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GEOTECHNICAL FEASIBILITY INVESTIGATION

10 Acre Parcel
Northeast Side of Adams Avenue, about 1,000 Feet Southeast of Fig Street
Murrieta, CA

Client:

Murrieta Commercial Land Property #2
1301 South Sunkist
Anaheim, CA 92806

Attention: Mr. George Gamor

Job No: 2692
May 31, 2007

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APPENDIX

1. INTRODUCTION

1.1 General

This report presents the results of a geotechnical study of a currently undeveloped 10 acre parcel located on Adams Avenue, just south of Fig Street in Murrieta, California. It is understood that the parcel will be developed for several future small industrial buildings. At this time, there are no specific site plans available. Based on our study, the site is feasible for development provided that our recommendations are included in the project design and implemented during the construction and occupancy phases of the project.

Due to the close proximity of the parcel to the active Elsinore-Temecula Fault Zone, the site could be susceptible to high site acceleration and related ground motion effects. This report provides appropriate design parameters and recommendations for seismic design. Due to the presence of soft or loose upper surface soils, the site will require some overexcavation and recompaction in order to provide adequate support of the proposed building structures.

In the absence of actual loading data from the structural engineer, the following footing loadings will be assumed.

Continuous Footings-	3 to 4 kips per lineal foot
Pad Footings-	50 to 70 kips each

1.2 Purpose and Scope of Work

The purposes of this investigation were to: (1) obtain information on the general regional geologic conditions and specific subsurface conditions within the project area; (2) perform an engineering and geologic evaluation of the collected data and its influence on the project; and (3) provide geotechnical conclusions and recommendations for design and construction.

The work performed during this study included the following:

1. Collect and review project data available to us and developed an exploration program.
2. Performed a subsurface investigation by drilling 5 test borings to depths ranging from 21 to 51 feet below existing grades.
3. Performed laboratory testing to establish the engineering properties of the subsurface materials in order to develop suitable recommendations for geotechnical design and construction aspects of the project.
4. Performed a visual reconnaissance of the site and surrounding area to discern if any obvious unstable or otherwise adverse geologic conditions exist.
5. Analyzed the collected data and prepare this report of our geotechnical conclusions and recommendations.

2. INVESTIGATION AND LABORATORY TESTING

2.1 Field Exploration

The field investigation consisted of excavating five exploratory borings to depths ranging from 21 to 51 feet below the existing grades. The borings were excavated using an 8 inch diameter hollow-stem auger drilling rig. Selected specimens of the in-situ soils were obtained by using a 2.5 inch I.D. drive tube sampler equipped with one-inch high liner rings and a 2 inch O.D. by 1-3/8 inch I.D. Standard Penetration Test sampler. In addition to these relatively undisturbed specimens, bulk samples of the soils were obtained for additional laboratory analysis. These soil samples served as the basis for the laboratory testing and the engineering conclusions contained in this report. The logs of the borings and a plot plan showing the approximate boring locations are included with this report.

2.2 Laboratory Testing

The laboratory testing consisted of performing classification, strength, settlement, soluble sulfate, corrosion potential, and expansion tests, determining the in-situ dry density, R-value and moisture content, and determining the moisture-density relationship of major soil types.

Descriptions of the test standards used in this investigation in addition to other tests not used in this investigation are included in the Appendix of this report.

The results of all laboratory tests are presented in the text below, in the Appendix, or on the boring logs.

The results of Atterberg Limits classification tests are as follows:

Sample Location	Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)
Combined B-3 + B-4 @ 20'-21'	31	19	12
B-1 @ 1-4'	Could not roll to a 1/8 inch thread, considered non plastic		
B-1 @ 15-16'	Could not roll to a 1/8 inch thread, considered non plastic		
B-1 @ 25-26'	Could not roll to a 1/8 inch thread, considered non plastic		
B-1 @ 45-46'	Could not roll to a 1/8 inch thread, considered non plastic		

3. SURFACE AND SUBSURFACE CONDITIONS

3.1 Site Description and Observations

The site consists of a rectangular shaped 10 Acre parcel. The site is undeveloped and is on Adams Avenue. At the time of our investigation the parcel was vacant and free of manmade structures. The site is bordered on the southeast by a concrete batch plant which is about 6 to 10 feet higher in elevation that the subject property, to the northwest by an open field at site level, and to the northeast, by a light industrial complex consisting of several new tilt-up buildings which are about 10 to 15 feet above the site. The parcel is relatively flat. The site has been recently tilled for weed control and therefore the near-surface soils are loose. A

shallow unlined culvert along the southeast property is draining into the property and saturating the central portion of the site as shown on the attached Geotechnical Plan.

3.2 Soil and Geologic Conditions

Our borings revealed that this site is underlain by a thick deposit of alluvium to a least 50 feet, the maximum depth drilled. The site occurs within a broad linear northwest depression which is commonly knows as the Elsinore Trough. Created by tectonic forces along an active fault, the Elisinore Trough is an area of sedimentary deposition. Most sediments deposited in the trough are from nearby adjacent mountain sources such as the Santa Ana Mountains and the Gavilan Hills. The total depth of the alluvium below the project site is unknown, but based on the location of the site with respect to the closest bedrock exposures, the alluvium below this site is probably several hundred feet thick.

Our subsurface investigation, indicated that the alluvium below this site consists predominantly of poorly-bedded deposits of sandy silts and silty sand. Interbedded deposits of silt, clayey silt, and silty clay also occur but in lesser quantities. In general, the soils range from loose to compact within the upper 50 foot depth explored. Below about 20 feet, the alluvium was found to be generally dense or compact. From the surface down to approximately 20 feet the soils range from loose to moderately compact.

Perched groundwater and saturated soil conditions were first encountered at approximately 15 feet below the existing ground surface. Some unsaturated zones were noted at various horizons between 20 and 50 feet.

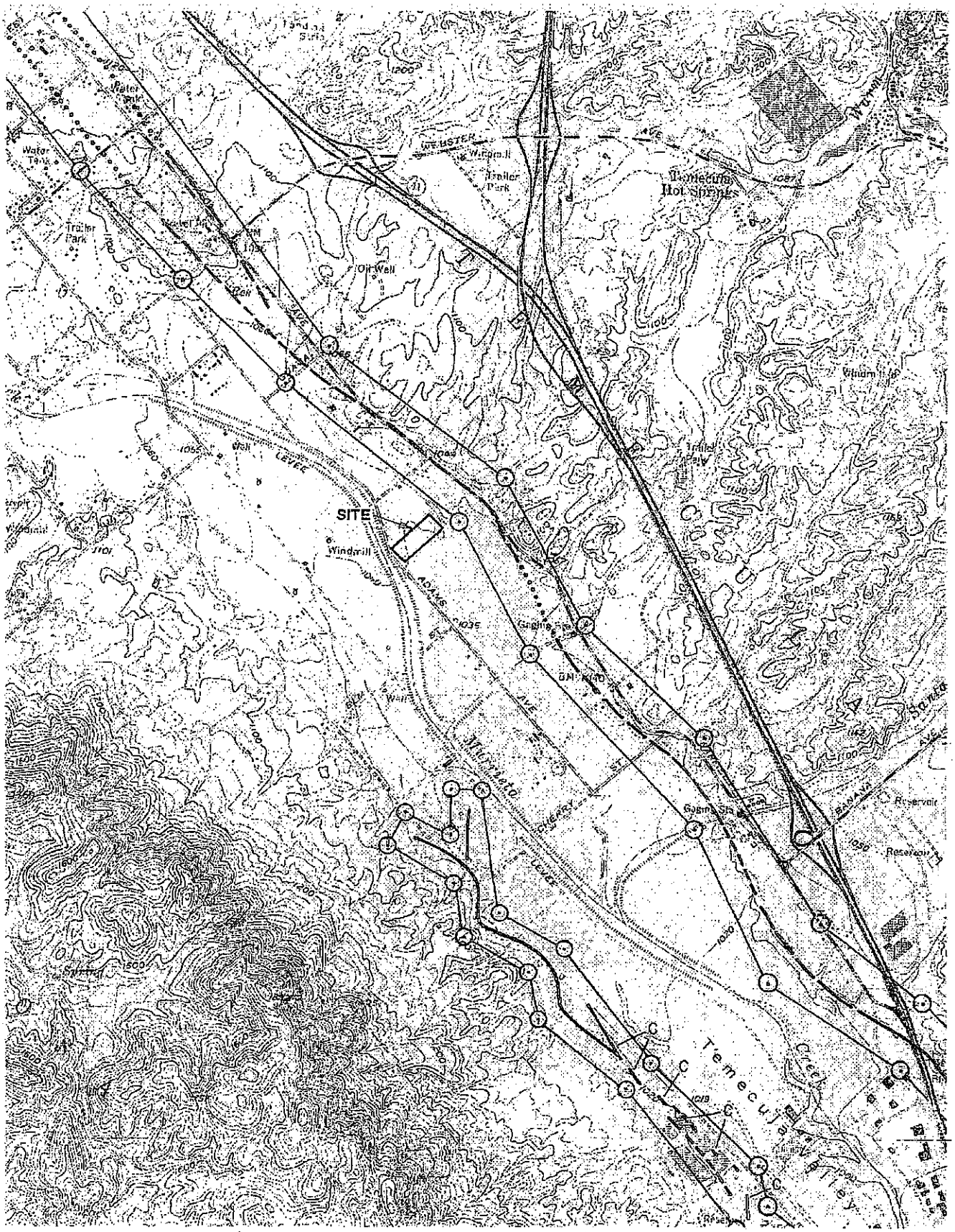
No evidence of shallow or perched ground water has been noted in the form of seeps, springs, tufa deposits, mineral efflorescence, or concentrated growth of phreatophyte plants was encountered during this investigation.

More detailed descriptions of the subsurface conditions are shown on the attached boring logs.

3.2.1 Seismicity

The subject property is not located within any State of California Earthquake Hazard Zones or astride a known, active or potentially active fault, and, accordingly, need not be considered for potential surface fault rupture. This site however, does border a State of California Earthquake Hazard Zone which may contain one or several branches of the Elsinore-Temecula Fault. The limits of the seismic hazard zone roughly trends parallel to Adams Avenue and the site location is shown on the map on the next page. The State of California has determined that a branch or branches of the active Elisinore-Temecula Fault has a significant probability (based on their research) of occurring within this zone which is beyond the limits of the subject site. If the site were within the Special Studies Zone boundary a fault study would be required, but should not be needed for this site. The state typically requires a 50 foot setback from any fault found in a fault trench study and it is therefore our recommendation that any buildings proposed for this site be set back 50 feet from the northeast property boundary.

As the site is located near an active fault, it will be subject to strong ground shaking by a nearby or distant strong earthquake.



Approximate Site Location on State of California Special Studies Zone Murrieta Quadrangle Map
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Earthquakes which might occur on faults within a 60 mile (100 km.) radius from the site are listed below on Appendix Pages "seis-1-9" of this report, along with their seismic parameters.

Secondary seismic hazards that are also considered for this project are liquefaction, seismic settlement, differential compaction, landsliding, earthquake induced flooding, tsunamis, and seiches. Each is addressed below.

Potential for liquefaction, seismic settlement and differential compaction - is discussed in detail in the section immediately below.

Potential for landsliding - is considered to be negligible, based on the limited height of slopes along the northeast and southeast sides of the site.

Potential for earthquake induced flooding, tsunamis, and seiches - can be precluded, as no upstream dams or other nearby bodies of water are present.

3.3 Liquefaction Potential and Seismic Settlement

The potential for liquefaction and dynamic settlement has been evaluated as outlined in Chapter 6 of the California Division of Mines and Geology (DMC) Special Publication 117 ("Guidelines for Evaluation and Mitigation of Seismic Hazards in California") and "Recommended Procedures for Implementation of DMG Special Publication 117 - Guidelines for Analyzing and Mitigating Liquefaction in California", published by the Southern California Earthquake Center, 1999. The LIQUEFY2 computer program and DMG fault data has been utilized, along with the simplified procedures for estimating seismic settlement outlined by Tokimatsu and Seed (1987). The design and construction recommendations presented below in this report include consideration of possible liquefaction and/or dynamic settlement. The analysis results are included in the Appendix as pages liq-1-4 and set-1.

The general purposes of this analysis have been to respond to 2 general questions stated by Bartlett and Youd (1995), as follows:

1. "Are the sediments susceptible to liquefaction?": and
2. "If liquefaction does occur, what will be the ensuing amount of ground deformation?"

The analysis indicates that the sediments are susceptible to liquefaction. The resulting ground deformation is anticipated to include some settlement, but not lateral spreading or any other horizontal deformation.

The safety factor against liquefaction is generally below the 1.3 minimum which can be considered an acceptable level of risk from about 15 to 25 feet and from 30 to 40 feet below existing grades. The dynamic settlement has been calculated to be about 4.5 inches, assuming that the maximum probable earthquake occurs at the closest point to the site on the Eldinore-Temecula fault.

It is our opinion that the presence of a 15 foot overburden along with clay seam at 25 to 30 foot layer and dense soils below 40 feet precludes any surface manifestation and associated significant differential settlements at the ground surface. A relatively thick overexcavated and recompacted soils and the proposed light buildings warrants the use of mat foundation system. The rigid mat footings on compacted soils will likely limit anticipated to-

tal settlements to less than 2 inches with less than 1 inch differential, which we believe to be tolerable for the planned structures.

4. GEOTECHNICAL ANALYSIS AND CONCLUSIONS

1. It is the opinion of this office that the subject site is suitable for support of the proposed development without detrimental effects on the adjacent properties. The grading, building construction, backfilling, and other construction supported by the earth materials should be conducted in accordance with the provisions of the applicable edition of the Uniform Building Code (UBC) or California Building Code (CBC), as adopted by the controlling agency. References to the UBC within this report shall also be considered to refer to the same section of the CBC.
2. The site is underlain by thick deposits of natural alluvium which, when properly prepared by grading will be considered suitable for support of the proposed facilities.
3. The soils at the site possess very low expansion potential and negligible soluble sulfate concentrations and were not found to be potentially corrosive to buried metal pipes. Recommendations are presented below in this report to reduce the effects of soil expansion and other chemical factors.
4. An active faults is known to transect or trend towards the site, however the project is not expected to be affected by ground rupture. It will be affected by substantial ground motion from earthquakes during the design life of the project due to the nearby Temecula Elsinore Fault. More detailed seismicity data is included in the appendix of this report.
5. Ground water and/or saturated soil conditions were encountered during our investigation and are not considered a significant site development condition.
6. Adverse surface water discharge from runoff onto or from the site is not anticipated, providing proper engineering design, construction, and maintenance of graded surfaces and drainage devices is implemented.
7. Conventional mat foundations seated into compacted fill can be used to support the structures providing the design and construction recommendations presented in this report and the requirements of applicable codes are followed. Concrete floor and hardscape slabs may be founded entirely on firm competent compacted fill.

5. DESIGN AND CONSTRUCTION RECOMMENDATIONS

5.1 Foundation Design and Construction

5.1.1 Vertical and Lateral Bearing

Vertical

The earth materials on this site when properly prepared are considered suitable for the support of the proposed structures using conventional mat footings.

Mat foundations may be designed using an allowable bearing value of 2,000 pounds per square foot for footings placed to a minimum depth of 12 inches below the lowest adjacent

finished grade. An increase of 1/3 of the aforementioned bearing value is permissible for short duration wind or seismic loading.

The above bearing values have been based on mat footings placed into approved compacted fill. These bearing values are considered to be net values and as a result the weight of the footings and/or backfill above the footings may be ignored in calculating the footing loads.

Lateral

For purposes of resisting lateral forces, an allowable lateral soil pressure of 250 pounds per square foot per foot of depth may be used for the design. A coefficient of friction of 0.40 may be used for concrete placed directly on the natural soils or compacted fill. These values may be combined without reduction for resisting lateral forces.

The above values are based on footings placed directly against previously compacted fill. In the case where footing sides are formed, all backfill against footings should be compacted to at least 90 percent of maximum density.

Foundation Construction

All foundation excavations should be observed by the project soils engineer prior to the placement of forms, reinforcement, or concrete. The excavations should be trimmed neat, level, and square. All loose, sloughed, or moisture softened soil should be removed prior to concrete placement.

Excavated material from footing excavations should not be placed in slab-on-grade areas unless properly compacted and tested.

5.1.2 Settlement

Static

Based on the general settlement characteristics of the in-situ soil types and the anticipated loading, it has been estimated that footings will settle approximately ½ inch.

Differential settlement is expected to be about one-half of the total settlement. It is anticipated that the majority of the settlement will occur during or shortly following the completion of construction as the loads are applied. Differential settlement is not expected to exceed ¼ inch in any 20 foot horizontal distance.

The above settlement estimates are based on the assumption that the grading will be performed in accordance with the grading recommendations presented elsewhere in this report and that representatives of this firm will observe or test the bearing conditions in the footing excavations.

Seismic

Seismic settlement is discussed above in Section 3.3.

5.1.3 Soil Design Parameters (Section 1815, 1997 UBC)

The following geotechnical design parameters are presented, as defined in UBC Section 1815.2, Symbols and Notations:

Parameter	Design Value
C_o	1.8
C_s	1.0
C_w	15
PI	non-plastic- could not be rolled
q_u	100 psf
Effective PI = C_o x C_s x PI = 1.8 x 1.0 x 0=	0

As a result, no special slab design is considered necessary for expansive/plastic soils.

5.1.4 Seismic Design

Seismic design of the structures should be performed using criteria presented in the Uniform Building Code (UBC) for Zone 4 seismic conditions.

Seismic design parameters required by the 1997 UBC and the State of California Seismic Hazards Act are included on Appendix Pages "seis-1-8" of this report. Recommended design parameters are as follows:

Design Parameter	Recommended Value
Design Fault	The Elsinore-Temecula Fault
Fault/Site Distance	<0.5 km (Special Studies Zone Map)
Maximum Site Acceleration	0.56 g (CGS Web Site)
Soil Profile Type	S_D
N_a	1.3
N_v	1.6
C_a	0.57
C_v	1.02
T_s	0.716
T_o	0.143

5.2 Retaining Walls

Retaining walls may be designed using the following parameters:

Bearing - See Soil Bearing Section above

Active Earth Pressure (Cantilevered Walls)
Level Backfill - 35 psf/ft

At-Rest Earth Pressure (Restrained At Top Walls)
Level Backfill - 54 psf/ft

Passive Earth Pressure - 250 psf/ft

Sliding Coefficient - 0.40

Sliding friction and passive resistance may be combined without reduction in calculating the total lateral resistance. Passive pressures may be assumed to become constant at a value of 5 times the above values below a depth of 5 feet.

All retaining wall backfill should consist of soil with an expansion index of 20 or less.

The soils existing on the site were found to possess very low expansion potential. These soils can be used for backfill of retaining walls.

Retaining walls should be provided with adequate drainage to reduce hydrostatic pressures.

5.3 Concrete Slabs

All concrete slabs must be designed in accordance with the applicable UBC or CBC.

It is cautioned that slabs in areas to receive ceramic tile or other rigid, crack sensitive floor coverings must be designed and constructed to reduce hairline cracking. Extra reinforcing and careful control of concrete slump to reduce concrete shrinkage are recommended.

Wherever the floor slab is to be subjected to traffic loading such as forklifts, especially those with hard rubber wheels, the performance of the floor slab is critical with respect to movements between adjacent slab areas and spalling of joints. Proper design and construction to provide shear transfer between adjacent slab units and proper joint details is critical to proper service of these floors. Proper control of concrete slump and curing to reduce slab "curling" and the resultant voids under the slab is also critical.

The following geotechnical recommendations are presented for your consideration:

1. The finished grade of the building pad should be made by overfilling and cutting back to a firm, compact surface. The required depth of overfilling will depend on the soil types, contractors equipment, and other factors.
2. The concrete contractor and underground subcontractors should be prohibited from placing excess soil from excavations on the building pad unless these materials are compacted and tested.
3. The project structural engineer should be consulted regarding the design of the slab thickness, reinforcing, and joint design spacing and details. A coefficient of subgrade reaction (K value) of 120 psi/inch may be used for design of the concrete floor slabs.

Moisture conditions below slabs-on-grade vary greatly due to soil conditions, ground water depth, and other conditions. The construction details of a moisture retarder membrane below slabs-on-grade, particularly where floor coverings are to be used, must be based on several factors, including concrete placement and curing, whether floor coverings will be glued to the slab, and other factors.

It has been typical to place slabs-on-grade on top of a layer of sand over the plastic membrane over a layer of sand over the subgrade soils, however this can result in water being trapped in the sand layer between the slab and the plastic membrane. This trapped moisture can then only leave the sand layer by vapor flow upward through the slab. This condition can potentially soften and loosen current water based floor mastics.

The alternative in areas to receive carpet, tile, or other moisture sensitive coverings or mastics, to construct the slab over a 15 mil (or equivalent puncture resistant) plastic membrane. The plastic membrane should be properly lapped, sealed, and protected with at least a two inch thick layer of sand below the plastic membrane, however the concrete should be placed directly on the plastic membrane. This construction detail will reduce future vapor movement upward through the slab. Slab placement using proper concrete mix slump and careful proper curing of the slab must be implemented.

The detailed design of the vapor retarder, if used, should be performed by the architect, structural engineer, and/or contractor after consideration of the above factors.

5.4 Expansive Soils

The results of tests indicate that the near-surface soils on the site possess very low expansion potential. The test results are as follows:

Sample Location	Expansion Index
B-1 @ 1-4'	14

As a result, no special design or construction is considered necessary for expansive soil purposes on this project

Additional testing will be performed during grading and final recommendations will be presented in our Geotechnical Report of Rough Grading. It should be noted that slab, footing, and other construction details may change based on testing during grading.

5.5 Soil Chemistry Considerations

5.5.1 Soluble Sulfates

The results of tests show that the on-site soils possess negligible concentrations of soluble sulfates. The test results are as follows:

Sample Location	% Soluble Sulfates
B-1 @ 1-4'	0.030

A soluble sulfate content less than 0.10 percent is not considered detrimental to standard concrete mixes. As a result, no special design or construction is considered necessary for soluble sulfates on this project.

5.5.2 Corrosion Potential

Several governing agencies in southern California require that corrosion potential of soils toward buried metal facilities be determined by the geotechnical engineer. As a result, and due to changing agency requirements with time, we routinely test for this potential by submitting samples for "corrosion series" tests on each and every project. Coleman Geotechnical does not have corrosion engineering expertise, and therefore we present the test results

below for the use of the client and other consultants as they determine necessary. The test results are as follows:

Sample Location	pH	Soluble Chlorides	Minimum Resistivity
B-1 @ 1-4'	9.8	170 ppm	1,752 ohm-cm

5.5.3 Hazardous Materials

This investigation does not include any evaluation or assessment of hazardous or toxic materials which may or may not exist on the site.

5.6 Pavement Design

The stability of the soil at the site was determined in accordance with California Test Method 301G. The test results are as follows:

Sample Location	R-Value
B-1 @ 1-4'	11

Based on the test results and our estimate of traffic conditions, the following pavement sections have been computed in accordance with State of California design procedures:

Pavement Area	Traffic Index - TI	Pavement Section
Parking Stalls	4.5	3" AC over 7" AB
Driving Lanes	5.0	4" AC over 8" AB
Truck Docks/Truck Parking	6.0	4" AC over 10" AB

Unless otherwise specified by others, aggregate base should conform to either Processed Miscellaneous Base as per the Standard Specifications for Public Works Construction, latest edition or Class II Aggregate Base as per Caltrans Specifications, latest edition. Aggregate base should be compacted to at least 95 percent of the maximum density determined in accordance with California Test Method 216.

Unless otherwise specified by others, asphaltic concrete (AC) should conform to Section 39 of the State of California, Caltrans Standard Specifications, latest edition. Asphaltic concrete should be Type B, 1/2 inch maximum size, medium graded.

Since this design is based on assumed traffic data, this office should be notified if definite information becomes available which warrants an alteration of the design sections.

This pavement design may be subject to approval by the governing agency who may have minimum sections in excess of those presented above.

5.7 Stability Considerations

5.7.1 Trenches and Other Excavations

Excavations

Even though no caving was experienced during the subsurface exploration, it can be expected that instability of utility trenches or other excavations will be experienced and, as a consequence, shoring or sloping excavation walls will be required to protect workers. The contractor should refer to the State of California, Division of Industrial Safety for minimum safety standards.

No surcharge loads should be permitted above unshored or unretained excavations. This includes, but is not limited to vehicles carrying material or stockpiles of lumber, concrete block, or soil. Drainage above excavations must be directed away from the banks. Care must be taken to prevent saturation of the soils.

Backfills

It should be noted that the City of Murrieta requires that the compaction of all utility trench backfills be tested and commented on by the project soil engineer prior to final completion of the project and issuance of a certificate of occupancy.

Materials to be used for backfilling utility trenches may consist of sand, "birds-eye", or pea gravel having a sand equivalent (SE) of 30 or more, or the excavated soil, at the contractor's option.

Materials used for backfill should be placed in thin lifts and each lift should be mechanically compacted to at least 90 percent relative compaction and tested by the soil engineer.

This firm will give an opinion of the adequacy of the backfill of utility trenches only if the backfill operations are observed during the backfilling work and only if tests are obtained as the work progresses.

If testing is performed after all backfilling is complete, without the benefit of observation of the work, only the test results at the test locations can be reported.

5.7.2 Graded Slopes

All permanent slopes on this project should be constructed at slope ratios of 2 horizontal to 1 vertical or flatter.

5.8 Site Design

5.8.1 Shrinkage and Subsidence

Calculations have been performed based on the in-situ density of the soils and the estimated compacted density of the soils after grading to estimate the shrinkage which might be expected between cutting and filling. It is estimated that shrinkage on this project could range from 5 to 10 percent. Subsidence as a result of the grading operations could range up to 0.1 feet in these types of soils. Please note that these estimates should be used with extreme caution.

Contingencies must be developed for balancing the earthwork quantities based on the actual shrinkage and subsidence which occurs during grading.

This firm assumes no responsibility for the use of these earthwork factors or the balancing of earthwork quantities on this project.

5.8.2 Drainage Design

This project should be designed and constructed with drainage devices at gradients adequate to insure proper drainage after the completion of construction.

It is important that drainage patterns established during finish grading of the site be maintained throughout the life of the structures. Property owners should be aware that altering drainage patterns during landscaping or at any other time can affect the performance of the structures and other site improvements. In addition, variations in irrigation and seasonal rainfall can also affect the performance of on site facilities.

5.9 Grading Recommendations

The following special grading provisions are recommended for the grading of this project in addition to the Grading Specifications, General Provisions included in the Appendix of this report.

1. The construction may include retaining or garden walls which may or may not be shown on the currently available plans. Such walls should be considered as part of the structures to be constructed, and foundation design, construction, and grading recommendations presented in this report should apply to these walls as if they were part of the building.
2. The natural soils in areas to receive fill outside the structure and hardscape areas shall be scarified and compacted to a depth of 12 inches below the existing surface after clearing and grubbing.
3. The existing soil in the building pad and hardscape areas shall be overexcavated to a depth of 4 feet below rough pad grade or existing grade, whichever is deeper, and the resulting surface scarified to a depth of 9 to 12 inches prior to placing new compacted fill.
4. All scarification and removals specified herein shall extend to a distance of at least 5 feet beyond all footing, building, and hardscape edges unless property line or other constraints exist. Special recommendations will be presented during grading for grading in those areas where constraints are present.
5. Some soft or loose soils were encountered in the areas of recommended overexcavation which may limit the mobility of conventional grading equipment and may cause difficulty with the compaction of soil. This must be determined at the time of grading and will be dependent on the grading equipment selected by the contractor. It is recommended that the drainage channel along the southeast side of the site be evaluated and re-graded to reduce free surface water from entering the property. This should be done prior to site grading in order to allow the wet site area to dry somewhat prior to the start of grading for the buildings.

6. Soil utilized for filling shall consist of approved on-site or imported soil. On-site soils which are free of trash, debris, and organic materials can be considered as suitable.
7. Any imported soil shall be approved by the soil engineer for both expansive and strength qualities prior to importation to the project site. Final acceptance of any imported soil will be based on observation of the soil actually delivered to the site.
8. All fill shall be compacted to at least 90 percent relative compaction.
9. The maximum density of all soils shall be determined in accordance with A.S.T.M. Test Method D-1557. The maximum density of aggregate base shall be determined in accordance with California Test Method 216.
10. Any surface soils showing wet spots on the ground surface shall be examined at the time of grading and a solution proposed at the same time by our field representative.
11. All other fill shall be placed with a moisture content of optimum or greater.
12. All grading plans shall be forwarded to the soil engineer for review and comment prior to the start of construction.

6. ADDITIONAL GEOTECHNICAL SERVICES

The recommended bearing values presented in this report are based on the assumption that the footings will be supported directly on firm, competent compacted fill. All footing excavations should be observed prior to placing steel or concrete to insure that the footings are founded on suitable material.

All grading and fill compaction should be observed and/or tested by this firm, including rough grading, installation of special drainage devices, retaining wall backfills, utility trench backfills, precise grading, and pavement subgrade and aggregate base, if applicable.

It is the responsibility of the owner or his representative to review the recommendations presented herein and to authorize the other design consultants and contractors to perform such work as necessary to comply with the recommendations as well as to inform this firm when necessary observations or testing are needed.

7. PROJECT MAINTENANCE CONSIDERATIONS

Attached to this report is a "Maintenance Guidelines - Commercial/Industrial Sites") sheet which discusses items which should be a part of the homeowners maintenance of the lot. The conditions discussed on this attachment are of paramount importance to the long-term stability of slopes, but should be read and considered at any site, especially those where the expansion index is reported as being greater than 40.

8. CLOSURE

This report has been prepared for the exclusive use of Murrieta Commercial Land Property #2 to assist the project design consultants and contractors in the design and construction of the proposed development. It is recommended that this firm be engaged to review the design drawings and specifications prior to construction to verify that our recommendations have been properly interpreted and included in the design. If we do not perform this review, we can accept no responsibility for misinterpretation of our recommendations.

This firm strives to perform it's services in a manner consistent with generally accepted current professional principles and practice in geotechnical engineering. We make no other warranty, either expressed or implied.

It has been assumed, and it is expected, that the geotechnical conditions which exist between the test excavations are similar to those encountered in the test excavations. However, no warranty of such is implied in this report.

The conclusions and opinions contained in this report are based on the results of the described geotechnical evaluations and represent our best professional judgment. The findings, conclusions, and opinions contained in this report are to be considered tentative only, and subject to confirmation by the undersigned during the construction process. Without this confirmation, this report is to be considered incomplete and this firm or the undersigned professionals assume no responsibility for its use. In addition, this report should be reviewed and updated after a period of one year or if the site ownership or project concept changes from that described herein.

This report is issued with the understanding that it is the responsibility of the owner or his representative to insure that interested parties have this information.

This report is subject to review by the controlling governing authorities for the subject project. It must be noted that this report may not meet all the requirements of the controlling agency since codes and agency interpretation of same are continually changing, and a review document may be issued which requires additional analysis and follow up information. This additional work will be performed at the billing rates which have been established.

Respectfully submitted,

COLEMAN GEOTECHNICAL

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APPENDIX

LABORATORY TESTING PROCEDURES

Below are brief descriptions of the laboratory tests which are performed by our firm on various projects. All of these may, or may not, have been performed as part of our analysis on the subject project. The selection of which samples to be tested and which tests to perform is a part of the professional services performed.

SHEAR STRENGTH

The shear strength of the soil is determined by performing direct shear tests in accordance with A.S.T.M. Test Method D-3080.

Direct shear tests are performed on either "undisturbed" or remolded samples which represent anticipated conditions at the finished site. The samples are either tested at in-situ moisture or are saturated to simulate the most severe field conditions expected. The relationship between the normal stress and shear stress are shown on the Direct Shear Summary.

EXPANSION

Tests for Expansion Index are performed on compacted samples in accordance with Uniform Building Code (UBC) Test Method 18-2. Test results are included within the report body.

SETTLEMENT

The settlement characteristics of soil samples are determined by performing consolidation tests on "undisturbed" or remolded specimens in accordance with A.S.T.M. Test Method D-2435. The samples are tested in the original sample liner ring and the incremental loads for consolidation are applied for periods of 12 or 24 hours by means of a single counterbalanced lever system. Sample consolidation is measured in increments of 0.0001 inches. The pressure-consolidation curves are shown in the appendix.

MOISTURE-DENSITY

The moisture-density relationship of the various soil types is determined in accordance with A.S.T.M. Test Method D-1557. The results are shown on the subsurface logs.

CLASSIFICATION

The following test methods are used to aid in the classification of soils in accordance with the Unified Soil Classification system:

1. Particle size analysis - A.S.T.M Test Method D-422
2. Liquid Limit / Plastic Limit - A.S.T.M. Test Method D-423

The results of these tests are included on the Grading Analysis sheets or are tabulated within the report body.

RESISTANCE "R"-VALUE

The resistance "R"-Value of soils is determined in accordance with California Test Method 301. The results are used for pavement design purposes.

SAND EQUIVALENT

The sand equivalent (S.E.) of granular soils and fine aggregates in determined in accordance with A.S.T.M. Test Method D-2419. The results are used to determine the applicability of the material for use as fill or backfill and to establish whether flooding or jetting is a suitable compaction method.

SOLUBLE SULFATE CONTENT

The concentration of soluble sulfates in the soil is determined by A.S.T.M. Test Method D-516, Method A, and is expressed as a percentage by weight of the dry soil. The results are included within the body of the report and are utilized in determining suitable concrete mixes.

CORROSION POTENTIAL

The potential for the soil to corrode buried metal components is consists of determining the following:

1. Soil pH (Acidity-Alkalinity)
2. Soluble Chloride content in accordance with California Test Method 417.
3. Minimum Resistivity in accordance with California Test Method 643.

These results are included within the body of the report and are intended to be utilized by a Corrosion Engineer in determining protection methods for various buried metal components of the project.

GRADING SPECIFICATIONS
GENERAL PROVISIONS

These specifications are presented to be used wholly, or in part, either as presented or as a guide for the preparation of separate grading specifications.

RESPONSIBILITY

1. The geotechnical consultants are his clients representative on the project. For the purposes of these specifications, observations and/or testing by the soil engineer includes the observation and/or testing performed by any person or persons assigned by, and responsible to, the licensed geotechnical engineer signing the report.

2. All clearing, site preparation, or earthwork performed on this project shall be conducted by the contractor(s) with periodic or full-time observation and testing by the geotechnical engineer.

3. It is the contractors responsibility to conform to the Grading Specifications for the project and the applicable grading ordinances for the jurisdiction in which the project is located. Services performed, and test results obtained, by the geotechnical consultants in no way relieve the contractor(s) from their responsibilities.

CLEARING

1. The site shall be cleared of all vegetable growth and other deleterious materials including, but not limited to, trees, stumps, logs, trash, heavy weed growth, and organic deposits.
2. Unless otherwise approved, all remnants of any previous facilities on the site shall be removed from the site. Included with the removal of foundations and slabs shall be the removal of basements, cellars, cisterns, septic tanks, paving, curbs, pipes, storage tanks, improperly abandoned water or petroleum wells, and other deleterious materials. No cavity created by demolition shall be backfilled until it has been observed by the geotechnical engineer.
3. Unless otherwise specified, all cleared materials shall be removed from the boundaries of the project to an approved disposal site. The determination of the acceptability of the material for disposal or the disposal site is not the responsibility of Coleman Geotechnical.

SITE PREPARATION

1. Loose soils within areas of fill shall be processed by either excavating and stockpiling the loose soil or by scarifying, adjusting the soil moisture content to the amount specified elsewhere in this report, and compacting to the recommended relative compaction as determined by A.S.T.M. Test Method D-1557.

2. The soils within areas of fill placement shall be processed to a depth adequate to insure the removal of major tree roots and pipelines and the compaction of cavaties left from tree removal.

3. Excavation voids created following the removal of subsurface structures shall be cleared of any loose soil, the resulting surface moisture conditioned, and filled with compacted soil. The backfill of such excavations shall be compacted to the relative compaction recommended elsewhere in this report.

4. Cesspools shall be pumped of liquids and solids and backfilled with clean sand, pea gravel, "birds eye", or sand-cement slurry. Sand backfill may be flooded and jetted into place for compaction. Any unsuitable backfill shall be removed when found to not be in compliance with the recommendations contained in this report. Preparation of cesspools for backfilling shall be observed by the soil engineer. Permits may be required by governing agencies for the project, and any specifications which the agency has should be complied with, unless the above is more restrictive.

5. Abandonment of oil, gas, or water wells shall be performed in accordance with applicable state or local laws. The backfilling of any voids left from such abandonment shall be performed as specified in Section 3.3, above.

6. Unless otherwise specified, the tops of any abandoned subsurface structure shall be removed to a depth of 5 feet below any planned improvements, such as footings, slabs, utility lines, future swimming pools, etc.

FILL PLACEMENT

1. Unless otherwise approved and unless a specific rock disposal plan is shown on the plans in this report, no cobbles over 12 inches in diameter shall be accepted in any fill.

2. All on-site and imported soils to be used for an engineered fill shall be subject to the approval of the geotechnical engineer prior to placement. Preliminary approval of a source of imported soil shall not relieve the contractor of delivering proper material to the site. Final acceptance of imported soil will be based upon the material actually delivered to the site.

3. Fill shall be placed in near horizontal lifts with a maximum placed thickness such that the required compaction can be achieved for the entire lift thickness with the available equipment and methods.

4. Site and project specific recommendations for overexcavation, processing, special materials, fill placement, and compaction shall be as recommended in the "Grading Recommendations" section in the main body of this report and any addendum reports which have been prepared by the geotechnical consultants for the project.

COLEMAN GEOTECHNICAL

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GEOTECHNICAL ENGINEERING SERVICES

KEY TO SOIL TERMS

Terms used for describing soils according to their Texture, Grain Size, and Moisture Content. Terms are generally in accordance with the Unified Soil Classification System.

MAJOR DIVISION	FINE GRAINED SOILS (More than 50% finer than #200 sieve)				COARSE GRAINED SOILS (More than 50% coarser than #200 sieve)									
	HIGHLY ORGANIC SOILS	SILTS & CLAYS (Liquid Limit more than 50)			SILTS & CLAYS (Liquid Limit less than 50)			SANDS (More than half of coarse fraction is finer than #4 sieve)				GRAVELS (More than half of coarse fraction is larger than #4 sieve)			
								SANDS WITH FINES		CLEAN SANDS		GRAVEL WITH FINES		CLEAN GRAVEL	
SYMBOL	PT	OH	CH	MH	OL	CL	ML	SC	SM	SP	SW	GC	GM	GP	GW
TYPICAL NAMES	PEAT and other Highly Organic Soils	Organic Clays and Silts of High Plasticity	Inorganic Clays of High Plasticity	Inorganic Clays and Silts of High Plasticity	Organic Silts and Organic Silty Clays of Low Plasticity	Inorganic Clays of Low Plasticity, Sandy Clays, Silty Clays	Inorganic Silts and Very Fine Sands, Rock Flour, clayey Silts with slight plasticity	Clayey Sands, Sand-Clay Mixtures	Silty Sands, Sand – Silt Mixtures	Poorly Graded Sands, gravelly Sands; little or no fines	Well Graded Sands, gravelly Sands; little or no fines	Clayey Gravels, Gravel – Sand - Clay Mixtures	Silty Gravels, Gravel – Sand – Silt Mixtures	Poorly Graded Gravels, Gravel-Sand Mixtures, little fines	Well Graded Gravels, Gravel -Sand Mixtures, little fines

HARDNESS AND DENSITY

CONSISTENCY	SHEAR STRENGTH	SPT "N" VALUE
Very Soft	Less Than 0.25 tsf	Less Than 2
Soft	0.25 – 0.50 tsf	2 – 4
Firm	0.50 – 1.00 tsf	5 - 8
Stiff	1.00 – 2.00 tsf	9 – 15
Very Stiff	2.00 – 4.00 tsf	16 – 30
Hard	> 4.00 tsf	> 30

RELATIVE DENSITY	SPT "N" VALUE
Very Loose	< 4
Loose	4 – 10
Medium Compact (Firm)	11 – 30
Compact	31 – 50
Very Compact	> 50

MOISTURE

From low to high, the soil moisture is indicated by:

Dry (Very Rare)
Damp
Slightly Moist
Moist (Near Optimum)
Very Moist
Wet (Saturated)

TERMS CHARACTERIZING SOIL STRUCTURE

Slickensided - having inclined planes that are slick and glossy in appearance
Fissured - containing near vertical shrinkage cracks, frequently filled with fine soil
Laminated - composed of thin layers of varying color and texture
Calcareous - contains significant amounts of calcium carbonate
Porous - having visibly apparent void spaces through which air and water may pass

SAMPLER TYPES

(Shown in SAMPLE column on log)

R = Ring
S = Standard Penetration Test
B = Bulk

MAINTENANCE GUIDELINES - COMMERCIAL / INDUSTRIAL SITES

Commercial / Industrial sites, in general, and hillside lots, in particular, need maintenance to continue to function and retain their value. Many occupants are unaware of this and allow deterioration of their property. It is important to be familiar with some guidelines for maintenance of property and that they be aware of the importance of maintenance. These guidelines are NOT all encompassing, but discuss some items which may be important.

Governing agencies require hillside property developers to utilize specific methods of engineering and construction to protect those investing in improved lots or buildings. For example, the developer may be required to grade the property in such a manner that surface water will be drained away from the lot and to plant slopes so that erosion will be minimized. He may also be required to install permanent drains.

It is the owner / occupant's responsibility to maintain these safety features by pursuing a prudent program of lot care and maintenance. Failure to make regular inspection and to maintain drainage devices and sloping areas may cause severe financial loss. In addition to his own property damage, the owner may be subject to civil liability for damage occurring to neighboring properties as a result of his negligence.

If slope ownership and maintenance is the responsibility of an association, individual owners can aid their association by observing conditions in the immediate area of their site, and reporting any possible problems to their association.

The following maintenance guidelines are provided for the protection of the owner's investment:

1. Landscape irrigation adjacent to buildings and pavement areas MUST be carefully controlled to reduce water entering beneath floor slabs and subgrade areas, since such water can cause slab heave and pavement failure.
2. Care should be taken that slopes, terraces, berms (ridges at crown of slopes) and proper lot drainage are not disturbed or impaired. Surface drainage should be conducted to the street through the approved devices or by maintained surfaces.
3. In general, roof and landscape area runoff should be directed to the street or storm drain by nonerosive devices such as sidewalks, drainage pipes, or ground gutters. Drainage systems installed by the developer should not be altered without expert consultation.
4. All drains should be kept cleaned and unclogged, including gutters and downspouts. Terrace drains or gunite ditches should be kept free of debris to allow proper drainage. During heavy rain periods, performance of the drainage system should be observed. Problems, such as gullying and/or ponding, if observed, should be corrected as soon as possible.
5. Any leakage from waterlines or surface flow by-passing drains should be repaired or corrected as soon as practical.
6. Animal burrows should be eliminated since they may cause diversion of surface runoff or deep saturation of surficial soils, promote accelerated erosion, and even trigger shallow soil slumps or failures due to loosened and saturated surficial soils.
7. Slopes and near slope areas should not be altered without expert consultation. Whenever an owner plans a significant topographic modification of the lot or slope, a qualified geotechnical consultant should be contacted. In the case of areas near the top of slope, a "significant" topographic modification could be the addition of as little as one foot of soil against a wall to create a planter area. This type of modification is often performed as a part of landscape construction, and often causes wall distress, movement, and possibly failure of the nearby slope.
8. If the owner plans modification of cut, fill, or natural slopes within his property, a geotechnical consultant should be contacted. Any oversteepening will likely result in a need for retaining devices, per building code requirements. Undercutting of a toe-of-slope would reduce the safety factor of the slope and should not be undertaken without expert consultation.
9. If any unusual cracking, settling or earth slippage occurs on the property, the owner should consult a qualified soil engineer or engineering geologist immediately.
10. The most common causes of slope erosion and shallow slope failures are as follows:

    ** Neglect of the care and maintenance of the slopes and drainage devices.

    ** Inadequate and/or improper planting. Barren areas should be replanted as soon as possible.

    ** Excessive or insufficient irrigation or diversion of runoff over the top of slope.

11. Whether required by the governing agency, or not, a geotechnical consultant should be contacted prior to and during any near slope construction, ESPECIALLY slabs or landscaping which results in the placement of ANY fill.
12. Hillside lot owners should not let conditions on their property create a problem for their neighbors. Cooperation with neighbors in maintaining proper drainage and landscaping could reduce problems, promote slope stability, and also increase the aesthetic attractiveness of the community.

COLEMAN GEOTECHNICAL SUBSURFACE LOG

CLIENT: Murrieta Commercial Land Property | **JOB NO:** 2692 | **DATE:** 5/1/2007

BORING NO: B-1

EQUIPMENT: [x] HOLLOW STEM AUGER [ ] BACKHOE - SAMPLERS ADVANCED BY 140 POUND TRIP HAMMER FALLING 30 INCHES OR [ ] BUCKET AUGER - _____ POUND KELLY BAR FALLING _____ INCHES [ ] HAND AUGER

DIAMETER: 8"

ADDRESS: NE of Adams & 1000 feet SE of Fig St. Murrieta, CA

LOGGED BY: AA

LABORATORY DATA				DEPTH (feet)	FIELD DATA			SOIL / GEOLOGY CLASSIFICATION	SOIL/BEDROCK DESCRIPTION
DRY DENSITY (pcf)	MAX. DENSITY (pcf)	RELATIVE COMPACTION%	MOISTURE CONTENT (%)		BULK SAMPLE	DRIVE SAMPLE	"N" VALUE		
									ALLUVIUM: Sandy SILT, dry, very soft, tilled in upper 12"
				2'					
105	126		13.7			R		SM-ML	Sandy SILT, moist, soft to firm, gray brown
				5'					
114			13.6			R		ML	-Sandy SILT, moist, brown, firm to stiff
				10'					
116			17.5			R		ML	-Sandy SILT, trace of clay, very moist, firm to stiff
				15'				v	- very moist , nearly saturated
			17.9			S	9		- Sandy SILT, brown, very moist, firm to stiff
				20'					
122			13.7			R		SC	- Clayey SAND, gray brown, moist, dense
				25'					
			20.3			S	12	SM-ML	- Sandy SILT and Silty SAND, brown, moist, dense
				30'					
126			13.2			R		SC	- Clayey SAND, brown, moist, very dense
			25.3	35'		S	17	SM-ML	- Sandy SILT to Silty SAND, brown, very moist, dense

This log is a representation of conditions at the time and place of excavation. With the passage of time and at other locations, conditions may vary.

DRIVE SAMPLER: S = Standard Penetration Test, R = Ring Sampler, M = Moisture

COLEMAN GEOTECHNICAL SUBSURFACE LOG

CLIENT: Murrieta Commercial Land Property | **JOB NO:** 2692 | **DATE:** 5/1/2007

BORING NO: B-1

EQUIPMENT: [x] HOLLOW STEM AUGER [] BACKHOE - SAMPLERS ADVANCED BY 140 POUND TRIP HAMMER FALLING 30 INCHES OR [] BUCKET AUGER - _____ POUND KELLY BAR FALLING _____ INCHES [] HAND AUGER

DIAMETER: 8"

ADDRESS: NE of Adams & 1000 feet SE of Fig St. Murrieta, CA

LOGGED BY: AA

LABORATORY DATA				DEPTH (feet)	FIELD DATA			SOIL / GEOLOGY CLASSIFICATION	SOIL/BEDROCK DESCRIPTION
DRY DENSITY (pcf)	MAX. DENSITY (pcf)	RELATIVE COMPACTION%	MOISTURE CONTENT (%)		BULK SAMPLE	DRIVE SAMPLE	"N" VALUE		
									ALLUVIUM cont....
				40'					
89			34.2			R		SC	- Silty CLAY, gray, very moist, stiff
				45'					
			27.9			S	31	SM	- Silty SAND, clay, gray, very moist, dense
				50'					
						R			- no sample recovery
									Bottom of Boring @ 51.0 Feet
									Groundwater and Saturated @ 14.5'

This log is a representation of conditions at the time and place of excavation. With the passage of time and at other locations, conditions may vary. DRIVE SAMPLER: S = Standard Penetration Test, R = Ring Sampler, M = Moisture

COLEMAN GEOTECHNICAL SUBSURFACE LOG

CLIENT: Murrieta Commercial Land Property	**JOB NO: 2692**	**DATE: 5/1/2007**
BORING NO: B-2	**EQUIPMENT:** [x] HOLLOW STEM AUGER [ ] BACKHOE - SAMPLERS ADVANCED BY 140 POUND TRIP HAMMER FALLING 30 INCHES OR [ ] BUCKET AUGER - _____ POUND KELLY BAR FALLING _____ INCHES [ ] HAND AUGER	**DIAMETER: 8"**
ADDRESS: NE of Adams & 1000 feet SE of Fig St. Murrieta, CA		**LOGGED BY: AA**

LABORATORY DATA					FIELD DATA				
DRY DENSITY (pcf)	MAX. DENSITY (pcf)	RELATIVE COMPACTION%	MOISTURE CONTENT (%)	DEPTH (feet)	BULK SAMPLE	DRIVE SAMPLE	"N" VALUE	SOIL / GEOLOGY CLASSIFICATION	SOIL/BEDROCK DESCRIPTION
									ALLUVIUM: Sandy SILT and SILT, gray brown, dry, very soft, tilled in upper 12"
			5.0			S	13	ML-SM	- Sandy SILT, brown, moist, firm to stiff
				5'					
			14.6			S	7	ML-SM	- Sandy SILT, brown, moist, firm
				10'					
			18.3			S	13	ML-SM	- Sandy SILT, brown, moist, firm to stiff
				15'					
			20.0			S	15	SC	- SAND, gray, very moist, medium dense
				20'					
			14.6			S	17	SM	- Silty SAND, brown, moist, medium dense
									Bottom of Boring @ 21.0 Feet No Groundwater Noted, Soils nearly Saturated at 15.0'

This log is a representation of conditions at the time and place of excavation. With the passage of time and at other locations, conditions may vary. DRIVE SAMPLER: S = Standard Penetration Test, R = Ring Sampler, M = Moisture

COLEMAN GEOTECHNICAL SUBSURFACE LOG

CLIENT: Murrieta Land Property #2	**JOB NO: 2692**	**DATE: 5/16/2007**
BORING NO: B-3	**EQUIPMENT:** [X] HOLLOW STEM AUGER [ ] BACKHOE - SAMPLERS ADVANCED BY 140 POUND TRIP HAMMER FALLING 30 INCHES OR [ ] BUCKET AUGER - _____ POUND KELLY BAR FALLING _____ INCHES [ ] HAND AUGER	**DIAMETER: 8"**
ADDRESS: NE Side of Adams Ave., 1000' SE of Fig St., Murrieta CA		**LOGGED BY: LAS**

LABORATORY DATA				DEPTH (feet)	FIELD DATA			SOIL / GEOLOGY CLASSIFICATION	SOIL/BEDROCK DESCRIPTION
DRY DENSITY (pcf)	MAX. DENSITY (pcf)	RELATIVE COMPACTION%	MOISTURE CONTENT (%)		BULK SAMPLE	DRIVE SAMPLE	"N" VALUE		
									Alluvium: Mixed SILT and Sandy SILT, gray brown, top 12" is dry and very soft(tilled), firm and damp below
				2'					
			7.2			S	9		- Silty Fine SAND and Sandy SILT, moderate brown damp to moist, medium dense, no open pores
				5'					
			10.5			S	9		- Silty Fine Sand, SILT, Sandy SILT, trace of clay moderate brown, moist, medium dense
				10'					
			7.7			S	14		- Silty SAND, dark gray brown, well graded, poorly sorted moist, thin interbed of silt
				15'					
			21.1			S	6		- Silty SAND, SILT, and Clayey SILT, soft, wet, slightly plastic
								∇ ≈≈≈	- water
				20'					
			18.8			S	8		- Clayey SILT to Silty CLAY, trace of sand, dark gray brown, very moist, firm to stiff, moderately plastic
				25'					Bottom of Boring @ 21.0 Feet Saturated and wet @ 18.0 Feet
				30'					

This log is a representation of conditions at the time and place of excavation. With the passage of time and at other locations, conditions may vary. DRIVE SAMPLER: S = Standard Penetration Test, R = Ring Sampler, M = Moisture

COLEMAN GEOTECHNICAL SUBSURFACE LOG

CLIENT: Murrieta Land Property #2	**JOB NO: 2692**	**DATE: 5/16/2007**
BORING NO: B-4	EQUIPMENT: [X] HOLLOW STEM AUGER [ ] BACKHOE - SAMPLERS ADVANCED BY 140 POUND TRIP HAMMER FALLING 30 INCHES OR [ ] BUCKET AUGER - _____ POUND KELLY BAR FALLING _____ INCHES [ ] HAND AUGER	**DIAMETER: 8"**
ADDRESS: NE Side of Adams Ave., 1000' SE of Fig St., Murrieta CA		**LOGGED BY: LAS**

LABORATORY DATA					FIELD DATA				
DRY DENSITY (pcf)	MAX. DENSITY (pcf)	RELATIVE COMPACTION%	MOISTURE CONTENT (%)	DEPTH (feet)	BULK SAMPLE	DRIVE SAMPLE	"N" VALUE	SOIL / GEOLOGY CLASSIFICATION	SOIL/BEDROCK DESCRIPTION
									Alluvium: Mixed SILT and Sandy SILT, gray brown, top 12" is dry and very soft(tilled), firm to stiff below
				2'					
			2.9			S	14		- Sandy SILT, brown, dry to damp, stiff
				5'					
			14.7			S	6		- SILT and Sandy SILT, dark gray brown, moist , firm
				10'					
			12.1			S	10		- Silty SAND and Sandy SILT, trace of clay, dark gray Brown, medium dense
				15'					
			22.0			S	4	▽	- Sandy CLAY to Clayey SILT, dark gray brown, very moist, moderately plastic
				20'				≈≈≈	
			26.3			S	4		- Clayey SILT, very moist, firm, slightly to moderately plastic
				25'					Bottom of Boring @ 21.0 Feet Saturated and Wet At 17.0 Feet
				30'					

This log is a representation of conditions at the time and place of excavation. With the passage of time and at other locations, conditions may vary. DRIVE SAMPLER: S = Standard Penetration Test, R = Ring Sampler, M = Moisture

COLEMAN GEOTECHNICAL SUBSURFACE LOG

CLIENT: Murrieta Land Property #2	**JOB NO: 2692**	**DATE: 5/16/2007**
BORING NO: B-5	**EQUIPMENT:** [X] HOLLOW STEM AUGER [ ] BACKHOE - SAMPLERS ADVANCED BY 140 POUND TRIP HAMMER FALLING 30 INCHES OR [ ] BUCKET AUGER - _____ POUND KELLY BAR FALLING ____ INCHES [ ] HAND AUGER	**DIAMETER: 8"**
ADDRESS: NE Side of Adams Ave., 1000' SE of Fig St., Murrieta CA		**LOGGED BY: LAS**

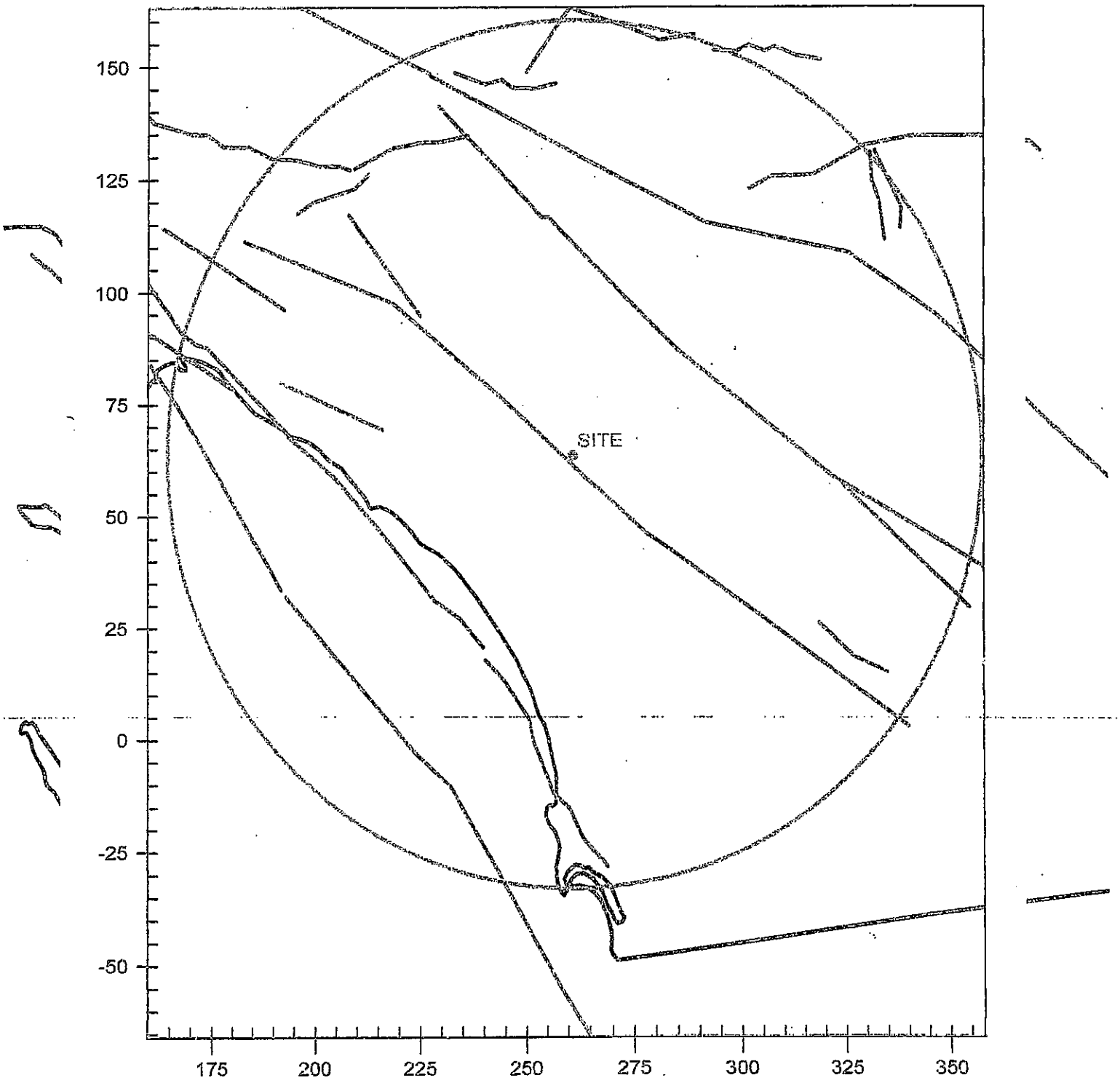
LABORATORY DATA					FIELD DATA				
DRY DENSITY (pcf)	MAX. DENSITY (pcf)	RELATIVE COMPACTION%	MOISTURE CONTENT (%)	DEPTH (feet)	BULK SAMPLE	DRIVE SAMPLE	"N" VALUE	SOIL / GEOLOGY CLASSIFICATION	SOIL/BEDROCK DESCRIPTION
									Alluvium: Mixed SILT and Sandy SILT, gray brown, top 18" is dry and very soft(tilled), firm to stiff below
				2'					
118			8.1			R			- Sandy SILT and Silty SAND, brown, damp, medium Dense
				5'					
107			16.6			R			- SILT, trace of clay and sand, gray brown, moist, firm
				10'					
120			11.9			R			-Sandy SILT to Silty SAND, gray brown, moist, medium Dense
				15'					
124			12.9			R			- Silty SAND, poorly sorted, trace of clay, sand varies from fine to coarse, moist
				20'		R			- no sample recovery
				25'		S	17		- Interbedded Sandy SILT, and Silty SAND, Fine SAND trace of clay, yellow brown, moist, moderately dense
			15.2	30'					Bottom of Boring @ 25.0 Feet Wet and Saturated at 22 Feet

This log is a representation of conditions at the time and place of excavation. With the passage of time and at other locations, conditions may vary.

DRIVE SAMPLER: S = Standard Penetration Test, R = Ring Sampler, M = Moisture

CALIFORNIA FAULT MAP

Industrial Building



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*  Version 3.00  *
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DETERMINISTIC ESTIMATION OF
PEAK ACCELERATION FROM DIGITIZED FAULTS

JOB NUMBER: Proposal DATE: 04-05-2007
JOB NAME: Industrial Buildings, 26100+ Adams Avenue, Murrieta, CA
CLIENT: Mr. George Gamor, c/o Grubb & Ellis (Mr. Roger Rhoades)
FAULT-DATA-FILE NAME: CDMGFLTE.DAT
SITE COORDINATES: SITE LATITUDE: 33.5361 SITE LONGITUDE: 117.1866
SEARCH RADIUS: 60 mi
ATTENUATION RELATION: 14) Campbell & Bozorgnia (1997 Rev.) - Alluvium
UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0
DISTANCE MEASURE: cdist
SCOND: 0
Basement Depth: 5.00 km Campbell SSR: 0 Campbell SHR: 0
COMPUTE PEAK HORIZONTAL ACCELERATION

FAULT-DATA FILE USED: CDMGFLTE.DAT
MINIMUM DEPTH VALUE (km): 3.0

EQFAULT SUMMARY

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)	ESTIMATED MAX. EARTHQUAKE EVENT: MAXIMUM EARTHQUAKE MAG. (Mw)	PEAK SITE ACCEL. g	EST. SITE INTENSITY MOD.MERC.
ELSINORE-TEMECULA	2.2(3.5)	6.8	0.481	X
ELSINORE-GLEN IVY	12.0(19.3)	6.8	0.219	IX
ELSINORE-JULIAN	15.0(24.1)	7.1	0.216	VIII
SAN JACINTO-ANZA	21.1(33.9)	7.2	0.163	VIII
SAN JACINTO-SAN JACINTO VALLEY	21.1(33.9)	6.9	0.130	VIII
NEWPORT-INGLEWOOD (Offshore)	28.1(45.3)	6.9	0.092	VII
SAN JOAQUIN HILLS THRUST	28.3(45.5)	6.6	0.075	VII
CHINO-CENTRAL AVE. (Elsinore)	30.1(48.4)	6.7	0.075	VII
ROSE CANYON	31.3(50.4)	6.9	0.080	VII
SAN JACINTO-SAN BERNARDINO	33.4(53.8)	6.7	0.062	VI
WHITTIER	34.1(54.8)	6.8	0.066	VI
SAN ANDREAS - Southern	37.5(60.4)	7.4	0.098	VII
SAN ANDREAS - San Bernardino	37.5(60.4)	7.3	0.090	VII
SAN JACINTO-COYOTE CREEK	39.5(63.6)	6.8	0.055	VI
EARTHQUAKE VALLEY	42.6(68.6)	6.5	0.038	V
NEWPORT-INGLEWOOD (L.A.Basin)	42.8(68.9)	6.9	0.054	VI
CORONADO BANK	44.7(71.9)	7.4	0.079	VII
PINTO MOUNTAIN	44.9(72.3)	7.0	0.055	VI
PALOS VERDES	46.8(75.3)	7.1	0.057	VI
ELYSIAN PARK THRUST	47.6(76.6)	6.7	0.039	V
CUCAMONGA	48.9(78.7)	7.0	0.048	VI
NORTH FRONTAL FAULT ZONE (West)	49.1(79.0)	7.0	0.048	VI

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)	ESTIMATED MAX. EARTHQUAKE EVENT: MAXIMUM EARTHQUAKE MAG. (Mw)	PEAK SITE ACCEL. g	EST. SITE INTENSITY MOD.MERC.
SAN ANDREAS - Coachella	49.2(79.2)	7.1	0.054	VI
COMPTON THRUST	49.2(79.2)	6.8	0.041	V
SAN JOSE	49.7(80.0)	6.5	0.032	V
CLEGHORN	51.2(82.4)	6.5	0.030	V
SIERRA MADRE	52.6(84.7)	7.0	0.043	VI
NORTH FRONTAL FAULT ZONE (East)	52.8(84.9)	6.7	0.034	V
BURNT MTN.	54.6(87.8)	6.4	0.025	V
SAN ANDREAS - 1857 Rupture	57.1(91.9)	7.8	0.082	VII
SAN ANDREAS - Mojave	57.1(91.9)	7.1	0.044	VI
EUREKA PEAK	57.4(92.4)	6.4	0.024	IV

-END OF SEARCH- 32 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE ELSINORE-TEMECULA FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 2.2 MILES (3.5 km) AWAY.

LARGEST MAXIMUM-EARTHQUAKE SITE ACCELERATION: 0.4808 g

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*                    *
*    U B C S E I S   *
*                    *
*    Version  1.03   *
*                    *
**********************

COMPUTATION OF 1997
UNIFORM BUILDING CODE
SEISMIC DESIGN PARAMETERS

JOB NUMBER: Proposal                                          DATE: 04-05-2007
JOB NAME: Industrial Buildings, 26100+ Adams Avenue, Murrieta, CA
CLIENT: Mr. George Gamor, c/o Grubb & Ellis (Mr. Roger Rhoades)
FAULT-DATA-FILE NAME: CDMGUBCR.DAT
SITE COORDINATES:   SITE LATITUDE:  33.5361   SITE LONGITUDE:  117.1866

UBC SEISMIC ZONE:  0.4
UBC SOIL PROFILE TYPE:  SD

NEAREST TYPE A FAULT:   NAME:  ELSINORE-JULIAN              DISTANCE:  23.9  km
NEAREST TYPE B FAULT:   NAME:  ELSINORE-TEMECULA            DISTANCE:   1.7  km
NEAREST TYPE C FAULT:   NAME:                          DISTANCE:  99999.0  km

SELECTED UBC SEISMIC COEFFICIENTS:
   Na:  1.3
   Nv:  1.6
   Ca:  0.57
   Cv:  1.02
   Ts:  0.716
   To:  0.143

   ********************************************************************
   * CAUTION:  The digitized data points used to model faults are     *
   *           limited in number and have been digitized from small-  *
   *           scale maps (e.g., 1:750,000 scale).  Consequently,     *
   *           the estimated fault-site-distances may be in error by  *
   *           several kilometers.  Therefore, it is important that   *
   *           the distances be carefully checked for accuracy and    *
   *           adjusted as needed, before they are used in design.    *
   ********************************************************************

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                        SUMMARY OF FAULT PARAMETERS
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ABBREVIATED FAULT NAME	APPROX. DISTANCE (km)	SOURCE TYPE (A,B,C)	MAX. MAG. (Mw)	SLIP RATE (mm/yr)	FAULT TYPE (SS,DS,BT)
ELSINORE-TEMECULA	1.7	B	6.8	5.00	SS
ELSINORE-GLEN IVY	19.1	B	6.8	5.00	SS
ELSINORE-JULIAN	23.9	A	7.1	5.00	SS
SAN JACINTO-ANZA	33.7	A	7.2	12.00	SS
SAN JACINTO-SAN JACINTO VALLEY	33.7	B	6.9	12.00	SS
NEWPORT-INGLEWOOD (Offshore)	45.2	B	6.9	1.50	SS
SAN JOAQUIN HILLS THRUST	45.4	B	6.6	0.50	BT
CHINO-CENTRAL AVE. (Elsinore)	48.0	B	6.7	1.00	DS
ROSE CANYON	50.3	B	6.9	1.50	SS
SAN JACINTO-SAN BERNARDINO	53.7	B	6.7	12.00	SS

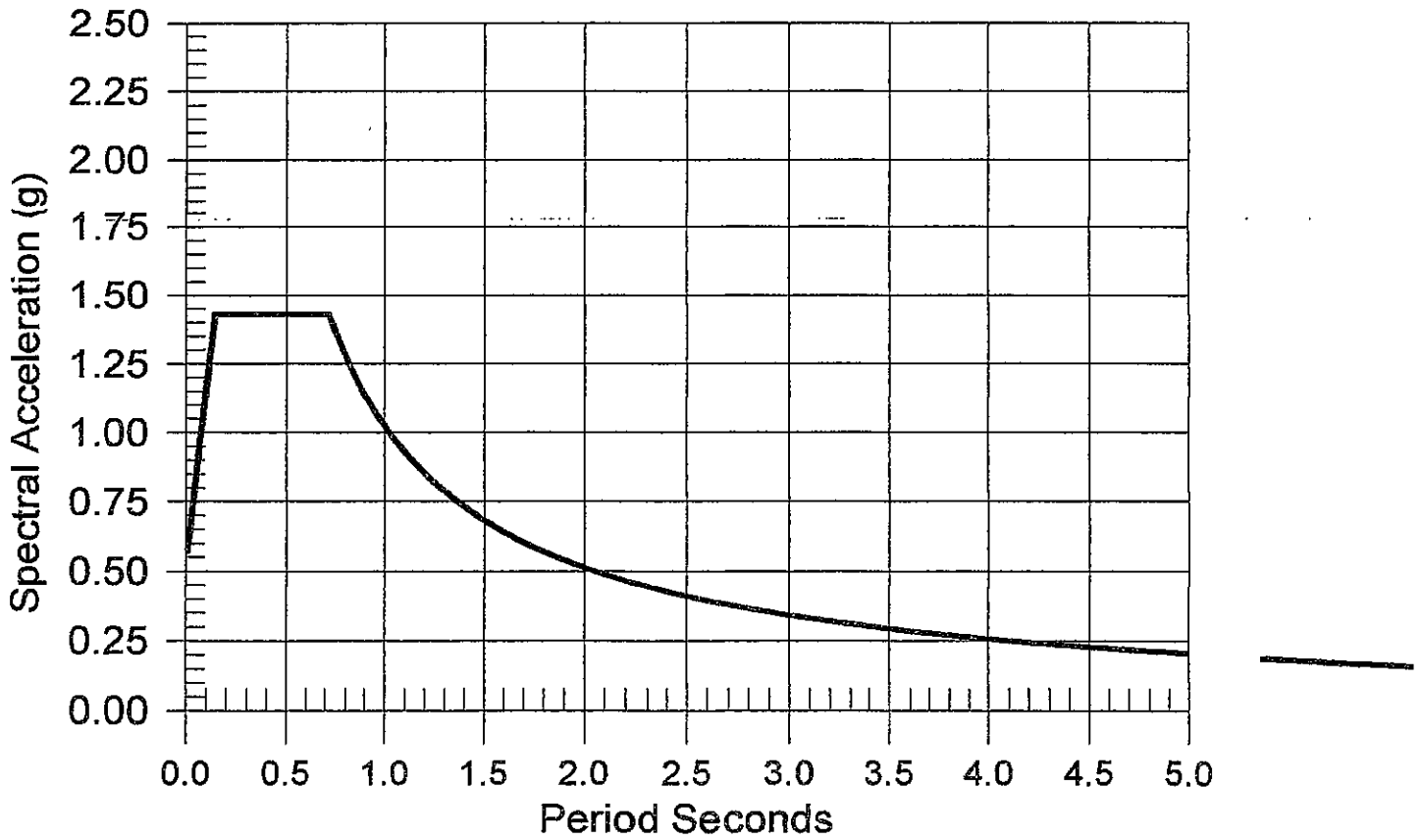
ABBREVIATED FAULT NAME	APPROX. DISTANCE (km)	SOURCE TYPE (A,B,C)	MAX. MAG. (Mw)	SLIP RATE (mm/yr)	FAULT TYPE (SS,DS,BT)
ELSINORE-WHITTIER	54.7	B	6.8	2.50	SS
SAN ANDREAS - Southern	60.3	A	7.4	24.00	SS
SAN JACINTO-COYOTE CREEK	63.5	B	6.8	4.00	SS
EARTHQUAKE VALLEY	68.5	B	6.5	2.00	SS
NEWPORT-INGLEWOOD (L.A.Basin)	68.7	B	6.9	1.00	SS
CORONADO BANK	71.8	B	7.4	3.00	SS
PINTO MOUNTAIN	72.2	B	7.0	2.50	SS
PALOS VERDES	75.0	B	7.1	3.00	SS
CUCAMONGA	75.6	A	7.0	5.00	DS
SAN JOSE	79.1	B	6.5	0.50	DS
NORTH FRONTAL FAULT ZONE (West)	79.6	B	7.0	1.00	DS
CLEGHORN	82.4	B	6.5	3.00	SS
SIERRA MADRE (Central)	83.0	B	7.0	3.00	DS
NORTH FRONTAL FAULT ZONE (East)	86.5	B	6.7	0.50	DS
BURNT MTN.	87.8	B	6.5	0.60	SS
SAN ANDREAS - 1857 Rupture	91.8	A	7.8	34.00	SS
EUREKA PEAK	92.3	B	6.5	0.60	SS
HELENDALE - S. LOCKHARDT	97.3	B	7.1	0.60	SS
SAN JACINTO - BORREGO	99.3	B	6.6	4.00	SS
CLAMSHELL-SAWPIT	99.3	B	6.5	0.50	DS
ELSINORE-COYOTE MOUNTAIN	99.4	B	6.8	4.00	SS
LANDERS	99.8	B	7.3	0.60	SS
RAYMOND	103.3	B	6.5	0.50	DS
LENWOOD-LOCKHART-OLD WOMAN SPRGS	104.3	B	7.3	0.60	SS
JOHNSON VALLEY (Northern)	110.7	B	6.7	0.60	SS
VERDUGO	111.4	B	6.7	0.50	DS
EMERSON So. - COPPER MTN.	114.8	B	6.9	0.60	SS
HOLLYWOOD	116.4	B	6.5	1.00	DS
CALICO - HIDALGO	125.3	B	7.1	0.60	SS
PISGAH-BULLION MTN.-MESQUITE LK	127.4	B	7.1	0.60	SS
SANTA MONICA	128.5	B	6.6	1.00	DS
SIERRA MADRE (San Fernando)	131.7	B	6.7	2.00	DS
SUPERSTITION MTN. (San Jacinto)	131.9	B	6.6	5.00	SS
SAN GABRIEL	133.5	B	7.0	1.00	SS
ELMORE RANCH	135.7	B	6.6	1.00	SS
MALIBU COAST	136.4	B	6.7	0.30	DS
SUPERSTITION HILLS (San Jacinto)	137.9	B	6.6	4.00	SS
BRAWLEY SEISMIC ZONE	138.8	B	6.5	25.00	SS
ANACAPA-DUME	148.4	B	7.3	3.00	DS
SANTA SUSANA	149.6	B	6.6	5.00	DS
GRAVEL HILLS - HARPER LAKE	150.7	B	6.9	0.60	SS
ELSINORE-LAGUNA SALADA	150.8	B	7.0	3.50	SS
HOLSER	158.6	B	6.5	0.40	DS
IMPERIAL	165.0	A	7.0	20.00	SS
BLACKWATER	166.2	B	6.9	0.60	SS
OAK RIDGE (Onshore)	169.6	B	6.9	4.00	DS
SIMI-SANTA ROSA	171.3	B	6.7	1.00	DS
SAN CAYETANO	177.0	B	6.8	6.00	DS
SANTA YNEZ (East)	196.1	B	7.0	2.00	SS
GARLOCK (West)	201.6	A	7.1	6.00	SS
VENTURA - PITAS POINT	202.3	B	6.8	1.00	DS
GARLOCK (East)	209.3	A	7.3	7.00	SS
M.RIDGE-ARROYO PARIDA-SANTA ANA	210.8	B	6.7	0.40	DS
PLEITO THRUST	213.1	B	6.8	2.00	DS
RED MOUNTAIN	216.6	B	6.8	2.00	DS

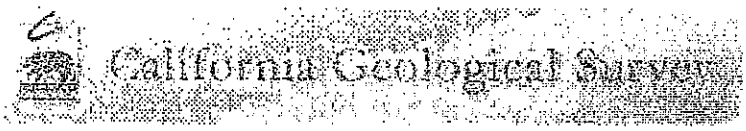
ABBREVIATED FAULT NAME	APPROX. DISTANCE (km)	SOURCE TYPE (A,B,C)	MAX. MAG. (Mw)	SLIP RATE (mm/yr)	FAULT TYPE (SS,DS,BT)
BIG PINE	221.1	B	6.7	0.80	SS
SANTA CRUZ ISLAND	221.7	B	6.8	1.00	DS
WHITE WOLF	228.2	B	7.2	2.00	DS
OWL LAKE	232.0	B	6.5	2.00	SS
PANAMINT VALLEY	232.3	B	7.2	2.50	SS
So. SIERRA NEVADA	232.4	B	7.1	0.10	DS
TANK CANYON	234.2	B	6.5	1.00	DS
LITTLE LAKE	234.6	B	6.7	0.70	SS
DEATH VALLEY (South)	240.7	B	6.9	4.00	SS
SANTA YNEZ (West)	250.2	B	6.9	2.00	SS
SANTA ROSA ISLAND	257.9	B	6.9	1.00	DS
DEATH VALLEY (Graben)	282.3	B	6.9	4.00	DS
LOS ALAMOS-W. BASELINE	293.2	B	6.8	0.70	DS
OWENS VALLEY	304.3	B	7.6	1.50	SS
LIONS HEAD	310.7	B	6.6	0.02	DS
SAN JUAN	313.4	B	7.0	1.00	SS
SAN LUIS RANGE (S. Margin)	318.1	B	7.0	0.20	DS
CASMALIA (Orcutt Frontal Fault)	327.8	B	6.5	0.25	DS
HUNTER MTN. - SALINE VALLEY	327.8	B	7.0	2.50	SS
DEATH VALLEY (Northern)	336.0	A	7.2	5.00	SS
INDEPENDENCE	340.3	B	6.9	0.20	DS
LOS OSOS	347.5	B	6.8	0.50	DS
HOSGRI	356.8	B	7.3	2.50	SS
RINCONADA	365.6	B	7.3	1.00	SS
BIRCH CREEK	397.1	B	6.5	0.70	DS
WHITE MOUNTAINS	400.8	B	7.1	1.00	SS
SAN ANDREAS (Creeping)	415.9	B	5.0	34.00	SS
DEEP SPRINGS	418.7	B	6.6	0.80	DS
DEATH VALLEY (N. of Cucamongo)	422.3	A	7.0	5.00	SS
ROUND VALLEY (E. of S.N.Mtns.)	433.0	B	6.8	1.00	DS
FISH SLOUGH	439.8	B	6.6	0.20	DS
HILTON CREEK	459.3	B	6.7	2.50	DS
HARTLEY SPRINGS	484.2	B	6.6	0.50	DS
ORTIGALITA	497.2	B	6.9	1.00	SS
CALAVERAS (So.of Calaveras Res)	504.9	B	6.2	15.00	SS
MONTEREY BAY - TULARCITOS	510.8	B	7.1	0.50	DS
PALO COLORADO - SUR	514.0	B	7.0	3.00	SS
QUIEN SABE	517.5	B	6.5	1.00	SS
MONO LAKE	520.4	B	6.6	2.50	DS
ZAYANTE-VERGELES	536.9	B	6.8	0.10	SS
SARGENT	541.7	B	6.8	3.00	SS
SAN ANDREAS (1906)	542.1	A	7.9	24.00	SS
ROBINSON CREEK	551.8	B	6.5	0.50	DS
SAN GREGORIO	585.9	A	7.3	5.00	SS
GREENVILLE	588.9	B	6.9	2.00	SS
HAYWARD (SE Extension)	590.9	B	6.5	3.00	SS
MONTE VISTA - SHANNON	591.9	B	6.5	0.40	DS
ANTELOPE VALLEY	592.5	B	6.7	0.80	DS
CALAVERAS (No.of Calaveras Res)	610.2	B	6.8	6.00	SS
HAYWARD (Total Length)	610.2	A	7.1	9.00	SS
GENOA	618.5	B	6.9	1.00	DS
CONCORD - GREEN VALLEY	656.6	B	6.9	6.00	SS
RODGERS CREEK	695.9	A	7.0	9.00	SS
WEST NAPA	696.2	B	6.5	1.00	SS
POINT REYES	717.0	B	6.8	0.30	DS

ABBREVIATED FAULT NAME	APPROX. DISTANCE (km)	SOURCE TYPE (A,B,C)	MAX. MAG. (Mw)	SLIP RATE (mm/yr)	FAULT TYPE (SS,DS,BT)
HUNTING CREEK - BERRYESSA	717.4	B	6.9	6.00	SS
MAACAMA (South)	758.0	B	6.9	9.00	SS
COLLAYOMI	774.1	B	6.5	0.60	SS
BARTLETT SPRINGS	776.6	A	7.1	6.00	SS
MAACAMA (Central)	799.5	A	7.1	9.00	SS
MAACAMA (North)	858.4	A	7.1	9.00	SS
ROUND VALLEY (N. S.F.Bay)	863.2	B	6.8	6.00	SS
BATTLE CREEK	881.5	B	6.5	0.50	DS
LAKE MOUNTAIN	921.6	B	6.7	6.00	SS
GARBERVILLE-BRICELAND	939.3	B	6.9	9.00	SS
MENDOCINO FAULT ZONE	996.4	A	7.4	35.00	DS
LITTLE SALMON (Onshore)	1001.6	A	7.0	5.00	DS
MAD RIVER	1003.4	B	7.1	0.70	DS
CASCADIA SUBDUCTION ZONE	1010.8	A	8.3	35.00	DS
McKINLEYVILLE	1014.1	B	7.0	0.60	DS
TRINIDAD	1015.4	B	7.3	2.50	DS
FICKLE HILL	1016.2	B	6.9	0.60	DS
TABLE BLUFF	1022.3	B	7.0	0.60	DS
LITTLE SALMON (Offshore)	1035.5	B	7.1	1.00	DS
BIG LAGOON - BALD MTN.FLT.ZONE	1051.9	B	7.3	0.50	DS

DESIGN RESPONSE SPECTRUM

Seismic Zone: 0.4 Soil Profile: SD





Probabilistic Seismic Hazards Mapping Ground Motion Page

User Selected Site

Longitude	-117.1866
Latitude	33.5361

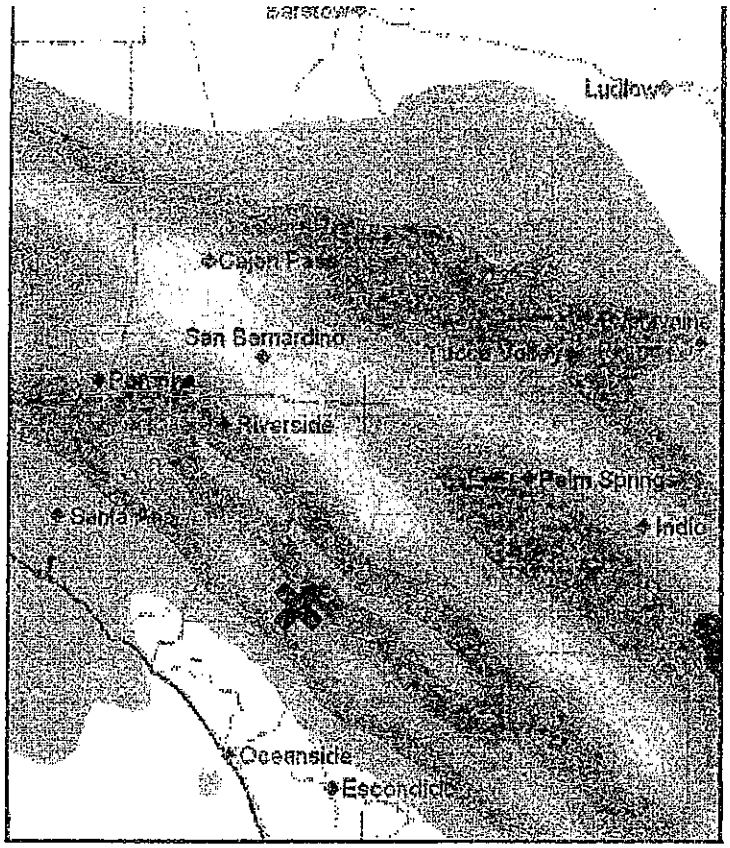
Ground Motions for User Selected Site

Ground motions (10% probability of being exceeded in 50 years) are expressed as a fraction of the acceleration due to gravity (g). Three values of ground motion are shown, peak ground acceleration (Pga), spectral acceleration(Sa) at short (0.2 second) and moderately long (1.0 second) periods. Ground motion values are also modified by the local site soil conditions. Each ground motion value is shown for 3 different site conditions: firm rock (conditions on the boundary between site categories B and C as defined by the building code), soft rock (site category C) and alluvium (site category D).

Ground Motion	Firm Rock	Soft Rock	Alluvium
Pga	0.564	0.564	0.564
Sa 0.2 sec	1.295	1.295	1.295
Sa 1.0 sec	0.484	0.578	0.661

NEHRP Soil Corrections were used to calculate Soft Rock and Alluvium.

Ground Motion values were interpolated from a grid (0.05 degree spacing)
of calculated values. Interpolated ground motion may not equal values
calculated for a specific site, therefore these values are not intended for
design or analysis.



Shaking (%g)
Pga (Peak Ground Acceleration)
Firm Rock
< 10%
10 - 20%
20 - 30%
30 - 40%
40 - 50%
50 - 60%
60 - 70%
70 - 80%
> 80%
The unit "g" is acceleration of gravity.

Click here to return to the statewide PSHA map or enter new coordinates below:

Longitude: Latitude: Submit

Please enter coordinates as Decimal Degrees
Example: Longitude -122.0017 Latitude 36.9894

Back to Top of Page

Last edited on October 30, 2006

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*                           *
*      L I Q U E F Y 2      *
*                           *
*       Version 1.50        *
*                           *
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EMPIRICAL PREDICTION OF
EARTHQUAKE-INDUCED LIQUEFACTION POTENTIAL

JOB NUMBER: 2692 DATE: 05-31-2007
JOB NAME: Industrial Building, Adams Ave, Murrieta, CA
SOIL-PROFILE NAME: 2692liquefy.LDW
BORING GROUNDWATER DEPTH: 15.00 ft
CALCULATION GROUNDWATER DEPTH: 15.00 ft
DESIGN EARTHQUAKE MAGNITUDE: 6.80 Mw
SITE PEAK GROUND ACCELERATION: 0.481 g
BOREHOLE DIAMETER CORRECTION FACTOR: 1.15
SAMPLER SIZE CORRECTION FACTOR: 1.00
N60 HAMMER CORRECTION FACTOR: 1.00
MAGNITUDE SCALING FACTOR METHOD: Idriss (1997, in press)
Magnitude Scaling Factor: 1.285
rd-CORRECTION METHOD: Seed (1985)
FIELD SPT N-VALUES ARE CORRECTED FOR THE LENGTH OF THE DRIVE RODS.
Rod Stick-Up Above Ground: 3.0 ft
CN NORMALIZATION FACTOR: 1.044 tsf
MINIMUM CN VALUE: 0.6

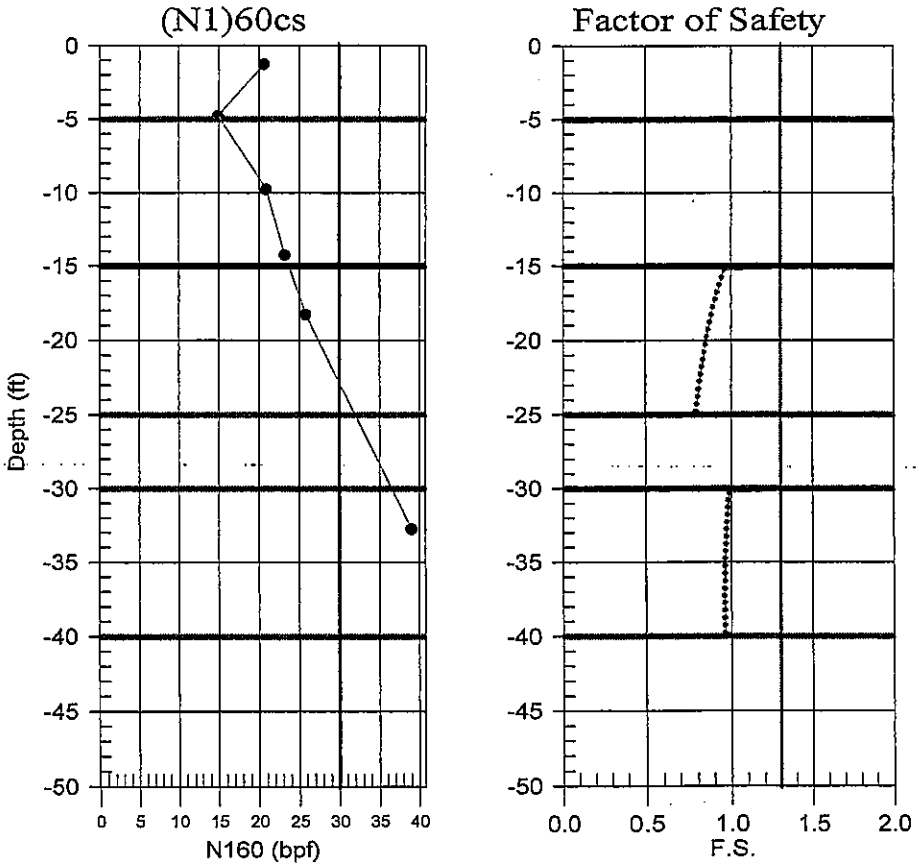
NCEER [1997] Method — LIQUEFACTION ANALYSIS SUMMARY

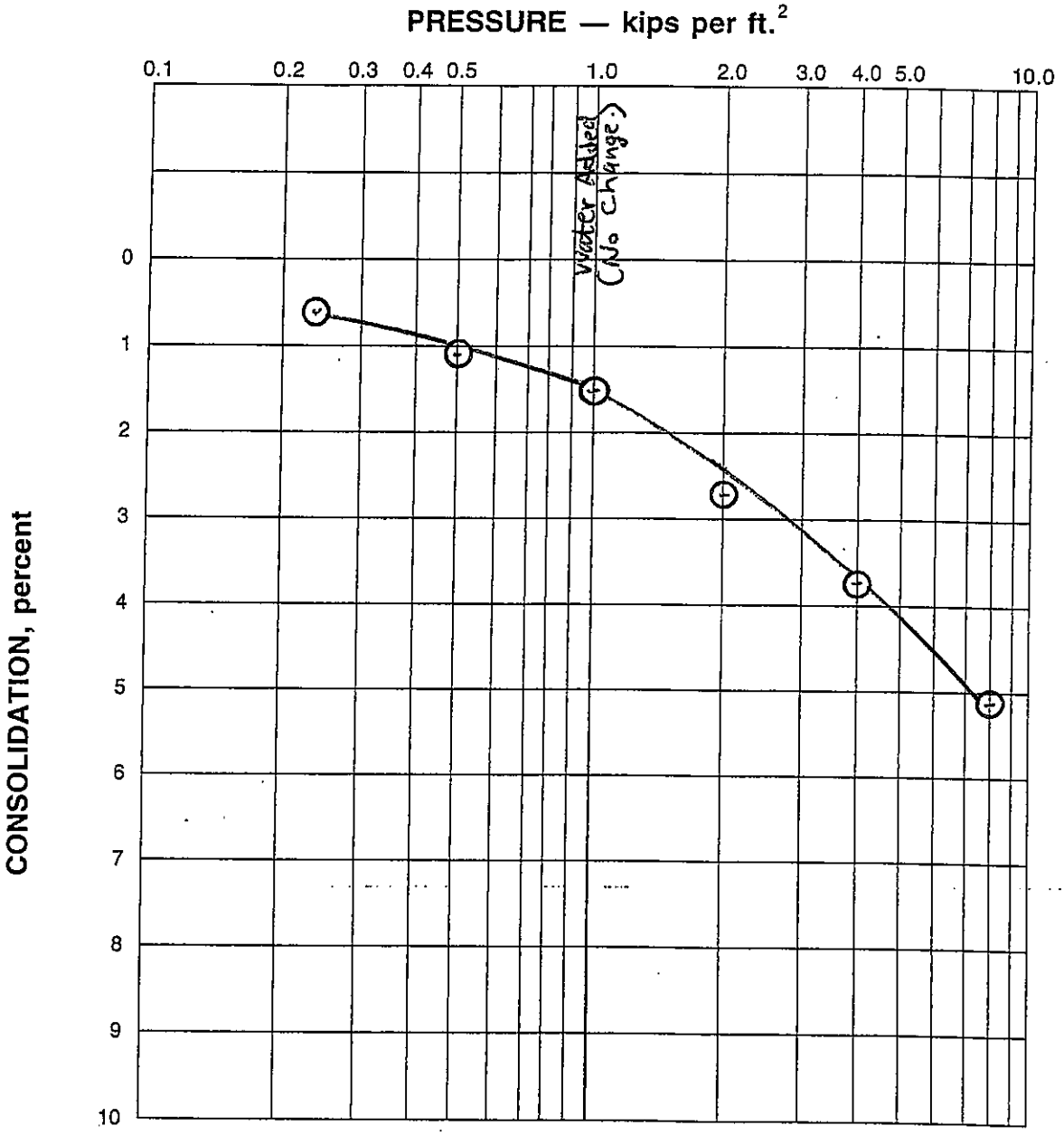
File Name: 2692liq2.txt

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
1	0.25	0.014	0.014	10	~	*	*	*	*	*	**
1	0.75	0.042	0.042	10	~	*	*	*	*	*	**
1	1.25	0.070	0.070	10	~	*	*	*	*	*	**
1	1.75	0.098	0.098	10	~	*	*	*	*	*	**
1	2.25	0.126	0.126	10	~	*	*	*	*	*	**
1	2.75	0.154	0.154	10	~	*	*	*	*	*	**
1	3.25	0.182	0.182	10	~	*	*	*	*	*	**
1	3.75	0.210	0.210	10	~	*	*	*	*	*	**
1	4.25	0.238	0.238	10	~	*	*	*	*	*	**
1	4.75	0.266	0.266	10	~	*	*	*	*	*	**
2	5.25	0.295	0.295	8	~	*	*	*	*	*	**
2	5.75	0.326	0.326	8	~	*	*	*	*	*	**
2	6.25	0.357	0.357	8	~	*	*	*	*	*	**
2	6.75	0.388	0.388	8	~	*	*	*	*	*	**
2	7.25	0.418	0.418	8	~	*	*	*	*	*	**
2	7.75	0.449	0.449	8	~	*	*	*	*	*	**
2	8.25	0.480	0.480	8	~	*	*	*	*	*	**
2	8.75	0.511	0.511	8	~	*	*	*	*	*	**
2	9.25	0.541	0.541	8	~	*	*	*	*	*	**
2	9.75	0.572	0.572	8	~	*	*	*	*	*	**
2	10.25	0.603	0.603	8	~	*	*	*	*	*	**
2	10.75	0.634	0.634	8	~	*	*	*	*	*	**
2	11.25	0.664	0.664	8	~	*	*	*	*	*	**
2	11.75	0.695	0.695	8	~	*	*	*	*	*	**
2	12.25	0.726	0.726	8	~	*	*	*	*	*	**
2	12.75	0.757	0.757	8	~	*	*	*	*	*	**

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
2	13.25	0.787	0.787	8	~	*	*	*	*	*	**
2	13.75	0.818	0.818	8	~	*	*	*	*	*	**
2	14.25	0.849	0.849	8	~	*	*	*	*	*	**
2	14.75	0.880	0.880	8	~	*	*	*	*	*	**
3	15.25	0.911	0.903	12	6.86	1.351	20.8	0.228	0.968	0.305	0.96
3	15.75	0.942	0.918	12	6.86	1.351	20.8	0.228	0.967	0.310	0.94
3	16.25	0.973	0.934	12	6.86	1.351	20.8	0.228	0.966	0.315	0.93
3	16.75	1.004	0.950	12	6.86	1.351	20.8	0.228	0.965	0.319	0.92
3	17.25	1.036	0.965	12	6.86	1.351	20.8	0.228	0.964	0.323	0.91
3	17.75	1.067	0.981	12	6.86	1.351	20.8	0.228	0.963	0.327	0.89
3	18.25	1.098	0.997	12	6.86	1.351	20.8	0.228	0.961	0.331	0.88
3	18.75	1.129	1.012	12	6.86	1.351	20.8	0.228	0.960	0.335	0.87
3	19.25	1.161	1.028	12	6.86	1.351	20.8	0.228	0.959	0.338	0.86
3	19.75	1.192	1.044	12	6.86	1.351	20.8	0.228	0.958	0.342	0.86
3	20.25	1.223	1.059	12	6.86	1.351	20.8	0.228	0.956	0.345	0.85
3	20.75	1.254	1.075	12	6.86	1.351	20.8	0.228	0.955	0.348	0.84
3	21.25	1.286	1.091	12	6.86	1.351	20.8	0.228	0.954	0.352	0.83
3	21.75	1.317	1.106	12	6.86	1.351	20.8	0.228	0.952	0.354	0.83
3	22.25	1.348	1.122	12	6.86	1.351	20.8	0.228	0.951	0.357	0.82
3	22.75	1.379	1.138	12	6.86	1.351	20.8	0.228	0.949	0.360	0.81
3	23.25	1.411	1.153	12	6.86	1.351	20.8	0.228	0.948	0.363	0.81
3	23.75	1.442	1.169	12	6.86	1.351	20.8	0.228	0.946	0.365	0.80
3	24.25	1.473	1.185	12	6.86	1.351	20.8	0.228	0.945	0.367	0.80
3	24.75	1.504	1.200	12	6.86	1.351	20.8	0.228	0.943	0.370	0.79
4	25.25	1.534	1.214	14	~	~	~	~	~	~	~~
4	25.75	1.563	1.227	14	~	~	~	~	~	~	~~
4	26.25	1.591	1.240	14	~	~	~	~	~	~	~~
4	26.75	1.620	1.253	14	~	~	~	~	~	~	~~
4	27.25	1.648	1.266	14	~	~	~	~	~	~	~~
4	27.75	1.677	1.279	14	~	~	~	~	~	~	~~
4	28.25	1.705	1.292	14	~	~	~	~	~	~	~~
4	28.75	1.734	1.305	14	~	~	~	~	~	~	~~
4	29.25	1.762	1.318	14	~	~	~	~	~	~	~~
4	29.75	1.791	1.331	14	~	~	~	~	~	~	~~
5	30.25	1.819	1.343	17	7.52	1.023	25.8	0.299	0.920	0.389	0.99
5	30.75	1.846	1.354	17	7.52	1.023	25.8	0.299	0.917	0.391	0.98
5	31.25	1.873	1.366	17	7.52	1.023	25.8	0.299	0.914	0.392	0.98
5	31.75	1.900	1.377	17	7.52	1.023	25.8	0.299	0.912	0.393	0.98
5	32.25	1.927	1.388	17	7.52	1.023	25.8	0.299	0.909	0.394	0.97
5	32.75	1.954	1.400	17	7.52	1.023	25.8	0.299	0.906	0.395	0.97
5	33.25	1.981	1.411	17	7.52	1.023	25.8	0.299	0.903	0.396	0.97
5	33.75	2.008	1.423	17	7.52	1.023	25.8	0.299	0.899	0.397	0.97
5	34.25	2.035	1.434	17	7.52	1.023	25.8	0.299	0.896	0.398	0.97
5	34.75	2.062	1.445	17	7.52	1.023	25.8	0.299	0.893	0.398	0.96
5	35.25	2.089	1.457	17	7.52	1.023	25.8	0.299	0.889	0.399	0.96
5	35.75	2.116	1.468	17	7.52	1.023	25.8	0.299	0.886	0.399	0.96
5	36.25	2.143	1.480	17	7.52	1.023	25.8	0.299	0.882	0.399	0.96
5	36.75	2.170	1.491	17	7.52	1.023	25.8	0.299	0.878	0.400	0.96
5	37.25	2.197	1.502	17	7.52	1.023	25.8	0.299	0.874	0.400	0.96
5	37.75	2.224	1.514	17	7.52	1.023	25.8	0.299	0.871	0.400	0.96
5	38.25	2.251	1.525	17	7.52	1.023	25.8	0.299	0.866	0.400	0.96
5	38.75	2.278	1.537	17	7.52	1.023	25.8	0.299	0.862	0.400	0.96
5	39.25	2.305	1.548	17	7.52	1.023	25.8	0.299	0.858	0.399	0.96
5	39.75	2.332	1.559	17	7.52	1.023	25.8	0.299	0.854	0.399	0.96
6	40.25	2.359	1.571	33	6.22	0.864	39.0	Infin	0.849	0.399	NonLiq
6	40.75	2.386	1.583	33	6.22	0.864	39.0	Infin	0.845	0.398	NonLiq
6	41.25	2.414	1.595	33	6.22	0.864	39.0	Infin	0.840	0.398	NonLiq
6	41.75	2.441	1.607	33	6.22	0.864	39.0	Infin	0.836	0.397	NonLiq

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
6	42.25	2.469	1.619	33	6.22	0.864	39.0	Infin	0.831	0.396	NonLiq
6	42.75	2.496	1.630	33	6.22	0.864	39.0	Infin	0.826	0.396	NonLiq
6	43.25	2.524	1.642	33	6.22	0.864	39.0	Infin	0.822	0.395	NonLiq
6	43.75	2.551	1.654	33	6.22	0.864	39.0	Infin	0.817	0.394	NonLiq
6	44.25	2.579	1.666	33	6.22	0.864	39.0	Infin	0.812	0.393	NonLiq
6	44.75	2.606	1.678	33	6.22	0.864	39.0	Infin	0.807	0.392	NonLiq
6	45.25	2.634	1.690	33	6.22	0.864	39.0	Infin	0.802	0.391	NonLiq
6	45.75	2.661	1.702	33	6.22	0.864	39.0	Infin	0.797	0.390	NonLiq
6	46.25	2.689	1.714	33	6.22	0.864	39.0	Infin	0.792	0.388	NonLiq
6	46.75	2.716	1.726	33	6.22	0.864	39.0	Infin	0.787	0.387	NonLiq
6	47.25	2.744	1.738	33	6.22	0.864	39.0	Infin	0.782	0.386	NonLiq
6	47.75	2.771	1.749	33	6.22	0.864	39.0	Infin	0.776	0.385	NonLiq
6	48.25	2.799	1.761	33	6.22	0.864	39.0	Infin	0.771	0.383	NonLiq
6	48.75	2.826	1.773	33	6.22	0.864	39.0	Infin	0.766	0.382	NonLiq
6	49.25	2.854	1.785	33	6.22	0.864	39.0	Infin	0.761	0.380	NonLiq
6	49.75	2.881	1.797	33	6.22	0.864	39.0	Infin	0.756	0.379	NonLiq





SAMPLE INFORMATION
Boring No. B-1
Sample Depth: 10-11'

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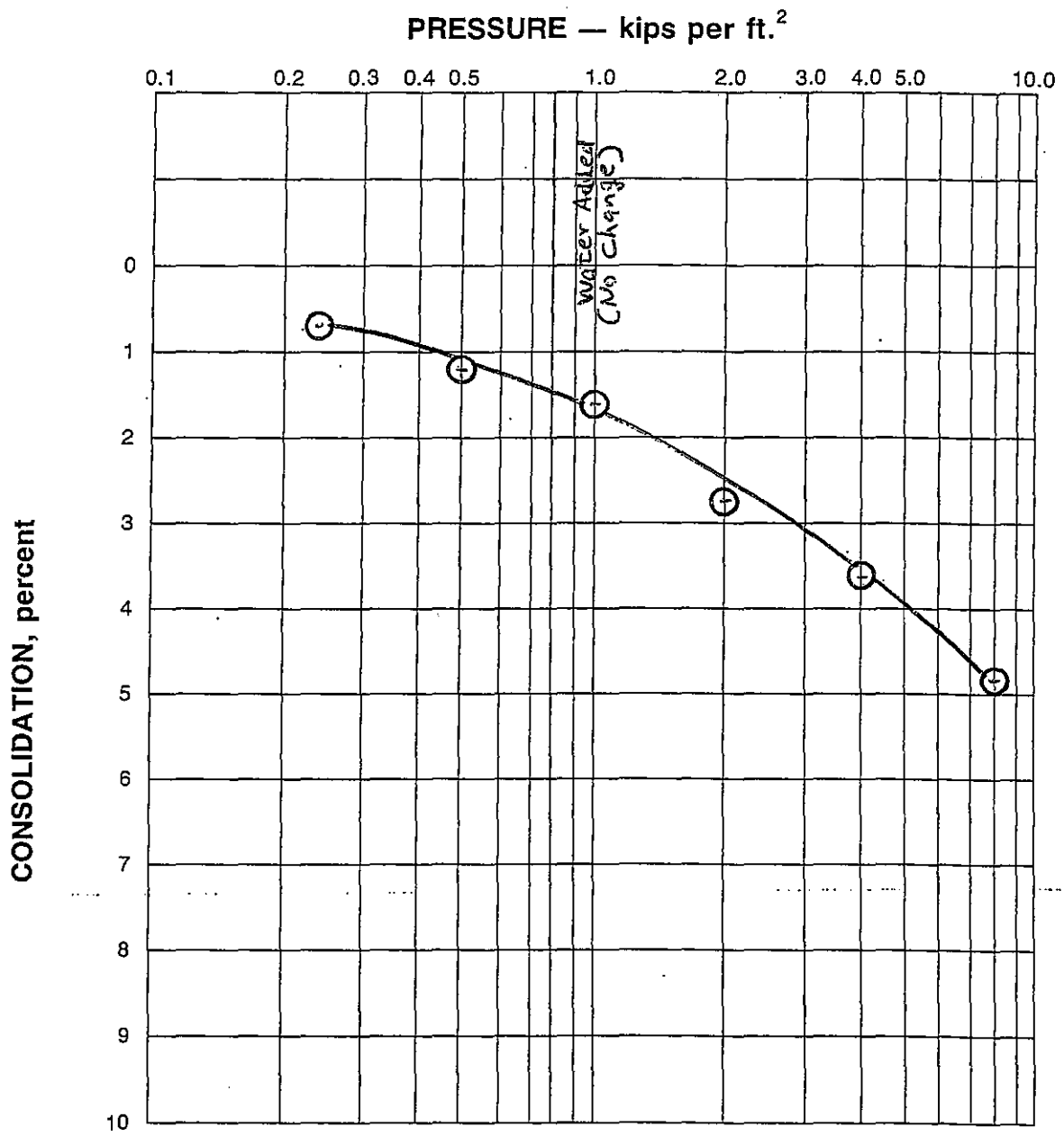
PRESSURE - CONSOLIDATION

JOB NO.	DATE	DRAWN BY	APPENDIX
2692	5/07	JRC	Page C



SAMPLE INFORMATION
Boring No. B-1
Sample Depth: 20-21'

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PRESSURE - CONSOLIDATION

JOB NO.	DATE	DRAWN BY	APPENDIX
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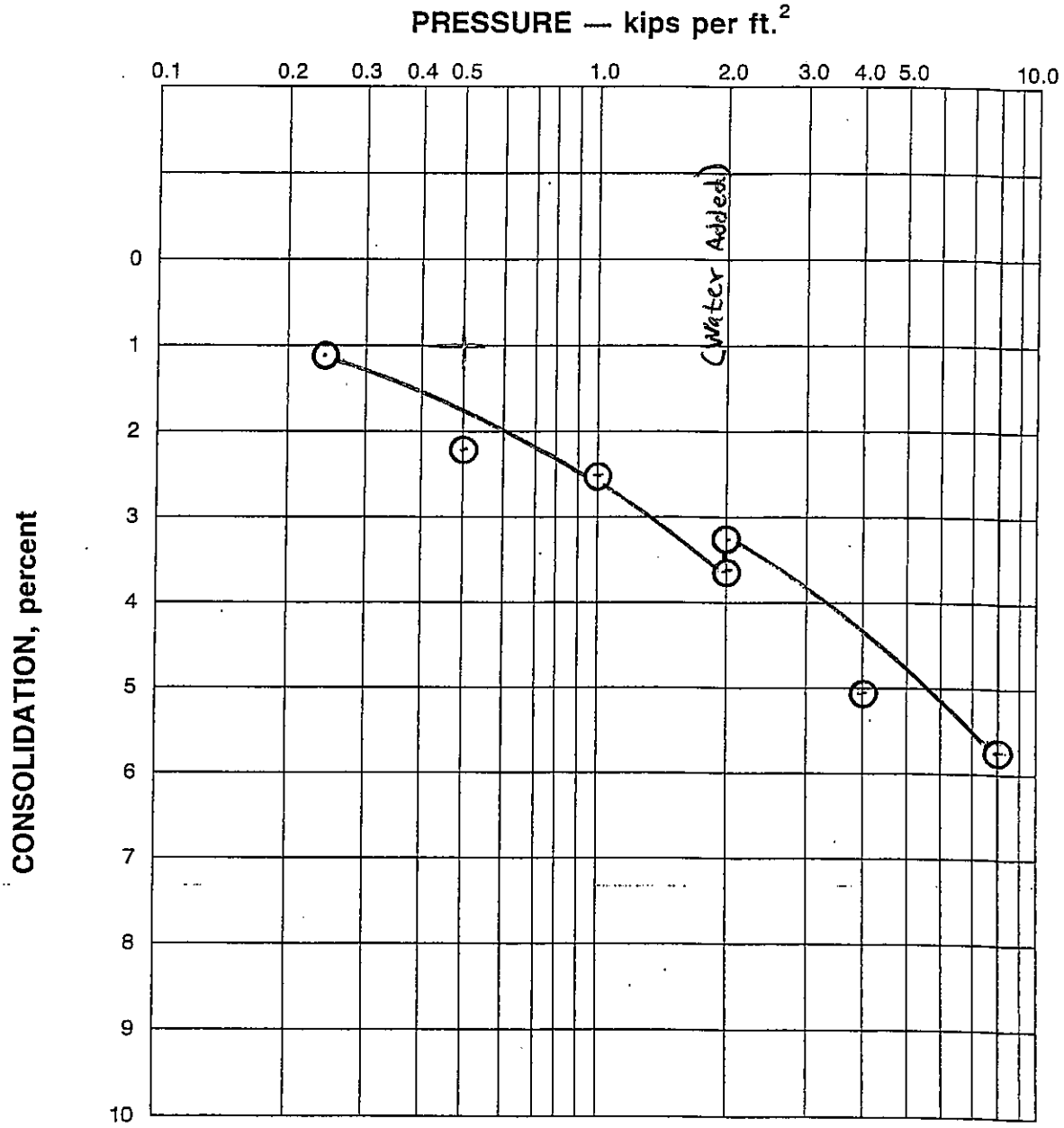

SAMPLE INFORMATION
Boring No. B-1
Sample Depth: 40'

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PRESSURE - CONSOLIDATION

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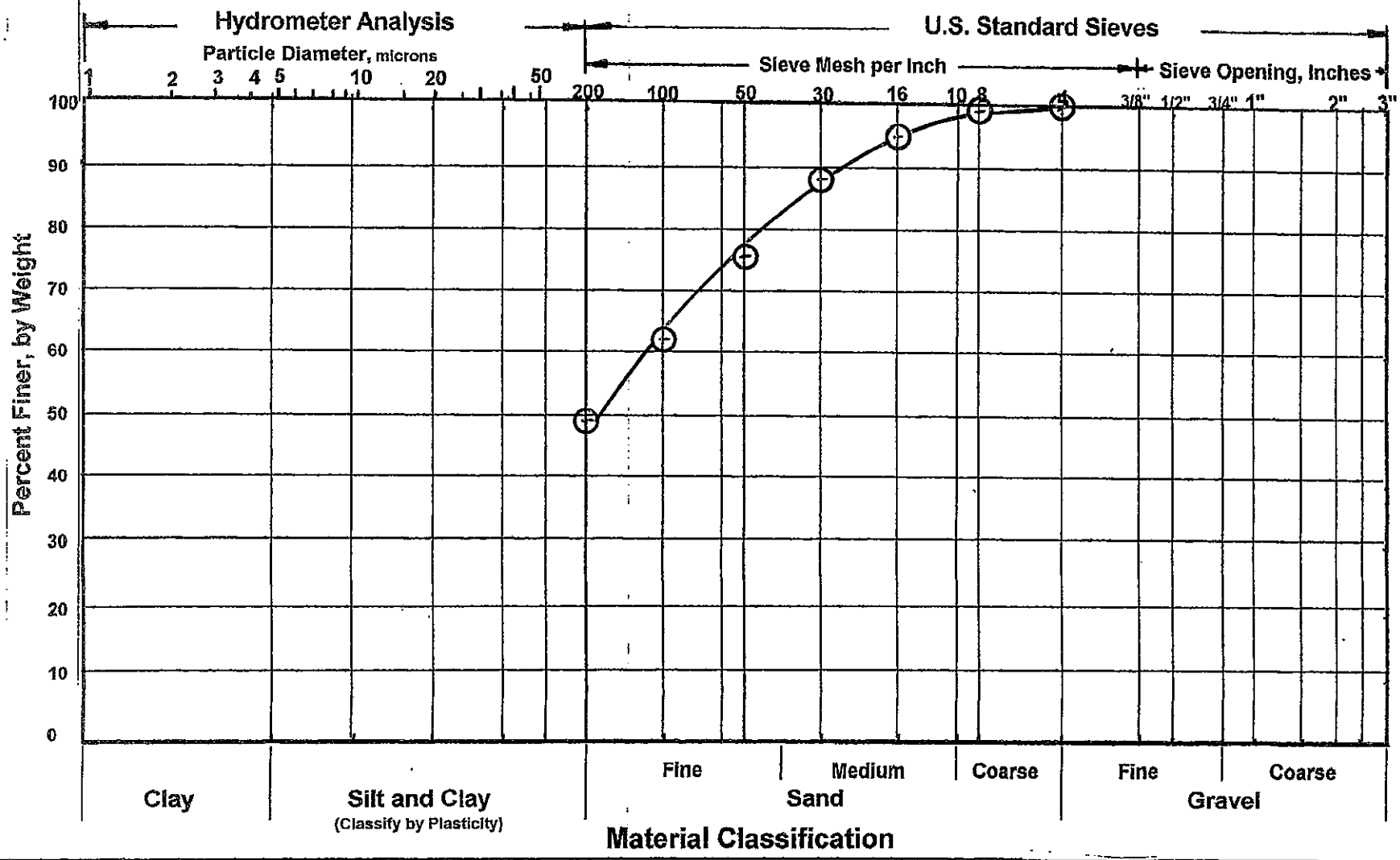

Sample Information:

Symbol	Boring	Depth	Liquid Limit	Plastic Limit	Plasticity Index
⊙	B-1	1-4'			
⊡					
△					

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GRADATION TESTS

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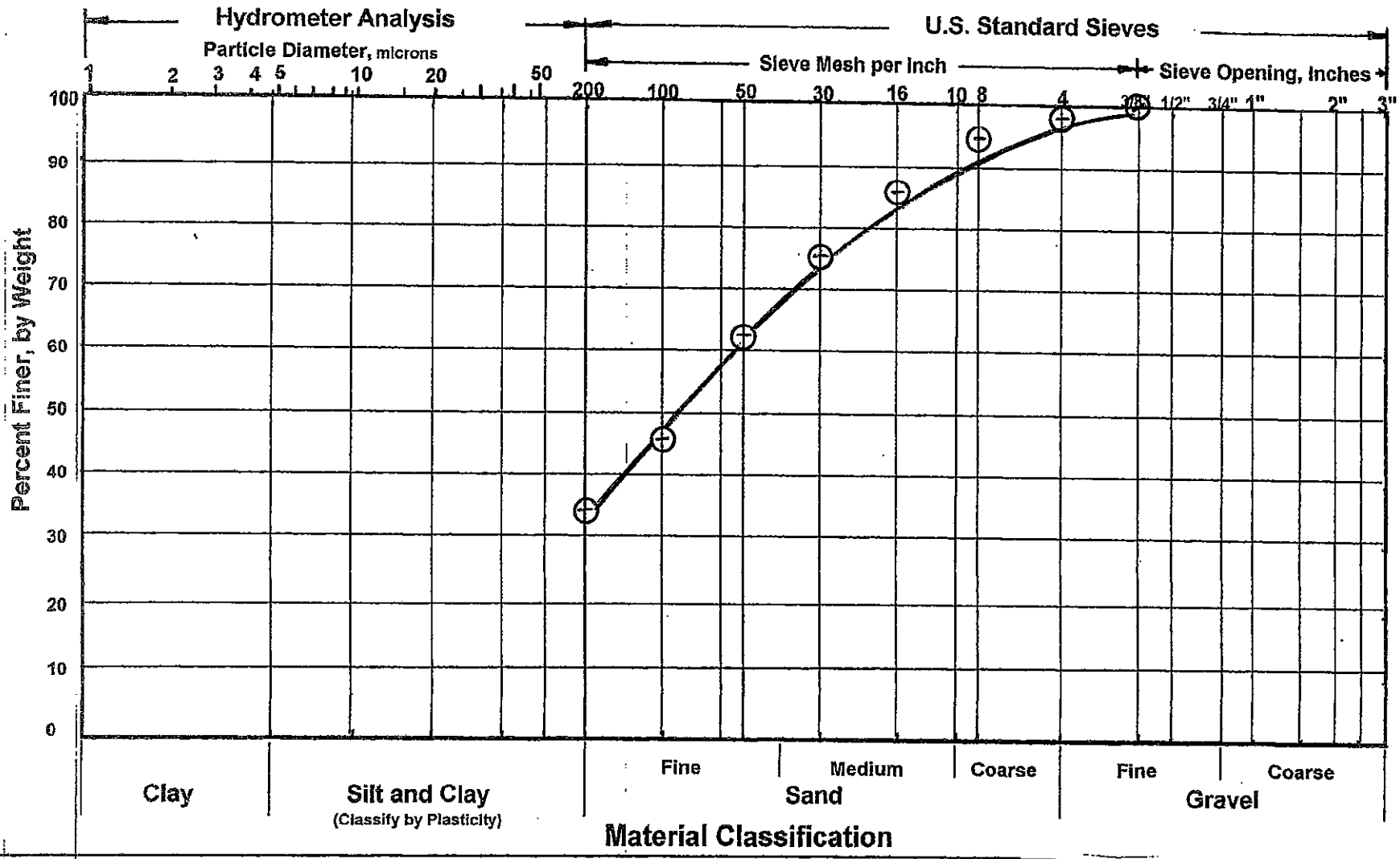

Sample Information:

Symbol	Boring	Depth	Liquid Limit	Plastic Limit	Plasticity Index
⊙	B-1	15-16'			
⊡					
△					

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GRADATION TESTS

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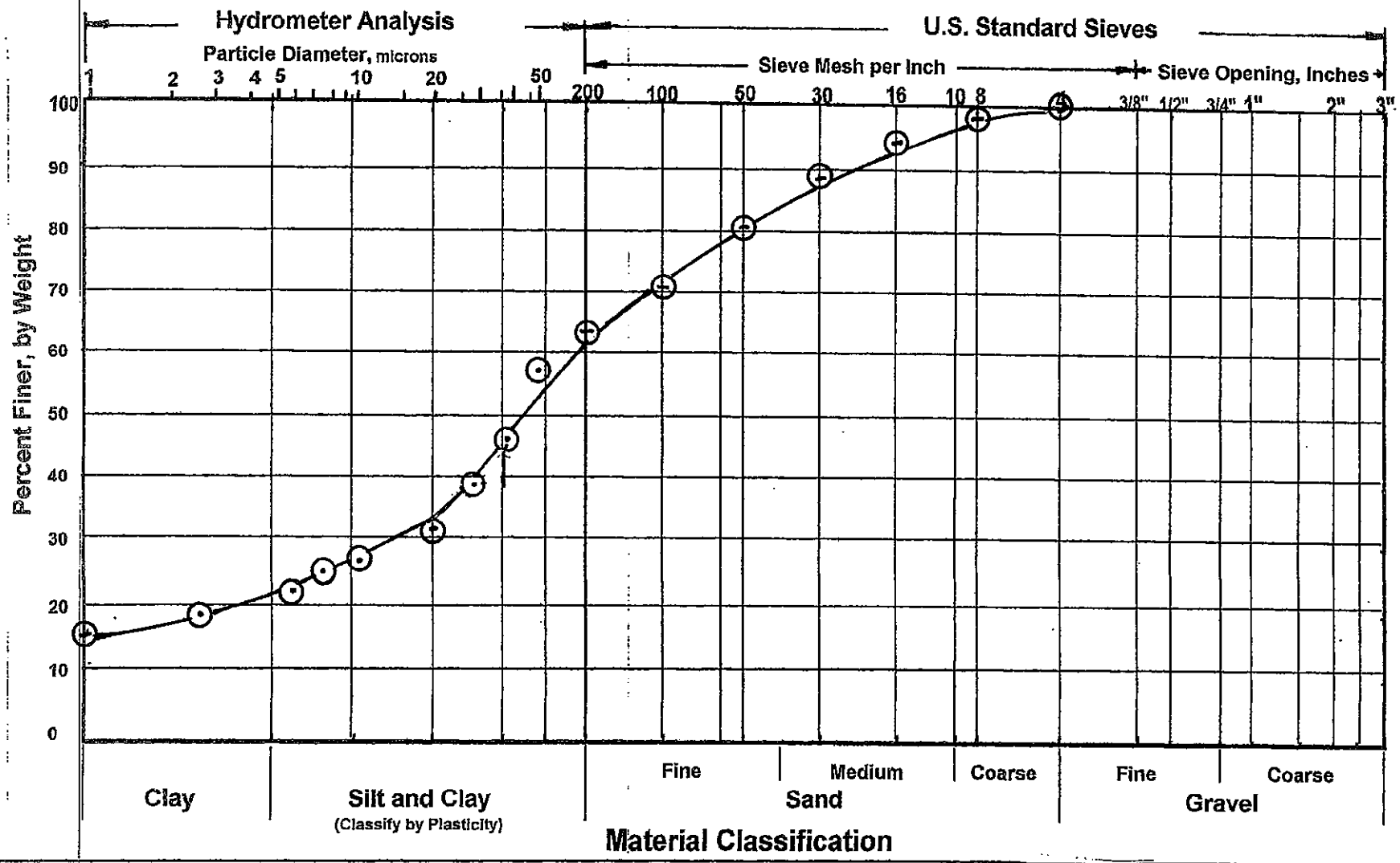

Sample Information:

Symbol	Boring	Depth	Liquid Limit	Plastic Limit	Plasticity Index
⊙	B-3+ B-4	20'			
⊡					
△					

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GRADATION TESTS

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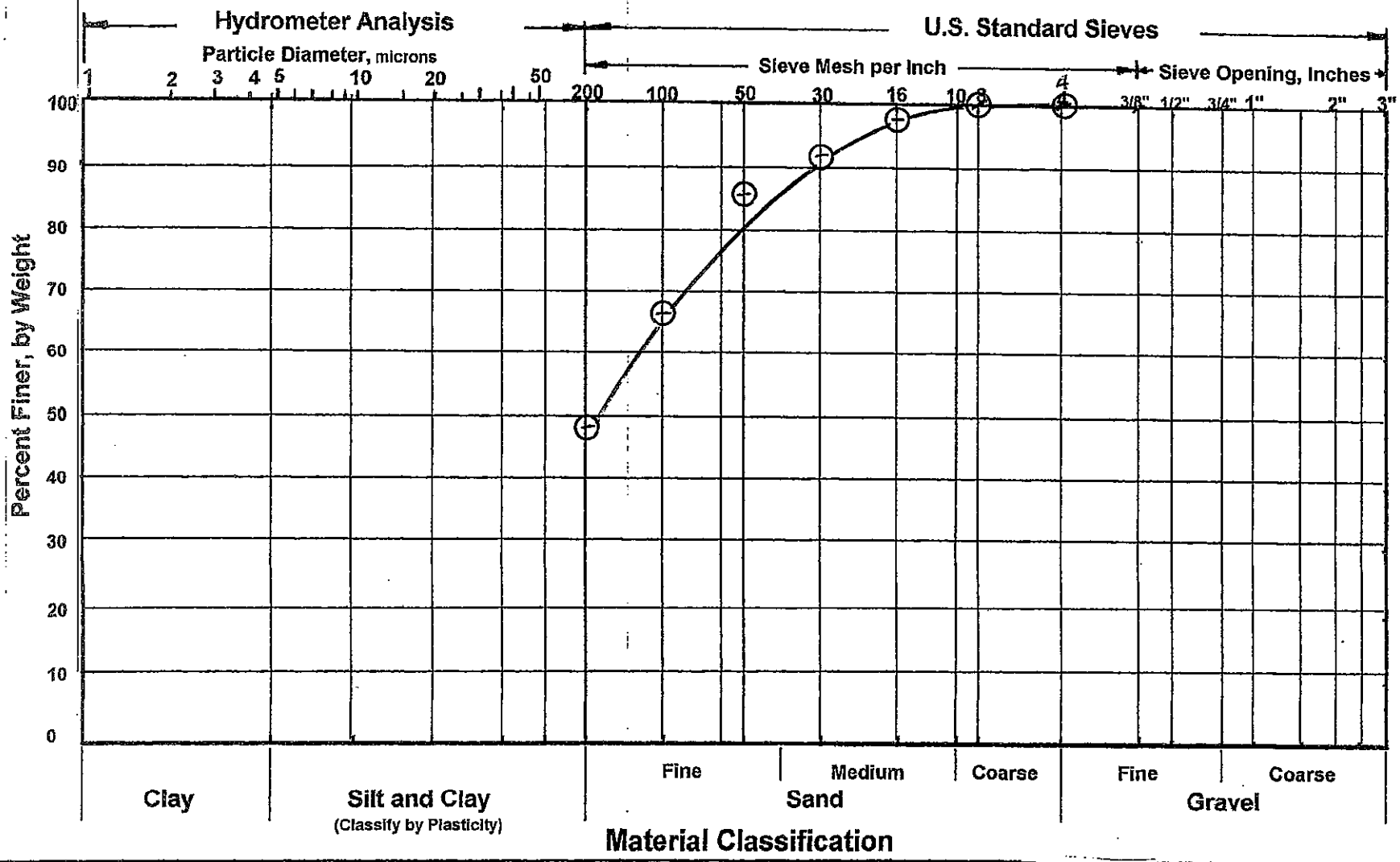

Sample Information:

Symbol	Boring	Depth	Liquid Limit	Plastic Limit	Plasticity Index
⊙	B-1	25-26'			
⊡					
△					

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GRADATION TESTS

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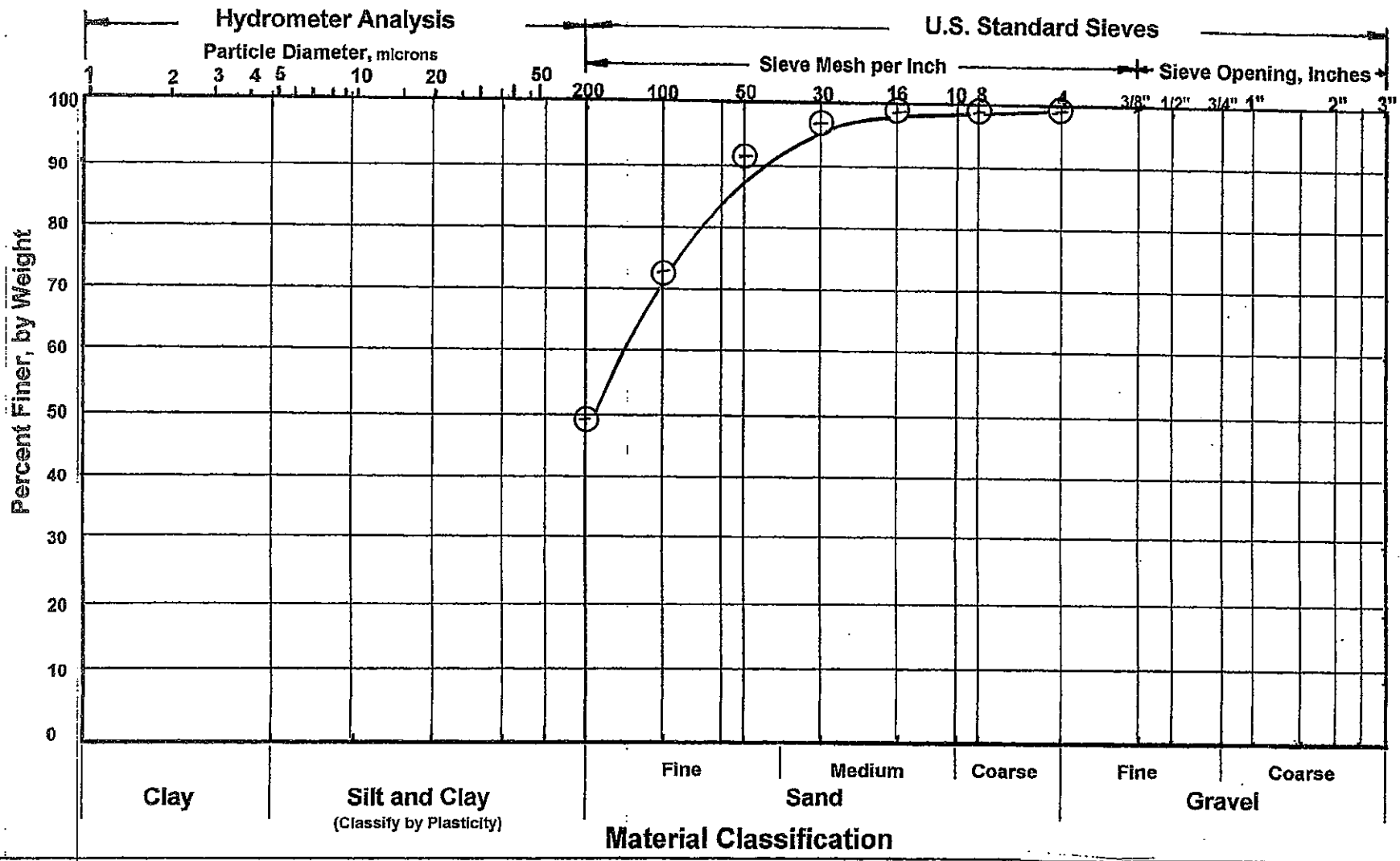
2692	5/07	JRC	Page D



Sample Information:

Symbol	Boring	Depth	Liquid Limit	Plastic Limit	Plasticity Index
⊙	B-1	45-46'			
⊡					
△					

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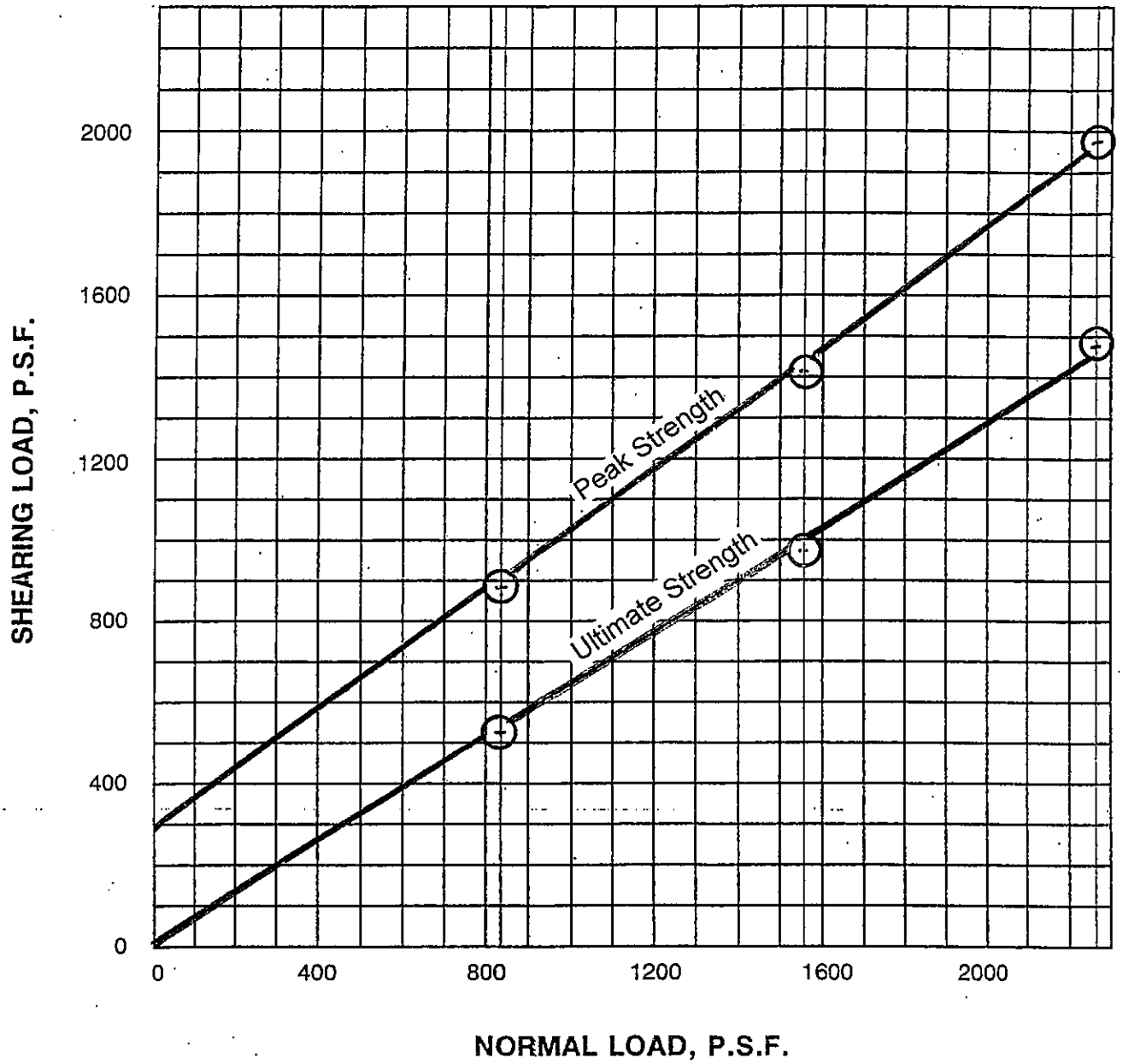
GRADATION TESTS

JOB NO.	DATE	DRAWN BY	APPENDIX
2692	5/07	JRC	Page P



SAMPLE INFORMATION	
Boring/Test Pit No.	B-1
Sample Depth (feet)	5-6'

TEST CONDITIONS		
	[x] Undisturbed	[ ] Remolded
Moisture Condition	[x] Saturated	[ ] Natural
Remolded Density	[ ] 90% of Max.	[x] Natural

TEST RESULTS	Cohesion (psf)	Friction Angle (φ)
Peak Strength	290	36°
Ultimate/Residual Strength	0	33°

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DIRECT SHEAR SUMMARY

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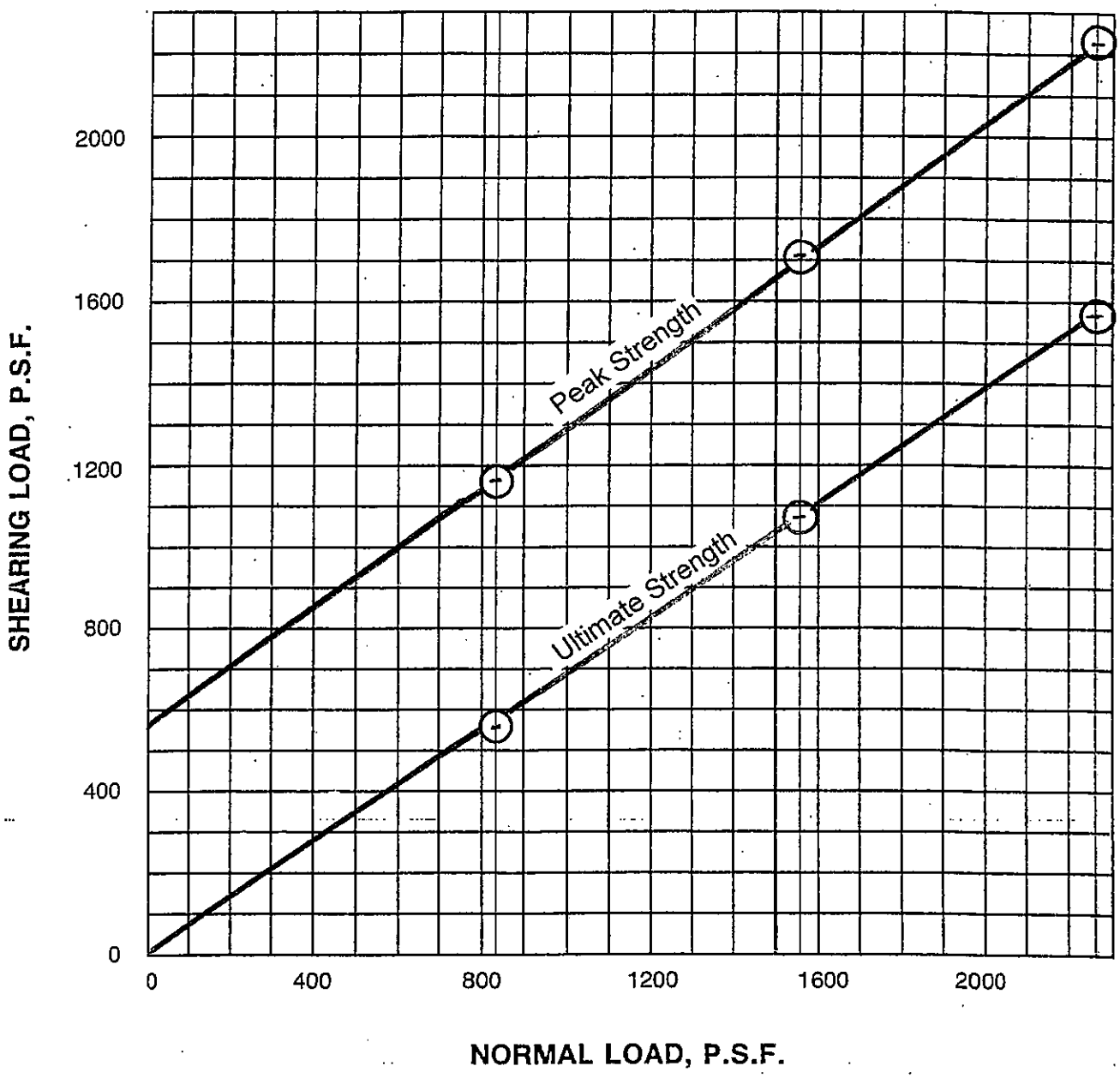
2692	5/07	JRC	Page C



SAMPLE INFORMATION	
Boring/Test Pit No.	B-1
Sample Depth (feet)	20-21'

TEST CONDITIONS		
	[✓] Undisturbed	[ ] Remolded
Moisture Condition	[✓] Saturated	[ ] Natural
Remolded Density	[ ] 90% of Max.	[✓] Natural

TEST RESULTS	Cohesion (psf)	Friction Angle (φ)
Peak Strength	570	36°
Ultimate/Residual Strength	0	34°

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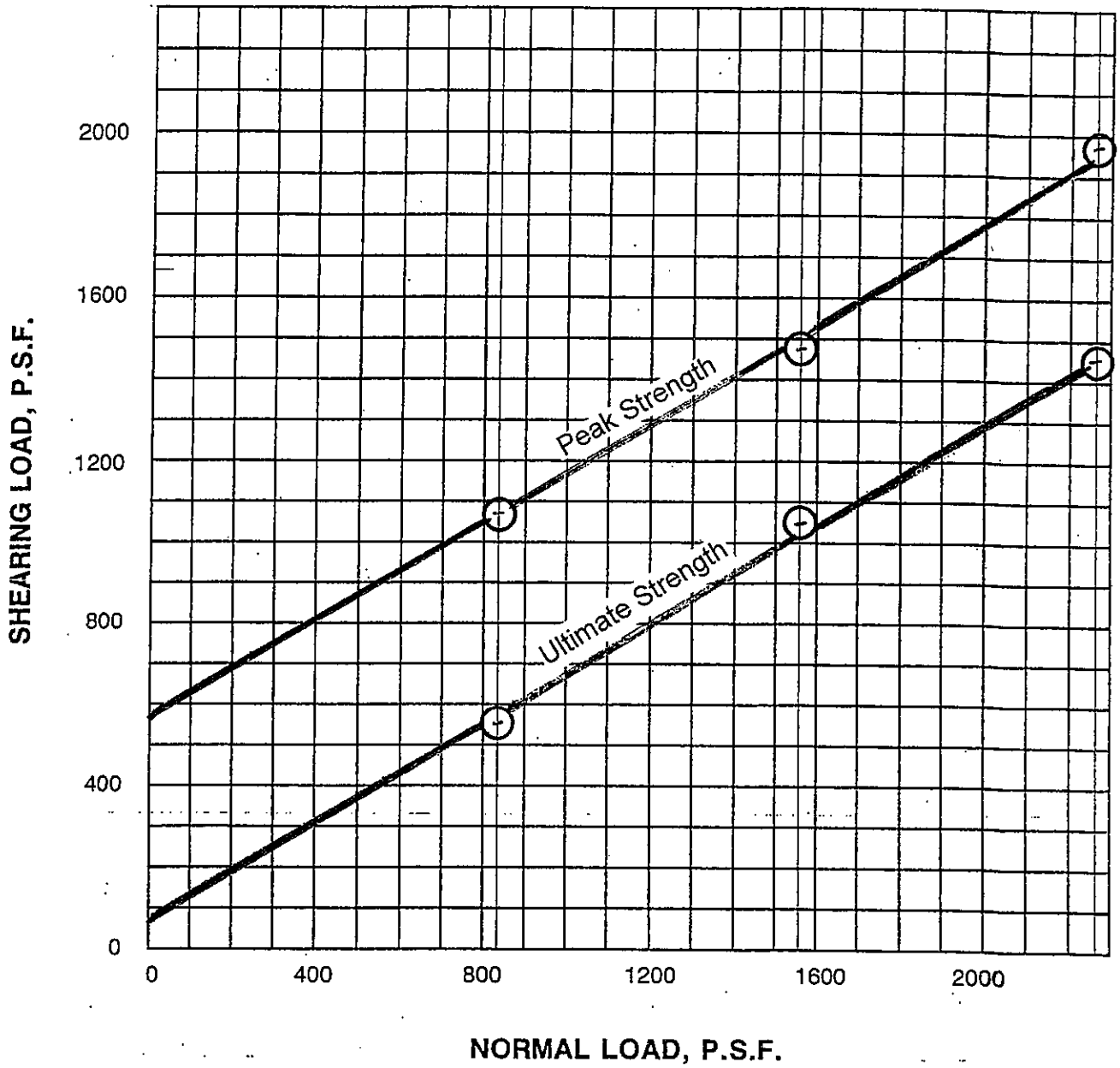
DIRECT SHEAR SUMMARY

JOB NO.	DATE	DRAWN BY	APPENDIX
2692	5/07	JRC	Page B



SAMPLE INFORMATION	
Boring/Test Pit No.	B-1
Sample Depth (feet)	40 - 41

TEST CONDITIONS		
	[X] Undisturbed	[ ] Remolded
Moisture Condition	[X] Saturated	[ ] Natural
Remolded Density	[ ] 90% of Max.	[ ] Natural

TEST RESULTS	Cohesion (psf)	Friction Angle (φ)
Peak Strength	570	31°
Ultimate/Residual Strength	80	31°

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DIRECT SHEAR SUMMARY

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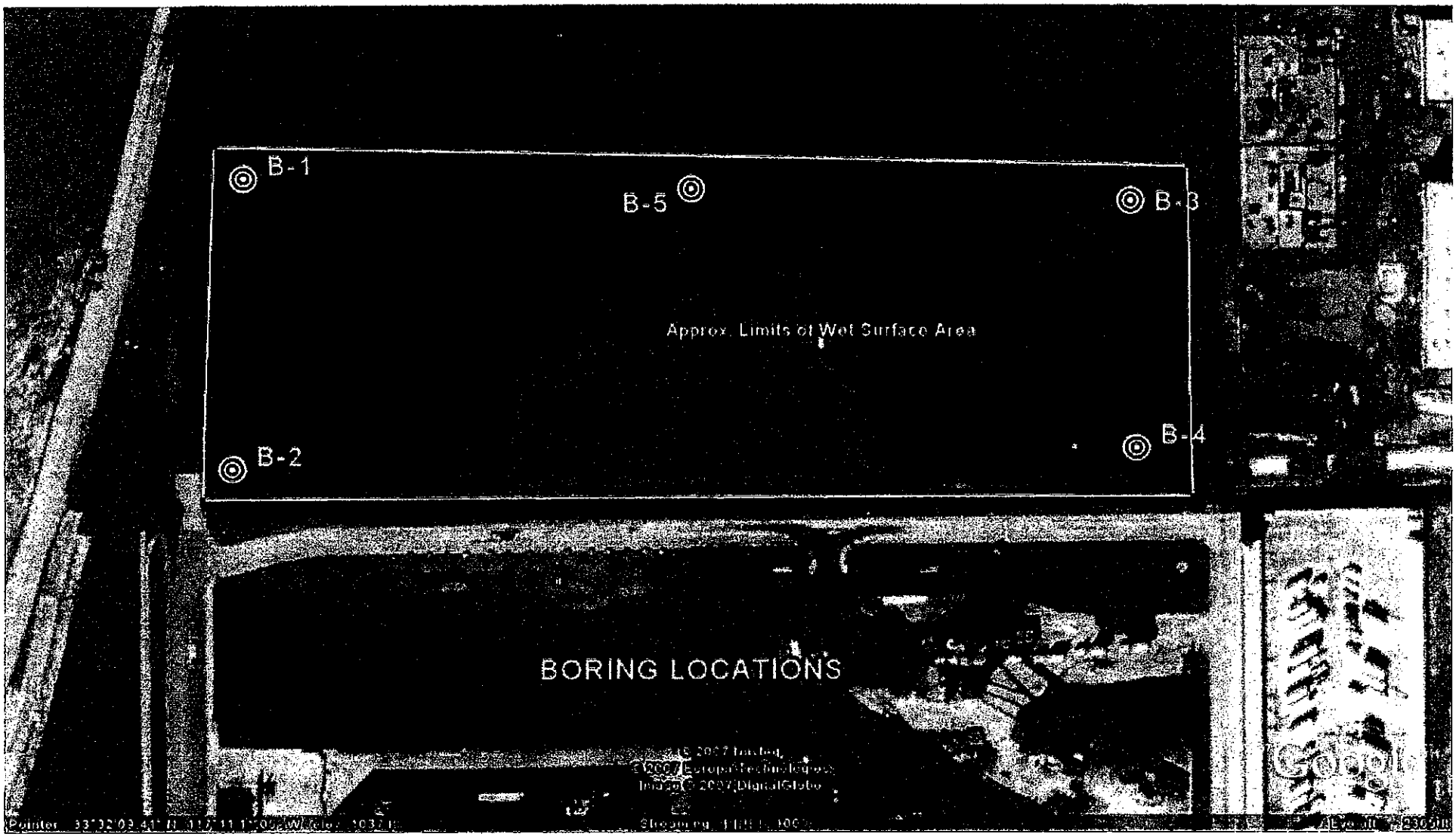
B-1
B-5
B-3
Approx. Limits of Wet Surface Area
B-2
B-4
BORING LOCATIONS