APPENDIX E

GEOTECHNICAL & SOILS

Krazan & ASSOCIATES, INC.

GEOTECHNICAL ENGINEERING • ENVIRONMENTAL ENGINEERING
CONSTRUCTION TESTING & INSPECTION

September 27, 2006

KA Project No. 112-06041

Mr. Chris Kitchen
Westfield Corporation, Inc.
11601 Wilshire Boulevard, 10th Floor
Los Angeles, CA 90025

RE: **Geotechnical Engineering Investigation**
Proposed Fashion Square Expansion
Woodman Avenue and Riverside Drive
Sherman Oaks, California

Dear Mr. Kitchen:

In accordance with your request and authorization, we have completed our Geotechnical Engineering Investigation for the above-referenced site. This report summarizes the results of our field investigation, laboratory testing and engineering analyses. Based on the data obtained, our understanding of the proposed project and our engineering analyses, it is our opinion that it is feasible to develop the site as planned.

As noted in our report, Krazan & Associates should be retained to review project plans and specifications prior to the start of construction, and to observe and test earthwork and foundation construction. Observation and testing services should also be performed by our field staff during construction activities will allow us to compare conditions exposed during construction with those encountered during our investigation and to present supplemental recommendations if warranted by different site conditions.

If you have any questions regarding the information or recommendations presented in our report, or if we may be of further assistance, please contact our Ontario, California office at (909) 974-4400.

Respectfully submitted,
KRAZAN & ASSOCIATES, INC.

James Kellogg

James M. Kellogg, PE
Regional Manager

cc: Addressee (4)

GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED FASHION SQUARE EXPANSION
WOODMAN AVENUE AND RIVERSIDE DRIVE
SHERMAN OAKS, CALIFORNIA

PROJECT NO. 112-06041
SEPTEMBER 27, 2006

PREPARED FOR:
WESTFIELD CORPORATION, INC.
11601 WILSHIRE BOULEVARD, 10TH FLOOR
LOS ANGELES, CALIFORNIA 90025

ATTENTION: MR. CHRIS KITCHEN

PREPARED BY:

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Offices Serving the Western United States

GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED FASHION SQUARE EXPANSION
WOODMAN AVENUE AND RIVERSIDE DRIVE
SHERMAN OAKS, CALIFORNIA

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GEOTECHNICAL ENGINEERING INVESTIGATION
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SHERMAN OAKS, CALIFORNIA

INTRODUCTION

This report presents the results of our Geotechnical Engineering Investigation for the proposed mall expansion in Sherman Oaks, California. Discussions regarding site conditions are presented herein, together with conclusions and recommendations pertaining to site preparation, grading, utility trench backfill, drainage and landscaping, foundations, concrete floor slabs and exterior concrete flatwork, retaining walls, soil corrosivity, and pavement design.

A Vicinity Map showing the location of the site is presented on Figure 1. A Site Plan showing the approximate boring locations is presented on Figure 2. Descriptions of the field and laboratory investigations, boring log legend and boring logs are presented in Appendix A. Appendix A contains a description of the laboratory-testing phase of this study, along with the laboratory test results. Appendices B and C contain general guides for earthwork and flexible pavement specifications. If conflicts in the text of the report occur with the general specifications in the appendices, the recommendations in the text of the report have precedence.

Two Foundation Investigation reports prepared by R.T. Frankian and Associates for the parking structures “A” and “B” (Job No. 25074-F, dated November 24, 1975) and the department store expansion (Job No. 95-113-W, dated January 31, 1996) were provided to us. Applicable information included in these two reports has been utilized for our analyses and foundation recommendations.

PURPOSE AND SCOPE OF SERVICES

This geotechnical investigation was conducted to evaluate subsurface soil and groundwater conditions at the project site. Engineering analysis of the field and laboratory data was performed for the purpose of developing and providing geotechnical recommendations for use in the design and construction of the earthwork, foundation and pavement aspects of the project.

Our scope of services was outlined in our proposal dated May 25, 2006 (KA Proposal No. PC299-06) and included the following:

- A site reconnaissance by a member of our engineering staff to evaluate the surface conditions at the project site.

- Review of selected published geologic maps, reports and literature pertinent to the site and surrounding area.

- A field investigation consisting of drilling ten (10) borings to depths ranging from 6 to 50 feet below the existing ground surface for evaluation of the subsurface conditions at the project site. The depth of investigation was limited due to auger refusal in 5 borings.

- Performing laboratory tests on representative soil samples obtained from the borings to evaluate the physical and index properties of the subsurface soils.

- Evaluation of the data obtained from the investigation and engineering analyses of the data with respect to the geotechnical aspects of structural design, and site grading and paving.

- Preparation of this report summarizing the results, conclusions, recommendations, and findings of our investigation.

PROPOSED CONSTRUCTION

Based on our review of the site plan and our discussions with the project representative, we understand that the proposed project will include demolition of two parking structures and construction of a new addition to the south and east of the existing mall buildings. The addition is planned to be of two to three -story, reinforced concrete construction with a slab-on-grade floor. Structural loads of the building were not available at the time of this investigation. Maximum column loads are assumed to be less than 350 kips.

Mass grading of the site is expected to entail minor cuts and fills from the existing grades to establish the building pad and to provide surface drainage of the site.

In the event these structural or grading details are inconsistent with the final design criteria, we should be notified so that we can evaluate the potential impacts of the changes on the recommendations presented in this report and provide an updated report as necessary.

SITE LOCATION AND SITE DESCRIPTION

The existing Fashion Square Mall is bounded by Woodman Avenue to the east, Freeway 101 to the south, Hazeltine Avenue to the west and Riverside Drive to the north in the City of Los Angeles (see Vicinity Map, Figure 1).

The mall consists of two major stores, Macy's and Bloomingdale's, a food court, a two-level enclosed mall between the two major stores, two parking structures, and a ground level parking lot. The site is relatively level with no major changes in grade. The average elevation of the site is approximately 640 feet above mean sea level.

SITE INVESTIGATION

GEOLOGIC SETTING

The site is underlain by Holocene and Pleistocene alluvium deposited in the San Fernando Valley, a structural basin surrounded by mountains on all four sides. The alluvium is estimated to be several hundred feet thick. These deposits are generally fine grained, consisting of mixtures of clay, silt and sand. Deposits encountered on the subject site during exploratory drilling are discussed in detail in this report.

Southern California is seismically active and will experience future earthquakes that will affect the project site. The earthquakes are predominately generated by periodic slip along the northwesterly trending faults associated with the San Andreas fault system and the east-west trending faults along the northern margin of the Los Angeles Basin. In addition to these probable earthquake sources, recent earthquakes in the region have occurred on previously unknown faults having no surface expression (1987 Whittier Narrows and the 1994 Northridge earthquakes). The Seismic hazard most likely to impact the site is groundshaking due to a large earthquake on one of the major active regional faults. The Hollywood Fault is the nearest active fault to the site, and is located approximately 4.8 kilometers away. The Santa Monica, Verdugo and Malibu Coast Fault Zones are located approximately 6.1, 9.8 and 14.3 kilometers from the site, respectively. Secondary hazards of earthquakes include rupture, seiche, landslides, liquefaction, and subsidence. Since there are no known faults within the immediate area, ground rupture from surface faulting should not be a potential problem. Seiche and landslides are not hazards in the area either. The area in consideration shows no mapped faults on-site according to maps prepared by the California Division of Mines and Geology (now known as the California Geologic Survey) and published by the International Conference of Building Officials (ICBO). No evidence of surface faulting was observed on the property during our reconnaissance. The site is located within a Seismic Zone 4.

FIELD AND LABORATORY INVESTIGATIONS

Subsurface soil conditions were explored by drilling ten (10) borings using a truck-mounted drill rig to depths ranging from 6 to 50 feet. The approximate boring locations are shown on the Site Plan, Figure 2. These approximate boring locations were estimated in the field based on pacing and measuring from the limits of existing site features. During drilling operations, penetration tests were performed at regular intervals to evaluate the soil consistency and to obtain information regarding the engineering properties of the subsurface soils. Soil samples were retained for laboratory testing. The soils encountered were continuously examined and visually classified in accordance with the Unified Soil Classification System. A more detailed description of the field investigation is presented in Appendix A.

Laboratory tests were performed on selected soil samples to evaluate their physical characteristics and engineering properties. The laboratory-testing program was formulated with emphasis on the evaluation of in-situ moisture and dry density, gradation, shear strength, consolidation and expansion potential, maximum dry density, R-value, pH value, minimum resistivity, sulfate and chloride contents of the materials encountered. Details of the laboratory-testing program are discussed in Appendix A. The results of the laboratory tests are presented on the borings logs or on the test reports, which are also included in Appendix A. This information, along with the field observations, was used to prepare the final boring logs in Appendix A.

SOIL PROFILE AND SUBSURFACE CONDITIONS

Based on our findings, the subsurface conditions encountered appear typical of those found in the geologic region of the site. The soils within the depth of exploration consist of up to 5 feet of fill underlain by native alluvium. Deeper fill soils may be present onsite between our exploratory boring locations.

Below the fill soils, alternative layers of clayey silt, sandy silt, silty clay, silty sand and sand were encountered. Field and laboratory tests suggest that the native soils are moderately strong and slightly compressible. Penetration resistance, measured by the number of blows required to drive a Modified California sampler or a Standard Penetration Test (SPT) sampler, ranged from 6 to over 50 blows per foot. Dry densities ranged from 81.7 to 126.9 pounds per cubic feet (pcf). Representative soil samples had angles of internal friction of 19 to 38 degrees and cohesion of 0 to 500 pounds per square feet (psf). Representative soil samples consolidated approximately -0.4 to 2.2 percent under a 2-ksf load when saturated. Representative soil samples had Expansion Indexes (EI) of 17 to 56. A representative soil sample had a maximum dry density of 135 pcf. Representative subgrade soil samples had R-values of 14 to 27.

The above is a general description of soil conditions encountered at the site in the borings drilled for this investigation. For a more detailed description of the soil conditions encountered, please refer to the boring logs in Appendix A.

GROUNDWATER

Test boring locations were checked for the presence of groundwater during and immediately following the drilling operations. Free groundwater was encountered in 3 borings at depths of 34, 43.5 and 44.5 feet during this time of field exploration.

It should be recognized that water table elevation might fluctuate with time. The depth to groundwater can be expected to fluctuate both seasonally and from year to year. Fluctuations in the groundwater level may occur due to variations in precipitation, irrigation practices at the site and in the surrounding areas, climatic conditions, flow in adjacent or nearby canals, pumping from wells and possibly as the result of other factors that were not evident at the time of our investigation. Therefore, water level observations at the time of our field investigation may vary from those encountered during the construction phase of the project. The evaluation of such factors is beyond the scope of this report. Long-term monitoring in observation wells, sealed from the influence of surface water, is often required to more accurately define the potential range of groundwater conditions on a site.

SEISMICITY AND LIQUEFACTION POTENTIAL

Seismicity is a general term relating to the abrupt release of accumulated strain energy in the rock materials of the earth's crust in a given geographical area. The recurrence of accumulation and subsequent release of strain have resulted in faults and fault systems. Fault patterns and density reflect relative degrees of regional stress through time, but do not necessarily indicate recent seismic activity; therefore, the degree of seismic risk must be determined or estimated by the seismic record in any given region.

Soil liquefaction is a state of soil particle suspension caused by a complete loss of strength when the effective stress drops to zero. Liquefaction normally occurs under saturated conditions in soils such as sand in which the strength is purely frictional. However, liquefaction has occurred in soils other than clean sand. Liquefaction usually occurs under vibratory conditions such as those induced by seismic events. To evaluate the liquefaction potential of the site, the following items were evaluated:

1) Soil type
2) Groundwater depth
3) Relative density
4) Initial confining pressure
5) Intensity and duration of ground shaking

The potential for soil liquefaction and densification (unsaturated sand) during a seismic event was evaluated using the LiquefyPro computer program (version 4.5b) developed by CivilTech. For the analysis, a maximum earthquake magnitude of 6.5 M_w and a peak horizontal ground surface acceleration of 0.49g (with a 10 percent probability of exceedance in 50 years) were considered appropriate for the liquefaction analysis. The maximum probable high groundwater depth of 30 feet was used in the analysis.

The analysis indicated that the loose to medium dense sandy soils have a low to moderate potential for liquefaction under seismic conditions. The total liquefaction-induced settlement was calculated to be on the order of 1 inch. The differential settlement is estimated to be on the order of ½ inch over a distance of 50 feet.

SOIL CORROSIVITY

Corrosion tests were performed to evaluate the soil corrosivity to the buried structures. The tests consisted of sulfate content, chloride content, and resistivity and the results of the tests are included as follows:

Parameter	Results	Test Method
Resistivity	6,670 ohms-cm	CALTRANS
Sulfate	303 ppm	EPA 9038
Chloride	17.1 ppm	EPA 9253
pH	7.77	EPA 9045C

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of our field and laboratory investigations, along with previous geotechnical experience in the project area, the following is a summary of our evaluations, conclusions, and recommendations.

ADMINISTRATIVE SUMMARY

Based on the data collected during this investigation, and from a geotechnical engineering standpoint, it is our opinion that the proposed development may be made as presently anticipated provided that the recommendations presented in this report are considered in the design and construction of the project.

In brief, the subject site and soil conditions, with the exception of the existing structures, undocumented fill, seismic-induced settlements and expansive clayey soils, appear to be conducive to the development of the project. Recommendations pertaining to the removal and recompaction of these loose soils are presented herein. After completion of the recommended site preparation, the site should be suitable for deep foundation support.

The estimated soil settlements for moderately loaded structures are anticipated to be excessive utilizing a shallow foundation system. In addition, all the current structures are supported on deep foundations. Therefore, it is recommended that the proposed structures be supported on similar deep foundations. Design values for drilled piles with various diameters are provided in the report.

Associated with the existing development are buried structures, such as footings, septic systems, backfilled excavations, and utility lines. These buried structures should be properly removed and the resulting excavations backfilled with Engineered Fill. Any other buried structures encountered during construction should be removed and backfilled in accordance with the recommendations of the Soils Engineer. The site should be inspected for possible buried fill material, using heavy excavating equipment. If loose fill material is encountered, excavations should extend to native ground. The exposed native subgrade should be scarified to a minimum of 6 inches, moisture-conditioned as necessary, and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. Limits of recompaction should extend 5 feet beyond structural elements. Prior to fill placement, Krazan & Associates, Inc. should inspect the bottom of the excavation to verify no additional excavation will be required.

It is recommended that any fill material encountered within proposed pavement areas be removed and/or recompacted. The fill material should be moisture-conditioned to near optimum moisture and compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. As an alternative, the owner may elect not to recompact the existing fill within paved areas. However, the owner should be aware that paved areas may settle which may require annual maintenance. At a minimum it is recommended that the upper 12 inches of subgrade soil be moisture-conditioned to at or above optimum moisture and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

Expansion Index (EI) testing was performed on representative soil samples obtained from the borings. The test results indicate that the clayey soils have an expansion potential of moderately high. The estimated swell pressure of the clayey material may cause movement affecting slabs and brittle exterior finishes. To minimize the potential soil movement, it is recommended that the upper 24 inches of soil within the building slab and exterior flatwork areas be replaced with "non-expansive" soils (with EI≤20).

With the anticipated seismic-induced settlements, the foundation shallower than 30 feet should be designed to tolerate seismic settlements of 1 inch total and ½ inch differential over a distance of 50 feet. The static settlements are anticipated to be less than ½ inch total and ¼ inch differential over a distance of 50 feet.

Sandy soil conditions were also encountered at the site. These cohesionless soils have a tendency to cave in trench wall excavations. Shoring or sloping back trench sidewalls may be required within these loose cohesionless soils.

The shrinkage on recompacted soil and fill placement is estimated at 10 to 15 percent. This value is an estimate and may vary significantly depending on several items including soil conditions, compaction effort, weather, etc.

All grading and earthwork should be performed in accordance with the Grading Ordinances of the City of Los Angeles and the applicable portions of the General Earthwork Specifications in Appendix B, except as modified herein.

GROUNDWATER INFLUENCE ON STRUCTURES/CONSTRUCTION

Based on our findings and historical records, it is not anticipated that groundwater will rise within the zone of structural influence or affect the construction of foundations and pavements for the project. However, if earthwork is performed during or soon after periods of precipitation, the subgrade soils may become saturated, "pump," or not respond to densification techniques. Typical remedial measures include: discing and aerating the soil during dry weather; mixing the soil with dryer materials; removing and replacing the soil with an approved fill material; or mixing the soil with an approved lime or cement product. Our firm should be consulted prior to implementing remedial measures to observe the unstable subgrade conditions and provide appropriate recommendations.

SITE PREPARATION

General site clearing should include removal of vegetation and existing utilities; structures; including foundations basement walls and floors; existing stockpiled soil; trees and associated root systems; rubble; rubbish; and any loose and/or saturated materials. Site stripping should extend to a minimum depth of 2 to 4 inches, or until all organics in excess of 3 percent by volume are removed. Deeper stripping may be required in localized areas. These materials will not be suitable for reuse as Engineered Fill. However, stripped topsoil may be stockpiled and reused in landscape or non-structural areas.

It is recommended that the upper 24 inches of soil within proposed building and exterior flatwork areas consist of non-expansive Engineered Fill. The intent is to support the proposed slab-on-grade and exterior flatwork areas with 24 inches of non-expansive fill. The non-expansive fill material should be a well-graded silty sand or sandy silt soil. A clean sand or very sandy soil is not acceptable for this purpose. A sandy soil will allow the surface water to drain into the expansive clayey soils below, which may result in soil swelling. Imported Fill should be approved by the Soils Engineer prior to placement. The fill should be placed as specified as Engineered Fill.

Within the proposed pavement areas, it is recommended that the upper 12 inches of subgrade soil be moisture-conditioned to near optimum moisture and recompacted to a minimum of 90 percent of maximum density based on ASTM D1557 Test Method.

The upper soils, during wet winter months, become very moist due to the absorptive characteristics of the soil. Earthwork operations performed during winter months may encounter very moist unstable soils, which may require removal to grade a stable building foundation. Project site winterization consisting of placement of aggregate base and protecting exposed soils during the construction phase should be performed.

Any buried structures or loosely backfilled excavations encountered during construction should be properly removed and the resulting excavations backfilled with Engineered Fill. Excavations, depressions, or soft and pliant areas extending below planned finished subgrade levels should be cleaned to firm, undisturbed soil and backfilled with Engineered Fill. In general, any septic tanks, debris pits, cesspools, or similar structures should be entirely removed. Concrete footings should be removed to an equivalent depth of at least 3 feet below proposed footing elevations or as recommended by the Soils Engineer. Any other buried structures should be removed in accordance with the recommendations of the Soils Engineer. The resulting excavations should be backfilled with Engineered Fill.

A representative of our firm should be present during all site clearing and grading operations to test and observe earthwork construction. This testing and observation is an integral part of our service, as acceptance of earthwork construction is dependent upon compaction and stability of the material. The Soils Engineer may reject any material that does not meet compaction and stability requirements. Further recommendations of this report are predicated upon the assumption that earthwork construction will conform to recommendations set forth in this section and the Engineered Fill section.

ENGINEERED FILL

The organic-free, on-site, upper soils are predominately silty sand and sandy silt with various amount of clay. Some of these soils may be suitable for reuse as non-expansive Engineered Fill, provided they are cleansed of excessive organics and debris. The soils with Expansion Index greater than 20 should not be used within the upper 24 inches of the building pad and exterior flatwork areas.

The preferred materials specified for Engineered Fill are suitable for most applications with the exception of exposure to erosion. Project site winterization and protection of exposed soils during the construction phase should be the sole responsibility of the contractor, since he has complete control of the project site at that time. Imported non-expansive Fill should consist of a well-graded, slightly cohesive, fine silty sand or sandy silt soil, with relatively impervious characteristics when compacted.

This material should be approved by the Soils Engineer prior to use and should typically possess the following characteristics:

Percent Passing No. 200 Sieve	20 to 50
Plasticity Index	10 maximum
UBC Standard 29-2 Expansion Index	20 maximum

Fill soils should be placed in lifts approximately 6 inches thick, moisture-conditioned as necessary, and compacted to achieve at least 90 percent of maximum density as determined by ASTM D1577 Test Method. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.

TEMPORARY EXCAVATION STABILITY

All excavations should comply with the current OSHA requirements. All cuts greater than 3 feet in depth should be sloped or shored. Temporary excavations should be sloped at 1:1 (horizontal to vertical) or flatter, up to a maximum depth of 10 feet. Heavy construction equipment, building materials, excavated soil, and vehicular traffic should not be allowed within five feet of the top (edge) of the excavation.

Where sloped excavations are not feasible due to site constraints, the excavations may require shoring. The design of the shoring system is normally the responsibility of the contractor or shoring designer, and therefore, is outside the scope of this report. The design of the temporary shoring should take into account lateral pressures exerted by the adjacent soil, and, where anticipated, surcharge loads due to adjacent buildings and any construction equipment or traffic expected to operate alongside the excavation.

The excavation recommendations provided herein are based on soil characteristics derived from test borings within the area. Variations in soil conditions will likely be encountered during the excavations. Krazan & Associates, Inc. should be afforded the opportunity to provide field review to evaluate the actual conditions and account for field condition variations, not otherwise anticipated in the preparation of this recommendation.

UTILITY TRENCH LOCATION, CONSTRUCTION AND BACKFILL

To maintain the desired support for existing or new foundations, new utility trenches should be located such that the base of the trench excavation is located above an imaginary plane having an inclination of 1.0 horizontal to 1.0 vertical, extending downward from the bottom edge of the adjacent footing.

Utility trenches should be excavated according to accepted engineering practices following OSHA (Occupational Safety and Health Administration) standards by a contractor experienced in such work. The responsibility for the safety of open trenches should be borne by the contractor. Traffic and vibration adjacent to trench walls should be kept to a minimum; cyclic wetting and drying of excavation side slopes should be avoided. Depending upon the location and depth of some utility trenches, groundwater flow into open excavations could be experienced, especially during or shortly following periods of precipitation.

For purposes of this section of the report, backfill is defined as material placed in a trench starting one foot above the pipe; bedding and shading (also referred to as initial backfill) is all material placed in a trench below the backfill. With the exception of specific requirements of the local utility companies or building department, pipe bedding and shading should consist of clean medium-grained sand. The sand should be placed in a damp state and should be compacted by mechanical means prior to the placement of backfill soils. Above the pipe zone, underground utility trenches may be backfilled with either free-draining sand, on-site soil or approved imported soil. The trench backfill should be compacted to at least 90 percent relative compaction.

COMPACTED MATERIAL ACCEPTANCE

Compaction specifications are not the only criteria for acceptance of the site grading or other such activities. However, the compaction test is the most universally recognized test method for assessing the performance of the Grading Contractor. The numerical test results from the compaction test cannot be solely used to predict the engineering performance of the compacted material. Therefore, the acceptance of compacted materials will also be dependent on the moisture content and the stability of that material. The Geotechnical Engineer has the option of rejecting any compacted material regardless of the degree of compaction if that material is considered to be too dry or excessively wet, unstable or if future instability is suspected. A specific example of rejection of fill material passing the required percent compaction is a fill which has been compacted with in-situ moisture content significantly less than optimum moisture. Where expansive soils are present, heaving of the soils may occur with the introduction of water. Where the material is a lean clay or silt, this type of dry fill (brittle fill) is susceptible to future settlement if it becomes saturated or flooded.

SURFACE DRAINAGE AND LANDSCAPING

The ground surface should slope away from building and pavement areas toward appropriate drop inlets or other surface drainage devices. We recommended that adjacent paved exterior grades be sloped at a minimum of 2 percent for a minimum distance of 5 feet away from structures. Ideally, asphalt concrete pavement areas should be sloped at a minimum of 2 percent, with Portland cement concrete sloped at a minimum of one percent toward drainage structures. These grades should be maintained for the life of the project.

Roof drains should be designed to avoid discharging into landscape areas adjacent to the buildings. Downspouts should be directed to discharge directly onto paved surfaces to allow for surface drainage into the storm systems or should be connected directly to the on-site storm drain.

DEEP FOUNDATION

The bearing capacities for the structures can be provided by means of a deep foundation system. Drilled piles with diameters of 18, 24, 30 and 36 inches are recommended. The allowable capacities for compression are illustrated as Figure 3. These values are similar to the recommended chart presented in the reports prepared by R. T. Frankian and Associates. A one-third increase may be used when considering temporary seismic or wind loads. The uplift capacity of the piles may be assumed to be one-half of the download (compression) capacity.

The existing piles for the parking structures may be left-in-place and reused for the new addition structures provided they are evaluated and approved by the structural engineer.

If groundwater is encountered during pile excavation or installation, casing and/or drilling mud may be required to prevent caving. The City of Los Angeles Building Code also has special provisions for installing drilled piles below groundwater level.

The drilling of piles should be continuously inspected by a representative of the Geotechnical Engineer of Record. The same representative should approve each pile excavation prior to placement of reinforcing steel and prior to casting concrete. These provisions are also required by the City of Los Angeles Building Code. Concrete should be placed the same day of pile excavation.

The total soil movement is not expected to exceed ½ inch. Differential soil movement should be less than ¼ inch. Piles spaced on centers at 2½ times of the diameter or greater will not require any reduction in load capacity due to group effect.

The bearing capacities of the drilled piers should be verified by load test. Lateral bearing may be taken as 300 pounds per cubic feet. A 1/3 increase in the allowable bearing loads may be used for short duration, wind, or seismic loads. The lateral load criteria for the piles are given below. A lateral deflection of ¼ inch has been considered at the pile head.

Pile Diameter (Inches)	**Maximum Moment (kip-ft)**	**Maximum Reverse Moment (kip-ft)**	**Depth to Reverse Moment (ft)**	**Depth to Point of Inflection (ft)**	**Depth to Zero Moment (ft)**	**Allowable Load (kips)**
18	5.1P*	1.3P	10	6.1	20	16.5
24	6.5P	1.6P	13	7.8	26	26
30	7.7P	1.9P	15	9.2	31	37
36	8.9P	2.2P	18	10.7	36	50

*P is applied lateral load in kips

FLOOR SLABS AND EXTERIOR FLATWORK

Concrete slab-on-grade floors should be underlain by a water vapor retarder. The water vapor retarder should be installed in accordance with ASTM Specification E 1643-98. According to ASTM Guidelines, the water vapor retarder should consist of a vapor retarder sheeting underlain by a minimum of 3 inches of compacted, clean, gravel of ¾-inch maximum size. To aide in concrete curing an optional 2 to 4 inches of granular fill may be placed on top of the vapor retarder. The granular fill should consist of damp clean sand with at least 10 to 30 percent of the sand passing the 100 sieve. The sand should be free of clay, silt or organic material. Rock dust which is manufactured sand from rock crushing operations is typically suitable for the granular fill. This granular fill material should be compacted.

The exterior floors should be poured separately in order to act independently of the walls and foundation system. All fills required to bring the building pads to grade should be Engineered Fills.

Moisture within the structures may be derived from water vapors, which were transformed from the moisture within the soils. This moisture vapor can travel through the vapor membrane and penetrate the slab-on-grade. This moisture vapor penetration can affect floor coverings and produce mold and mildew in the structure. To minimize moisture vapor intrusion, it is recommended that a vapor retarder be installed in accordance with ASTM guidelines. It is recommended that the utility trenches within the structure be compacted, as specified in our report, to minimize the transmission of moisture through the utility trench backfill. Special attention to the immediate drainage and irrigation around the building is recommended. Positive drainage should be established away from the structure and should be maintained throughout the life of the structure. Ponding of water should not be allowed adjacent to the structure. Over-irrigation within landscaped areas adjacent to the structure should not be performed. In addition, ventilation of the structure (i.e. ventilation fans) is recommended to reduce the accumulation of interior moisture.

RETAINING WALLS

Walls retaining horizontal backfill and capable of deflecting a minimum of 0.1 percent of its height at the top may be designed using an equivalent fluid active pressure of 35 pounds per square foot per foot of depth. Walls that are incapable of this deflection or walls that are fully constrained against deflection may be designed for an equivalent fluid at-rest pressure of 55 pounds per square foot per foot per depth. Expansive soils should not be used for backfill against walls. The wedge of non-expansive backfill material should extend from the bottom of each retaining wall outward and upward at a slope of 2:1 (horizontal to vertical) or flatter. The wall backfill should be compacted to at least 90 percent of maximum density based on ASTM D1557-00 Test Method.

The active and at-rest earth pressures do not include hydrostatic pressures. To reduce the build-up of hydrostatic pressures, drainage should be provided behind the retaining walls. Wall drain should consist of a minimum 12-inch wide zone of drainage material, such as 3/4-inch or 1/2-inch drain rock wrapped in a non-woven polypropylene geotextile filter fabric such as Mirafi 140N or equivalent. Alternatively, drainage may be provided by the placement of a commercially produced composite drainage blanket, such as Miradrain, extending continuously up from the base of the wall. The drainage material should extend from the base of the wall to finished subgrade in paved areas and to within about 12 inches below the top of the wall in landscape areas. In landscape areas the top 12 inches should be backfilled with compacted native soil. A 4-inch minimum diameter, perforated, Schedule 40 PVC drain pipe should be placed with holes facing down in the lower portion of the wall drainage material, surrounded with drain rock wrapped in filter fabric. A solid drainpipe leading to a suitable discharge point should provide drainage outlet. As an alternative, weep holes may be used to provide drainage. If weep holes are used the weep holes should be 3 inches in diameter and spaced about 8 feet on centers. The backside of the weep holes should be covered with a corrosion-resistant mesh to prevent loss of backfill and/or drainage material.

PAVEMENT DESIGN

Based on the laboratory R-value testing of the near-surface materials, an R-value of 20 was used for the preliminary flexible asphaltic concrete pavement design. The R-value should be verified during grading of the pavement areas. The following table shows the recommended pavement sections for various traffic indices.

Traffic Index	Asphaltic Concrete (inches)	Class 2 Aggregate Base* (inches)	Compacted Subgrade** (inches)
4.5	3.0	5.5	12.0
6.0	4.0	8.5	12.0
7.0	4.0	12.0	12.0

***** 95% compaction based on ASTM D1557 Test Method or CAL 216*
*** 90% compaction based on ASTM D1557 Test Method or CAL 216*

If traffic indices are not available, an estimated (typical value) index of 4.5 may be used for automobile parking and an index of 7.0 may be used for light truck traffic.

Pavement areas should be sloped and drainage gradients maintained to carry all surface water off the site. A cross slope of 2 percent is recommended in asphalt concrete pavement areas to provide good surface drainage and to reduce the potential for water to penetrate into the pavement structure.

SITE COEFFICIENT

The site coefficient, per Table 16-J, California Building Code (CBC), is based upon the site soil conditions. It is our opinion that a site coefficient of soil type S_D is appropriate for building design at this site. For seismic design of the structures, in accordance with the seismic provisions of the Building Code, we recommend the following parameters:

Seismic Item	Value	CBC Reference
Zone Factor	0.4	Table 16-I
Source Type	B	Table 16-U
Coefficient N_a	1.0	Table 16-S
Coefficient N_v	1.2	Table 16-T
Coefficient C_a	0.45	Table 16-Q
Coefficient C_v	0.78	Table 16-R

SOIL CORROSIVITY

Excessive sulfate or chloride in either the soil or native water may result in an adverse reaction between the cement in concrete and the soil. California Building Code has developed criteria for evaluation of sulfate and chloride levels and how they relate to cement reactivity with soil and/or water. The soil samples from the subject site were tested to have negligible sulfate and chloride concentrations. Therefore, normal concrete mixes may be used for concentrations such as found in these soils.

Electrical resistivity testing of the soil indicates that the onsite soils may have a low potential for metal loss from electrochemical corrosion process. A qualified corrosion engineer should be consulted regarding the corrosion effects of the onsite soils on underground metal utilities.

TESTING AND INSPECTION

A representative of Krazan & Associates, Inc. should be present at the site during the earthwork activities to confirm that actual subsurface conditions are consistent with the exploratory fieldwork. This activity is an integral part of our service, as acceptance of earthwork construction is dependent upon compaction testing and stability of the material. This representative can also verify that the intent of these recommendations is incorporated into the project design and construction. Krazan & Associates, Inc. will not be responsible for grades or staking, since this is the responsibility of the Prime Contractor.

LIMITATIONS

Geotechnical Engineering is one of the newest divisions of Civil Engineering. This branch of Civil Engineering is constantly improving as new technologies and understanding of earth sciences advance. Although your site was analyzed using appropriate and current techniques and methods, undoubtedly there will be substantial future improvements in this branch of engineering. In addition to advancements in the field of Geotechnical Engineering, physical changes in the site due to site clearing or grading activities, new agency regulations, or possible changes in the proposed structure or development after issuance of this report will result in the need for professional review of this report. Updating or revisions to the recommendations report, and possibly additional study of the site may be required at that time. In light of this, the Owner should be aware that there is a practical limit to the usefulness of this report without critical review. Although the time limit for this review is strictly arbitrary, it is suggested that two years be considered a reasonable time for the usefulness of this report.

Foundation and earthwork construction is characterized by the presence of a calculated risk that soil and groundwater conditions have been fully revealed by the original foundation investigation. This risk is derived from the practical necessity of basing interpretations and design conclusions on limited sampling of the earth. The recommendations made in this report are based on the assumption that soil conditions do not vary significantly from those disclosed during our field investigation. The logs of the exploratory borings do not provide a warranty as to the conditions that may exist beneath the entire site. The extent and nature of subsurface soil and groundwater variations may not become evident until construction begins. It is possible that variations in soil conditions and depth to groundwater could exist beyond the points of exploration that may require additional studies, consultation, and possible design revisions. If conditions are encountered in the field during construction, which differ from those described in this report, our firm should be contacted immediately to provide any necessary revisions to these recommendations.

This report presents the results of our Geotechnical Engineering Investigation, which was conducted for the purpose of evaluating the soil conditions in terms of foundation and retaining wall design, and grading and paving of the site. This report does not include reporting of any services related to environmental studies conducted to assessment the presence or absence of hazardous and/or toxic materials in the soil, groundwater, or atmosphere, or the presence of wetlands. Any statements in this report or on any boring log regarding odors, unusual or suspicious items, or conditions observed, are strictly for descriptive purposes and are not intended to convey professional judgment regarding the presence of potential hazardous or toxics substances. Conversely, the absence of statements in this report or on any boring log regarding odors, unusual or suspicious items, or conditions observed, does not constitute our rendering professional judgment regarding the absence of potentially hazardous or toxics substances.

The conclusions of this report are based on the information provided regarding the proposed construction. We emphasize that this report is valid for the project as described in the text of this report and it should not be used for any other sites or projects. The geotechnical engineering information presented herein is based upon our understanding of the proposed project and professional interpretation of the data obtained in our studies of the site. It is not warranted that such information and interpretation cannot be superseded by future geotechnical engineering developments. The Geotechnical Engineer should be notified of any changes to the proposed project so the recommendations may be reviewed and re-evaluated. The work conducted through the course of this investigation, including the preparation of this report, has been performed in accordance with the generally accepted standards of geotechnical engineering practice, which existed in geographic area of the project at the time the report was written. No other warranty, express or implied, is made. This report is issued with the understanding that the owner chooses the risk they wish to bear by the expenditures involved with the construction alternatives and scheduling that are chosen.

If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office at (909) 974-4400.

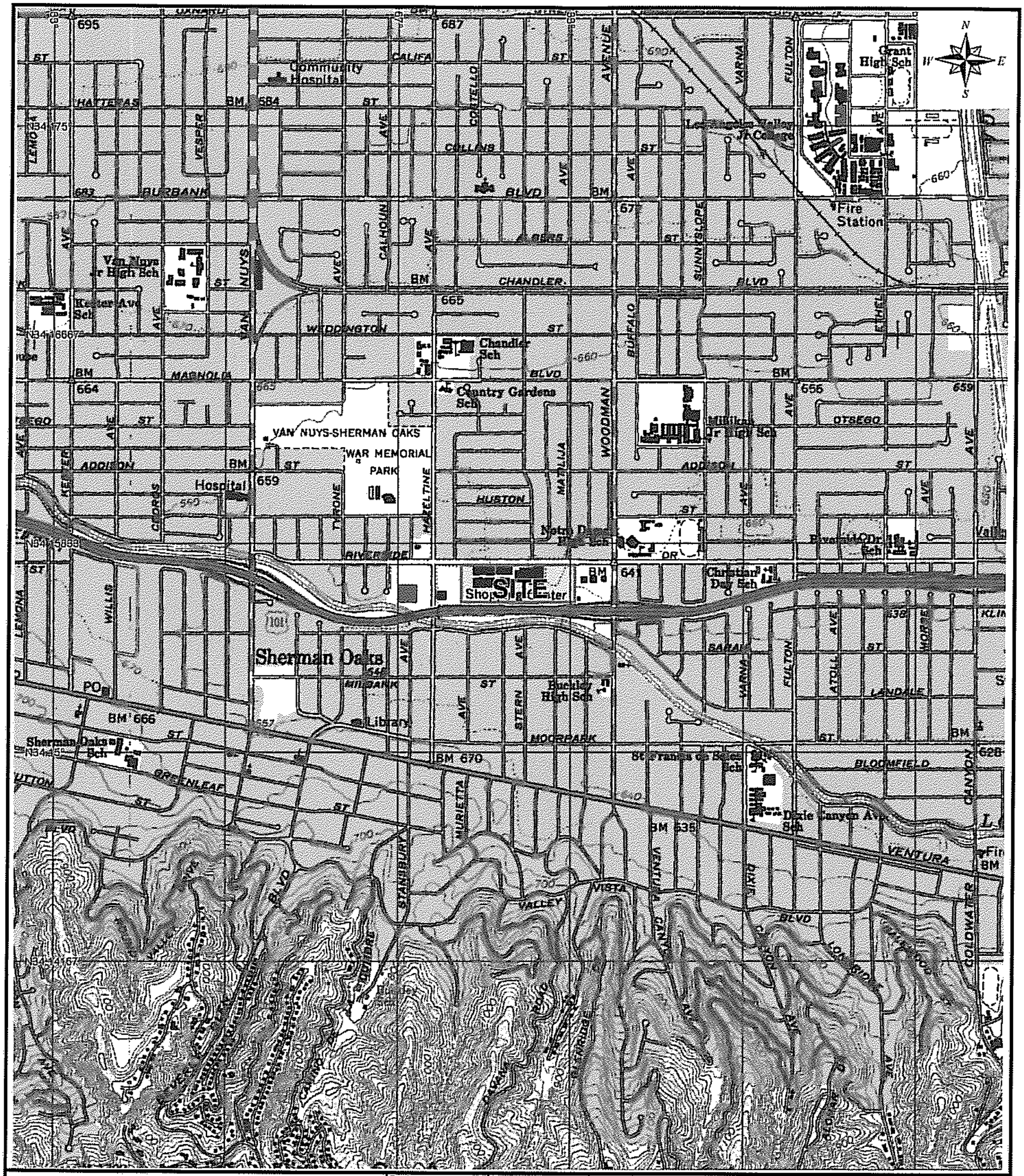
Respectfully submitted,
KRAZAN & ASSOCIATES, INC.

James Kellogg

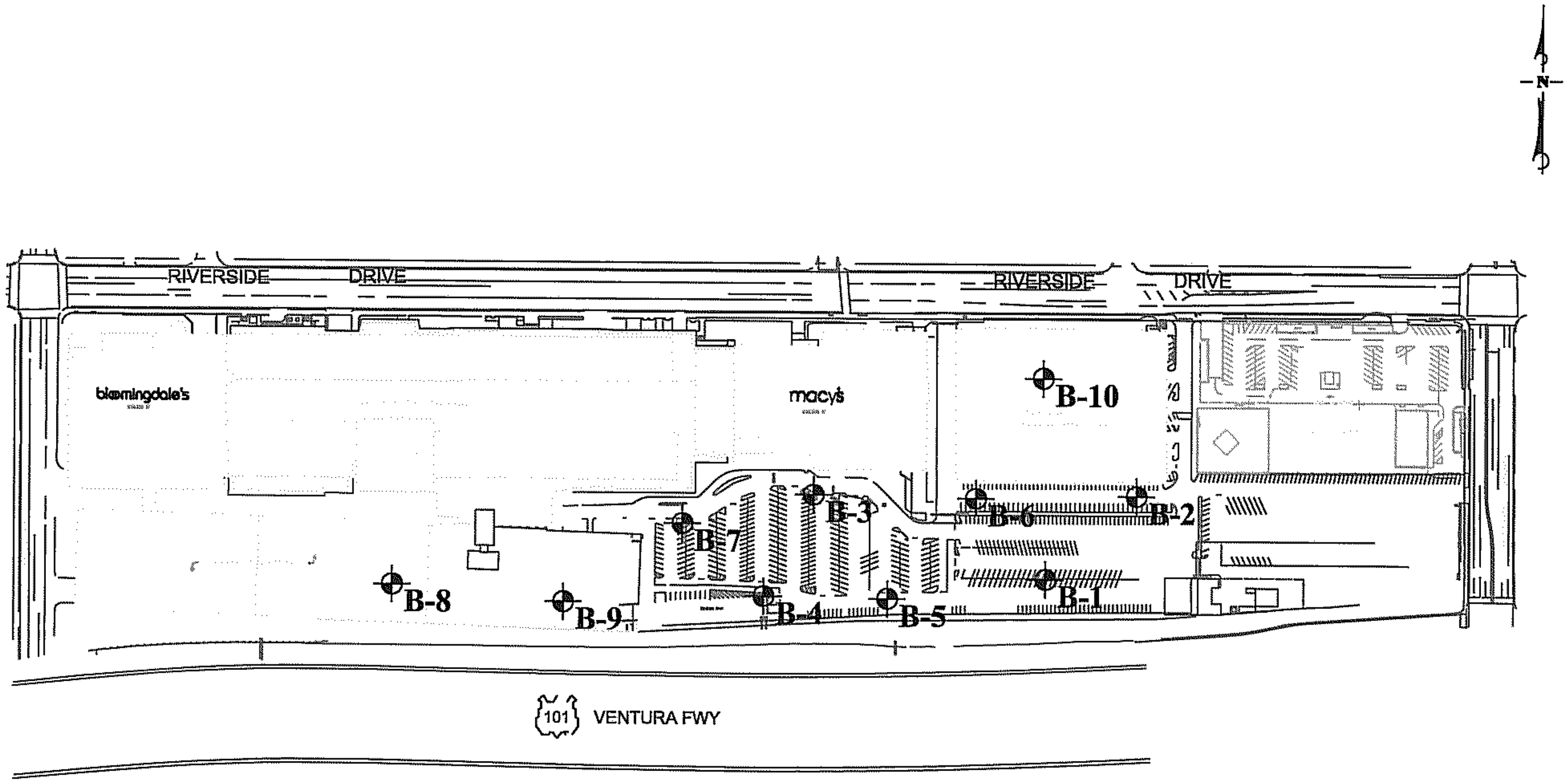
Clarence Jiang, GE
Project Engineer
R.G.E. No. 2477

James M. Kellogg, PE
Regional Manager
R.C.E. No. 65092

CJ/JMK:rm



PROPOSED FASHION SQUARE EXPANSION SHERMAN OAKS, CALIFORNIA	Scale: 1:24,000	Date: July '06	Krazan GEOTECHNICAL ENGINEERS Offices Serving the Western United States
	Drawn by: CJ	Approved by: CJ	
VICINITY MAP	Project No. 112-06041	Figure No. 1	



LEGEND

⊕ B-10 APPROXIMATE BORING LOCATION

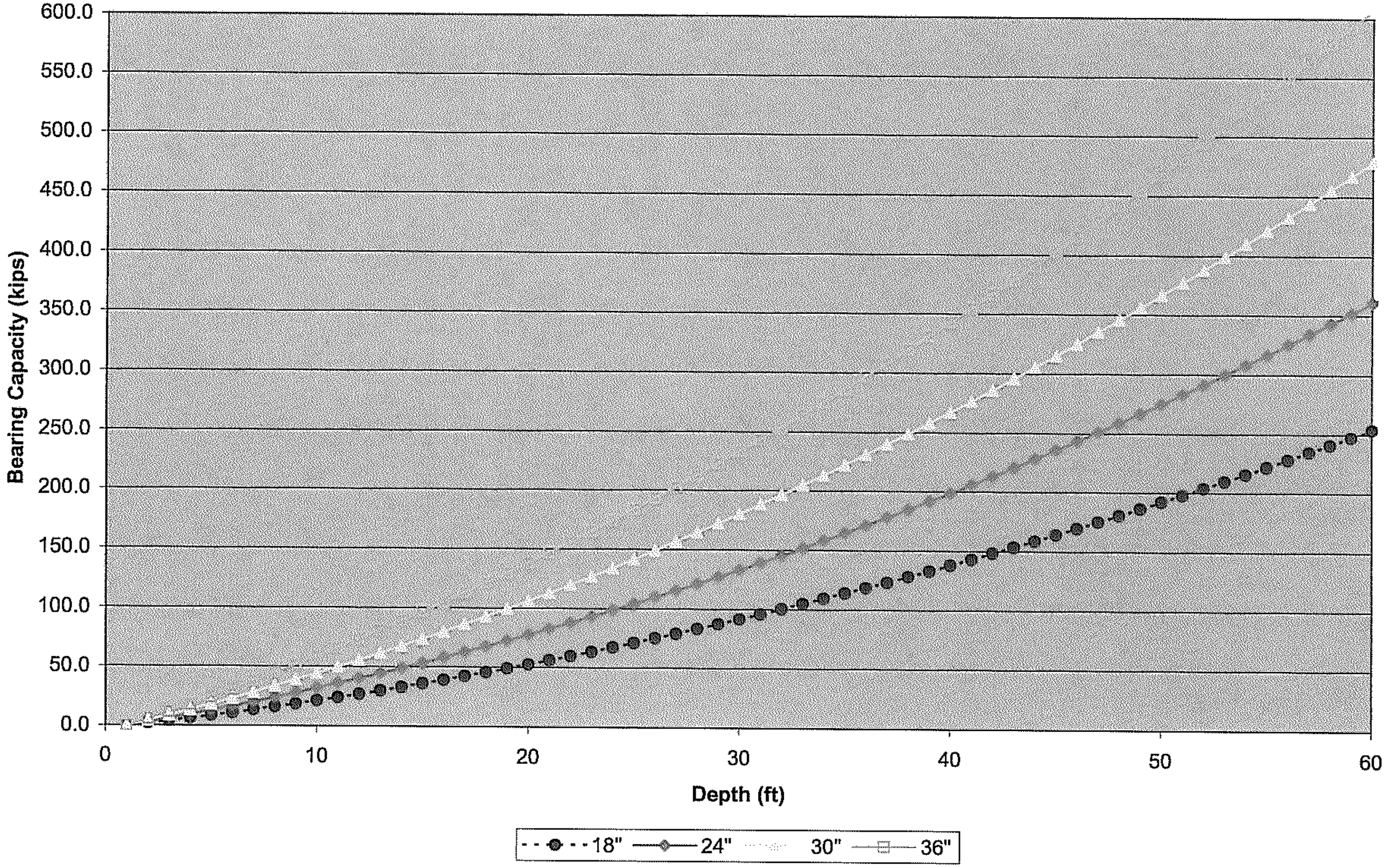
FASHION SQUARE EXPANSION
SHERMAN OAKS, CA

SITE PLAN

Scale: NTS	Date: SEPT 2006
Drawn by: RM	Approved by: CJ
Project No. 112-06041	Figure No. 2

Krazan
SITE DEVELOPMENT ENGINEERS
Offices Serving the Western United States

FIGURE 3, PILE CAPACITY



APPENDIX A

FIELD AND LABORATORY INVESTIGATIONS

Field Investigation

Our field investigation consisted of a surface reconnaissance and a subsurface exploration program consisted of drilling, logging and sampling a total of 10 borings. The depths of exploration ranged from about 6 feet to 50 feet below the existing site surface.

Members of our staff visually classified the soils in the field as the drilling and excavating progressed and recorded a continuous log of each boring. Visual classification of the soils encountered in our exploratory borings was made in general accordance with the Unified Soil Classification System (ASTM D2487). A key for the classification of the soil and the boring logs are presented in this Appendix.

During drilling operations, penetration tests were performed at regular intervals to evaluate the soil consistency and to obtain information regarding the engineering properties of the subsoils. Samples were obtained from the borings by driving either a 2.5-inch inside diameter Modified California tube sampler fitted with brass sleeves or a 2-inch outside diameter, 1-3/8-inch inside diameter Standard Penetration ("split-spoon") test (SPT) sampler without sleeves. Soil samples were retained for possible laboratory testing. The samplers were driven up to a depth of 18 inches into the underlying soil using a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler was recorded for each 6-inch penetration interval and the number of blows required to drive the sampler the last 12 inches are shown as blows per foot on the boring logs.

The approximate locations of our borings are shown on the Site Plan, Figure 2. These approximate locations were estimated in the field based on pacing and measuring from the limits of existing site features.

Laboratory Investigation

The laboratory investigation was programmed to determine the physical and mechanical properties of the soil underlying the site. The laboratory-testing program was formulated with emphasis on the evaluation of in-situ moisture and dry density, gradation, shear strength, expansion potential, and R-value of the materials encountered. In addition, chemical tests were performed to evaluate the soil/cement reactivity and corrosivity. Test results were used in our engineering analysis with respect to site and building pad preparation through mass grading activities, foundation and retaining wall design recommendations, pavement section design, evaluation of the materials as possible fill materials and for possible exclusion of some soils from use at the structures as fill or backfill.

Select laboratory test results are presented on the boring logs, with graphic or tabulated results of selected tests included in this Appendix. The laboratory test data, along with the field observations, was used to prepare the final boring logs presented in the Appendix.

Krazan & ASSOCIATES, INC.

GEOTECHNICAL ENGINEERING • ENVIRONMENTAL ENGINEERING
CONSTRUCTION TESTING & INSPECTION

UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

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

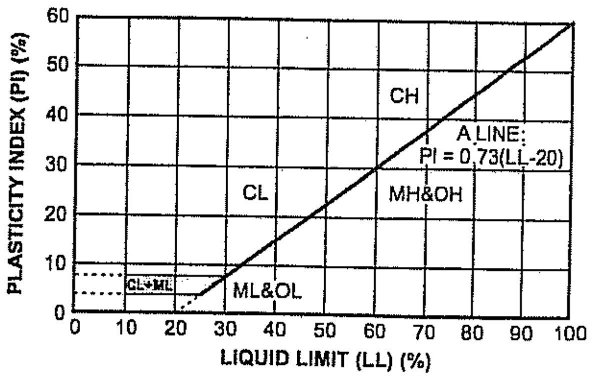
CONSISTENCY CLASSIFICATION

Description	Blows per Foot
Granular Soils	
Very Loose	< 5
Loose	5 – 15
Medium Dense	16 – 40
Dense	41 – 65
Very Dense	> 65
Cohesive Soils	
Very Soft	< 3
Soft	3 – 5
Firm	6 – 10
Stiff	11 – 20
Very Stiff	21 – 40
Hard	> 40

GRAIN SIZE CLASSIFICATION

Grain Type	*Standard Sieve Size*	*Grain Size in Millimeters*
Boulders	Above 12 inches	Above 305
Cobbles	12 to 13 inches	305 to 76.2
Gravel	3 inches to No. 4	76.2 to 4.76
Coarse-grained	3 to ¾ inches	76.2 to 19.1
Fine-grained	¾ inches to No. 4	19.1 to 4.76
Sand	No. 4 to No. 200	4.76 to 0.074
Coarse-grained	No. 4 to No. 10	4.76 to 2.00
Medium-grained	No. 10 to No. 40	2.00 to 0.042
Fine-grained	No. 40 to No. 200	0.042 to 0.074
Silt and Clay	Below No. 200	Below 0.074

PLASTICITY CHART



Log of Drill Hole B1

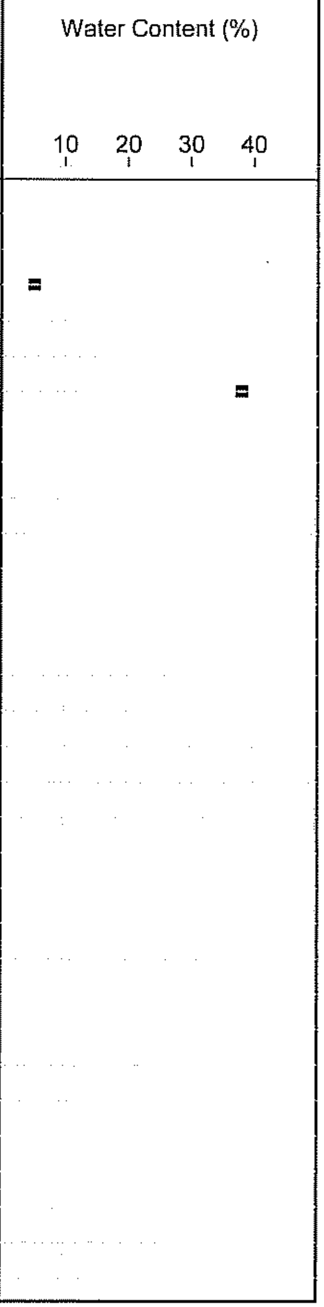
Project: Westfield Fashion Square Expansion
Project No: 112-06041

Client: Westfield Corporation, Inc.
Figure No.: A-1

Location: Sherman Oaks, CA
Logged By: AK

Depth to Water>
Initial:
At Completion:

SUBSURFACE PROFILE			SAMPLE			
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
0		Ground Surface				
		3" AC ON 8" AB				
2	▥	***FILL: SANDY SILT W/SOME CLAY (ML),*** fine grained, brown, slightly moist, firm	113.2	5.2	⧗	10
4	▥	***FILL: SILTY SAND (SM),*** fine to medium grained, brown, slightly moist, loose 4" fiber mesh pipe at 4' (abandoned)				
6	▥	***CLAYEY SILT (ML),*** fine grained, brown/tan, wet, medium stiff	81.7	38.1	⧗	13
		TERMINATED @ 6' / GRAVEL				
8		Total Depth = 6' No groundwater was encountered during drilling Hole backfilled with soil cuttings and patched 06/27/06				
10						
12						
14						
16						
18						
20						
22						
24						
26						
28						
30						



Drill Method: Hollow Stem Auger
Drill Date: 06/27/06

Drill Rig: CME 55

Krazan and Associates

Hole Size: 8"

Driller: TS

Elevation: See Site Plan

Sheet: 1 of 1

Log of Drill Hole B2

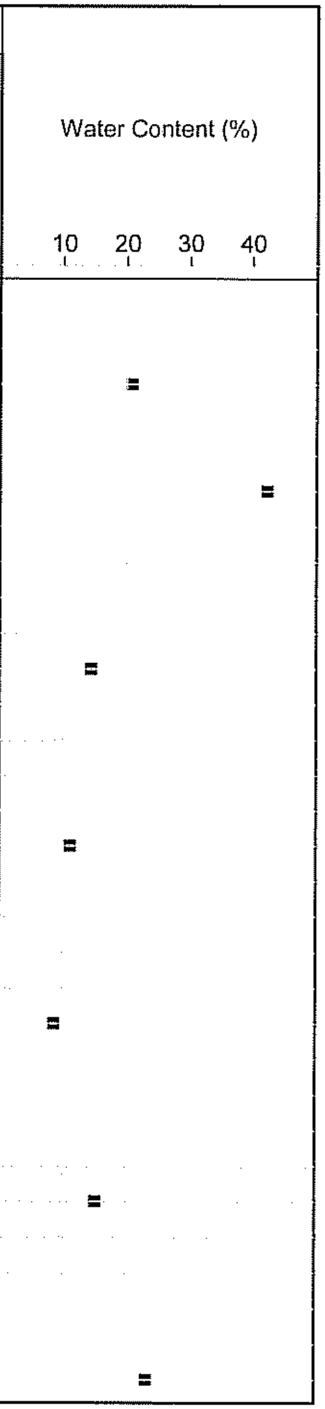
Project: Westfield Fashion Square Expansion
Project No: 112-06041

Client: Westfield Corporation, Inc.
Figure No.: A-2

Location: Sherman Oaks, CA
Logged By: AK

Depth to Water> **Initial:** **At Completion:**

SUBSURFACE PROFILE			SAMPLE			
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
		Ground Surface				
0 2	▥	*FILL: SILTY SAND/SANDY SILT W/TRACE CLAY (SM/ML),* fine to medium grained, brown/black/tan, moist, medium dense/stiff	98.6	20.8	⧗	25
4 6	▥	*CLAYEY SILT (ML),* tan/brown, wet, soft, (tan material slightly competant)		42.3	⧗	8
8 10 12	▥	*SANDY SILT W/TRACE CLAY (ML),* fine to medium grained, dark brown, moist, medium stiff		14.4	◥	7
14 16	▥	*SILTY SAND (SM),* fine to medium grained, brown, moist, medium dense		11.2	◥	12
18 20	▥	Same as above, very firm drilling				
22	▨	*SILTY CLAY (CL),* olive, slightly moist, very stiff		8.7	◥	27
24	▨	Same as above, increasingly difficult drilling				
26	▨	Same as above, moist, medium stiff w/some fine to medium grained sand		15.3	◥	10
28 30	▨	*SILTY CLAY (CL),* olive, moist, stiff			◥	15



Drill Method: Hollow Stem Auger
Drill Date: 06/27/06

Drill Rig: CME 55
Hole Size: 8"

Krazan and Associates

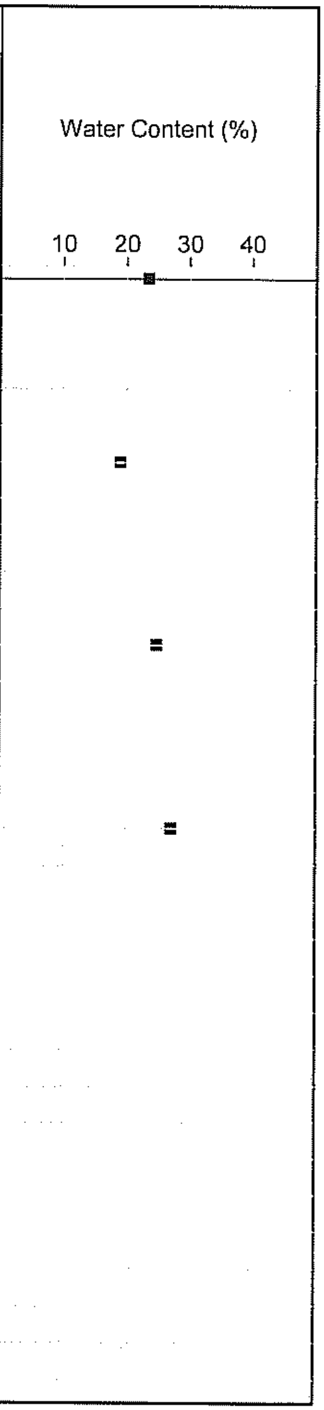
Driller: TS
Elevation: See Site Plan

Sheet: 1 of 2

Log of Drill Hole B2

Project: Westfield Fashion Square Expansion
Project No: 112-06041
Client: Westfield Corporation, Inc.
Figure No.: A-2
Location: Sherman Oaks, CA
Logged By: AK
Depth to Water>
Initial:
At Completion:

SUBSURFACE PROFILE			SAMPLE			
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
	▨			23.4	◥	15
32	▨					
34	▨	Same as above, w/fine grained sand				
	▨			19.0	◥	12
36		***SILTY SAND W/TRACE CLAY (SM),*** fine to medium grained, brown, moist, medium dense				
38	▨	***SILTY CLAY (CL),*** olive, moist, stiff				
40		***CLAYEY SILT W/SOME SAND (ML),*** fine grained, olive, moist, medium stiff		24.8	◥	11
42		Same as above, decrease in sand/blueish gray				
44						
		Same as above, stiff		27.2	◥	15
46						
48						
50		End of Borehole Total Depth = 50' No groundwater was encountered during drilling Hole backfilled with soil cuttings and patched 06/27/06				
52						
54						
56						
58						
60						



Drill Method: Hollow Stem Auger
Drill Date: 06/27/06
Drill Rig: CME 55
Krazan and Associates
Hole Size: 8"
Driller: TS
Elevation: See Site Plan
Sheet: 2 of 2

Log of Drill Hole B4

Project: Westfield Fashion Square Expansion

Project No: 112-06041

Client: Westfield Corporation, Inc.

Figure No.: A-4

Location: Sherman Oaks, CA

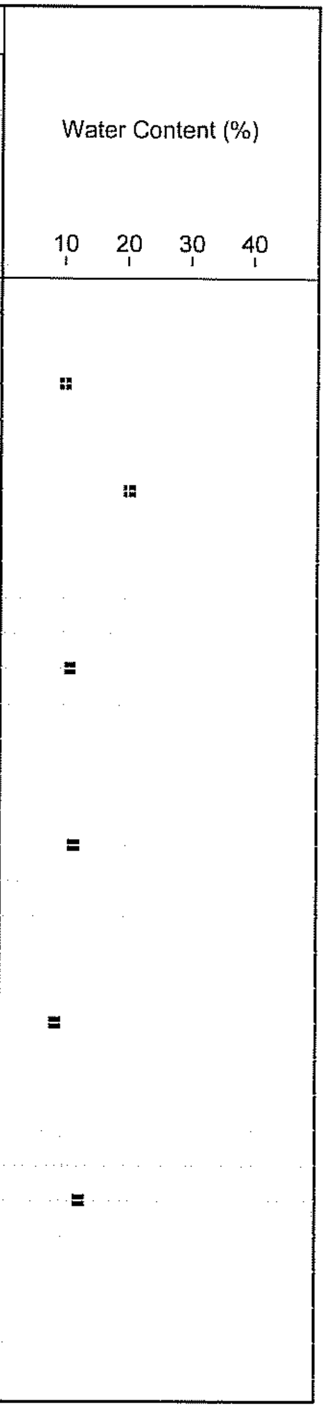
Logged By: AK

Depth to Water>

Initial:

At Completion:

SUBSURFACE PROFILE			SAMPLE			
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
0		Ground Surface				
		2" AC ON 6" AB				
2		***FILL: SILTY SAND (SM),*** fine to medium grained, brown, damp, loose	113.4	10.1	⧗	30
4		***SILTY SAND W/SOME CLAY (SM),*** fine to medium grained, brown, moist, medium dense				
6		***SANDY SILT W/TRACE CLAY (ML),*** fine grained, brown, moist, very stiff	106.5	20.3	⧗	48
8		***SILTY SAND/SANDY SILT (SM/ML),*** fine to medium grained, brown, moist, medium dense				
10				10.9	◣	22
12		***SILTY SAND W/TRACE CLAY (SM),*** fine to medium grained, brown, medium dense				
14		Same as above, decrease in grain size				
16				11.6	◣	17
		Same as above, very tight				
18						
20		Same as above, increase in density		8.8	◣	37
22						
24		***SILTY SAND/SANDY SILT W/TRACE CLAY (SM/ML)*** fine grained, brown, moist, dense				
26				12.7	◣	44
28		***REFUSAL AT 27' / MATERIAL TOO TIGHT*** Total Depth = 27' No groundwater was encountered during drilling Hole backfilled with soil cuttings and patched				
30						



Drill Method: Hollow Stem Auger

Drill Date: 06/28/06

Drill Rig: CME 55

Krazan and Associates

Hole Size: 8"

Driller: TS

Elevation: See Site Plan

Sheet: 1 of 1

Log of Drill Hole B3

Project: Westfield Fashion Square Expansion

Project No: 112-06041

Client: Westfield Corporation, Inc.

Figure No.: A-3

Location: Sherman Oaks, CA

Logged By: AK

Depth to Water> 43.5'

Initial:

At Completion:

SUBSURFACE PROFILE			SAMPLE				
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.	Water Content (%) 10 20 30 40
0		Ground Surface					
		3" AC ON 4" AB					
2		***FILL: SANDY SILT W/TRACE CLAY (ML),*** fine grained, brown, damp, stiff	126.9	12.1		30	
4		***SANDY SILT W/TRACE CLAY (ML),*** fine grained, brown, damp, stiff					
6		***SANDY CLAY (CL),*** fine grained, brown, moist, very stiff	115.6	18.1		48	
10		Same as above, increase in coarse grained material		17.6		22	
14		***SANDY SILT (ML),*** fine grained, brown, moist, stiff					
16				19.2		17	
18		***SILTY SAND (SM),*** fine to medium grained, brown, moist, medium dense					
20				11.7		37	
24		***SILTY SAND/SAND (SM/SP),*** fine to coarse grained, brown, damp, dense					
26				3.1		44	
28		***SAND (SP),*** fine to coarse grained, brown/light brown, damp, dense					
30						47	

Drill Method: Hollow Stem Auger

Drill Date: 06/28/06

Drill Rig: CME 55

Krazan and Associates

Hole Size: 8"

Driller: TS

Elevation: See Site Plan

Sheet: 1 of 2

Log of Drill Hole B3

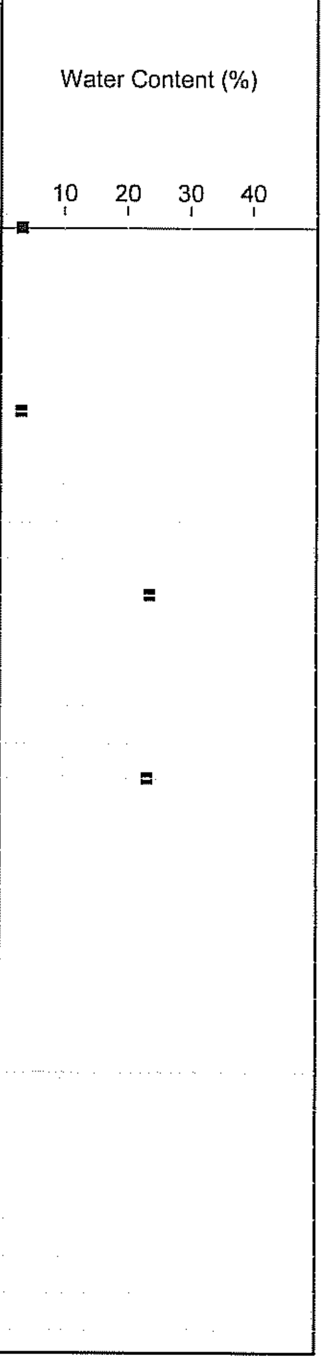
Project: Westfield Fashion Square Expansion
Project No: 112-06041

Client: Westfield Corporation, Inc.
Figure No.: A-3

Location: Sherman Oaks, CA
Logged By: AK

Depth to Water> 43.5'
Initial:
At Completion:

SUBSURFACE PROFILE			SAMPLE			
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
	░			3.4	◥	47
32	░					
34	░					
	░	Same as above, dark brown		3.3	◥	37
36	░					
38	░					
	▨	***SILTY CLAY W/SOME SAND (CL),*** fine grained, brown/olive, moist, firm				
40	▨			23.6	◥	6
42	▨					
44	▨					
	▨	Same as above, stiff/grey/decrease in coarse material		23.2	◥	14
46	▨					
48	▨					
50		End of Borehole Total Depth = 50' Groundwater was encountered during drilling at 43.5' Hole backfilled with soil cuttings and patched 06/28/06				
52						
54						
56						
58						
60						



Drill Method: Hollow Stem Auger
Drill Date: 06/28/06

Drill Rig: CME 55
Hole Size: 8"

Krazan and Associates

Driller: TS
Elevation: See Site Plan

Sheet: 2 of 2

Log of Drill Hole B5

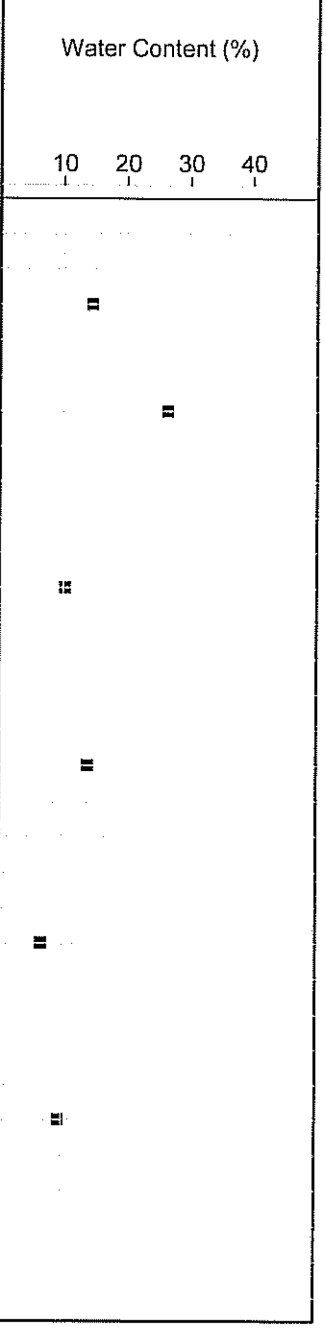
Project: Westfield Fashion Square Expansion
Project No: 112-06041

Client: Westfield Corporation, Inc.
Figure No.: A-5

Location: Sherman Oaks, CA
Logged By: AK

Depth to Water>
Initial:
At Completion:

SUBSURFACE PROFILE			SAMPLE			
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
0		Ground Surface				
		2" AC ON 5" AB				
2		***FILL: SILTY SAND W/LITTLE CLAY (SM),*** fine to medium grained, brown, damp, medium dense	105.5	14.5	⧗	37
4		***SANDY SILT W/SOME CLAY (ML),*** fine grained, brown, moist, stiff				
6		***SANDY CLAY (CL),*** fine grained, brown, moist, stiff	94.4	26.5	⧗	27
8						
10		***SILTY SAND W/TRACE CLAY (SM),*** fine to medium grained, brown, moist, medium dense		10.3	◥	22
12						
		SANDY CLAY (CL), fine grained, brown, moist, stiff				
14		***SANDY SILT W/LITTLE CLAY (ML),*** fine grained, brown, moist, very stiff				
16		***SILTY SAND (SM),*** fine to medium grained, brown, moist, medium dense		13.9	◥	37
18		***SILTY SAND/SANDY SILT (SM/ML),*** fine grained, brown, slightly moist, dense				
20				6.7	◥	42
22						
		Same as above, increasingly difficult				
24						
		Same as above, w/trace clay				
26				9.5	◥	47
28						
30		***REFUSAL AT 29' / MATERIAL TOO TIGHT***				



Drill Method: Hollow Stem Auger
Drill Date: 06/28/06

Drill Rig: CME 55
Krazan and Associates
Hole Size: 8"

Driller: TS
Elevation: See Site Plan

Sheet: 1 of 1

Log of Drill Hole B6

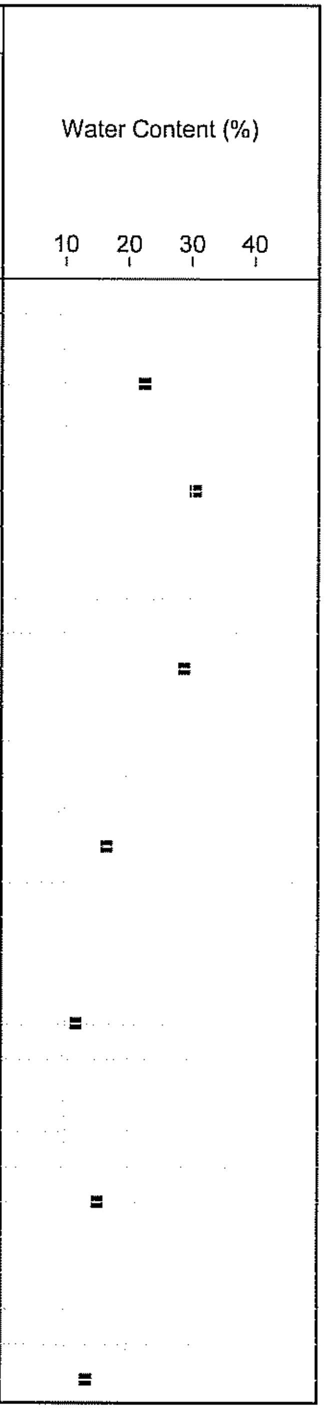
Project: Westfield Fashion Square Expansion
Project No: 112-06041

Client: Westfield Corporation, Inc.
Figure No.: A-6

Location: Sherman Oaks, CA
Logged By: AK

Depth to Water> 34'
Initial:
At Completion:

SUBSURFACE PROFILE			SAMPLE			
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
0		Ground Surface				
		4" AC ON 4" AB				
2		***FILL: SANDY SILT (ML),*** fine grained, brown, damp, loose	106.8	22.5		37
4		***SANDY SILT (ML),*** fine grained, brown, damp, medium dense				
6		***SILTY CLAY W/TRACE SAND (CL),*** fine grained, brown, moist, very stiff	92.7	30.6		26
8						
10		Same as above, stiff w/increase in plasticity		28.9		12
12						
14		***SANDY SILT W/LITTLE CLAY (ML),*** fine to medium grained, brown, moist, very stiff				
16				16.6		34
18		***CLAY (CL),*** brown, moist, stiff				
20		***SILTY SAND/CLAYEY SILT (SM/ML),*** fine to medium grained, brown, moist, dense/hard		11.8		43
22		***SILTY SAND/SANDY SILT W/TRACE CLAY (SM/ML),*** fine to medium grained, brown, moist, very firm, medium dense				
24						
26				15.2		37
28						
30						50 @ 6"



Drill Method: Hollow Stem Auger
Drill Date: 06/28/06

Drill Rig: CME 55
Krazan and Associates
Hole Size: 8"

Driller: TS
Elevation: See Site Plan

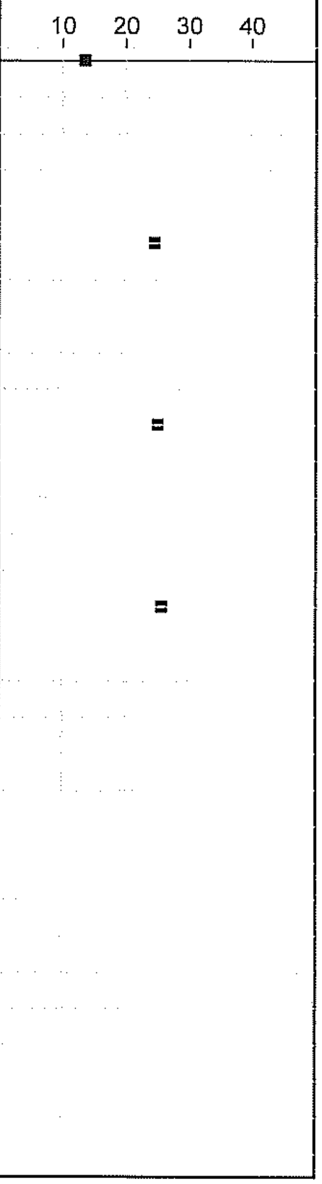
Sheet: 1 of 2

Log of Drill Hole B6

Project: Westfield Fashion Square Expansion
Project No: 112-06041
Client: Westfield Corporation, Inc.
Figure No.: A-6
Location: Sherman Oaks, CA
Logged By: AK
Depth to Water> 34'
Initial:
At Completion:

SUBSURFACE PROFILE			SAMPLE			
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
32 34	▥	***SILTY SAND W/CLAY (SM),*** moist, very dense		13.5	◣	50 @ 6"
36 38	▨	***SILTY CLAY W/TRACE SAND (CL),*** fine grained, olive, moist, very stiff		24.5	◣	21
40 42 44	▨	Same as above, stiff w/increase in sand		25.1	◣	18
	▨	Same as above, very stiff		25.7	◣	29
46 48	▥	***SILTY SAND W/TRACE CLAY (SM),*** fine to medium grained, brown, slightly moist, medium dense				
50 52 54 56 58 60		End of Borehole Total Depth = 50' Groundwater was encountered during drilling at 34' Hole backfilled with soil cuttings and patched 06/28/06				

Water Content (%)



Drill Method: Hollow Stem Auger
Drill Date: 06/28/06
Drill Rig: CME 55
Krazan and Associates
Hole Size: 8"
Driller: TS
Elevation: See Site Plan
Sheet: 2 of 2

Log of Drill Hole B7

Project: Westfield Fashion Square Expansion

Client: Westfield Corporation, Inc.

Location: Sherman Oaks, CA

Depth to Water>

Initial:

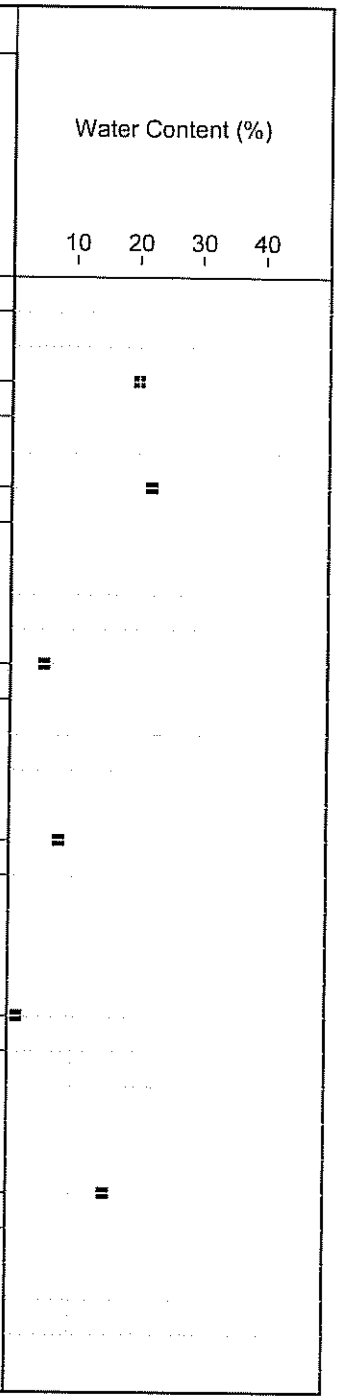
Project No: 112-06041

Figure No.: A-7

Logged By: AK

At Completion:

SUBSURFACE PROFILE		SAMPLE			
Depth (ft)	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
0	Ground Surface				
	2" AC ON 5" AB				
2	***FILL: SILTY SAND/SANDY SILT W/TRACE CLAY (SM/ML),*** fine to medium grained, brown, moist, medium dense	112.9	19.9	⧗	37
4	***SANDY SILT W/SOME CLAY (ML),*** fine grained, brown, moist, stiff				
6	Same as above, decrease in clay	106.2	22.0	⧗	36
8	***SILTY SAND/SAND (SM/SP),*** fine to medium grained, brown, slightly moist, medium dense				
10		117.5	5.3	⧗	33
12					
14	***SILTY SAND (SM),*** fine to medium grained, brown, moist, dense				
16	Same as above, w/lenses of silt and trace of clay		7.8	◥	43
18	***SAND (SP),*** fine to medium grained, light brown/brown, damp, dense				
20	Same as above, fine to coarse grained		1.4	◥	46
22					
24	***SANDY SILT W/TRACE CLAY (ML),*** fine grained, brown, moist, stiff				
26			15.3	◥	19
28					
30	***SILTY SAND W/TRACE CLAY (SM),*** fine grained, brown, moist, medium dense				



Drill Method: Hollow Stem Auger

Drill Rig: CME 55

Driller: TS

Krazan and Associates

Drill Date: 06/28/06

Hole Size: 8"

Elevation: See Site Plan

Sheet: 1 of 2

Log of Drill Hole B7

Project: Westfield Fashion Square Expansion
Project No: 112-06041

Client: Westfield Corporation, Inc.
Figure No.: A-7

Location: Sherman Oaks, CA
Logged By: AK

Depth to Water>
Initial:
At Completion:

SUBSURFACE PROFILE			SAMPLE				
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.	Water Content (%) 10 20 30 40
	▥			17.9	◣	32	■
32	▨	***SILTY SAND/CLAYEY SAND (SM/SC),*** fine to medium grained, brown, moist, medium dense					
34		***REFUSAL AT 34' / MATERIAL TOO TIGHT*** Total Depth = 34' No groundwater was encountered during drilling Hole backfilled with soil cuttings and patched 06/28/06					
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							
58							
60							

Drill Method: Hollow Stem Auger
Drill Date: 06/28/06

Drill Rig: CME 55
Krazan and Associates
Hole Size: 8"

Driller: TS
Elevation: See Site Plan

Sheet: 2 of 2

Log of Drill Hole B8

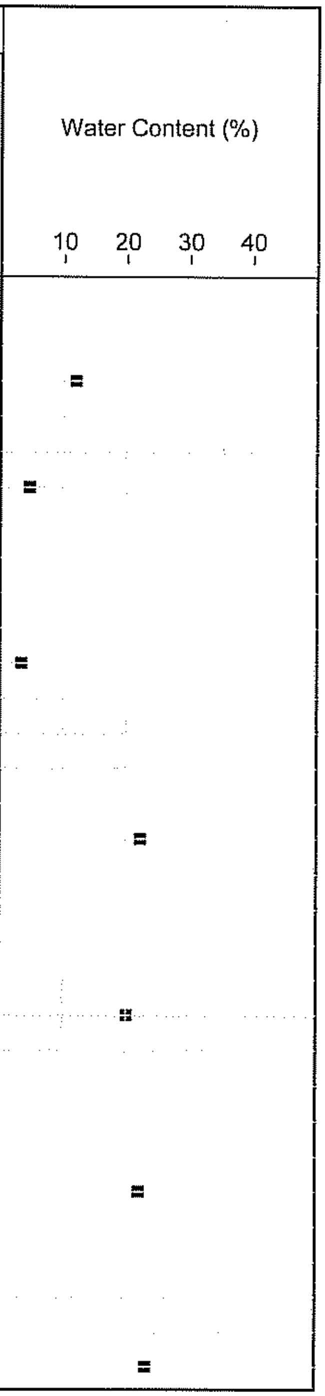
Project: Westfield Fashion Square Expansion
Project No: 112-06041

Client: Westfield Corporation, Inc.
Figure No.: A-8

Location: Sherman Oaks, CA
Logged By: AK

Depth to Water> 44.5
Initial: 45.5
At Completion: 44.5

SUBSURFACE PROFILE			SAMPLE			
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
0		Ground Surface				
		3" AC ON 3" AB				
2		***FILL: SANDY SILT W/SOME CLAY (ML),*** fine to medium grained, brown, moist, very stiff Same as above, decrease in clay	122.7	11.9	⧗	29
4		***SILTY SAND W/TRACE CLAY/GRAVEL (SM),*** fine to coarse grained, brown, slightly moist, dense				
6			118.0	4.6	⧗	54
8		***SILTY SAND/SAND W/LITTLE GRAVEL (SM/SP),*** fine to coarse grained, brown, slightly moist, very dense				
10			121.0	3.4	⧗	50 @ 6"
12						
14		***SILTY SAND/SANDY SILT (SM/ML),*** fine to medium grained, brown, very moist, medium dense				
16		***CLAY (CL),*** brown, very moist, very stiff	107.6	22.2	⧗	29
18						
20			107.6	20.1	⧗	27
22						
24		***SANDY SILT W/SOME CLAY (ML),*** fine grained, brown, very moist, very stiff				
26			106.2	22.1	⧗	28
28		***SILTY CLAY W/TRACE SAND (CL),*** fine grained, brown, moist, very stiff				
30					⧗	34



Drill Method: Hollow Stem Auger
Drill Date: 08/14/06

Drill Rig: LAR (custom)
Krazan and Associates
Hole Size: 8"

Driller: Pacific Drilling
Elevation: See Site Plan
Sheet: 1 of 2

Log of Drill Hole B8

Project: Westfield Fashion Square Expansion

Project No: 112-06041

Client: Westfield Corporation, Inc.

Figure No.: A-8

Location: Sherman Oaks, CA

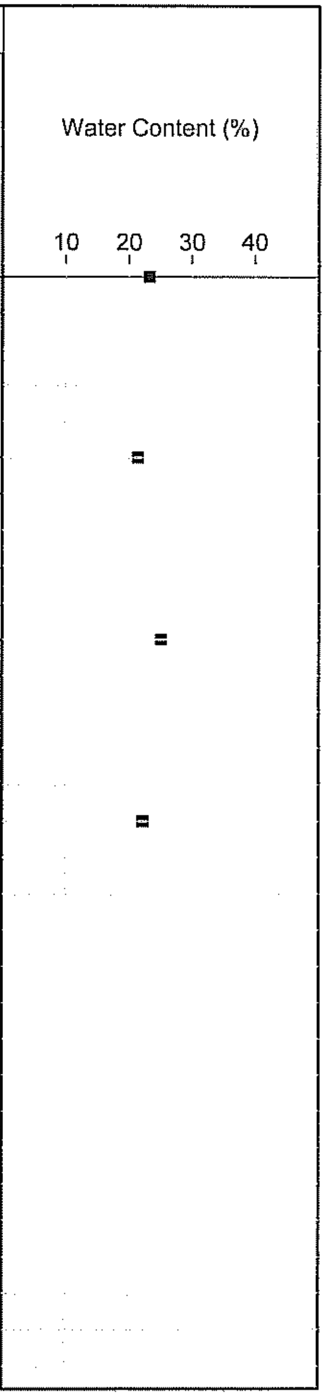
Logged By: AK

Depth to Water> 44.5

Initial: 45.5

At Completion: 44.5

SUBSURFACE PROFILE			SAMPLE			
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
			106.0	23.2	⧗	34
32						
34						
		Same as above, hard	106.5	21.4	⧗	53
36						
38						
		SANDY SILT W/TRACE CLAY (ML), fine grained, brown, wet, hard				
40						
			99.9	25.1	⧗	48
42		Same as above, increase in clay				
44						
			104.5	22.2	⧗	50
46		***SILTY SAND/SAND (SM/SP),*** fine to medium grained, brown, very moist, dense				
48						
		SILTY SAND (SM), fine to medium grained, brown, damp, dense				
50						
		End of Borehole Total Depth = 50' Groundwater was encountered at 45.5' during drilling Hole backfilled with soil cuttings and patched 08/14/06				
52						
54						
56						
58						
60						



Drill Method: Hollow Stem Auger

Drill Date: 08/14/06

Drill Rig: LAR (custom)

Krazan and Associates

Hole Size: 8"

Driller: Pacific Drilling

Elevation: See Site Plan

Sheet: 2 of 2

Log of Drill Hole B9

Project: Westfield Fashion Square Expansion

Project No: 112-06041

Client: Westfield Corporation, Inc.

Figure No.: A-9

Location: Sherman Oaks, CA

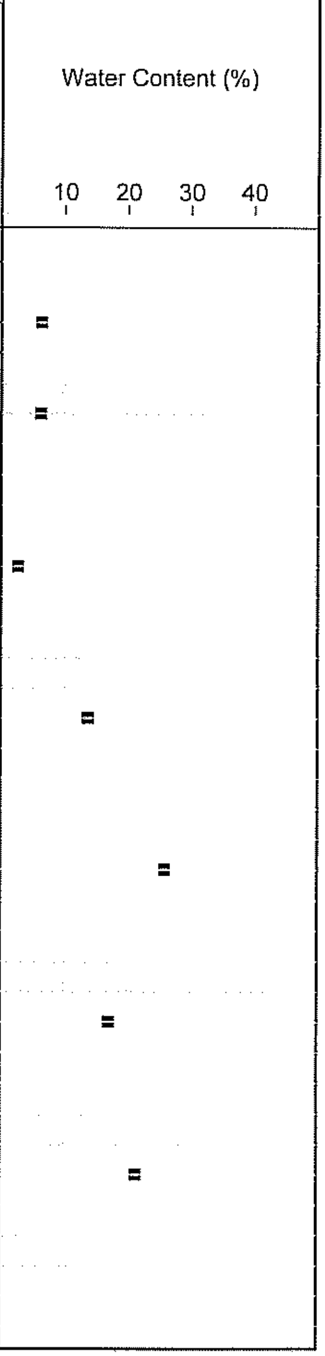
Logged By: AK

Depth to Water>

Initial:

At Completion:

SUBSURFACE PROFILE			SAMPLE			
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
0		Ground Surface				
		2" OVERLAY AC ON 3" CONCRETE ON 2" AB				
2		***FILL: SANDY SILT W/LITTLE CLAY (ML),*** fine to medium grained, brown, slightly moist, loose	113.8	6.3	⧗	16
4 6		***SANDY SILT W/TRACE CLAY/GRAVEL (ML),*** fine to medium grained, brown, slightly moist, medium dense	116.0	6.2	⧗	28
8 10		***SILTY SAND W/TRACE CLAY/GRAVEL (SM),*** fine to medium grained, brown, damp, medium dense	124.6	2.7	⧗	30
12		***SAND W/SOME GRAVEL (SP),*** fine to coarse grained, brown, damp, medium dense				
14		***SILTY SAND W/TRACE CLAY (SM),*** fine to medium grained, brown, moist, medium dense	118.1	13.8	⧗	69
16 18		***SILTY SAND/SANDY SILT W/TRACE CLAY (SM/ML),*** Same as above, fine to medium grained				
20 22		***CLAY (CL),*** brown/olive, wet, very stiff	98.9	25.9	⧗	32
24		***SANDY SILT W/SOME CLAY (ML),*** fine grained, brown, moist, hard				
26		***CLAY (CL),*** brown, very moist, hard	110.9	17.1	⧗	63
28		***SILTY SAND (SM),*** fine grained, brown, moist, dense				
30		***CLAYEY SILT W/TRACE SAND (ML),*** fine grained, brown, very moist, hard	109.5	21.4	⧗	42
32 34		***REFUSAL AT 29.5' / MATERIAL TOO*** Total Depth = 29.5' No groundwater was encountered during drilling Hole backfilled with soil cuttings and patched 08/15/06				



Drill Method: Hollow Stem Auger

Drill Date: 08/15/06

Drill Rig: LAR (custom)

Krazan and Associates

Hole Size: 8"

Driller: Pacific Drilling

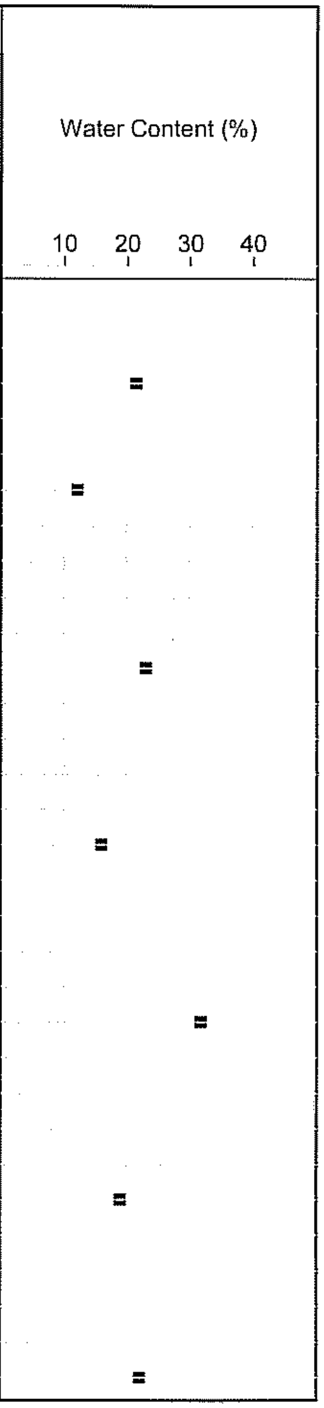
Elevation: See Site Plan

Sheet: 1 of 1

Log of Drill Hole B10

Project: Westfield Fashion Square Expansion
Project No: 112-06041
Client: Westfield Corporation, Inc.
Figure No.: A-10
Location: Sherman Oaks, CA
Logged By: AK
Depth to Water> **Initial:** **At Completion:**

SUBSURFACE PROFILE			SAMPLE			
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
0		Ground Surface				
		2" AC ON 3" AB				
2		***FILL: SILTY SAND (SM),*** fine to medium grained, brown, very moist, loose	106.0	21.4	⧗	23
4		***FILL: SILTY CLAY W/SOME SAND (CL),*** fine to medium grained, brown, very moist, very stiff				
6		***SILTY CLAY W/TRACE SAND (CL),*** fine grained, brown, moist, very stiff	111.5	12.1	⧗	39
		SILTY SAND (SM), fine to medium grained, brown, moist, medium dense				
8		***CLAYEY SILT (ML),*** brown, very moist, very stiff				
10		Same as above, w/some sand	99.2	22.9	⧗	21
12						
14		***SILTY SAND/SANDY SILT W/TRACE CLAY (SM/ML),*** fine to medium grained, brown, moist, medium dense	111.9	15.9	⧗	37
16						
18		***SILTY CLAY (CL),*** brown, wet, very stiff				
20		Same as above, decrease in silt	90.9	31.7	⧗	33
22						
24		***SANDY SILT W/TRACE CLAY (ML),*** fine to medium grained, brown, very moist, medium dense	112.9	18.9	⧗	37
26						
28		***CLAY (CL),*** brown, moist, very stiff				
30					⧗	40



Drill Method: Hollow Stem Auger
Drill Date: 08/16/06
Drill Rig: LAR (custom)

Krazan and Associates

Hole Size: 8"
Driller: Pacific Drilling
Elevation: See Site Plan
Sheet: 1 of 2

Log of Drill Hole B10

Project: Westfield Fashion Square Expansion
Project No: 112-06041

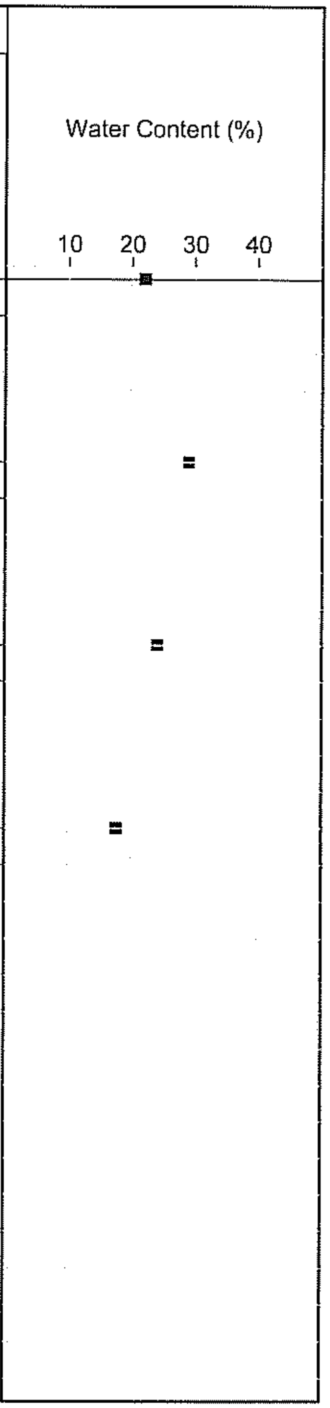
Client: Westfield Corporation, Inc.
Figure No.: A-10

Location: Sherman Oaks, CA
Logged By: AK

Depth to Water> **Initial:** **At Completion:**

SUBSURFACE PROFILE	SAMPLE			
Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
SANDY SILT (ML), fine grained, brown, very moist, medium dense	107.1	22.0	⧗	40
SILTY CLAY (CL), brown, very moist, very stiff	97.7	29.1	⧗	24
CLAYEY SILT W/LITTLE SAND (ML), fine grained, brown, wet, medium dense	106.2	24.0	⧗	35
SANDY SILT W/TRACE CLAY (ML), fine grained, brown, very moist, very dense				
SILTY SAND/SANDY SILT W/TRACE CLAY (SM/ML), fine to medium grained, brown, very moist, very stiff	112.8	17.6	⧗	74
SANDY SILT W/SOME CLAY (ML), fine grained, brown, moist, very stiff				
End of Borehole Total Depth = 50' No groundwater was encountered during drilling Hole backfilled with soil cuttings and patched 08/16/06				

Depth (ft): 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60



Drill Method: Hollow Stem Auger
Drill Date: 08/16/06

Drill Rig: LAR (custom)
Hole Size: 8"

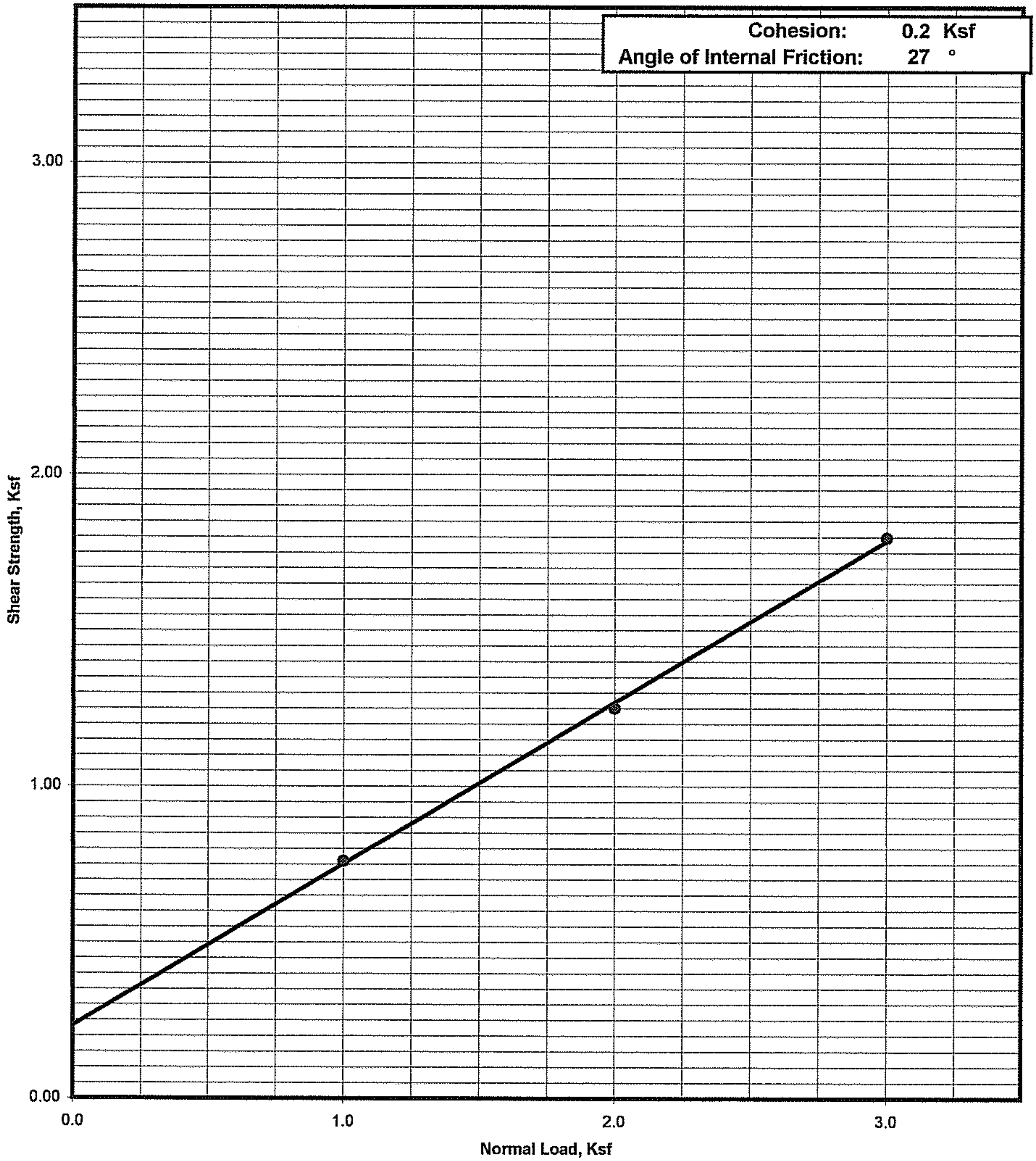
Krazan and Associates

Driller: Pacific Drilling
Elevation: See Site Plan

Shear Strength Diagram (Direct Shear)

ASTM D - 3080 / AASHTO T - 236

Project Number	Boring No. & Depth	Soil Type	Date
112-06041	B-2 @ 2'	(ML), Sandy Silt w/ Clay	7/6/06

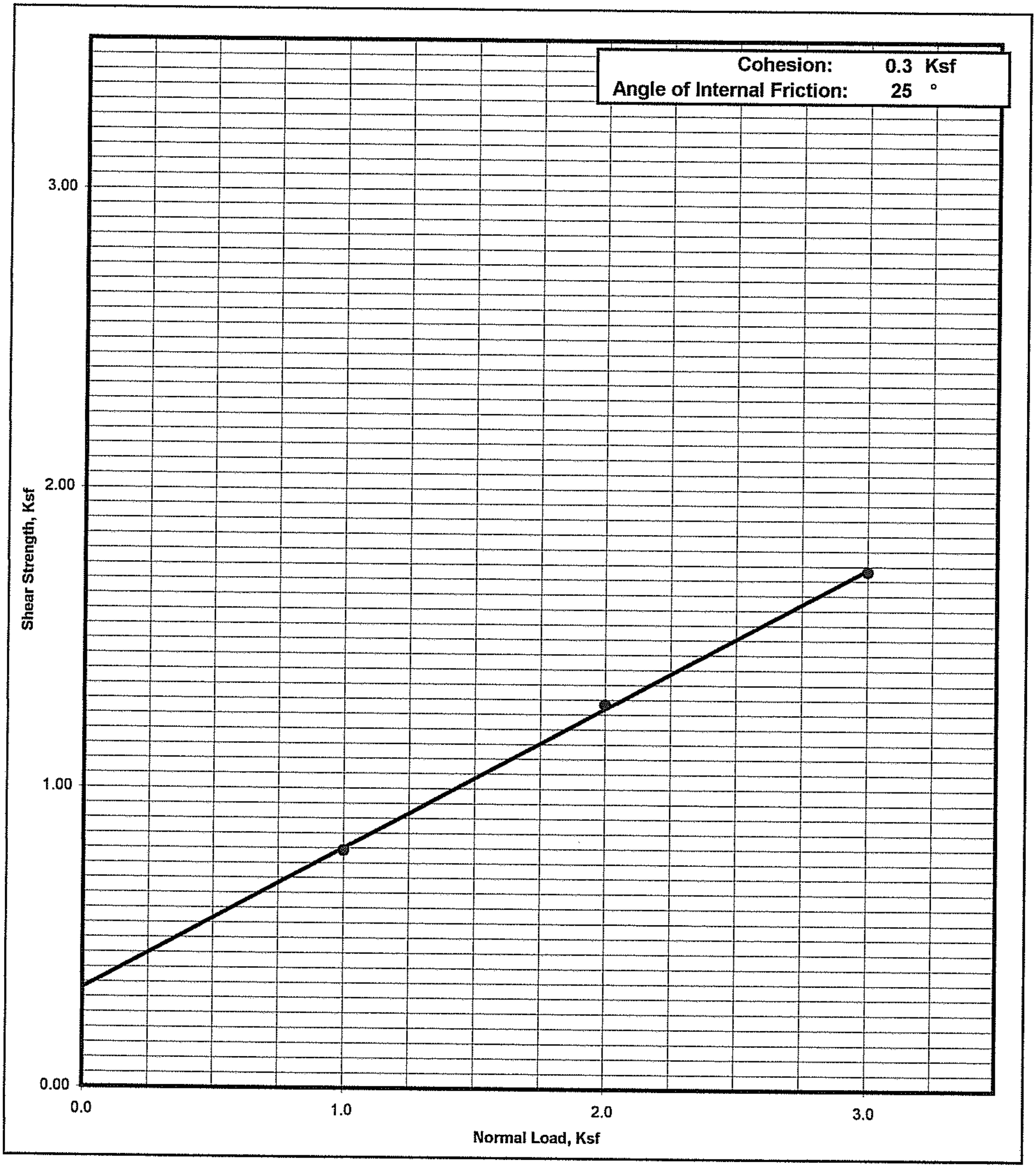


Krazan Testing Laboratory

Shear Strength Diagram (Direct Shear)

ASTM D - 3080 / AASHTO T - 236

Project Number	Boring No. & Depth	Soil Type	Date
112-06041	B-7 @ 2'	(ML), Sandy Silt w/ Clay	7/6/06

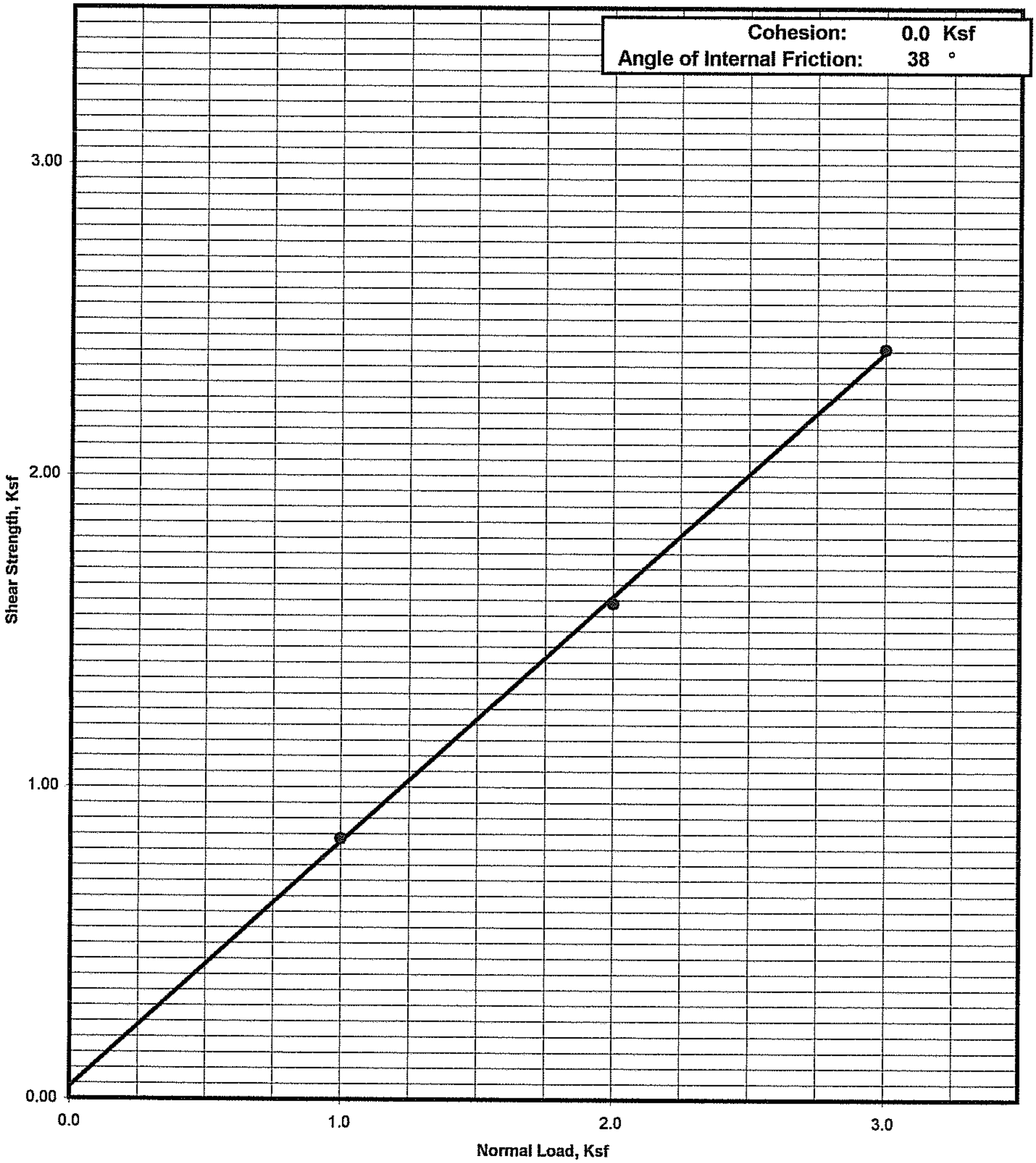


Krazan Testing Laboratory

Shear Strength Diagram (Direct Shear)
ASTM D - 3080 / AASHTO T - 236

Project Number	Boring No. & Depth	Soil Type	Date
112-06041	B-8 @ 10' - 11'	(SM-SP), Silty Sand - Sand w/ Trace Gravel	8/21/06

Cohesion: 0.0 Ksf
Angle of Internal Friction: 38 °

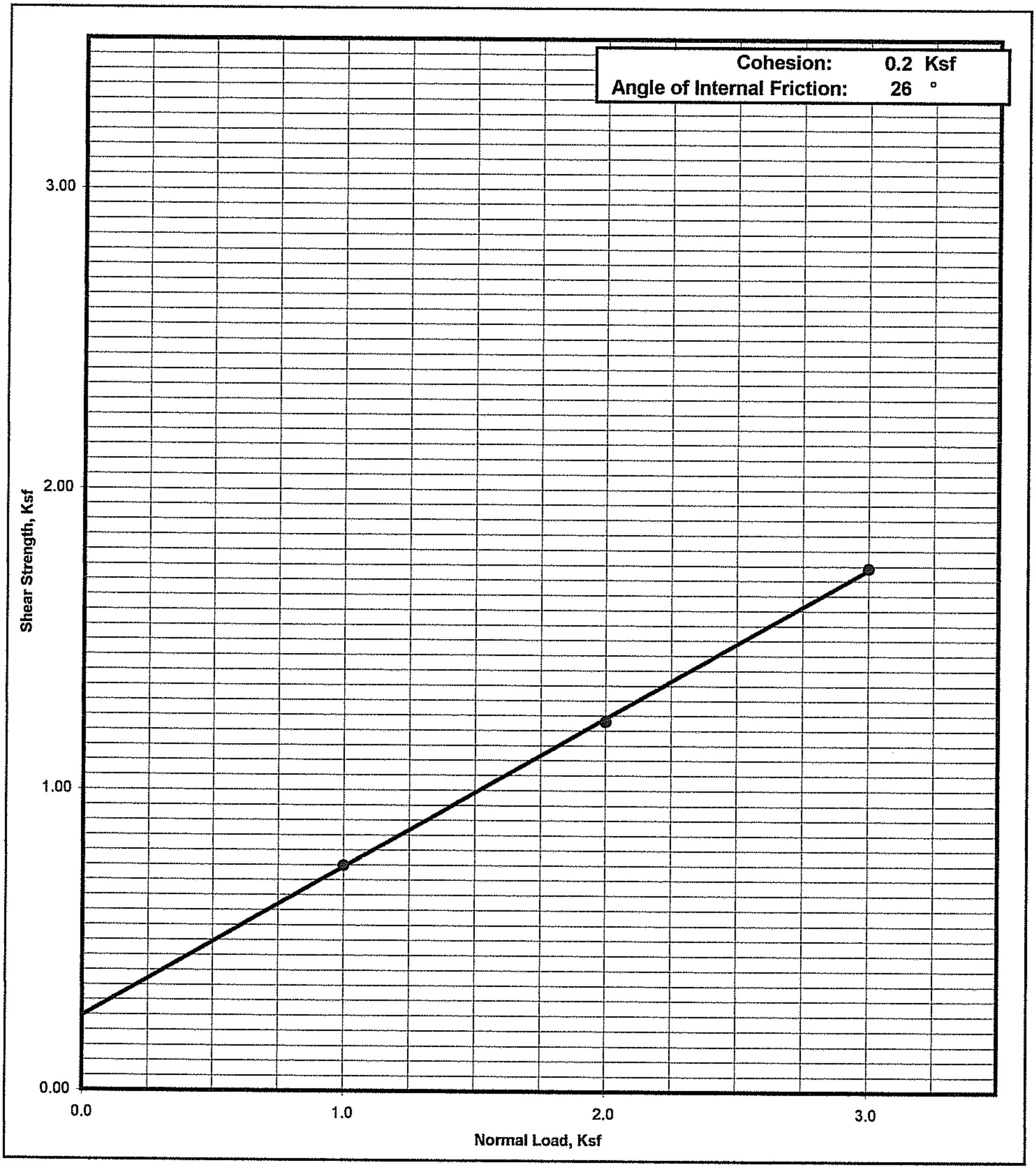


Krazan Testing Laboratory

Shear Strength Diagram (Direct Shear)

ASTM D - 3080 / AASHTO T - 236

Project Number	Boring No. & Depth	Soil Type	Date
112-06041	B-8 @ 20' - 21'	(ML), Sandy Silt w/ Clay	8/21/06

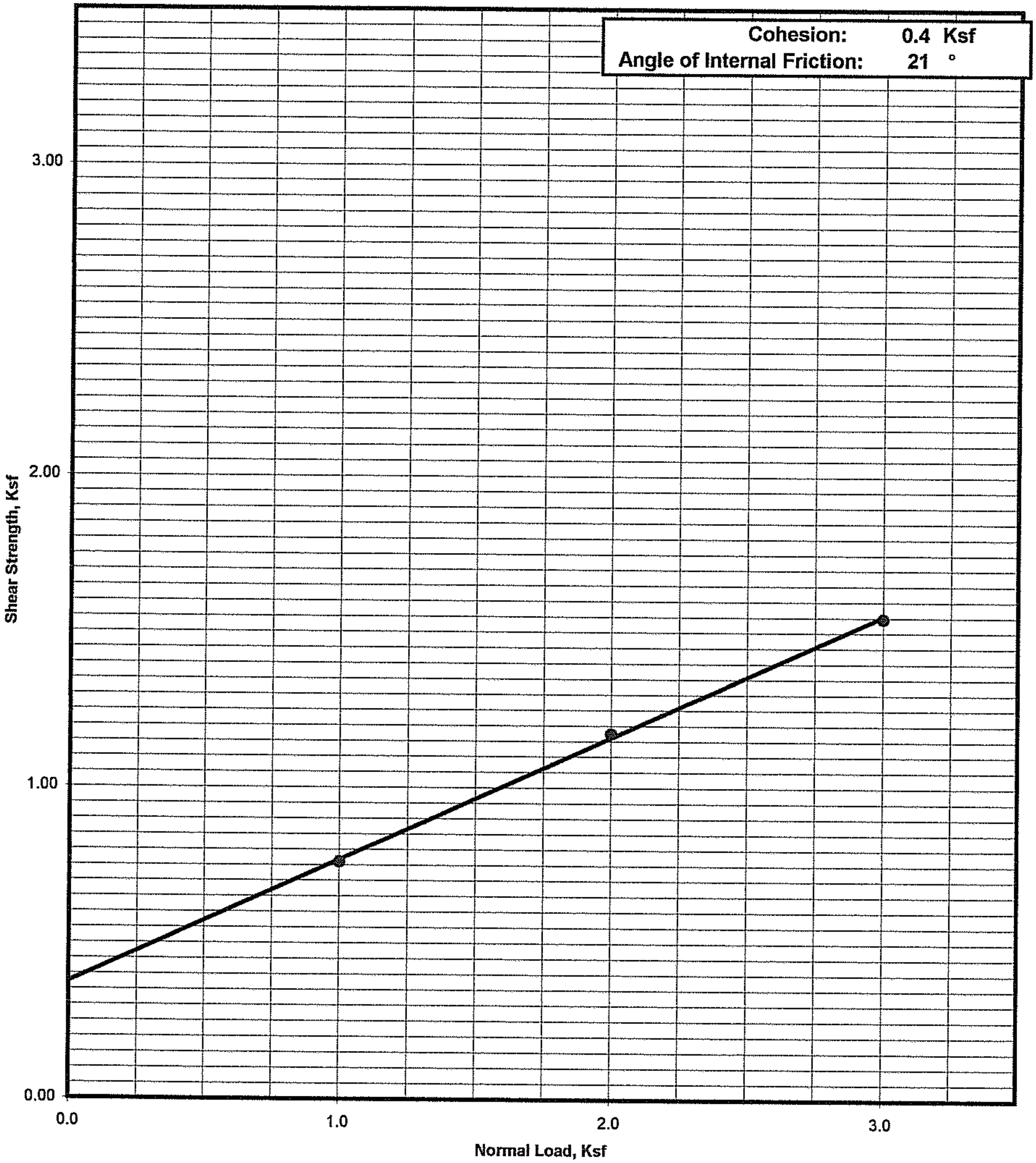


Krazan Testing Laboratory

Shear Strength Diagram (Direct Shear)

ASTM D - 3080 / AASHTO T - 236

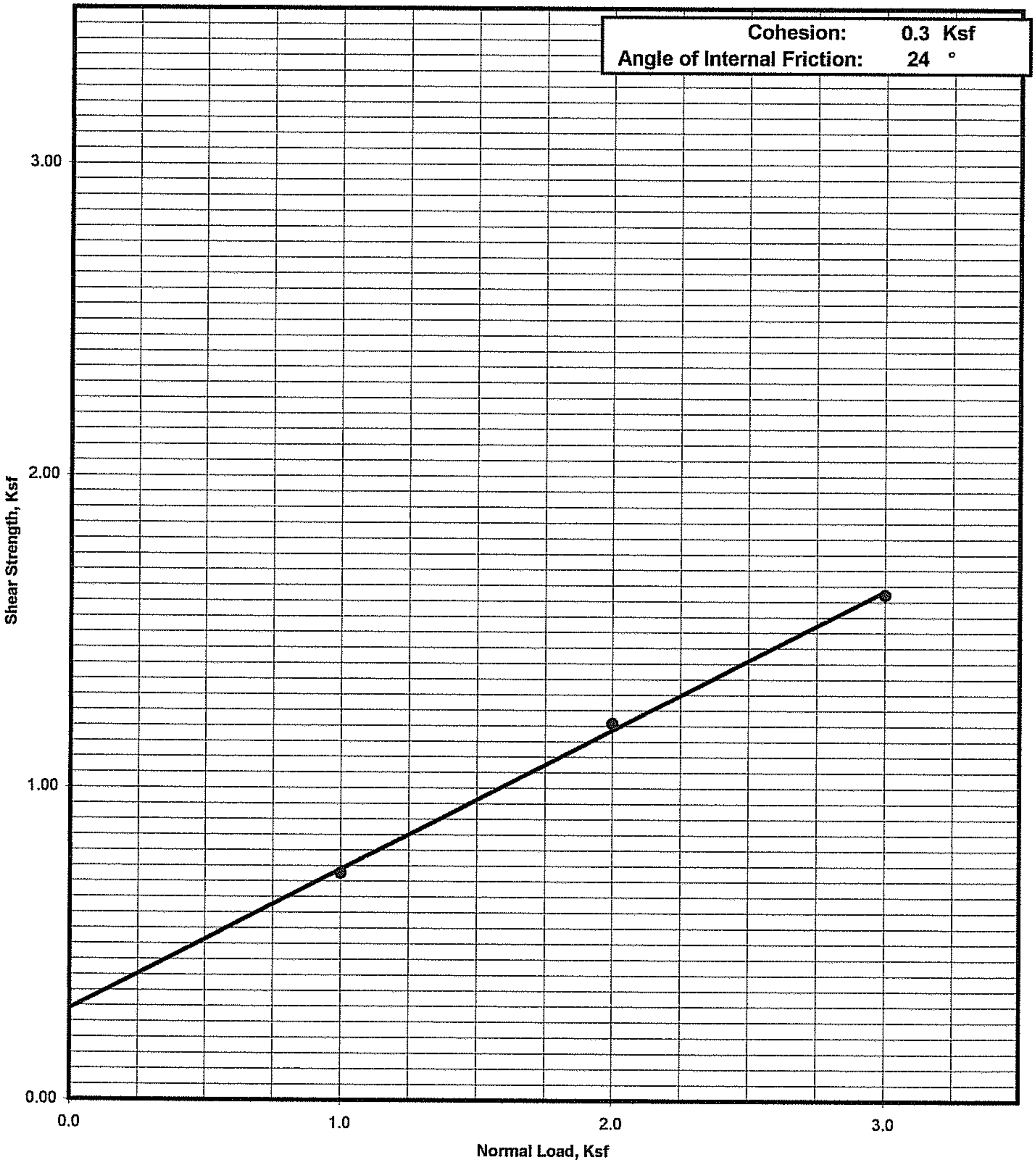
Project Number	Boring No. & Depth	Soil Type	Date
112-06041	B-8 @ 30' - 31'	(ML), Clayey Silt	8/21/06



Krazan Testing Laboratory

Shear Strength Diagram (Direct Shear)
ASTM D - 3080 / AASHTO T - 236

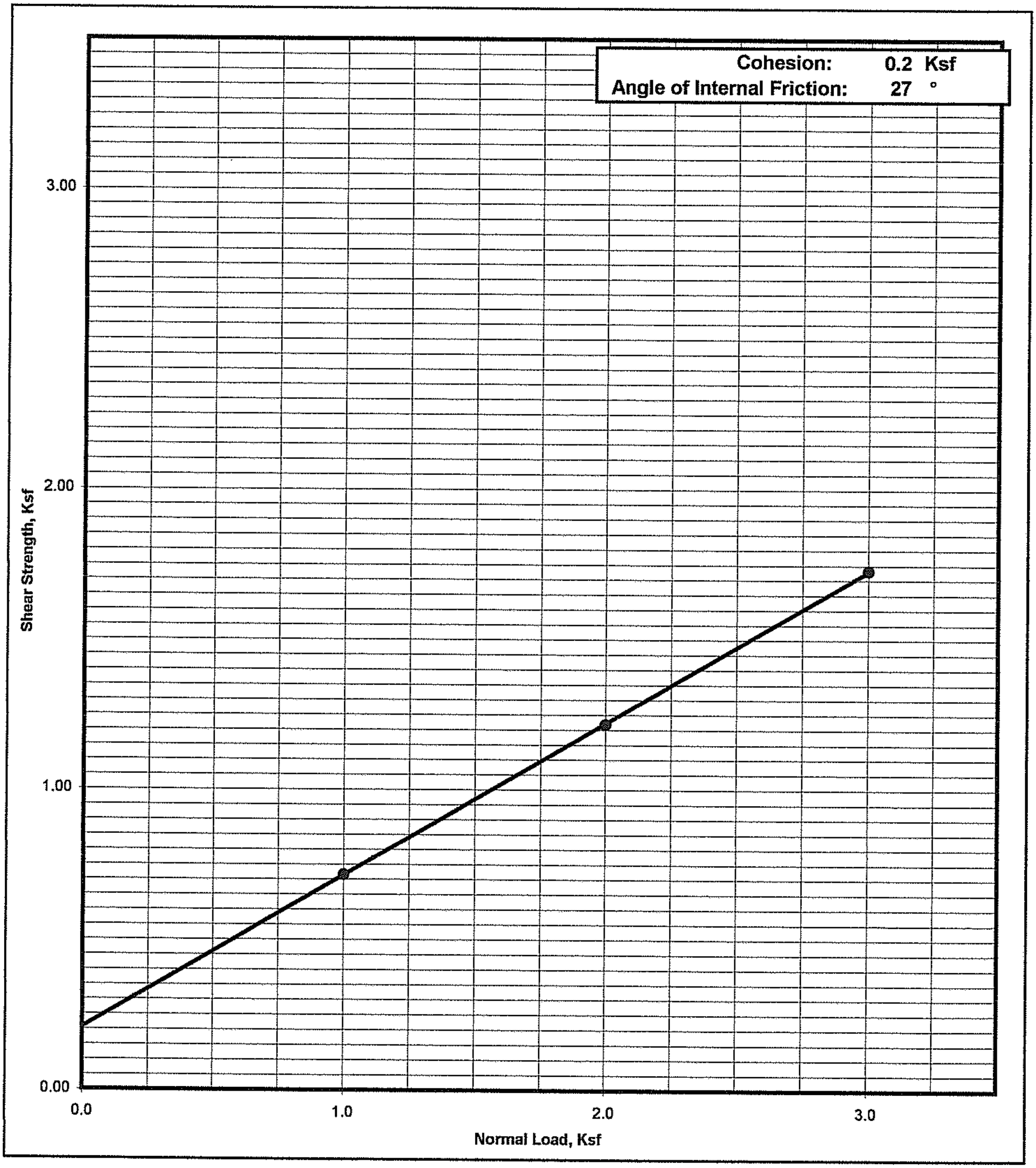
Project Number	Boring No. & Depth	Soil Type	Date
112-06041	B-8 @ 40' - 41'	(ML), Sandy Silt w/ Clay	8/21/06



Krazan Testing Laboratory

Shear Strength Diagram (Direct Shear)
ASTM D - 3080 / AASHTO T - 236

Project Number	Boring No. & Depth	Soil Type	Date
112-06041	B-10 @ 15' - 16'	(ML), Sandy Silt w/ Trace Clay	8/21/06

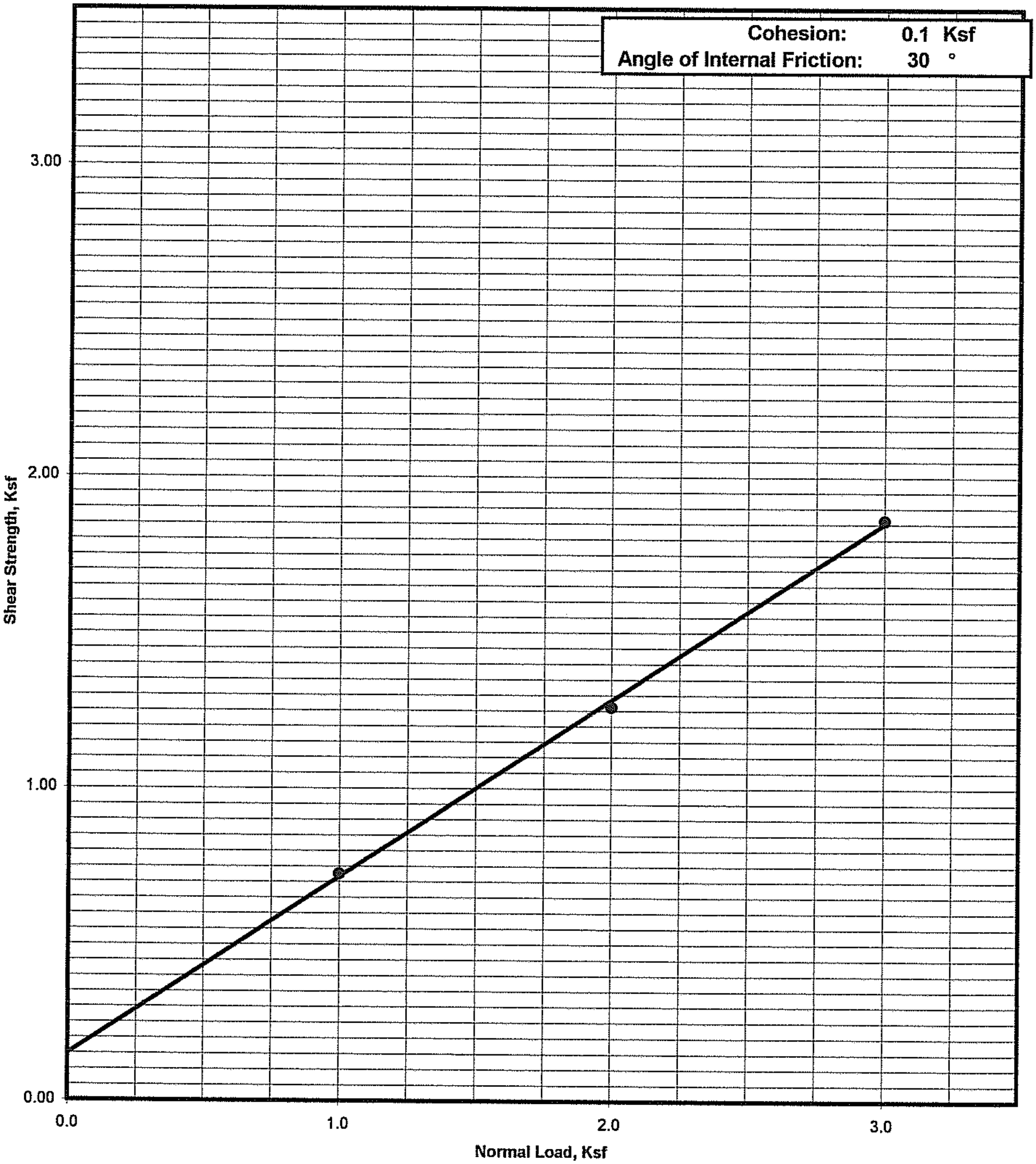


Krazan Testing Laboratory

Shear Strength Diagram (Direct Shear)

ASTM D - 3080 / AASHTO T - 236

Project Number	Boring No. & Depth	Soil Type	Date
112-06041	B-10 @ 25' - 26'	(SM-ML), Silty Sand-Sandy Silt w/ Trace Clay	8/21/06

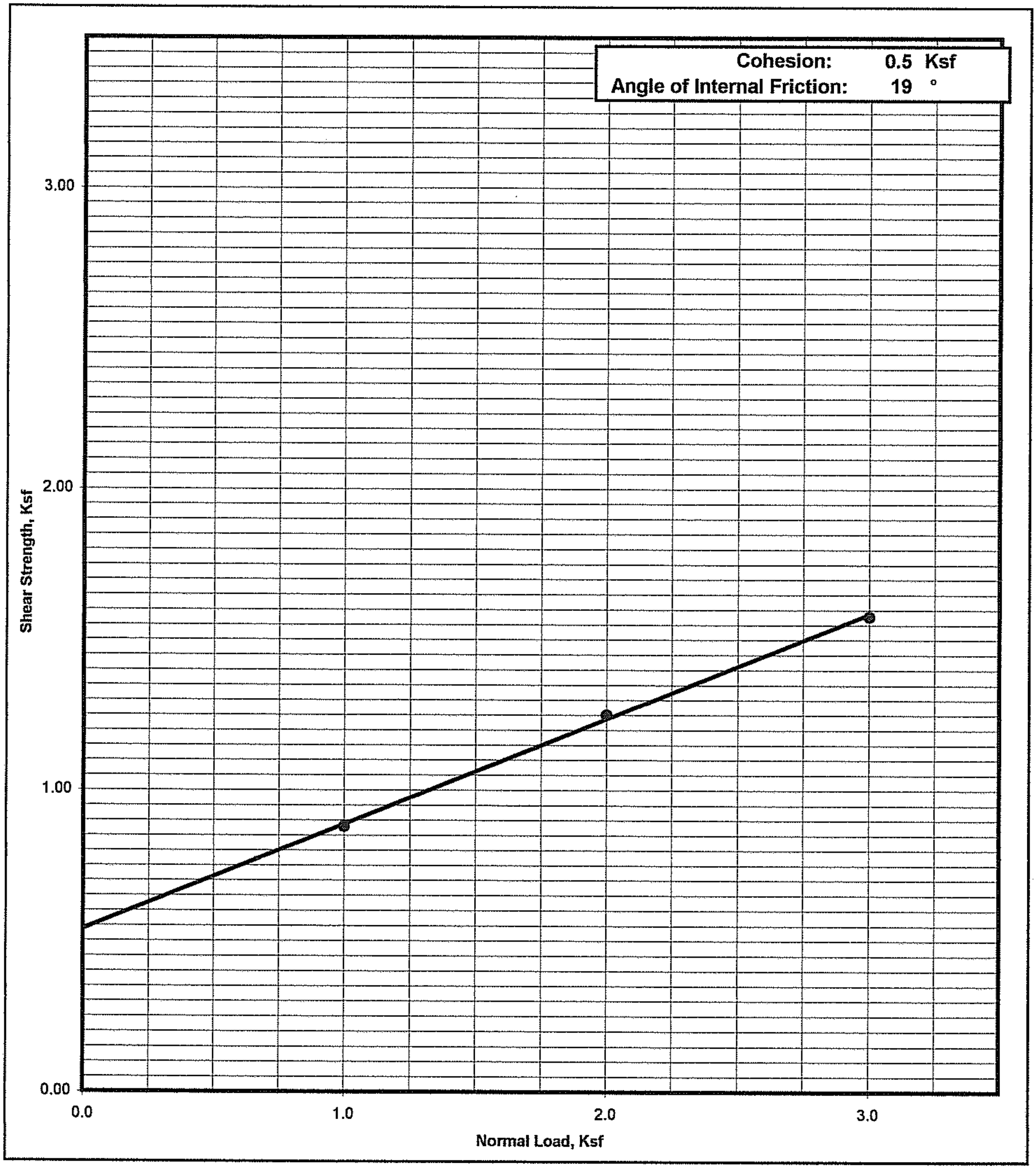


Krazan Testing Laboratory

Shear Strength Diagram (Direct Shear)

ASTM D - 3080 / AASHTO T - 236

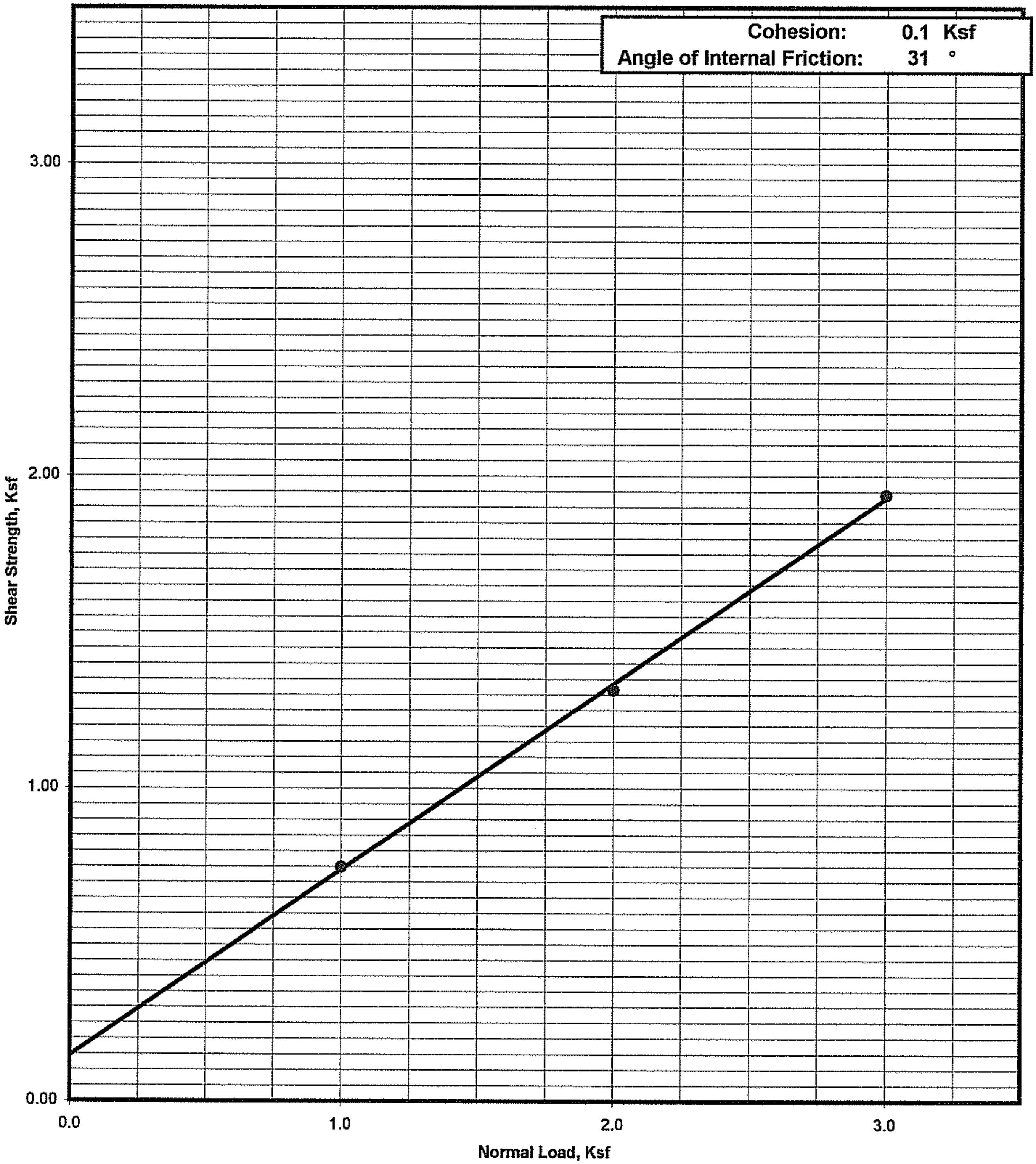
Project Number	Boring No. & Depth	Soil Type	Date
112-06041	B-10 @ 35' - 36'	(CL), Silty Clay	8/21/06



Krazan Testing Laboratory

Shear Strength Diagram (Direct Shear)
ASTM D - 3080 / AASHTO T - 236

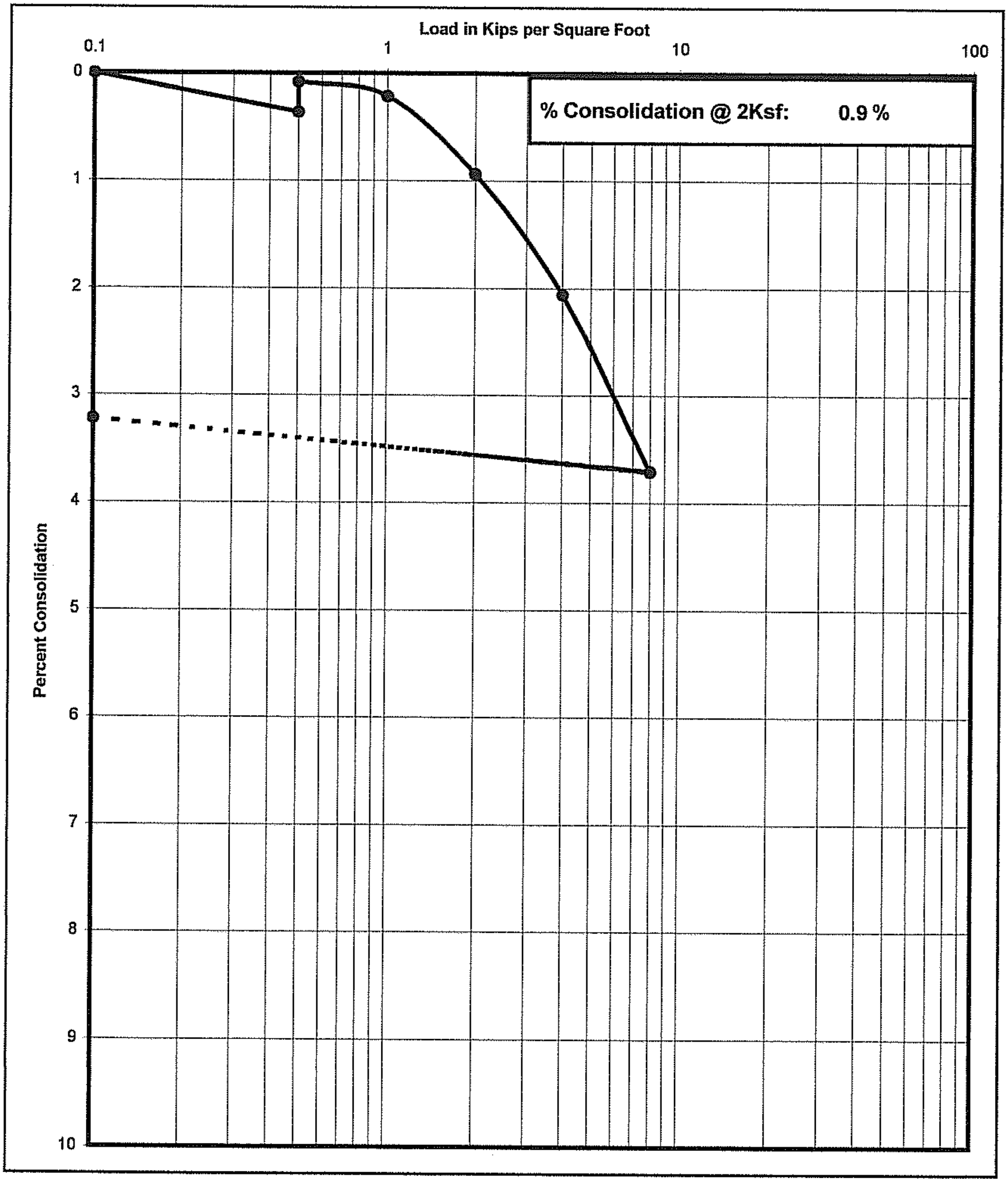
Project Number	Boring No. & Depth	Soil Type	Date
112-06041	B-10 @ 45' - 46'	(SM-ML), Silty Sand-Sandy Silt w/ Trace Clay	8/21/06



Krazan Testing Laboratory

Consolidation Test

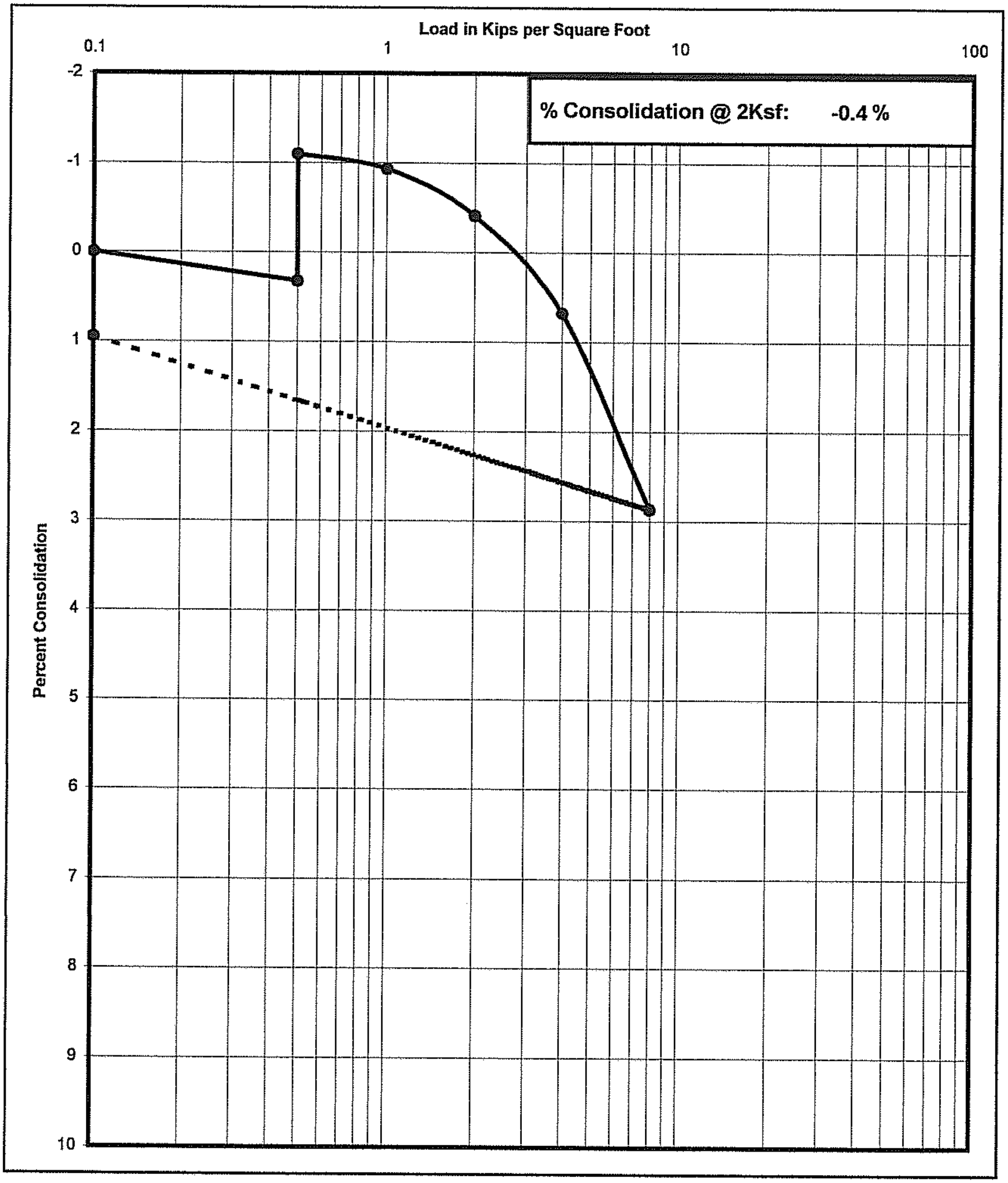
Project No	Boring No. & Depth	Date	Soil Classification
112-06041	B-1 @ 5'	7/6/06	(ML), Clayey Silt



Krazan Testing Laboratory

Consolidation Test

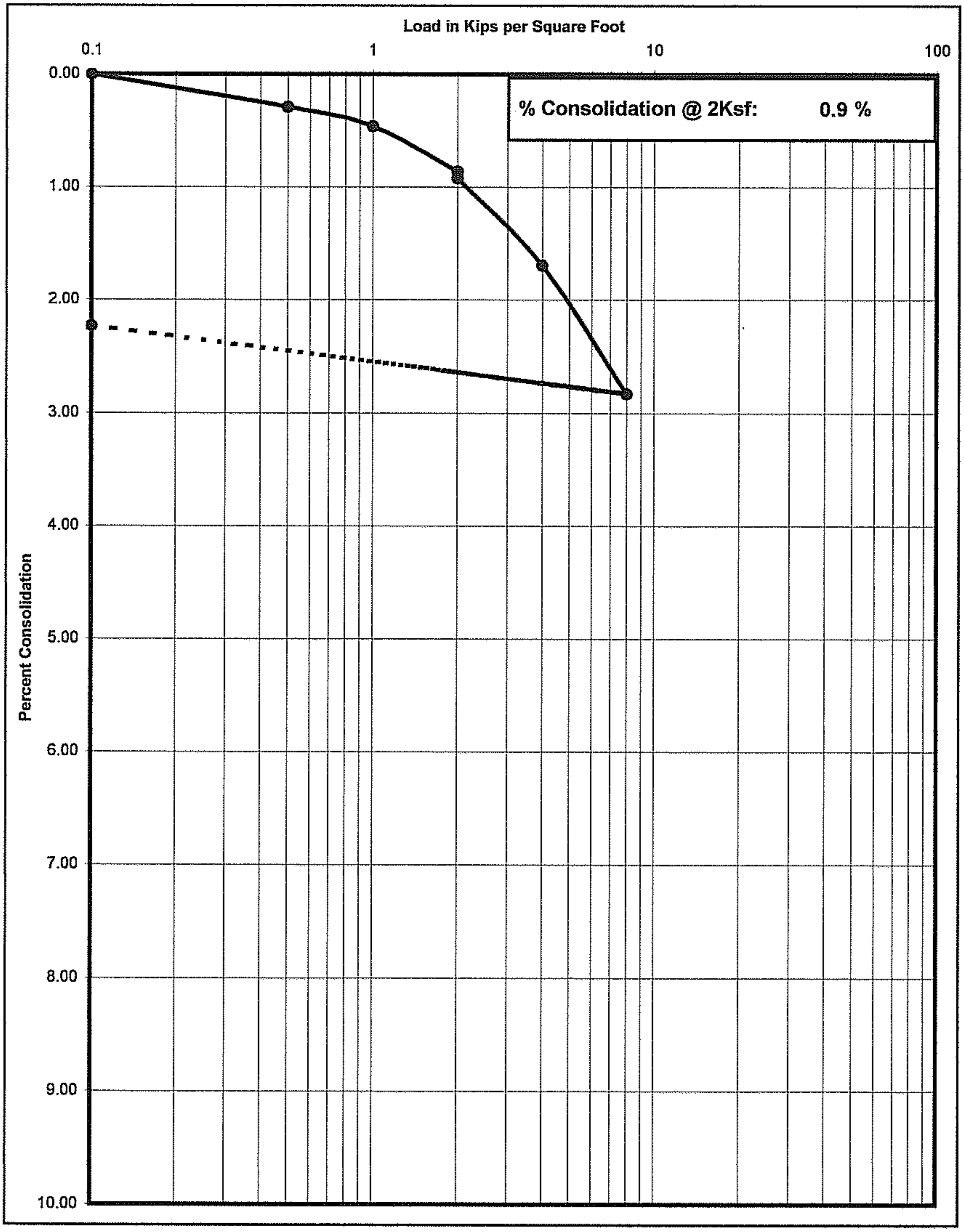
Project No	Boring No. & Depth	Date	Soil Classification
112-06041	B-5 @ 5'	7/6/06	(CL), Silty Clay



Krazan Testing Laboratory

Consolidation Test

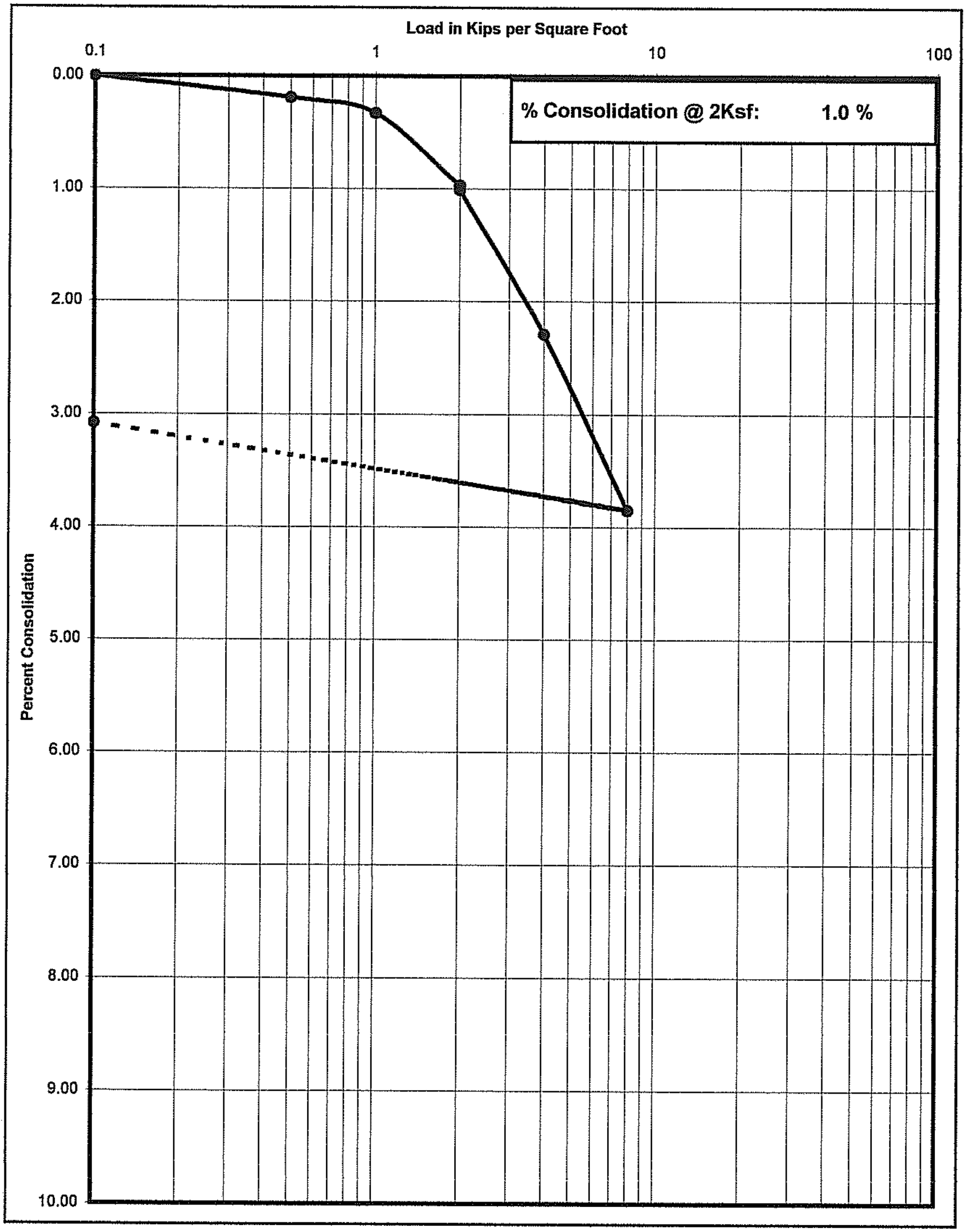
Project No	Boring No. & Depth	Date	Soil Classification
112-06041	B-7 @ 5'	7/6/06	(ML), Sandy Silt w/ Clay



Krazan Testing Laboratory

Consolidation Test

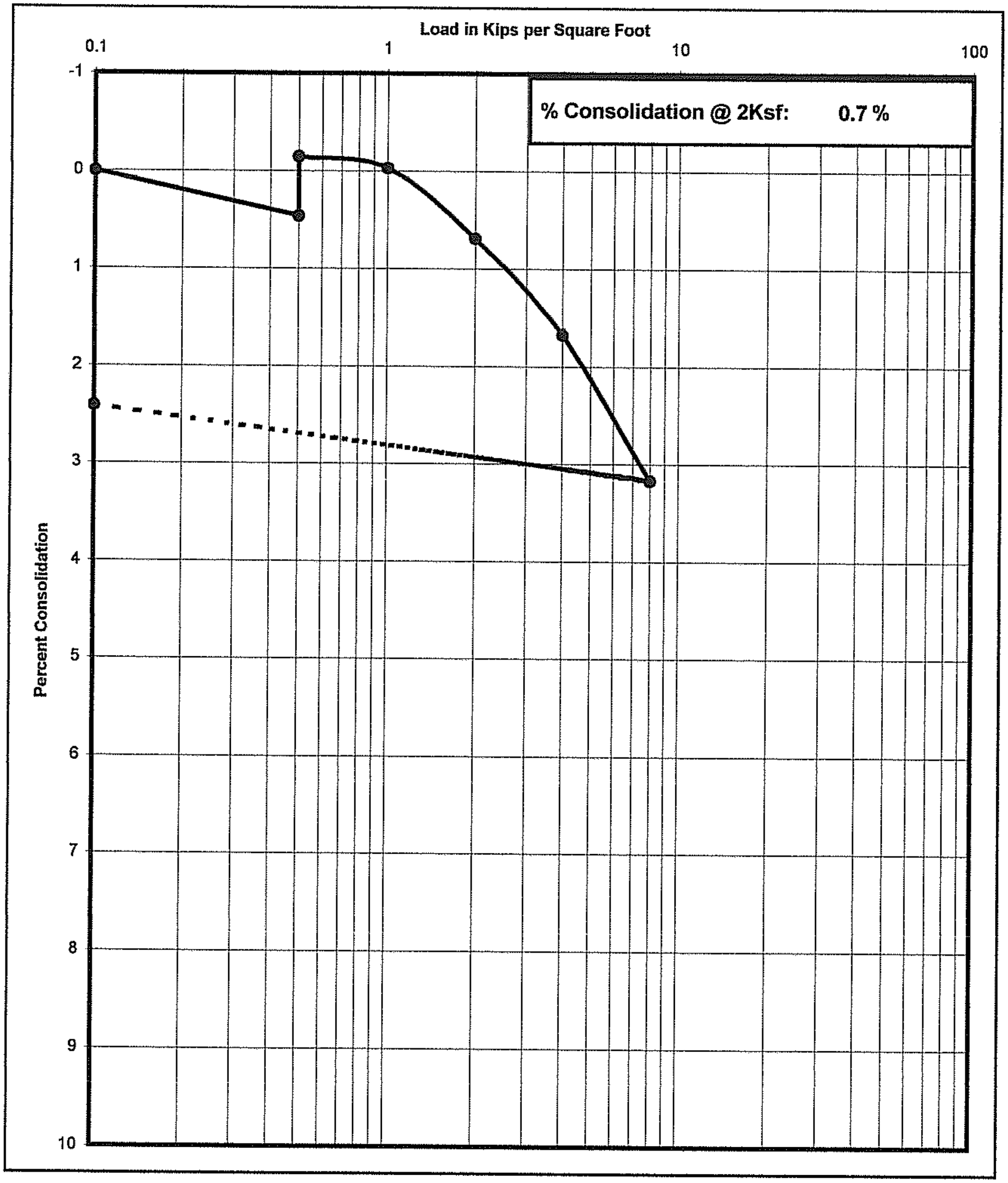
Project No	Boring No. & Depth	Date	Soil Classification
112-06041	B-10 @ 10' - 11'	8/21/06	(ML), Sandy Silt w/ Clay



Krazan Testing Laboratory

Consolidation Test

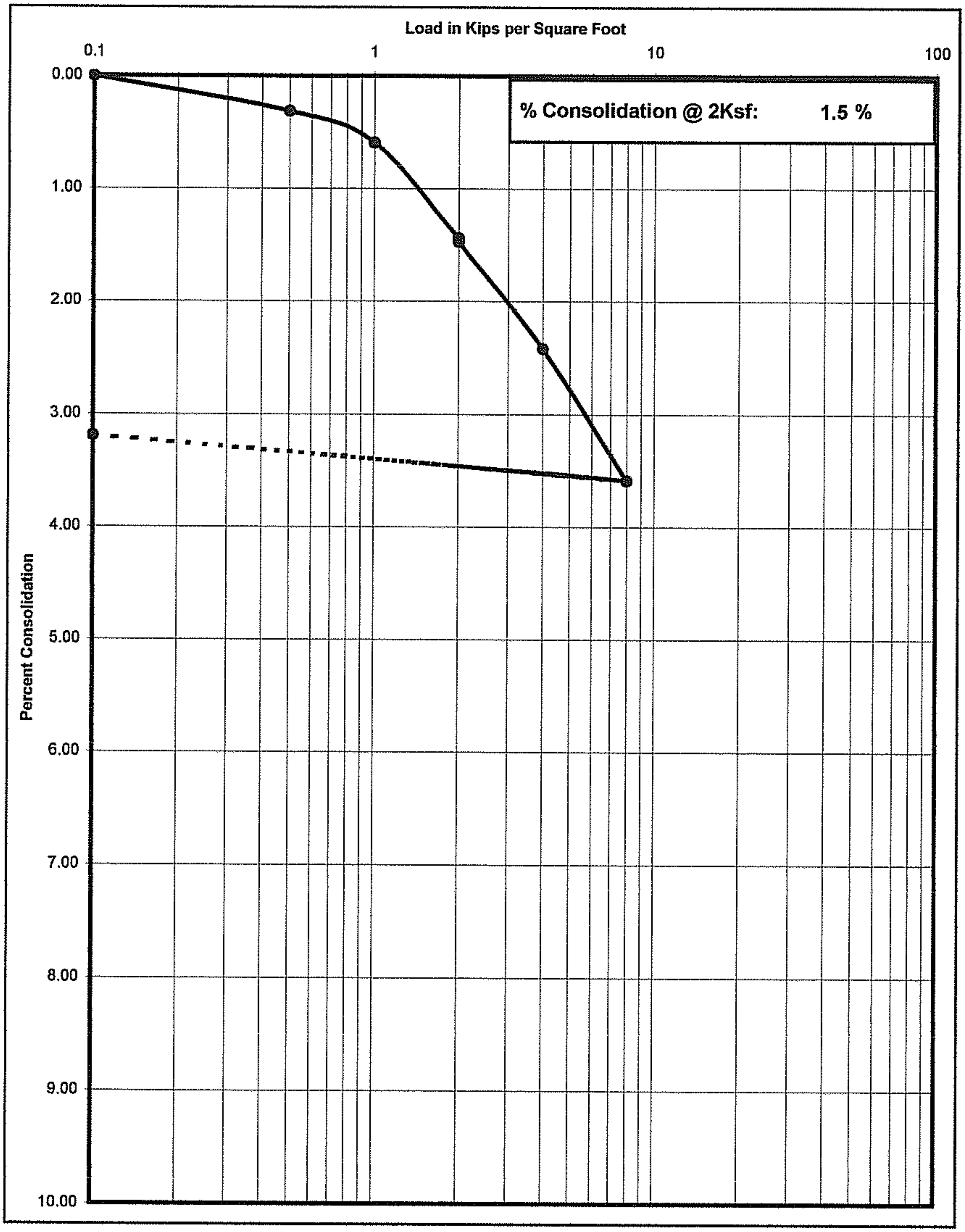
Project No	Boring No. & Depth	Date	Soil Classification
112-06041	B-10 @ 20' - 21'	8/21/06	(CL), Silty Clay



Krazan Testing Laboratory

Consolidation Test

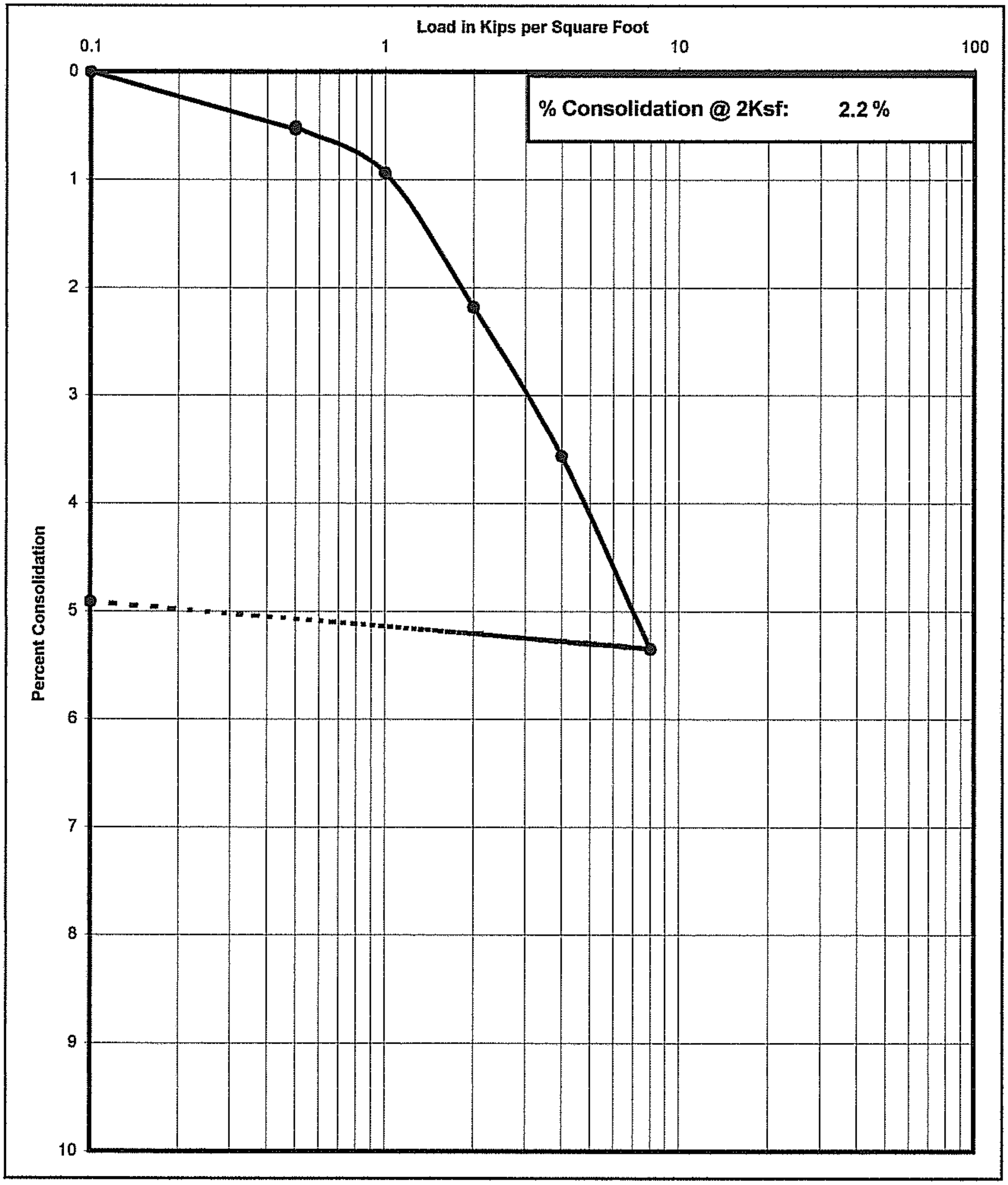
Project No	Boring No. & Depth	Date	Soil Classification
112-06041	B-10 @ 30' - 31'	8/21/06	(ML), Sandy Silt w/ Trace Clay



Krazan Testing Laboratory

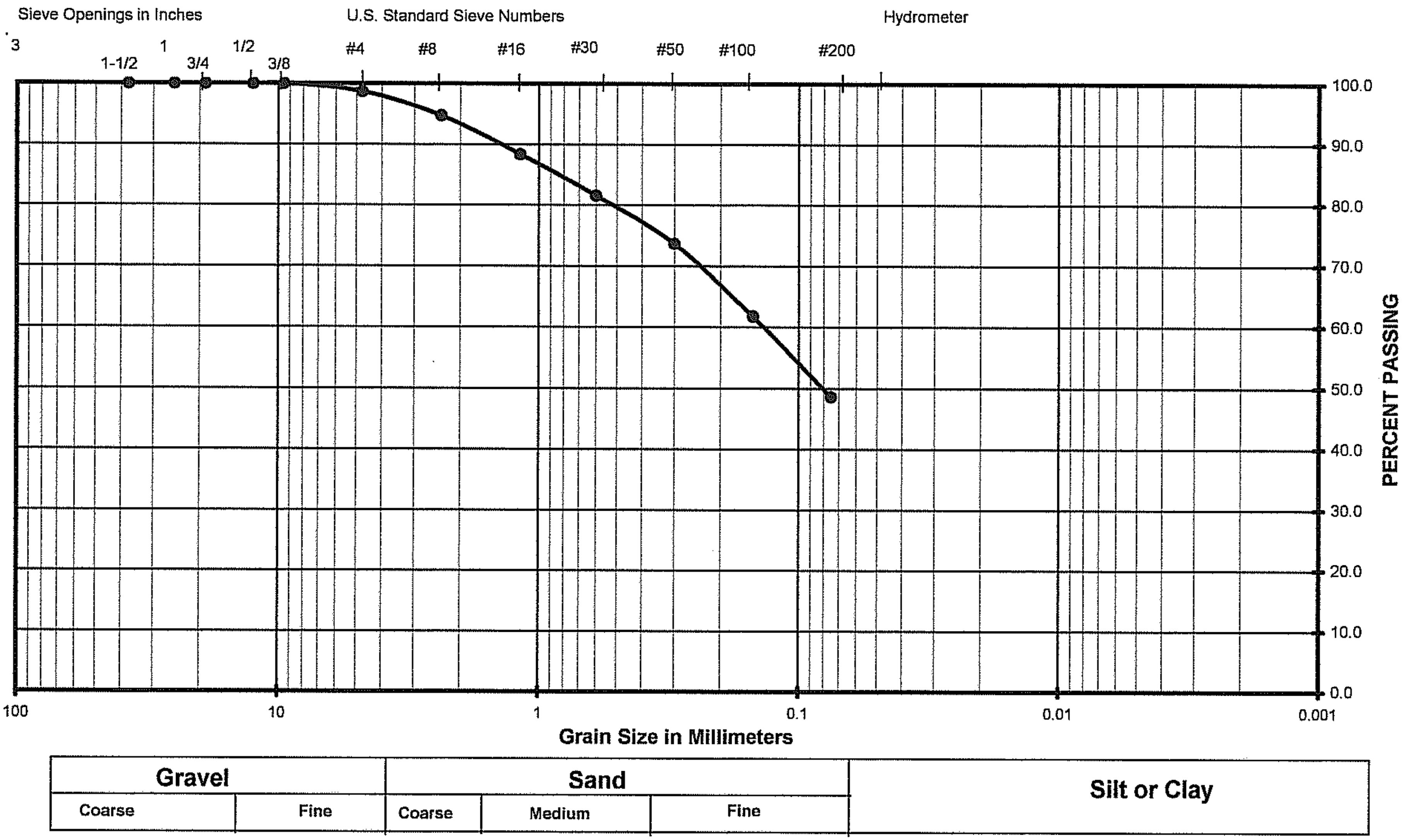
Consolidation Test

Project No	Boring No. & Depth	Date	Soil Classification
112-06041	B-10 @ 40' - 41'	8/21/06	(ML), Clayey Silt



Krazan Testing Laboratory

Grain Size Analysis

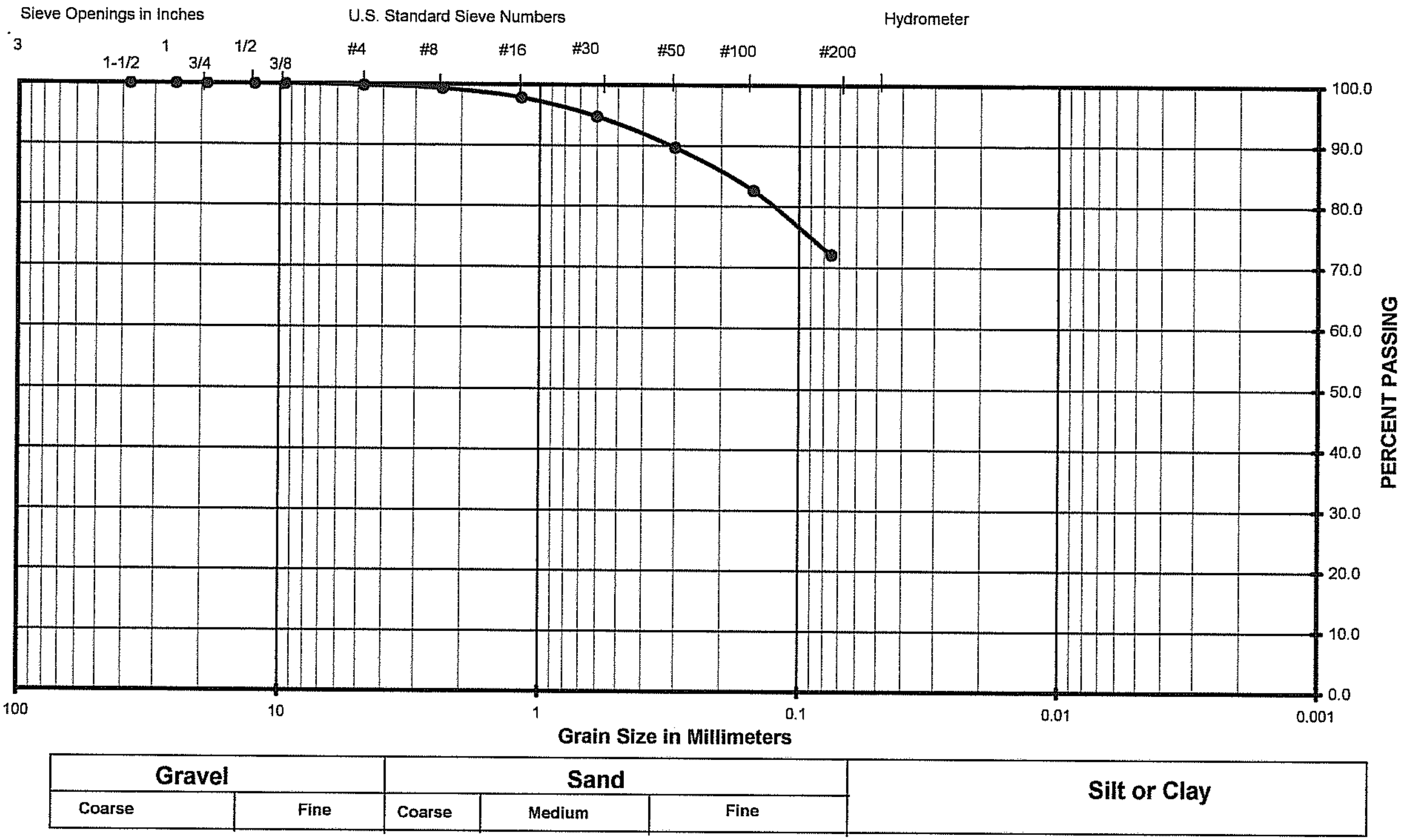


(Unified Soils Classification)

Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(SM-ML), Silty Sand-Sandy Silt w/ Clay
Sample Number	B-2 @ 0-3'

Krazan Testing Laboratory

Grain Size Analysis

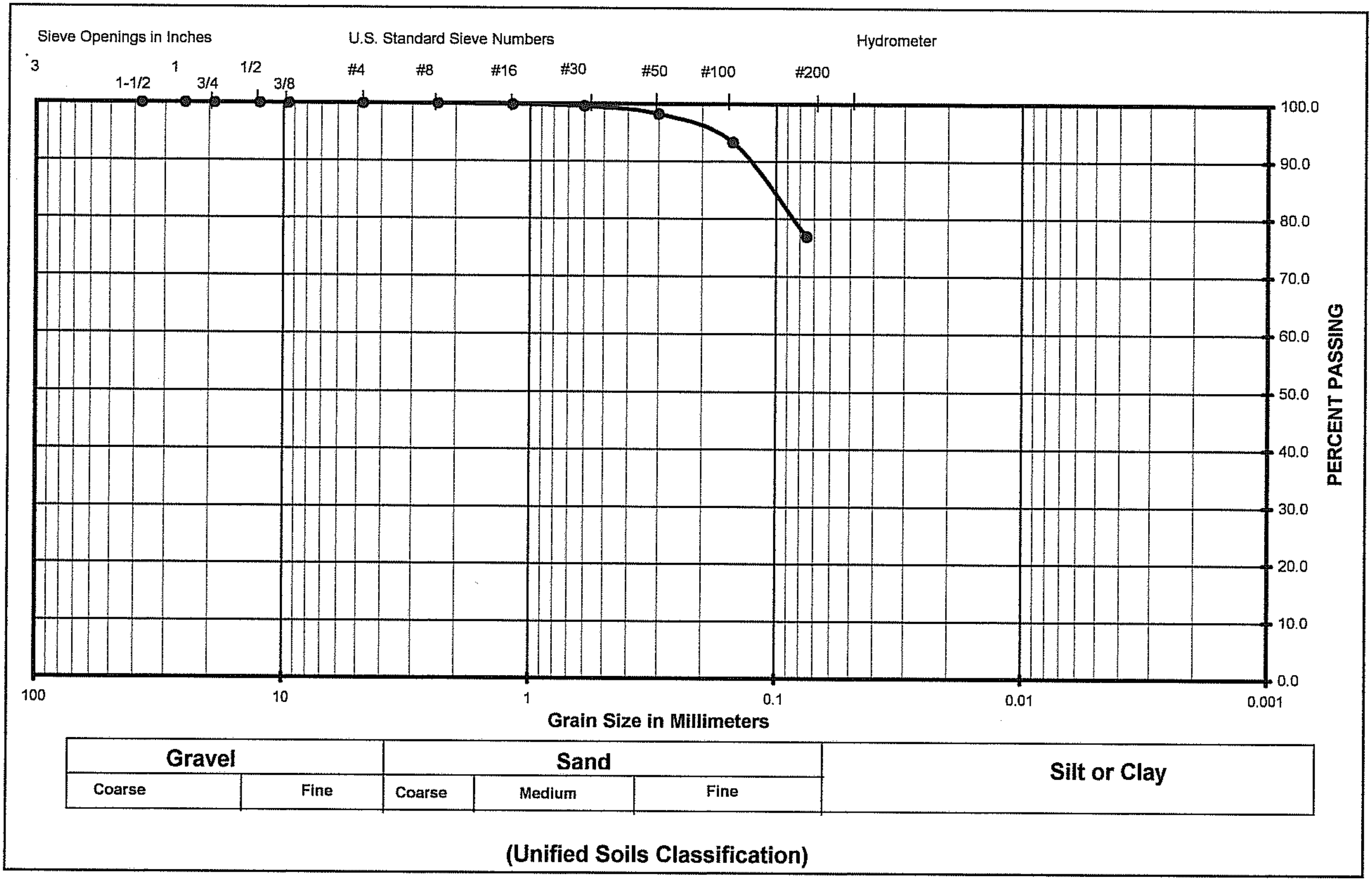


(Unified Soils Classification)

Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(ML), Sandy Silt w/ Clay
Sample Number	B-3 @ 2'

Krazan Testing Laboratory

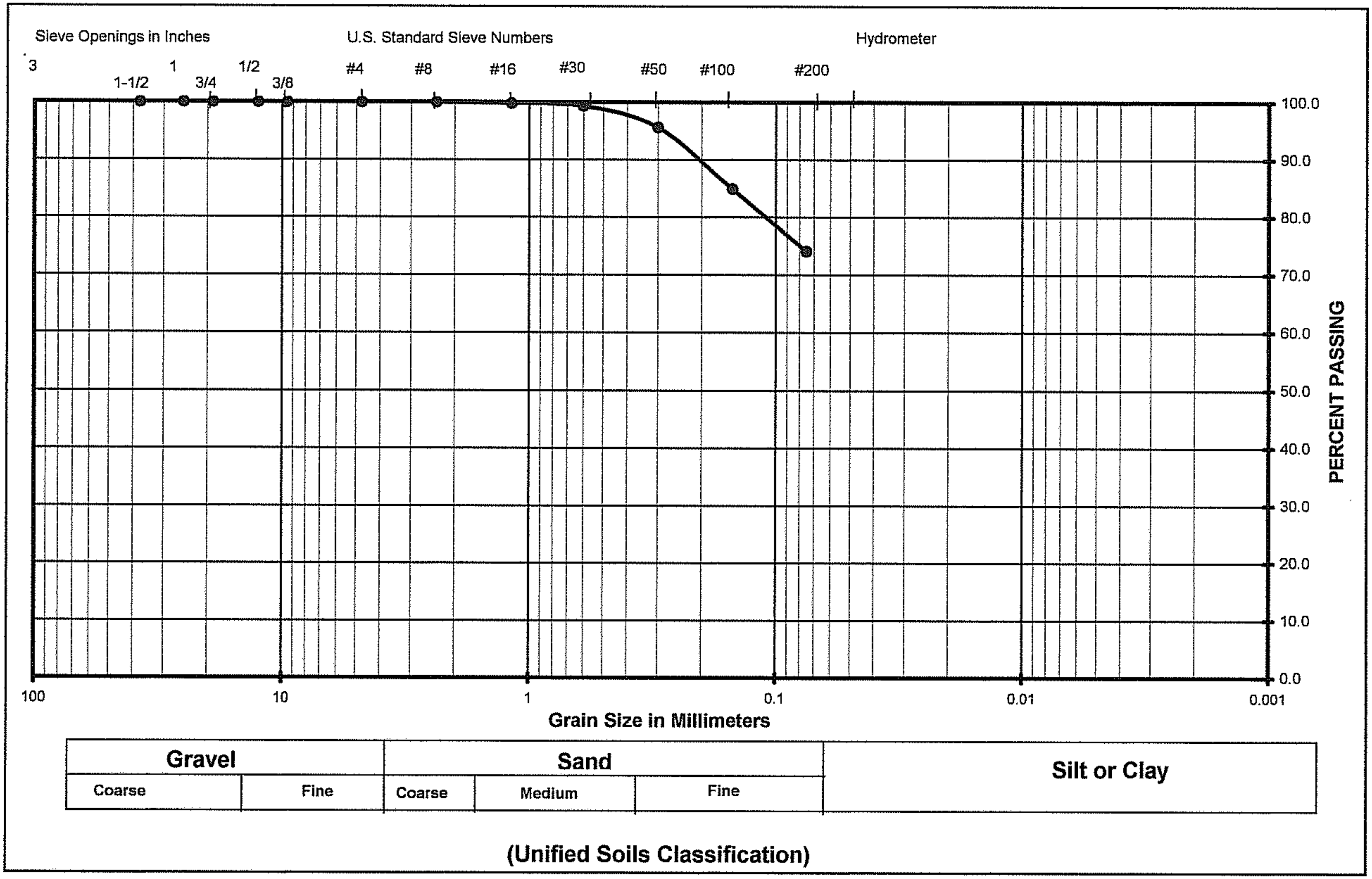
Grain Size Analysis



Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(ML), Sandy Silt w/ Clay
Sample Number	B-6 @ 2'

Krazan Testing Laboratory

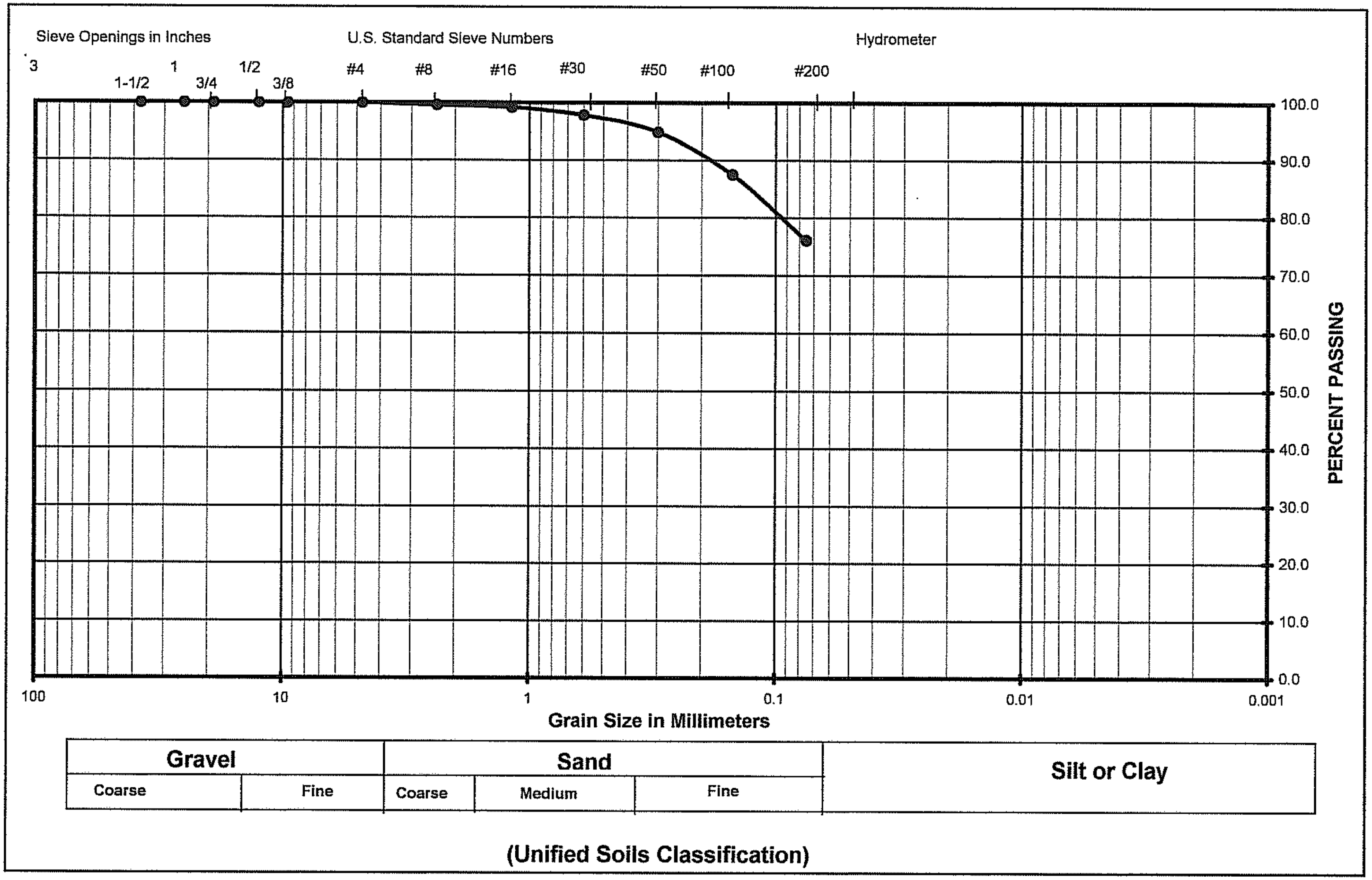
Grain Size Analysis



Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(ML), Clayey Silt
Sample Number	B-6 @ 5'

Krazan Testing Laboratory

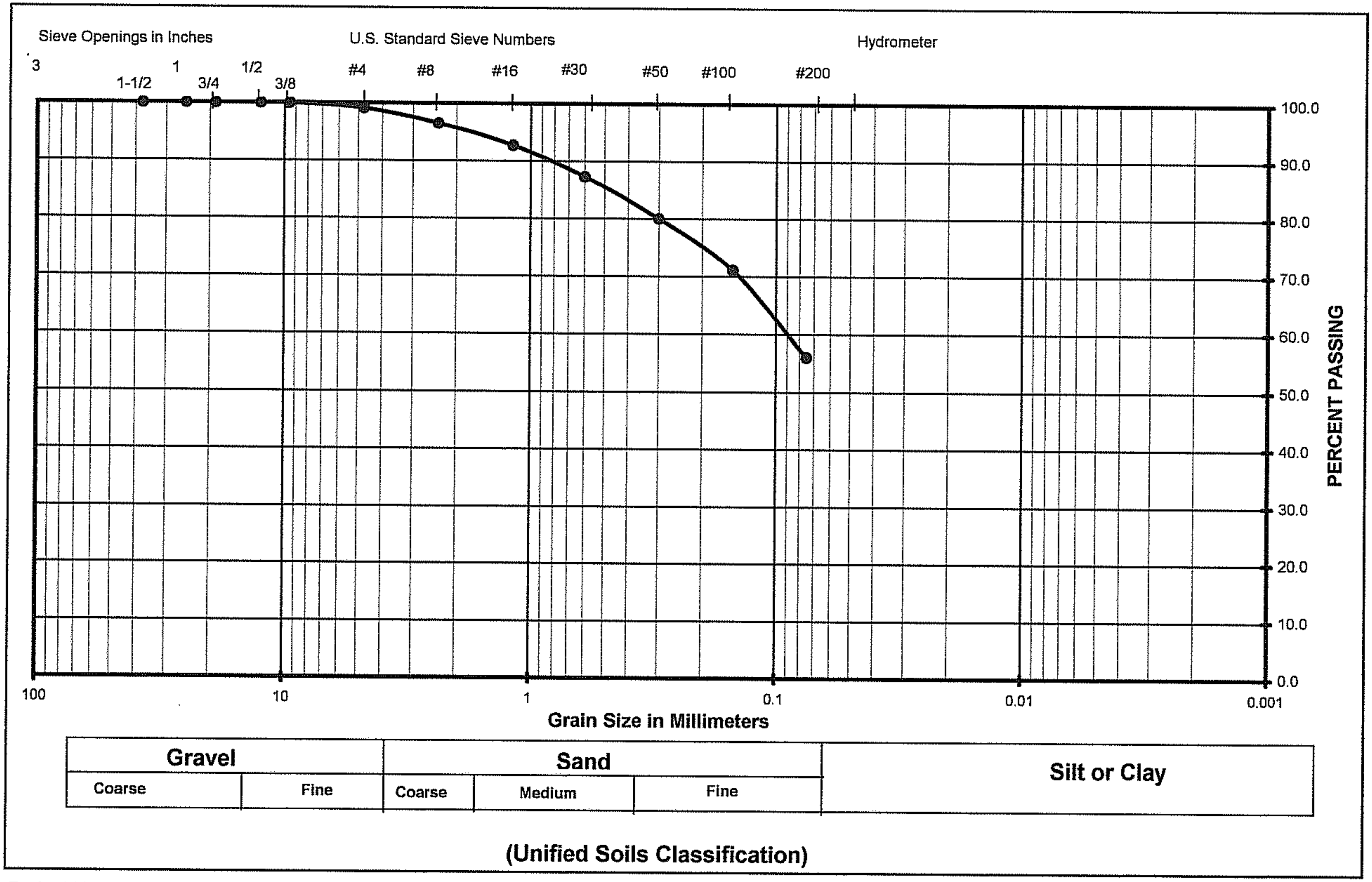
Grain Size Analysis



Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(CL), Silty Clay
Sample Number	B-6 @ 10'

Krazan Testing Laboratory

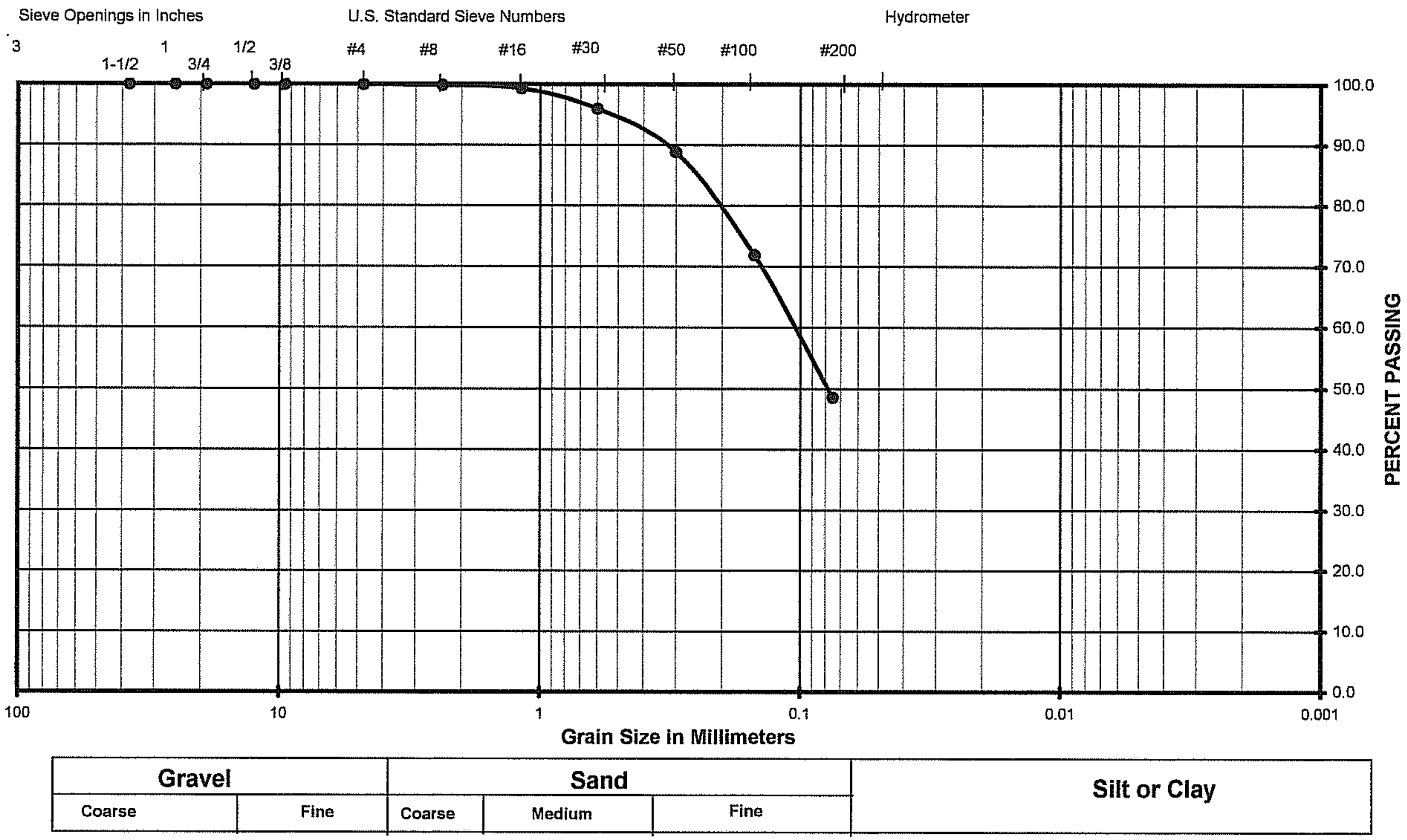
Grain Size Analysis



Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(ML), Sandy Silt w/ Clay
Sample Number	B-6 @ 15'

Krazan Testing Laboratory

Grain Size Analysis



(Unified Soils Classification)

Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(SM-ML), Silty Sand-Sandy Silt w/ Clay
Sample Number	B-6 @ 20'

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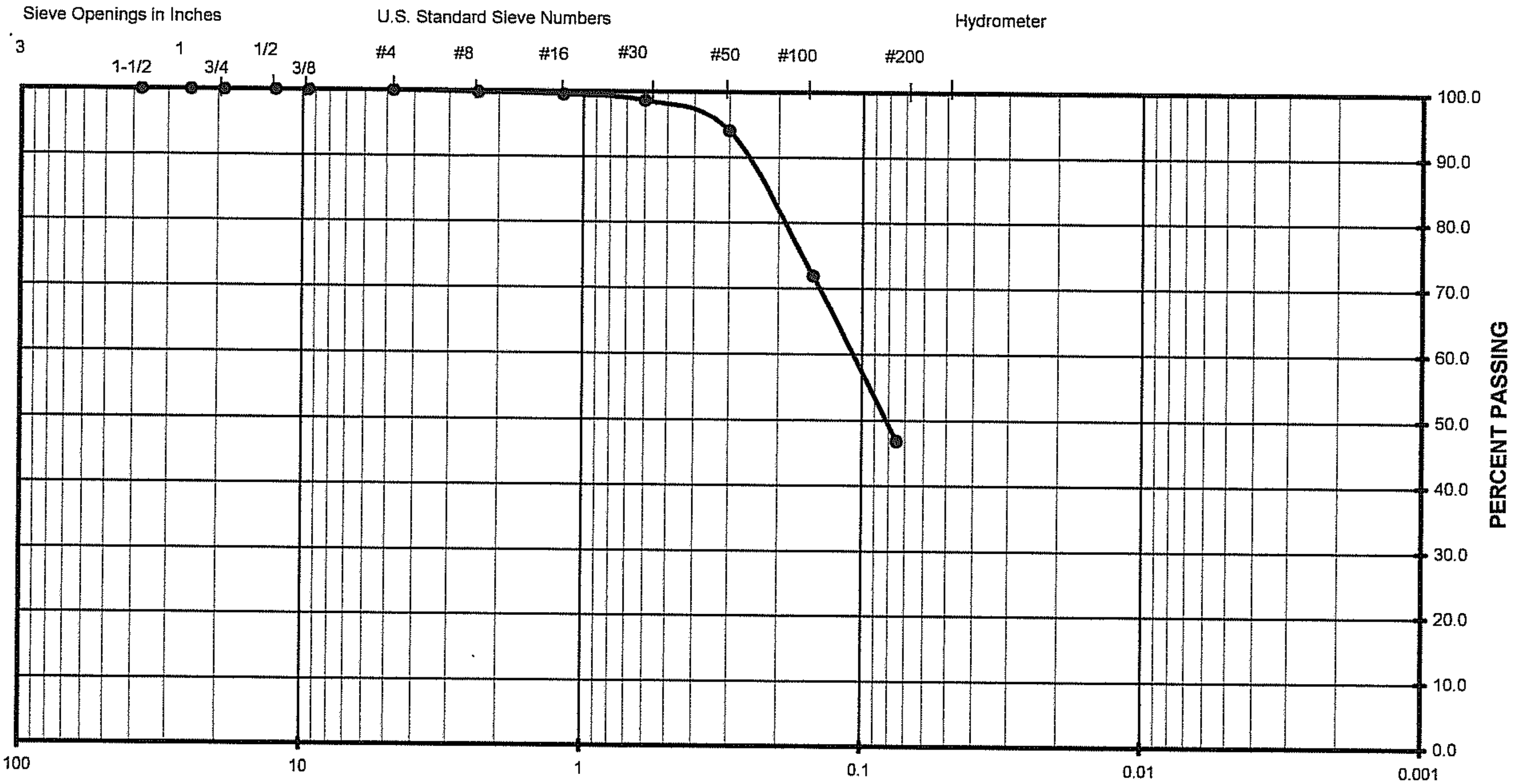
Grain Size Analysis



Gravel		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

(Unified Soils Classification)

Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(SM-ML), Silty Sand-Sandy Silt w/ Clay
Sample Number	B-6 @ 25'

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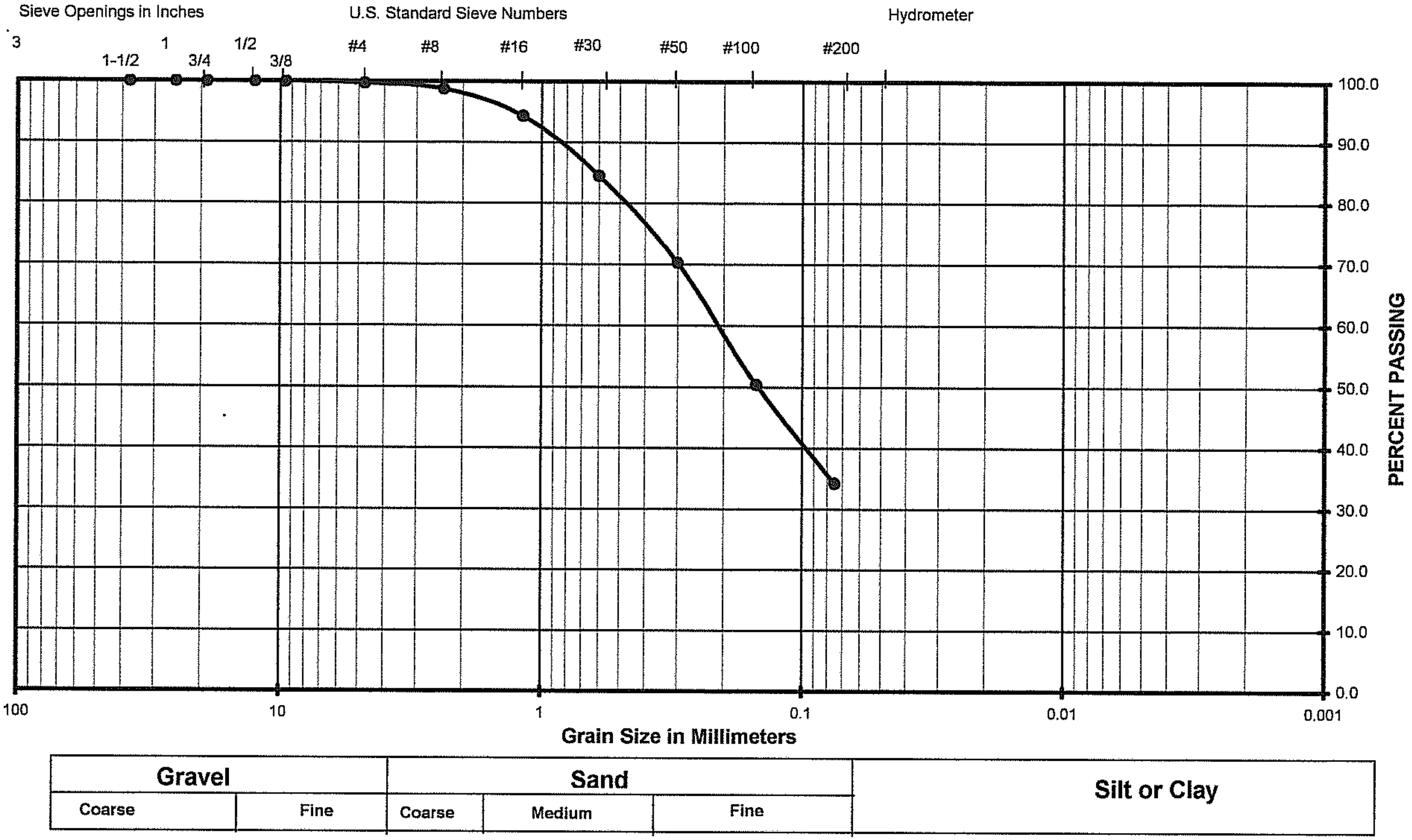
Grain Size Analysis

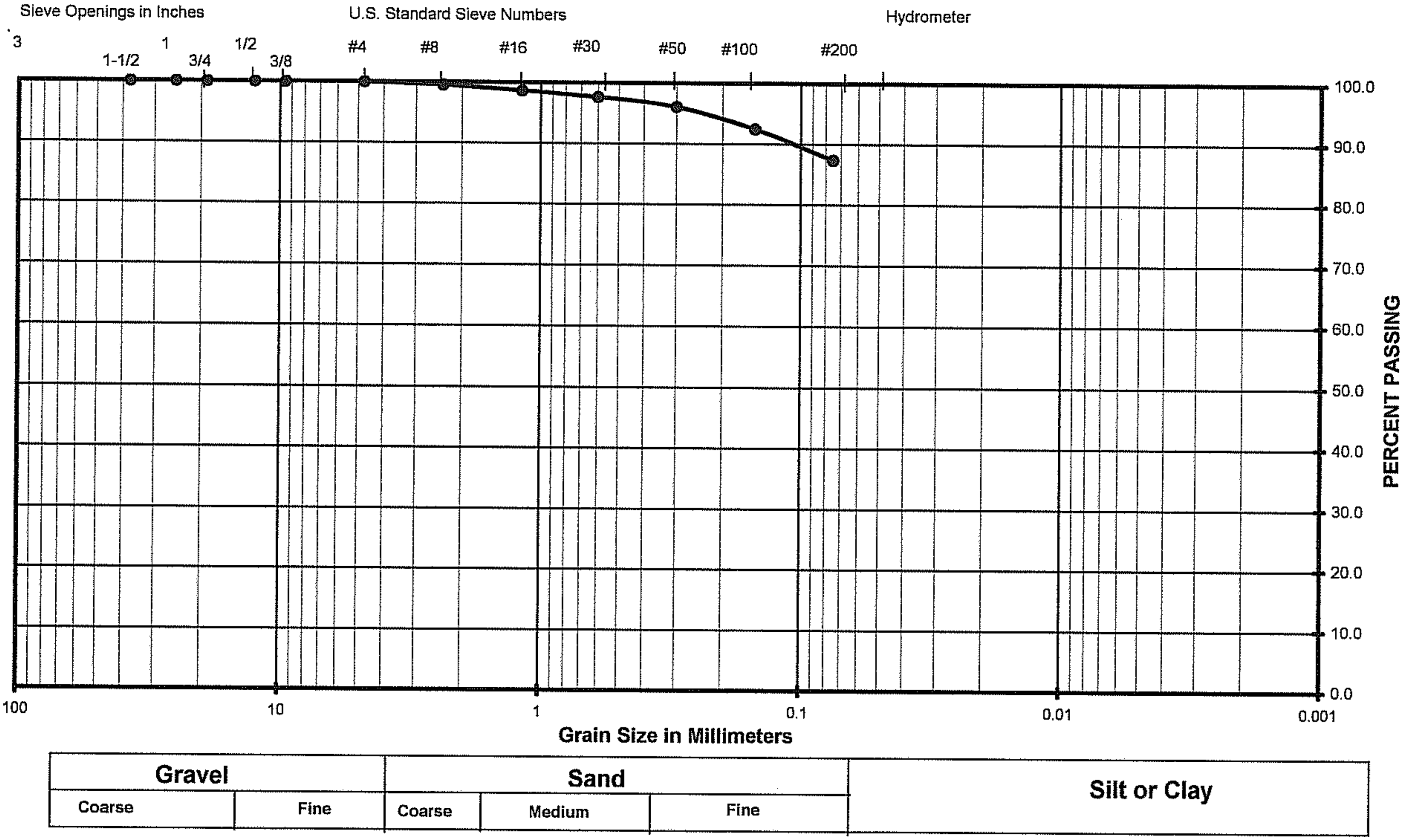


(Unified Soils Classification)

Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(SM), Silty Sand w/ Clay
Sample Number	B-6 @ 30'

Krazan Testing Laboratory

Grain Size Analysis

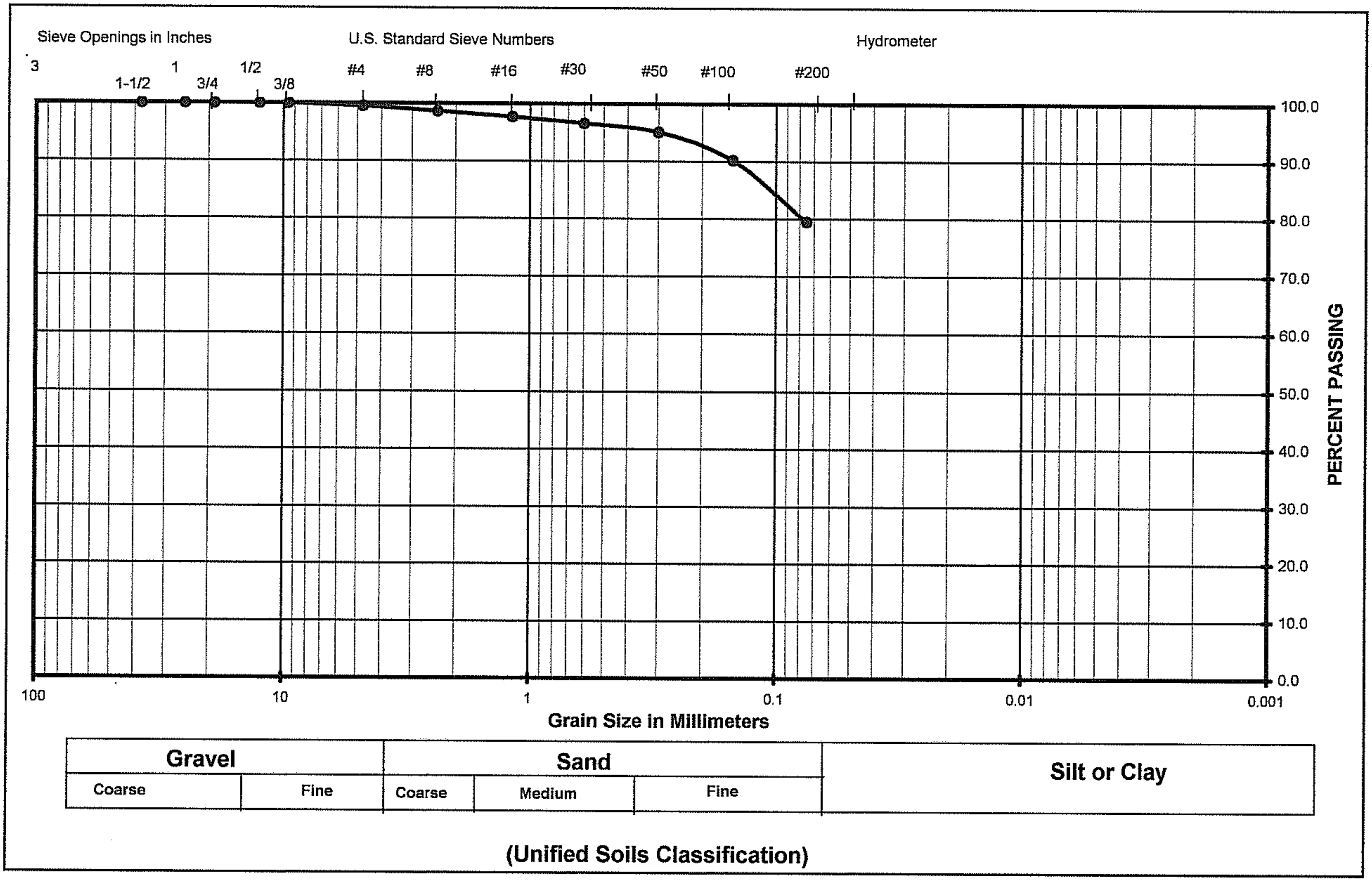


(Unified Soils Classification)

Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(CL), Silty Clay
Sample Number	B-6 @ 35'

Krazan Testing Laboratory

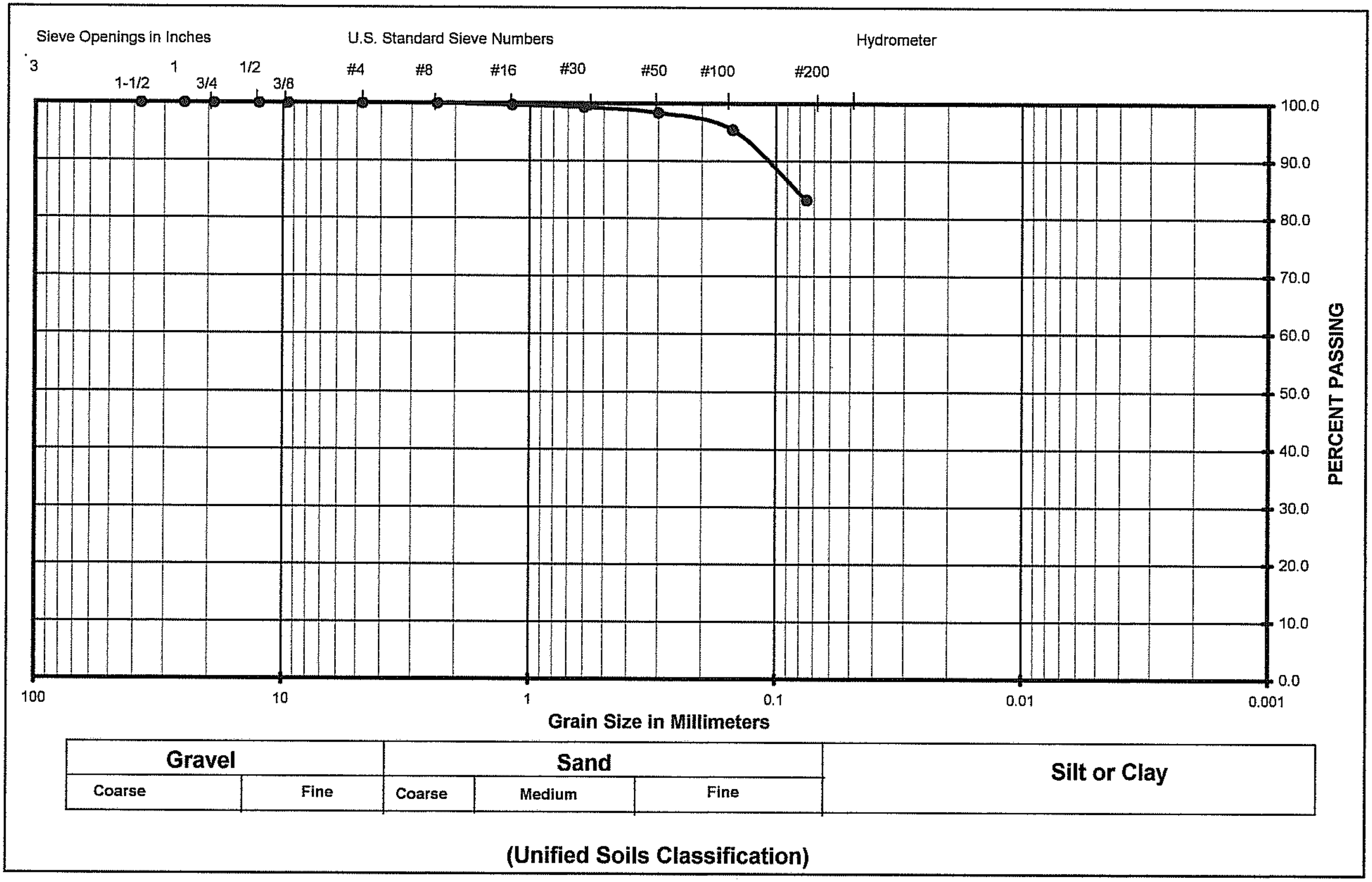
Grain Size Analysis



Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(CL), Silty Clay
Sample Number	B-6 @ 40'

Krazan Testing Laboratory

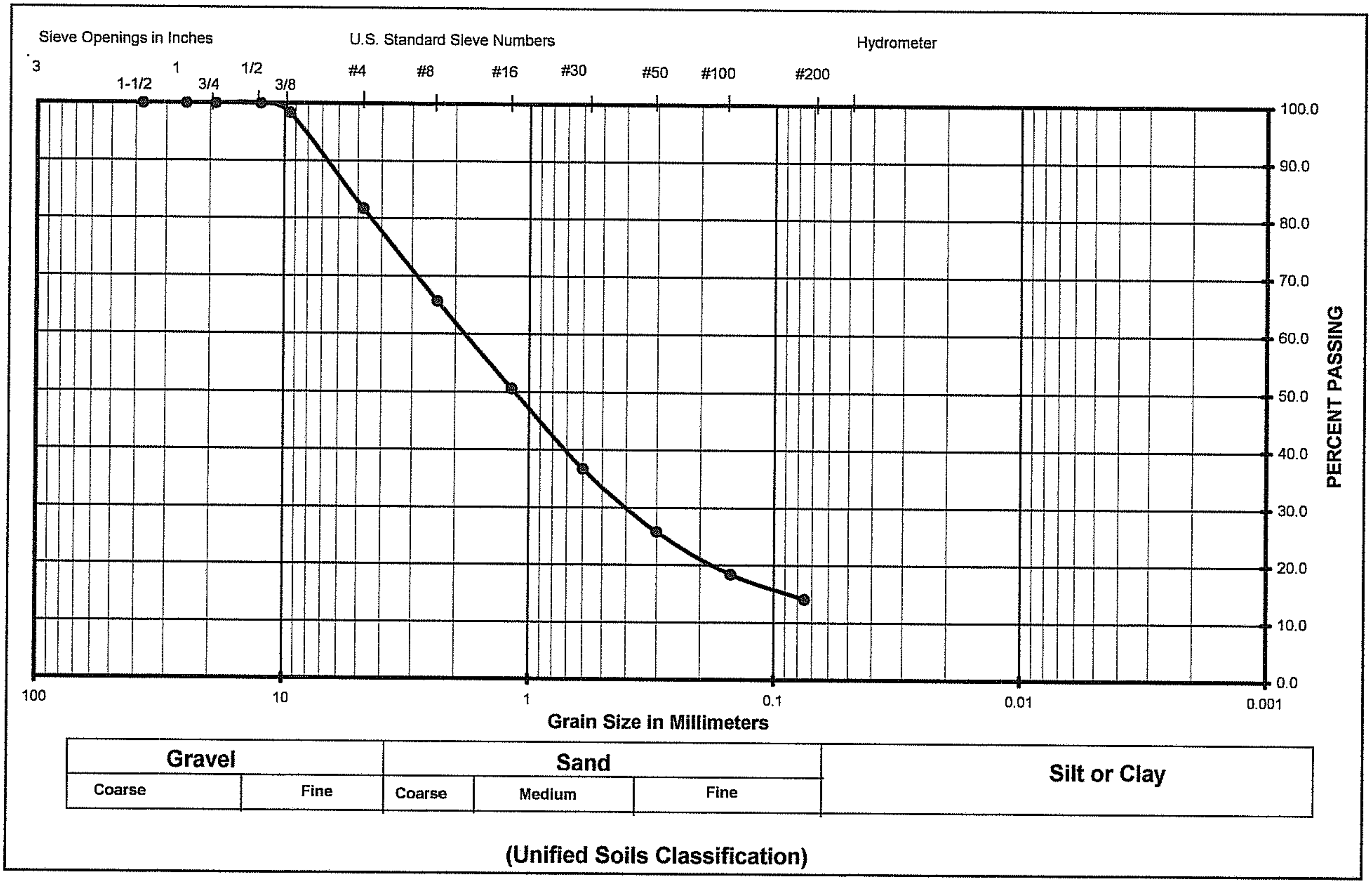
Grain Size Analysis



Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(CL), Silty Clay
Sample Number	B-6 @ 45'

Krazan Testing Laboratory

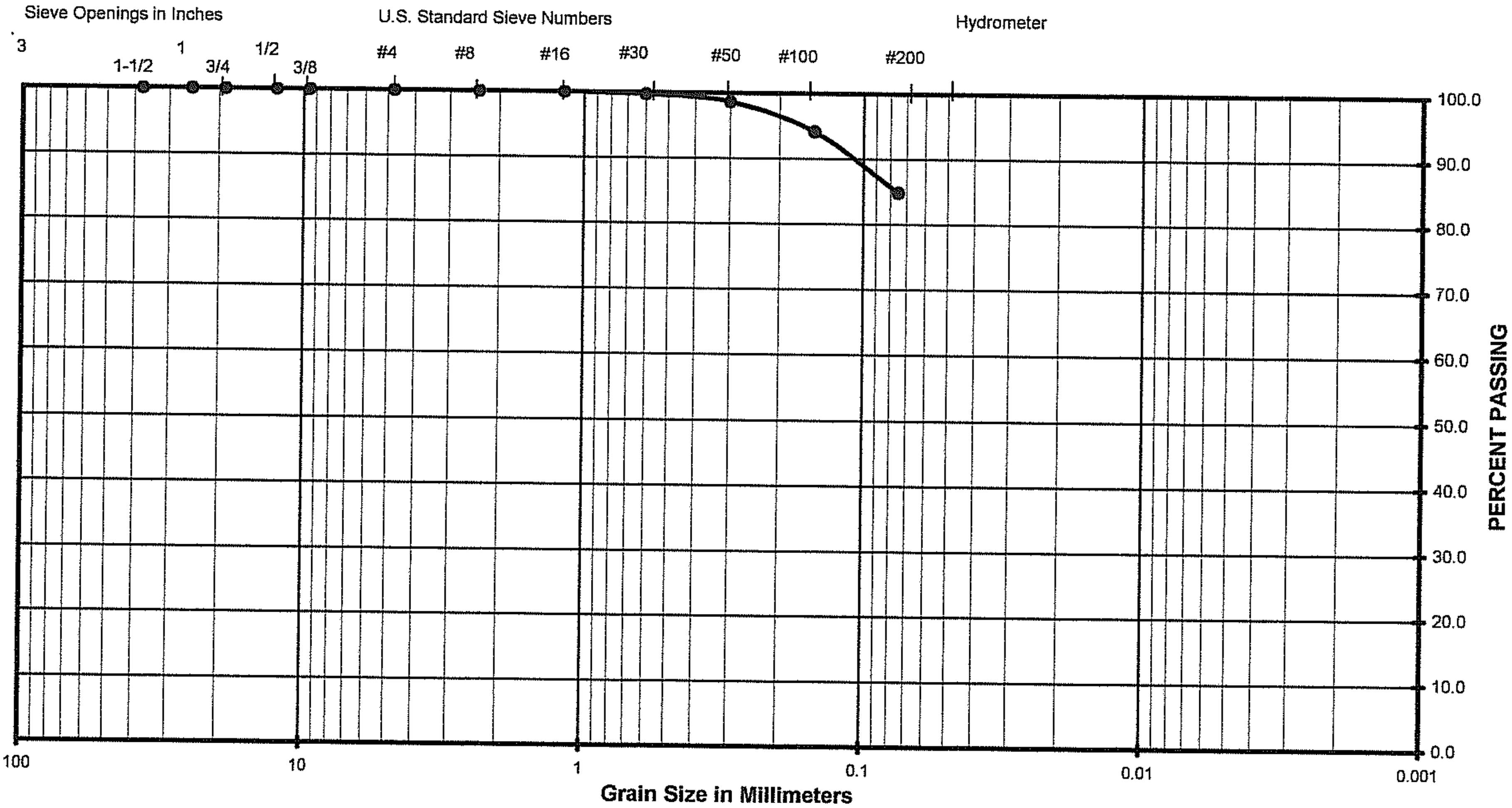
Grain Size Analysis



Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(SM), Silty Sand w/ Little Gravel
Sample Number	B-8 @ 5' - 6'

Krazan Testing Laboratory

Grain Size Analysis



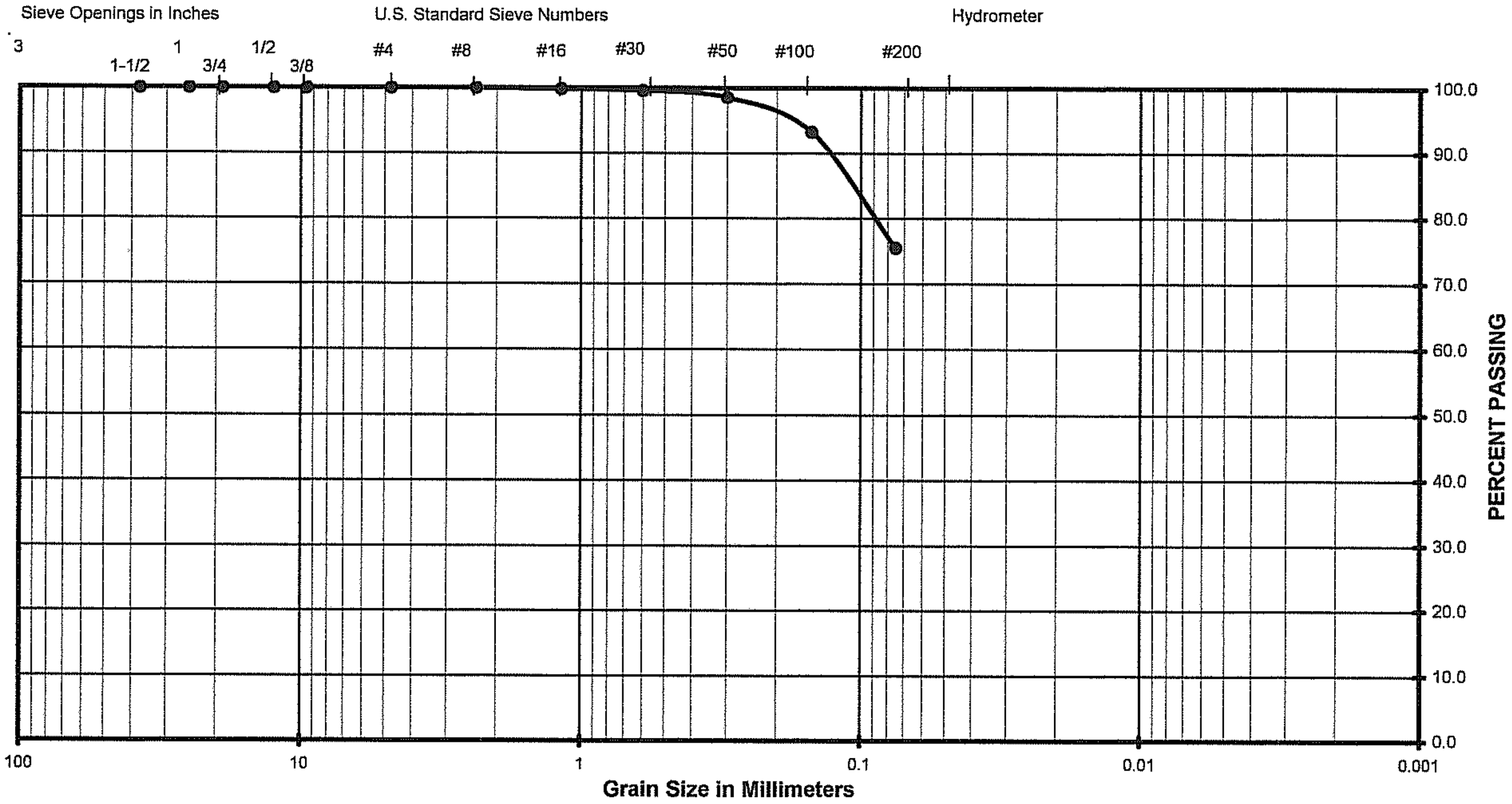
Gravel		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

(Unified Soils Classification)

Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(CL), Silty Clay
Sample Number	B-8 @ 15' - 16'

Krazan Testing Laboratory

Grain Size Analysis



Gravel		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

(Unified Soils Classification)

Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(ML), Sandy Silt w/ Clay
Sample Number	B-8 @ 25' - 26'

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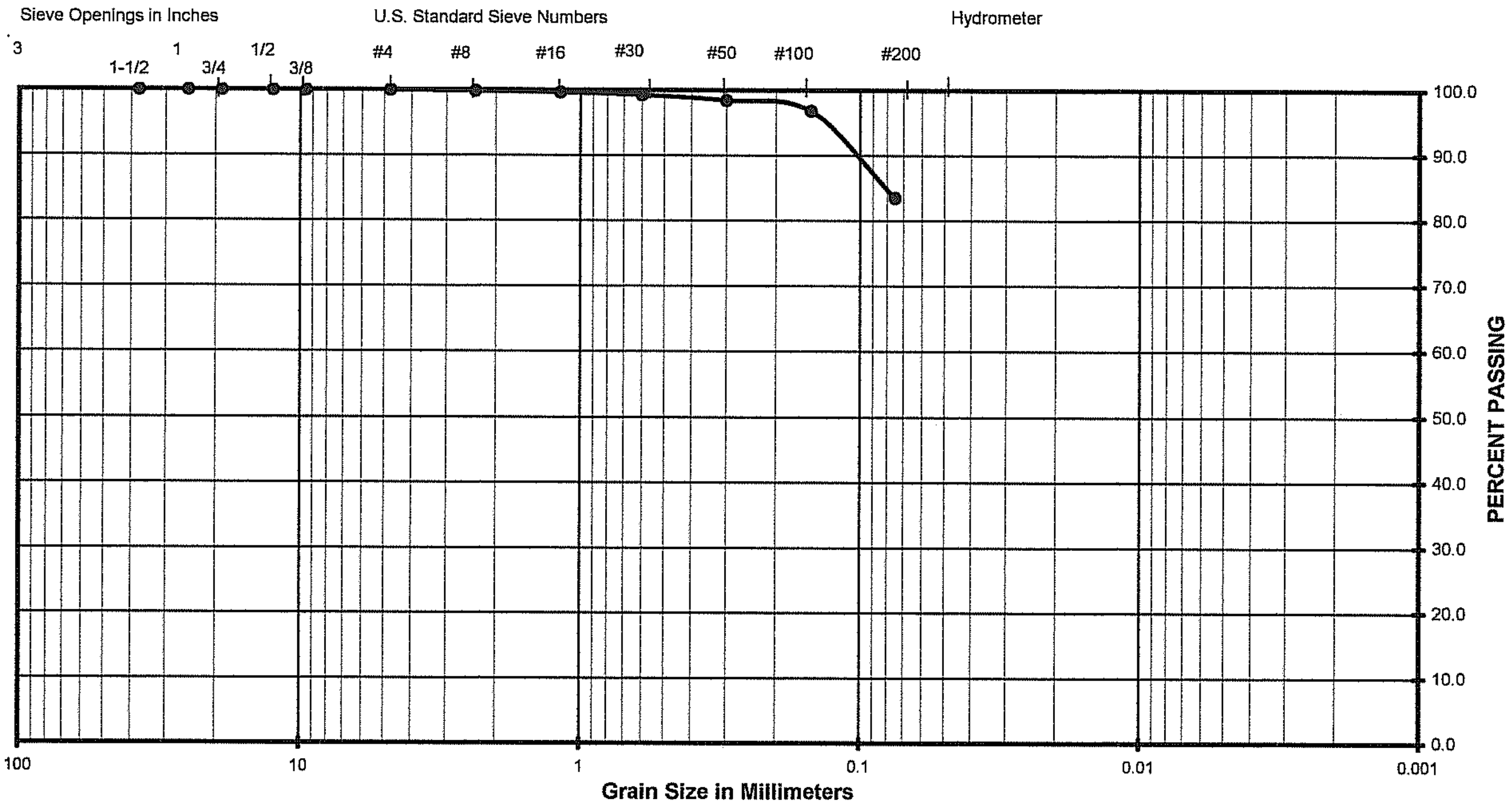
Grain Size Analysis



Gravel		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

(Unified Soils Classification)

Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(ML), Clayey Silt
Sample Number	B-8 @ 35' - 36'

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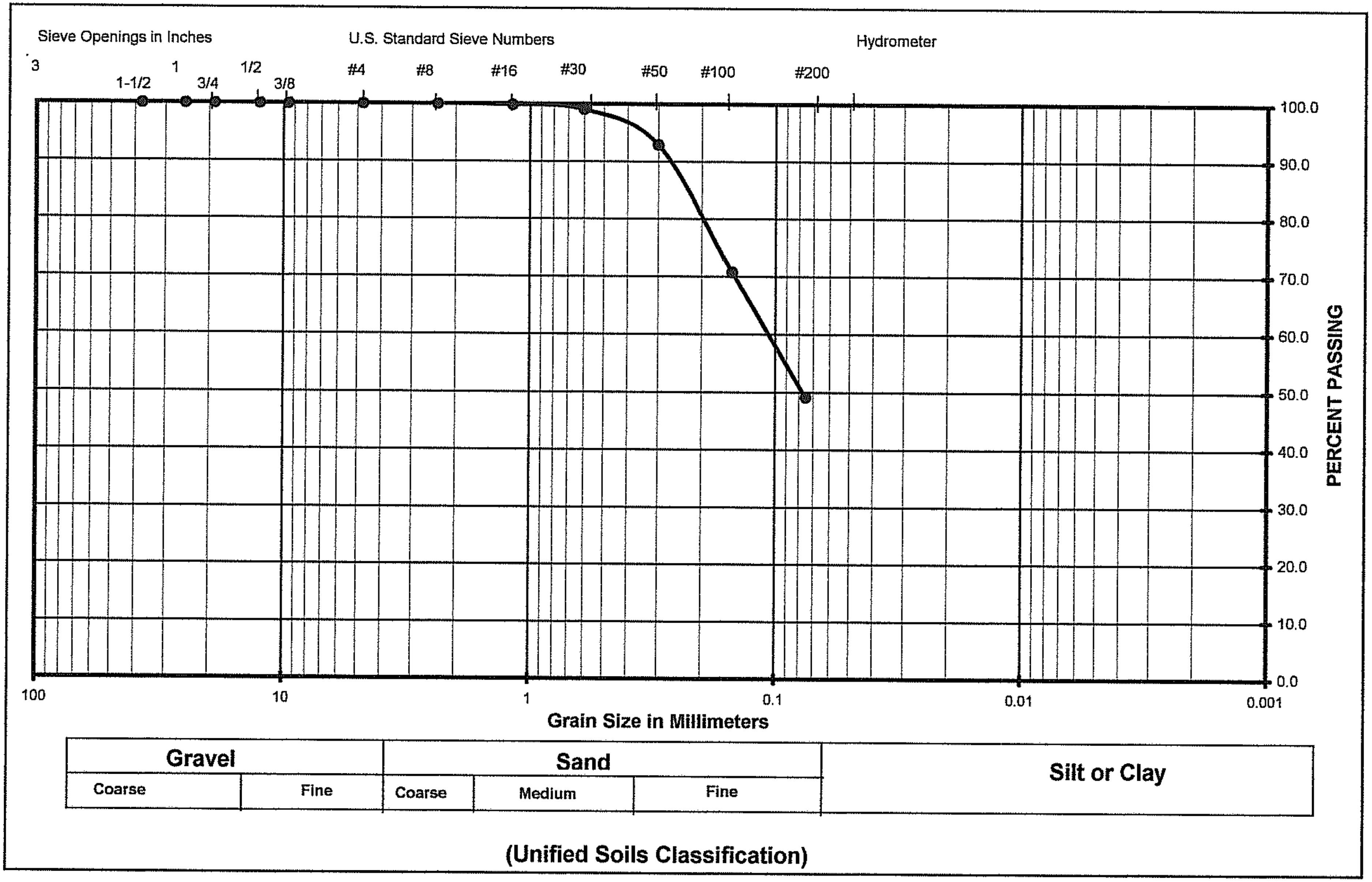
Grain Size Analysis



Project Name	Westfield Mall
Project Number	112-06041
Soil Classification	(SM-ML), Silty Sand-Sandy Silt w/ Trace Clay
Sample Number	B-8 @ 45' - 46'

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Expansion Index Test

ASTM D - 4829/ UBC Std. 18-2

Project Number : 112-06041
Project Name : Westfield Mall
Date : 7/6/06
Sample location/ Depth : B-1 @ 0-3'
Sample Number : 1
Soil Classification : (SM), Silty Sand w/ Trace Clay

Trial #	**1**	**2**	**3**
Weight of Soil & Mold, gms	596.7		
Weight of Mold, gms	170.8		
Weight of Soil, gms	425.9		
Wet Density, Lbs/cu.ft.	128.4		
Weight of Moisture Sample (Wet), gms	300.0		
Weight of Moisture Sample (Dry), gms	277.8		
Moisture Content, %	8.0		
Dry Density, Lbs/cu.ft.	118.9		
Specific Gravity of Soil	2.7		
Degree of Saturation, %	51.8		

Time	Inital	30 min	1 hr	6hrs	12 hrs	24 hrs
Dial Reading	--	--	--	--	--	0.016

Expansion Index $_{\text{measured}}$ = 16

Expansion Index $_{50}$ = 16.9

Expansion Index = 17

Expansion Potential Table	
Exp. Index	Potential Exp.
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
>130	Very High

Krazan Testing Laboratory

Expansion Index Test

ASTM D - 4829/ UBC Std. 18-2

Project Number	: 112-06041
Project Name	: Westfield Mall
Date	: 7/6/06
Sample location/ Depth	: B-4 @ 0-3'
Sample Number	: 2
Soil Classification	: (SM), Silty Sand w/ Clay

Trial #	**1**	**2**	**3**
Weight of Soil & Mold, gms	615.8		
Weight of Mold, gms	185.0		
Weight of Soil, gms	430.8		
Wet Density, Lbs/cu.ft.	129.9		
Weight of Moisture Sample (Wet), gms	300.0		
Weight of Moisture Sample (Dry), gms	277.0		
Moisture Content, %	8.3		
Dry Density, Lbs/cu.ft.	120.0		
Specific Gravity of Soil	2.7		
Degree of Saturation, %	55.4		

Time	Inital	30 min	1 hr	6hrs	12 hrs	24 hrs
Dial Reading	--	--	--	--	--	0.042

Expansion Index $_{\text{measured}}$ = 42

Expansion Index $_{50}$ = 45.5

Expansion Index = 46

Expansion Potential Table	
Exp. Index	Potential Exp.
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
>130	Very High

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Expansion Index Test

ASTM D - 4829/ UBC Std. 18-2

Project Number	: 112-06041
Project Name	: Westfield Mall
Date	: 7/6/06
Sample location/ Depth	: B-7 @ 0-3'
Sample Number	: 3
Soil Classification	: (ML), Sandy Silt w/ Clay

Trial #	1	2	3
Weight of Soil & Mold, gms	599.7		
Weight of Mold, gms	185.0		
Weight of Soil, gms	414.7		
Wet Density, Lbs/cu.ft.	125.1		
Weight of Moisture Sample (Wet), gms	300.0		
Weight of Moisture Sample (Dry), gms	274.5		
Moisture Content, %	9.3		
Dry Density, Lbs/cu.ft.	114.4		
Specific Gravity of Soil	2.7		
Degree of Saturation, %	53.1		

Time	Inital	30 min	1 hr	6hrs	12 hrs	24 hrs
Dial Reading	--	--	--	--	--	0.054

Expansion Index $_{\text{measured}}$ = 54

Expansion Index $_{50}$ = 56.2

Expansion Index = 56

Expansion Potential Table	
Exp. Index	Potential Exp.
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
>130	Very High

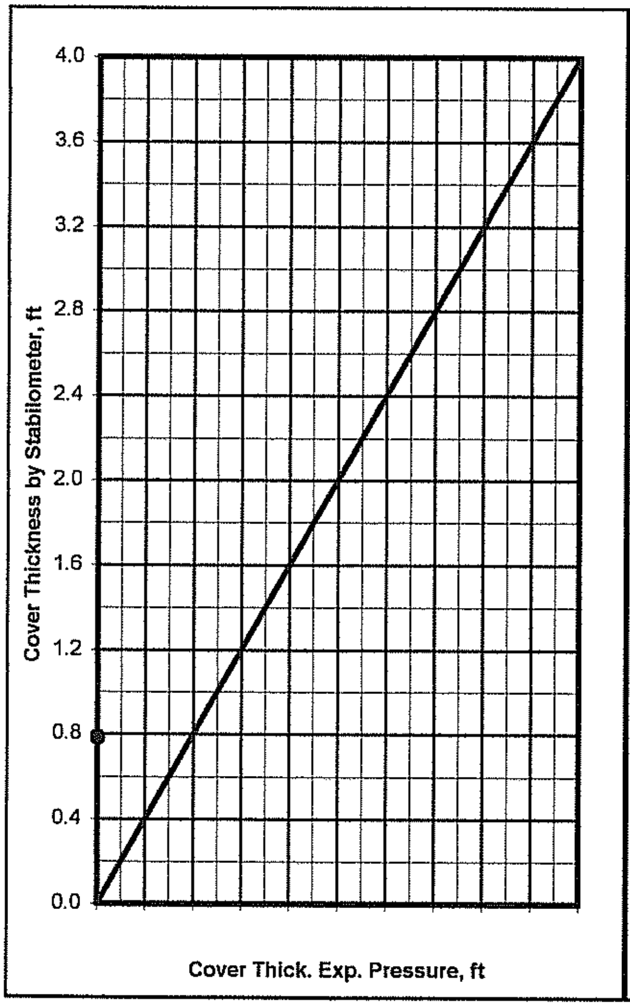
Krazan Testing Laboratory

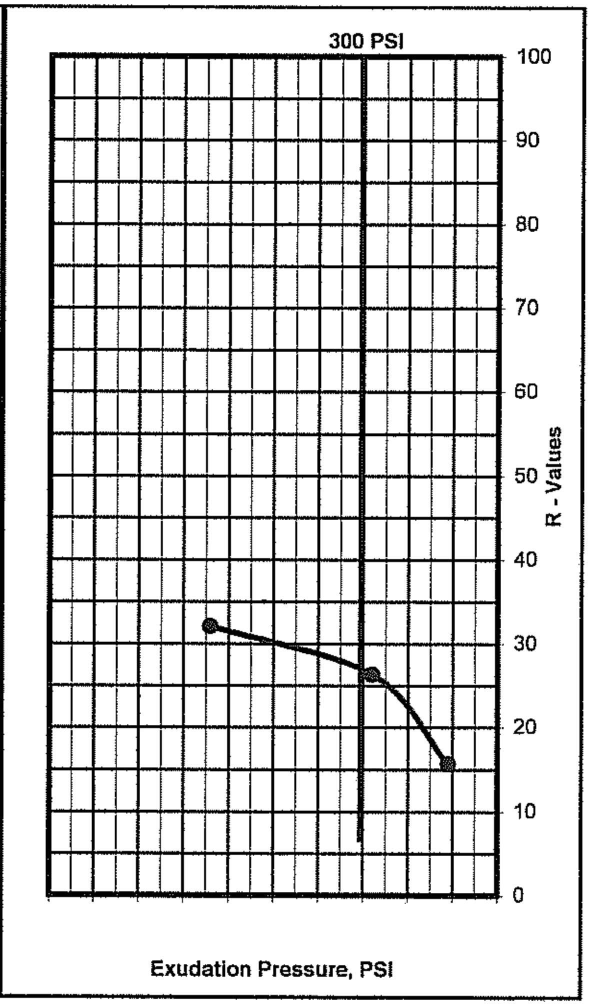
R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number : 112-06041
Project Name : Westfield Mall
Date : 9/21/06
Sample Location/Curve Number : RV#1 (B-1 @ 0-3')
Soil Classification : (SM), Silty Sand w/ Clay

TEST	A	B	C
Percent Moisture @ Compaction, %	14.5	13.5	15.5
Dry Density, lbm/cu.ft.	120.5	121.1	122.2
Exudation Pressure, psi	280	640	110
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	26	32	16

R Value at 300 PSI Exudation Pressure	**27**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**





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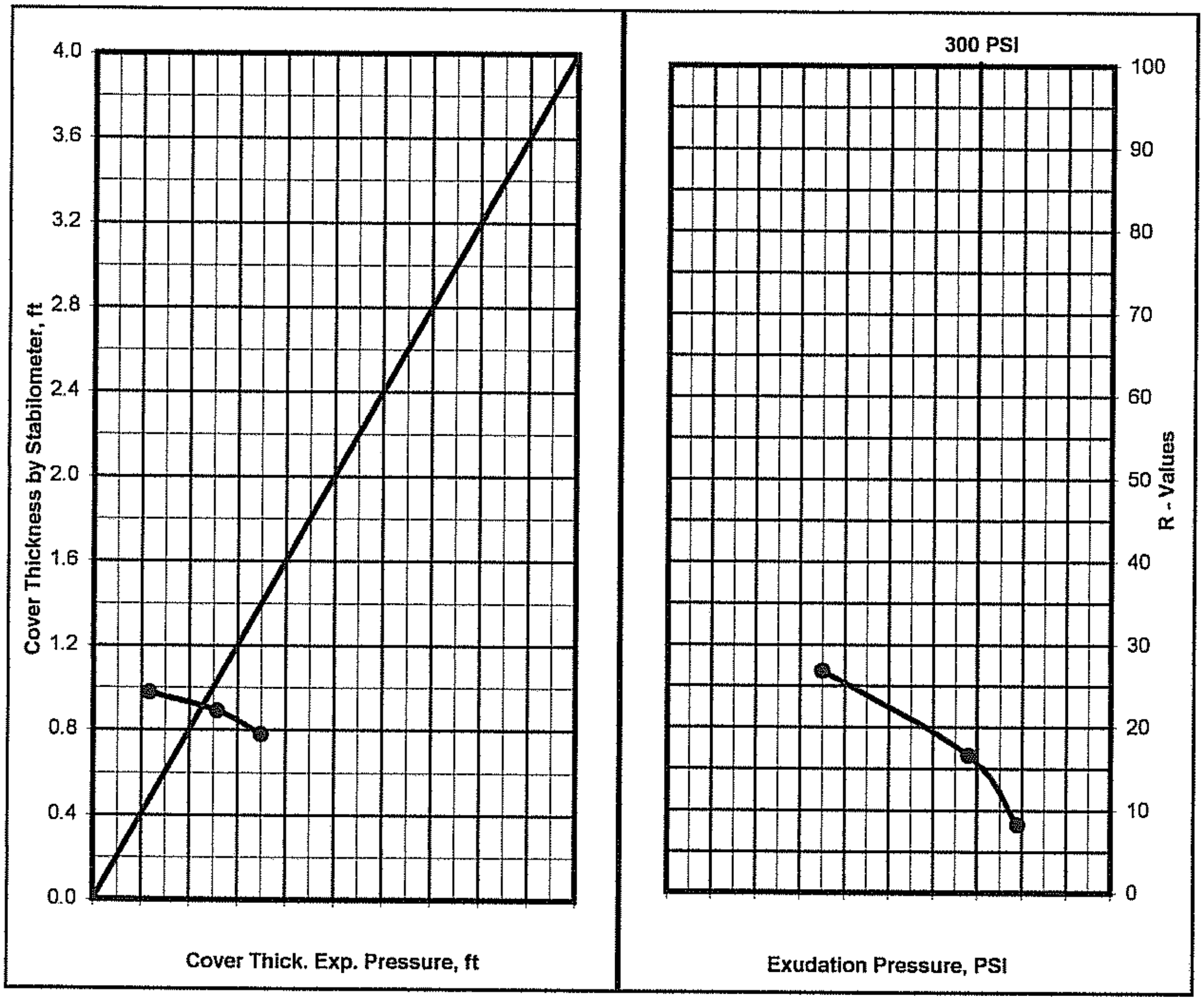
R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	112-06041
Project Name	:	Westfield Mall
Date	:	9/21/06
Sample Location/Curve Number	:	RV# 7 (B-2 @ 0-3')
Soil Classification	:	(ML), Sandy Silt w/ Clay

TEST	A	B	C
Percent Moisture @ Compaction, %	18.8	19.9	17.7
Dry Density, lbm/cu.ft.	111.2	112.3	111.6
Exudation Pressure, psi	320	210	650
Expansion Pressure, (Dial Reading)	31	14	42
Expansion Pressure, psf	134	61	182
Resistance Value R	17	8	27

R Value by Expansion Pressure (TI =): 5	**14**
R Value at 300 PSI Exudation Pressure	**16**



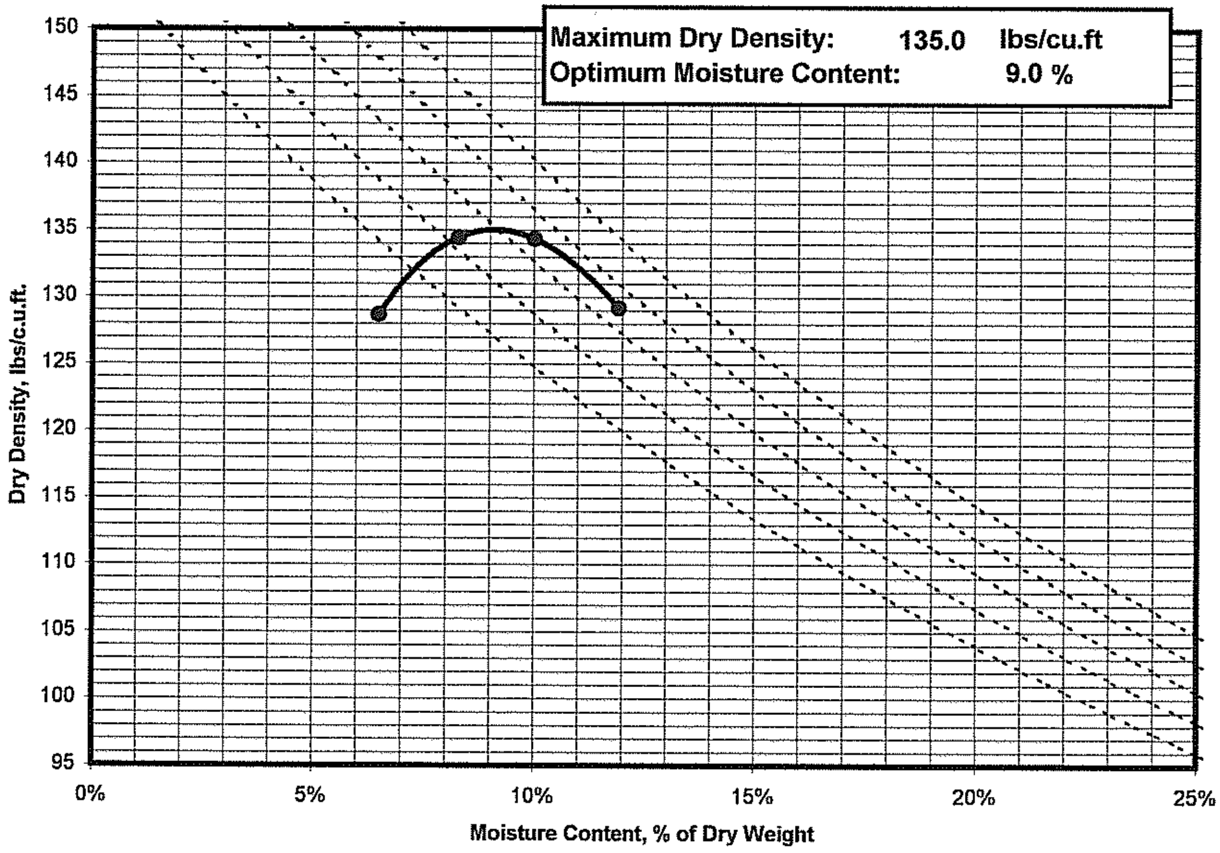
Krazan Testing Laboratory

Laboratory Compaction Curve

ASTM - D1557, D698

Project Number	: 112-06041
Project Name	: Westfield Mall
Date	: 07/06/06
Sample location	: B-7 @ 0-3'
Sample/Curve Number	: 3
Soil Classification	: (SM), Silty Sand w/ Clay
Test Method	: 1557A

	1	2	3	4
Weight of Moist Specimen & Mold, gm	4229.3	4195.9	4067.8	4181.6
Weight of Compaction Mold, gm	2003.7	2003.7	2003.7	2003.7
Weight of Moist Specimen, gm	2225.6	2192.2	2064.1	2177.9
Volume of mold, cu. ft.	0.0332	0.0332	0.0332	0.0332
Wet Density, lbs/cu.ft.	147.8	145.6	137.1	144.6
Weight of Wet (Moisture) Sample, gm	200.0	200.0	200.0	200.0
Weight of Dry (Moisture) Sample, gm	181.8	184.7	187.8	178.7
Moisture Content, %	10.0%	8.3%	6.5%	11.9%
Dry Density, lbs/cu.ft.	134.3	134.4	128.7	129.2



Krazan Testing Laboratory

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: **Krazan & Associates, Inc.**
4221 Brickell St.
Ontario, CA 91761
Tel(909)974-4400 Fax(909)974-4022

PROJECT: **Sherman Oaks**

MATRIX: SOIL
SAMPLING DATE: 06/29/06
REPORT TO: MR. CLARENCE JIANG
DATE RECEIVED: 07/11/06
DATE ANALYZED: 07/11-12/06
DATE REPORTED: 07/14/06

SAMPLE I.D.: **112-06041 / B-1@0-3'** LAB I.D.: 060711-9

PARAMETER	SAMPLE RESULT	UNIT	PQL	DF	METHOD
RESISTIVITY	6670	OHMS-CM	100000*	--	CALTRANS
SULFATE	303	MG/KG	10	2	EPA 9038
CHLORIDE	17.1	MG/KG	10	1	EPA 9253
pH	7.77	pH/Unit	--	--	EPA 9045C

COMMENTS
DF = DILUTION FACTOR
PQL = PRACTICAL QUANTITATION LIMIT
ACTUAL DETECTION LIMIT = DF X PQL
MG/KG = MILLIGRAM PER KILOGRAM = PPM
OHMS-CM = OHMS-CENTIMETER
RESISTIVITY = 1/CONDUCTIVITY
* = HIGH LIMIT

DATA REVIEWED AND APPROVED BY:________________
CAL-DHS ELAP CERTIFICATE No.: 1555

APPENDIX B

GENERAL EARTHWORK SPECIFICATIONS

GENERAL

When the text of the report conflicts with the general specifications in this appendix, the recommendations in the report have precedence.

SCOPE OF WORK: These specifications and applicable plans pertain to and include all earthwork associated with the site rough grading, including, but not limited to, the furnishing of all labor, tools and equipment necessary for site clearing and grubbing, stripping, preparation of foundation materials for receiving fill, excavation, processing, placement and compaction of fill and backfill materials to the lines and grades shown on the project grading plans and disposal of excess materials.

PERFORMANCE: The Contractor shall be responsible for the satisfactory completion of all earthworks in accordance with the project plans and specifications. This work shall be inspected and tested by a representative of Krazan and Associates, Incorporated, hereinafter referred to as the Soils Engineer and/or Testing Agency. Attainment of design grades, when achieved shall be certified by the project Civil Engineer. Both the Soils Engineer and the Civil 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 adjustments until all work is deemed satisfactory as determined by both the Soils Engineer and the Civil Engineer. No deviation from these specifications shall be made except upon written approval of the Soils Engineer, Civil Engineer, or project Architect.

No earthwork shall be performed without the physical presence or approval of the Soils Engineer. The Contractor shall notify the Soils Engineer at least 2 working days prior to the commencement of any aspect of the site earthwork.

The Contractor agrees that he shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the Contractor shall defend, indemnify and hold the Owner and the Engineers harmless from any and all liability, real or alleged, in connection with the performance of work on this project, except for liability arising from the sole negligence of the Owner or the Engineers.

TECHNICAL REQUIREMENTS: All compacted materials shall be densified to no less that 90 percent of relative compaction based on ASTM D1557-00 Test Method, UBC or CAL-216, as specified in the technical portion of the Soil Engineer's report. The location and frequency of field density tests shall be as determined by the Soils Engineer. The results of these tests and compliance with these specifications shall be the basis upon which satisfactory completion of work will be judged by the Soils Engineer.

SOILS AND FOUNDATION CONDITIONS: The Contractor is presumed to have visited the site and to have familiarized himself with existing site conditions and the contents of the data presented in the Geotechnical Engineering Report.

The Contractor shall make his own interpretation of the data contained in the Geotechnical Engineering Report and the Contractor shall not be relieved of liability under the Contractor for any loss sustained as a result of any variance between conditions indicated by or deduced from said report and the actual conditions encountered during the progress of the work.

DUST CONTROL: The work includes dust control as required for the alleviation or prevention of any dust nuisance on or about the site or the borrow area, or off-site if caused by the Contractor's operation either during the performance of the earthwork or resulting from the conditions in which the Contractor leaves the site. The Contractor shall assume all liability, including court costs of codefendants, for all claims related to dust or wind-blown materials attributable to his work.

SITE PREPARATION

Site preparation shall consist of site clearing and grubbing and preparation of foundation materials for receiving fill.

CLEARING AND GRUBBING: The Contractor shall accept the site in this present condition and shall demolish and/or remove from the area of designated project earthwork all structures, both surface and subsurface, trees, brush, roots, debris, organic matter and all other matter determined by the Soils Engineer to be deleterious. Such materials shall become the property of the Contractor and shall be removed from the site.

Tree root systems in proposed building areas should be removed to a minimum depth of 3 feet and to such an extent, which would permit removal of all roots greater than 1 inch in diameter. Tree roots removed in parking areas may be limited to the upper 1½ feet of the ground surface. Backfill or tree root excavation should not be permitted until all exposed surfaces have been inspected and the Soils Engineer is present for the proper control of backfill placement and compaction. Burning in areas, which are to receive fill materials, shall not be permitted.

SUBGRADE PREPARATION: Surfaces to receive Engineered Fill, shall be prepared as outlined above, excavated/scarified to a minimum depth of 8 inches, moisture-conditioned as necessary, and recompacted to at least 90 percent relative compaction.

Loose soil areas and/or areas of disturbed soil shall be moisture-conditioned as necessary and recompacted to 90 percent relative compaction. All ruts, hummocks, or other uneven surface features shall be removed by surface grading prior to placement of any fill materials. All areas, which are to receive fill materials, shall be approved by the Soils Engineer prior to the placement of any of the fill material.

EXCAVATION: All excavation shall be accomplished to the tolerance normally defined by the Civil Engineer as shown on the project grading plans. All over-excavation below the grades specified shall be backfilled at the Contractor's expense and shall be compacted in accordance with the applicable technical requirements.

FILL AND BACKFILL MATERIAL: No material shall be moved or compacted without the presence of the Soils Engineer. Material from the required site excavation may be utilized for construction site fills, provided prior approval is given by the Soils Engineer. All materials utilized for constructing site fills shall be free from vegetation or other deleterious matter as determined by the Soils Engineer.

PLACEMENT, SPREADING AND COMPACTION: The placement and spreading of approved fill materials and the processing and compaction of approved fill and native materials shall be the responsibility of the Contractor. However, compaction of fill materials by flooding, ponding, or jetting shall not be permitted unless specifically approved by local code, as well as the Soils Engineer.

Both cut and fill shall be surface-compacted to the satisfaction of the Soils Engineer prior to final acceptance.

SEASONAL LIMITS: No fill material shall be placed, spread, or rolled while it is frozen or thawing, or during unfavorable wet weather conditions. When the work is interrupted by heavy rains, fill operations shall not be resumed until the Soils Engineer indicates that the moisture content and density of previously placed fill is as specified.

APPENDIX C

GENERAL PAVEMENT SPECIFICATIONS

1. **DEFINITIONS** - The term "pavement" shall include asphalt concrete surfacing, untreated aggregate base, and aggregate subbase. The term "subgrade" is that portion of the area on which surfacing, base, or subbase is to be placed.

The term “Standard Specifications”: hereinafter referred to is the January 1999 Standard Specifications of the State of California, Department of Transportation, and the "Materials Manual" is the Materials Manual of Testing and Control Procedures, State of California, Department of Public Works, Division of Highways. The term "relative compaction" refers to the field density expressed as a percentage of the maximum laboratory density as defined in the ASTM D1557-00.

2. **SCOPE OF WORK** - This portion of the work shall include all labor, materials, tools, and equipment necessary for, and reasonably incidental to the completion of the pavement shown on the plans and as herein specified, except work specifically notes as "Work Not Included."

3. **PREPARATION OF THE SUBGRADE** - The Contractor shall prepare the surface of the various subgrades receiving subsequent pavement courses to the lines, grades, and dimensions given on the plans. The upper 12 inches of the soil subgrade beneath the pavement section shall be compacted to a minimum relative compaction of 90 percent. The finished subgrades shall be tested and approved by the Geotechnical Engineer prior to the placement of additional pavement courses.

4. **UNTREATED AGGREGATE BASE** - The aggregate base material shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate base material shall conform to the requirements of Section 26 of the Standard Specifications for Class 2 material, ¾-inches maximum size. The aggregate base material shall be compacted to a minimum relative compaction of 95 percent. The aggregate base material shall be spread and compacted in accordance with Section 26 of the Standard Specifications. The aggregate base material shall be spread in layers not exceeding 6 inches and each layer of aggregate material course shall be tested and approved by the Geotechnical Engineer prior to the placement of successive layers.

5. **AGGREGATE SUBBASE** - The aggregate subbase shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate subbase material shall conform to the requirements of Section 25 of the Standard Specifications for Class II material. The aggregate subbase material shall be compacted to a minimum relative compaction of 95 percent, and it shall be spread and compacted in accordance with Section 25 of the Standard Specifications. Each layer of aggregate subbase shall be tested and approved by the Geotechnical Engineer prior to the placement of successive layers.

6. ASPHALT CONCRETE SURFACING - Asphalt concrete surfacing shall consist of a mixture of mineral aggregate and paving grade asphalt, mixed at a central mixing plant and spread and compacted on a prepared base in conformity with the lines, grades, and dimensions shown on the plans. The viscosity grade of the asphalt shall be AR-4000. The mineral aggregate shall be Type B, ½-inch or ¾-inch maximum, medium grading, for the wearing course and ¾-inch maximum, medium grading for the base course, and shall conform to the requirements set forth in Section 39 of the Standard Specifications. The drying, proportioning, and mixing of the materials shall conform to Section 39.

The prime coat, spreading and compacting equipment, and spreading and compacting the mixture shall conform to the applicable chapters of Section 39, with the exception that no surface course shall be placed when the atmospheric temperature is below 50 degrees F. The surfacing shall be rolled with a combination steel-wheel and pneumatic rollers, as described in Section 39-6. The surface course shall be placed with an approved self-propelled mechanical spreading and finishing machine.

7. FOG SEAL COAT - The fog seal (mixing type asphalt emulsion) shall conform to and be applied in accordance with the requirements of Section 37.