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PRELIMINARY GEOTECHNICAL ENGINEERING SERVICES, JOB NO. 1-40901 MESA DEL SOL ALBUQUERQUE, NEW MEXICO

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SANTA FE, NEW MEXICO ALBUQUERQUE, NEW MEXICO LAS CRUCES, NEW MEXICO

PRELIMINARY
GEOTECHNICAL ENGINEERING
SERVICES, JOB NO. 1-40901
MESA DEL SOL
ALBUQUERQUE, NEW MEXICO

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December 21, 2004
File No. 1-40901

Bohannan Huston, Inc.
7500 Jefferson NE
Albuquerque, New Mexico 87109

Attn: **Mr. James Topmiller, PE**

RE: **Preliminary Geotechnical Engineering Services**
Mesa Del Sol
Albuquerque, New Mexico

Dear Mr. Topmiller:

Submitted herein is the Preliminary Geotechnical Engineering Services Report for the above referenced project. The report contains the results of our field investigation and laboratory testing, and planning guides with respect to geotechnical and geologic conditions.

It has been a pleasure to serve you on this project. If you should have any questions, please contact this office.

Respectfully submitted:
GEO-TEST, INC.

Charles M. Miller, PE

cc: Addressee (3)

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INTRODUCTION

This report presents the results of the preliminary geotechnical engineering services performed at Mesa del Sol, located as shown on the Boring Location Map, Figure 1, in Albuquerque, New Mexico.

The objective of this investigation is to:

1) Provide preliminary determinations of the nature and engineering properties of the subsurface soils.

2) Provide preliminary recommendations for the design and construction of foundations, floor slabs, and pavements.

3) Provide discussion of soil or geologic conditions which may impact or constrain development.

The investigation includes subsurface exploration, geologic research and field verification of soil conditions at the site, representative soil sampling, performing infiltration tests, performing laboratory testing of the samples, performing preliminary engineering analysis and preparation of this report.

PROPOSED CONSTRUCTION & SITE CONDITIONS

It is our understanding that future development may include low to high density residential construction, retail and employment centers, community development facilities, and infrastructure and drainage facilities.

The site consists of the high mesa area which is relatively flat. The west side slopes down to the west to the lower areas on both the east and west sides of Interstate 25. Drainage in the high mesa area to be developed consists of a planned infiltration system. Conventional drainage systems are planned in western portion of the site.

MESA DEL SOL SOILS

Nomenclature and soil classification for this discussion of the Mesa del Sol area is based on the Soil Conservation Service (a subdivision of the USDA)

Report issued June 1977. The predominant soils in the upper 5 feet are:

Bluepoint loamy fine sand (BCC);
Bluepoint-Kokan association, hilly (BKD;
Latene sandy loam (LtB);
Madurez loamy fine sand (MaB);
Madurez-Wink association, gently sloped (MWA);
Pajarito loamy fine sand (PAC);
Tome series (To);
Wink fine sandy loam (WaB); and
Wink Madurez association (WM).

Many of these soils are "loamy" in nature. A loamy soil is a friable mixture of varying proportions of sand, silt and clay.

The generalized engineering properties of these soils are summarized from the SCS publication.

USDA Classifi-cation	USCS Classifi-cation	% Passing #200	Perme-ability (in/hr)	Shrink Swell Potential	Plasti-city Index	Risk of Corrosion to uncoated Steel	Risk of Corrosion to concrete
BCC	SP-SM ,SM	5-20	5.-20	LOW	NP	LOW	LOW
BKD	SC-SM, SC	5-20	5-20	LOW	NP	LOW	LOW
LtB	SC-SM, SC	15-35	0.6-2.0	LOW	0-10	HIGH	LOW
MaB	SM, CL-ML, CL	15-65	0.6-6.0	MOD	0-15	HIGH	LOW
MWA	SC-SM, SC, CL	45-60	0.6-2.0	MOD	5-15	HIGH	LOW
PAC	SM or ML	30-60	2-6	LOW	0-5	HIGH	LOW

USDA Classifi-cation	USCS Classifi-cation	% Passing #200	Perme-ability (in/hr)	Shrink Swell Potential	Plasti-city Index	Risk of Corrosion to uncoated Steel	Risk of Corrosion to concrete
To	ML, CL-ML, CL	50-85	0.6-2.0	MOD	0-15	HIGH	LOW
WaB	SM, SM-SC	30-50	2-6	LOW	0-15	HIGH	LOW
WM	SM, SM-SC	15-40	2-6	LOW	NP	HIGH	LOW

MESA DEL SOL REGIONAL GEOLOGY

The site occupies a position on a gently sloping Piedmont surface which extends westward to the Rio Grande. The Rio Grande Valley in Albuquerque is a small part of an interconnected series of north-south aligned grabens and structural basins which have subsided between mountain and highland uplifts comprising the Rio Grande rift. This sloping surface of the valley fill from the base of the mountains to the valley floor is locally referred to as the "east mesa"

The Piedmont surface consists of a series of coalescing alluvial fans deposited uncomfortably on the Santa Fe Group. The Santa Fe Group consists of beds of unconsolidated to loosely consolidated sediments locally inter-bedded with volcanic rocks. The Piedmont surface begins at the base of the Sandia and Manzanita mountains and extends to a series on bluffs and terraces along the east side of the Rio Grande Valley. The combined thickness of the Santa Fe Group and recent alluvium increases towards the river. The recent alluvium ranges in thickness from 0 to 200 feet.

The soils on the "east mesa" were deposited as arroyo channel fill and lenticular inter-channel deposits. The soils consist of poorly sorted mud-flow material to well-sorted stream gravel. The variable deposition conditions occasionally created low density/loose layers within the recent arroyo deposits.

EXPLORATION BORINGS

A total of eight exploratory borings were drilled for the project at the locations shown on the accompanying Boring Location Map, Figure 1. Borings were drilled to a depth of 20 feet below existing grade. Seven temporary wells were installed at the seven boring located on the mesa. The wells consist of 2 inch diameter PVC well screen. The well screen was sand packed with silica sand. Solid PVC pipe was installed to one to two feet above ground level. A bentonite seal was installed above the sand pack. Locking caps were installed. The borings were continuously logged during the drilling operation. The borings were drilled utilizing a CME-75 drill rig and 6 inch outside diameter hollow stem auger. Subsurface soils were generally sampled at depths of 2½ feet, 5 feet, and at 5 feet intervals thereafter, utilizing a standard split-spoon sampler. The texture, moisture content, relative density, color, and other physical properties of soils were observed and noted by the field engineer. Samples along with drill cuttings were visually classified to maintain a continuous geologic/lithologic log of the boring. Boring logs are presented at the end of this report.

Following are the latitude and longitude of the boring locations obtained by GPS readings.

BORING	LATITUDE	LONGITUDE
DH-01	34°59'47.7"	-106°37'10.9"
DH-02	34°59'30.3"	-106°36'34.2"
DH-03	34°59'17.2"	-106°37'20.6"
DH-04	34°59'1.6"	-106°36'40.6"
DH-05	34°58'42.9"	-106°37'25.4"
DH-06	34°59'5.6"	-106°38'8.8"
DH-07	34°58'25.0"	-106°38'10.0"

BORING	LATITUDE	LONGITUDE
DH-08	34°58'41.3"	-106°39'21.5"

LABORATORY TESTING

Representative samples were tested in the laboratory to determine certain engineering properties of the soils. Moisture contents were determined to evaluate the various soil deposits both with depth and laterally. Sieve Analysis and Atterberg Limits Tests were performed to aid in soil classification.

Soil chemistry consisting of pH, resistivity, and sulfate content was performed to aid in evaluation of the corrosivity of the soils and the cement type to be used in concrete in contact with site soils.

The results of these laboratory tests are presented in the Summary of Laboratory Results and on the Boring Logs located in subsequent sections of this report. All soil samples will be discarded 30 days after the date of this report unless we receive a specific request to retain the samples for a longer period of time.

SUBSURFACE SOIL CONDITIONS

As encountered in the exploratory borings, the subsoils across the project area generally consist of medium dense to dense, clean to silty and/or clayey sand. Borings #1 through #7 encountered a very dense, variably calcareously cemented layer (caliche) at the 2.5 foot or the 5.0 foot drive sample. Standard Penetration Test values ranged from 13 to greater than 100 across the site. Please refer to the Boring Logs, Appendix A, for detailed strata descriptions.

Groundwater was not encountered in any boring, and soil moisture contents were low to moderate.

SITE SEISMICITY

The site is located within Seismic Zone 2b. Based on the latitude and longitude

for Boring #5 (latitude of 34.9785833 and longitude of -106.6237222), the USGS Earthquake Hazards Program web site provided the following interpolated probabalistic ground motions in %g.

	10%PE in 50 yr	2%PE in 50 yr
PGA	10.13	24.28
0.2 sec SA	23.75	58.36
1.0 sec SA	6.58	17.44

In accordance with IBC 2003, we recommend using Site Class D for design.

CONCLUSIONS

The primary subsurface conditions affecting the proposed site development would be the shallow low to medium plasticity cemented clayey sands (caliche) and the possible existence of some loose or low void ratio surficial sands. The presence of loose materials on the site is likely to be on a limited basis, but is included here primarily based on the SCS data. The borings are located in areas to be developed. The borings generally indicate medium dense to very dense soils (cemented near surface) such that the preliminary information would tend to indicate a relatively less significant occurrence of the loose or low void ratio soils. Some of the low to medium plasticity cohesive soils on the site have low to moderate expansion potential when subjected to an increase in moisture content, refer to the plasticity indices in the Summary of Laboratory Results. Considering the topography of the site, it is probable that many building areas will be partially in cut and partially in fill.

FOUNDATIONS

It is anticipated that lightly loaded building structures, including residences, will be founded on shallow conventional spread footings with bearing pressures in the range of 1,500 psf to 3,000 psf. In high void ratio sands, densification and/or deep wetting and vibratory compaction may be required to limit settlement to acceptable levels. We recommend that structures not bear partially on cut and partially on fill. In these cases, the cut area should be over

excavated to provide a minimum thickness of structural fill below all foundations and slabs. Where dense sands are encountered densification of native soils by over excavation or deep soil treatments will not be required. In areas where foundations or slabs will bear on or within a certain distance above low to moderate plasticity clayey sands, foundation options may include over excavation and replacement with non-expansive structural fill (imported or blended on site material) and the use of conventional spread footings; grade beam and straight shaft pier construction with suspended floor systems for heavily loaded structures; or the use of post tensioned slabs. Selective placement of soils during grading operations may help to minimize the use of over excavation or the more costly foundation systems.

Structures with moderate to heavy loads bearing in dense sand may be founded on conventional footings. However, deep foundations in the dense soils will achieve relatively high capacities with small diameters, and thus may be an economical alternative.

Natural clayey or silty layers impeding downward flow of moisture and causing horizontal flow or migration were encountered. Also, some of the silty and clayey sands will have relatively low permeabilities when compacted. Therefore, we recommend that below grade habitable space be protected by exterior "French" drains, or equivalent, led to sumps, "daylight", or other positive discharge. This will be most important where substantial irrigation is anticipated, and may not be warranted where native vegetation is maintained. Eliminating sub-slab HVAC ductwork will preclude problems with irrigation water entering the ductwork.

In addition to the recommended site treatments, moisture protection of subgrade soils will be essential to satisfactory performance of the structures. Foundation support properties of soils as encountered can change if saturated. Consequently, final site grading and drainage should reflect this consideration. In addition, typical preliminary guide specifications for Site Grading are presented later in this report.

LATERAL LOADS

Resistance to lateral forces can be assumed to be provided by soil friction on the floor slab and footings by passive earth resistance. A coefficient of friction

of 0.40 should be used for computing the lateral resistance between bases of footings and slabs with soil. This coefficient should be reduced to 0.30 when used in conjunction with passive pressure. For planning purposes, a passive soil resistance equivalent to a fluid weighing 325 pounds per cubic foot should be used for analysis. An active earth pressure equivalent to a fluid weighing 35 pounds per cubic foot should be used for analysis.

TYPICAL SLABS ON GRADE

If the grading requirements are complied with, light duty concrete slabs will typically be supported on grade on compacted structural fill or densified native soils. Slab subgrade should be maintained at or above its natural moisture content during construction. If required as a working surface, a 4 inch course of gravel should be placed on properly prepared subgrade. The gravel base should consist of ¾ inch maximum size aggregate with less than 5% passing the No. 200 sieve.

The gravel base will act as a capillary barrier, but will not eliminate moisture intrusion totally. If this is critical, an impervious membrane barrier should be placed beneath the slabs with a minimum of 2 inches of clean non-plastic sand overlying the barrier to minimize differential cracking and curling of floor slabs.

Floor slabs should be separated from foundation walls and utilities to allow their independent movement.

RETAINING WALLS

Retaining walls which are free to rotate or translate such that the top of the wall can deflect laterally a distance equal to 0.001 times the height of the wall can be designed to resist active lateral earth pressure. Walls which are restrained from movement should be designed for at-rest pressures.

Retaining walls may be founded on conventional spread footings bearing on structural fill or compacted native soils compacted in accordance with the criteria outlined in the SITE-GRADING section of this report. Footings should be designed for a maximum soil bearing pressure determined by final geotechnical investigations.

The lateral earth pressures stated above assume no build up of hydrostatic pressures behind the wall. To prevent the buildup of hydrostatic pressures, adequate weep holes or composite drainage systems such as Miradrain or equivalent can be readily installed by attaching to the backside of a subgrade wall prior to backfilling. The drainage layer would be connected to a perforated collector pipe at the base of the wall and routed to a sump or to a positive gravity drain.

As an alternative, the conventional french drain type system comprised of free draining granular fill can be placed behind the walls. A perforated PVC drainage pipe would be placed at the bottom of the wall to collect water from the granular fill. A filter fabric should encapsulate the granular fill to control migration of fines into the drain.

To minimize the potential for saturation of the backfill by infiltration of surface water, the ground surface behind the wall should be sloped to drain away from the structure at a minimum 2 percent slope.

During backfilling, the contractor should be limited to the use of hand operated compaction equipment within a zone of about 5 feet horizontally from the back of the wall. The use of heavier equipment could apply lateral pressures well in excess of the earth pressure, particularly over the upper portions of the wall.

FIELD PERMEABILITY TESTS

Field permeability tests (infiltration tests) were conducted in Borings #1 through #7. The tests were conducted using 2 inch diameter well screen and sand pack in a six inch diameter boring, 20 feet deep. The tests were conducted according to the Bureau of Reclamation Test Designation E-19. It should be noted that in general, these seven borings became cleaner, and thus more permeable with depth. The greatest flows probably occurred in the deeper portion of the borings. The test results are as follows:

BORING DESIGNATION	DISCHARGE RATE (gpm)	COEFFFICIENT OF PERMEABILITY (feet/year)
DH-01	4.62	30,198
DH-02	4.65	30,198
DH-03	6.20	40,427
DH-04	19.09	124,203
DH-05	4.06	26,302
DH-06**	>47.73	>310,751
DH-07	10.05	65,268

** The wells were filled and a constant head maintained at the ground surface. In DH-06, the well never filled using a gravity fed 2 inch line. Over 1,500 gallons of water were used in attempting to fill the well and complete the test.

TYPICAL SITE-GRADING

The following general guidelines should be considered as a typical specification which may be included in individual project construction specifications to provide a basis for quality control during site preparation.

It is recommended that all structural fill and backfill be placed and compacted under engineering supervision and in accordance with the following:

1) After clearing and grubbing and performing any required excavations, the building area shall be densified.

2) Where grading plans provide for the required structural fill thicknesses, over excavation may not be required.

3) The surface of the area to receive fill and final cut areas should

then be compacted as required to achieve 95 percent of the ASTM D-1557 maximum dry density.

4) Most on site soils are suitable for use as backfill soils and structural fill if blended with on site or imported granular material. Blending or removal and replacement will be required for materials having a plasticity index greater than 12. All backfill material shall be non expansive, free of vegetation and debris and contain no rocks larger than 6 inches. Gradation of the backfill material, as determined in accordance with ASTM D-422, should be as follows:

Sieve Size	Percent Passing
3 inch	90-100
No. 4	60-100
No. 200	5- 60

5) The plasticity index should be no greater than 12 when tested in accordance with ASTM D-4318. Where subgrade is relatively impermeable and/or cohesive the minimum percent passing the #200 sieve should be changed to 15%, and the plasticity index should be between 4 and 12.

6) Fill or backfill, consisting of soil approved by the Geotechnical Engineer, shall be placed in controlled compacted layers with approved compaction equipment. All compaction shall be a minimum of 95 percent of maximum dry density determined in accordance with the ASTM D-1557 test method.

7) Tests for degree of compaction shall be determined by the ASTM D-1556 method or ASTM D-2922. Observation and field tests shall be carried on during filling and backfill placement by the Geotechnical Engineer assist the contractor in obtaining the required degree of compaction. If less than 95 percent relative compaction is indicated, additional compaction effort shall be made with adjustment of the moisture content as necessary until 95 percent compaction is obtained.

SOIL CORROSIVITY

To evaluate soil corrosivity we performed the following tests on soil samples from the site:

- Resistivity on as sampled and saturated paste of the sample;
- pH determination of soil as sampled and on saturated paste of the sample (distilled water solution and calcium chloride solution; and
- Chemical analyses.

The results of the laboratory tests are presented in the table at the end of this section.

Corrosion is an electrochemical process requiring an electrolyte in which anions and cations migrate to promote the flow of electric current. Resistivity is a measure of the soils' electrolytic strength and its ability to promote corrosion. The lower the resistivity of a soil, the greater its potential to promote corrosion. Corrosion engineers generally agree upon the following resistivity-based corrosivity classifications for ferrous metals:

Corrosivity	Resistivity (ohm - cm)
Very Corrosive	0 to 500
Corrosive	500 to 1,000
Moderately Corrosive	1,001 to 2,000
Fairly Corrosive	2,001 to 4,000
Mildly Corrosive	4,001 to 10,000
Slightly Corrosive	10,001 to 30,000
Negligible	Above 30,000

The analytical results are as follows:

ANALYTICAL RESULTS					
Boring # and Depth	pH as Rec'd	pH Dist. Water Soln.	pH CaCl Soln	Resistivity as Rec'd (ohm-cm)	Saturated Resistivity (ohm-cm)
DH-3 @ 14.5	7.05	8.21	8.20	∞	485
DH-5 @ 15'	6.65	8.77	8.55	∞	4714

The soils on the site have negligible corrosivity at their natural moisture contents but are generally mildly corrosive to very corrosive in a saturated condition. The pH of the test soil varied from 6.65 to 8.77. In most cases, pH does not play a direct role in corrosion in the near-neutral pH region (5<pH, <9). Steel, copper, aluminum, zinc, and lead in near-neutral soil have their corrosion behavior influenced more by soil chemistry than pH. Note that the very corrosive soil is in the near surface calcium cemented zone.

Chemical analysis was performed for the presence of major anions and cations to further characterize the corrosivity of the soil. Sulfates (SO_4) can be corrosive to ferrous metals. Sulfates can also be deleterious to concrete structures. The chemical analysis found the soil samples to vary from 38 to 560 mg/kg soluble sulfate. This is a non-critical sulfate content. Therefore, Type I/II cement should be used for concrete exposed to soils on the site. The use of this type of cement in concrete is common in the area.

PAVEMENTS

Pavement sections will be typical for the area with the provision that good drainage be maintained and with the understanding that clay subgrades may be stabilized with lime or other methods, or removed and replaced with suitable

subgrade materials. Low plasticity clayey sand may not require any special treatment other than subgrade preparation.

PAVEMENT MATERIALS

Asphalt concrete pavement and all structural components thereof should meet the requirements of the City of Albuquerque's "Standard Specifications for Public Works Construction".

All asphalt should have a stability of no less than 1500 pounds for residential streets and no less than 1800 pounds for heavier duty pavements and conform to the aggregate gradation of Type B as indicated in Table 401 of the above referenced specification.

All base course should be compacted to a minimum of 95 percent of the ASTM D-1557 maximum dry density. The aggregate gradation should conform to a Class II-B as outlined in Table 304 of the above referenced specification.

If lime stabilization is used for treatment of the subgrade, an evaluation of the mixture should be performed to optimize the percentage of lime. Due to the variability of the on-site soils and insufficient final grading information it is not practical to perform such tests until final grading is established. The lime treatment should be performed using a hydrated lime slurry at the minimum application rate determined by laboratory analysis. Application and compaction should be performed in accordance with Section 306 of the above referenced specification.

CONSTRUCTION EXCAVATION

Excavated slopes for foundation and utility construction should be designed and constructed in accordance with 29 CFR 1926, Subpart P, and any applicable state or local regulations. Even though high N values and cemented soils (some caliche) were encountered in the exploration borings, we do not anticipate excavation difficulties beyond using heavy duty equipment. Extra effort may be required in some areas. Reuse of these materials should be further defined in future borings.

MOISTURE PROTECTION

Precautions should be taken during and after construction to minimize saturation of the foundation soils. Positive drainage should be established away from the foundations of the structures.

Concrete walks and asphalt pavement should be constructed adjacent to the exterior foundations where possible. All utility trenches leading into the structures should be backfilled with compacted fill. Final detailed soil reports may define more detailed requirements for moisture protection, especially for residential areas, and with respect to grading plans.

FOUNDATION REVIEW AND INSPECTION

This report has been prepared to aid in the evaluation of this site and to assist in the design of this project. It is recommended that the Geotechnical Engineer be provided the opportunity to review the final design drawings and specifications in order to determine whether the recommendations in this report are applicable to the final design. Review of the final design drawings and specifications will be noted in writing by the Geotechnical Engineer.

Variations from soil conditions presented herein may be encountered during construction of this project. In order to permit correlation between the conditions encountered during construction and to confirm recommendations presented herein, it is recommended that the Geotechnical Engineer be retained to perform sufficient review during construction of this project. Observation and testing should be performed during construction to confirm that suitable fill soils are placed upon competent materials and properly compacted and foundation elements penetrate the recommended soils.

CLOSURE

Our conclusions, recommendations and opinions presented herein are:

(1) Based upon our evaluation and interpretation of the findings of the field and laboratory program.

(2) Based upon an interpolation of soil conditions between and beyond the

explorations.

(3) Subject to confirmation of the conditions encountered during construction.

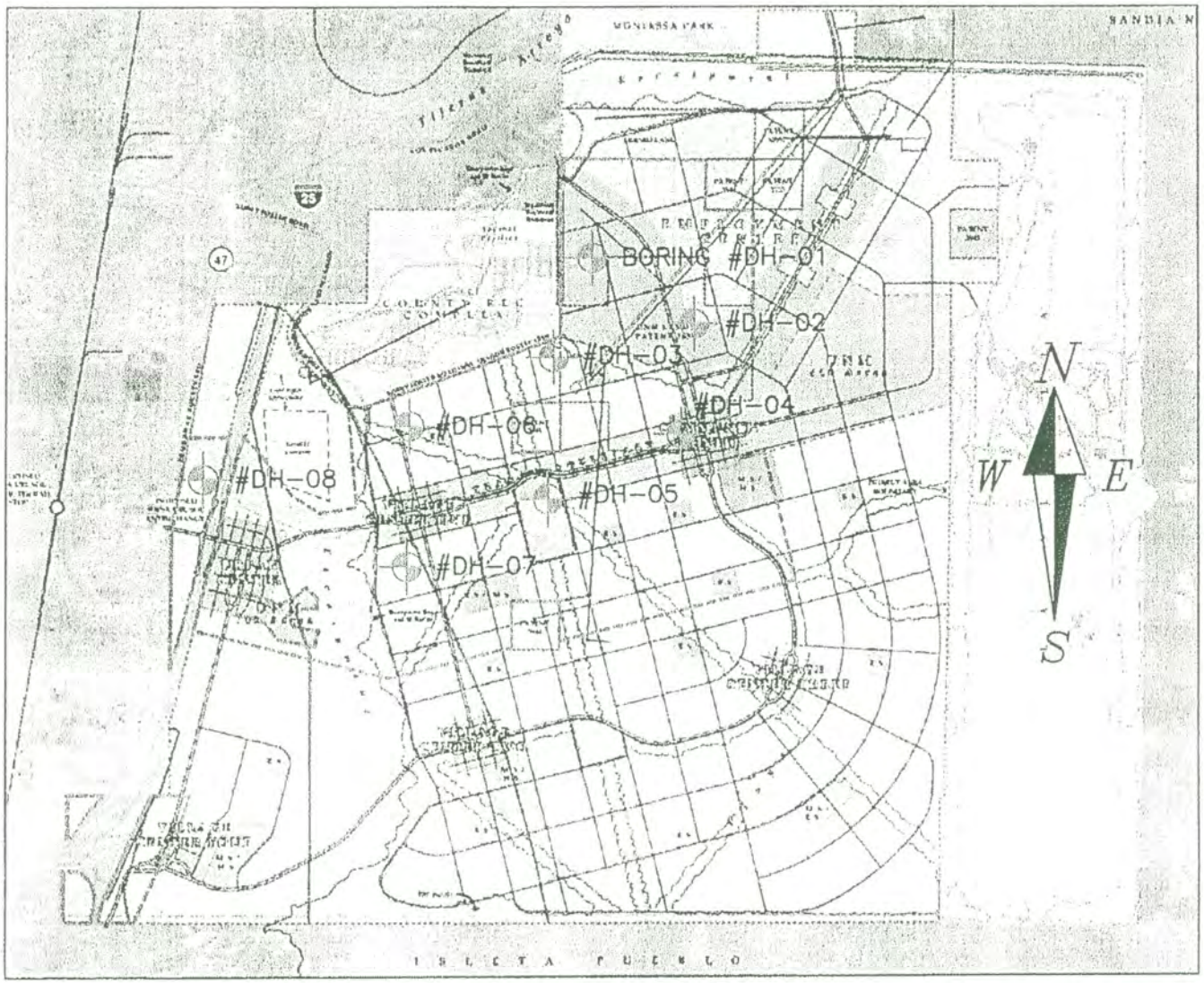
(4) Based upon the assumption that sufficient observation will be provided during construction.

(5) Prepared in accordance with generally accepted professional geotechnical engineering principles and practice.

We make no other warranty, either express or implied. Any person using this report for bidding or construction purposes should perform such independent investigation as he deems necessary to satisfy himself as to the surface and subsurface conditions to be encountered and the procedures to be used in the performance of work on this project. If conditions are encountered during construction that appear to be different than indicated by this report, this office should be notified.

Variations from soil conditions presented herein may be encountered during construction of this project. In order to permit correlation between the conditions encountered during construction and to confirm recommendations presented herein, it is recommended that the Geotechnical Engineer be retained to perform sufficient review during construction of this project.

BORING LOCATION MAP



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MESA DEL SOL ALBUQUERQUE, NEW MEXICO Figure 1 (NTS)

TEST BORING PROCEDURES

A soil test boring provides small samples of subsurface soil. The samples are used for classification and in laboratory testing to determine various properties of the soil. Our drilling and sampling are performed in general accordance with applicable ASTM standards.

In general, test borings are advanced by rotary equipment. When using solid or hollow stem fight augers, cuttings are returned to the surface on the flights of the augers and can be collected as disturbed bulk samples. In the case of hollow-stem augers, sampling can be accomplished through the hollow interior of the auger. If rotary drill bits are used, cuttings are flushed to the surface by a drilling fluid pumped through the hollow drill rods. At sampling intervals, the drill bit is removed and replaced by a sampling device. The sampling intervals vary according to project data requirements.

Samples are commonly obtained by driving one of two standard sampling devices: 1) a 1.4-inch inside diameter (I.D.), 2.0-inch outside diameter (O.D.) split barrel sampler; and 2) a 2.4-inch I.D., 3.0-inch O.D. ring sampler. The samplers are driven with blows of a 140-pound hammer falling approximately 30 inches. The ring samplers are designed to obtain relatively undisturbed samples of subsurface soil. The samples are retrieved and visually classified in the field by an engineer or a geologist. A representative portion of the sample is sealed in a container and transported to our laboratory.

In addition to providing a material sample, a driving resistance value is recorded based on the number of blows needed to drive the sampling device through a specific length of penetration. Penetration resistances provide a general indication of soil strength and density.

The subsurface conditions encountered at the boring locations are shown on the Test Boring Records. These records represent our interpretation of the subsurface conditions based on our field observations, a visual examination of samples by an engineer, and the indicated laboratory tests performed on selected samples. The lines designating the interface between various strata on the test boring records represent the approximate position of the interface. In addition, transitions between strata may be gradual. Ground water levels shown on the test boring records represent conditions only at the time of our exploration.

The designation shown in "Boring No." refers to the boring location illustrated on the Boring Location Map labeled with the same designation. The actual field boring locations were determined by measuring with a tape measure and turning estimated right angles to features shown on provided drawings of the project site and found at the site. The approximate boring locations are shown on the Boring Location Diagram and should be considered accurate only to the degree implied by the method of the location used. If a more precise location is required, we recommend that a registered land surveyor located the borings.

The date shown on the Record indicates the date when the boring was performed.

The designation shown in "Sample No." refers to a sample recovered during exploration; this designation is also used to identify the samples in the laboratory test results.

"N/12" refers to the number of blows of a 140 pound hammer falling 30 inches required to advance the sampler a distance of one foot. Driving resistance values for less than one foot is indicated by a value and the corresponding driving length in inches.

"Sample Type" refers to the following:

"SS" refers to a 2-inch outside diameter (O.D), 1.4-inch inside diameter (I.D.) split barrel sampler. Refusal to penetration is defined as more than 100 blows per foot.

"UD" refers to a 2.42-inch I.D. ring sampler. Refusal to penetration is defined as more than 100 blows per foot.

"AC" refers to a grab sample of auger cuttings.

"γ" refers to the dry unit weight in pounds per cubic foot of a representative portion of the sample as determined in the laboratory.

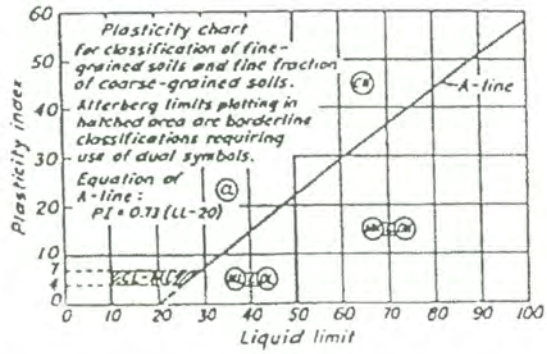
"M" refers to the moisture content as a percentage of the dry soil weight of a representative portion of the sample as determined in the laboratory.

"USC" refers to the classification of the soil as determined by a visual examination of the soil, and in some cases by laboratory tests, according to the Unified Soil Classification System.

Major Divisions			Group Symbols	Typical Names	Classification Criteria
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	Gravels: 50% or more of coarse fraction retained on No. 4 sieve	Clean Gravels	*GW*	Well-graded gravels and gravel-sand mixtures, little or no fines	$C_u = D_{60}/D_{10}$ Greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines	Not meeting both criteria for *GW*
		Gravels with Fines	*GM*	Silty gravels, gravel-sand-silt mixtures	Atterberg limits plot below "A" line or plasticity index less than 4
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits plot above "A" line and plasticity index greater than 7
	Sands: More than 50% of coarse fraction passes No. 4 sieve	Clean Sands	*SW*	Well-graded sands and gravelly sands, little or no fines	$C_u = D_{60}/D_{10}$ Greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3
			SP	Poorly graded sands and gravelly sands, little or no fines	Not meeting both criteria for *SW*
		Sands with Fines	*SM*	Silty sands, sand-silt mixtures	Atterberg limits plot below "A" line or plasticity index less than 4
			SC	Clayey sands, sand-clay mixtures	Atterberg limits plot above "A" line and plasticity index greater than 7
Fine-Grained Soils: 50% or more passes No. 200 sieve	Silts and Clays: Liquid limit 50% or less		*ML*	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
			OL	Organic silts and organic silty clays of low plasticity	
	Silts and Clays: Liquid limit greater than 50%		*MH*	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts	
			CH	Inorganic clays of high plasticity, fat clays	
			OH	Organic clays of medium to high plasticity	
Highly organic soils			*Pt*	Peat, muck and other highly organic soils	Visual-manual identification

Classification on basis of percentage of fines
Less than 5% Pass No. 200 sieve: *GW, GP, SW, SP*
More than 12% Pass No. 200 sieve: *GM, GC, SM, SC*
5% to 12% Pass No. 200 sieve: Borderline classification requiring use of dual symbols

Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols



UNIFIED SOIL CLASSIFICATION SYSTEM

APPENDIX A

GEO-TEST

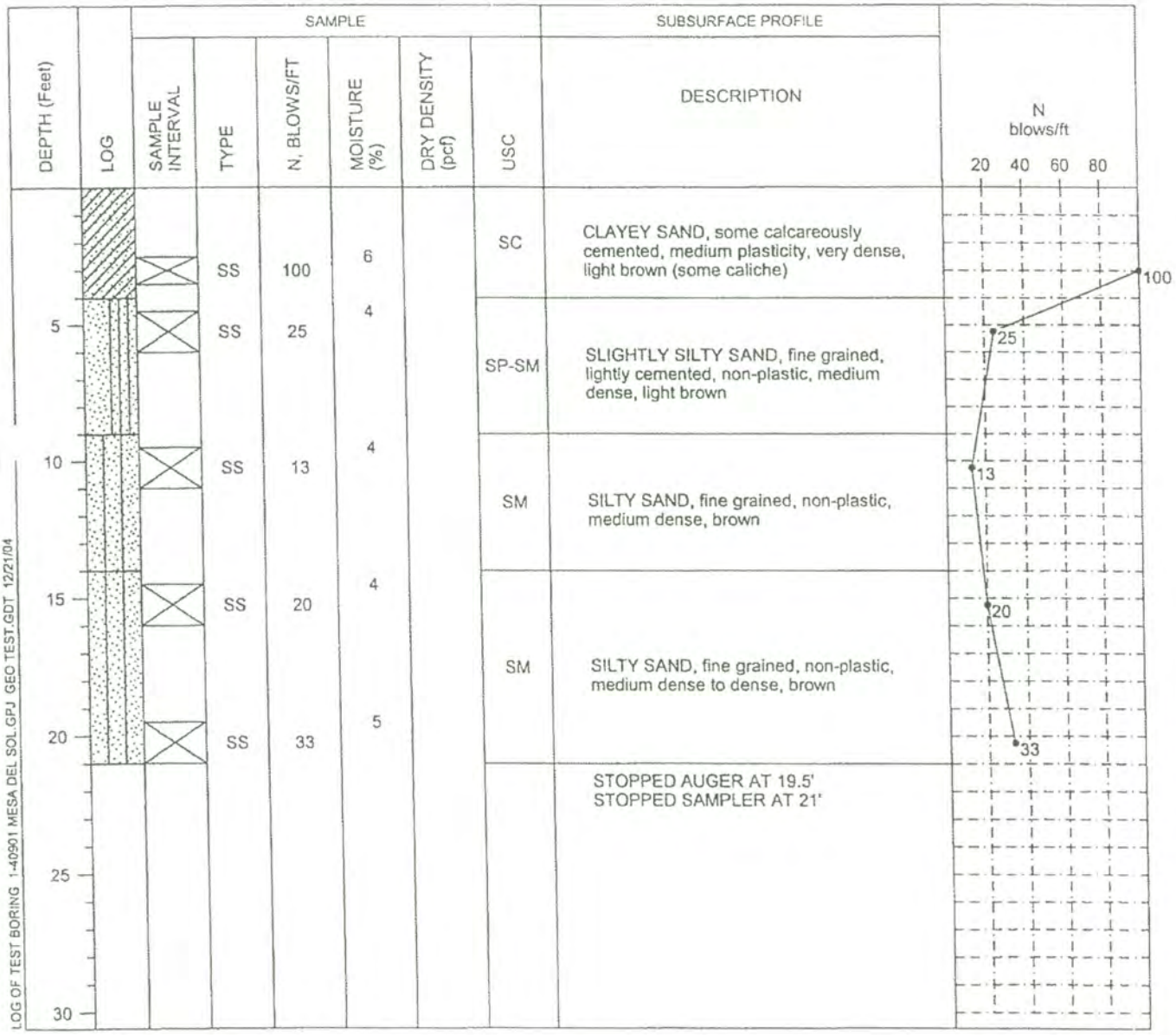
Project: Mesa del Sol
Date: 11/12/2004 Project No: 1-40901
Elevation: Type: 6.25" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 1

During Drilling: None After 24 Hours:



LEGEND

SS - Split Spoon
AC - Auger Cuttings
CAL - Modified California Sampler
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurments were made.

GEO-TEST

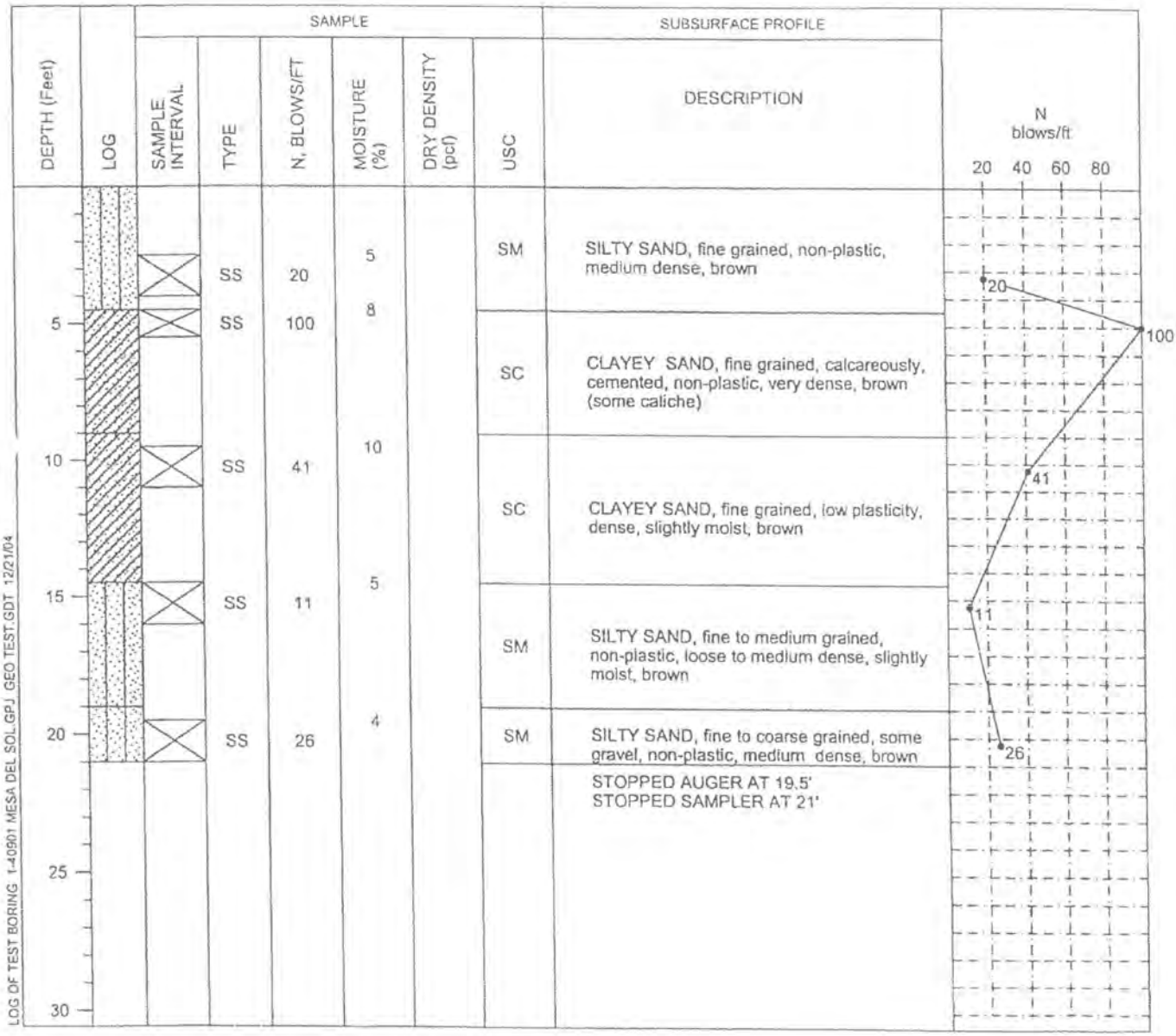
Project: Mesa del Sol
Date: 11/17/2004 Project No: 1-40901
Elevation: Type: 6.25" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 2

During Drilling: None After 24 Hours:



LOG OF TEST BORING 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/21/04

LEGEND

SS - Split Spoon
AC - Auger Cuttings
CAL - Modified California Sampler
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurments were made.

GEO-TEST

Project: Mesa del Sol
Date: 11/16/2004 Project No: 1-40901
Elevation: Type: 6.25" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 3

During Drilling: None After 24 Hours:

DEPTH (Feet)	LOG	SAMPLE INTERVAL	TYPE	N, BLOWS/FT	MOISTURE (%)	DRY DENSITY (pcf)	USC	DESCRIPTION
5			SS	100	6		SC	CLAYEY SAND, fine grained, calcareously cemented, non-plastic, very dense, brown (some caliche)
			SS	50				
10			SS	16	7			
15			SS	23	7		SM	SILTY SAND, fine grained, some cementing, non-plastic, medium dense, brown
20			SS	31	2		SP	SAND, fine to coarse grained, non-plastic, dense, brown
25								STOPPED AUGER AT 19.5' STOPPED SAMPLER AT 21'
30								

LOG OF TEST BORING 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/21/04

LEGEND

SS - Split Spoon
AC - Auger Cuttings
CAL - Modified California Sampler
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurments were made.

GEO-TEST

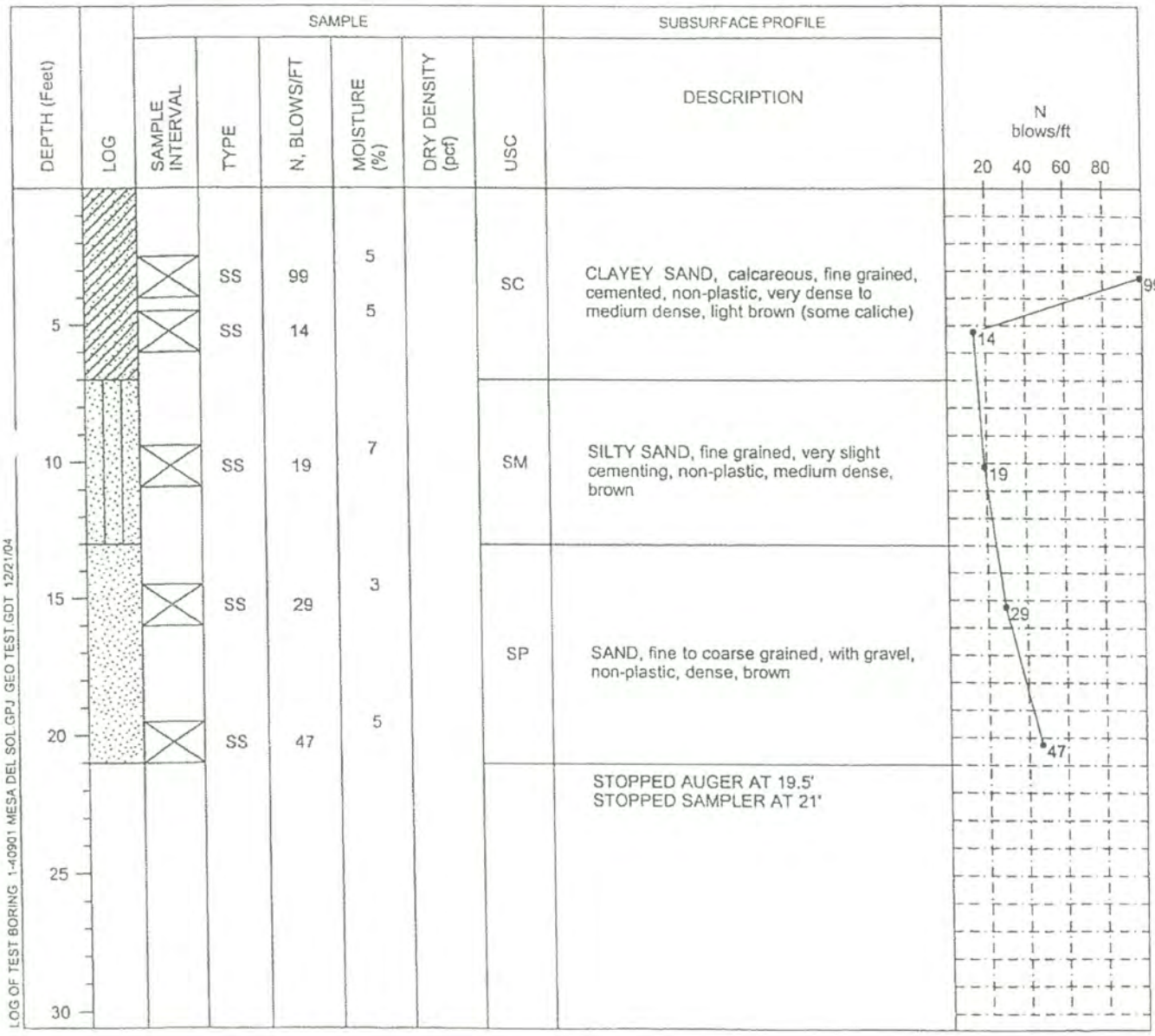
Project: Mesa del Sol
Date: 11/17/2004 Project No: 1-40901
Elevation: Type: 6.25" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 4

During Drilling: None After 24 Hours:



LOG OF TEST BORING 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/21/04

LEGEND

SS - Split Spoon
AC - Auger Cuttings
CAL - Modified California Sampler
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurments were made.

GEO-TEST

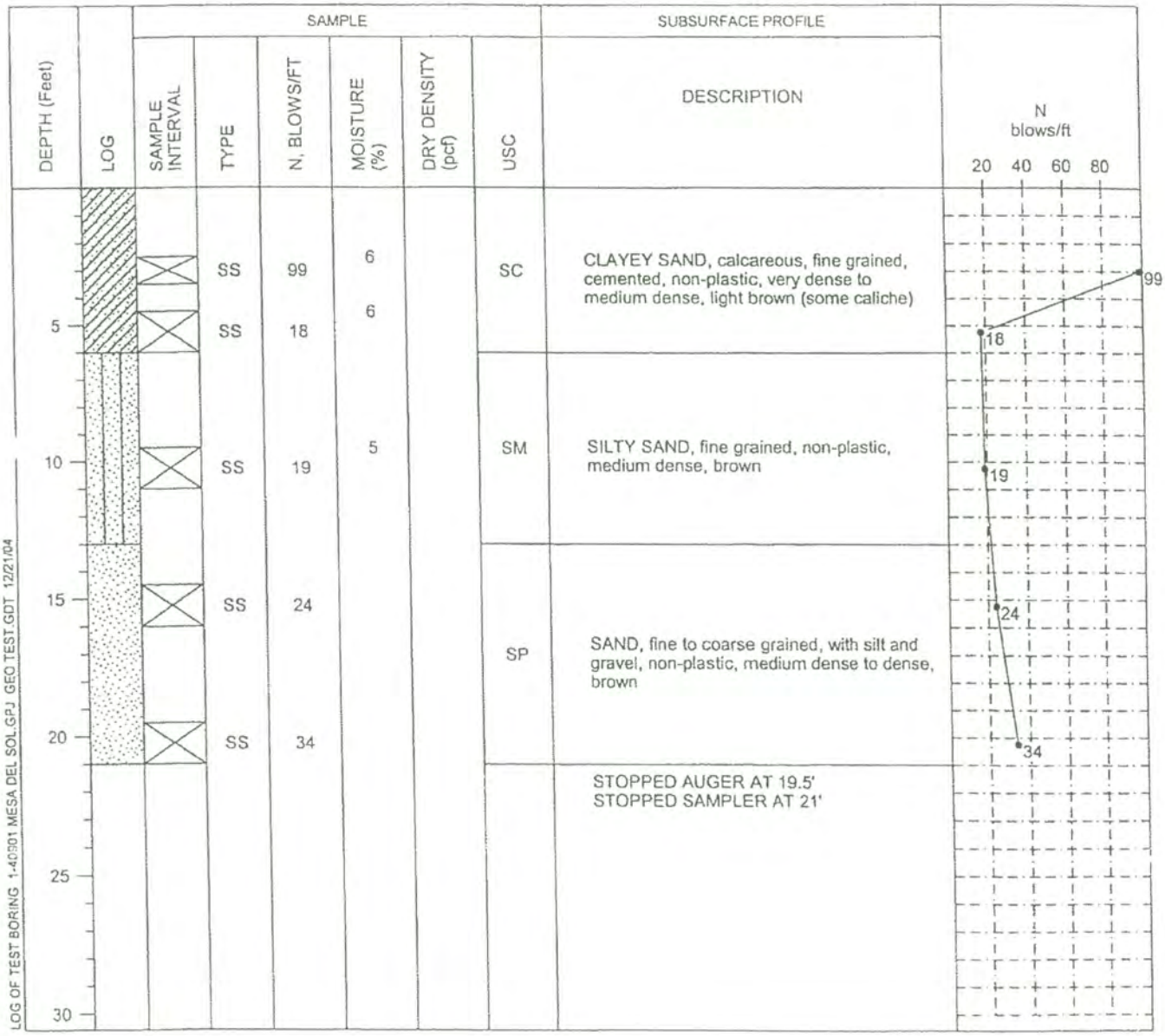
Project: Mesa del Sol
Date: 11/16/2004 Project No: 1-40901
Elevation: Type: 6.25" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 5

During Drilling: None After 24 Hours:



LEGEND

SS - Split Spoon
AC - Auger Cuttings
CAL - Modified California Sampler
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurments were made.

GEO-TEST

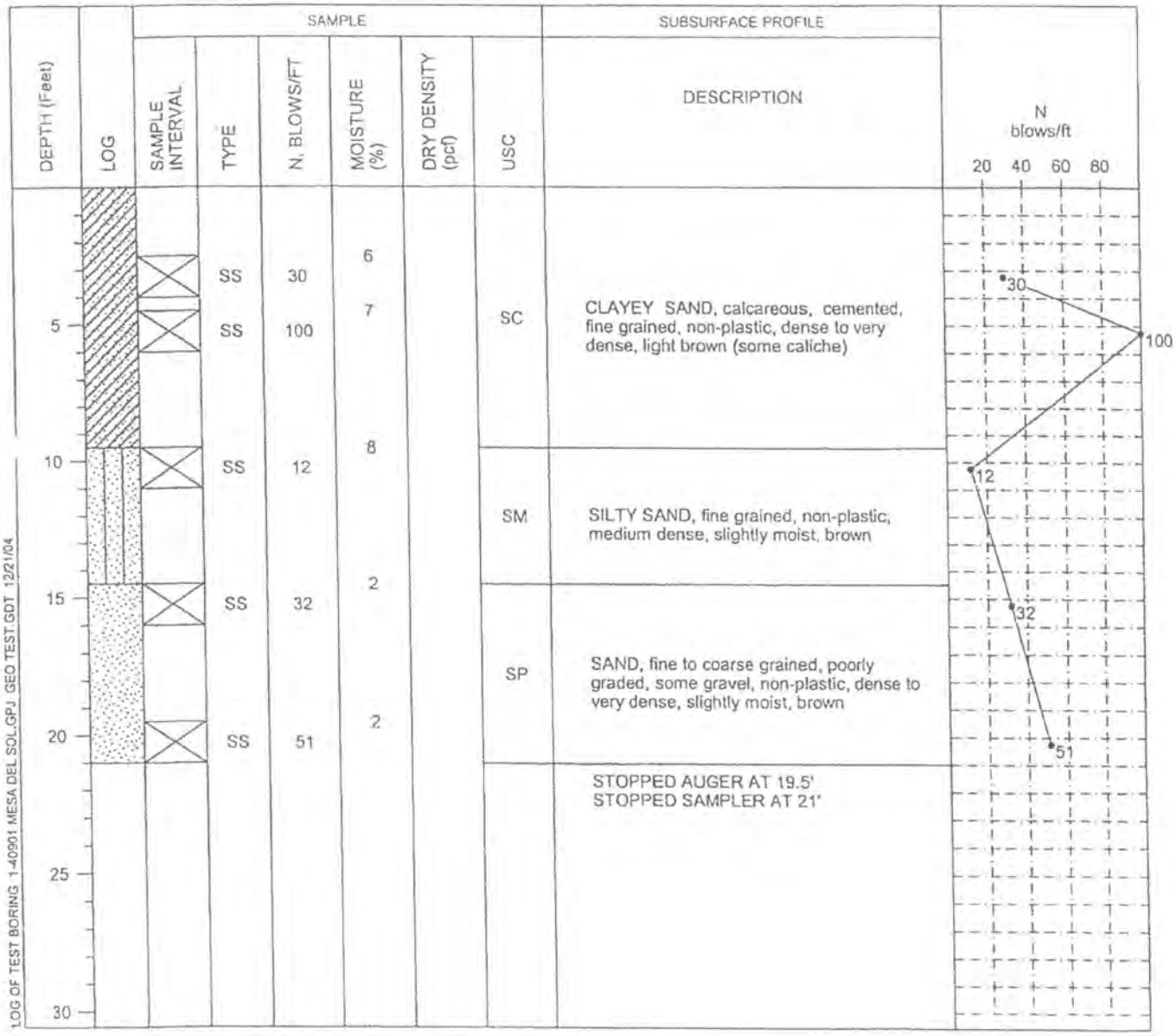
Project: Mesa del Sol
Date: 11/15/2004 Project No: 1-40901
Elevation: Type: 5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 6

During Drilling: None After 24 Hours:



LOG OF TEST BORING 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/21/04

LEGEND

SS - Split Spoon
AC - Auger Cuttings
CAL - Modified California Sampler
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurments were made.

GEO-TEST

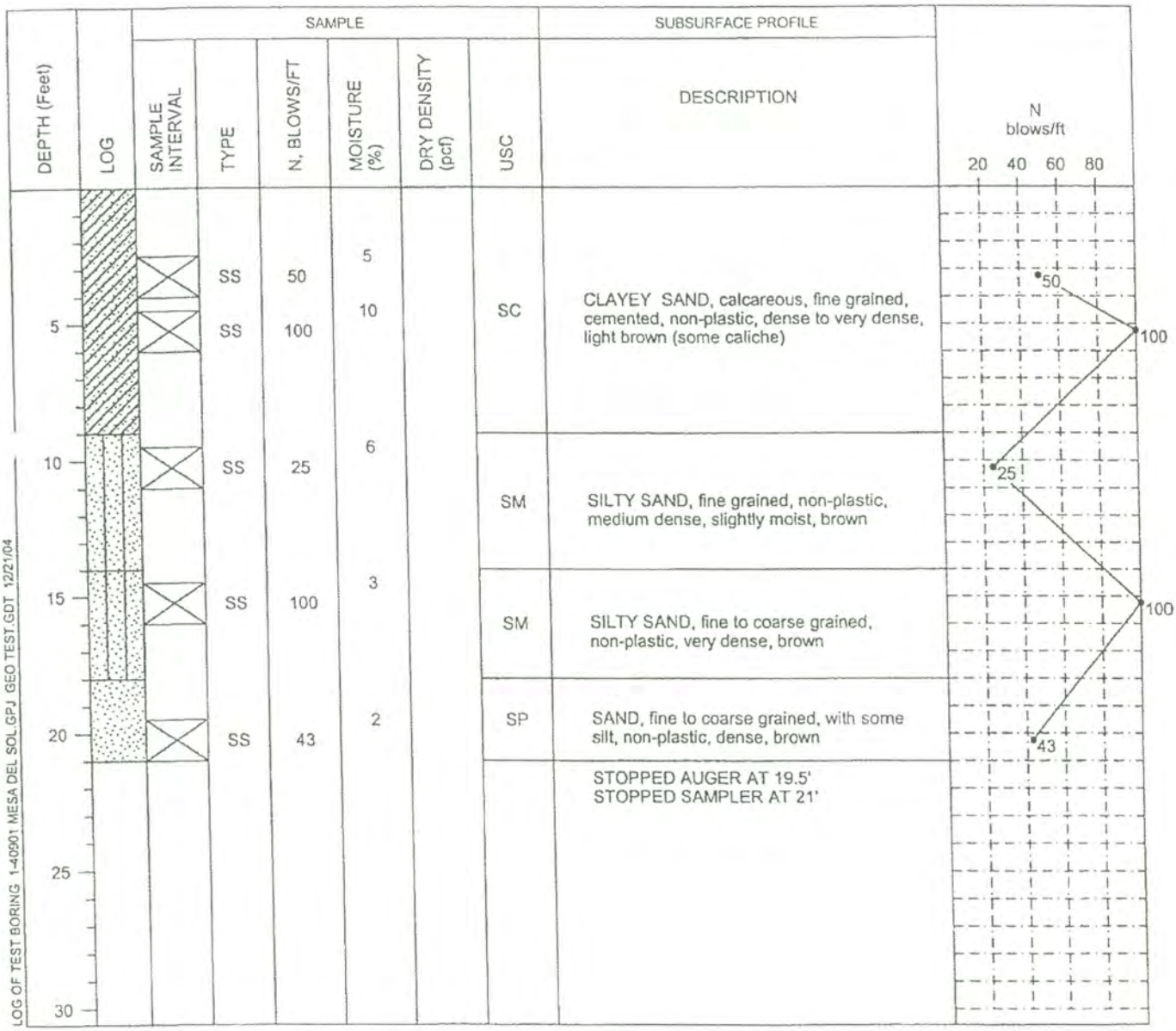
Project: Mesa del Sol
Date: 11/15/2004 Project No: 1-40901
Elevation: Type: 5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 7

During Drilling: None After 24 Hours:



LEGEND

SS - Split Spoon
AC - Auger Cuttings
CAL - Modified California Sampler
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurments were made.

GEO-TEST

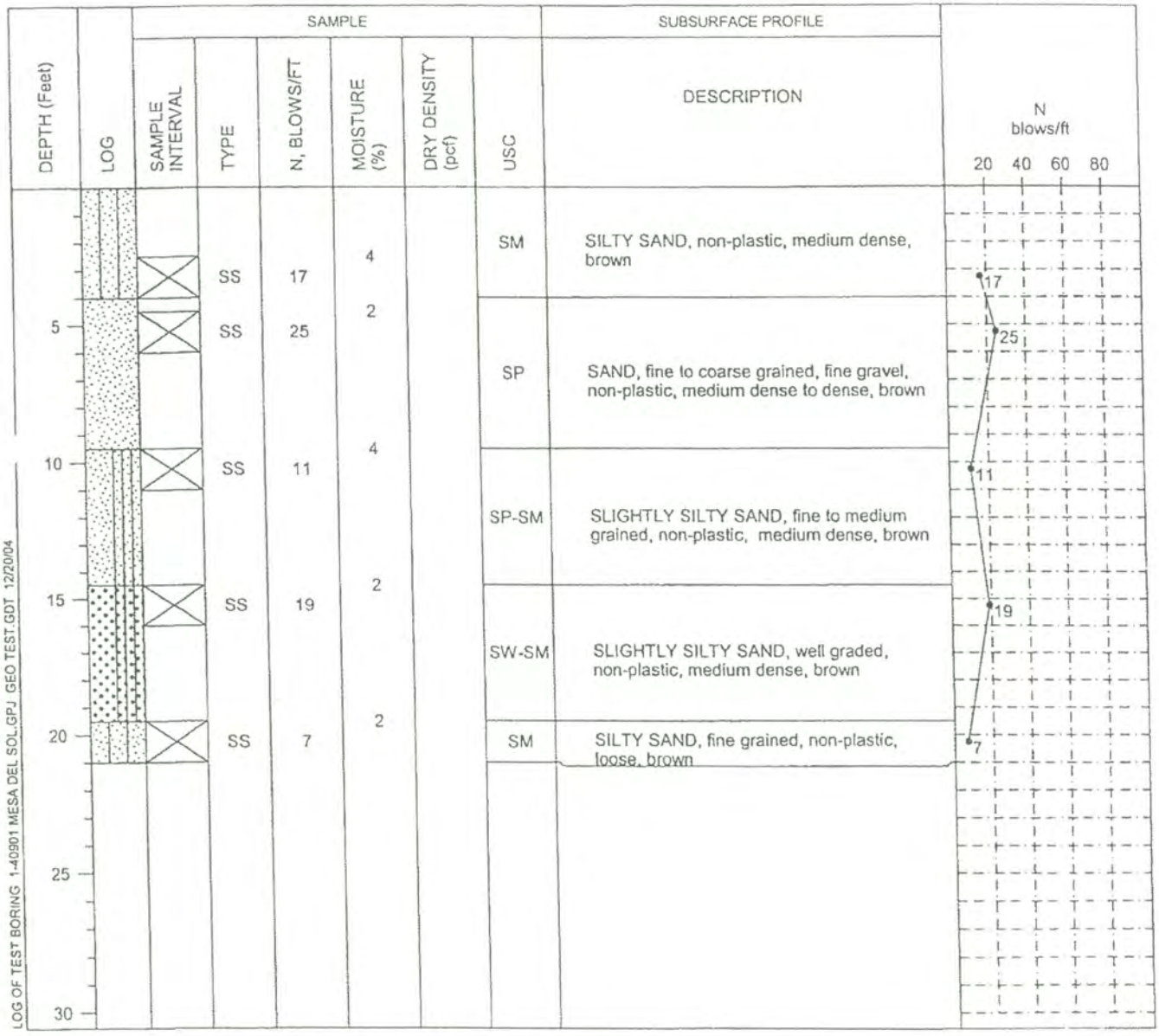
Project: Mesa del Sol
Date: 12/13/2004 Project No: 1-40901
Elevation: Type: 5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 8

During Drilling: None After 24 Hours:



LOG OF TEST BORING 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/20/04

LEGEND

SS - Split Spoon
AC - Auger Cuttings
CAL - Modified California Sampler
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurments were made.

APPENDIX B

Borehole	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	Class-ification	Water Content (%)	Dry Density (pcf)	Falling Perm (cm/sec)	Specific Gravity
1	2.5	33	19	14	9.5	20	SC	5.7			
1	4.5							3.8			
1	9.5	NP	NP	NP	9.5	12	SP-SM	3.7			
1	14.5							4.2			
1	19.5	NP	NP	NP	9.5	18	SM	4.8			
2	2.5							4.8			
2	4.5	38	18	20	19	21	SC	8.0			
2	9.5							10.2			
2	14.5	NP	NP	NP	9.5	18	SM	4.8			
2	19.5							3.5			
3	2.5	31	19	12	9.5	25	SC	6.0			
3	9.5	31	15	16	12.5	23	SC	6.8			
3	14.5							6.9			
3	19.5							1.9			
4	2.5							5.1			
4	4.5	34	17	17	9.5	20	SC	5.1			
4	9.5							7.3			
4	14.5	NP	NP	NP	12.5	6	SP-SM	3.1			
4	19.5							5.1			
5	2.5	30	16	14	9.5	30	SC	5.8			
5	4.5							5.5			
5	9.5	NP	NP	NP	9.5	14	SM	4.8			
6	2.5							6.0			
6	4.5	40	23	17	9.5	20	SC	6.5			
6	9.5							7.8			
6	14.5	NP	NP	NP	19	1	SP	2.3			
6	19.5							2.1			
7	2.5	28	17	11	12.5	28	SC	4.7			
7	4.5							9.6			
7	9.5	NP	NP	NP	12.5	19	SM	6.3			
7	14.5							2.7			
7	19.5							2.2			
8	2.5	NP	NP	NP	9.5	14	SM	4.2			
8	4.5	NP	NP	NP	19	3	SP	1.6			
8	9.5	NP	NP	NP	9.2	17	SM	4.2			
8	14.5	NP	NP	NP	19	6	SP-SM	1.7			
8	19.5	NP	NP	NP	9.5	6	SW-SM	1.7			

GEO-TEST

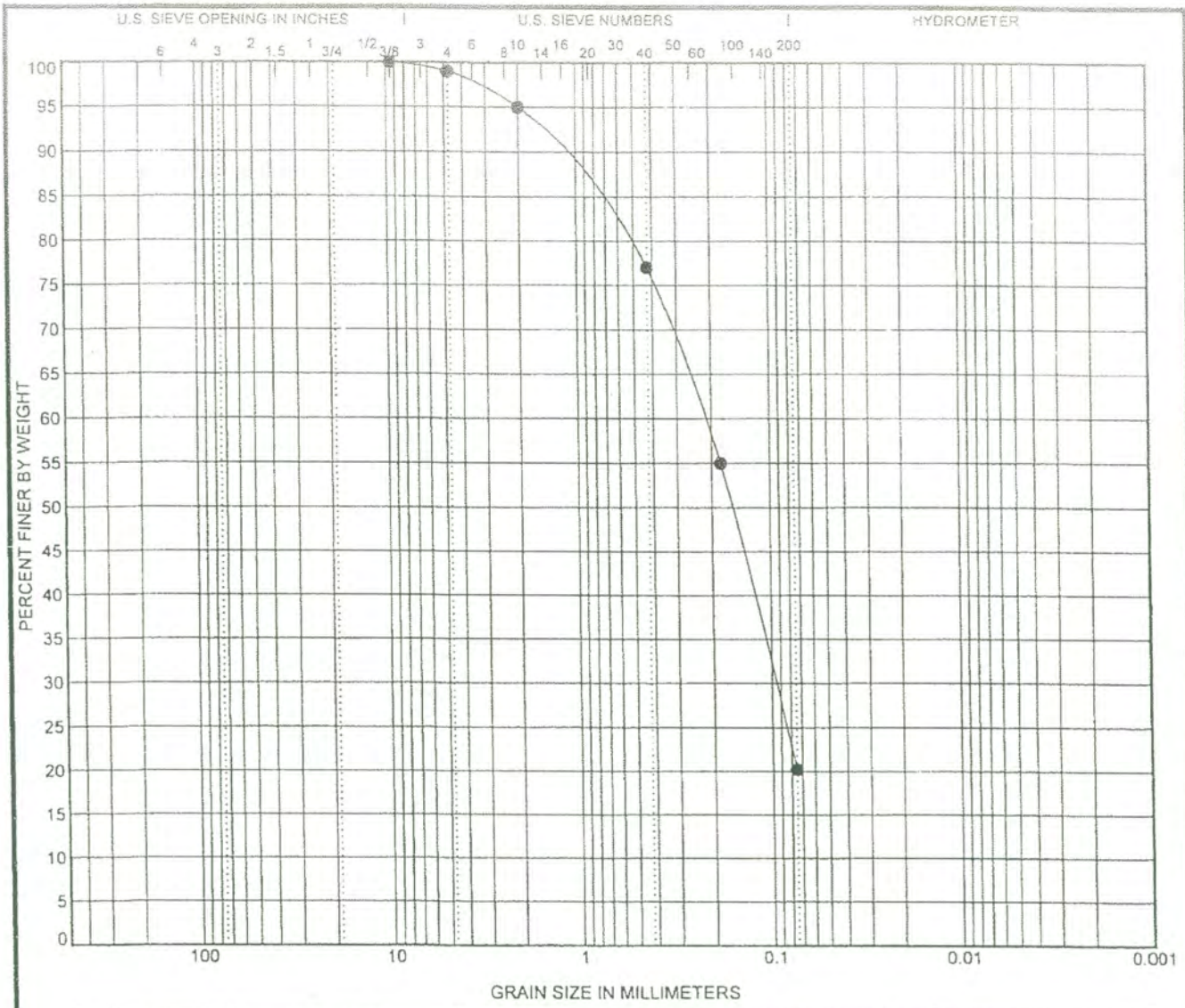
Summary of Laboratory Results

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US LAB SUMMARY 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/20/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	1	2.5	CLAYEY SAND(SC)	33	19	14		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	1	2.5	9.5	0.219	0.096		1.0	78.8	20.2	

GEO-TEST

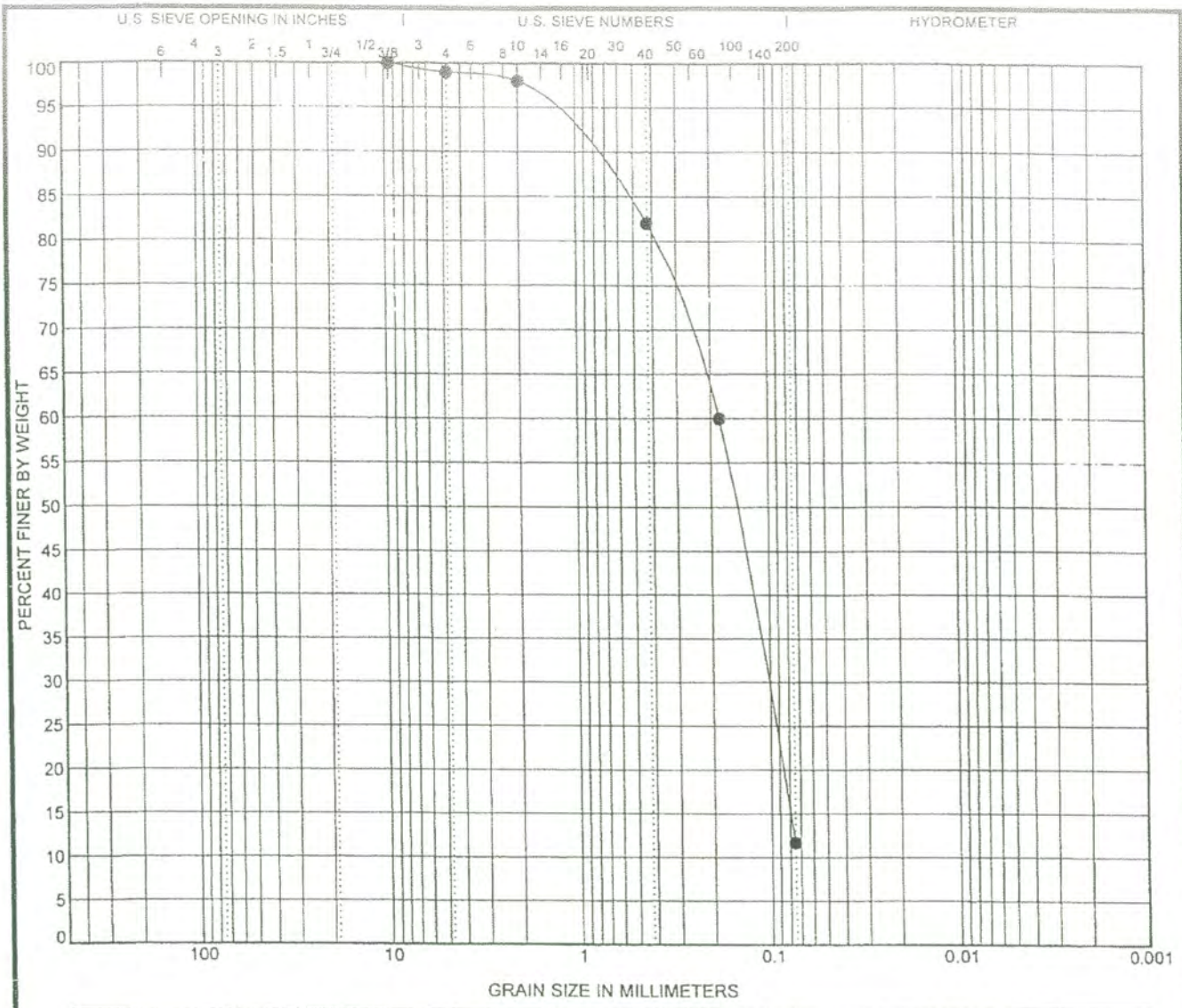
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/8/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	1	9.5	POORLY GRADED SAND with SILT(SP-SM)	NP	NP	NP	0.83	2.48

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	1	9.5	9.5	0.18	0.105		1.0	87.3	11.7	

GEO-TEST

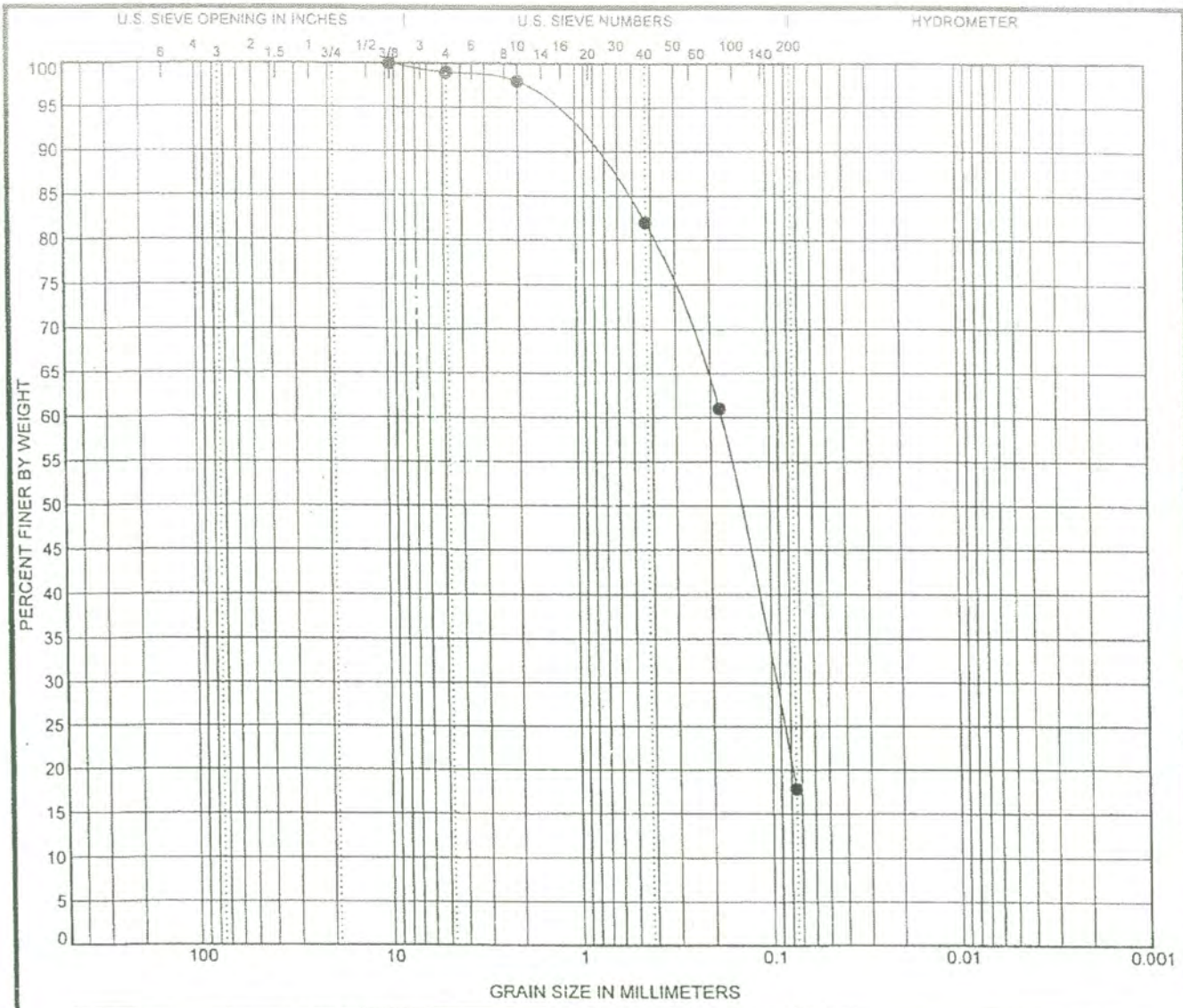
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/8/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	1	19.5	SILTY SAND(SM)	NP	NP	NP		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	1	19.5	9.5	0.176	0.096		1.0	81.2	17.8	

GEO-TEST

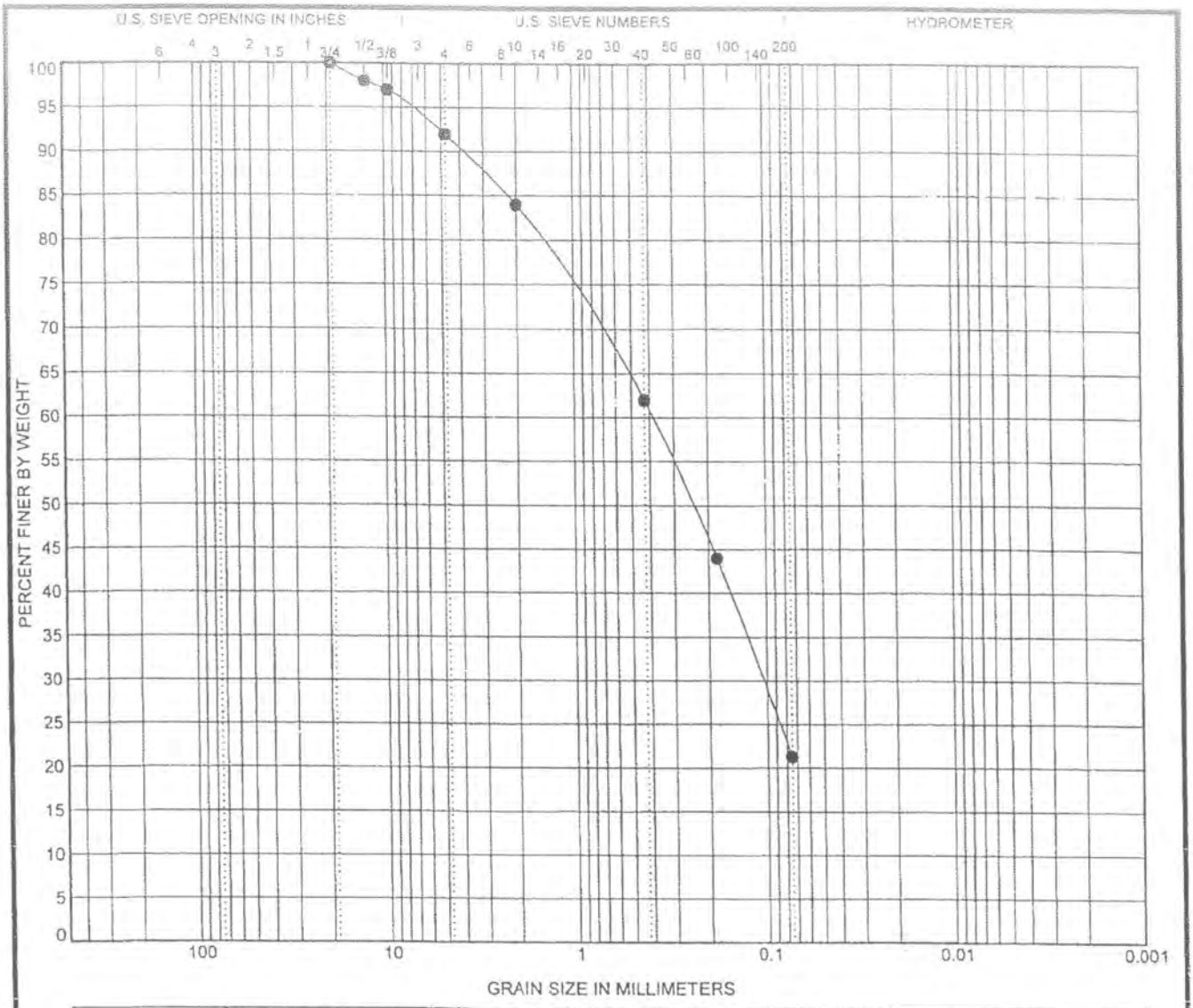
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/8/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	2	4.5	CLAYEY SAND(SC)	38	18	20		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	2	4.5	19	0.386	0.105		8.0	70.7	21.3	

GEO-TEST

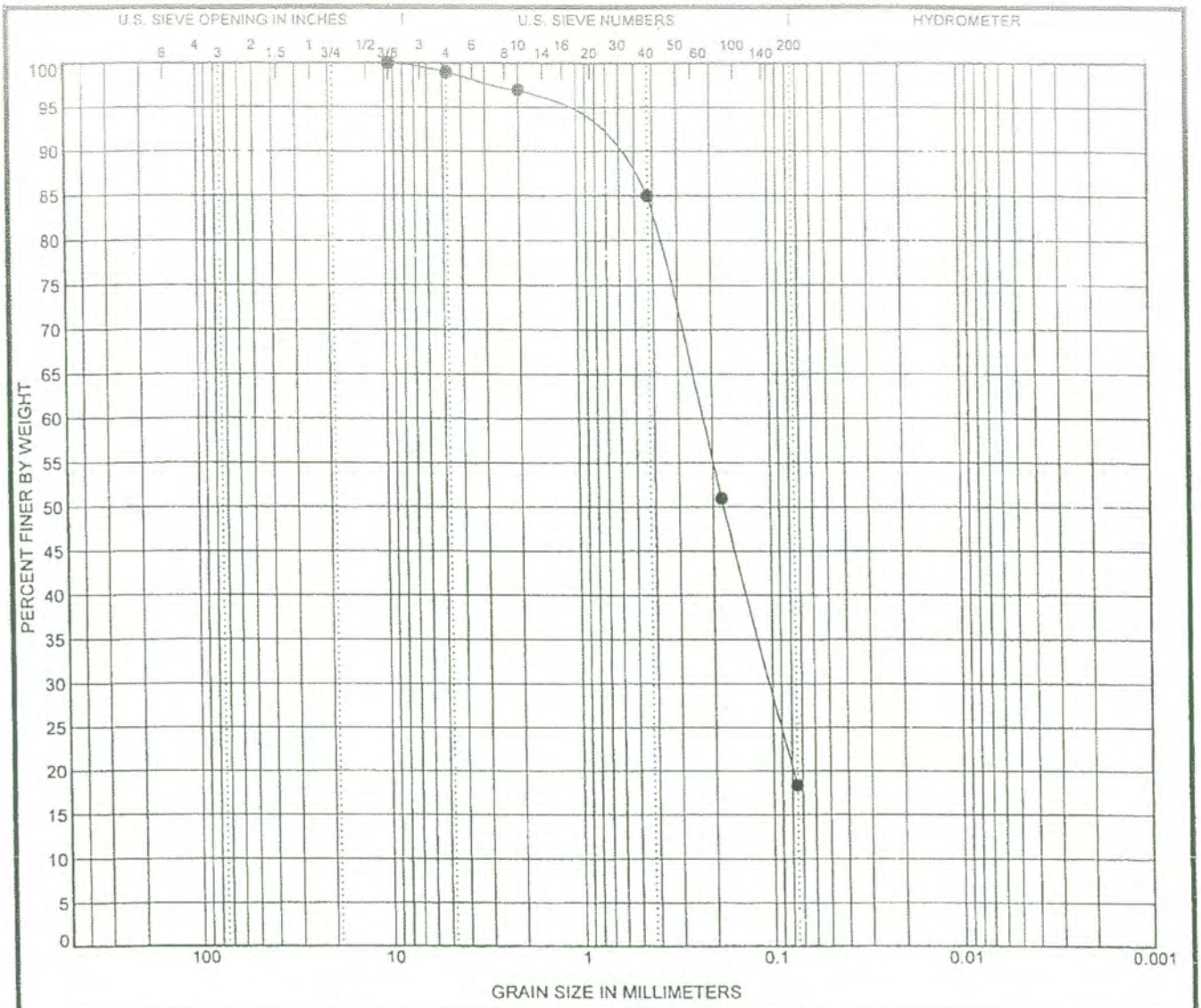
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO_TEST.GDT 12/8/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	2	14.5	SILTY SAND(SM)	NP	NP	NP		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	2	14.5	9.5	0.226	0.102		1.0	80.6	18.4	

GEO-TEST

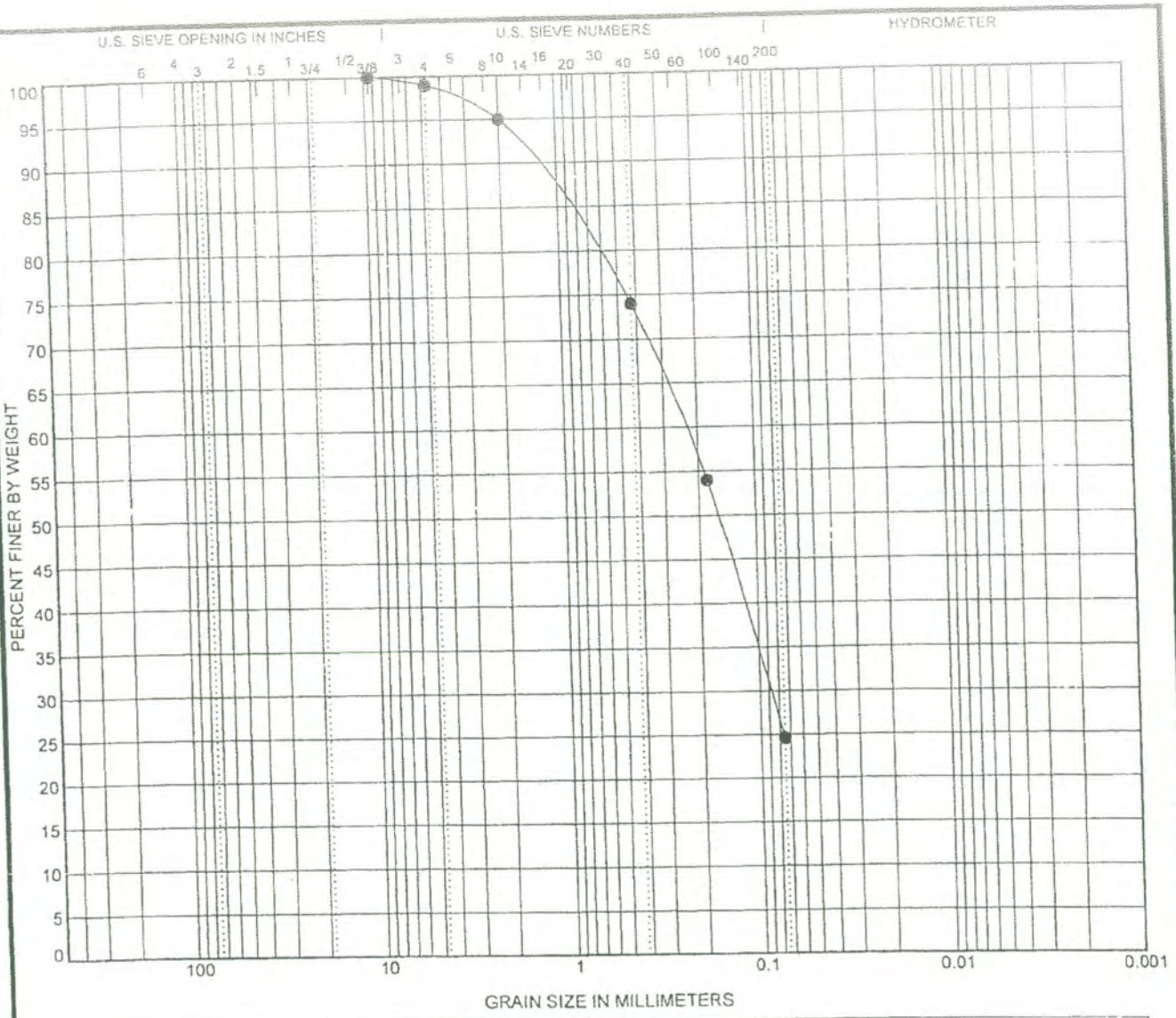
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/8/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	3	2.5	CLAYEY SAND(SC)	31	19	12		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	3	2.5	9.5	0.233	0.088		1.0	74.4	24.6	

GEO-TEST

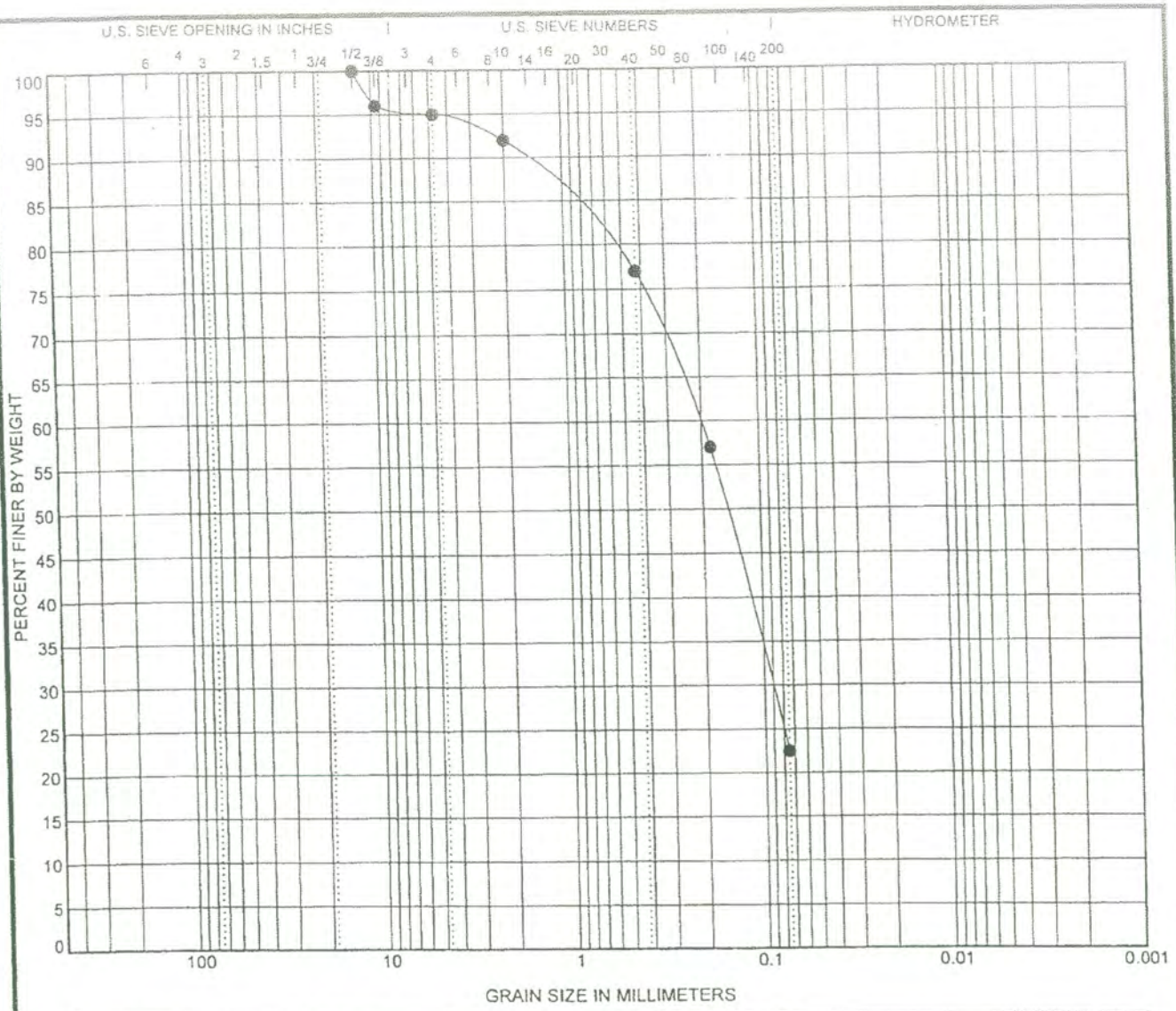
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/8/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	3	9.5	CLAYEY SAND(SC)	31	15	16		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	3	9.5	12.5	0.205	0.091		5.0	72.5	22.5	

GEO-TEST

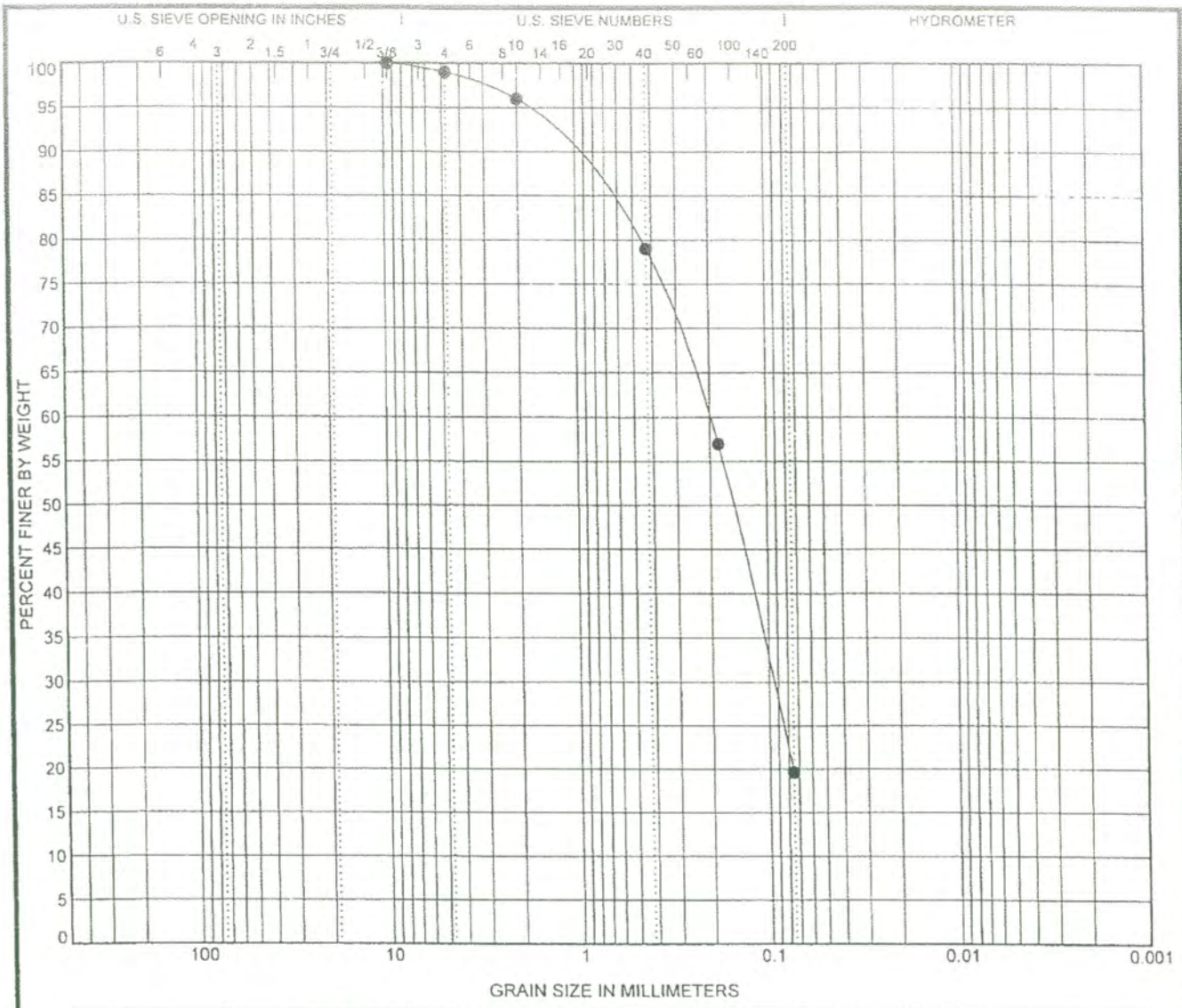
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL GPJ GEO TEST.GDT 12/8/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	4	4.5	CLAYEY SAND(SC)	34	17	17		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	4	4.5	9.5	0.202	0.096		1.0	79.4	19.6	

GEO-TEST

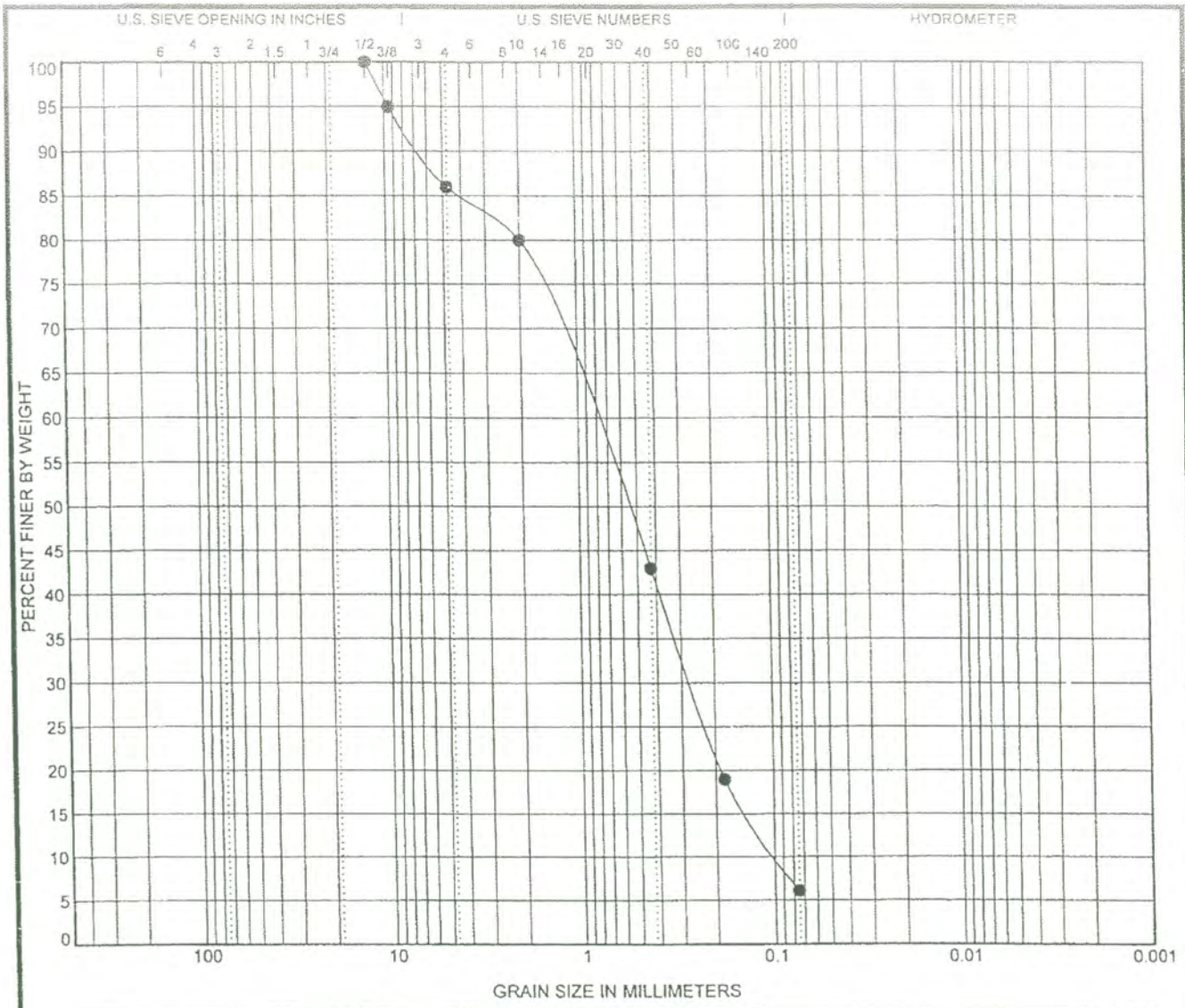
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/8/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● 4	14.5	POORLY GRADED SAND with SILT(SP-SM)	NP	NP	NP	0.84	8.86

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 4	14.5	12.5	0.866	0.267	0.098	14.0	79.9	6.1	

GEO-TEST

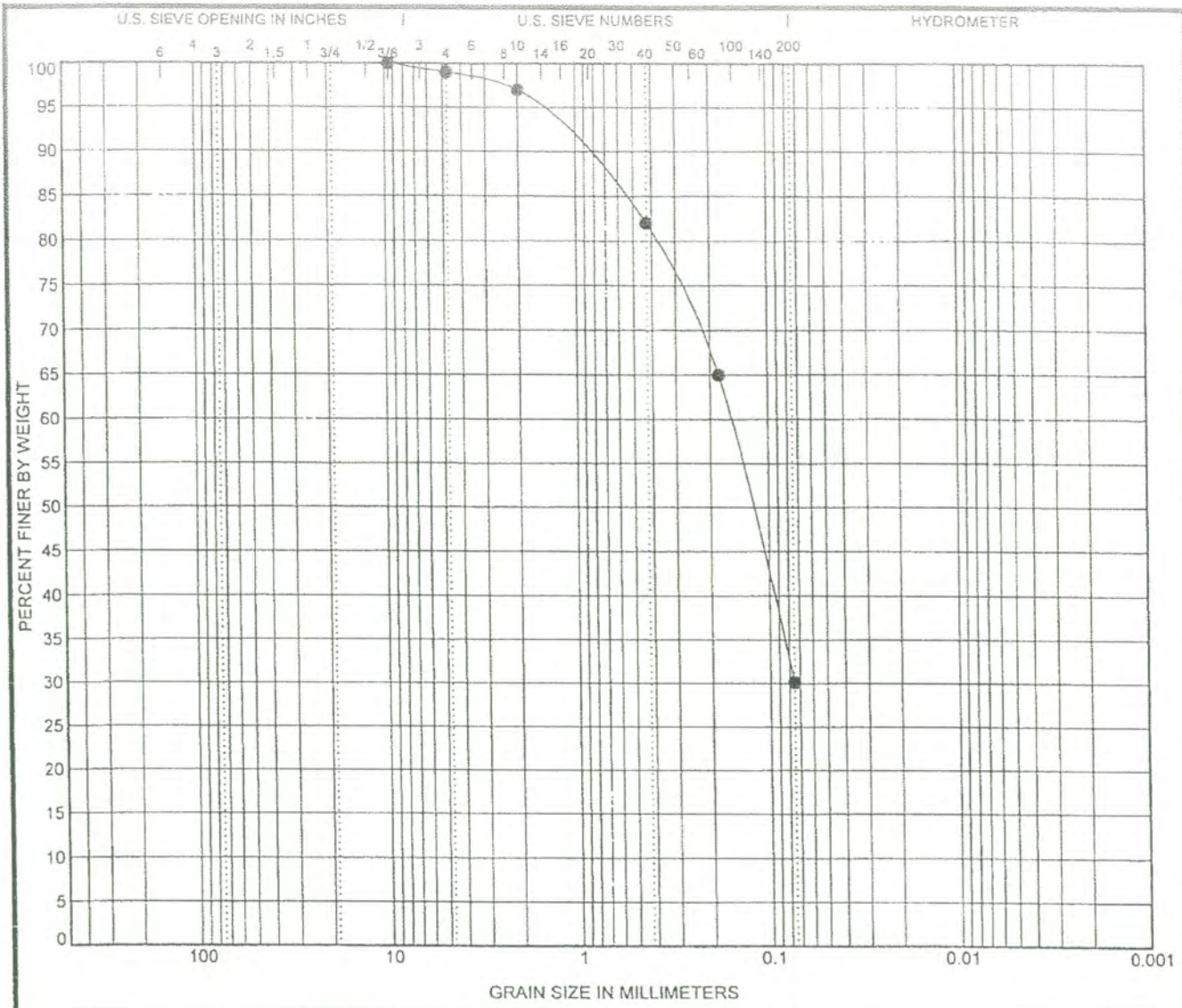
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/8/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	5	2.5	CLAYEY SAND(SC)	30	16	14		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	5	2.5	9.5	0.159			1.0	68.9	30.1	

GEO-TEST

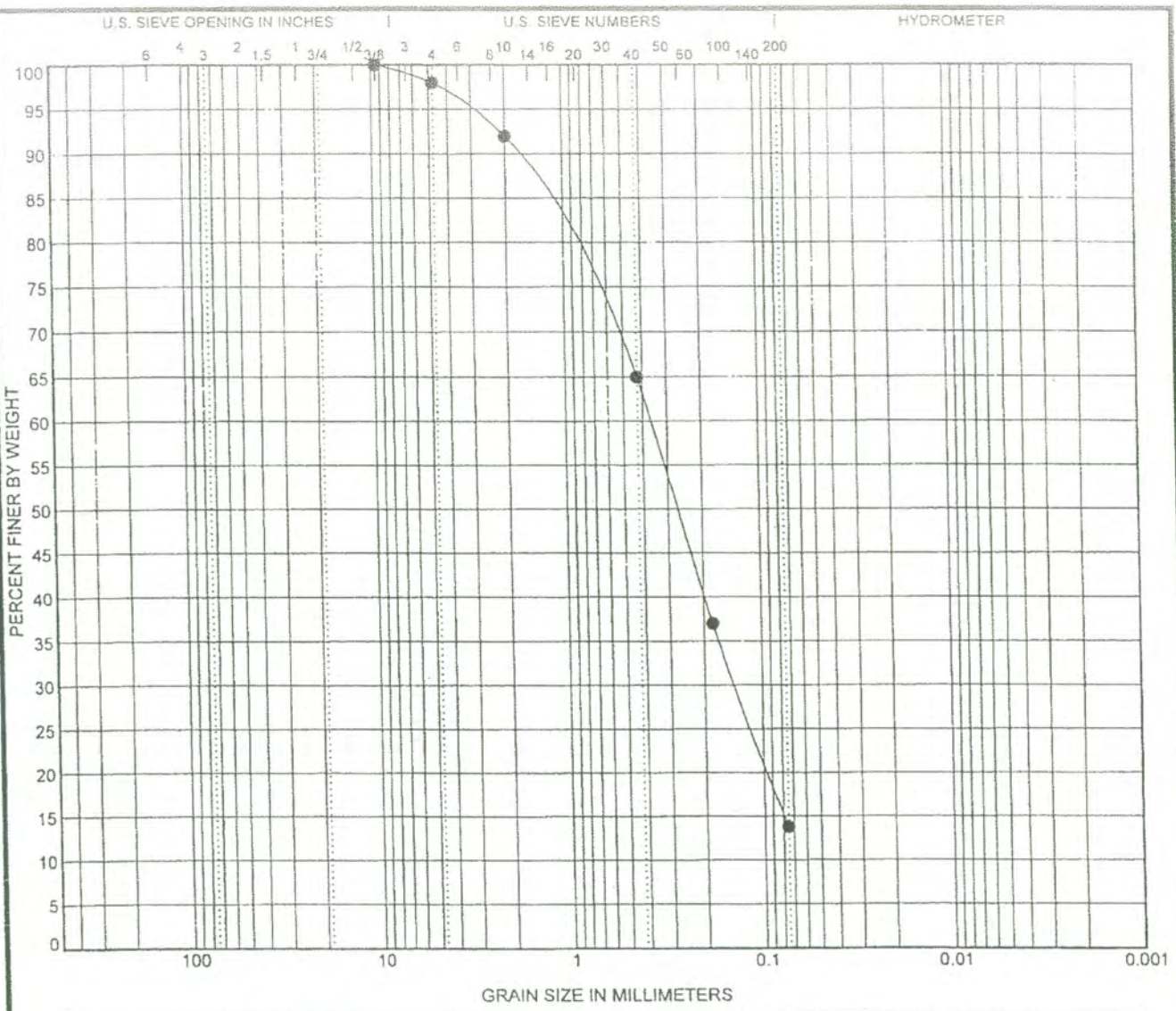
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/8/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	5	9.5	SILTY SAND(SM)	NP	NP	NP		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	5	9.5	9.5	0.365	0.138		2.0	84.2	13.8	

GEO-TEST

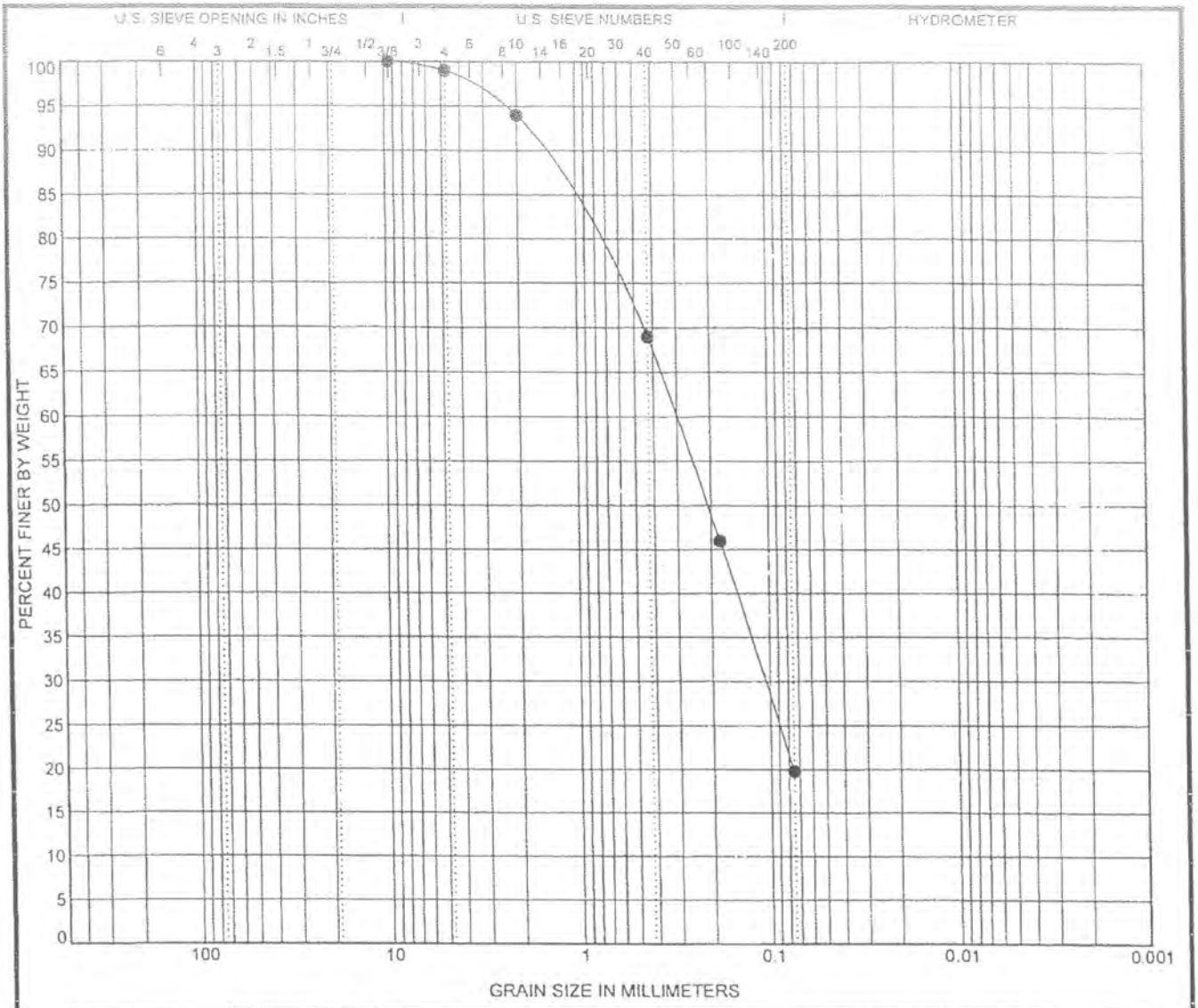
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/8/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	6	4.5	CLAYEY SAND(SC)	40	23	17		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	6	4.5	9.5	0.304	0.105		1.0	79.2	19.8	

GEO-TEST

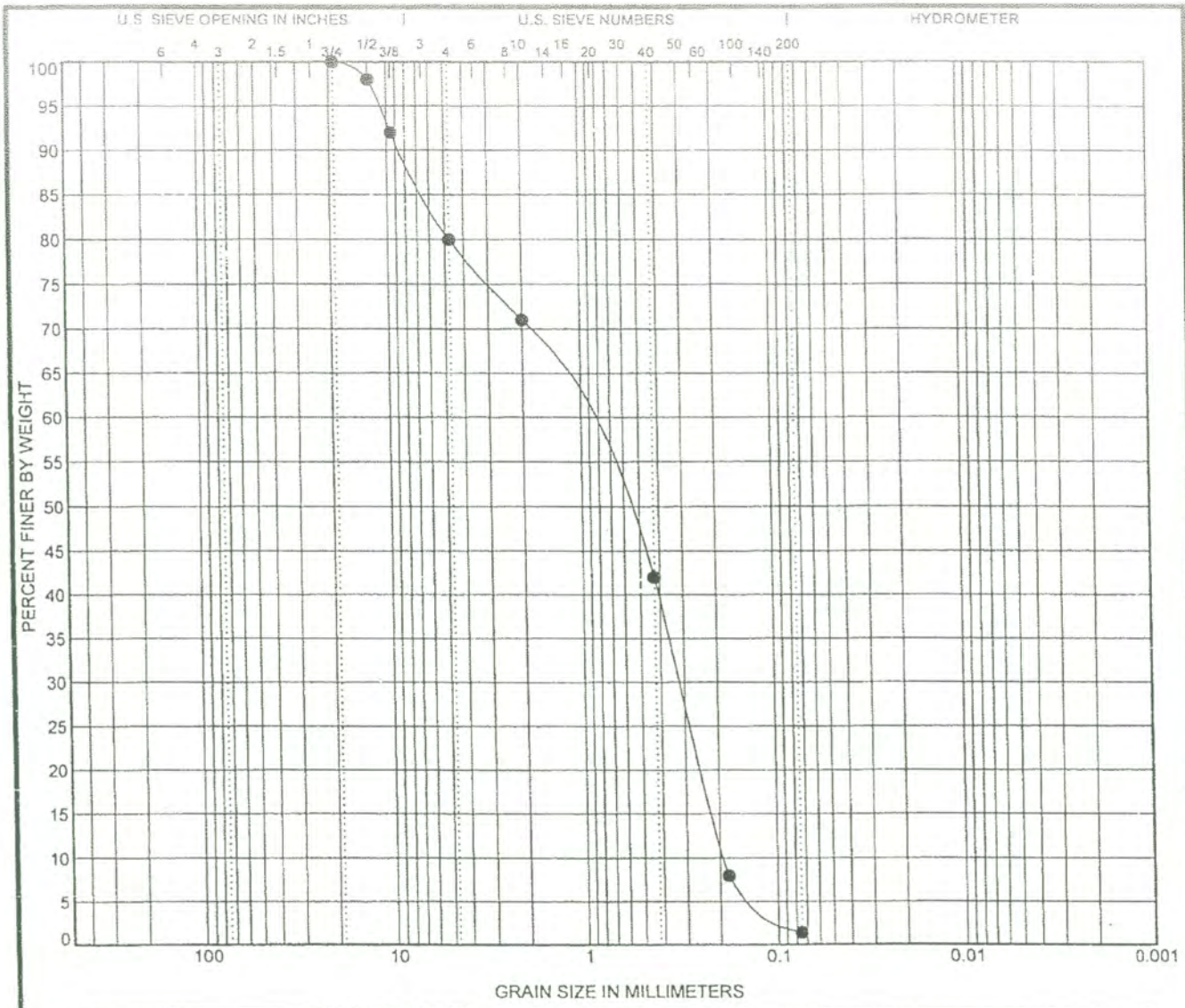
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/8/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	6	14.5	POORLY GRADED SAND with GRAVEL(SP)	NP	NP	NP	0.47	5.87

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	6	14.5	19	1.111	0.314	0.189	20.0	78.6	1.4	

GEO-TEST

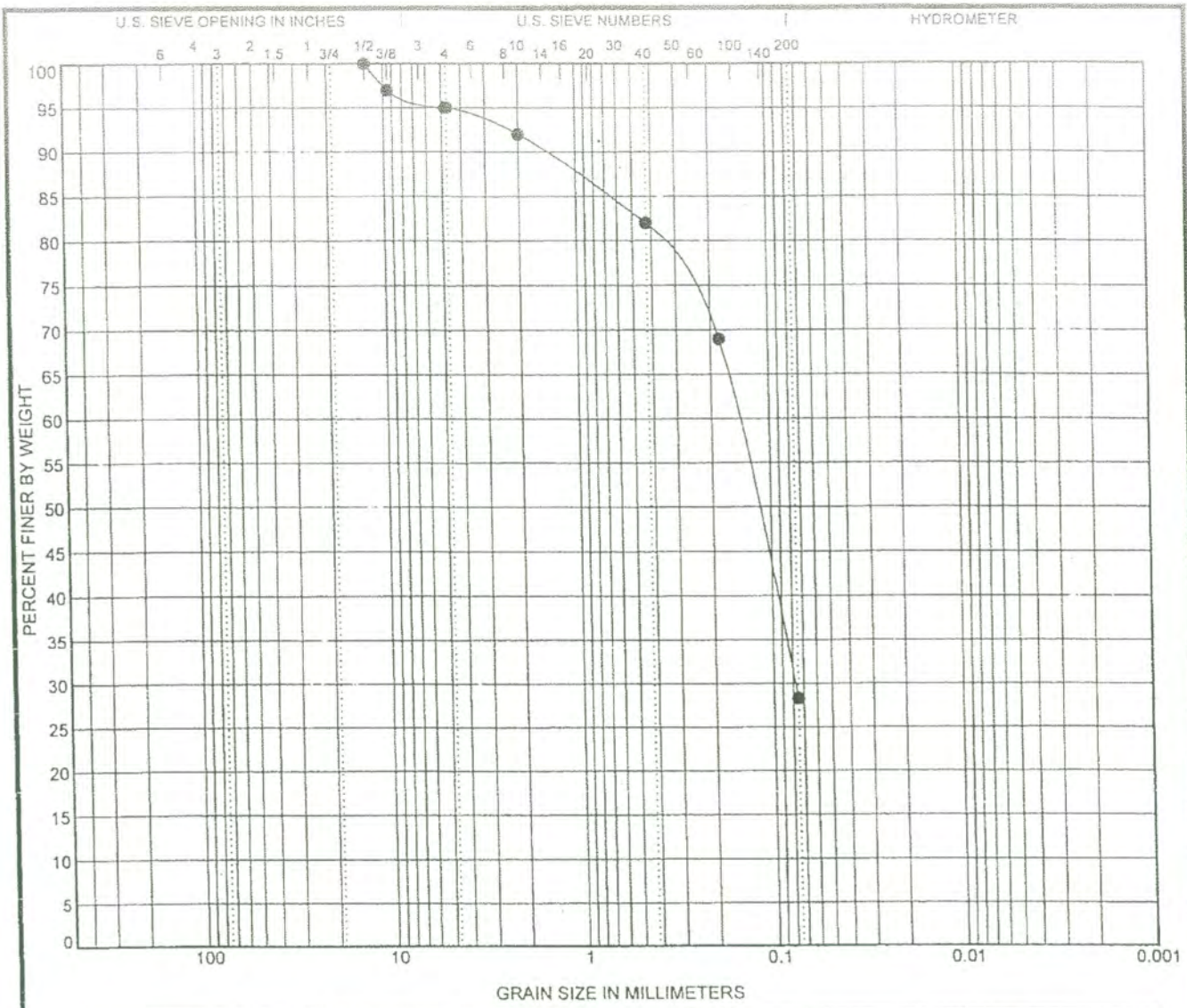
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/8/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	7	2.5	CLAYEY SAND(SC)	28	17	11		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	7	2.5	12.5	0.148	0.078		5.0	66.7	28.3	

GEO-TEST

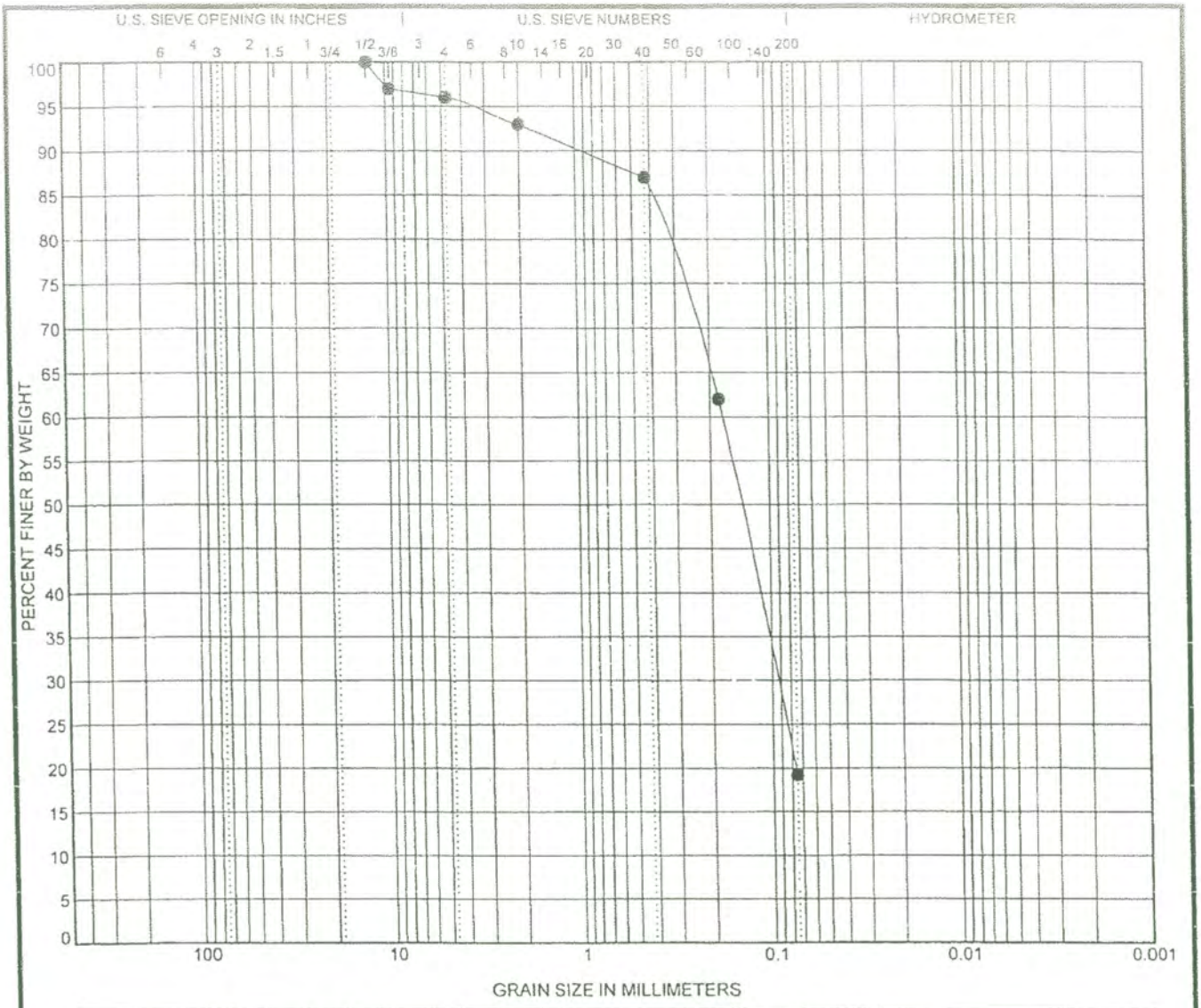
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/8/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	7	9.5	SILTY SAND(SM)	NP	NP	NP		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	7	9.5	12.5	0.173	0.094		4.0	76.8	19.2	

GEO-TEST

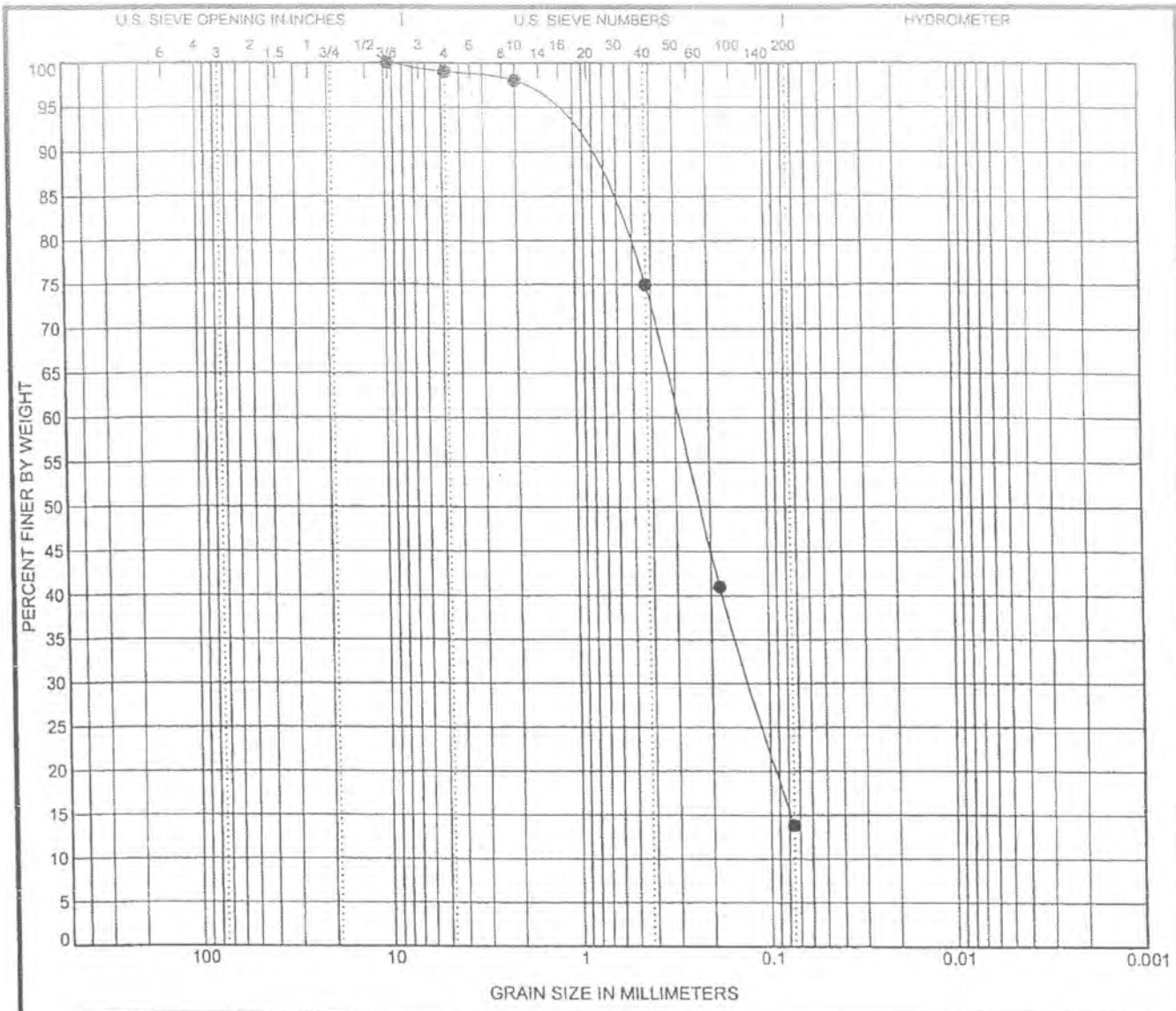
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/8/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	8	2.5	SILTY SAND(SM)	NP	NP	NP		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	8	2.5	9.5	0.291	0.126		1.0	85.2	13.8	

GEO-TEST

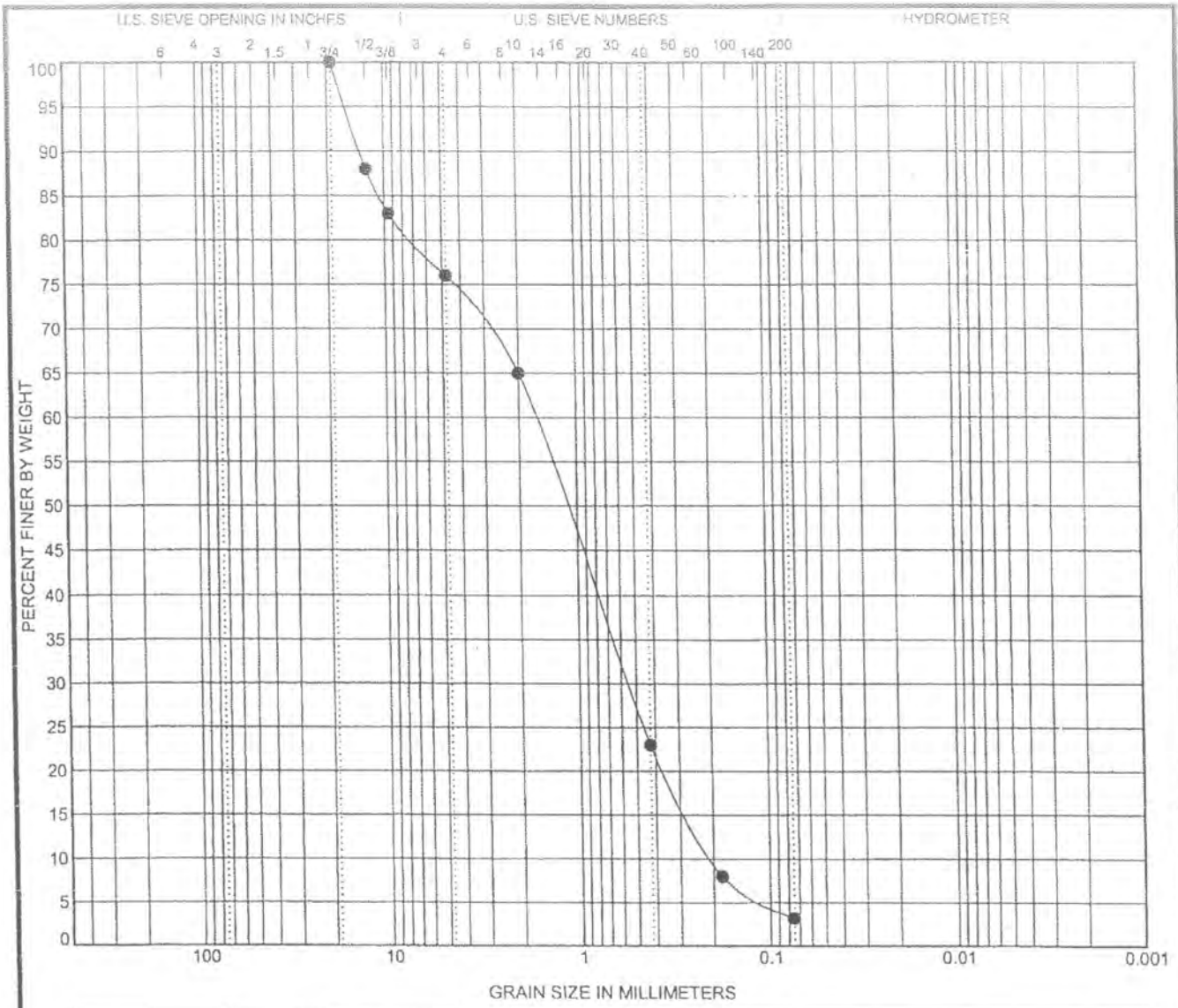
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/17/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	8	4.5	POORLY GRADED SAND with GRAVEL(SP)	NP	NP	NP	0.90	8.24

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	8	4.5	19	1.663	0.55	0.202	24.0	72.8	3.2	

GEO-TEST

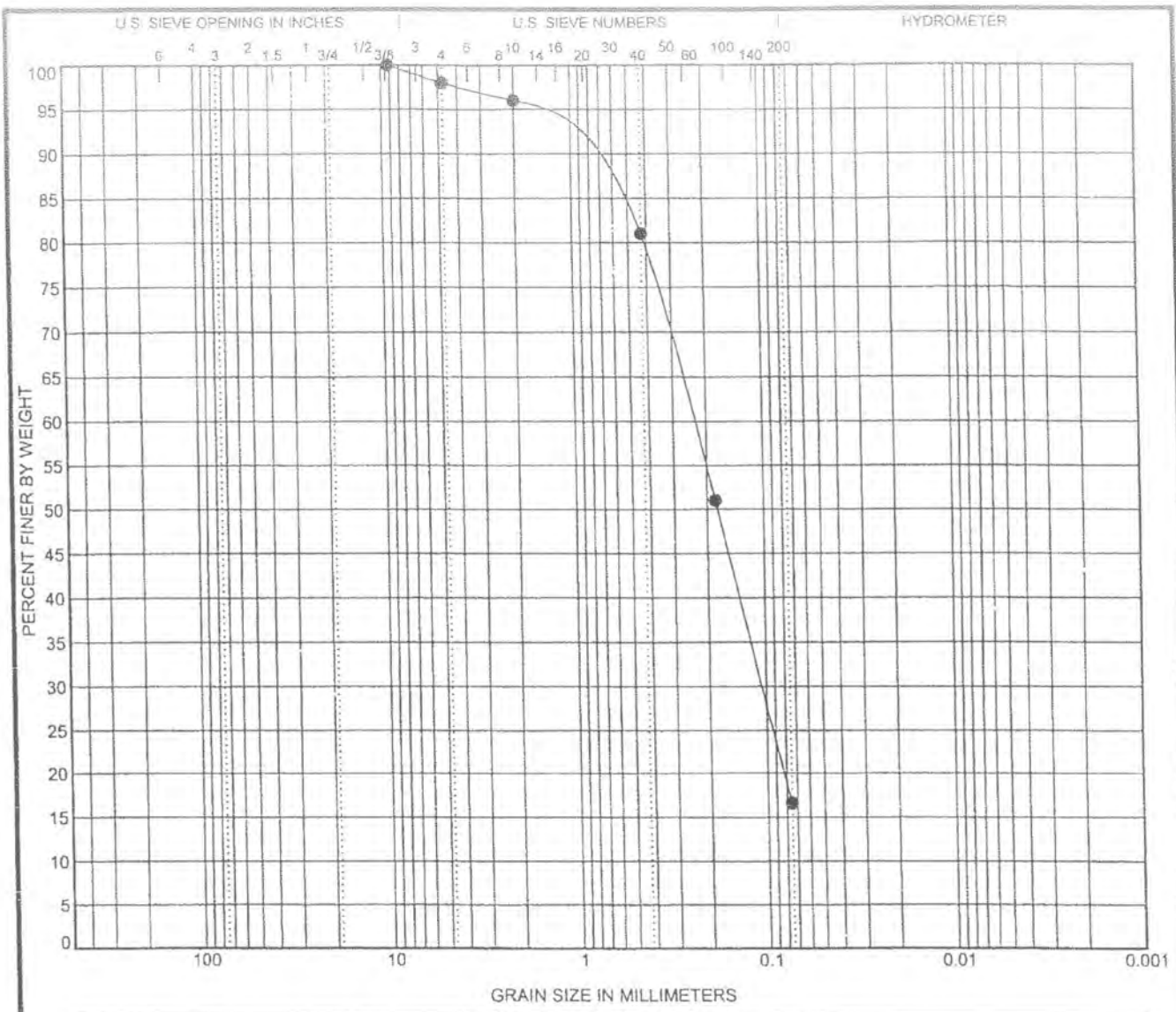
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/17/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	8	9.5	SILTY SAND(SM)	NP	NP	NP		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	8	9.5	9.2	0.233	0.105		2.0	81.4	16.6	

GEO-TEST

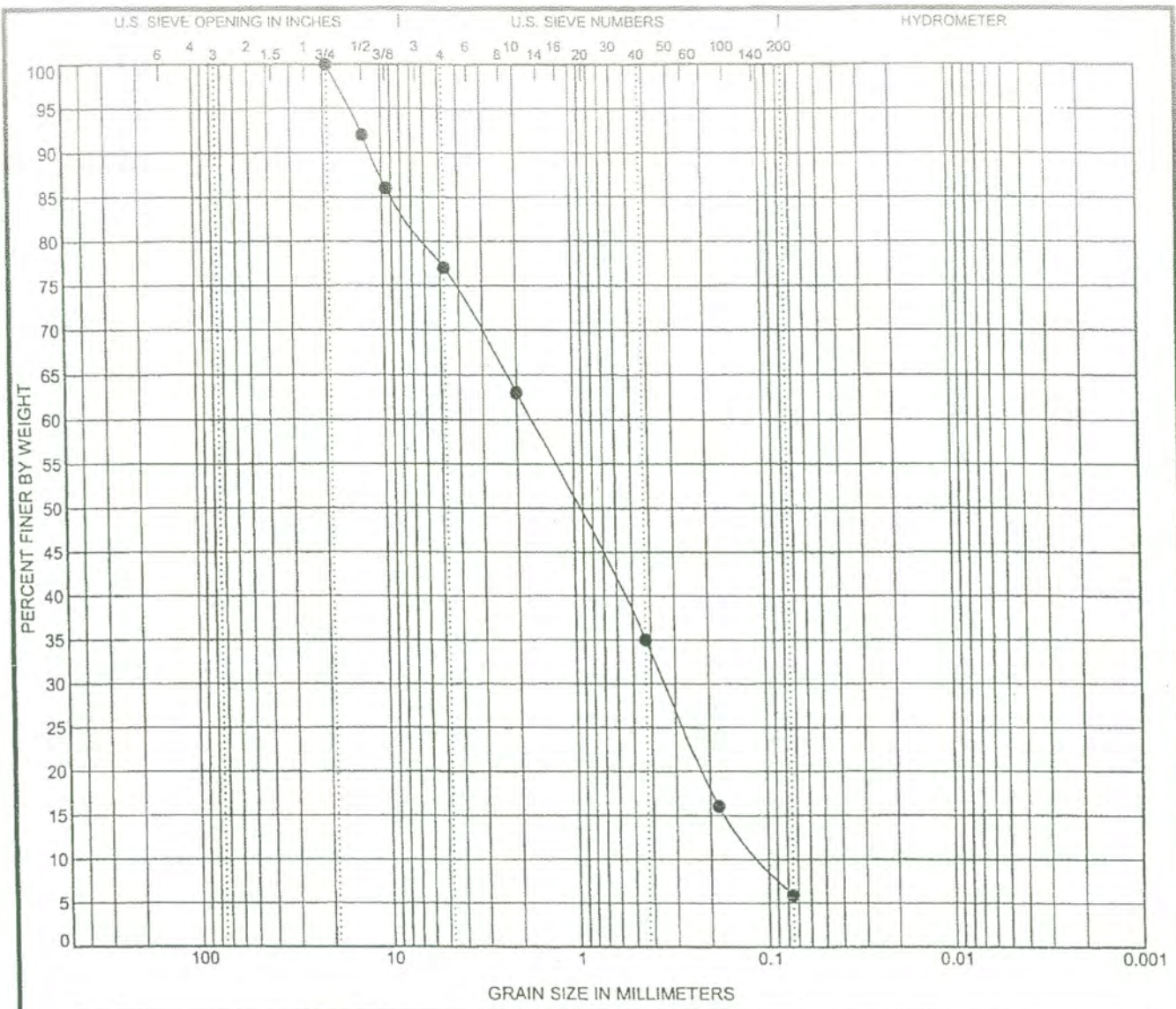
GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/17/04



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	8	14.5	POORLY GRADED SAND with SILT and GRAVEL(SP-SM)	NP	NP	NP	0.63	15.83

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	8	14.5	19	1.694	0.339	0.107	23.0	71.1	5.9	

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/17/04

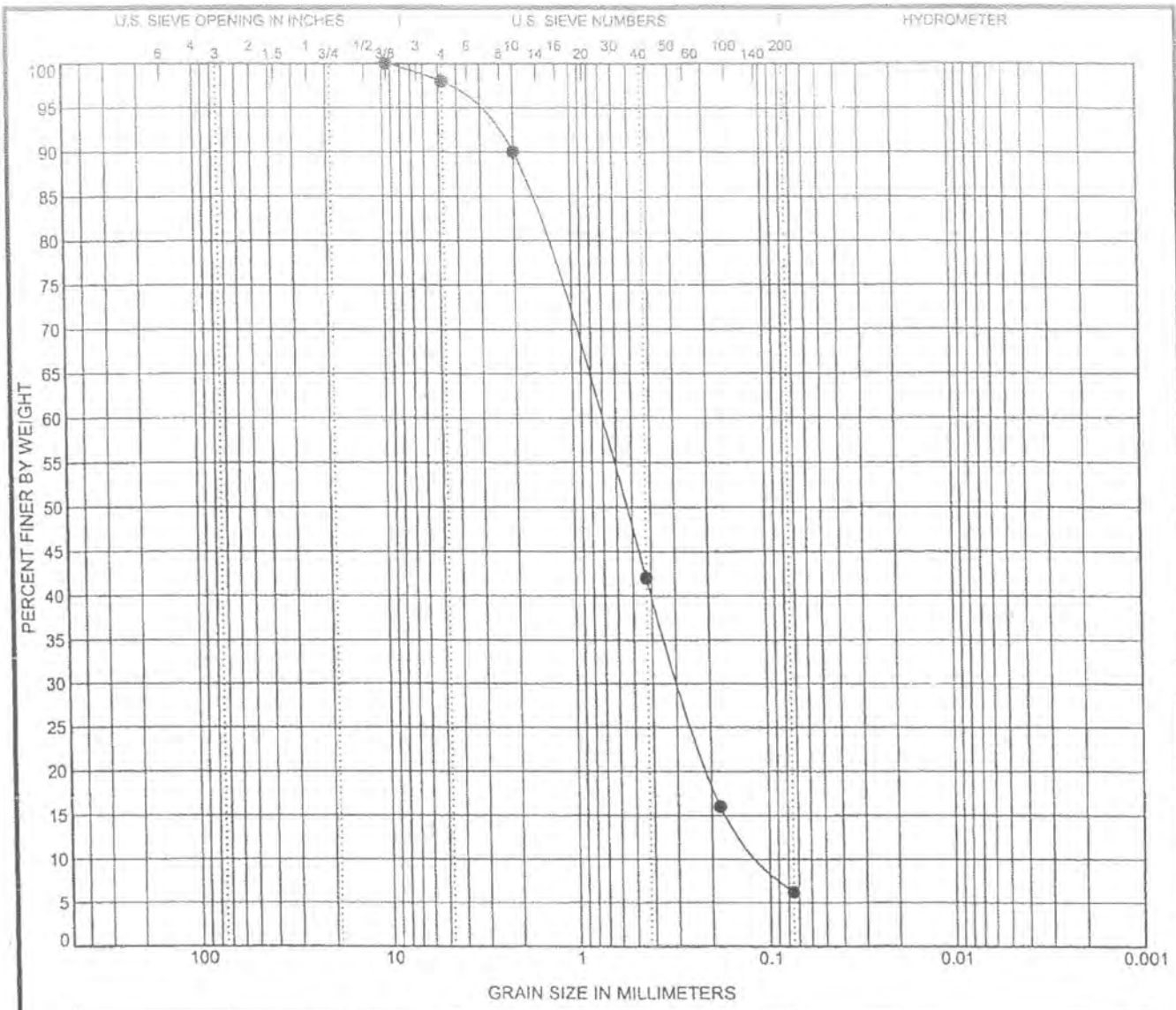
GEO-TEST

GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	8	19.5	WELL-GRADED SAND with SILT(SW-SM)	NP	NP	NP	1.02	7.21

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	8	19.5	9.5	0.76	0.286	0.105	2.0	91.8	6.2	

GEO-TEST

GRAIN SIZE DISTRIBUTION

Project: Mesa del Sol

Location: Albuquerque, New Mexico

Number: 1-40901

US GRAIN SIZE 1-40901 MESA DEL SOL.GPJ GEO TEST.GDT 12/17/04

GEO-TEST

SOIL RESISTIVITY (ASTM G-57)

PROJECT: Mesa del Sol

CLIENT: Bohannan-Huston, Inc.

JOB NO: 1-40901

DATE SAMPLED: 11/16/04

DATE TESTED: _____

LAB NO: _____

SAMPLE LOCATION: DH-5 @ 14.5'

MOISTURE CONTENT

SOIL WET WEIGHT: ___

SOIL DRY WEIGHT: ___

AS RECEIVED MOISTURE CONTENT: ___

RESISTIVITY AS RECEIVED

CHANGE IN POTENTIAL (volts): 2

CURRENT (Amps): 0

RESISTIVITY (Volts/Amps): 00 Ohm-cm

RESISTIVITY SATURATED CONDITION

CHANGE IN POTENTIAL (Volts): 16.5

CURRENT (Amps): .0035

RESISTIVITY (Volts/Amps): 4714 Ohm-cm

LAB NO: _____

SAMPLE LOCATION: DH-3 @ 4.5'

MOISTURE CONTENT

SOIL WET WEIGHT: ___

SOIL DRY WEIGHT: ___

AS RECEIVED MOISTURE CONTENT: ___

RESISTIVITY AS RECEIVED

CHANGE IN POTENTIAL (volts): 7.5

CURRENT (Amps): 0

RESISTIVITY (Volts/Amps): 00 Ohm-cm

RESISTIVITY SATURATED CONDITION

CHANGE IN POTENTIAL (Volts): 16

CURRENT (Amps): .033

RESISTIVITY (Volts/Amps): 485 Ohm-cm

GEO-TEST

pH of SOIL (ASTM G-51 & D-4972)

PROJECT: Mesa del Sol CLIENT: Bohannan-Huston Inc.

JOB NO: 1-40901 DATE SAMPLED: 11/16/04

DATE TESTED: 11/29/04

LAB NO: _____

SAMPLE LOCATION: DH-5 @ 14.5'

pH OF SOIL AS RECEIVED (ASTM G-51)

pH READING 1:	6.34
pH READING 2:	6.43
pH READING 3:	6.56
pH READING 4:	6.60
STABILIZED pH READING:	6.65

MOISTURE CONTENT (AS RECEIVED)

CAN #:	_____
WET WT.:	93.1
DRY WT.:	91.9
% MOISTURE:	_____

pH OF SOIL (ASTM D-4972)

pH READING: (DISTILLED WATER SOLUTION)	8.77
pH READING: (CALCIUM CHLORIDE SOLUTION)	8.55

LAB NO: _____

SAMPLE LOCATION: DH-3@ 4.5'

pH OF SOIL AS RECEIVED (ASTM G-51)

pH READING 1:	6.51
pH READING 2:	6.69
pH READING 3:	6.86
pH READING 4:	6.99
STABILIZED pH READING:	7.05

MOISTURE CONTENT (AS RECEIVED)

CAN #:	___
WET WT.:	74.2
DRY WT.:	69.8
% MOISTURE:	___

pH OF SOIL (ASTM D-4972)

pH READING: (DISTILLED WATER SOLUTION)	8.21
pH READING: (CALCIUM CHLORIDE SOLUTION)	8.20

APPENDIX C

Hall Environmental Analysis Laboratory

Date: *22-Dec-04*

CLIENT: Geo-Test
Lab Order: 0412053
Project: 1-40901
Lab ID: 0412053-01

Client Sample ID: DH 5 @ 19.5'
Collection Date: 12/1/2004
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 9056A: ANIONS						Analyst: IC
Chloride	12	0.30		mg/Kg	1	12/21/2004
Sulfate	38	1.5		mg/Kg	1	12/21/2004

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 22-Dec-04

CLIENT:	Geo-Test	Client Sample ID:	DH 1 @ 4.5'
Lab Order:	0412053	Collection Date:	12/1/2004
Project:	1-40901		
Lab ID:	0412053-02	Matrix:	SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 9056A: ANIONS						Analyst: IC
Chloride	250	1.5		mg/Kg	5	12/22/2004
Sulfate	560	7.5		mg/Kg	5	12/22/2004

Qualifiers:	ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits
	J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits
	B - Analyte detected in the associated Method Blank	E - Value above quantitation range
	* - Value exceeds Maximum Contaminant Level	

CHAIN-OF-CUSTODY RECORD

Accreditation Applied: NELAC ☐ USACE ☐ Other:

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

Client: Geo-Test, Inc

Address: 8528 Calle Alameda N.E. Alb, N.M. 87113

Phone #: (505) 857-0933

Fax #: (505) 857-0803

Project Name:

Project #: 1-40901

Project Manager: Tim Byres

Sampler: TB

Sample Temperature: 70

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative H_2Cl_2	Preservative HNO_3	Preservative	HEAL No.
12/1/04		Bag	1-40901 BT	DH5eA½				04120S3-1
"		"	"	DH1e4½				-2

ANALYSIS REQUEST

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B MOD (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Cations (Na, K, Ca, Mg)	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / PCB's (8082)	8260 (VOA)	8270 (Semi-VOA)	SO_4	Cl_2			Air Bubbles or Headspace (Y or N)
													✓	✓			
													✓	✓			

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)	Remarks:
12/6/04	2:40			12-6-04 @ 14:40
12/6/04	14:40			

Remarks: