	0.61	2.88	6.3	-1.90	2.4	clayey silt to silty clay	10
12.35	40.5	26.6	26.7	1.10	4.12	6.6	-1.42	2.4	silty clay to clay	17
12.40	40.7	33.2	33.3	1.35	4.28	7.1	-1.05	2.5	clay	32
12.45	40.8	35.1	35.2	2.04	5.80	7.7	-0.85	2.6	clay	35
12.50	41.0	40.4	40.5	2.30	5.69	8.1	-0.71	2.6	clay	37
12.55	41.2	33.1	33.2	1.50	4.66	7.8	-0.83	2.7	clay	32
12.60	41.3	38.8	39.0	1.95	5.02	8.2	-0.74	2.7	clay	37
12.65	41.5	38.2	38.3	2.45	6.41	8.3	-0.75	2.7	clay	41
12.70	41.7	51.5	51.6	2.65	5.17	8.7	-0.51	2.7	clay	45
12.75	41.8	45.0	45.1	2.87	6.38	8.6	-0.62	2.7	clay	45
12.80	42.0	45.8	45.9	2.73	5.95	9.1	-0.52	2.7	clay	45
12.85	42.2	49.2	49.4	2.92	5.92	10.4	-0.32	2.7	clay	48
12.90	42.3	43.1	43.2	2.55	5.91	10.7	-0.18	2.7	clay	43
12.95	42.5	54.5	54.7	4.42	8.12	10.7	-0.26	2.7	very stiff fine grained (*)	61
13.00	42.7	87.0	87.2	4.99	5.74	12.6	-0.16	2.7	very stiff fine grained (*)	59
13.05	42.8	57.1	57.3	4.39	7.68	8.4	-0.58	2.6	very stiff fine grained (*)	62
13.10	43.0	45.3	45.4	2.32	5.13	10.7	-0.35	2.6	clay	47
13.15	43.1	45.2	45.4	2.12	4.69	11.2	-0.25	2.6	clay	42
13.20	43.3	42.5	42.7	3.09	7.27	11.3	-0.31	2.6	clay	47
13.25	43.5	59.3	59.4	4.22	7.13	11.1	-0.25	2.6	clay	55
13.30	43.6	63.7	63.8	4.76	7.47	7.9	-0.50	2.6	very stiff fine grained (*)	61
13.35	43.8	66.3	66.4	4.49	6.58	6.4	-0.73	2.6	very stiff fine grained (*)	51
13.40	44.0	53.5	53.6	4.21	7.86	5.1	-1.11	2.6	clay	53
13.45	44.1	44.2	44.3	3.12	6.73	5.3	-1.31	2.6	clay	42
13.50	44.3	51.1	51.2	2.41	4.72	4.5	-1.27	2.5	clay	45
13.55	44.5	35.6	35.6	2.24	6.14	3.4	-1.62	2.5	clay	42
13.60	44.6	43.1	43.2	3.40	7.89	2.6	-1.34	2.5	clay	51
13.65	44.8	62.6	66.1	4.52	6.62	3.5	-0.74	2.5	very stiff fine grained (*)	55
13.70	44.9	61.0	61.2	4.48	7.35	0.5	-1.50	2.5	very stiff fine grained (*)	64
13.75	45.1	46.5	46.6	2.74	5.63	2.5	-1.76	2.6	clay	52
13.80	45.3	49.4	49.4	3.22	6.73	2.6	-1.65	2.6	clay	54
13.85	45.4	73.5	73.6	4.65	6.32	3.5	-1.05	2.6	very stiff fine grained (*)	72
13.90	45.6	97.4	97.5	5.90	6.02	3.2	-0.81	2.6	very stiff fine grained (*)	98
13.95	45.8	133.7	129.7	5.56	4.27	3.2	-0.61	2.6	very stiff fine grained (*)	111
14.00	45.9	131.0	131.0	6.05	5.01	2.1	-0.72	2.6	very stiff fine grained (*)	107
14.05	46.1	84.7	84.7	4.72	5.57	-0.5	-1.25	2.6	very stiff fine grained (*)	63
14.10	46.3	53.4	53.3	3.60	6.80	-1.7	-2.17	2.6	very stiff fine grained (*)	55
14.15	46.4	44.5	44.5	1.88	4.23	-1.3	-2.58	2.5	clay	42
14.20	46.6	33.0	33.0	0.98	2.95	-1.5	-3.50	2.5	clayey silt to silty clay	16
14.25	46.8	20.5	20.5	0.70	3.42	-1.3	-5.58	2.5	clayey silt to silty clay	12
14.30	46.9	21.5	21.5	0.57	2.66	-1.1	-5.25	2.7	clayey silt to silty clay	12
14.35	47.1	21.4	21.4	0.71	3.30	-1.1	-5.12	2.7	clayey silt to silty clay	11
14.40	47.2	23.6	23.6	0.72	3.04	-1.2	-4.77	2.8	clayey silt to silty clay	11
14.45	47.4	23.6	23.6	0.77	3.22	-0.9	-4.77	2.8	clayey silt to silty clay	12
14.50	47.6	26.6	26.6	0.93	3.48	-0.6	-4.37	2.8	clayey silt to silty clay	12

Soil interpretation reference: Robertson & Campanella-1983. Based on 60% hammer efficiency and .15 m sliding data average

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qc tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Pn)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
14.55	47.7	27.3	27.2	1.06	3.94	-0.3	-4.19	2.6	silty clay to clay	18
14.60	47.9	32.5	32.5	1.41	4.30	-0.7	-3.46	2.6	silty clay to clay	21
14.65	48.1	32.7	32.7	1.35	3.55	-0.7	-2.95	2.6	silty clay to clay	22
14.70	48.2	33.3	33.3	1.36	4.10	-0.6	-3.43	2.6	silty clay to clay	22
14.75	48.4	32.8	32.8	1.57	4.80	-0.3	-3.44	2.6	silty clay to clay	22
14.80	48.6	36.4	36.4	1.54	4.23	-0.4	-3.11	2.6	silty clay to clay	23
14.85	48.7	36.5	36.7	1.45	3.93	-0.1	-3.04	2.6	silty clay to clay	21
14.90	48.9	26.4	26.4	1.15	4.35	0.0	-4.23	2.6	silty clay to clay	18
14.95	49.0	23.0	23.0	0.87	3.75	0.2	-4.61	2.6	silty clay to clay	[illegible]
15.00	49.2	23.2	23.2	0.83	3.58	0.3	-4.77	2.6	silty clay to clay	[illegible]
15.05	49.4	24.1	24.1	0.87	3.60	0.3	-4.22	2.6	silty clay to clay	16
15.10	49.5	26.6	26.6	1.05	3.97	0.3	-4.17	2.6	silty clay to clay	18
15.15	49.7	33.4	33.4	1.54	4.62	0.5	-3.30	2.6	silty clay to clay	[illegible]
15.20	49.9	56.9	56.9	2.37	4.17	0.6	-1.91	2.6		
15.25	50.0	63.3	63.3	?	?	0.4	-1.62	2.6		
15.30	50.2	46.7	46.7	?	?	0.5	-2.40	2.6		

WRITE NUMBER OF RODS USED __

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .15 m sliding data average

SOUNDING DATA IN FILE 00Z268 09-25-00 14:21

OPERATOR : VIRGIL A. BAKER LOCATION : CPT-3

CONE ID : HD 738 TC - U2 JOB No. :

V & I Insitu Testing Inc.

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qt tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Ph)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
Baseline		-76.5		-0.46		-24.3		0.0		
0.05	0.2	332.6	332.6	1.3	0.38	-0.6	-0.00	0.1		
0.10	0.3	606.3	606.8	1.64	0.27	0.0	0.00	0.6	gravelly sand to sand	75
0.15	0.5	380.2	380.2	2.80	0.74	0.2	0.01	0.5	gravelly sand to sand	73
0.20	0.7	320.1	320.1	2.66	0.82	1.6	0.04	0.7	sand	57
0.25	0.8	266.4	266.4	2.04	0.33	0.1	0.00	0.7	sand	42
0.30	1.0	124.6	124.6	2.56	2.06	0.3	0.02	0.6	sand to silty sand	34
0.35	1.1	34.6	34.6	2.67	2.62	0.4	0.03	0.6	sandy silt to clayey silt	32
0.40	1.3	23.2	23.2	2.22	6.30	0.3	0.05	0.5	clayey silt to silty clay	22
0.45	1.5	16.6	16.5	0.50	5.34	2.5	1.22	0.5	clay	15
0.50	1.6	14.4	14.4	0.57	3.99	2.7	1.64	0.5	clay	14
0.55	1.8	13.6	13.6	0.57	4.11	3.4	1.76	0.5	silty clay to clay	10
0.60	2.0	15.6	15.6	0.50	3.20	3.1	1.11	0.5	clayey silt to silty clay	9
0.65	2.1	22.4	22.4	0.32	2.76	2.5	0.17	0.5	clayey silt to silty clay	11
0.70	2.3	20.2	20.2	0.55	2.12	0.3	0.07	0.5	sandy silt to clayey silt	9
0.75	2.5	25.1	25.1	0.42	1.69	-0.6	-0.22	0.5	sandy silt to clayey silt	5
0.80	2.6	15.5	15.5	0.35	2.32	-0.8	-0.35	0.5	clayey silt to silty clay	6
0.85	2.8	16.7	16.7	0.52	3.01	0.7	0.47	0.5	clayey silt to silty clay	7
0.90	3.0	14.5	14.5	0.26	1.80	0.2	0.08	0.5	clayey silt to silty clay	7
0.95	3.1	16.4	16.4	0.24	1.33	-0.1	-0.02	0.5	sandy silt to clayey silt	6
1.00	3.3	15.3	15.3	0.19	1.21	-2.4	-0.17	0.5	sandy silt to clayey silt	6
1.05	3.4	13.2	13.2	0.20	1.52	-0.6	-0.42	0.5	clayey silt to silty clay	6
1.10	3.6	10.1	10.1	0.15	1.51	-0.8	-0.50	0.5	clayey silt to silty clay	5
1.15	3.8	6.1	6.1	0.14	2.34	-0.4	-0.42	0.5	silty clay to clay	5
1.20	3.9	5.1	5.1	0.17	3.40	0.6	1.15	0.5	clay	5
1.25	4.1	6.0	6.0	0.20	3.34	1.1	1.37	0.5	silty clay to clay	5
1.30	4.3	12.9	12.9	0.22	2.15	0.5	0.12	0.5	clayey silt to silty clay	5
1.35	4.4	16.1	16.1	0.24	1.51	0.6	0.20	0.6	clayey silt to silty clay	7
1.40	4.6	15.6	15.6	0.23	1.49	0.0	0.01	0.6	sandy silt to clayey silt	6
1.45	4.8	17.2	17.2	0.24	1.41	0.0	0.00	0.6	sandy silt to clayey silt	7
1.50	4.9	22.7	22.7	0.31	1.36	-0.2	-0.06	0.5	sandy silt to clayey silt	9
1.55	5.1	29.3	29.3	0.35	1.19	-0.5	-0.10	0.7	sandy silt to clayey silt	11
1.60	5.2	33.2	33.3	0.37	1.10	-0.5	-0.11	0.7	silty sand to sandy silt	11
1.65	5.4	36.5	36.5	0.41	1.11	-0.1	-0.02	0.7	silty sand to sandy silt	11
1.70	5.6	37.3	37.3	0.41	1.25	-0.2	-0.03	0.6	silty sand to sandy silt	12
1.75	5.7	39.2	39.2	0.46	1.16	-0.2	-0.04	0.5	silty sand to sandy silt	13
1.80	5.9	43.5	43.5	0.55	1.27	-2.4	-0.05	0.6	silty sand to sandy silt	14
1.85	6.1	52.7	52.7	0.65	1.23	-0.0	-0.00	0.5	silty sand to sandy silt	16
1.90	6.2	55.7	55.7	0.74	1.31	-1.8	-0.23	0.5	silty sand to sandy silt	16
1.95	6.4	56.1	56.1	0.79	1.41	-1.5	-0.15	0.5	silty sand to sandy silt	16
2.00	6.6	54.4	54.4	0.79	1.44	-1.2	-0.15	0.5	silty sand to sandy silt	16

Soil interpretation reference: Robertson & Campanella-1988, based on 60% hammer efficiency and 1.5 x sliding data average

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qt tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Pn)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
2.05	6.7	57.9	57.9	1.10	1.91	-0.7	-0.09	0.9	silty sand to sandy silt	17
2.10	6.9	51.2	51.2	1.12	2.18	-1.2	-0.15	1.0	sandy silt to clayey silt	19
2.15	7.1	36.0	36.0	0.91	2.51	-0.3	-0.07	1.0	silty sand to sandy silt	16
2.20	7.2	62.4	62.4	0.53	0.85	-1.9	-0.22	1.0	silty sand to sandy silt	17
2.25	7.4	53.2	53.2	[illegible]	0.55	-1.1	-0.13	1.0	sand to silty sand	15
2.30	7.5	50.3	50.3	0.23	0.45	-2.6	-0.12	1.0	sand to silty sand	14
2.35	7.7	54.6	54.6	0.35	0.64	0.2	0.03	1.0	sand to silty sand	13
2.40	7.9	52.7	52.7	0.49	0.93	0.9	0.12	1.0	silty sand to sandy silt	17
2.45	8.0	54.6	54.6	0.57	1.04	0.3	0.07	1.0	silty sand to sandy silt	16
2.50	8.2	63.6	63.6	0.65	1.02	0.1	0.02	1.0	silty sand to sandy silt	21
2.55	8.4	63.7	63.6	1.23	1.54	0.8	0.07	1.1	silty sand to sandy silt	22
2.60	8.5	66.5	66.5	1.72	2.58	1.1	0.13	1.0	sandy silt to clayey silt	24
2.65	8.7	38.2	38.2	1.57	4.11	1.2	0.22	1.0	clayey silt to silty clay	21
2.70	8.9	25.4	25.5	1.37	5.18	3.2	1.07	1.0	clay	30
2.75	9.0	30.4	30.5	1.36	4.47	3.0	0.66	1.0	clay	23
2.80	9.2	26.8	26.8	1.18	4.39	3.0	0.80	1.0	silty clay to clay	18
2.85	9.4	26.8	26.8	0.91	3.39	4.0	1.07	1.1	clayey silt to silty clay	13
2.90	9.5	28.7	28.7	0.73	2.51	4.1	1.10	1.1	clayey silt to silty clay	13
2.95	9.7	26.3	26.3	0.72	2.73	4.1	1.12	1.1	clayey silt to silty clay	12
3.00	9.8	24.6	24.6	0.70	2.86	4.3	1.25	1.1	clayey silt to silty clay	12
3.05	10.0	22.9	23.0	0.61	2.64	4.5	1.41	1.1	clayey silt to silty clay	11
3.10	10.2	21.6	21.9	0.60	2.72	4.6	1.51	1.1	clayey silt to silty clay	11
3.15	10.3	21.0	21.1	0.72	3.18	4.6	1.43	1.1	clayey silt to silty clay	11
3.20	10.5	21.5	21.6	0.53	3.51	4.5	1.41	1.1	silty clay to clay	12
3.25	10.7	25.6	25.6	1.01	3.92	3.8	1.06	1.1	silty clay to clay	13
3.30	10.8	22.6	22.6	0.85	4.13	2.8	1.00	1.1	silty clay to clay	14
3.35	11.0	17.3	17.3	0.81	4.67	2.4	0.93	1.1	clay	17
3.40	11.2	16.3	16.4	0.73	4.45	2.4	1.24	1.1	clay	13
3.45	11.3	16.3	16.3	0.75	4.61	2.0	0.88	1.1	clay	15
3.50	11.5	16.9	16.9	0.80	4.73	1.7	0.75	1.1	clay	17
3.55	11.6	19.7	19.7	1.16	5.92	1.1	0.53	1.1	clay	21
3.60	11.8	27.7	27.7	1.33	4.78	-2.9	-0.24	1.1	clay	23
3.65	12.0	24.3	24.3	1.42	5.82	-2.8	-0.81	1.2	clay	20
3.70	12.1	23.3	23.4	1.33	5.64	-2.8	-0.75	1.2	clay	23
3.75	12.3	26.7	26.7	1.36	5.09	-2.6	-0.76	1.2	clay	23
3.80	12.5	26.7	26.6	1.21	4.73	-3.0	-0.81	1.2	clay	22
3.85	12.6	23.8	23.7	1.04	4.40	-2.8	-0.76	1.2	clay	24
3.90	12.8	23.8	23.7	1.01	4.26	-2.4	-0.63	1.3	silty clay to clay	15
3.95	13.0	25.1	25.0	1.00	3.99	-2.6	-0.53	1.2	silty clay to clay	13
4.00	13.1	26.6	26.6	1.12	4.21	-2.1	-0.57	1.3	silty clay to clay	17
4.05	13.3	27.4	27.4	0.99	3.62	-2.1	-0.53	1.3	silty clay to clay	17
4.10	13.5	26.6	26.6	0.97	3.66	-1.9	-0.56	1.3	clayey silt to silty clay	13
4.15	13.6	27.5	27.5	0.94	3.43	-1.5	-0.45	1.3	clayey silt to silty clay	12
4.20	13.8	28.7	28.7	1.04	3.62	-1.5	-0.45	1.3	clayey silt to silty clay	14
4.25	13.9	29.2	29.2	1.12	3.85	-1.4	-0.45	1.3	clayey silt to silty clay	14
4.30	14.1	30.7	30.7	1.20	3.92	-1.3	-0.40	1.3	silty clay to clay	19
4.35	14.3	30.6	30.6	1.34	4.34	-1.3	-0.41	1.3	silty clay to clay	20
4.40	14.4	31.6	31.6	1.34	4.25	-1.2	-0.40	1.3	silty clay to clay	19
4.45	14.6	28.7	28.7	1.51	5.26	-1.0	-0.42	1.4	silty clay to clay	19
4.50	14.8	28.8	28.8	1.14	3.99	-0.9	-0.41	1.4	clay	22

Soil interpretation reference: Robertson & Campanella-1988, based on 60% hammer efficiency and .15 m sliding data average

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qt tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Pn)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
4.55	14.9	23.2	23.1	1.01	4.37	-1.2	-0.62	1.3	silty clay to clay	16
4.60	15.1	23.7	23.7	0.88	3.72	-1.0	-0.55	1.4	silty clay to clay	15
4.65	15.3	24.4	24.4	0.93	3.80	-0.9	-0.52	1.4	silty clay to clay	15
4.70	15.4	23.2	23.2	0.88	3.81	-0.6	-0.57	1.3	silty clay to clay	15
4.75	15.6	23.2	23.2	0.92	3.95	-0.5	-0.61	1.3	silty clay to clay	15
4.80	15.7	23.2	23.2	0.79	3.39	-0.7	-0.58	1.4	clayey silt to silty clay	12
4.85	15.9	23.8	23.7	0.67	2.82	-0.5	-0.52	1.4	clayey silt to silty clay	11
4.90	16.1	23.2	23.2	0.65	2.79	-0.1	-0.44	1.4	clayey silt to silty clay	11
4.95	16.2	23.5	23.5	0.60	2.51	-0.3	-0.49	1.4	clayey silt to silty clay	11
5.00	16.4	23.4	23.4	0.59	2.53	-0.2	-0.49	1.4	clayey silt to silty clay	11
5.05	16.6	23.9	23.9	0.65	2.72	-0.1	-0.47	1.4	clayey silt to silty clay	12
5.10	16.7	26.2	26.2	0.67	2.55	-0.1	-0.45	1.4	clayey silt to silty clay	12
5.15	16.9	25.0	25.0	0.72	2.88	0.1	-0.42	1.4	clayey silt to silty clay	12
5.20	17.1	24.3	24.3	0.65	2.68	0.2	-0.44	1.4	clayey silt to silty clay	12
5.25	17.2	23.4	23.4	0.65	2.78	0.2	-0.43	1.4	clayey silt to silty clay	11
5.30	17.4	23.1	23.1	0.52	2.23	0.3	-0.49	1.4	clayey silt to silty clay	11
5.35	17.6	21.4	21.4	0.47	2.22	0.4	-0.52	1.4	sandy silt to clayey silt	5
5.40	17.7	22.4	22.4	0.42	1.92	0.6	-0.44	1.4	sandy silt to clayey silt	5
5.45	17.9	23.2	23.2	0.51	2.21	0.6	-0.46	1.5	sandy silt to clayey silt	5
5.50	18.0	24.2	24.2	0.51	2.11	0.6	-0.46	1.5	sandy silt to clayey silt	5
5.55	18.2	23.1	23.1	0.49	2.11	0.7	-0.46	1.5	sandy silt to clayey silt	5
5.60	18.4	21.6	21.6	0.48	2.22	0.9	-0.46	1.5	sandy silt to clayey silt	6
5.65	18.5	21.2	21.2	0.45	2.14	0.9	-0.50	1.5	clayey silt to silty clay	10
5.70	18.7	20.4	20.4	0.47	2.30	1.0	-0.50	1.5	clayey silt to silty clay	10
5.75	18.9	22.8	22.4	0.52	2.32	1.2	-0.41	1.5	clayey silt to silty clay	11
5.80	19.0	22.8	22.8	0.52	2.45	1.3	-0.35	1.6	clayey silt to silty clay	11
5.85	19.2	24.8	24.7	0.58	2.34	-1.5	-1.21	1.6	sandy silt to clayey silt	5
5.90	19.4	24.2	24.2	0.53	2.20	-1.4	-1.21	1.6	sandy silt to clayey silt	5
5.95	19.5	22.4	22.4	0.50	2.22	-1.3	-1.29	1.6	sandy silt to clayey silt	5
6.00	19.7	21.7	21.7	0.42	1.92	-0.8	-1.22	1.6	sandy silt to clayey silt	6
6.05	19.8	21.5	21.5	0.45	2.04	-0.6	-1.15	1.6	sandy silt to clayey silt	6
6.10	20.0	21.5	21.5	0.46	2.12	-0.4	-1.12	1.6	sandy silt to clayey silt	6
6.15	20.2	23.1	23.1	0.52	2.41	-0.1	-0.97	1.6	clayey silt to silty clay	11
6.20	20.3	24.6	24.6	0.75	3.02	-0.1	-0.52	1.6	clayey silt to silty clay	12
6.25	20.5	25.4	25.4	0.87	3.42	0.0	-0.51	1.6	clayey silt to silty clay	12
6.30	20.7	24.2	24.6	0.91	3.70	0.4	-0.87	1.6	silty clay to clay	13
6.35	20.8	21.7	21.7	0.85	3.92	0.3	-1.00	1.6	silty clay to clay	14
6.40	21.0	20.3	20.3	0.63	3.13	0.5	-1.24	1.6	clayey silt to silty clay	10
6.45	21.2	22.0	22.0	0.62	2.84	0.5	-0.84	1.7	clayey silt to silty clay	11
6.50	21.3	24.6	24.6	0.55	2.23	1.0	-0.75	1.7	clayey silt to silty clay	11
6.55	21.5	20.2	20.2	0.49	2.42	1.1	-0.69	1.7	clayey silt to silty clay	10
6.60	21.7	19.5	19.5	0.37	1.89	1.3	-0.85	1.7	clayey silt to silty clay	5
6.65	21.8	17.4	17.4	0.31	1.78	1.3	-1.01	1.7	sandy silt to clayey silt	7
6.70	22.0	16.4	16.5	0.29	1.78	1.6	-1.00	1.7	sandy silt to clayey silt	6
6.75	22.1	16.5	16.5	0.28	1.68	1.7	-0.93	1.7	sandy silt to clayey silt	7
6.80	22.3	18.1	18.1	0.32	1.79	1.9	-0.64	1.8	sandy silt to clayey silt	7
6.85	22.5	22.6	22.6	0.37	1.62	2.6	-0.47	1.8	sandy silt to clayey silt	8
6.90	22.6	23.1	23.2	0.45	1.97	2.7	-0.44	1.8	sandy silt to clayey silt	5
6.95	22.8	27.5	27.6	0.58	2.04	3.0	-0.32	1.8	sandy silt to clayey silt	11
7.00	23.0	33.1	33.1	0.72	2.18	3.3	-0.22	1.8	sandy silt to clayey silt	13

Soil interpretation reference: Robertson & Campanella-1983. based on 60% hammer efficiency and .15 m sliding data average

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qc tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Pn)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
7.05	23.1	39.1	39.1	0.96	2.46	3.6	-0.13	1.6	sandy silt to clayey silt	15
7.10	23.3	44.2	44.3	1.18	2.67	4.4	-0.01	1.6	sandy silt to clayey silt	18
7.15	23.5	54.0	54.1	1.74	3.23	4.9	0.06	1.6	clayey silt to silty clay	25
7.20	23.6	56.6	56.5	2.23	3.93	5.2	0.09	1.6	clayey silt to silty clay	27
7.25	23.8	57.5	57.6	2.52	4.36	5.4	0.10	1.6	clayey silt to silty clay	27
7.30	23.9	56.1	56.2	2.46	4.39	5.7	0.13	1.6	silty clay to clay	35
7.35	24.1	52.4	52.5	2.62	4.99	5.7	0.12	1.6	silty clay to clay	34
7.40	24.3	50.6	50.6	2.66	5.26	5.4	0.06	1.6	clay	42
7.45	24.4	47.7	47.8	2.74	5.74	5.4	0.07	1.6	clay	46
7.50	24.6	46.4	46.5	2.67	5.75	5.3	0.05	1.6	clay	46
7.55	24.8	51.1	51.1	2.68	5.24	5.1	0.01	1.6	clay	45
7.60	24.9	44.1	44.2	2.48	5.63	5.1	-0.20	1.6	clay	47
7.65	25.1	51.0	51.1	2.81	5.50	5.1	-0.01	1.6	clay	45
7.70	25.3	57.5	57.6	3.02	5.25	4.5	-0.10	1.7	clay	50
7.75	25.4	47.5	47.6	3.08	6.47	3.5	-0.22	1.7	clay	47
7.80	25.6	41.9	41.9	3.35	8.11	3.7	-0.29	1.7	clay	44
7.85	25.8	48.5	49.0	3.42	6.99	3.7	-0.25	1.7	clay	46
7.90	25.9	52.9	53.0	3.37	6.36	3.7	-0.25	1.7	clay	47
7.95	26.1	44.4	44.5	3.13	7.05	3.1	-0.41	1.7	clay	42
8.00	26.2	35.7	35.7	2.05	5.75	3.1	-0.52	1.7	clay	34
8.05	26.4	27.1	27.2	1.39	5.14	3.7	-0.58	1.7	clay	26
8.10	26.6	23.5	23.6	1.16	4.97	3.7	-0.64	1.6	clay	23
8.15	26.7	22.4	22.5	1.10	4.91	3.8	-0.66	1.6	clay	22
8.20	26.9	22.5	22.5	0.96	4.25	4.0	-0.64	1.5	clay	21
8.25	27.1	21.6	21.7	0.80	3.65	3.9	-0.78	1.5	silty clay to clay	17
8.30	27.2	19.5	19.6	0.66	3.35	3.8	-0.92	1.5	silty clay to clay	15
8.35	27.4	16.5	16.6	0.55	3.38	3.9	-1.02	1.5	silty clay to clay	11
8.40	27.6	16.2	16.2	0.55	3.41	3.9	-1.06	1.5	silty clay to clay	12
8.45	27.7	15.5	15.6	0.56	3.58	3.8	-1.16	1.5	silty clay to clay	10
8.50	27.9	15.6	15.6	0.57	3.64	3.7	-1.24	1.5	silty clay to clay	10
8.55	28.1	15.7	15.8	0.57	3.61	3.6	-1.32	1.5	silty clay to clay	10
8.60	28.2	13.9	14.0	0.54	3.84	3.7	-1.45	1.5	silty clay to clay	9
8.65	28.4	12.6	12.6	0.46	3.67	3.8	-1.71	1.5	silty clay to clay	8
8.70	28.5	11.4	11.5	0.40	3.51	3.8	-1.93	1.5	silty clay to clay	[illegible]
8.75	28.7	10.5	10.6	0.35	3.32	3.9	-2.00	1.5	silty clay to clay	[illegible]
8.80	28.9	11.4	11.4	0.39	3.47	3.9	-1.90	1.5	silty clay to clay	8
8.85	29.0	13.7	13.8	0.47	3.41	4.2	-1.46	1.5	silty clay to clay	8
8.90	29.2	13.3	13.4	0.56	4.20	4.4	-1.40	1.5	clay	13
8.95	29.4	14.6	14.7	0.63	4.28	4.4	-1.31	1.5	clay	14
9.00	29.5	17.5	17.5	0.66	3.79	4.4	-1.10	1.5	silty clay to clay	11
9.05	29.7	16.0	16.1	0.61	3.38	4.2	-1.16	1.5	silty clay to clay	11
9.10	29.9	15.3	15.3	0.59	3.85	4.3	-1.23	1.5	silty clay to clay	11
9.15	30.0	16.6	16.6	0.55	3.33	4.6	-1.19	1.5	silty clay to clay	10
9.20	30.2	16.7	16.7	0.53	3.17	4.6	-1.22	1.5	clayey silt to silty clay	8
9.25	30.3	17.1	17.1	0.53	3.11	4.8	-1.20	1.5	clayey silt to silty clay	8
9.30	30.5	16.0	16.1	0.51	3.19	4.9	-1.18	1.6	silty clay to clay	10
9.35	30.7	15.1	15.2	0.52	3.34	4.9	-1.29	1.7	silty clay to clay	10
9.40	30.8	16.2	16.3	0.60	3.69	5.1	-1.12	1.7	clay	15
9.45	31.0	18.5	18.5	0.95	5.15	5.2	-0.95	1.7	clay	20
9.50	31.2	25.3	25.4	1.23	4.48	5.3	-0.63	1.7	clay	25

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .15 m sliding data average

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qt tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Pn)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
9.55	31.3	31.4	31.4	1.61	5.12	4.6	-0.71	1.7	silty clay to clay	21
9.60	31.5	39.7	39.7	1.17	2.95	4.3	-0.67	1.8	silty clay to clay	22
9.65	31.7	22.5	22.6	1.16	5.26	3.8	-1.34	1.8	silty clay to clay	17
9.70	31.8	16.7	16.6	0.74	4.41	4.5	-1.55	1.8	clay	17
9.75	32.0	12.9	12.9	0.61	4.73	4.6	-1.93	1.8	clay	14
9.80	32.2	13.4	13.5	0.65	4.85	4.8	-1.64	1.8	clay	13
9.85	32.3	15.7	15.6	0.67	4.25	5.5	-1.29	2.0	clay	14
9.90	32.5	15.3	15.4	0.68	4.42	6.0	-1.11	2.0	clay	15
9.95	32.6	15.6	15.9	0.64	4.05	6.2	-1.04	2.0	clay	[illegible]
10.00	32.8	15.6	15.9	0.63	3.99	6.2	-1.05	2.0	clay	15
10.05	33.0	15.4	15.5	0.71	4.64	6.3	-1.07	2.0	clay	15
10.10	33.1	15.6	15.9	0.72	4.77	6.3	-1.09	2.0	clay	15
10.15	33.3	14.6	14.9	0.81	5.43	6.2	-1.21	2.0	clay	15
10.20	33.5	17.1	17.2	0.84	4.92	6.6	-0.95	2.0	clay	15
10.25	33.6	15.4	15.5	0.84	5.42	6.5	-1.11	2.0	clay	15
10.30	33.8	15.0	15.1	0.79	5.26	6.7	-1.10	2.0	clay	12
10.35	34.0	15.6	15.9	0.83	5.22	6.8	-1.02	2.0	clay	15
10.40	34.1	16.4	16.2	0.83	5.05	6.6	-1.05	2.0	clay	15
10.45	34.3	16.5	16.6	0.79	4.77	6.9	-0.93	2.0	clay	15
10.50	34.4	15.2	15.3	0.73	4.82	6.9	-1.12	2.0	clay	15
10.55	34.6	15.3	15.4	0.72	4.73	7.0	-1.05	2.0	clay	15
10.60	34.8	17.9	18.0	0.77	4.30	7.1	-0.91	2.0	clay	17
10.65	34.9	16.8	16.9	0.81	4.81	7.3	-0.83	2.1	clay	[illegible]
10.70	35.1	16.5	16.6	0.75	4.26	7.3	-0.85	2.1	clay	16
10.75	35.3	18.1	18.2	0.87	4.81	7.5	-0.85	2.1	clay	17
10.80	35.4	17.6	18.0	0.85	4.82	7.5	-0.89	2.1	clay	17
10.85	35.6	18.4	18.6	0.78	4.20	8.1	-0.93	2.1	clay	17
10.90	35.8	17.2	17.1	0.74	4.33	8.1	-0.71	2.1	clay	17
10.95	35.9	16.4	16.6	0.69	4.15	8.3	-0.65	2.1	clay	15
11.00	36.1	17.4	17.5	0.70	4.03	8.2	-0.73	2.1	silty clay to clay	11
11.05	36.3	17.6	18.0	0.69	3.88	8.5	-0.60	2.2	silty clay to clay	11
11.10	36.4	17.2	17.5	0.59	3.39	8.7	-0.55	2.2	silty clay to clay	11
11.15	36.6	15.5	15.6	0.63	4.06	8.9	-0.77	2.2	clay	12
11.20	36.7	16.1	16.2	0.73	4.55	9.0	-0.57	2.2	clay	16
11.25	36.9	17.6	18.0	0.74	4.14	9.0	-0.54	2.2	clay	17
11.30	37.1	18.4	18.5	0.95	5.17	9.1	-0.32	2.2	clay	22
11.35	37.2	27.6	28.0	1.23	4.45	9.4	-0.20	2.2	silty clay to clay	16
11.40	37.4	31.2	31.3	0.95	3.06	6.9	-0.64	2.2	silty clay to clay	17
11.45	37.6	18.6	18.9	0.73	3.90	6.1	-1.57	2.2	clayey silt to silty clay	11
11.50	37.7	17.6	17.7	0.52	2.96	6.7	-1.62	2.2	clayey silt to silty clay	9
11.55	37.9	17.6	17.7	0.53	2.99	6.5	-1.62	2.3	clayey silt to silty clay	9
11.60	38.1	18.9	19.0	0.57	3.04	7.0	-1.44	2.3	clayey silt to silty clay	9
11.65	38.2	22.1	22.2	0.73	3.30	7.1	-1.25	2.3	clay	22
11.70	38.4	28.3	28.4	2.79	9.85	7.5	-0.87	2.3	silty clay to clay	35
11.75	38.5	115.1	115.2	4.19	3.64	6.9	-0.26	2.3	very stiff fine grained (*)	[illegible]
11.80	38.7	109.1	109.1	4.54	4.16	0.9	-0.57	2.3	clayey silt to silty clay	47
11.85	38.9	66.9	66.9	3.62	5.26	-2.3	-1.41	2.3	clayey silt to silty clay	33
11.90	39.0	46.0	47.9	2.18	4.54	-2.7	-2.10	2.3	silty clay to clay	30
11.95	39.2	26.4	26.4	1.09	4.10	-2.8	-3.75	2.3	silty clay to clay	[illegible]
12.00	39.4	22.6	22.6	0.57	2.53	-2.3	-4.34	2.3	clayey silt to silty clay	14

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .15 m sliding data average

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qt tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Ph)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
12.05	39.5	16.6	16.6	0.30	1.78	-2.3	-5.94	2.3	clayey silt to silty clay	9
12.10	39.7	16.3	16.2	0.21	1.28	-2.1	-6.04	2.4	sandy silt to clayey silt	6
12.15	39.9	15.6	15.6	0.23	1.48	-2.0	-6.25	2.4	sandy silt to clayey silt	6
12.20	40.0	15.1	15.1	0.21	1.42	-1.9	-6.47	2.4	sandy silt to clayey silt	6
12.25	40.2	15.9	15.9	0.23	1.47	-1.8	-6.11	2.4	sandy silt to clayey silt	6
12.30	40.4	16.5	16.5	0.24	1.44	-1.6	-5.88	2.5	sandy silt to clayey silt	6
12.35	40.5	16.7	16.7	0.30	1.82	-1.5	-5.76	2.5	sandy silt to clayey silt	7
12.40	40.7	18.4	18.4	0.34	1.85	-1.4	-5.23	2.5	clayey silt to silty clay	8
12.45	40.8	16.0	16.0	0.35	2.12	-1.5	-5.39	2.5	sandy silt to clayey silt	7
12.50	41.0	19.5	19.5	0.34	1.74	-1.3	-4.35	2.5	clayey silt to silty clay	9
12.55	41.2	20.2	20.2	0.43	2.15	-1.1	-4.74	2.6	clayey silt to silty clay	10
12.60	41.3	24.1	24.1	0.74	3.08	-0.9	-3.92	2.6	clayey silt to silty clay	12
12.65	41.5	30.6	30.6	1.05	3.44	-0.8	-3.07	2.6	clayey silt to silty clay	14
12.70	41.7	31.7	31.7	1.25	3.95	-0.7	-2.98	2.7	silty clay to clay	22
12.75	41.8	32.8	32.8	1.54	4.70	-0.4	-2.82	2.7	silty clay to clay	22
12.80	42.0	37.5	37.5	1.95	5.19	-0.4	-2.49	2.7	clay	36
12.85	42.2	40.5	40.3	2.45	5.95	-0.0	-2.22	2.9	clay	39
12.90	42.3	45.0	45.0	2.52	5.59	0.1	-2.01	2.9	clay	41
12.95	42.5	43.3	43.3	2.25	5.19	0.2	-2.09	2.9	clay	41
13.00	42.7	39.8	39.8	1.55	4.54	0.3	-2.24	2.9	clay	38
13.05	42.8	35.1	35.1	1.62	4.62	0.4	-2.55	2.9	silty clay to clay	23
13.10	43.0	34.0	34.0	1.41	4.14	0.6	-2.60	2.9	silty clay to clay	22
13.15	43.1	35.2	35.2	1.47	4.18	0.5	-2.53	2.9	silty clay to clay	23
13.20	43.3	37.0	37.0	1.77	4.78	0.8	-2.39	2.8	clay	36
13.25	43.5	40.1	40.1	2.33	5.81	0.5	-2.22	2.8	clay	38
13.30	43.6	42.8	42.8	3.00	7.03	0.7	-2.12	2.8	clay	39
13.35	43.8	39.1	39.1	3.18	8.14	0.8	-2.34	2.8	clay	37
13.40	44.0	33.4	33.4	3.00	8.48	0.3	-1.81	2.9	clay	37
13.45	44.1	41.2	[illegible]	2.22	5.18	0.4	-2.28	2.8	clay	38
13.50	44.3	32.2	32.2	1.88	5.86	0.1	-2.90	2.8	clay	32
13.55	44.5	24.5	24.5	1.57	6.39	0.5	-3.64	2.8	clay	32
13.60	44.6	41.2	41.3	2.53	6.45	0.4	-1.32	2.8	clay	43
13.65	44.8	70.6	[illegible]	3.98	5.39	0.4	-1.30	2.7	very stiff fine grained (*)	72
13.70	44.9	129.0	129.0	5.42	4.21	-2.1	-2.78	2.7	sandy silt to clayey silt	48
13.75	45.1	155.5	155.5	1.81	1.16	-1.1	-0.69	2.7	silty sand to sandy silt	43
13.80	45.3	173.1	173.1	5.58	3.22	-2.2	-0.67	2.7	sandy silt to clayey silt	52
13.85	45.4	75.3	75.2	5.58	7.41	-3.9	-1.82	2.6	sand to clayey sand (*)	70
13.90	45.6	221.4	221.3	5.96	2.70	-4.1	-0.59	2.8	sand to clayey sand (*)	80
13.95	45.8	157.8	157.7	5.90	3.49	-6.7	-0.78	2.6	sand to clayey sand (*)	[illegible]
14.00	45.9	161.7	161.6	6.77	4.19	-7.0	-0.92	2.8	sand to clayey sand (*)	[illegible]
14.05	46.1	143.4	143.3	4.88	3.29	-7.0	-1.63	2.6	sand to clayey sand (*)	78
14.10	46.3	164.8	164.7	6.12	3.71	-7.2	-2.54	2.6	sandy silt to clayey silt	60
14.15	46.4	150.1	150.0	5.62	3.73	-7.5	-1.01	2.9	very stiff fine grained (*)	124
14.20	46.6	65.1	66.0	3.96	6.03	-7.8	-2.43	2.9	very stiff fine grained (*)	89
14.25	46.8	55.5	55.4	3.03	5.47	-7.6	-2.82	3.0	clay	56
14.30	46.9	52.7	52.6	2.31	4.38	-7.7	-3.06	3.0	clay	44
14.35	47.1	30.0	29.9	1.71	5.69	-7.9	-5.42	3.0	silty clay to clay	23
14.40	47.2	27.4	27.3	0.90	3.28	-8.2	-5.57	3.0	clay	27
14.45	47.4	28.0	28.3	1.23	4.74	-8.0	-6.34	3.0	clay	30
14.50	47.6	41.7	41.6	2.27	5.45	-8.2	-3.96	3.0	clay	42

Soil interpretation reference: Robertson & Campanella-1988, based on 60% hammer efficiency and .15 m sliding data average

DEPTH meters	DEPTH feet	TIP Qc tsf	CORR TIP Qt tsf	FRICTION Fs tsf	FR RATIO Fs/Qc %	PORE PR Pw psi	DIFF P P RATIO (Pw-Ph)/Qc %	INC I deg	INTERPRETED SOIL TYPE	N SPT
14.55	47.7	56.3	56.2	2.55	4.52	-6.0	-2.54	3.0	clay	43
14.60	47.9	38.1	38.0	2.04	5.34	-6.1	-4.37	3.0	silty clay to clay	26
14.65	48.1	27.7	27.6	1.15	4.25	-6.1	-6.03	3.0	silty clay to clay	20
14.70	48.2	29.4	29.3	1.05	3.55	-6.2	-5.73	3.0	silty clay to clay	19
14.75	48.4	31.1	31.0	1.14	3.65	-6.1	-5.48	3.1	clay	25
14.80	48.6	29.0	28.9	2.17	7.45	-6.1	-5.82	3.1	clay	32
14.85	48.7	39.7	39.6	3.24	8.15	-6.0	-4.24	3.1	clay	30
14.90	48.9	88.5	88.4	4.13	4.75	-7.2	-1.91	3.2	very stiff fine grained (*)	57
14.95	49.0	82.3	82.2	3.35	4.07	-7.5	-2.62	3.2	clayey silt to silty clay	36
15.00	49.2	55.3	55.2	2.30	4.16	-7.5	-3.01	3.2	clayey silt to silty clay	27
15.05	49.4	32.2	32.1	1.52	4.70	-7.4	-5.16	3.2	silty clay to clay	24
15.10	49.5	28.3	28.2	1.33	4.73	-7.4	-6.36	3.2	clay	27
15.15	49.7	28.1	28.0	1.27	4.67	-7.4	-6.43	3.3	clay	27
15.20	49.9	31.0	30.9	2.17	6.99	-7.4	-5.4[illegible]	3.3	?	?
15.25	50.0	65.3	65.2		?	-7.4	-2.58	3.3	?	?
15.30	50.2	120.6	120.5	?	?	-7.5	-1.65	3.3	?	?

WRITE NUMBER OF RODS USED __

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .15 m sliding data average

APPENDIX B

Laboratory Investigation

APPENDIX B

Laboratory Investigation

The laboratory testing program for Andante Emeryville Mixed-Use Development was directed toward a quantitative and qualitative evaluation of the physical and mechanical properties of the soils underlying the site.

The natural water content was determined on 20 samples of the materials recovered from the borings in accordance with ASTM Test Designation D-2216, latest edition. These water contents are recorded on the boring logs at the appropriate sample depths.

Dry density determinations were performed on 19 samples of the subsurface soils to evaluate their physical properties. The results of these tests are shown on the boring logs at the appropriate sample depths.

Atterberg Limit determinations were performed on 2 samples of the subsurface soils to determine the range of water content over which these materials exhibit plasticity. The Atterberg Limits were determined in accordance with ASTM Test Designations D-428 and D-424, latest editions. These values are used to classify the soil in accordance with the Unified Soil Classification System and to indicate the soil's compressibility and expansion potentials. The results of these tests are presented on Figure B-1 and on the logs of the borings at the appropriate sample depths.

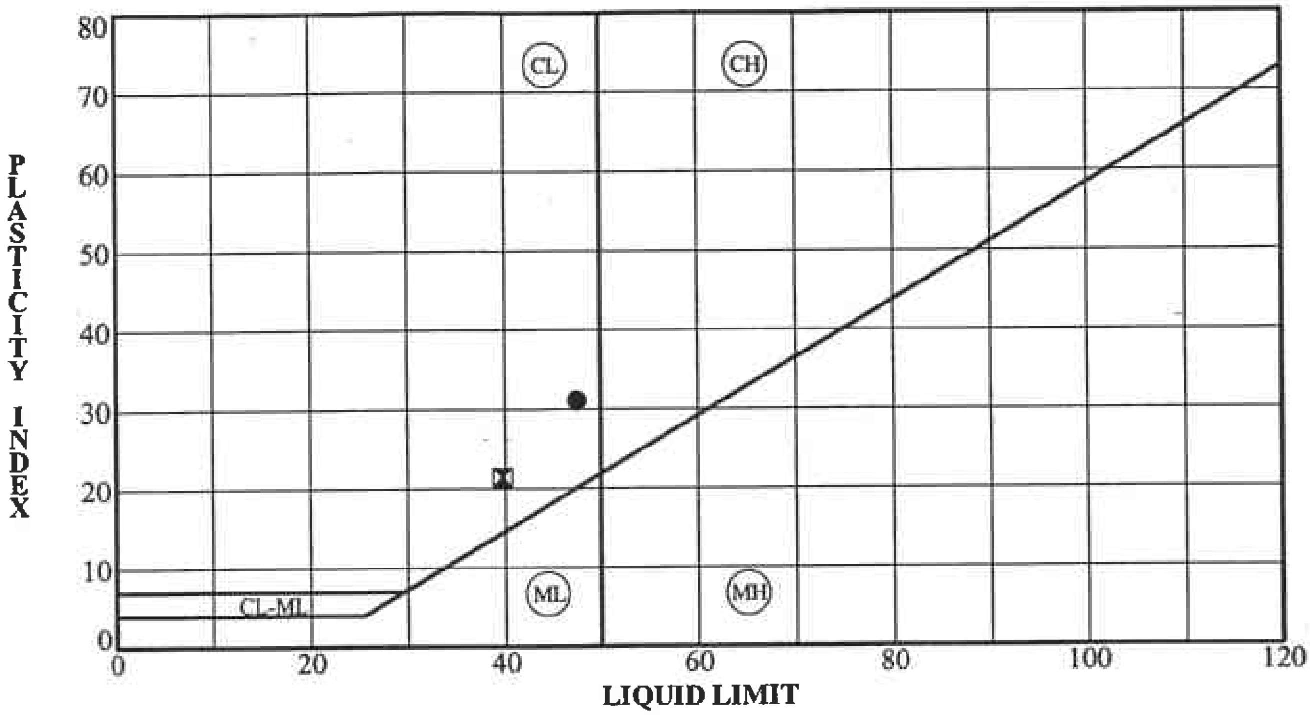
The percent passing the #200 sieve was determined on 2 samples of the subsurface soils to aid in the classification of these soils. These tests were performed in accordance with ASTM Designation D-1140, latest edition. The results of these tests are shown on the boring logs at the appropriate sample depths.

Gradation tests were performed on 2 samples of the subsurface soils in accordance with California Test Method No. 202. These tests were performed to assist in the classification of the soils and to determine their grain size distribution. The results of these tests are presented on Figure B-2.

Unconfined compression tests were performed on 7 undisturbed samples of the clayey subsurface soils to evaluate the undrained shear strengths of these materials. The unconfined tests were performed in accordance with ASTM Test Designation D-2166, latest edition on samples having a diameter of 2.4 inches and a height-to-diameter ratio of at least two. Failure was taken as the peak normal stress. The results of these tests are presented on the boring logs at the appropriate sample depths.

A resistance R- value test was performed on a representative sample of the surface soils on-site to provide data for pavement design. The test was performed in accordance with California Test Method 301-F and indicated an R-value of 9 at an exudation pressure of 300 pounds per square inch. The results of the tests are presented below:

RESULTS OF R-VALUE TEST					
Description of Material	**Dry Density (pcf)**	**Water Content (%)**	**Exudation Pressure (psi)**	**Expansion Pressure (psf)**	**R-Value**
Dark Brown Silty Clay (CL) EB-7 @2.5'	103.4	20.6	191	0	3
	103.8	19.5	302	44	9
	105.5	18.4	406	74	17
R-Value = 9 at Exudation pressure of 300 psi					



Key Symbol	Boring No.	Depth (Feet)	Liquid Limit	Plasticity Index	Liquidity Index	Water Content (%)	% Passing #200 Sieve	USCS
●	EB-12	3.0	48	31	0.318	26	96	CL
⊠	EB-2	2.0	40	21	0.317	25	75	CL

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HARZA Engineering Company

PREP'D BY:

APP'D BY:

DATE: 11/20/00

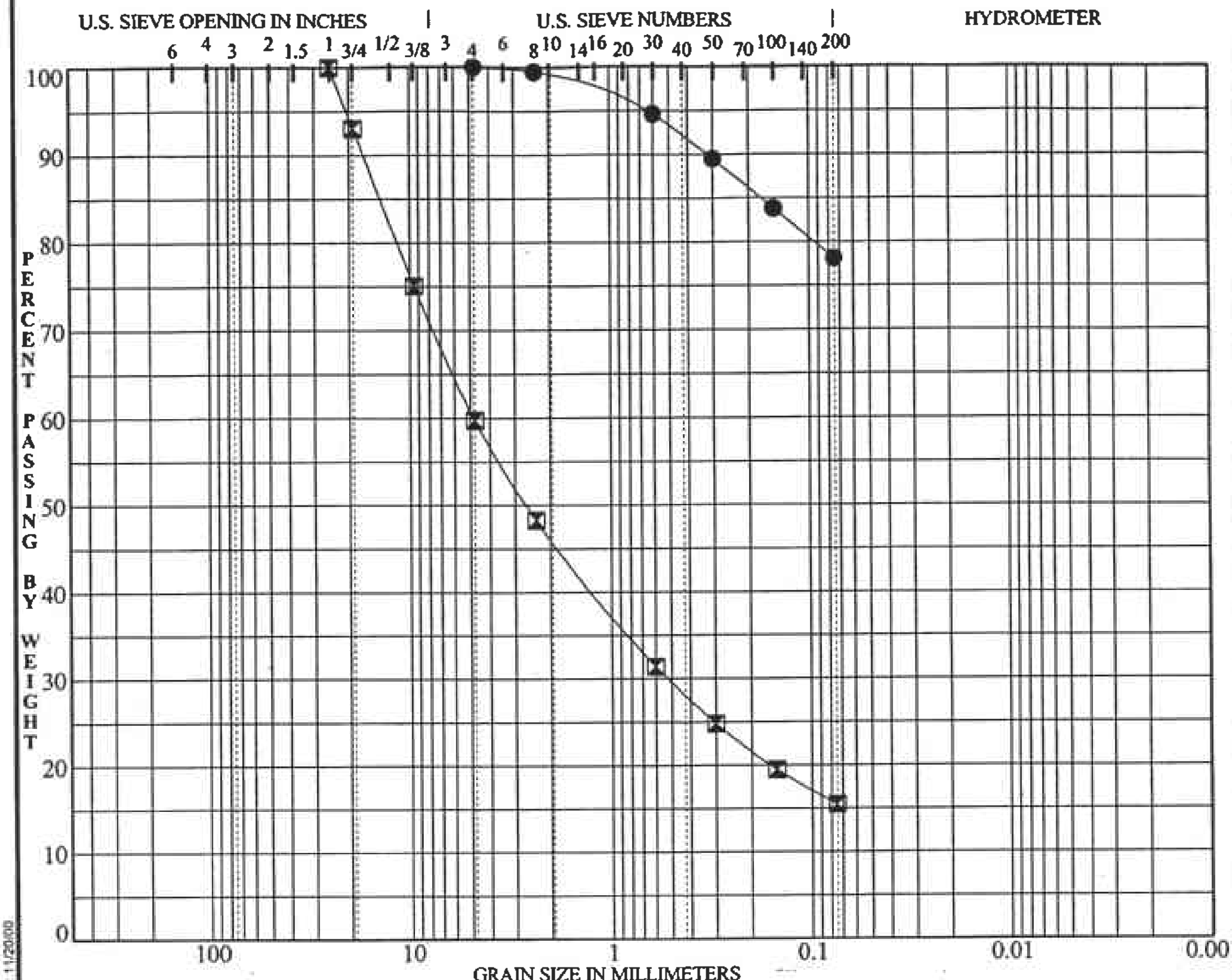
DWG FILE: 17752-CA.GPJ

PLASTICITY CHART AND DATA

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

FIGURE B-1

PROJECT No. 17752-CA



Cobbles	Gravel		Sand			Silt and Clay
	Coarse	Fine	Coarse	Medium	Fine	

Key Symbol	Boring No.	Depth (Feet)	% Passing No. 200 Sieve	% Passing No. 4 Sieve	Sample Descsription	USCS
●	EB-1	34.5	78	100	Light brown silty CLAY some sand	CL
⊠	EB-7	39.5	15	60	Brown gravelly SAND some clay	SC

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DATE: 11/20/00
DWG FILE: 17752-CA.GPJ

GRADATION TEST DATA

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

FIGURE B-2

PROJECT No. 17752-CA

APPENDIX C

Guide Specifications - Site Earthwork

APPENDIX C

Guide Specifications - Site Earthwork
for
Andante Emeryville Mixed-Use Development
Emeryville, California

1.0 GENERAL

1.1 Scope of Work

These specifications and applicable plans pertain to and include all site earthwork including, but not limited to, the finishing of all labor, tools, and equipment necessary for site clearing and stripping, disposal of excess materials, excavation, preparation of foundation materials for receiving fill, and placement and compaction of fill to the lines and grades shown on the project grading plans.

1.2 Performance

The Contractor warrants all work to be performed and all materials to be furnished under this contract against defects in materials or workmanship for a period of ____ year(s) from the date of written acceptance of the entire construction work by the Owner.

Upon written notice of any defect in materials or workmanship during said _____ year period, the Contractor shall, at the option of the Owner, repair or replace said defect and any damage to other work caused by or resulting from such defect without cost to the Owner. This shall not limit any rights of the Owner under the "acceptance and inspection" clause of this contract.

The Contractor shall be responsible for the satisfactory completion of all site earthwork in accordance with the project plans and specifications. This work shall be observed and tested by a representative of Harza, hereinafter known as the Geotechnical Engineer. Both the Geotechnical Engineer and the Architect/Engineer are the Owner's representatives. If the Contractor should fail to meet the technical or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory as determined by the Geotechnical Engineer and the Architect/Engineer. No deviation from the specifications shall be made except upon written approval of the Geotechnical Engineer or Architect/Engineer.

No site earthwork shall be performed without the physical presence or approval of the Geotechnical Engineer. The Contractor shall notify the Geotechnical Engineer at least twenty-four hours prior to commencement of any aspect of the site earthwork.

The Geotechnical Engineer shall be the Owner's representative to observe the grading operations during the site preparation work and the placement and compaction of fills. He shall make enough visits to the site to familiarize himself generally with the progress and quality of the work. He shall make a sufficient number of tests and/or observations to enable him to form an opinion regarding the adequacy of the site preparation, the acceptability of the fill material, and the extent to which the compaction of the fill, as placed, meets the specification requirements. Any fill that does not meet the specification requirements shall be removed and/or recompacted until the requirements are satisfied.

In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal work hours.

Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures in, on or near the construction site.

Upon completion of the construction work, the Contractor shall certify that all compacted fills and foundations are in place at the correct locations, have the correct dimensions, are plumb, and have been constructed in accordance with sound construction practice. In addition, he shall certify that the materials used are of the types, quantity, and quality required by the plans and specifications.

1.3 Site and Foundation Conditions

The Contractor is presumed to have visited the site and to have familiarized himself with existing site conditions and the soil report titled, "Geotechnical Investigation, Andante Emeryville Mixed-Use Development, Emeryville, California," dated December 6, 2000. The Contractor shall not be relieved of liability under the contract for any loss sustained as a result of any variance between conditions indicated by or deduced from the soil report and the actual conditions encountered during the course of the work.

The Contractor shall, upon becoming aware of surface and/or subsurface conditions differing from those disclosed by the original soil investigation, promptly notify the Owner as to the nature and extent of the differing conditions, first verbally to permit verification of the conditions, and then in writing. No claim by the Contractor for any conditions differing from those anticipated in the plans and specifications and disclosed by the soil investigation will be allowed unless the Contractor has so notified the Owner, verbally and in writing, as required above, of such changed conditions.

1.4 Dust Control

The Contractor shall assume responsibility for the alleviation or prevention of any dust nuisance on or about the site or off-site borrow areas. The Contractor shall assume all liability, including court costs of codefendant, for all claims related to dust or windblown materials attributable to his work.

2.0 DEFINITION OF TERMS

Structural Fill: All soil or soil-rock material placed on-site in order to raise grades or to backfill excavations, and upon which the Geotechnical Engineer has conducted sufficient tests and/or observations to enable him to issue a written statement that, in his opinion, the fill has been placed and compacted in accordance with the specification requirements.

On-Site Material: Material obtained from the required site excavations.

Import Material: Material obtained from off-site borrow areas.

ASTM Specifications: The American Society for Testing and Materials Standards, latest edition.

Degree of Compaction: The ratio, expressed as a percentage, of the in-place dry density of the compacted fill material to the maximum dry density of the same material as determined by ASTM Test Designation D1557, latest edition.

3.0 SITE PREPARATION

3.1 Clearing and Grubbing

The contractor shall accept the site in its present condition and shall remove from the area of the designated project earthwork all obstructions including existing buildings and their foundations and slabs, pavement, abandoned utilities, trees and associated root systems, debris, and any other matter determined by the Geotechnical Engineer to be deleterious. Such material shall become the property of the Contractor and shall be removed from the site. Holes resulting from the removal of underground obstructions that extend below finish grades shall be cleared and backfilled with structural fill.

3.2 Stripping

Where vegetation exists, the site shall be stripped to a minimum depth of 3 inches or to such greater depth as the Geotechnical Engineer in the field may consider as being advisable to remove all surface vegetation and organic laden topsoil. Stripped topsoil with an organic content in excess of 3 percent by volume shall be stockpiled for possible use in landscaped areas.

4.0 EXCAVATION

All excavations shall be performed to the lines and grades and within the tolerances specified on the project grading plans. All overexcavation below the grades specified shall be backfilled at the Contractor's expense and shall be compacted in accordance with the specifications. The Contractor shall assume full responsibility for the stability of all temporary construction slopes on-site.

5.0 SUBGRADE PREPARATION

Surfaces to receive compacted fill, and those on which concrete slabs and pavements will be constructed, shall be scarified to a minimum depth of 6 inches and compacted. All ruts, hummocks, or other uneven surface features shall be removed by surface grading prior to placement of any fill materials. All areas that are to receive fill material shall be approved by the Geotechnical Engineer prior to placement of any fill material.

6.0 GENERAL REQUIREMENTS FOR FILL MATERIAL

All fill material must be approved by the Geotechnical Engineer. The material shall be a soil or soil-rock mixture, which is free from organic matter or other deleterious substances. The fill material shall not contain rocks or rock fragments over 6 inches in greatest dimension and not more than 15 percent shall be over 2.5 inches in greatest dimension. On-site material having an organic content of less than 3 percent by volume is suitable for use as fill in all areas except where non-expansive import material is specified.

All imported fill material shall be non-expansive with a plasticity index of 12 or less.

7.0 PLACING AND COMPACTING FILL MATERIAL

All structural fill less than 5 feet thick shall be compacted by mechanical means to produce a minimum degree of compaction of 90 percent as determined by ASTM Test Designation D1557, latest edition. All structural fill greater than 5 feet in thickness shall be compacted to at least 95 percent relative compaction. Field density tests shall be performed in accordance with either ASTM Test Designation D1556, latest edition (Sand-Cone Method) or ASTM Test Designation D2922, latest edition and D3017, latest edition (Nuclear Probe Method). The locations and number of field density tests shall be determined by the Geotechnical Engineer. The results of these tests and compliance with these specifications shall be the basis upon which satisfactory completion of work shall be judged by the Geotechnical Engineer.

8.0 TRENCH BACKFILL

Pipeline trenches should be backfilled with fill placed in lifts of approximately 8 inches in uncompacted thickness. However, thicker lifts can be used provided the method of compaction is approved by the Geotechnical Engineer and the required minimum degree of compaction is achieved. Backfill should be placed by mechanical means only. Jetting is not permitted.

On-site trench backfill should be compacted to at least 90 percent relative compaction. The upper 3 feet of on-site trench backfill in slab and pavement areas should be compacted to at least 95 percent relative compaction. Imported sand trench backfill should be compacted to at least 95 percent relative compaction and sufficient water is added during backfilling operations to prevent the soil from "bulking" during compaction.

Where utility trenches backfilled with sand or other granular material enter building pads, they should be backfilled by an impermeable soil plug that extends to at least two feet beyond both sides of exterior foundations. This should help to minimize moisture change in the moderate to highly expansive clays beneath the slabs. Where sand backfilled utility trench laterals pass below pavements or concrete sidewalks, they should be sealed as described above to minimize soil volume change below asphalt and concrete areas. Alternatively, the lateral trench can be sealed with Controlled Density Fill (CDF), a low strength concrete.

9.0 TREATMENT AFTER COMPLETION OF EARTHWORK

After the earthwork operations have been completed and the Geotechnical Engineer has finished his observation of the work, no further earthwork operations shall be performed except with the approval of and under the observation of the Geotechnical Engineer.

It shall be the responsibility of the Contractor to prevent erosion of freshly graded areas during construction and until permanent drainage and erosion control measures have been installed.

APPENDIX D

Guide Specifications - Asphalt Paving

APPENDIX D

Guide Specifications - Asphalt Paving
for
Andante Emeryville Mixed-Use Development
Emeryville, California

1.0 GENERAL

This portion of the work shall include all labor, materials, tools, and equipment necessary for incidental to the completion of the pavement shown on the plans and as herein specified.

2.0 DEFINITION OF TERMS

Pavement:	Both asphalt concrete, and aggregate base materials.
Subgrade:	That portion of the construction on which asphalt concrete and aggregate base is to be placed.
Standard Specifications:	Standard Specifications of the State of California Department of Transportation, latest edition.
ASTM Specifications:	The American Society for Testing and Materials Standards, latest edition.

3.0 MATERIALS

3.1 Asphalt

3.1.1 Asphalt for prime coat shall be liquid asphalt, grade MC-70 conforming to the provisions of Sections 39 and 93 of the Standard Specifications.

3.1.2 Asphalt for tack coat and seal coat shall be SS-1h asphalt emulsion conforming to Sections 37 and 94 of the Standard Specifications.

3.1.3 Paving asphalt to be mixed with aggregate shall be steam refined asphalt conforming to the provisions of Section 92 of the Standard Specifications for viscosity grade AR 4000.

3.2 Mineral Aggregate for Asphalt Concrete:

Type B Aggregate as specified in the Standard Specifications, Section 39, ½-inch maximum size, medium grading.

4.0 CONSTRUCTION

4.1 Existing Pavement

Remove the existing asphalt concrete and base to the subgrade elevation. Existing pavements which are removed can be used as fill material provided the asphalt is broken up to meet the maximum allowable size requirements for imported fill material.

4.2 Subgrade Preparation

The Contractor shall prepare the surface of the various subgrades receiving subsequent pavement courses to the lines, grades, and dimensions given on the plans. Isolated unstable areas shall be stabilized by recompaction or excavation and replacement of materials. The upper 6 inches of the subgrade soil shall be compacted to a density not less than 95 percent of that obtained in the laboratory according to Test Method ASTM D1557-91.

4.3 Aggregate Base

Aggregate base shall be spread and compacted in conformance with Standard Specifications Section 26 for Class 2 Aggregate Base. Finished aggregate base shall have the minimum depth shown and finished grade shall not vary more than 0.05 foot above or below the established grade. The aggregate base shall be compacted to a density not less than 95 percent of that obtained in the laboratory according to Test Method ASTM D1557-91.

4.4 Prime Coat

Apply prime coat at an approximate total rate of ¼ gallons per square yard to all areas receiving asphalt concrete. Conform to Section 39 of Standard Specifications.

4.5 Tack Coat

Apply a "tack coat" to all vertical faces, against which asphalt concrete is to be placed. Apply at a rate of from 0.02 gallon to 0.10 gallon per square yard. Conform to Section 39 of Standard Specifications.

4.6 Seal Coat

Seal coat shall be diluted with an equal amount of water and applied at the rate of 0.10 gallon of the diluted emulsion per square yard of surface. The surface shall be free of dust and loose material prior to application.

4.7 Asphalt Concrete

Asphalt concrete shall be spread and compacted on the prepared base in conformance with the lines, grades and dimensions shown on the drawing and as specified in Section 39 of the Standard Specifications. In addition to the compaction requirements described in Section 39 of the Standard Specifications, each layer of asphalt concrete (surface or base) shall be compacted to a density no less than 95 percent of that obtained in the laboratory according to ASTM Test Method D-1561 (latest edition.)

4.8 Improper Workmanship

Cracks, settling of surface, improper drainage and sloppy connection to previously laid surfaces will be construed as improper workmanship and will not be acceptable.