CARSON CITY PURCHASING AND CONTRACTS
201 North Carson Street, Suite 3
Carson City, NV 89701
775-283-7137/FAX 887-2107
http://www.carson.org/index.aspx?page=998

NOTICE TO CONTRACTORS
BID #1314-134
Fuji Park/Fairgrounds Maintenance Building
PWP # CC-2014-071

Jan. 17th, 2014

Addendum No. 2

Please make the following additions/changes/clarifications to the above referenced project.

Replace sheet C3.0 of the plans for the attached revised sheet C3.0 showing existing grades at the four corners of the new maintenance building.

The following is based on Request For Information items received by 1/15/2014.

1. *Will the existing electrical power be available for the contractor's use at no cost?*

   Yes, the existing power service will be moved outside of the building footprint but will still be usable by the contractor.

2. *Please provide Carson City's adopted IBC code this will affect the PEB design criteria in relationship to snow and wind load.*

   The Carson City Building Department has adopted the 2012 IBC. Please see Addendum 1, item 7 regarding the incorrect wind loading shown on the plans.

3. *Plan sheet C5.0 shows a single man gate but this gate is not shown on C3.0. Is this man gate required?*

   There is no man gate required. The detail on C5.0 is for the fencing and double swing gate.

4. *Has there been a geotechnical soils report completed, if not what are we to base footings design requirements on?*

Please see the attached soils report for the Fairgrounds Property. This report was completed for previous work on the Fairgrounds property 200 feet to the east of the new maintenance building but provides an accurate description of the soil conditions for the project.

5. *You ask the bid to break out the interior slab price. Is the intent to not install this slab? If you leave the ground dirt you will have to increase the size of the footing and make a full perimeter footing with a center grade beam for engineering purposes. If you install the slab the columns can be set on thickened areas and the use of a turn down or thickened edge. Do you still wish, regardless of option a full perimeter footing? Please explain intent.*

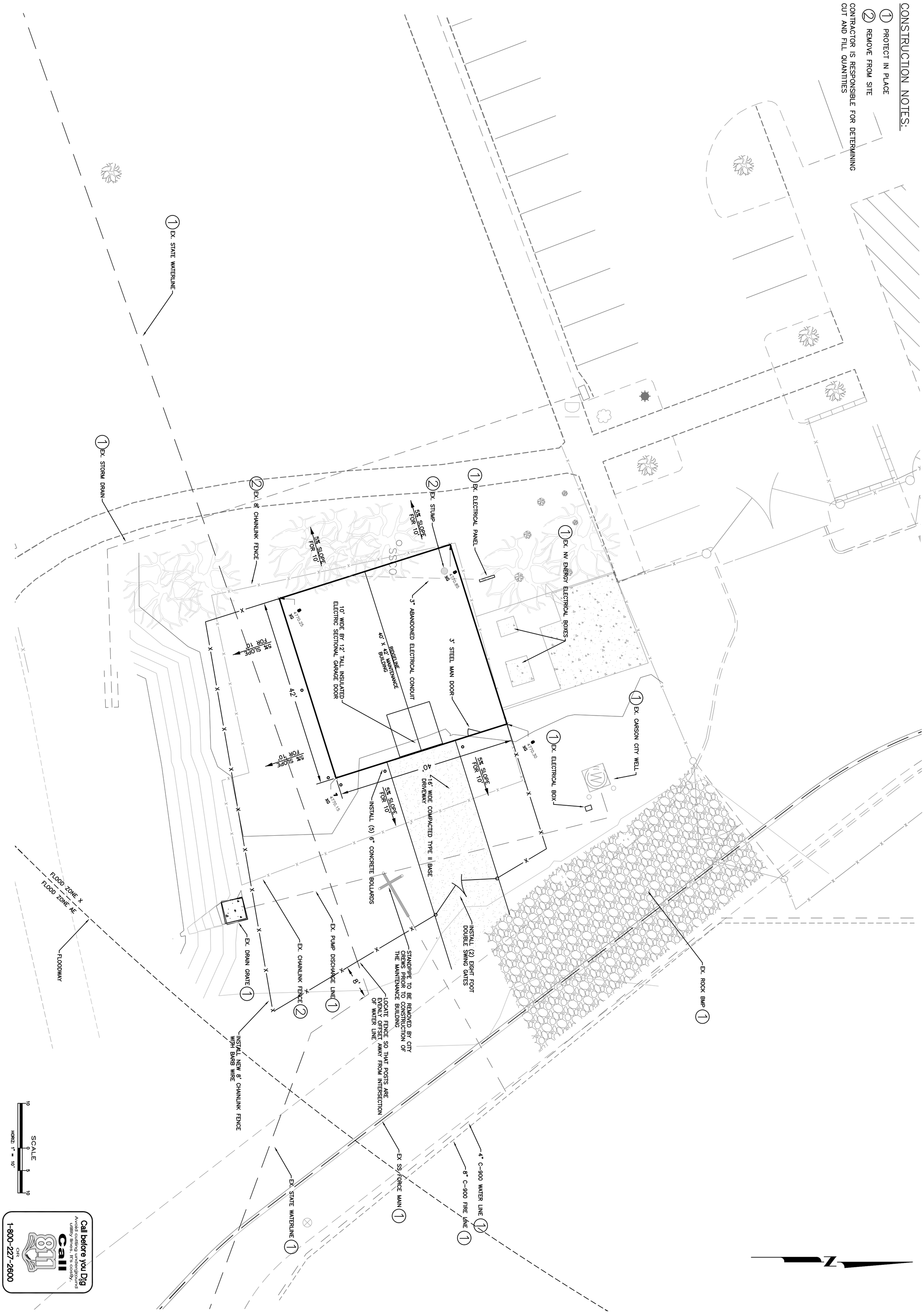
   The City wasn't sure if they had enough money to include the slab with the project so it was created as an additive alternate so that it could be included if the bids allowed it to be. The Maintenance Building bid item (BP. 2) shall be bid including a full perimeter footing but excluding a concrete floor. The Concrete Slab bid item (BP. 4) shall be the price difference to provide a footings/floor system that would include a concrete slab within the building.

H:\PROJECTS\2.1301 Fuji Park Maintenance Building\DWG\Mainenance Shed 1.dwg; 1/16/14

CONSTRUCTION NOTES:

1. PROTECT IN PLACE
2. REMOVE FROM SITE

CONTRACTOR IS RESPONSIBLE FOR DETERMINING CUT AND FILL QUANTITIES



SCALE
HORIZ. 1" = 10'
10 0 5 10

Call before you Dig
Avoid cutting underground utility lines, it's costly.
Call 811 OR 1-800-227-2600

SHEET C3.0

FUJI PARK / FAIRGROUNDS
MAINTENANCE BUILDING
601 OLD CLEAR CREEK ROAD
SITE PLAN

REV.	DATE	DESCRIPTION	BY	APP'D

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS B. GRUNDY
No. 18808
CIVIL
Exp: 6/30/15

CARSON CITY
PUBLIC WORKS DEPARTMENT

3505 BUTTI WAY CARSON CITY, NEVADA 89701
PH: 887-2355 FAX: 887-2112

DESIGNED BY: DA
DRAWN BY: DA
CHECKED BY: TG SF VK
DWG NO.: mainenance shed 1.dwg
SCALE (HORIZ): 1" = 10'
SCALE (VERT): N/A
PLOT DATE: 1/16/14

START OF FILE:

601 OLD CLEAR CREEK RD.

GEOTECHNICAL REPORT

07-653

601 Old Clear Creek Rd

GEOTECHNICAL INVESTIGATION

for

FUJI PARK PHASE 4

Carson City, Nevada

Prepared for:

Mr. Vern Krahn, Park Planner
Carson City Parks and Recreation Department
3303 Butti Way, Building No. 9
Carson City, Nevada 89701

Prepared by:

LUMOS and ASSOCIATES, INC.
800 E. College Parkway
Carson City, Nevada 89706
Tel: (775) 883-7077
Fax: (775) 883-7114

January, 2007

JN: 5496.601

GEOTECHNICAL INVESTIGATION

FUJI PARK PHASE 4

Carson City, Nevada

TABLE OF CONTENTS

GEOTECHNICAL INVESTIGATION
for
FUJI PARK PHASE 4
CARSON CITY, Nevada

INTRODUCTION

Submitted herewith are the results of Lumos and Associates, Inc. (Lumos) geotechnical investigation for the proposed Fuji Park Phase 4 project to be located in Carson City, Nevada (Plate 1). The project site boundaries generally consist of Clear Creek Road to the North, Clear Creek on the south, the propose Bodine's Casino on the east and the Exhibit Hall on the west (Plate 2).

It is our understanding that the proposed Fairgrounds/Fuji Park improvement projects will consist of a new arena with relocated grandstands, new and /or relocated buildings, asphalt concrete paving, sidewalks and landscape areas. Structural loads for this project have been assumed not to exceed one (1) to three (3) kips per lineal foot and 30 to 40 kips for continuous-wall and isolated-column loads, respectively. Since the final grade elevations are not finalized and are not available to Lumos at this time, we have assumed that final grades at the site will be within one (1) to two (2) feet from existing grades.

The purpose of our investigation was to characterize the site geology and soil conditions, describe the native soils, and determine their engineering properties as they relate to the proposed construction. The investigation was also intended to identify possible adverse geologic, soil, and or water table conditions. However, this study did not include an environmental assessment, a fault study, or an evaluation for soil and/or groundwater contamination at the site.

This report concludes with recommendations for site grading, foundations, footing area preparation, utility installation, asphalt concrete pavement, and Portland cement concrete. In addition, information such as logs of all exploratory borings, laboratory test data, liquefaction potential of subsurface soils, allowable soil bearing capacities, estimated total and differential settlements based on static loads and liquefaction, lateral earth pressures and International Building Code (IBC) seismic site class designation are provided in this report.

The recommendations contained herein have been prepared based on our understanding of the proposed construction, as outlined above. Re-evaluation of the recommendations presented in this report should be conducted after the final site grading and construction plans are completed, if there are any variations from the assumptions described herein.

It is possible that subsurface discontinuities may exist between and beyond exploration points. Such discontinuities are beyond the evaluation of the Engineer at this time. No guarantee of the consistency of site geology and sub-surface conditions is implied or intended.

GEOLOGIC SETTING

Carson City is at the extreme western portion of the Great Basin geomorphic province. The Great Basin is characterized by internal drainage and large normal fault-bounded valleys (grabens) separated by high mountain ranges (horst). The Sierra Nevada province to the west is characterized by large granite masses that have been uplifted and tilted a few degrees toward the west. Overlying the granites are older oceanic meta-sedimentary rocks.

Specifically, the site is located in the western portion of Eagle Valley. The surface geology of the project area has been mapped by Pease, (1980). The mapping indicates that Flood-plain deposits of Clear Creek underlie the site. The mapping indicates that the deposit consists of dark-brown, muddy very fine sand. Non-indurated, moderately well sorted. Robert C. Pease (1979) has also mapped this area as an area to experience possible moderate to severe liquefaction locally.

SEISMIC CONSIDERATIONS

Carson City, similar to many areas of Nevada, is located near active faults, which are capable of producing significant earthquakes. This area can be described as an area that may experience major damage due to earthquakes having intensities of VII or more when evaluated using the Modified Mercalli Intensity Scale of 1931 (Plate 3).

The Carson City area is located within the Sierra Nevada-Great Basin seismic belt and at least 4 major earthquakes with moment magnitudes greater than 6.0 (Plate 4) have occurred historically within 20 miles of the site. The areas north and south of Carson City have experienced a number of large earthquakes in the past, with a swarm of large events during the single years 1868 and 1869. During these episodes, the three (3) largest events were magnitudes 6.0, 6.1, and 6.7. The causative faults were located approximately 7 to 20 miles northeast of the site within the Virginia Mountain Range.

The Carson area, similar to many areas of Nevada, is located near active faults, which are capable of producing significant earthquakes. According to the Earthquake Hazards Map by Pease (1979) no faults cross the site (Plate 5). Additionally no active Holocene (<11,000 years) age faulting is known to cross the site, nor has any direct evidence of on-site faulting been observed in the field or found in the excavation at the site. However, there is a mapped Holocene fault within 1/2 mile northwest of the site.

Ground shaking should be anticipated at the site and intensities should be governed by a design earthquake occurring within a few hundred feet of the site on faults belonging to the Sierra Nevada – Great Basin seismic belt that crosses Carson City. For design purposes, ground shaking intensities should be based on a design earthquake occurring on the Carson City or Genoa Fault Zones with a maximum credible earthquake of 7.5 in moment magnitude.

Liquefaction is the phenomena where more commonly loose saturated sands or silty sands lose their shear strength when subjected to cyclic loading, and become unstable. Large earthquakes, as described above, may provide that type of cyclic loading. A

liquefaction evaluation of on site soils is part of our current scope-of-work and included under the "Site Specific Evaluation" section of this report. Ground water was encountered during our field exploration from six (6) to nine (9) feet.

2003 IBC Design: The mapped maximum considered earthquake spectral response acceleration at short periods (S_S) is 1.65g corresponding to a 0.2 second spectral response acceleration at 5 percent of critical damping and for a Site Class B (IBC Figure 1615(3)). The mapped maximum considered earthquake spectral response acceleration at a 1-second period (S_1) is 0.67g corresponding to a 1.0 second spectral response acceleration at 5 percent of critical damping and for a Site Class B (IBC Figure 1615(4)). The site is considered to be liquefiable, corresponding to a Site Class F (IBC Table 1615.1.1). However for the purpose of this report, we have assumed the periods of vibration of the structure to be less than 0.5 seconds. When this is the case, values for F_a and F_v are permitted by the IBC, to be taken equal to the values for the site class determined without regard to liquefaction. Without regard to liquefaction, the site should be classified as a Site Class D. Therefore, the spectral response accelerations must be adjusted for Site Class effects. The site coefficient for spectral response accelerations adjustment at short periods (F_a) is 1.0 (IBC Table 1615.1.2(1)). The site class effect for spectral response accelerations adjustment at 1-second periods (F_v) is 1.5 (IBC 1615.1.2(1)). The maximum considered earthquake spectral response acceleration parameter for short periods (S_{MS}) is 1.65g and for 1-second periods (S_{M1}) is 1.01g. This corresponds to design spectral response acceleration parameters of 1.1g for short periods (S_{DS}) and of 0.67g for 1-second periods (S_{D1}). A peak ground acceleration of 0.44g (S_{DS} /2.5) may be used for the project. According to the USGS 2002 website, (www.eqdesign.cr.usgs.gov), a peak ground acceleration of 0.43g corresponds to a 10% probability of exceedance in 50 years and a peak ground acceleration of 0.76g corresponds to a 2% probability of exceedance in 50 years.

It is emphasized that the above values are the minimum requirements intended to maintain public safety during strong ground shaking. These minimum requirements are meant to safeguard against loss of life and major structural failures, but are not intended to prevent damage or insure the functionality of the structure during and/or after a large seismic event. Additionally, they do not protect against damage to non-structural components or the contents of the building.

SITE CONDITIONS AND FIELD EXPLORATION

At the time of our investigation, the site has the existing outdoor arena, grandstands, restrooms and various barns. The site has a small amount of landscaping. The site, in general, is relatively flat.

Field exploration included a site reconnaissance and subsurface soil-exploration. During the site reconnaissance, surface conditions were noted and the locations of the exploratory borings were determined. They were located using existing features and a conceptual plan available to Lumos as a guide. Locations and elevations of the exploratory borings should be considered accurate only to the degree implied by the method used.

Six (6) exploratory borings were excavated within the proposed building improvement area and parking area to a maximum depth of 35 feet below-ground-surface (bgs). The approximate locations of the exploratory borings within the site are shown on Plate 2. The subsurface soils were continuously logged and visually classified in the field by our Geotechnical Engineer in accordance with the Unified Soil Classification System. Representative soil samples were collected at 2.5 foot and 5 foot intervals within the exploratory borings and subsequently transported to our Carson City geotechnical laboratory for testing and analysis.

The subsurface soils consisted generally of silty sands and poorly graded sands to a depth of about 35 feet below-ground-surface (bgs).

Groundwater was encountered at depths from six (6) to nine (9) bgs in our exploratory borings at the time of our field investigation. However, seasonal groundwater (water table) fluctuations should be anticipated at the site. Our Engineer at a depth of approximately six (6) feet bgs observed mottling in the soils in several borings. Mottling is an indication of previous groundwater presence.

FIELD AND LABORATORY TEST DATA

Field and laboratory data was developed from samples taken and tests conducted during the field exploration and laboratory phases of this project. The Borings were advanced by a B-61 Drill Rig. Representative samples were collected at 2.5 foot and 5 foot intervals using a 1.4 inch inside diameter Standard Penetration Testing (SPT) split spoon sampler. A 140-pound safety hammer powered by a rope drove the sampler/ cathead pulley system free falling 30 inches.

Laboratory tests performed on representative samples included Atterberg Limits, moisture density curve, sieve analysis (including fines content), R-Value, direct shear, pH value, resistivity and soluble sulfates. Much of this data is displayed on the "logs" of the exploratory borings to facilitate correlation. Field descriptions presented on the logs have been modified, where appropriate, to reflect laboratory test results. The logs of the exploratory borings are included in Appendix A of this report as Plates A-1 through A-6. Plate A-7 describes the various symbols and nomenclature shown on the logs.

Individual laboratory test results are presented in Appendix B as Plates B-1 through B-7. Laboratory testing was performed per ASTM standards, except when test procedures are briefly described and no ASTM standard is specifically referenced in the report. Atterberg limits were determined using the dry method of preparation (Plate B-2). Special testing conducted for this project are described below.

Analytical Testing: Atlas Consultants, out of Las Vegas, Nevada, conducted this testing. The testing included pH value, resistivity and soluble sulfates. Test results are included (on Atlas Consultants Inc. letterhead) in Plates B-6 and B-7.

The soil samples obtained during this investigation will be held in our laboratory for 30 days from the date of this report. The samples may be retained longer at an additional cost to the client or obtained from this office upon request.

SITE-SPECIFIC LIQUEFACTION EVALUATION

A simplified liquefaction evaluation was performed in accordance with the Geotechnical Earthquake Engineering Reference Manual by Munfakh et. Al. (1998), Federal Highway Administration Report No. FHWA-HI-99-012.

Data used for the liquefaction evaluation included log information Standard Penetration (SPT) blow counts, unit weight of in-situ soils, depth to groundwater, Atterberg limits, and percent fines (percent passing the #200 sieve). Calculations to evaluate liquefaction included total vertical stress, effective vertical stress, effective confining stress, normalized and standardized SPT blow counts, critical stress ratio induced by the deign earthquake, corrected critical stress ratio resisting liquefaction, and the factor of safety. Experience and engineering judgement were also exercised during our evaluation. The following parameters were used as part of analysis:

Moment Magnitude: (M_W) = 7.5
Ground acceleration = 0.44g (S_{DS}/ 2.5)
Unit Weight of Soil Above Groundwater = 115 pounds-per-cubic-foot (BH-3)
Unit Weight of Soil Below Groundwater = 50 pounds-per-cubic-foot (BH-3)

The peak ground acceleration of 0.44g was adopted based on S_{DS}/2.5 utilizing F_a and F_v factors for a Site Class D. Therefore, the critical stress ratio induced by the design earthquake was calculated. The critical stress ratio at which liquefaction is expected to occur during a M=7.5 earthquake was evaluated from the chart showing the relationship between cyclic stress ratio causing liquefaction and corrected SPT blow counts, which shows the liquefaction/no liquefaction for sand with fine content of 5, 15 and 35 percent. The corrected critical stress ratio resisting liquefaction was calculated by multiplying the critical stress ratio at which liquefaction is expected to occur times the magnitude scaling factor (not necessary in this case). Finally, the factor of safety against liquefaction was calculated by dividing the corrected critical stress resisting liquefaction by the stress ratio induced by the design earthquake.

Results of our analysis indicated potentially liquefiable soil layers between 8 feet and 12 feet in borings 1, 3, 5 and 6. Our analysis also indicates that liquefaction induced total settlement of between 0.5 and 2.5 inches across the site should be expected.

DISCUSSION AND RECOMMENDATIONS

General

From a geotechnical viewpoint, the site is considered suitable for the proposed improvements when prepared as recommended herein.

During earthwork, any existing improvements within the proposed development area should be demolished and removed offsite, or salvaged if to remain. Demolition/ salvage activities, where applicable, should be conducted in general accordance with the specifications presented in Appendix C

The following recommendations are based upon the construction and our understanding of this project, as outlined in the introduction of this report. If changes in the construction are proposed, they should be presented to Lumos, so that these recommendations can be reviewed and modified in writing, as necessary. As a minimum, final construction drawings should be submitted to Lumos for review prior to actual construction and verification that our geotechnical design recommendations have been implemented.

General Site Grading

Prior to placement of fill, the areas to receive fill shall be cleared and grubbed. Clearing and grubbing is anticipated to be as much as three (3) to six (6) inches or more where thicker vegetation/trees were present.

Root- or organic-laden soils encountered during excavations, should be stockpiled in a designated area on site for later use in landscaping, or removed off site as directed by the owner. Excavated soils free from any organics, debris or otherwise unsuitable material and with particles no larger than three (3) inches in maximum dimension may be stockpiled and moisture conditioned for later use as compacted fill provided it meets the criteria for acceptable fill soils.

All surfaces to receive fill, particularly those underneath foundations and slabs-on-grade, should be observed and approved by a Lumos representative prior to placement of fill. The surfaces shall be scarified to a minimum of twelve (12) inches; moisture conditioned to within two (2) percent of optimum and re-compacted to at least 90% of the ASTM D1557 standard. Fill material should not be placed, spread or compacted while the ground is frozen or during unfavorable weather conditions. When site grading is interrupted by heavy rain or snow, grading or filling operations should not resume until a Lumos representative approves the moisture content and density conditions of the subgrade or previously placed fill.

Pumping or yielding conditions may be encountered during the construction activities due to the depth to ground water. If yielding or pumping conditions are encountered, the soils should be stabilized by one of the following options. These options are: (1) Scarify the soils, allow them to dry, and re-compact; (2) Stabilizing with a geotextile fabric, angular rock, and filter fabric combination; and (3) stabilizing with a geogrid and a specified fill. A brief description of these stabilizing options are presented below:

1. This option requires that the soils be scarified in place and allowed to dry. Re-compaction of these soils should be conducted as stated in this report. Note that this option is only useful for relatively minor, shallow stabilization.

2. This option involves grading the site to a relatively smooth surface condition and compacting the surface as much as practical without causing further pumping. A geotextile stabilization fabric (Mirafi Geolon HP370 or equivalent) should be placed as specified by the manufacturer. No traffic or other action should be allowed directly on the fabric, which may cause it to deflect/deform. The fabric should be covered, by end dumping, with at least 12 inches of 4- to 12-inch diameter angular cobble rocks with enough fines to fill the inter-rock pore spaces. Test sections should be conducted to determine the minimum thickness and/or layers required for stabilization. Stabilization should be evaluated by proof-rolling commensurate with the equipment used, and under the supervision and approval by a Lumos

representative. A filter fabric (Mirafi 140N or equivalent) should be placed over the cobble rock fill to prevent piping of fines from the covering soils into the cobble matrix. However, a thin layer of minus 2-inch material should be placed on top of the rock fill to provide a smooth surface to place the filter fabric and prevent fabric rupture and/or puncture. **NOTE:** This option may require over-excavation to maintain appropriate grading elevations.

3. This option involves grading the site to a relatively smooth surface condition and compacting the surface as much as practical without causing further pumping. For fine-grained soils, a separation may be required to prevent migration of fines into the stabilization section. If required, it should consist of a filter fabric (Mirafi 140N or equivalent). In addition, approximately two (2) to three (3) inches of preferred specified fill (See Table 1) may be required, if practical, on the existing surface or filter fabric across the entire area to be stabilized prior to placing the geogrid.

TABLE 1

PREFERRED SPECIFIED FILL GRADATION

SIZE	% FINER
1-1/2"	100
¾"	50-100
#4	25-50
#40	10-20
#100	5-15
#200	Less than 10

A geogrid (Tensar BX1100 or equivalent) should be placed as recommended by the manufacturer. No traffic or other action should be allowed directly on the grid, which may cause it to deflect/deform. The grid should be covered, by end dumping, with at least 8 to 12 inches of preferred specified fill (See Table 1). Test sections should be used to determine the minimum thickness and/or layers required for stabilization. Static rather than vibratory equipment should be used. Stabilization should be evaluated by proof-rolling commensurate with the equipment used, and under the supervision and approval by a Lumos representative. If the fill thickness required for stabilization is greater than 12 inches, then a filter fabric (Mirafi 140N or

equivalent) should be placed at the top of the preferred fill to prevent piping of fines from the covering soils into the preferred fill matrix. **NOTE:** This option may also require over-excavation to maintain appropriate grading elevations and may not be as effective as option 2 under shallow groundwater conditions.

Acceptable fill soils to be used for this project should consist of non-expansive material similar to on-site soils (LL less than 40 and/or a PI less than 15, and/or an Expansion Index less than 20), and should be free of contaminants, organics (less than two (2) percent), rubble, or natural rock larger than three (3) inches in largest dimension. The soluble sulfate content shall be less than 0.1%. Any import soils should be tested and approved prior to being placed or delivered on-site. Native soils encountered during our field investigation meet these criteria.

Compacted fill should be placed only on compacted sub-grade or on compacted fill in lifts not exceeding eight (8) inches in loose thickness, moisture conditioned to within two (2) percent of optimum, and compacted to at least ninety percent (90%) relative compaction, as determined by the ASTM D1557 standard.

Landscaped areas should be cleared of all organic and objectionable material such as wood, root stumps, etc., if any. In cut areas, no other work is necessary except grading to proper elevation and drainage conditions. In landscape fill areas, fill should be placed in loose lifts not exceeding eight (8) inches, and compacted to at least eighty-five percent (85%) relative compaction to prevent erosion.

Water should not be allowed to pond on pavements or adjacent to structures, and measures should be taken to reduce surface water infiltration into the foundation soils.

A representative of Lumos should be present during all site clearing, excavation removals, and grading operations to ensure that any unforeseen or concealed conditions within the site are identified and properly mitigated, and to test and observe earthwork construction. This testing and observation is an integral part of our services as acceptance of earthwork construction and is dependent upon compaction and stability of

the subgrade soils. The soils engineer may reject any material that does not meet acceptable fill, compaction, and stability requirements. Further, recommendations in this report are provided upon the assumption that earthwork construction will conform to recommendations set forth in this section of the report.

FOUNDATION DESIGN CRITERIA

Conventional spread footings founded on at least 12 inches of properly compacted fill/subgrade, as recommended previously, may be used to support the proposed buildings within the project site.

Spread footings: Footings should have a minimum embedment of 24 inches below lowest adjacent grade for frost protection. Footings founded on at least 12 inches of properly compacted fill/subgrade may be designed for a net allowable bearing pressure of 2,500 pounds-per-square-foot (psf).

If fill is placed to bring building pads to grade, no footings should be founded within a distance of at least one third of the total height of fill (H/3) placed from the face of the slope or equal to the depth of compacted fill below the bottom of footing, whichever is greater. In drainage areas, no footings should be located or founded above a 1:1 (horizontal:vertical) plane drawn up from the toe of slopes, outside edge of drainage conduits or drainage ditches, to avoid loss of bearing strength of supporting soils. No drainage or water diverting conduits other than associated utilities should be allowed underneath building footprints.

Footing Settlements: The maximum anticipated settlements for continuous or isolated footings bearing on less than five (5) feet of properly compacted fill and designed for a 2,500 psf bearing pressure is estimated at one (1) inch or less under static conditions only. Differential settlements are generally expected to be half of the total settlements. Settlements in granular soils are primarily expected to occur shortly after dead and sustained live loads are applied. However, we recommend designing the structures for a total settlement of three (3) inches and a differential settlement of 1.5 inches due to the

liquefaction potential of the site as discussed earlier.

Lateral Loading: Resistance to lateral loads can be provided by friction acting at the base of foundations and by lateral earth resistance. A coefficient of friction of 0.30 may be assumed at the base of footings. An allowable passive earth resistance of 250 psf per foot of depth starting 6 inches below lowest adjacent grade may be used for the sides of footings poured against properly compacted fill. Passive resistance should not exceed 2,500 psf. The at-rest lateral pressure can be calculated utilizing an equivalent fluid pressure of 55 pcf.

Dynamic Factors: Vertical and lateral bearing values indicated above are for total dead-load and frequently applied live loads. If normal code requirements are applied for design, the above vertical bearing values may be increased by 33 percent for short duration loading due to wind or seismic forces. The additional Dynamic Lateral earth pressure can be calculated utilizing the following equation.

$$\text{Dynamic Lateral Force} = 19H^2$$

H = height of wall

This force should be assumed to act at a height of 0.6H above the bottom of the wall.

CONCRETE SLAB DESIGN

Interior concrete slabs should be underlain with at least six (6) inches of Type 2 Aggregate Base, compacted to a minimum of ninety-five percent (95%) and supported on at least 12 inches of properly compacted fill and / or subgrade. We recommend the aggregate base be placed after utility trenches are excavated and backfilled. A vapor barrier should be provided for all interior concrete slabs where floor moisture is undesirable. The vapor barrier should be a synthetic plastic sheeting at least ten (10) mils thick placed below the aggregate base. The vapor barrier may be set on top of the base material and covered with approximately two (2) inches of clean medium sand. As an option to the owner, an additional one (1) inch of sand may be placed below the vapor barrier to help prevent puncture of this sheeting.

Slab thickness design should be based on a Modulus of Subgrade Reaction equal to two hundred (200) pounds-per-cubic-inch (pci) for construction on properly compacted fill/subgrade. Reinforcement of concrete slabs should be as specified by the Project Structural Engineer.

Exterior concrete slabs on grade should be underlain with at least six (6) inches of Type 2 aggregate base and at least 12 inches of properly compacted subgrade/fill. All subgrade and fill should be prepared and placed as described in the grading section of this report, while the aggregate base material should be compacted to at least ninety-five percent (95%) relative compaction as determined by the ASTM D1557 standard.

RETAINING WALLS

Retaining structures over three (3) feet in height, if used, will require local code compliance and engineered based on parameters described in this section of the report. Retaining structures should be designed to resist the appropriate lateral earth pressures. Cantilevered walls, which are able to deflect at least 0.01 radians, can be designed using an equivalent fluid (backfill) unit weight of 40 pounds-per-cubic-foot (pcf). However, if the wall is fixed against rotation, the wall should be designed using an equivalent fluid (backfill) unit weight of 55 pcf. These design parameters are based upon the assumption that walls will retain only level backfill and no hydrostatic pressure will be present. Any other surcharge pressures should be added to the above recommended lateral earth pressures. Retaining walls should be backfilled with free draining granular material that extends vertically to the bottom of the stem and laterally at least six (6) inches beyond the face of the stem (wall) and wrapped with a Mirafi 140 N or equivalent non-woven filter fabric. Weep holes should be provided on the walls at regular intervals, or a slotted drainpipe placed at the bottom of the wall (bottom of granular material) to relieve any possible build-up of hydrostatic pressure. Backfill material within two (2) feet of the wall should be compacted with hand-held equipment only, and to at least 90% of the maximum ASTM D1557 standard.

PAVEMENT DESIGN

Areas to be paved should be excavated and/or scarified in place to a depth of at least 12 inches, moisture conditioned to within two (2) percent of optimum, and compacted to at least 90 percent of the laboratory maximum dry density determined by the ASTM D1557 standard. Pavement structural sections for auto/light trucks and heavy trucks were determined for the driveway and parking areas utilizing an R-value of 70 (based on laboratory test results) and are provided in Table 2, "Recommended Asphalt Pavement Sections". Traffic Index (TI) values of 5 were assumed for auto/light truck pavement loads and 7 for heavier truck loads. Aggregate base should consist of Type 2, Class B material and meet the requirements of the Standard Specifications for Public Works Construction (SPPWC). Aggregate base material should be compacted to at least 95% of the laboratory maximum density, as determined by the ASTM D1557 standard.

TABLE 2

RECOMMENDED ASPHALT PAVEMENT SECTIONS

Parking / Driveway Pavement Area	**Minimum Asphalt Pavement (inches)**	**Minimum Aggregate Base (inches)**	**Properly Compacted Subgrade/Fill (inches)**
Auto and Light Truck Loads (TI = 5)	3	4	12
Heavy Truck Loads (TI = 7)	4	4	12

In all areas of the project, asphalt concrete should be AC-20 or AC-20P, and Type 3 or Type 2 asphalt aggregate per the 'Orange Book" standards. The selection of AC-20P will add about 5% – 10% to the paving costs, but will significantly reduce cracking and future maintenance cost. Asphalt concrete, in any case, should be compacted to between ninety-two percent (92%) and ninety-seven percent (97%) of the Rice theoretical maximum density.

CORROSION AND CHEMICAL ATTACK

On-site soils have a negligible water soluble sulfate content of less than 0.10% (0.01%). No specific type of cement is required for concrete in direct contact with on-site soils, as required by the International Building Code. However, Type II cement (meeting ASTM C150) is recommended for concrete in direct contact with on-site soils.

All exterior concrete should have between 4.5 and 7.5 percent entrained air, a maximum water-cement ratio of 0.45, and comply with all other ACI recommendations for concrete placed in areas subject to freezing. A minimum compression strength of 4,000 psi is recommended for all external concrete. All interior concrete should also be placed pursuant to ACI recommendations.

Native soils have a pH of 8.3 and have a resistivity of 9,900 ohm-cm under saturated conditions. This indicates a moderate corrosive potential for ferrous metals in contact with these soils. Corrosion mitigation measures, such as protective coatings, wrappings, and cathodic protection are therefore recommended. If protective coatings are used, the type and quantity will depend on the kind of steel and specific construction application. Steel and wire concrete reinforcement cover of at least 3 inches where cast against soil, unformed, is recommended.

UTILITY EXCAVATIONS

On-site soils are anticipated to be excavatable with conventional construction equipment. Compliance with OSHA regulations should be enforced for Type C soils. Excavated soils may be suitable for backfill of utility trenches after screening any oversize material and debris. However, on-site soils may not meet the minimum requirements for Class A bedding and should be imported, where required.

MOISTURE PROTECTION, EROSION AND DRAINAGE

The finish surfaces around all structures should slope away from the building and toward appropriate drop inlets or other surface drainage devices. It is recommended that within ten (10) feet of the buildings a minimum slope of five percent (5%) be used for soil subgrades and one percent (1%) be used for pavements. These grades should be maintained for the life of the structures.

Landscaping and downspouts should be planned to prevent discharge adjacent to buildings. Instead, water flow should be conveyed and re-routed to discharge areas away from any improvements.

Backfill adjacent to the proposed building perimeters should be properly compacted to minimize water infiltration into the foundation soils.

CONSTRUCTION SPECIFICATIONS

All work on-site shall be governed by the latest edition of the International Building Code as accepted by Carson City, except where modified herein.
All work off-site shall be governed by the Standard Specifications and Standard Details for Public Works Construction, as distributed by Carson City, except as modified herein.

LIMITATIONS

This report has been prepared in accordance with generally accepted engineering practices in Carson City at this time. The analysis and recommendations are based upon exploration performed at the locations shown on the site plan and the proposed improvements, as described in the "Introduction" section of this report. Subsurface variations may occur between and beyond exploration points. If subsurface variations are found, they should be brought to the immediate attention of the Engineer. We recommend that a representative of Lumos be present to perform observations throughout all phases of this project, particularly where the recommendations of this report may be affected.

Bert Sexton, E.I.
Geotechnical Intern
Lumos and Associates, Inc.

Mitch Burns, P.E.
Construction Services Engineer
Lumos and Associates, Inc.

References

Bowels, Joseph E., 1988 Foundation Analyses and Design

Carson City Building Department, 1996, Standard Specifications for Public Works Construction, "Orange Book", Lyon Co., NV

Federal Highway Administration, 1998, Geotechnical Earthquake Engineering

International Code Council, Inc. (ICC) 2002, 2003 International Building Code (IBC) County Club Hills, IL.

Naval Facilities Engineering Command, 1986, Design Manual 7.01

Naval Facilities Engineering Command, 1986, Design Manual 7.02

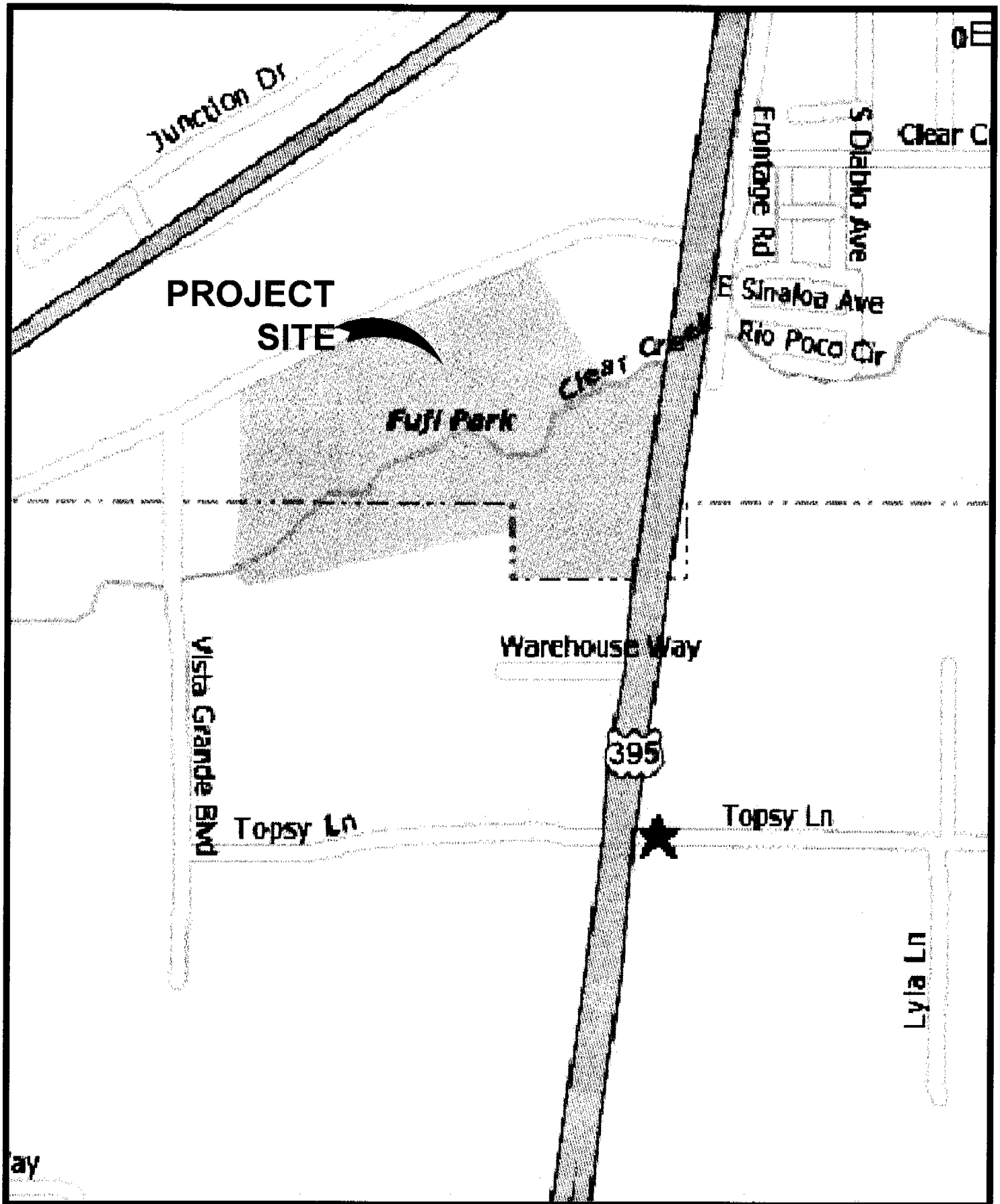
Occupational Safety and Health Administration (OSHA), 1995, Occupational Safety And Health Standards for the Construction Industry, Commerce Clearing House, Inc.

Pease, Robert C., 1979, Genoa Quadrangle Earthquake Hazards Map of Nevada, Nevada Bureau of Mines and Geology, Reno, NV.

Pease, Robert C., 1980, Genoa Quadrangle Geologic Map of Nevada, Nevada Bureau of Mines and Geology, Reno, NV.

Roberge, Pierre R., 2000, Handbook of Corrosion Engineering

USGS 2002 Website, www.eqdesign.cr.usgs.gov



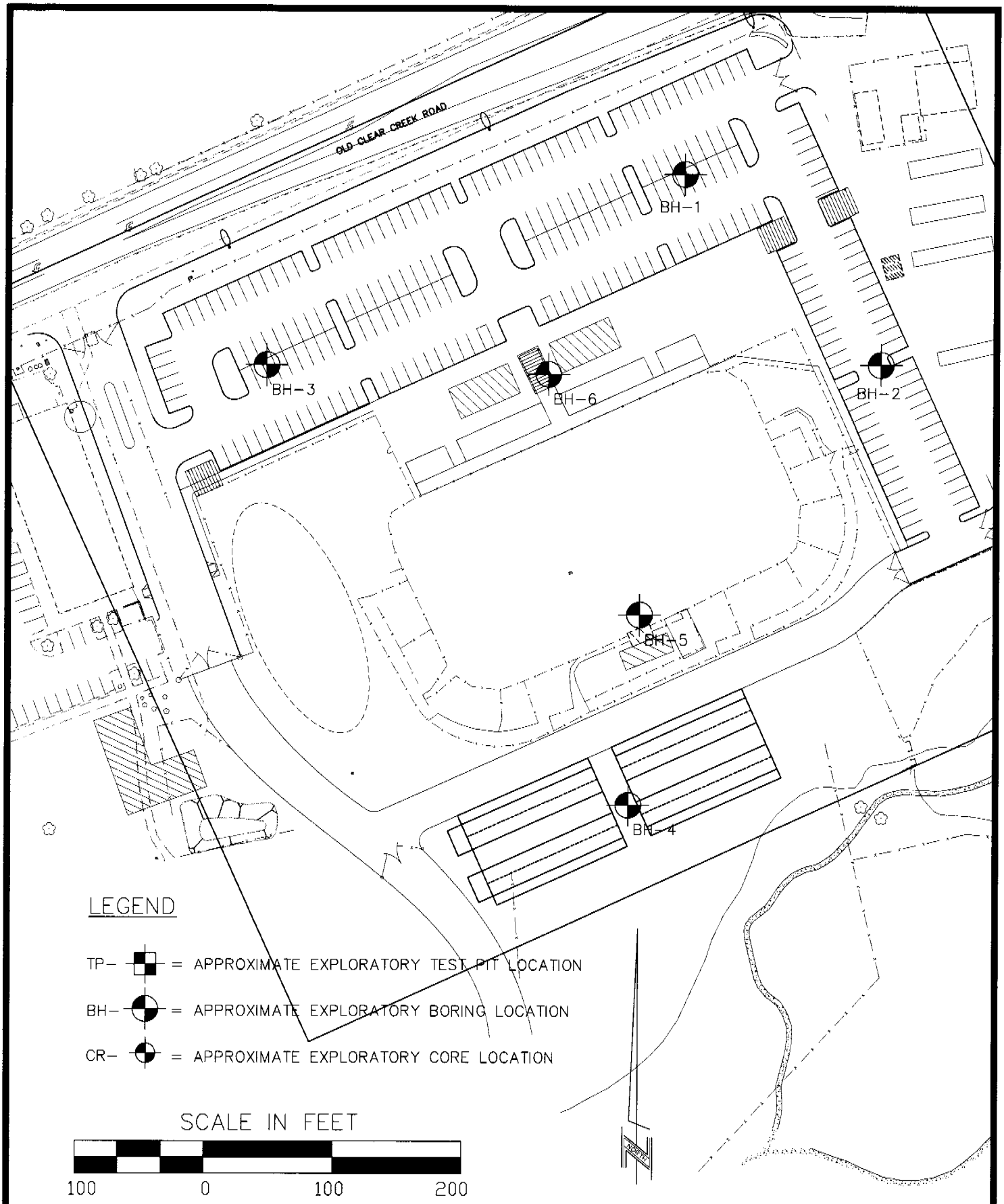
LUMOS & ASSOCIATES
800 E. COLLEGE PARKWAY
CARSON CITY, NEVADA 89706
PH. (775) 883-7077 FAX (775) 883-7114

FUJI PARK PHASE IV

VICINITY MAP

CARSON CITY NEVADA

Date: JANUARY 2007
Scale: N.T.S.
Job No: 5496.601
FIGURE 1



LUMOS & ASSOCIATES
800 E. COLLEGE PARKWAY
CARSON CITY, NEVADA 89706
PH. (775) 883-7077 FAX (775) 883-7114

FUJI PARK PHASE IV

SITE PLAN

CARSON CITY **NEVADA**

Date: JANUARY 2007
Scale: AS NOTED
Job No: 5496.601
FIGURE 2

MODIFIED MERCALLI INTENSITY SCALE

INTENSITY	EFFECTS
I	Not felt except by a very few under especially favorable circumstances.
II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III	Felt quite noticeable indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration like passing of truck. Duration estimated.
IV	During the day felt Indoors by many, outdoors by few. At night some awaken. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building; standing motor cars rock noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbance of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
VI	Felt by all; many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well- built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Disturbs persons driving motor cars.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
X	Some well-built wooden structures destroyed; most masonry and frame structures with foundations destroyed; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed (sloped) over banks.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipe lines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.
XII	Damage total. Waves seen on ground surfaces. Lines of sight and level distorted. Objects thrown upward into the air.

From Wood and Newman, 1931, by U.S. Geological Survey, 1974, Earthquake Information Bulletin, v. 6, no. 5, p. 28.

Richter Magnitude	Intensity (maximum expected Modified Mercalli)
3.0 - 3.9	II - III
4.0 - 4.9	IV - V
5.0 - 5.9	VI - VII
6.0 - 6.9	VII - VIII
7.0 - 7.9	IX - X
8.0 - 8.9	XI - XII

LUMOS & ASSOCIATES
800 E. COLLEGE PARKWAY
CARSON CITY, NEVADA 89706
PH. (775) 883-7077 FAX (775) 883-7114

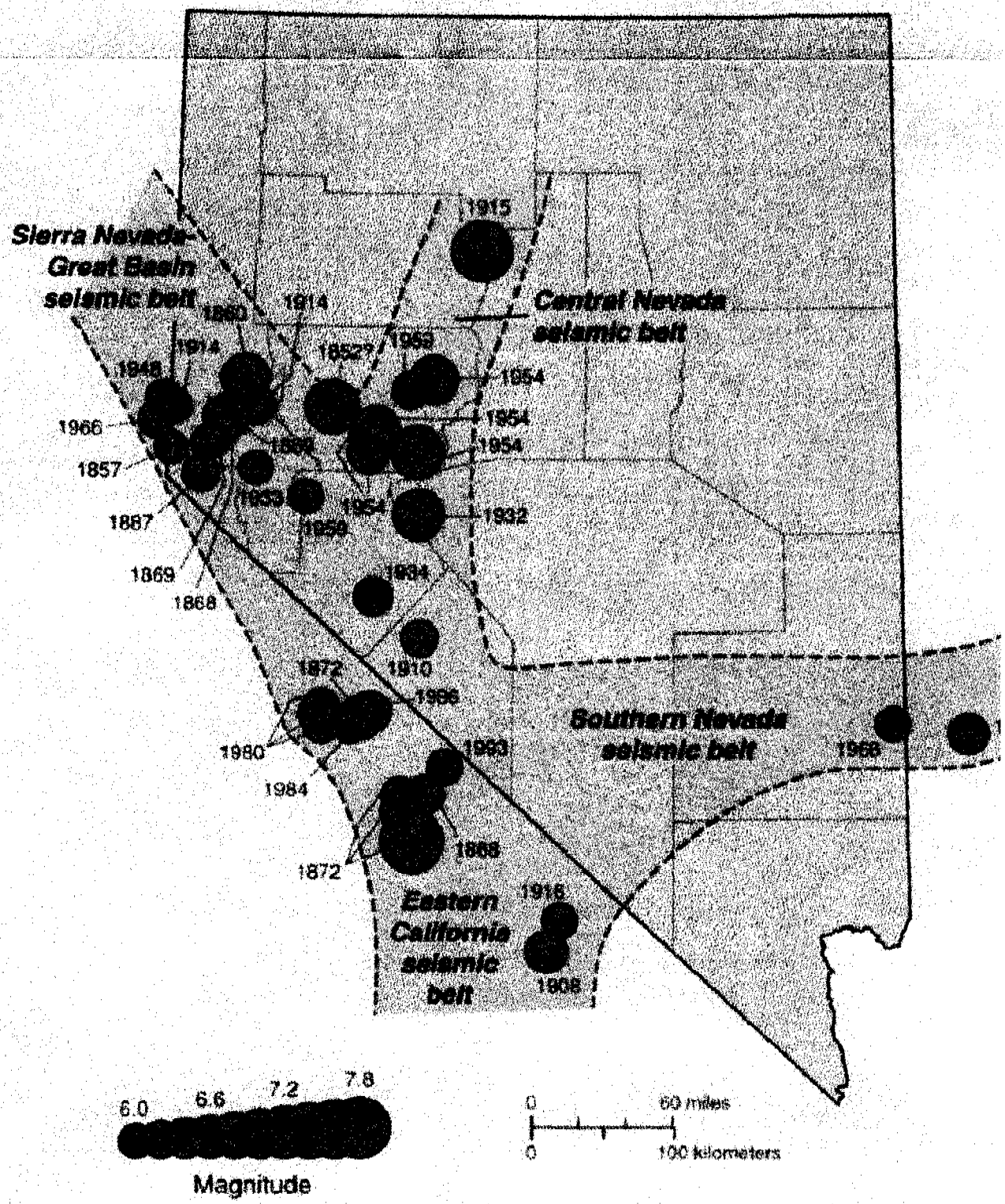
FUJI PARK PHASE IV

MODIFIED MERCALLI SCALE

CARSON CITY NEVADA

Date: JANUARY 2007
Scale: N.T.S.
Job No: 5496.601
FIGURE 3

MAJOR EARTHQUAKES AND SEISMIC BELTS



From NBMG, Map 119, Earthquakes in Nevada 1852-1998, dePolo and dePolo, 1999.

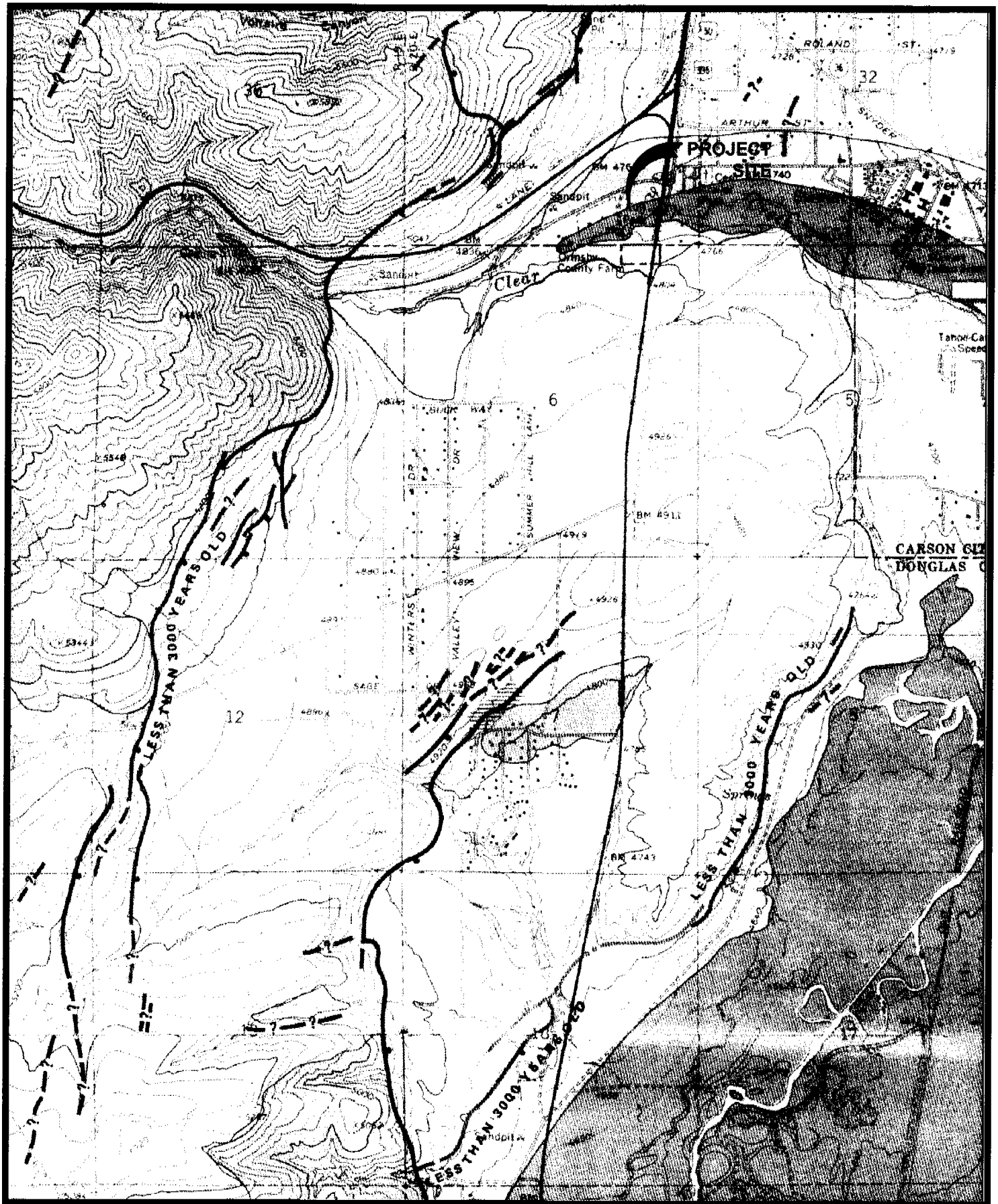
LUMOS & ASSOCIATES
800 E. COLLEGE PARKWAY
CARSON CITY, NEVADA 89706
PH. (775) 883-7077 FAX (775) 883-7114

FUJI PARK PHASE IV

MAJOR EARTHQUAKES/ SEISMIC BELTS

CARSON CITY NEVADA

Date: JANUARY 2007
Scale: N.T.S.
Job No: 5496.601
FIGURE 4



LUMOS & ASSOCIATES
800 E. COLLEGE PARKWAY
CARSON CITY, NEVADA 89706
PH. (775) 883-7077 FAX (775) 883-7114

FUJI PARK PHASE IV

FAULT MAP

CARSON CITY NEVADA

Date: JANUARY 2007
Scale: N.T.S.
Job No: 5496.601
FIGURE 5

APPENDIX A

LUMOS & ASSOCIATES

Sheet 1 of 1

BORING No. BH-1

Logged By: **M. Burns**
Date Logged: **1/15/07**
Drill Type: **B-61**

Total Depth: **11.5 feet**
Water Depth: **8 feet ±**
Ground Elev.: **E.G.S. feet ±**

Shelby Tube | Standard Split Spoon (SPT) | California Sampler | Modified California | Bag Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1			**Silty Sand (SM)** Dark Brown, Moist, Very Dense, Estimated 80% fine to Coarse sand 20% non-plastic silt										
2													
3			3.5										
4			**Poorly Graded Sand (SP)** Medium Brown, Moist to Very Moist, Dense to Very Dense, Estimated 95% fine to Coarse sand 5% non-plastic silt										
5				28									
6													
7													
8			▼ 8.0										
			Ground Water Encountered at 8'										
9													
10													
11			11.5	23									
			Boring terminated at 11.5 feet.										

LUMOS LOG ST BORE FUJU PHASE 4 5496.601.GPJ US LAB.GDT 1/30/07

LUMOS & ASSOCIATES
Lumos & Associates
800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

Fuji Park Phase 4

LOG OF EXPLORATORY BORING

Job Number: 5496.601
Date: January 2007

PLATE A-1

Sheet 1 of 1

BORING No. BH-2

Logged By: **M. Burns**
Date Logged: **1/15/07**
Drill Type: **B-61**

Total Depth: **11.5 feet**
Water Depth: **9 feet ±**
Ground Elev.: **E.G.S. feet ±**

Shelby Tube | Standard Split Spoon (SPT) | California Sampler | Modified California | Bag Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1		B	**Silty Sand (SM)** Dark Brown, Moist, Medium Dense, Estimated 80% Fine to Coarse Sand and 20% Non-plastic Silt.										
2													
3													
4													
5			5.5										
6			**Poorly Graded Sand (SP)** Medium Brown, Moist to Very Moist, Medium Dense to Dense, Estimated 95% Fine to Coarse Sand and 5% Non-plastic Silt.	16									
7													
8													
9			9.0 ▼ Ground Water Encountered at 9'										
10													
11			11.5	27									
			Boring terminated at 11.5 feet.										

LUMOS LOG ST BORE FUJU PHASE 4 5496.601.GPJ US LAB.GDT 1/30/07

LUMOS & ASSOCIATES
Lumos & Associates
800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

Fuji Park Phase 4

LOG OF EXPLORATORY BORING

Job Number: 5496.601
Date: January 2007

PLATE A-2

Sheet 1 of 1

BORING No. BH-3

Logged By: **M. Burns**
Date Logged: **1/15/07**
Drill Type: **B-61**

Total Depth: **11.5 feet**
Water Depth: **9 feet ±**
Ground Elev.: **E.G.S. feet ±**

Shelby Tube | Standard Split Spoon (SPT) | California Sampler | Modified California | Bag Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1			**Silty Sand (SM)** Dark Brown, Moist, Loose.										
2		B					NP	NP	2	76	21		
3			3.5										
4			**Poorly Graded Sand (SP)** Medium Brown, Moist, Loose, Estimated 95% Fine to Coarse Sand 5% Non-plastic Silt.										
5				5									
6			6.0										
7			**Silty Sand (SM)** Dark Brown, Moist to Very Moist, Loose, Estimated 60% Fine to Coarse Sand 40% Non-plastic Silt.										
8													
9			9.0										
10			Ground Water Encountered at 9'										
11			10.0										
			Poorly Graded Sand (SP) Medium Brown, Moist to Very Moist Loose, Estimated 95% Fine to Coarse Sand 5% Non-plastic Silt. 10.5	4									
			Silty Sand (SM) Dark Brown, Moist to Very Moist, Loose, Estimated 60% Fine to Coarse Sand 40% Non-plastic Silt. 11.5										
			Boring terminated at 11.5 feet.										

LUMOS LOG ST BORE FUJU PHASE 4 5496.601.GPJ US LAB.GDT 1/30/07

LUMOS & ASSOCIATES
Lumos & Associates
800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

Fuji Park Phase 4

LOG OF EXPLORATORY BORING

Job Number: 5496.601
Date: January 2007

PLATE A-3

Sheet 1 of 1

BORING No. BH-4

Logged By: **M. Burns**
Date Logged: **1/15/07**
Drill Type: **B-61**

Total Depth: **21.5 feet**
Water Depth: **6 feet ±**
Ground Elev.: **E.G.S. feet ±**

Shelby Tube | Standard Split Spoon (SPT) | California Sampler | Modified California | Bag Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
			Silty Sand (SM) Medium Brown, Moist, Medium Dense, Estimated 80% Fine to Coarse Sand and 20% Non-plastic Silt. EXISTING FILL TO 2'.										
			2.0										
			Silty Sand (SM) Dark Brown, Very Moist, Medium Dense, Estimated 80% Fine to Coarse Sand and 20% Non-plastic Silt.	11									
5			5.0										
			Poorly Graded Sand (SP) Medium Brown, Very Moist, Very Dense.	11			NP	NP	2	94	4		
			6.0 Ground Water Encountered at 6'										
				35									
10				35									
15				75									
20			20.5										
			Poorly Graded Sand (SP) Reddish Brown, Very Moist, Very Dense, Estimated 95% Fine to Coarse sand and 5% Non-plastic Silt.	82									
			21.5 Boring terminated at 21.5 feet.										

LUMOS LOG ST BORE FUJU PHASE 4 5496.601.GPJ US LAB.GDT 1/30/07

LUMOS & ASSOCIATES
Lumos & Associates
800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

Fuji Park Phase 4

LOG OF EXPLORATORY BORING

Job Number: 5496.601
Date: January 2007

PLATE A-4

Sheet 1 of 1

BORING No. BH-5

Logged By: **M. Burns**
Date Logged: **1/15/07**
Drill Type: **B-61**

Total Depth: **21.5 feet**
Water Depth: **8 feet ±**
Ground Elev.: **E.G.S. feet ±**

Shelby Tube | Standard Split Spoon (SPT) | California Sampler | Modified California | Bag Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
			Well Graded Sand with Silt (SW-SM) Dark Brown, Moist, Medium Dense to Dense.	10									
5				13									
			Ground Water Encountered at 8'. 8.0	16			NP	NP	2	86	12		
10			Color Change to Reddish Brown	25									
			Poorly Graded Sand (SP) Medium Brown, Very Moist, Very Dense, Estimated 95% Fine to Coarse Sand and 5% Non-plastic Silt	58									
15													
20			Less Degraded 21.5	36									
			Boring terminated at 21.5 feet.										

LUMOS LOG ST BORE FUJU PHASE 4 5496.601.GPJ US LAB.GDT 1/30/07

LUMOS & ASSOCIATES
Lumos & Associates
800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

Fuji Park Phase 4

LOG OF EXPLORATORY BORING

Job Number: 5496.601
Date: January 2007

PLATE A-5

Sheet 1 of 1

BORING No. BH-6

Logged By: **M. Burns**
Date Logged: **1/15/07**
Drill Type: **B-61**

Total Depth: **41.5 feet**
Water Depth: **8 feet ±**
Ground Elev.: **E.G.S. feet ±**

Shelby Tube | Standard Split Spoon (SPT) | California Sampler | Modified California | Bag Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
			Silty Sand (SM) Dark Brown, Moist, Medium Dense, Estimated 80% Fine to Coarse Sand and 20% Non-plastic Silt.	9									
			4.5										
5			**Poorly Graded Sand (SP)** Medium Brown, Moist, Dense.	24									
			8.0										
			▼ Ground Water Encountered at 8'.	27									
10				24			NP	NP	3	94	3		
15				25									
20													
			21.0										
			Sandy Silt (ML) Dark Brown, Very Moist, Stiff.	13			NP	NP			63		
			23.0										
25			**Poorly Graded Sand (SP)** Gray, Very Moist, Very Dense, Estimated 95% Fine to Coarse Sand and 5% Non-plastic Silt.	44									
			28.0										
30			**Silty Sand (SM)** Gray, Very Moist, Very Dense, Estimated 70% Fine to Coarse Sand and 30% Non-plastic Silt. Hard Drilling	150									
35				150									
40			41.5										
			Boring terminated at 41.5 feet.										

LUMOS LOG ST BORE FUJU PHASE 4 5496.601.GPJ US_LAB.GDT 1/30/07

LUMOS & ASSOCIATES
Lumos & Associates
800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

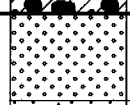
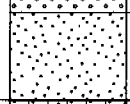
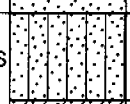
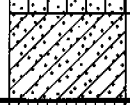
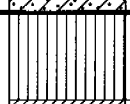
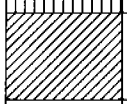
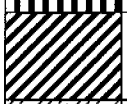
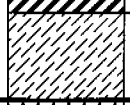
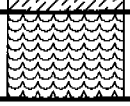
Fuji Park Phase 4

LOG OF EXPLORATORY BORING

Job Number: 5496.601
Date: January 2007

PLATE A-6

SOIL CLASSIFICATION CHART

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

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

Other Tests	
AN	ANALYTICAL TEST (pH, Soluble Sulfate, and Resistivity)
C	CONSOLIDATION TEST
DS	DIRECT SHEAR TEST
MD	MOISTURE DENSITY CURVE

LUMOS & ASSOCIATES
Lumos & Associates
800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

Fuji Park Phase 4

LEGEND

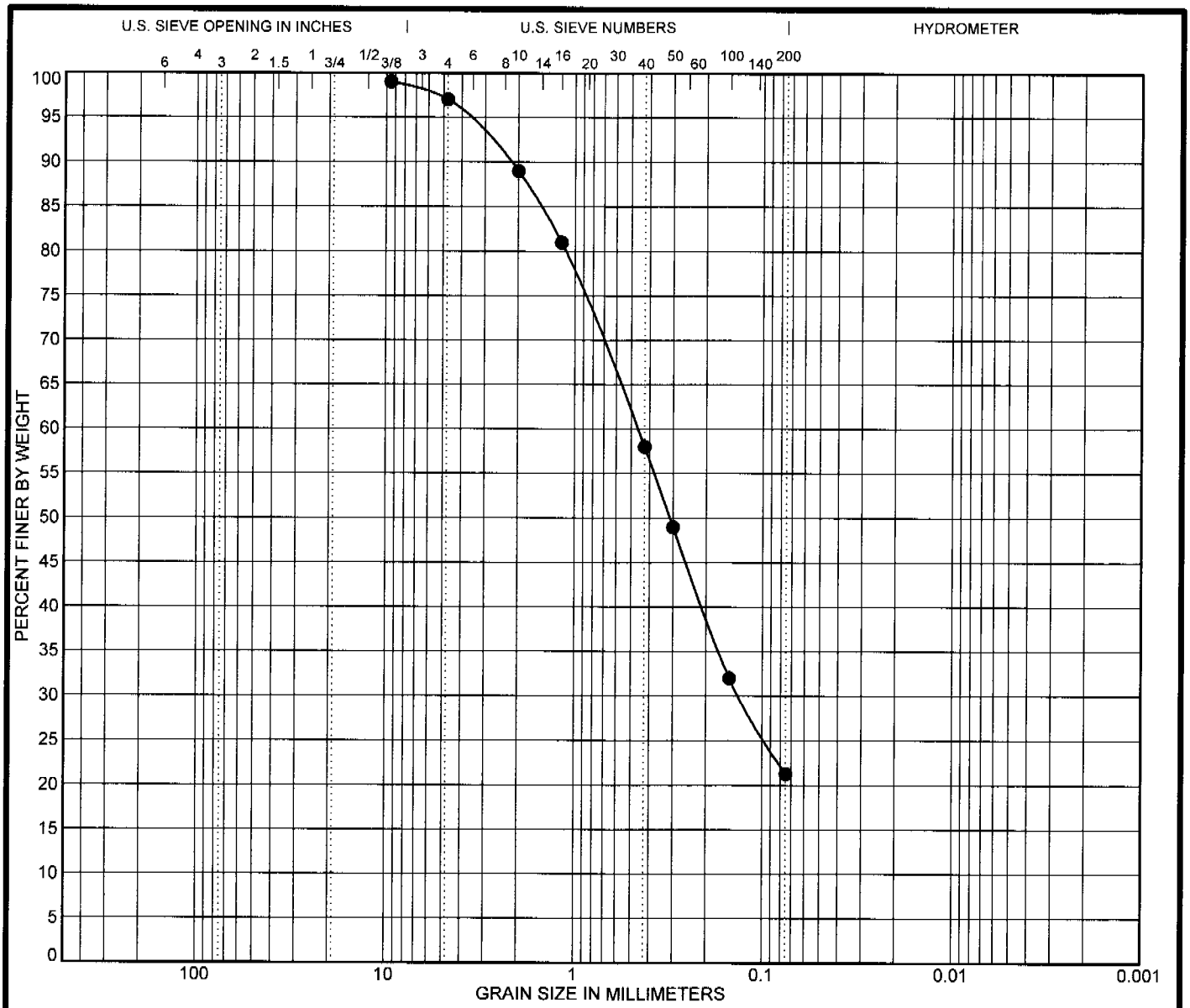
Job Number: 5496.601 Date: January 2007

PLATE A-7

LUMOS LEGEND FUJU PHASE 4 5496.601.GPJ 10-23-06.GDT 1/30/07

APPENDIX B

LUMOS & ASSOCIATES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● **BH-3**						
Depth: 0	DARK BROWN SILTY SAND (SM)	NP	NP	NP		
Sample Location						
USCS	Silty Sand (SM)					
AASHTO						

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH-3**								
Depth: 0	9.5	0.464	0.132		2.0	75.7	21.3	
Natural Moisture	%		S.E.					
R-Value			Durability Index					
Perctage of Wear (500 rev)	%		S.G.					

LUMOS_GRAIN_SIZE_FUJU PHASE 4 5496.601.GPJ US_LAB.GDT 1/30/07

LUMOS & ASSOCIATES

Lumos & Associates

800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

Fuji Park Phase 4

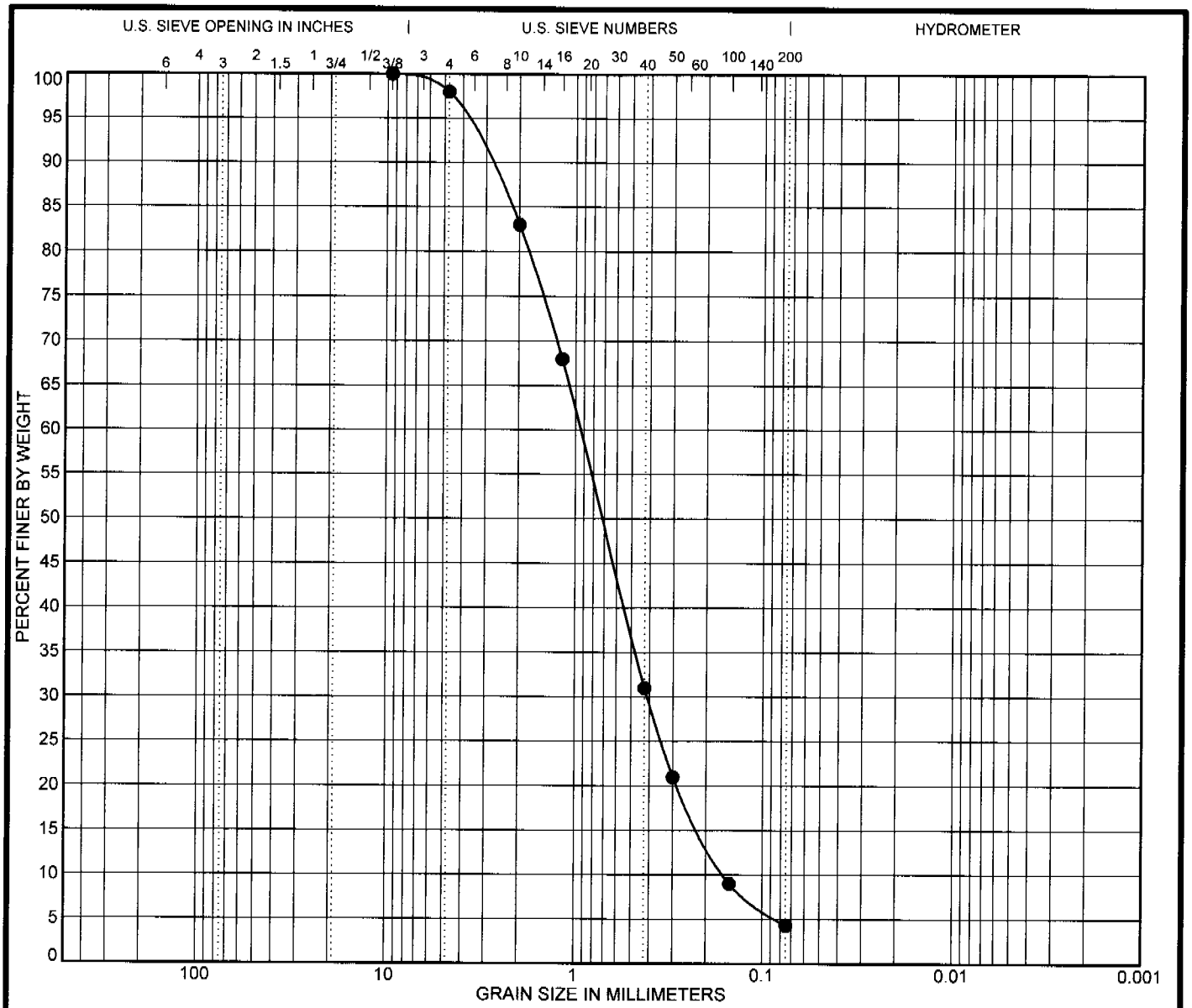
GRAIN SIZE DISTRIBUTION

Job Number: 5496.601

Date: January 2007

PLATE

B-1.1



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● **BH-4**						
Depth: 5	POORLY GRADED SAND (SP)	NP	NP	NP	1.1	6.0
Sample Location						
USCS	Poorly Graded Sand (SP)					
AASHTO						

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH-4**								
Depth: 5	9.5	0.946	0.41	0.159	2.0	93.7	4.3	
Natural Moisture	%		S.E.					
R-Value			Durability Index					
Perctage of Wear (500 rev)	%		S.G.					

LUMOS_GRAIN SIZE_FUJU PHASE 4 5496.601.GPJ US_LAB.GDT 1/30/07

LUMOS & ASSOCIATES
Lumos & Associates
800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

Fuji Park Phase 4

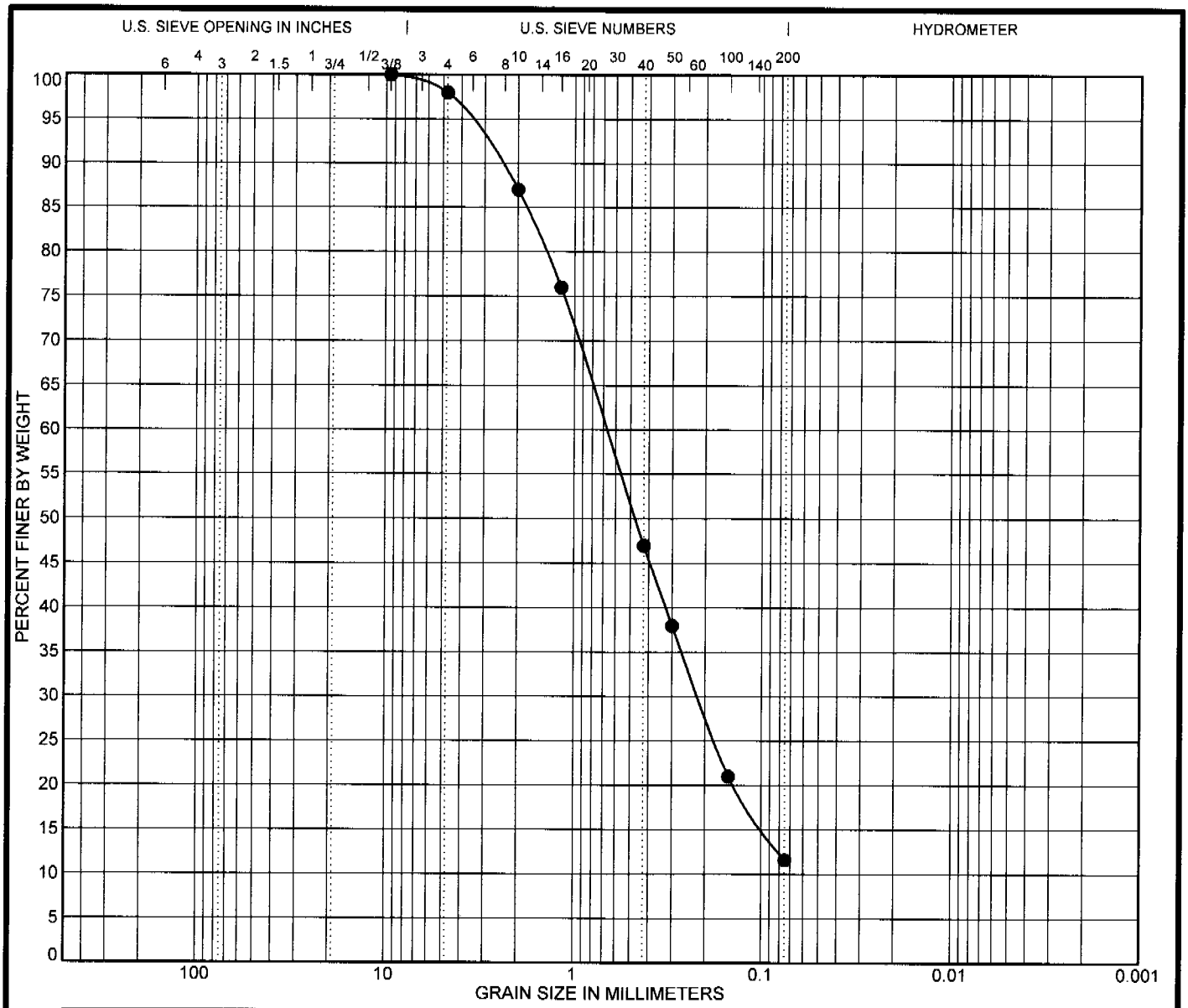
GRAIN SIZE DISTRIBUTION

Job Number: 5496.601

Date: January 2007

PLATE

B-1.2



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH-5**	WELL GRADED SAND with SILT (SW-SM)	NP	NP	NP	1.0	10.1
	Depth: 7.5						
	Sample Location						
	USCS	Well Graded Sand with Silt (SW-SM)					
	AASHTO						

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH-5**								
	Depth: 7.5	9.5	0.672	0.217		2.0	86.4	11.6	

	Natural Moisture	%	S.E.	
	R-Value		Durability Index	
	Perctage of Wear (500 rev)	%	S.G.	

LUMOS GRAIN SIZE FUJU PHASE 4 5496.601.GPJ US LAB.GDT 1/30/07

LUMOS & ASSOCIATES

Lumos & Associates

800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

Fuji Park Phase 4

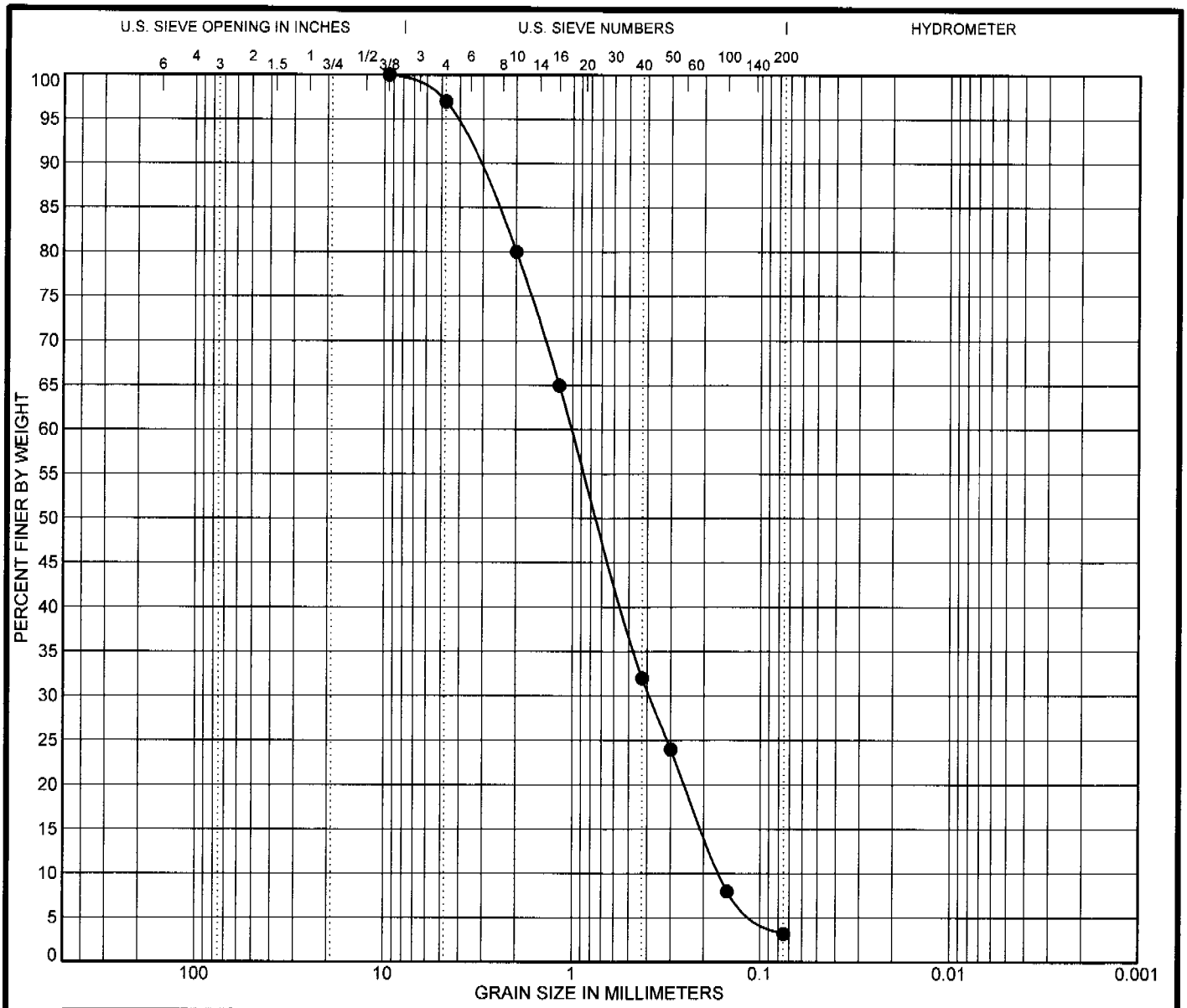
GRAIN SIZE DISTRIBUTION

Job Number: 5496.601

Date: January 2007

PLATE

B-1.3



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification									
●	**BH-6**	Classification				LL	PL	PI	Cc	Cu
	Depth: 10	POORLY GRADED SAND (SP)				NP	NP	NP	0.9	6.2
	Sample Location									
	USCS	Poorly Graded Sand (SP)								
	AASHTO									

	Specimen Identification								
●	**BH-6**	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
	Depth: 10	9.5	1.011	0.39	0.164	3.0	93.8	3.2	
	Natural Moisture	%		S.E.					
	R-Value			Durability Index					
	Perctage of Wear (500 rev)	%		S.G.					

LUMOS GRAIN SIZE FUJU PHASE 4 5496.601.GPJ US LAB.GDT 1/30/07

LUMOS & ASSOCIATES
Lumos & Associates
800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

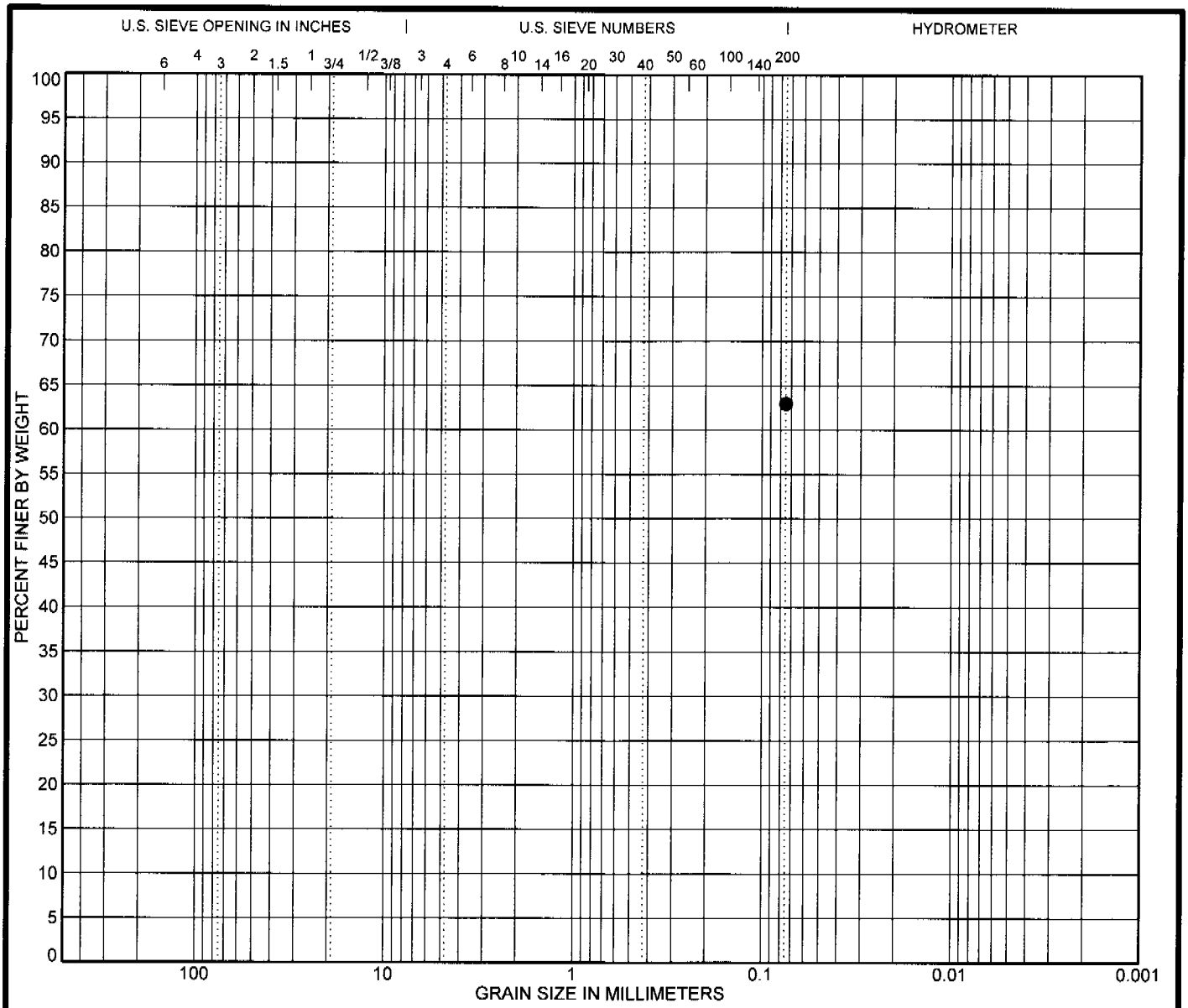
Fuji Park Phase 4

GRAIN SIZE DISTRIBUTION

Job Number: 5496.601 Date: January 2007

PLATE

B-1.4



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH-6**	SANDY SILT (ML)	NP	NP	NP		
	Depth: 21						
	Sample Location						
	USCS	Sandy Silt (ML)					
	AASHTO						

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH-6**								
	Depth: 21	0.075				0.0	0.0	63.0	
	Natural Moisture	%		S.E.					
	R-Value			Durability Index					
	Perctage of Wear (500 rev)	%		S.G.					

LUMOS_GRAIN_SIZE_FUJU PHASE 4 5496.601.GPJ US_LAB.GDT 1/30/07

LUMOS & ASSOCIATES

Lumos & Associates

800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

Fuji Park Phase 4

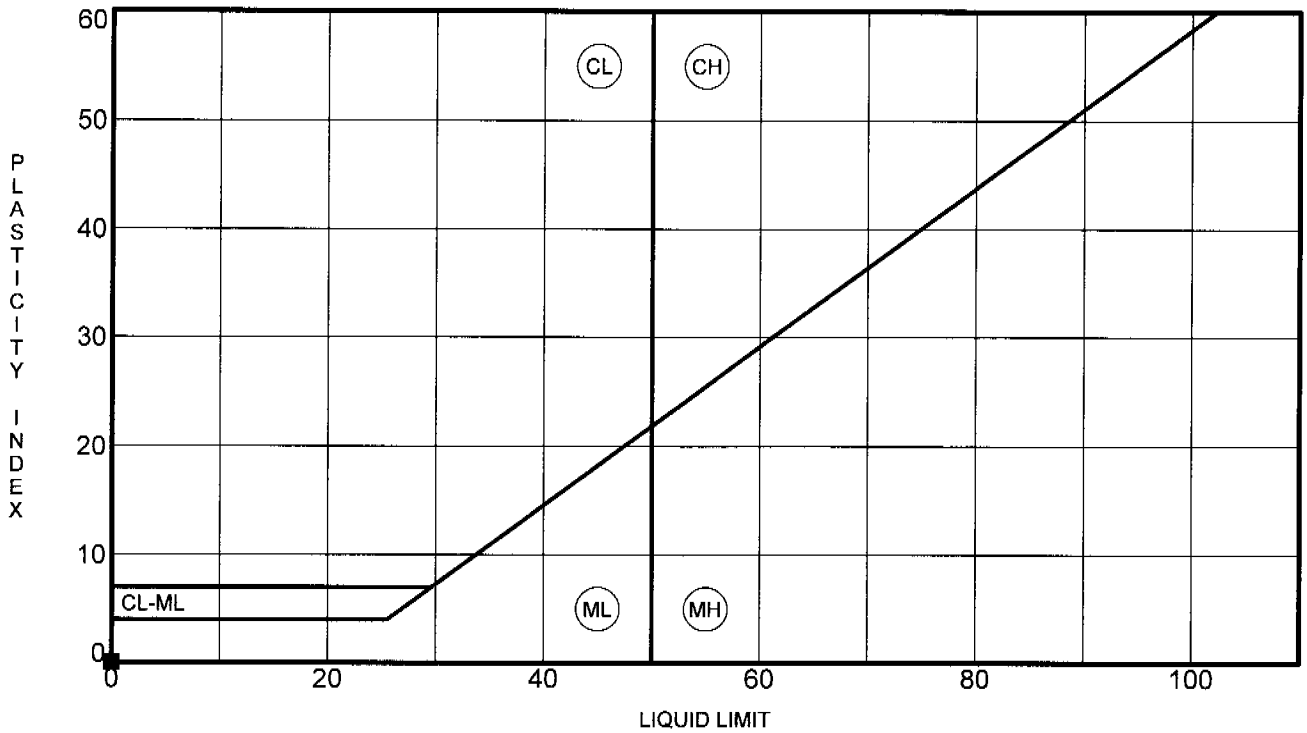
GRAIN SIZE DISTRIBUTION

Job Number: 5496.601

Date: January 2007

PLATE

B-1.5



	Specimen Identification		LL	PL	PI	Fines	Classification
●	BH-3	0.0	NP	NP	NP	21	DARK BROWN SILTY SAND (SM)
⊠	BH-4	5.0	NP	NP	NP	4	POORLY GRADED SAND (SP)
▲	BH-5	7.5	NP	NP	NP	12	WELL GRADED SAND with SILT (SW-SM)
★	BH-6	10.0	NP	NP	NP	3	POORLY GRADED SAND (SP)
⊙	BH-6	21.0	NP	NP	NP	63	SANDY SILT (ML)

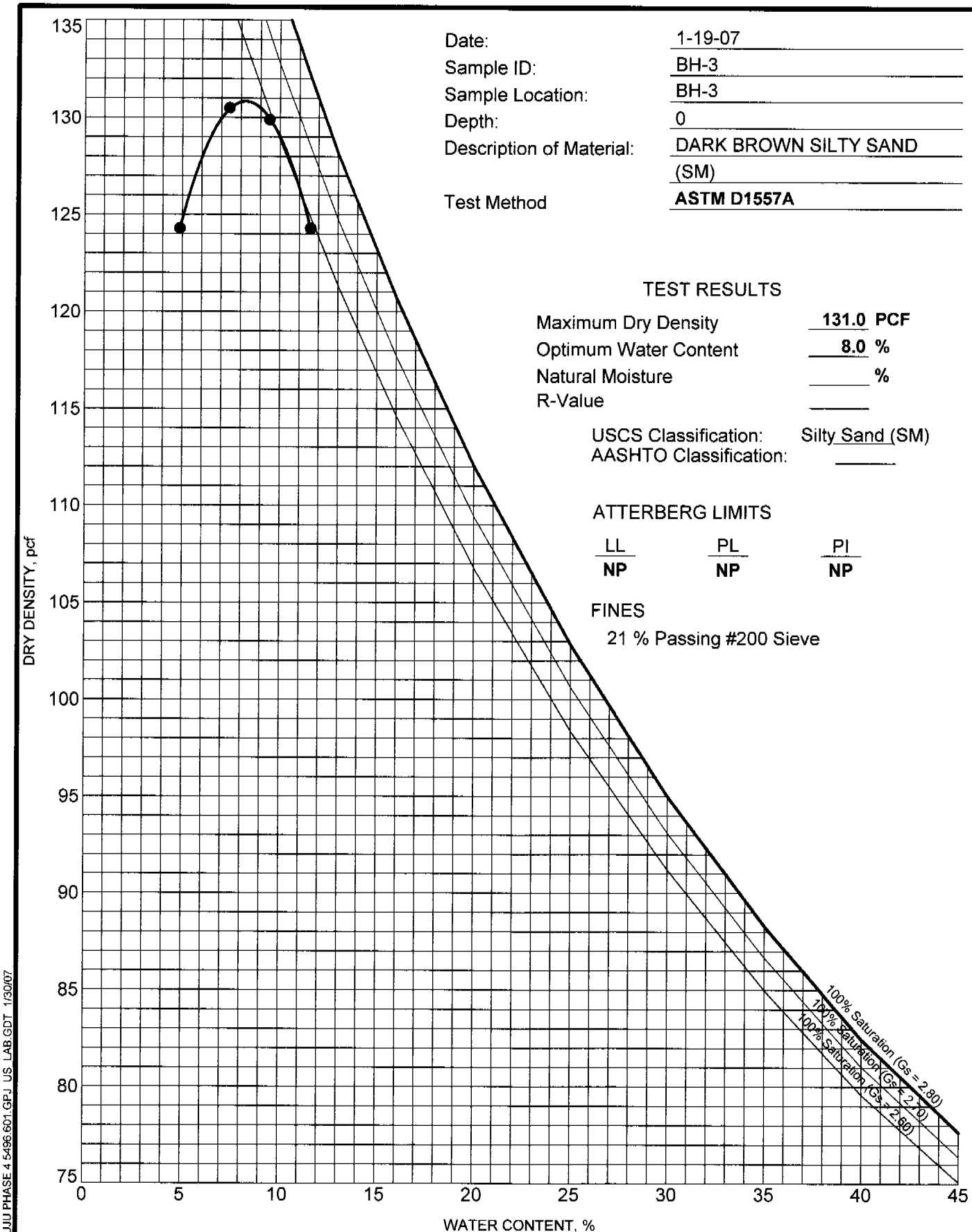
LUMOS & ASSOCIATES
Lumos & Associates
800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

Fuji Park Phase 4

ATTERBERG LIMITS' RESULTS

Job Number: 5496.601 Date: January 2007

PLATE B-2



Date: 1-19-07
Sample ID: BH-3
Sample Location: BH-3
Depth: 0
Description of Material: DARK BROWN SILTY SAND (SM)
Test Method **ASTM D1557A**

TEST RESULTS

Maximum Dry Density	**131.0 PCF**
Optimum Water Content	**8.0 %**
Natural Moisture	**%**
R-Value	

USCS Classification: Silty Sand (SM)
AASHTO Classification:

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

FINES
21 % Passing #200 Sieve

LUMOS COMPACTION FUJU PHASE 4 5496.601.GPJ US_LAB.GDT 1/30/07

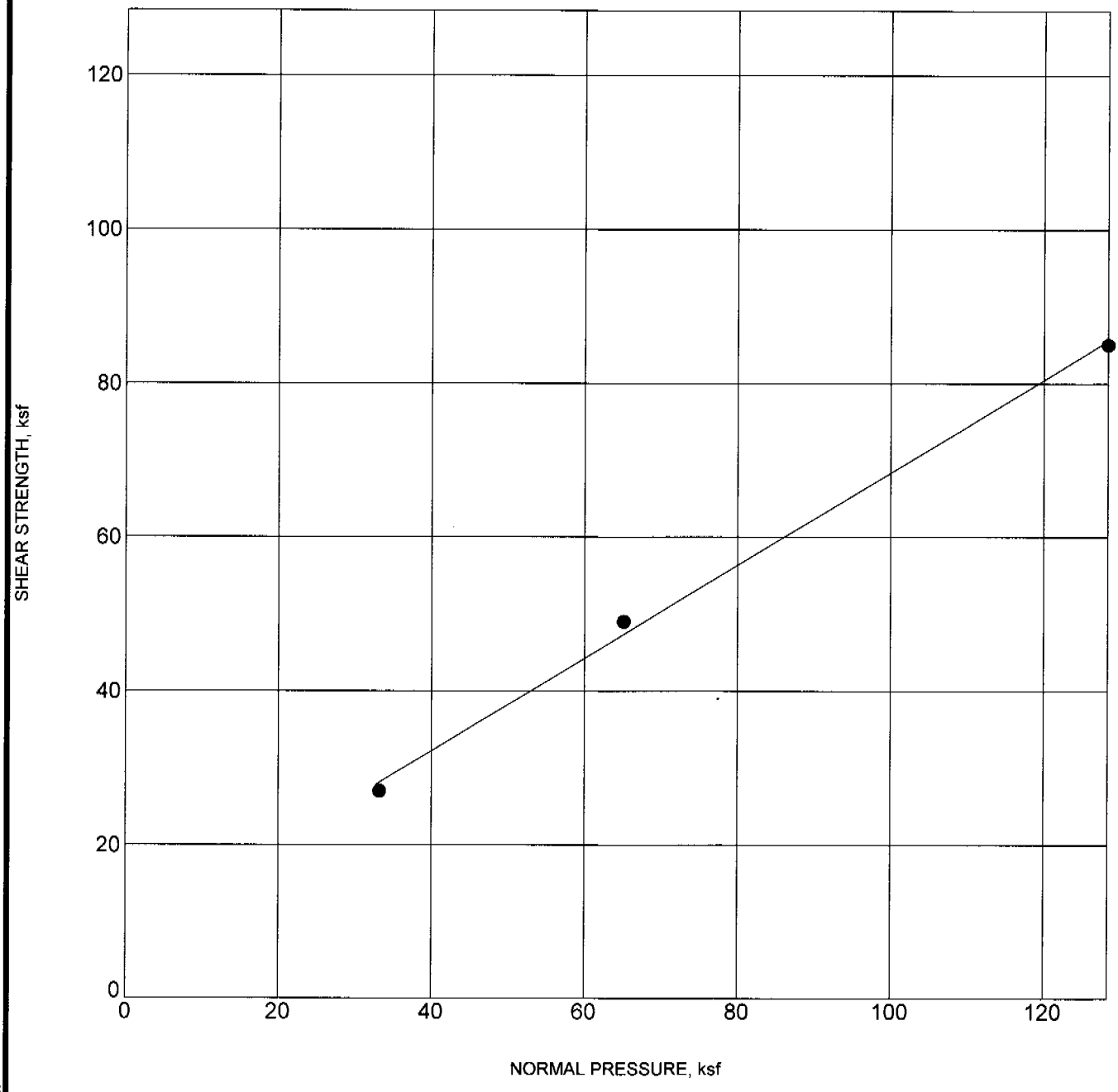
LUMOS & ASSOCIATES
Lumos & Associates
800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

Fuji Park Phase 4

MOISTURE-DENSITY CURVE

Job Number: 5496.601 Date: January 2007

PLATE B-3



Specimen Identification		Classification	γ_d	MC%	c	ϕ
● BH-3	0.0	DARK BROWN SILTY SAND (SM)	117	8	8.06	31.1

LUMOS DIRECT SHEAR FUJU PHASE 4 5496.601.GPJ US LAB.GDT 1/30/07

LUMOS & ASSOCIATES
Lumos & Associates
800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

Fuji Park Phase 4

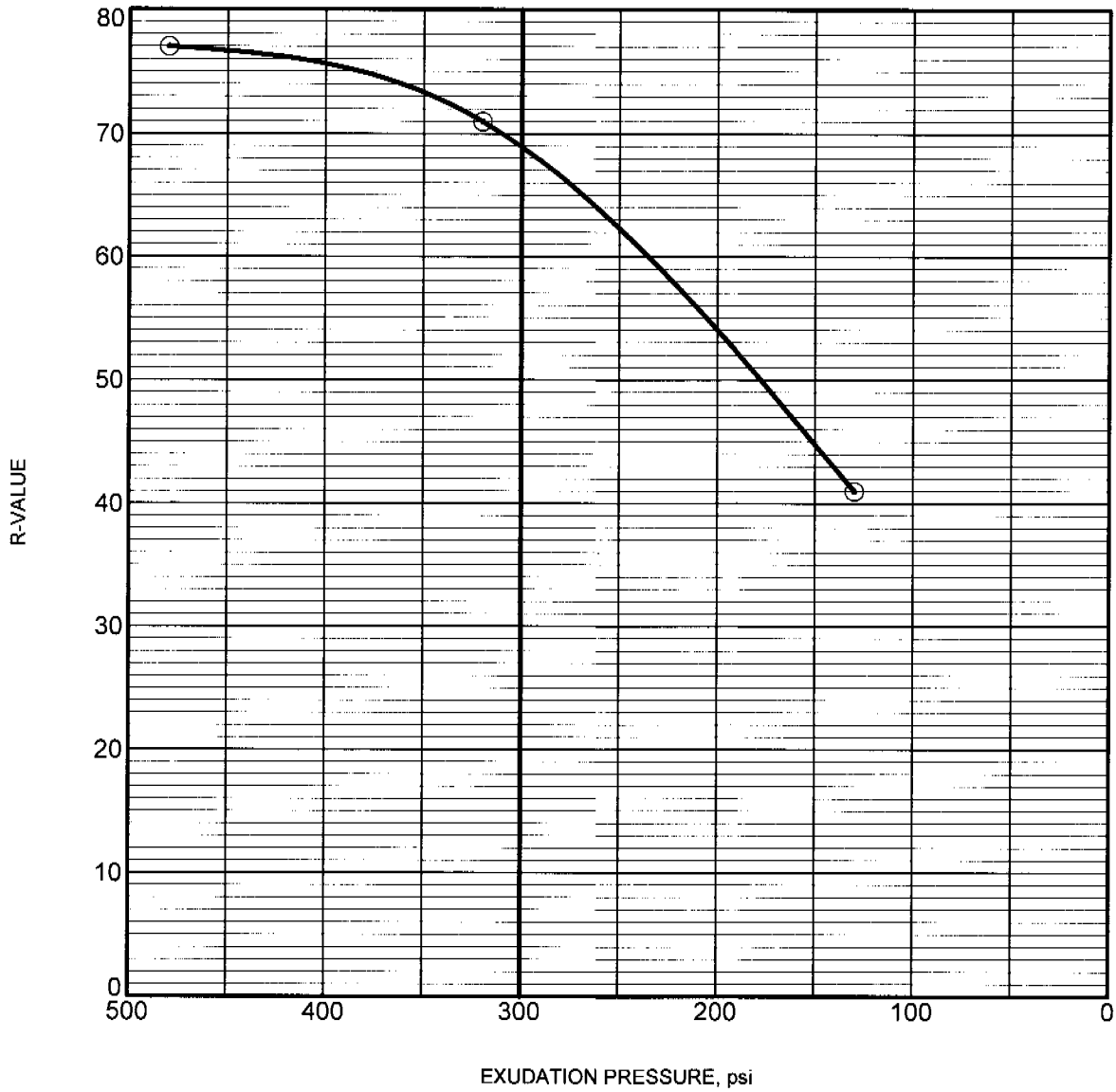
DIRECT SHEAR TEST

Job Number: 5496.601

Date: January 2007

PLATE

B-4



Test Data

Specimen No.	Water Content (%)	Dry Density (pcf)	Expansion (psf)	Exudation (psi)	Test R-Value*
1	**10.9**	**123.0**	**0.0**	**130.0**	**41.0**
2	**9.0**	**125.8**	**0.0**	**320.0**	**71.0**
3	**8.6**	**126.8**	**0.0**	**480.0**	**77.0**

* Reported values have been corrected for sample height, where required.

Test Result

Specimen Identification		Classification	R-Value
BH-2	**0.0**	**Dark Brown Silty Sand (SM)**	**70**

LUMOS & ASSOCIATES

Lumos & Associates

800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

Fuji Park Phase 4

RESISTANCE VALUE TEST

Job Number: 5496.601 Date: January 2007

PLATE B-5

R VALUE FUJI PHASE 4 5496.601.GPJ US LAB.GDT 1/30/07

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983

member of
AMERICAN SOCIETY FOR TESTING MATERIALS

ACT LAB NO: 14194(a) **DATE:** January 22, 2007

PROJECT NO: 5496.601 **P.O.:** 5496.601 (MTB)

ANALYZED BY: Kurt D. Ergun **LAB ID:**

WATER SOLUBLE SALT ANALYSIS IN SOIL

1:5 (soil:water) Aqueous Extraction
AWWA 3500-Na D, AWWA 4500 E

SOIL SIEVE SIZE = -10 MESH

Sample No.	Location	Depth (feet)	Sodium (Percent)	Water Soluble Sulfate (SO_4) (Percent)	Total Available Water Soluble Sodium Sulfate (Na_2SO_4) (Percent)
	BH-1	0-5	<0.01	0.01	0.01

LABORATORY MANAGER

Notes: The results for each constituent denote the percentage of that analyte, at a 1:5 (soil:water) extraction ratio, which is present in the soil. Sodium was determined by flame photometry, sulfate turbidimetrically, and sodium sulfate by calculation.

Received Time Jan. 22. 7:37AM

Atlas Consultants, Inc.

6000 S. Eastern Avenue, Suite 10J • Las Vegas, Nevada 89119
(702) 383-1199 • Fax (702) 383-4983

member of
AMERICAN SOCIETY FOR TESTING MATERIALS

LABORATORY NO:	14194(a)	**DATE:**	January 22, 2007
SAMPLE:	Soil	**P.O.:**	5496.601 (MTB)
MARKED:	5496.601	**LAB ID:**	
SUBMITTED BY:	Lumos and Associates, Inc.	**SOIL SIEVE =**	-10
ANALYZED BY:	Kurt D. Ergun		

REPORT OF DETERMINATION

BORING NUMBER	BH-1					
DEPTH (feet)	0-5					
pH VALUE	8.30					
RESISTIVITY (Ohm-cm)	9,900					

Robert L. Simmons
LABORATORY MANAGER

NOTES:

1. The soil:water extract ratio was 1:5, the results are in mg/Kg in the soil.
2. The standard methods used for the determinations are AWWA 4500 H pH Value, and ASTM G 57.

Received Time Jan. 22. 7:37AM

LUMOS & ASSOCIATES

Lumos & Associates
800 E. College Parkway
Carson City, Nevada 89706
(775) 883-7077
Fax: (775) 841-9416

Fuji Park Phase 4

pH VALUE/RESISTIVITY

Job Number: 5496.601 Date: January 2007

PLATE
B-7

APPENDIX C

LUMOS & ASSOCIATES

SPECIFICATIONS FOR DEMOLITION

Demolition shall include the removal of all designated structures/improvements to be removed, i.e. concrete structures, asphalt pavements, utilities, pipes and unsuitable material within the project area. Excavations caused by removal of existing improvements and utilities shall be cleared of all wastes, debris, and any loose/soft soils, and backfilled with properly compacted fill, as specified under the General Site Grading section of this report. All fill compaction should be performed under observation and testing by the Geotechnical Engineer.

Broken concrete, asphalt, and other materials shall be considered waste and shall be removed from the site.

Any existing drain lines, wires, utilities, etc., which are to remain on the site shall be protected from damage. Buried drain lines, pipe conduits, utilities, etc. which are necessarily cut shall be either carefully and permanently capped at the property line as specified by the City Engineer or re-routed as necessary. Utility lines not specifically noted for disposition, but which are encountered in the work area shall be capped, extended, protected or re-routed as necessary for completion of the work, as directed.

All work shall be performed in accordance with the Federal Occupational Safety and Health Administration, the local Division of Occupational Safety and Health requirements, and applicable ordinances of the governing municipality.

Care shall be taken not to damage adjoining utilities or structures to remain after completion of the work. Finished work damaged by operations during demolition and site preparation shall be repaired or replaced to the satisfaction of the Owner at no cost to the Owner.

All materials resulting from demolition and site preparation not designated by the Owner to be recovered or to be relocated by the Contractor shall be removed promptly and disposed of off the site.

Upon completion of demolition and site preparation, the site shall be "raked clean" – if applicable – and all waste, rubble, debris, etc. shall be removed and disposed of off the site.