# GEOTECHNICAL REPORT

**CARSON FREEWAY**
**CLEARVIEW DRIVE GRADE SEPARATION**
**CARSON CITY**
**EA 72781**
**DECEMBER 2003**

NEVADA DOT
GEOTECHNICAL ENGINEERING

**MATERIALS DIVISION**

**STATE OF NEVADA**

**DEPARTMENT OF TRANSPORTATION**

**MATERIALS DIVISION**

**GEOTECHNICAL SECTION**

# GEOTECHNICAL REPORT
# CARSON FREEWAY
# CLEARVIEW DRIVE GRADE SEPARATION

**December 2003**

**E.A. 72781 Fund 1**

**CARSON CITY, NEVADA**


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# INTRODUCTION

## General

This report has been prepared for the planned grade separation located at Clearview Drive, crossing over the proposed Carson Freeway in Carson City, Nevada. Clearview Drive runs generally east-west in this location, and is currently one lane wide in each direction (See Photo 1). The proposed freeway will run in a north-south direction, approximately 20 to 25 below existing grade, crossing under Clearview Drive approximately 200 feet west of South Edmonds Drive. To date, the proposed plan calls for construction of a double span concrete structure. For a more detailed description, see the contract plans. A site plan for the project is presented in Appendix A.

**Photo 1. Clearview Drive: Looking West toward US 50.**

### Purpose and Scope

The purpose of this report is to provide information regarding the subsurface soil conditions at the proposed project site. This report also provides geotechnical design recommendations for the bridge structure proposed for this project. The scope of this report consists primarily of geotechnical investigation, analysis, and recommendations for both design and construction. The investigation included gathering data from past field explorations and reports, in addition to information obtained from recent subsurface explorations, soil sampling, and analysis of field and laboratory testing data. This report includes boring logs and summaries of test results from the field investigations and the laboratory testing regimen. These may be found in appendices B and C, respectively.

## PROJECT DESCRIPTION

The project site is located in southwestern Carson City (See Photo 2). The freeway runs approximately 20 feet below the existing grade as shown in the current plans, and will pass under Clearview Drive. Preliminary plans indicate the proposed bridge will be designed as a double span concrete structure over the freeway alignment, conveying two lanes of traffic in each direction. It will be supported on spread footings founded in native soil. The new structure will be approximately 60 feet in width and 210 feet in length.

**Photo 2. Clearview Drive: Looking East toward S. Edmonds Drive.**

## GEOLOGIC CONDITIONS and SEISMICITY

The site is founded primarily in pediment and alluvial fan deposits (Qpa). These deposits are generally grayish-orange, tan, and gray-brown muddy sands and sandy gravels[1]. Although not anticipated, variable site conditions include the possibility of encountering large cobbles, boulders, or other adverse soil conditions.

This area lies at an elevation of approximately 4740 feet and slopes gently downward (≈3%) to the west[2]. Groundwater was measured nine weeks after drilling at a depth of approximately 72 feet in borehole CV-1. There are several seismic features near the project site; among them are three significant Fault Zones. The Genoa Fault Zone, approximately 4.0 miles to the west-southwest; the Carson City Fault, which lies about 2.0 miles to the west-northwest; and the Eastern Prison Hill Fault Zone, which lies about 7 miles to the northeast. These Holocene faults (<11,000 years old) are capable of producing large (magnitude 6.6 to 7.4) earthquakes. Estimates for the interval of

recurrence for these faults range from once every 1350 years, to less than once every 16,000 years[3,4,5,6].

## FIELD INVESTIGATION

The Geotechnical Section conducted a subsurface investigation at the proposed project site in July 2002. Subsurface soil conditions were explored in the investigation by drilling three boreholes placed along the Clearview Drive alignment near the proposed locations for the center pier and each abutment. The approximate location of each borehole is shown on the Borehole Location sheet in Appendix A. Boreholes CV-1, CV-2, and CV-3 were drilled to depths of 88.5 feet, 40.0 feet, and 118.0 feet, respectively. The surface elevations were obtained for the borehole locations by surveying from a known elevation point.

Drilling was accomplished utilizing a Mobile B-80 drill rig using wet rotary drilling with bentonite slurry on boreholes CV-1, and CV-3. Borehole CV-2 was drilled with a Mobile B-57 drill rig with 6-inch hollow stem auger. Both drill rigs were equipped for soil sampling. Soil samples and standard penetration resistance values (N-Values) were obtained utilizing the Standard Penetration Test (SPT) procedure as set forth in ASTM test number T206. The uncorrected blow counts are shown on the boring logs in Appendix B. Soil conditions were not suitable for using thin-walled Shelby tubes (SH), allowing only disturbed samples to be obtained. All soil samples were classified, both visually and using laboratory data, using the Unified Soil Classification System (USCS) described in ASTM test number D2487.

## LABORATORY ANALYSIS

Laboratory tests were performed on the samples collected from the boreholes. The testing program consisted of sieve analyses, moisture and unit weight, Atterberg limits, direct shear tests, specific gravities, and chemical analyses (chlorides, resistivity, pH). The results of this testing program show that the soils consist primarily of silty and clayey sands, with occasional gravel and interspersed clay layers. Further information is presented in the summaries of test results in Appendix C. Dry unit weights from 25 samples ranged from 96.4 pounds per cubic foot (pcf) in sandy lean clay, to 123.7 pcf in silty sand. The average dry unit weight for the soils was 115 pcf.

## DISCUSSION

The project site is located in one of the most seismically active regions in the state, which places this area at risk for liquefaction. Possible causes of liquefaction include seismic activity or induced vibrations. However, upon examination of specific site data, it has been determined that liquefaction will probably not occur due to soil densities, and low moisture content in combination with Atterberg limits[7].

High soil densities and a deep water table combine to make the site suitable for the use of spread footings for the bridge foundation. Initial settlement due to loading at the abutments is estimated to be between ½" and 1½", depending on the width and depth of the footing (see Table 1) with differential settlement being approximately one-half of the total settlement. This settlement should be immediate, occurring during construction, and is based on loading the foundations to four kips per square foot (4 ksf). Settlement due to consolidation should be negligible. The proposed construction of the bridge follows the

existing vertical profile over the depressed freeway, and has no significant increase in overburden in embankment. No additional settlement is expected to occur in these areas.

| | **CLEARVIEW DRIVE- SETTLEMENT SUMMARY** Compilation of Settlement Ranges in Inches based on 4 ksf loading | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | WEST ABUTMENT | | | CENTER PIER | | | EAST ABUTMENT | | |
| | Bottom of Footing Depth | | | | | | | | |
| Footing Width | 3' | 4' | 5' | 3' | 4' | 5' | 3' | 4' | 5' |
| 4' | 3/4" | 3/4" | 3/4" | 1/2" | 1/2" | 1/2" | 1/2" | 1/2" | 1/2" |
| 6' | 1" | 3/4" | 3/4" | 1/2" | 1/2" | 1/2" | 3/4" | 3/4" | 3/4" |
| 8' | 1-1/4" | 1" | 1" | 3/4" | 3/4" | 1/2" | 1" | 1" | 1" |
| 10' | 1-1/4" | 1-1/4" | 1-1/4" | 1" | 1" | 1" | 1-1/2" | 1-1/4" | 1-1/4" |

**Table 1. Settlement Summary**

## RECOMMENDATIONS

All excavation shall be performed in accordance with the NDOT 2001 Standard Specifications for Road and Bridge Construction. All permanent slopes should be constructed to lie at a maximum of 2:1 (Horiz:Vert) slope. The contractor shall be responsible for all necessary shoring for any excavation and/or construction. Although not anticipated, variable site conditions include the possibility of encountering large cobbles, boulders, very soft soils, or other adverse soil conditions.

The very dense sandy soils are well suited for spread footings. AASHTO recommends using a factor of safety of 3.00 in conjunction with this type of analysis. This factor of safety was used to calculate the allowable bearing capacity of the spread footings. Abutment footings placed on cut slopes in native ground should be a minimum of eight feet wide and extend a minimum of six feet deep. These footings will have an allowable bearing capacity of 4500 psf. The center pier footings should be a minimum of six feet wide and extend a minimum of four feet deep. These footings will have an allowable bearing capacity of 7000 psf.

**Abutment Retaining Walls**

The Acceleration Coefficient (A), Soil Profile Type, and Site Coefficient (S), are all obtained from AASHTO Standard Specifications for Highway Bridges, Division 1-A, Section 3. The horizontal Acceleration Coefficient (Kh) is obtained from AASHTO Standard Specifications for Highway Bridges, Division 1-A, Section 6. The vertical Acceleration Coefficient (Kv) is assumed to be zero. Earth pressure coefficients are calculated using Coulombs analysis method utilizing the Mononobe-Okabe equation for Ka, Kp, Kae, and Kpe. The structure - soil interface angle is taken as $\frac{2}{3}\phi$. These design parameters are found in tables 1 and 2.

**Recommended Design Parameters for Abutment Retaining Walls**

| | |
|---|---|
| Backfill Slope | 2H:1V |
| $\phi_1$ = soil friction angle (native) | 32º |
| $\delta_1$ = structure - soil interface angle (native) | 21.3º |
| $\gamma_1$' = effective soil unit weight | 115 pcf |
| A = Acceleration Coefficient (AASHTO) | 0.40 |
| Soil Profile Type (AASHTO) | II |
| S = Site Coefficient (AASHTO) | 1.2 |
| $K_a$ = Active Earth Pressure Coefficient (Coulomb) | 0.275 |
| $K_p$ = Passive Earth Pressure Coefficient (Coulomb) | N/A |
| $K_h$ = Horizontal Acceleration Coefficient (Abutments May Displace) | 0.20 |
| $K_h$ = Horizontal Acceleration Coefficient (Abutments Restrained) | 0.60 |
| $K_v$ = Vertical Acceleration Coefficient | 0.00 |
| $K_{ae}$ = Dynamic Active Earth Pressure Coefficient (Mononobe-Okabe) | 0.688 |
| $K_{pe}$ = Dynamic Passive Earth Pressure Coefficient (Mononobe-Okabe) | N/A |
| Coefficient of Base Friction (Sliding) | 0.40 |

**TABLE 1 - Native Soil**

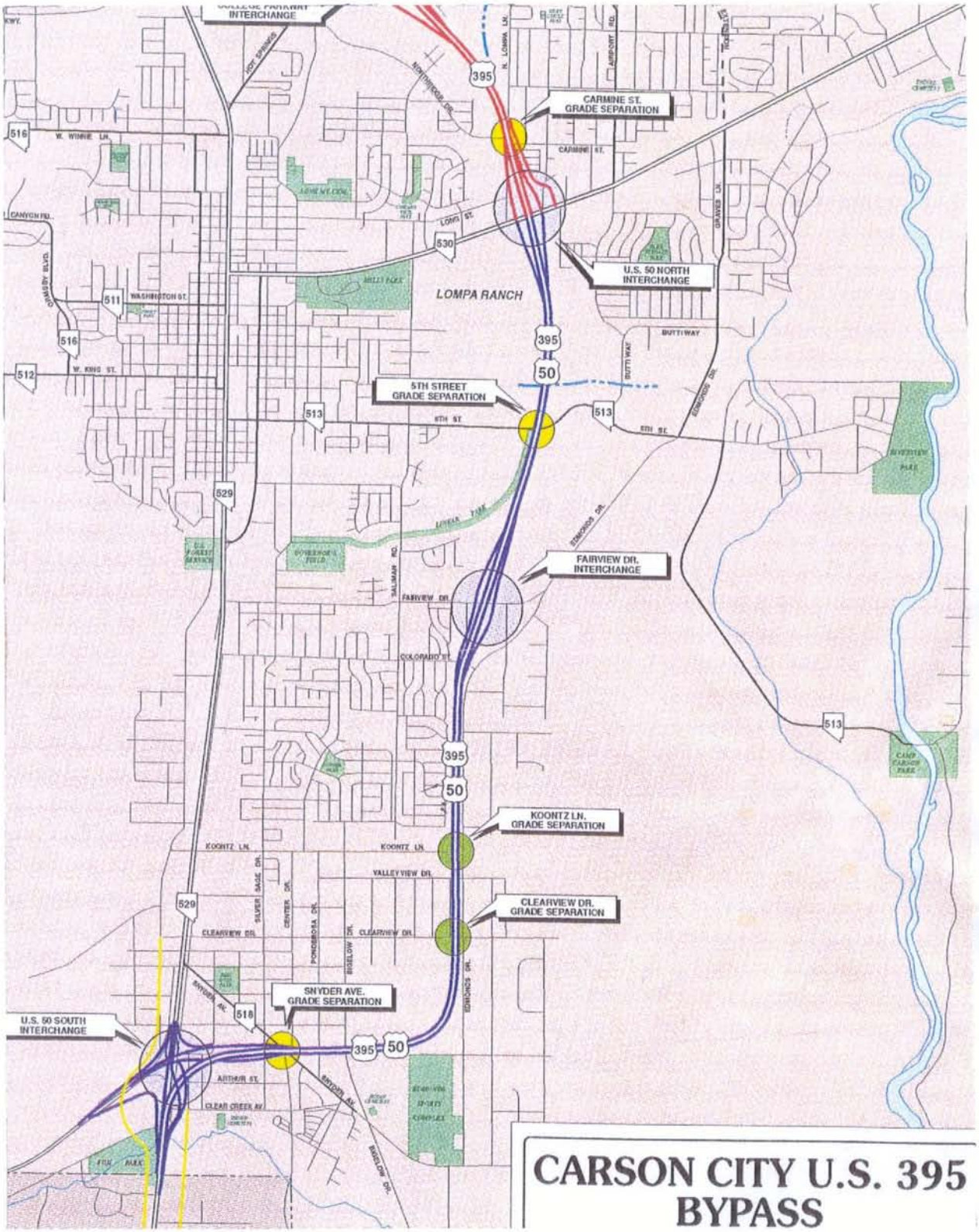
| | |
|---|---|
| Backfill Slope | 2H:1V |
| $\phi_2$ = soil friction angle (backfill) | 34º |
| $\delta_2$ = structure - soil interface angle (backfill) | 22.7º |
| $\gamma_2$' = effective soil unit weight | 125 pcf |
| A = Acceleration Coefficient (AASHTO) | 0.40 |
| $K_a$ = Active Earth Pressure Coefficient (Coulomb) | 0.254 |
| $K_p$ = Passive Earth Pressure Coefficient (Coulomb) | N/A |
| $K_h$ = Horizontal Acceleration Coefficient (Abutments May Displace) | 0.20 |
| $K_h$ = Horizontal Acceleration Coefficient (Abutments Restrained) | 0.60 |
| $K_v$ = Vertical Acceleration Coefficient | 0.00 |
| $K_{ae}$ = Dynamic Active Earth Pressure Coefficient (Mononobe-Okabe) | 0.426 |
| $K_{pe}$ = Dynamic Passive Earth Pressure Coefficient (Mononobe-Okabe) | N/A |
| Coefficient of Base Friction (Sliding) | 0.40 |

**TABLE 2 - Backfill**

## REFERENCES

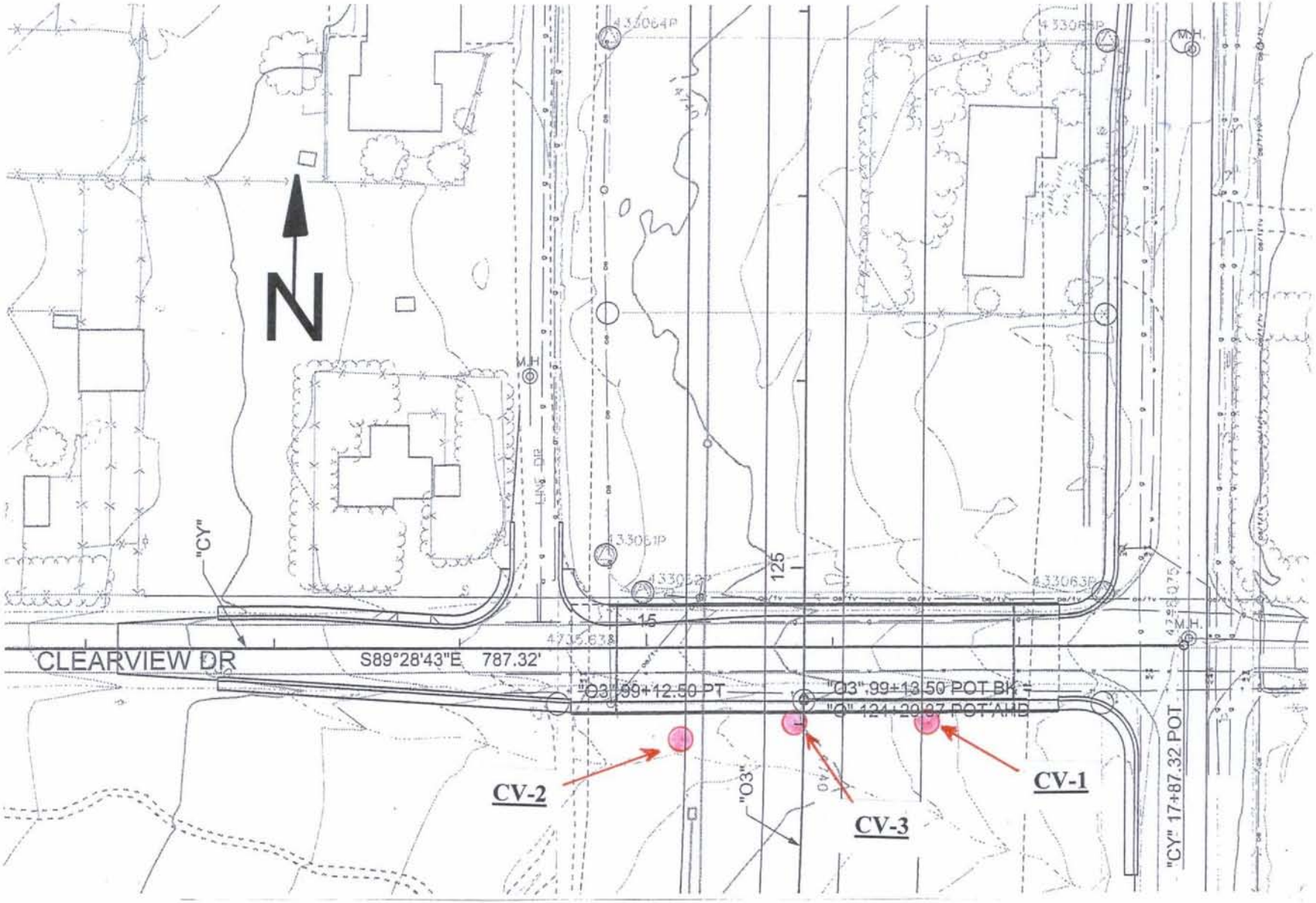

1. New Empire Geologic Map; Nevada Bureau of Mines and Geology, Map 59, 1977.
2. New Empire Folio Slope Map; Nevada Bureau of Mines and Geology, 1973.
3. Earthquake Occurrence in the Reno-Carson City Urban Corridor; dePolo, Anderson, dePolo, and Price; Seismological Research Letters, Volume 68; May/June 1997; from Internet article dated 12/31/01 modified by The Nevada Seismological Laboratory.
4. New Empire Quadrangle Earthquake Hazards Map; Nevada Bureau of Mines and Geology, Map 1Bi, Bell and Trexler, 1979.
5. Genoa Quadrangle Earthquake Hazards Map; Nevada Bureau of Mines and Geology, Map 1Ci, Pease, 1979.
6. Carson City Quadrangle Earthquake Hazards Map; Nevada Bureau of Mines and Geology, Map 1Ai, Trexler and Bell, 1979.
7. FHWA Geotechnical Earthquake Engineering, FHWA HI-99-012, 1998.
8. AASHTO Standard Specifications for Highway Bridges, sixteenth edition, 1996; with interims through 1999.
9. Standard Specifications for Road and Bridge Construction, State of Nevada Department of Transportation, 2001.

# APPENDIX A




# SITE PLAN

**Plate 1**




# BOREHOLE LOCATION SHEET

Plate 2

# APPENDIX B

# KEY TO BORING LOGS

| PARTICLE SIZE LIMITS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CLAY | SILT | SAND | | | GRAVEL | | COBBLES | BOULDERS |
| | | FINE | MEDIUM | COARSE | FINE | COARSE | | |
| .002 mm | | #200 | #40 | #10 | #4 | 3/4 inch | 3 inch | 12 inch |

| USCS GROUP | TYPICAL SOIL DESCRIPTION |
|---|---|
| GW | Well graded gravels, gravel-sand mixtures, little or no fines |
| GP | Poorly graded gravels, gravel-sand mixtures, little or no fines |
| GM | Silty gravels, poorly graded gravel-sand-silt mixtures |
| GC | Clayey gravels, poorly graded gravel-sand-clay mixtures |
| SW | Well graded sands, gravelly sands, little or no fines |
| SP | Poorly graded sands, gravelly sands, little or no fines |
| SM | Silty sands, poorly graded sand-silt mixtures |
| SC | Clayey sands, poorly graded sand-clay mixtures |
| ML | Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity |
| CL | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays |
| OL | Organic silts and organic silt-clays of low plasticity |
| MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts |
| CH | Inorganic clays of high plasticity, fat clays |
| OH | Organic clays of medium to high plasticity |
| CS | Claystone/Siltstone |
| PT | Peat and other highly organic soils |

**MOISTURE CONDITION CRITERIA**

| Description | Criteria |
|---|---|
| Dry | Absence of moisture, dusty, dry to touch. |
| Moist | Damp, no visible free water. |
| Wet | Visible free water,usually below groundwater table. |

▽ ▼ Groundwater Elevation Symbols

**SOIL CEMENTATION CRITERIA**

| Description | Criteria |
|---|---|
| Weak | Crumbles or breaks with handling or little finger pressure. |
| Moderate | Crumbles or breaks with considerable finger pressure. |
| Strong | Won't break or crumble w/finger pressure |

**STANDARD PENETRATION CLASSIFICATION***

| GRANULAR SOIL | | CLAYEY SOIL | |
|---|---|---|---|
| BLOWS/FT | DENSITY | BLOWS/FT | CONSISTENCY |
| 0 - 4 | VERY LOOSE | 0 - 1 | VERY SOFT |
| 5 - 10 | LOOSE | 2 - 4 | SOFT |
| 11 - 30 | MEDIUM DENSE | 5 - 8 | MEDIUM STIFF |
| 31 - 50 | DENSE | 9 - 15 | STIFF |
| OVER 50 | VERY DENSE | 16 - 30 | VERY STIFF |
| | | 31 - 60 | HARD |
| | | OVER 60 | VERY HARD |

*Standard Penetration Test (N) 140 lb hammer 30 inch free fall on 2 inch O.D. x 1.4 inch I.D. sampler.

Blow counts on Calif. Modified Sampler ($N_{CMS}$) can be converted to $N_{SPT}$ by:
$(N_{CMS})(0.62) = N_{SPT}$

Blow counts from Automatic or Safety Hammer can be converted to Standard SPT $N_{60}$ by:
$(N_{AUTOMATIC})(1.25) = N_{60}$
$(N_{SAFETY})(1.17) = N_{60}$

**TEST ABBREVIATIONS**

| | | | |
|---|---|---|---|
| CD | CONSOLIDATED DRAINED | O | ORGANIC CONTENT |
| CH | CHEMICAL (CORROSIVENESS) | OC | CONSOLIDATIONCPT |
| CM | COMPACTION | PI | PLASTICITY INDEX |
| CU | CONSOLIDATED UNDRAINED | RQD | ROCK QUALITY DESIGNATION |
| D | DISPERSIVE SOILS | RV | R-VALUE |
| DS | DIRECT SHEAR | S | SIEVE ANALYSIS |
| E | EXPANSIVE SOIL | SL | SHRINKAGE LIMIT |
| G | SPECIFIC GRAVITY | U | UNCONFINED COMPRESSION |
| H | HYDROMETER | UU | UNCONSOLIDATED UNDRAINED |
| HC | HYDRO-COLLAPSE | UW | UNIT WEIGHT |
| K | PERMEABILITY | W | MOISTURE CONTENT |

SOIL COLOR DESIGNATIONS ARE FROM THE MUNSELL SOIL COLOR CHART.
EXAMPLE: (7.5 YR 5/3) BROWN

**SAMPLER NOTATION**

| | |
|---|---|
| CMS | CALIF. MODIFIED SAMPLER① |
| | CONE PENETRATION |
| CS | CONTINUOUS SAMPLER② |
| CSS | CALIFORNIA SPLIT SPOON① |
| P | PUSHED (NOT DRIVEN) |
| PB | PITCHER BARREL |
| RC | ROCK CORE③ |
| SH | SHELBY TUBE④ |
| SPT | STANDARD PENETRATION TEST |
| TP | TEST PIT |

①- I.D.= 2.421 inch
②- I.D.=3.228 inch with tube; 3.50 inch w/o tube
③- NXB I.D.= 1.875 inch
④- I.D.= 2.875 inch

LAST MODIFIED: February 9, 2000

# EXPLORATION LOG



NEVADA DEPARTMENT OF TRANSPORTATION — GEOTECHNICAL ENGINEERING

START DATE 7/1/02
END DATE 7/2/02
JOB DESCRIPTION CARSON FREEWAY
LOCATION CLEARVIEW DRIVE GRADE SEPARATION
BORING CV-1
E.A. # 72781
GROUND ELEV. 4743.03 (ft)
HAMMER DROP SYSTEM SAFETY

| GROUNDWATER LEVEL | | |
|---|---|---|
| DATE | DEPTH ft | ELEV. ft |
| 7/8/02 | 56.10 | 4686.9 |
| 9/3/02 | 72.50 | 4670.5 |

STATION "CV"16+51
OFFSET 43' Right
ENGINEER BOOMHOWER
EQUIPMENT MOBILE B-80
OPERATOR ALTAMIRANO
DRILLING METHOD Wet w/ Bentonite Slurry
BACKFILLED _____ DATE _____

| ELEV. (ft) | DEPTH (ft) | SAMPLE NO. | SAMPLE TYPE | BLOW COUNT 6 inch Increments | BLOW COUNT Last 1 foot | Percent Recov'd | LAB TESTS | USCS Group | MATERIAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2.00 | | | | | | | | **SILTY SAND** dry, with scrub brush | |
| | 2.90 | A | CMS | 32<br>50/5" | 50/5" | 100 | | SM | **SILTY SAND** damp, brownish yellow (10 YR 6/6), very dense, partially cemented | |
| | 3.80 | B | SPT | 35<br>50/5" | 50/5" | 100 | | | | |
| 4738.0 | 5 | | | | | | | | | |
| | 5.50 | | | | | | | | | |
| | 7.00 | | | | | | | SC<br>SM | **SILTY CLAYEY SAND** damp, brownish yellow (10 YR 6/6), very dense, partially cemented | |
| | 7.90 | C | CMS | 52<br>50/4.5" | 50/4.5" | 100 | | | | |
| | 8.70 | D | SPT | 38<br>50/3.5" | 50/3.5" | 100 | | SC | **CLAYEY SAND** damp, brownish yellow (10 YR 6/6), very dense, partially cemented | |
| 4733.0 | 10 | | | | | | | | | |
| | 10.00 | | | | | | | | **SILTY SAND** damp, brownish yellow (10 YR 6/6), very dense, partially cemented | |
| | 12.00 | | | | | | | | | |
| | 13.25 | E | SPT | 23<br>52<br>50/3" | 50/3" | 80 | | | | |
| 4728.0 | 15 | | | | | | | | | Gravel layer @ 14'. |
| | 17.00 | | | | | | | | | |
| | 18.40 | F | SPT | 23<br>54<br>50/5" | 50/5" | 76 | | | | (F) Rock in sampler shoe. |
| 4723.0 | 20 | | | | | | | SM | | |
| | 22.00 | | | | | | | | | |
| | 23.33 | G | SPT | 16<br>35<br>50/4" | 50/4" | 94 | | | | |
| 4718.0 | 25 | | | | | | | | | |
| | 27.00 | | | | | | | | | |
| | 27.75 | H | SPT | 36<br>50/3" | 50/3" | 100 | | | **SILTY SAND** fine, dry, yellowish brown (10 YR 5/4), very dense | |
| | 30.00 | | | | | | | | | |

NV_DOT CLERVIEW.GPJ NV_DOT.GDT 10/6/06

# EXPLORATION LOG



NEVADA DEPARTMENT OF TRANSPORTATION — GEOTECHNICAL ENGINEERING

START DATE 7/1/02
END DATE 7/2/02
JOB DESCRIPTION CARSON FREEWAY
LOCATION CLEARVIEW DRIVE GRADE SEPARATION
BORING CV-1
E.A. # 72781
GROUND ELEV. 4743.03 (ft)
HAMMER DROP SYSTEM SAFETY

| GROUNDWATER LEVEL | | |
|---|---|---|
| DATE | DEPTH ft | ELEV. ft |
| 7/8/02 | 56.10 | 4686.9 |
| 9/3/02 | 72.50 | 4670.5 |

STATION "CV"16+51
OFFSET 43' Right
ENGINEER BOOMHOWER
EQUIPMENT MOBILE B-80
OPERATOR ALTAMIRANO
DRILLING METHOD Wet w/ Bentonite Slurry
BACKFILLED _____ DATE _____

| ELEV. (ft) | DEPTH (ft) | SAMPLE NO. | SAMPLE TYPE | BLOW COUNT 6 inch Increments | BLOW COUNT Last 1 foot | Percent Recov'd | LAB TESTS | USCS Group | MATERIAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | 32.00 | | | | | | | | **SILTY SAND** fine, dry, very dense, partially cemented | |
| | 33.50 | I | SPT | 19<br>31<br>32 | 63 | 83 | | | | |
| 4708.0 | 35 | | | | | | | | | |
| | 37.00 | | | | | | | **SM** | | |
| | 38.40 | J | SPT | 25<br>46<br>50/5" | 50/5" | 100 | | | | |
| 4703.0 | 40 | | | | | | | | | |
| | | | | | | | | | 43.00 | |
| | | | | | | | | **CL** | 43.50 **CLAY** | Clay layer from 43' to 43.5'. |
| | | | | | | | | | **SILTY CLAYEY SAND** fine, dry, yellowish brown (10 YR 5/4), very dense | |
| 4698.0 | 45 | | | | | | | | | |
| | 47.00 | | | | | | | | | |
| | 48.50 | K | CMS | 23<br>31<br>34 | 65 | 89 | | | | End day 1 @ 48.5' |
| 4693.0 | 50 | | | | | | | | | |
| | | | | | | | | **SC**<br>**SM** | | |
| 4688.0 | 55 | | | | | | | | | |
| | 57.00 | | | | | | | | | |
| | 58.25 | L | SPT | 27<br>40<br>50/3" | 50/3" | 100 | | | | (L) Rock in sampler shoe. |
| | | | | | | | | | 60.00 | |

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# EXPLORATION LOG



NEVADA DEPARTMENT OF TRANSPORTATION — GEOTECHNICAL ENGINEERING

START DATE 7/1/02
END DATE 7/2/02
JOB DESCRIPTION CARSON FREEWAY
LOCATION CLEARVIEW DRIVE GRADE SEPARATION
BORING CV-1
E.A. # 72781
GROUND ELEV. 4743.03 (ft)
HAMMER DROP SYSTEM SAFETY

| GROUNDWATER LEVEL | | |
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| DATE | DEPTH ft | ELEV. ft |
| 7/8/02 | 56.10 | 4686.9 |
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STATION "CV"16+51
OFFSET 43' Right
ENGINEER BOOMHOWER
EQUIPMENT MOBILE B-80
OPERATOR ALTAMIRANO
DRILLING METHOD Wet w/ Bentonite Slurry
BACKFILLED _____ DATE _____

| ELEV. (ft) | DEPTH (ft) | SAMPLE NO. | SAMPLE TYPE | BLOW COUNT 6 inch Increments | BLOW COUNT Last 1 foot | Percent Recov'd | LAB TESTS | USCS Group | MATERIAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | SC SM | **SILTY CLAYEY SAND** fine, dry, yellowish brown (10 YR 5/4), very dense | |
| | | | | | | | | | 62.50 | |
| 4678.0 | 65 | | | | | | | | | |
| | 67.00 | | | | | | | | | |
| | 68.50 | M | SPT | 17<br>30<br>60 | 90 | 100 | | SC | **CLAYEY SAND** medium to coarse, yellowish brown (10 YR 5/4), very dense | (M) Rock in sampler shoe. |
| 4673.0 | 70 | | | | | | | | | |
| | | | | | | | | | 72.50 | |
| 4668.0 | 75 | | | | | | | | | |
| | 77.00 | | | | | | | | | |
| | 78.50 | N | SPT | 19<br>32<br>50 | 82 | 100 | | | **SILTY SAND** fine to medium, dry, yellowish brown (10 YR 5/4), very dense | |
| 4663.0 | 80 | | | | | | | SM | | Gravel and cobbles @ 79' to 80.5'; hard drilling. |
| | | | | | | | | | | Hard drilling from 82' to 83.5'. |
| 4658.0 | 85 | | | | | | | | | |
| | 87.00 | | | | | | | | | |
| | 88.50 | O | SPT | 27<br>32<br>55 | 87 | 100 | | | **SILTY SAND** fine to medium, dry, yellowish brown (10 YR 5/4), very dense, some gravel | |
| | | | | | | | | | 88.50 | Flushed hole with clean water. |
| | | | | | | | | | **B.O.H.** | |

NV_DOT CLERVIEW.GPJ NV_DOT.GDT 10/6/06

# EXPLORATION LOG

NEVADA DEPARTMENT OF TRANSPORTATION — GEOTECHNICAL ENGINEERING



START DATE 7/2/02
END DATE 7/3/02
JOB DESCRIPTION CARSON FREEWAY
LOCATION CLEARVIEW DRIVE GRADE SEPARATION
BORING CV-2
E.A. # 72781
GROUND ELEV. 4736.95 (ft)
HAMMER DROP SYSTEM AUTOMATIC

| GROUNDWATER LEVEL | | |
|---|---|---|
| DATE | DEPTH ft | ELEV. ft |
| | | |
| | | |

STATION "CV"15+21
OFFSET 50' Right
ENGINEER BOOMHOWER
EQUIPMENT MOBILE B-57
OPERATOR ALTAMIRANO
DRILLING METHOD 6" H.S. AUGER
BACKFILLED Yes DATE 7/3/2002

| ELEV. (ft) | DEPTH (ft) | SAMPLE NO. | SAMPLE TYPE | BLOW COUNT 6 inch Increments | BLOW COUNT Last 1 foot | Percent Recov'd | LAB TESTS | USCS Group | MATERIAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1.00 | | | | | | | | **SILTY SAND** dry, very pale brown (10 YR 7/4), with scrub brush | |
| | 2.50 | A | BULK | | | 100 | | SM | | |
| | 3.00 | | | | | | | | | |
| | 4.50 | B | CMS | 8<br>14<br>28 | 42 | 100 | | | | |
| | | | | | | | | | 4.00 | |
| 4732.0 | 5 | | | | | | | | | |
| | 5.70 | C | SPT | 16<br>38<br>25/2" | 25/2" | 100 | | SC<br>SM | **SILTY CLAYEY SAND** dry to damp, yellowish brown (10 YR 5/4), very dense, lightly cemented | |
| | | | | | | | | | 7.00 | |
| | 8.00 | | | | | | | | **SILTY SAND** dry to damp, yellowish brown (10 YR 5/4), very dense, lightly cemented | Quartz gravel. |
| | 8.90 | D | CMS | 43<br>50/5" | 50/5" | 91 | | SM | | |
| 4727.0 | 10 | | | | | | | | | |
| | | | | | | | | | 11.00 | |
| | 13.00 | | | | | | | | **CLAYEY SAND** yellowish brown (10 YR 5/4), very dense | |
| | 14.50 | E | SPT | 49<br>45<br>39 | 84 | 100 | | | | |
| 4722.0 | 15 | | | | | | | | | End day 1 @ 14.5'. |
| | 18.00 | | | | | | | | | |
| | 18.80 | F | CMS | 62<br>50/3" | 50/3" | 100 | | SC | **CLAYEY SAND** with gravel, light reddish brown (5 YR 6/4), very dense | |
| 4717.0 | 20 | | | | | | | | | |
| | 23.00 | | | | | | | | | |
| | 24.50 | G | SPT | 43<br>58<br>70 | 128 | 100 | | | **CLAYEY SAND** with gravel, dry, light reddish brown (5 YR 6/4), very dense, cemented | |
| 4712.0 | 25 | | | | | | | | | |
| | | | | | | | | | 26.00 | |
| | 28.00 | | | | | | | | **SILTY CLAYEY SAND** light reddish brown (5 YR 6/4), very dense | Very hard drilling @ 27'. |
| | 29.50 | H | SPT | 28<br>48<br>70 | 118 | 89 | | SC<br>SM | | |
| | | | | | | | | | 30.00 | |

NV_DOT CLERVIEW.GPJ NV_DOT.GDT 10/6/06

# EXPLORATION LOG

NEVADA DEPARTMENT OF TRANSPORTATION — GEOTECHNICAL ENGINEERING



START DATE 7/2/02
END DATE 7/3/02
JOB DESCRIPTION CARSON FREEWAY
LOCATION CLEARVIEW DRIVE GRADE SEPARATION
BORING CV-2
E.A. # 72781
GROUND ELEV. 4736.95 (ft)
HAMMER DROP SYSTEM AUTOMATIC

| GROUNDWATER LEVEL | | |
|---|---|---|
| DATE | DEPTH ft | ELEV. ft |
| | | |
| | | |

STATION "CV"15+21
OFFSET 50' Right
ENGINEER BOOMHOWER
EQUIPMENT MOBILE B-57
OPERATOR ALTAMIRANO
DRILLING METHOD 6" H.S. AUGER
BACKFILLED Yes DATE 7/3/2002

| ELEV. (ft) | DEPTH (ft) | SAMPLE NO. | SAMPLE TYPE | BLOW COUNT 6 inch Increments | BLOW COUNT Last 1 foot | Percent Recov'd | LAB TESTS | USCS Group | MATERIAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | **CLAYEY SAND** with gravel, dry, light reddish brown (5 YR 6/4), very dense, cemented | Very hard drilling @ 31'. |
| 4702.0 | 35 35.00 | | | | | | | SC | | |
| | | I | SPT | 18<br>23<br>37 | 60 | 100 | | | | Very hard drilling @ 37'. |
| | 36.50 | | | | | | | | | |
| 4697.0 | 40 | | | | | | | | 40.00 **B.O.H.** | Auger vibrating severely; terminate drilling. |
| 4692.0 | 45 | | | | | | | | | |
| 4687.0 | 50 | | | | | | | | | |
| 4682.0 | 55 | | | | | | | | | |

NV_DOT CLERVIEW.GPJ NV_DOT.GDT 10/6/06

# EXPLORATION LOG

NEVADA DEPARTMENT OF TRANSPORTATION — GEOTECHNICAL ENGINEERING



START DATE 7/8/02
END DATE 7/9/02
JOB DESCRIPTION CARSON FREEWAY
LOCATION CLEARVIEW DRIVE GRADE SEPARATION
BORING CV-3
E.A. # 72781
GROUND ELEV. 4739.86 (ft)
HAMMER DROP SYSTEM SAFETY

| GROUNDWATER LEVEL | | |
|---|---|---|
| DATE | DEPTH ft | ELEV. ft |
| | | |
| | | |

STATION "CV"15+83
OFFSET 44' Right
ENGINEER BOOMHOWER
EQUIPMENT MOBILE B-80
OPERATOR MARSHALL
DRILLING METHOD Wet w/ Bentonite Slurry
BACKFILLED _____ DATE _____

| ELEV. (ft) | DEPTH (ft) | SAMPLE NO. | SAMPLE TYPE | BLOW COUNT 6 inch Increments | BLOW COUNT Last 1 foot | Percent Recov'd | LAB TESTS | USCS Group | MATERIAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | SM | **SILTY SAND** dry, with scrub brush | |
| | 2.00 | | | | | | | | | |
| 4734.9 | 5 | | | | | | | | | |
| | 7.00 | | | | | | | | | |
| | 7.90 | A | SPT | 17<br>50/5" | 50/5" | 91 | | SC | **CLAYEY SAND** dry, light reddish brown to yellowish brown (5 YR 6/4 to 10 YR 5/4), lightly cemented | |
| 4729.9 | 10 | | | | | | | | | |
| | 12.50 | | | | | | | | | |
| | | | | | | | | | **SILTY CLAYEY SAND** | |
| 4724.9 | 15 | | | | | | | | | |
| | 17.00 | | | | | | | | | |
| | 18.50 | B | SPT | 16<br>32<br>56 | 88 | 89 | | SC<br>SM | | |
| 4719.9 | 20 | | | | | | | | | |
| | 23.00 | | | | | | | | | |
| | | | | | | | | | **SANDY LEAN CLAY** damp, yellowish red (5 YR 5/6) | |
| 4714.9 | 25 | | | | | | | CL | | |
| | 27.00 | | | | | | | | | |
| | 27.80 | | | | | | | | | |
| | 28.50 | C | CMS | 13<br>21<br>56 | 77 | 100 | | | **CLAYEY SAND** damp, reddish brown (5 YR 5/4), very dense | |
| | 29.30 | D | SPT | 40<br>50/4" | 50/4" | 90 | | SC | | |
| | 30.00 | | | | | | | | | |

NV_DOT CLERVIEW.GPJ NV_DOT.GDT 10/6/06

# EXPLORATION LOG



NEVADA DEPARTMENT OF TRANSPORTATION — GEOTECHNICAL ENGINEERING

START DATE 7/8/02
END DATE 7/9/02
JOB DESCRIPTION CARSON FREEWAY
LOCATION CLEARVIEW DRIVE GRADE SEPARATION
BORING CV-3
E.A. # 72781
GROUND ELEV. 4739.86 (ft)
HAMMER DROP SYSTEM SAFETY

| GROUNDWATER LEVEL | | |
|---|---|---|
| DATE | DEPTH ft | ELEV. ft |
| | | |
| | | |

STATION "CV"15+83
OFFSET 44' Right
ENGINEER BOOMHOWER
EQUIPMENT MOBILE B-80
OPERATOR MARSHALL
DRILLING METHOD Wet w/ Bentonite Slurry
BACKFILLED _____ DATE _____

| ELEV. (ft) | DEPTH (ft) | SAMPLE NO. | SAMPLE TYPE | BLOW COUNT 6 inch Increments | BLOW COUNT Last 1 foot | Percent Recov'd | LAB TESTS | USCS Group | MATERIAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | 32.00 | | | | | | | | **SILTY SAND** medium to coarse, yellowish brown (10 YR 5/4) | |
| | 32.80 | E | CMS | 56<br>50/4" | 50/4" | 100 | | | | |
| 4704.9 | 35 | | | | | | | | | |
| | 37.00 | | | | | | | | | |
| | 38.30 | F | SPT | 38<br>54<br>50/4" | 50/4" | 92 | | | | |
| 4699.9 | 40 | | | | | | | | | |
| | 42.00 | | | | | | | | | |
| | 43.50 | G | SPT | 19<br>38<br>50 | 88 | 100 | | SM | **SILTY SAND with GRAVEL** medium to coarse | |
| 4694.9 | 45 | | | | | | | | | |
| | 47.00 | | | | | | | | | |
| | 48.50 | H | SPT | 22<br>34<br>40 | 74 | 100 | | | **SILTY SAND** dry, medium to coarse, yellowish brown (10 YR 5/4) | |
| 4689.9 | 50 | | | | | | | | | |
| | 52.00 | | | | | | | | | |
| | 52.90 | I | SPT | 34<br>50/5" | 50/5" | 100 | | | **SILTY SAND** damp, fine to medium, yellowish brown (10 YR 5/4) | |
| 4684.9 | 55 | | | | | | | | 55.00 | |
| | 57.00 | | | | | | | | **CLAYEY SAND** moist, fine to medium, yellowish red (5 YR 5/6) | |
| | 58.50 | J | SPT | 18<br>34<br>43 | 77 | 100 | | SC | | |
| | | | | | | | | | 60.00 | End day 1 @ 58.5'. |

# EXPLORATION LOG

NEVADA DEPARTMENT OF TRANSPORTATION — GEOTECHNICAL ENGINEERING



START DATE 7/8/02
END DATE 7/9/02
JOB DESCRIPTION CARSON FREEWAY
LOCATION CLEARVIEW DRIVE GRADE SEPARATION
BORING CV-3
E.A. # 72781
GROUND ELEV. 4739.86 (ft)
HAMMER DROP SYSTEM SAFETY

| GROUNDWATER LEVEL | | |
|---|---|---|
| DATE | DEPTH ft | ELEV. ft |
| | | |
| | | |

STATION "CV"15+83
OFFSET 44' Right
ENGINEER BOOMHOWER
EQUIPMENT MOBILE B-80
OPERATOR MARSHALL
DRILLING METHOD Wet w/ Bentonite Slurry
BACKFILLED _____ DATE _____

| ELEV. (ft) | DEPTH (ft) | SAMPLE NO. | SAMPLE TYPE | BLOW COUNT 6 inch Increments | BLOW COUNT Last 1 foot | Percent Recov'd | LAB TESTS | USCS Group | MATERIAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | 62.00 | | | | | | | | | |
| | 63.50 | K | CMS | 18<br>27<br>39 | 66 | 89 | | | **CLAYEY SAND** damp, yellowish red (5 YR 5/6), very dense | |
| 4674.9 | 65 | | | | | | | | | |
| | 67.00 | | | | | | | | | |
| | 68.50 | L | SPT | 25<br>49<br>55 | 104 | 94 | | | **CLAYEY SAND** damp, yellowish red (5 YR 5/6), very dense | |
| 4669.9 | 70 | | | | | | | | | |
| | 72.00 | | | | | | | | | |
| | 73.50 | M | SPT | 22<br>42<br>50 | 92 | 100 | | | | |
| 4664.9 | 75 | | | | | | | | | |
| | 77.00 | | | | | | | SC | | |
| | 78.50 | N | SPT | 24<br>28<br>44 | 72 | 100 | | | **CLAYEY SAND** damp, yellowish red (5 YR 5/6), very dense | |
| 4659.9 | 80 | | | | | | | | | |
| | 82.00 | | | | | | | | | |
| | 83.50 | O | SPT | 22<br>34<br>50 | 84 | 100 | | | | |
| 4654.9 | 85 | | | | | | | | | |
| | 87.00 | | | | | | | | | |
| | 88.50 | P | CMS | 24<br>34<br>44 | 78 | 100 | | | **CLAYEY SAND** moist, yellowish red (5 YR 5/6), very dense, some gravel | |
| | | | | | | | | | 90.00 | |

# EXPLORATION LOG

NEVADA DEPARTMENT OF TRANSPORTATION — GEOTECHNICAL ENGINEERING



START DATE 7/8/02
END DATE 7/9/02
JOB DESCRIPTION CARSON FREEWAY
LOCATION CLEARVIEW DRIVE GRADE SEPARATION
BORING CV-3
E.A. # 72781
GROUND ELEV. 4739.86 (ft)
HAMMER DROP SYSTEM SAFETY

| GROUNDWATER LEVEL | | |
|---|---|---|
| DATE | DEPTH ft | ELEV. ft |
| | | |
| | | |

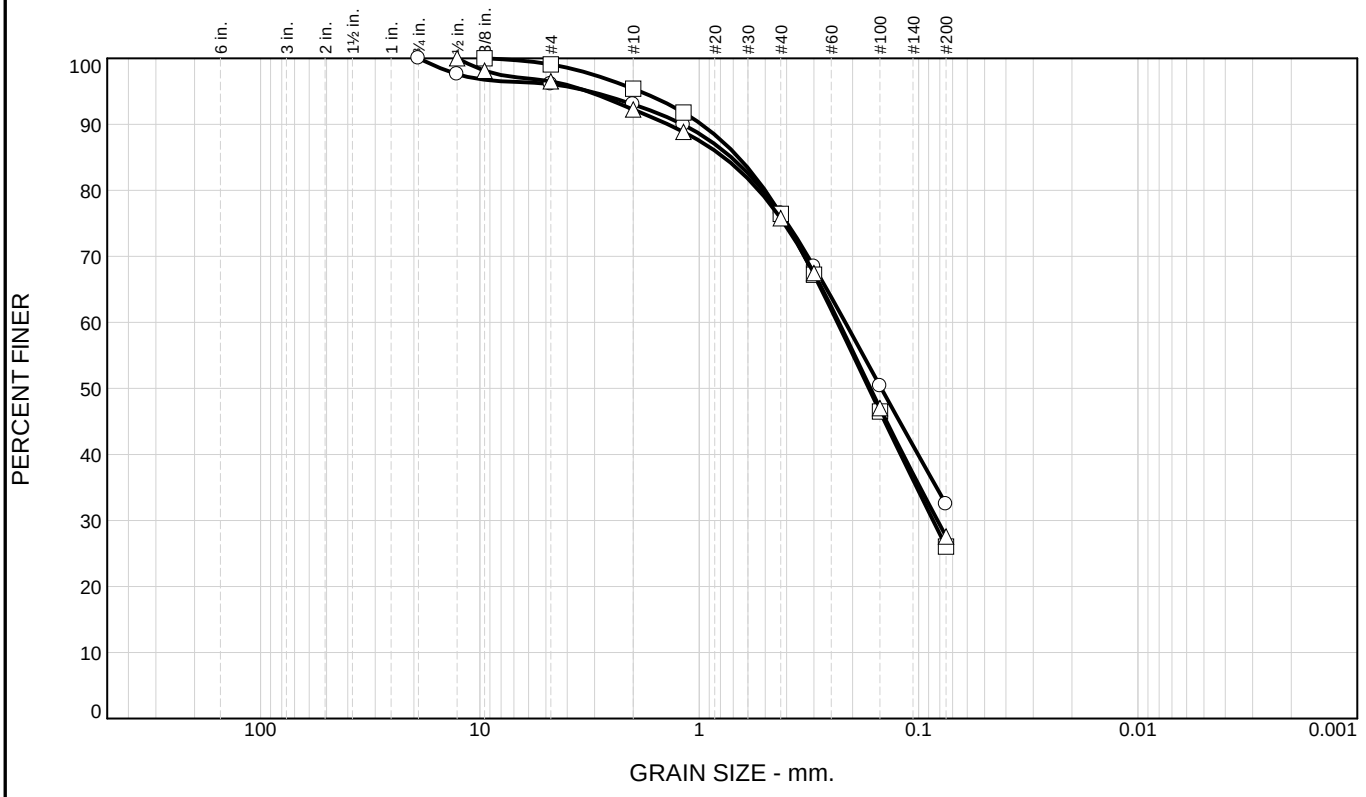
STATION "CV"15+83
OFFSET 44' Right
ENGINEER BOOMHOWER
EQUIPMENT MOBILE B-80
OPERATOR MARSHALL
DRILLING METHOD Wet w/ Bentonite Slurry
BACKFILLED _____ DATE _____

| ELEV. (ft) | DEPTH (ft) | SAMPLE NO. | SAMPLE TYPE | BLOW COUNT 6 inch Increments | BLOW COUNT Last 1 foot | Percent Recov'd | LAB TESTS | USCS Group | MATERIAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | 92.00 | | | | | | | | **CLAYEY SAND** damp, yellowish red (5 YR 5/6), very dense | |
| | 93.30 | Q | SPT | 25<br>30<br>50/4" | 50/4" | 100 | | SC | | |
| 4644.9 | 95 | | | | | | | | | |
| | 97.00 | | | | | | | | | |
| | | | | | | | | | **POORLY GRADED GRAVEL** very dense, yellowish red to brownish yellow (5 YR 5/6 to 10 YR 6/6) | |
| 4639.9 | 100 | | | | | | | | | |
| | 102.00 | | | | | | | | | Hard drilling @ 101' |
| | 102.25 | R | SPT | 50/3" | 50/3" | 67 | | GP | | |
| 4634.9 | 105 | | | | | | | | | |
| | 107.00 | | | | | | | | | |
| 4629.9 | 110 | | | | | | | | | Very hard drilling @ 109' to 112'. |
| | 112.00 | | | | | | | | | (s) No recovery. |
| 4624.9 | 115 | S | RC | | | 0 | | | | |
| | 118.00 | | | | | | | | | |
| | | | | | | | | | **B.O.H.** | |

NV_DOT CLERVIEW.GPJ NV_DOT.GDT 10/6/06

# APPENDIX C

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 3.9 | 63.6 | 32.5 | | SM | | | |
| □ | 0.0 | 0.9 | 73.1 | 26.0 | | SM | | 18 | 19 |
| △ | 0.0 | 3.5 | 68.9 | 27.6 | | SM | | 18 | 20 |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 3/4 | 100.0 | | |
| 1/2 | 97.6 | | 100.0 |
| 3/8 | | 100.0 | 98.1 |
| | GRAIN SIZE | | |
| $D_{60}$ | 0.2159 | 0.2343 | 0.2306 |
| $D_{30}$ | | 0.0859 | 0.0820 |
| $D_{10}$ | | | |
| | COEFFICIENTS | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 96.1 | 99.1 | 96.5 |
| #10 | 93.0 | 95.4 | 92.2 |
| #16 | 89.9 | 91.8 | 88.9 |
| #40 | 76.5 | 76.4 | 75.8 |
| #50 | 68.4 | 67.2 | 67.5 |
| #100 | 50.4 | 46.5 | 47.0 |
| #200 | 32.5 | 26.0 | 27.6 |

Material Description
○ Silty sand
□ Silty sand
△ Silty sand

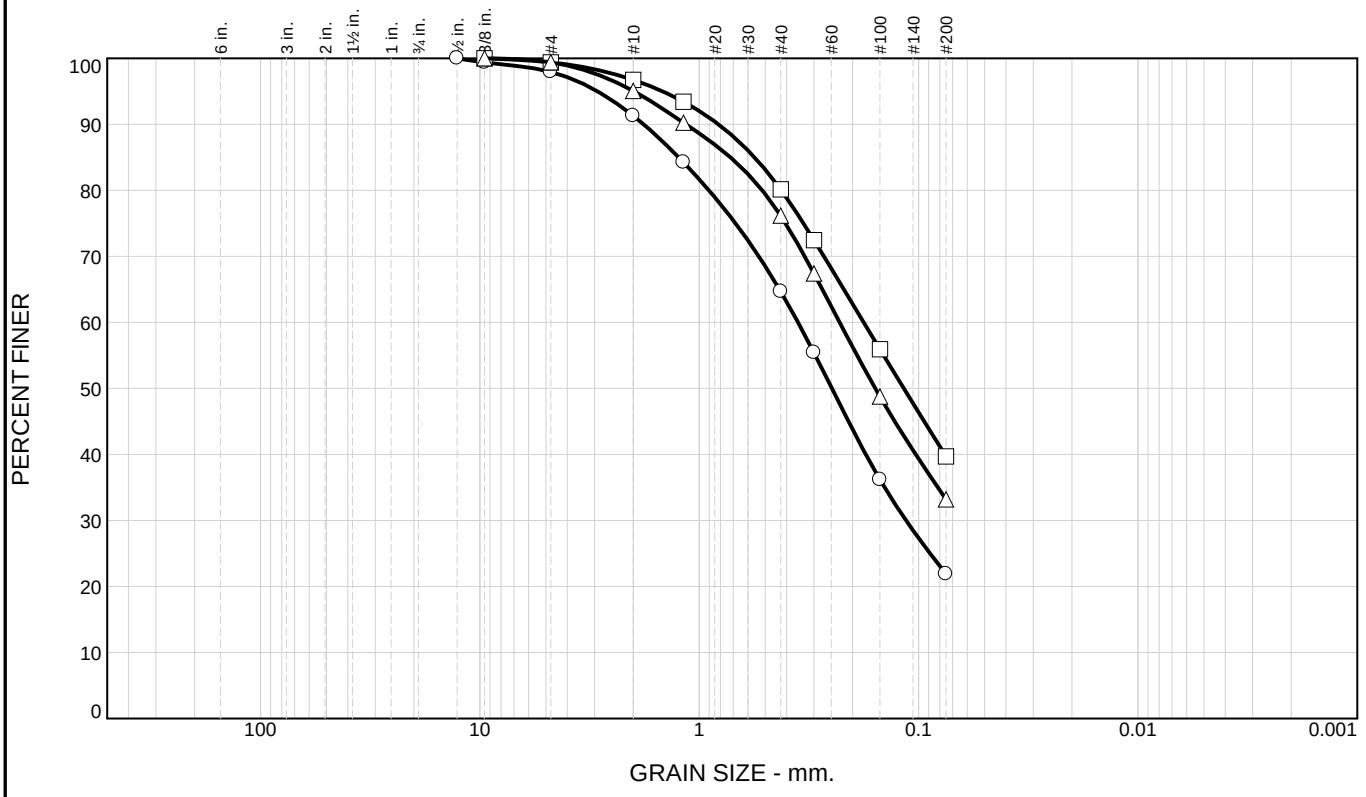
REMARKS:
○
□
△

○ Source of Sample: CV1 Depth: 2.1' Sample Number: A1
□ Source of Sample: CV1 Depth: 2.6' Sample Number: A2
△ Source of Sample: CV1 Depth: 2.9' Sample Number: B

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 2.1 | 76.0 | 21.9 | | SC-SM | | 17 | 24 |
| □ | 0.0 | 0.6 | 59.7 | 39.7 | | SC | | 19 | 28 |
| △ | 0.0 | 0.6 | 66.2 | 33.2 | | SM | | | |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 1/2 | 100.0 | | |
| 3/8 | 99.4 | 100.0 | 100.0 |
| | GRAIN SIZE | | |
| $D_{60}$ | 0.3544 | 0.1778 | 0.2290 |
| $D_{30}$ | 0.1140 | | |
| $D_{10}$ | | | |
| | COEFFICIENTS | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 97.9 | 99.4 | 99.4 |
| #10 | 91.3 | 96.7 | 95.1 |
| #16 | 84.2 | 93.4 | 90.2 |
| #40 | 64.7 | 80.1 | 76.2 |
| #50 | 55.4 | 72.5 | 67.4 |
| #100 | 36.2 | 55.9 | 48.8 |
| #200 | 21.9 | 39.7 | 33.2 |

Material Description
○ Silty, clayey sand
□ Clayey sand
△ Silty sand

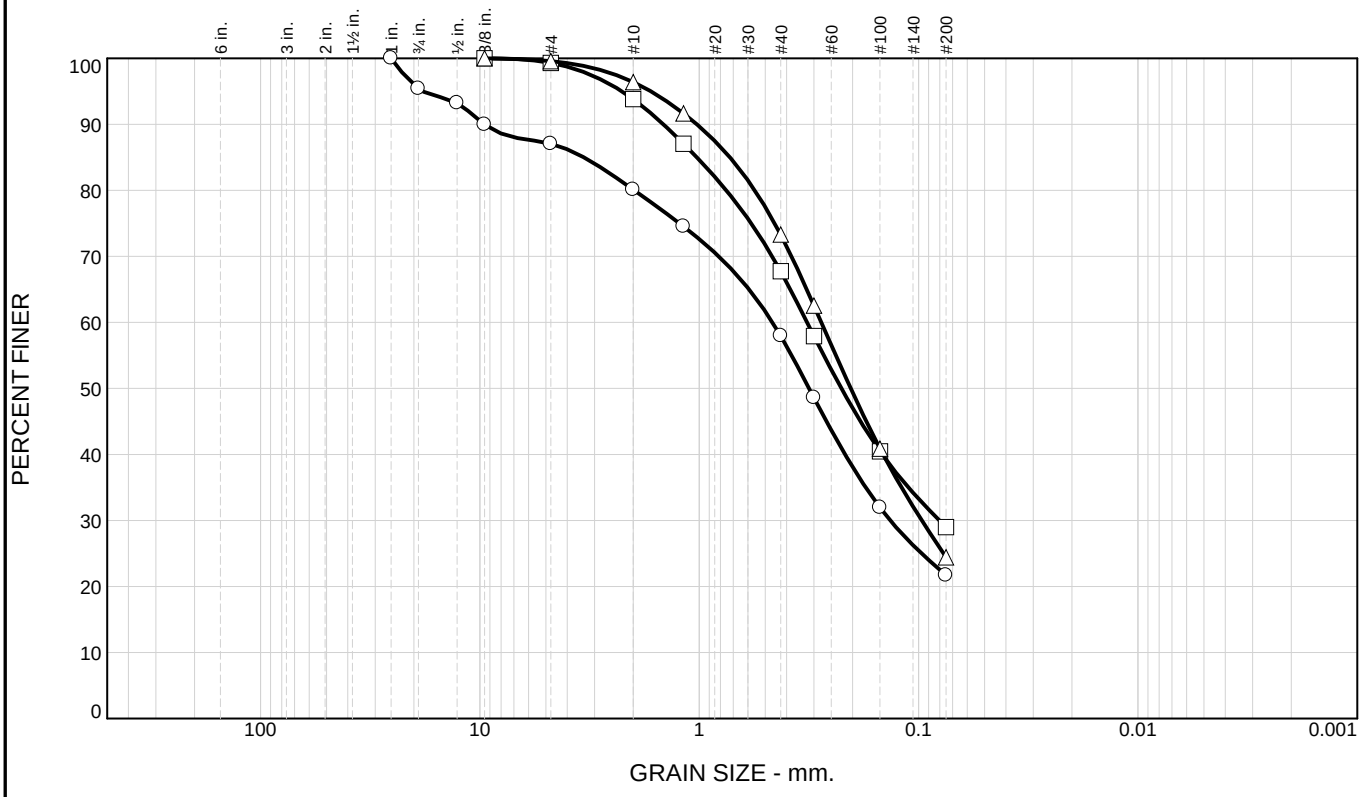
REMARKS:
○
□
△

○ Source of Sample: CV1 Depth: 7.2' Sample Number: C1
□ Source of Sample: CV1 Depth: 7.9' Sample Number: D
△ Source of Sample: CV1 Depth: 12.0' Sample Number: E

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 12.9 | 65.4 | 21.7 | | SM | | | |
| □ | 0.0 | 0.7 | 70.3 | 29.0 | | SM | | | |
| △ | 0.0 | 0.4 | 75.2 | 24.4 | | SM | | | |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 1 | 100.0 | | |
| 3/4 | 95.4 | | |
| 1/2 | 93.2 | | |
| 3/8 | 90.0 | 100.0 | 100.0 |
| | GRAIN SIZE | | |
| $D_{60}$ | 0.4630 | 0.3224 | 0.2776 |
| $D_{30}$ | 0.1347 | 0.0804 | 0.0966 |
| $D_{10}$ | | | |
| | COEFFICIENTS | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 87.1 | 99.3 | 99.6 |
| #10 | 80.1 | 93.8 | 96.4 |
| #16 | 74.5 | 87.1 | 91.7 |
| #40 | 58.0 | 67.7 | 73.3 |
| #50 | 48.6 | 57.9 | 62.5 |
| #100 | 32.0 | 40.5 | 40.9 |
| #200 | 21.7 | 29.0 | 24.4 |

Material Description
○ Silty sand
□ Silty sand
△ Silty sand

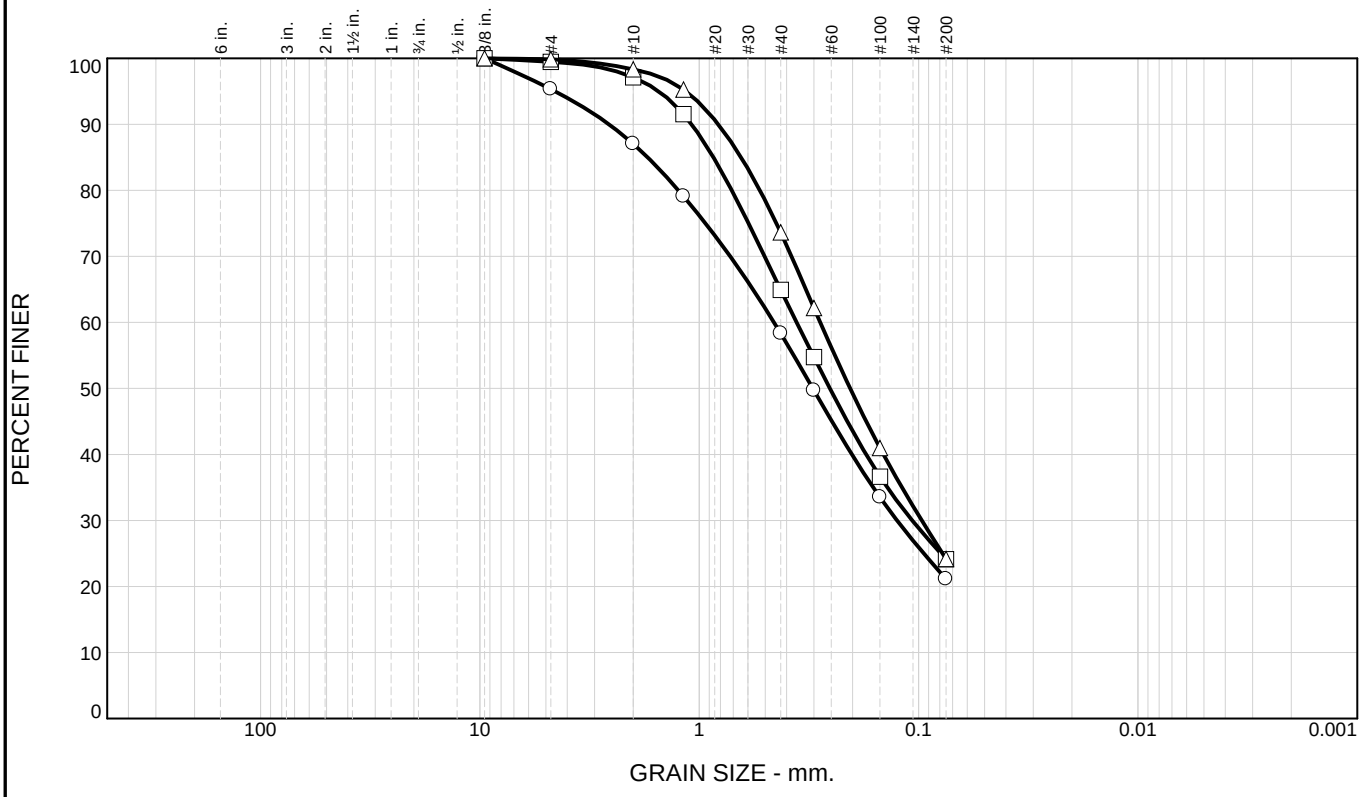
REMARKS:
○
□
△

○ Source of Sample: CV1 Depth: 17.0' Sample Number: F
□ Source of Sample: CV1 Depth: 22.0' Sample Number: G
△ Source of Sample: CV1 Depth: 27.0' Sample Number: H

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 4.7 | 74.2 | 21.1 | | SM | | | |
| □ | 0.0 | 0.5 | 75.4 | 24.1 | | SM | | | |
| △ | 0.0 | 0.1 | 75.7 | 24.2 | | SC-SM | | 20 | 26 |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 3/8 | 100.0 | 100.0 | 100.0 |
| | GRAIN SIZE | | |
| $D_{60}$ | 0.4561 | 0.3597 | 0.2809 |
| $D_{30}$ | 0.1254 | 0.1069 | 0.0966 |
| $D_{10}$ | | | |
| | COEFFICIENTS | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 95.3 | 99.5 | 99.9 |
| #10 | 87.0 | 97.1 | 98.3 |
| #16 | 79.1 | 91.5 | 95.3 |
| #40 | 58.3 | 64.9 | 73.6 |
| #50 | 49.7 | 54.7 | 62.2 |
| #100 | 33.5 | 36.6 | 41.0 |
| #200 | 21.1 | 24.1 | 24.2 |

Material Description
○ Silty sand
□ Silty sand
△ Silty, clayey sand

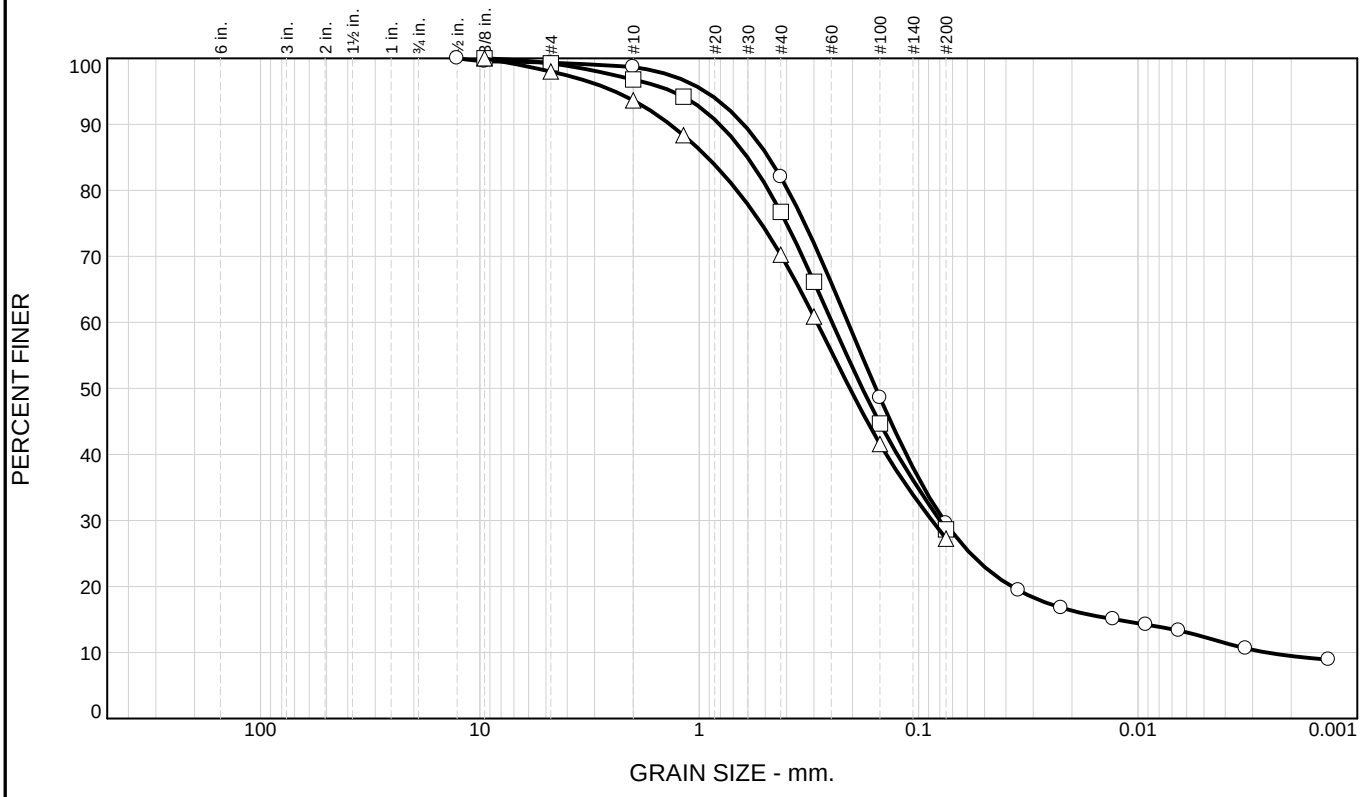
REMARKS:
○
□
△

○ Source of Sample: CV1 Depth: 32.0' Sample Number: I
□ Source of Sample: CV1 Depth: 37.0' Sample Number: J
△ Source of Sample: CV1 Depth: 47.3' Sample Number: K1

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 0.7 | 69.7 | 17.2 | 12.4 | SC | | 18 | 26 |
| □ | 0.0 | 0.8 | 70.6 | 28.6 | | SC | | | |
| △ | 0.0 | 2.0 | 70.8 | 27.2 | | SC-SM | | 19 | 24 |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 1/2 | 100.0 | | |
| 3/8 | 99.5 | 100.0 | 100.0 |
| | GRAIN SIZE | | |
| $D_{60}$ | 0.2099 | 0.2480 | 0.2909 |
| $D_{30}$ | 0.0766 | 0.0800 | 0.0868 |
| $D_{10}$ | 0.0026 | | |
| | COEFFICIENTS | | |
| $C_c$ | 10.79 | | |
| $C_u$ | 80.92 | | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 99.3 | 99.2 | 98.0 |
| #10 | 98.7 | 96.8 | 93.6 |
| #16 | | 94.2 | 88.3 |
| #40 | 82.0 | 76.7 | 70.3 |
| #50 | | 66.2 | 60.9 |
| #100 | 48.6 | 44.7 | 41.6 |
| #200 | 29.6 | 28.6 | 27.2 |

Material Description
○ Clayey sand
□ Clayey sand
△ Silty, clayey sand

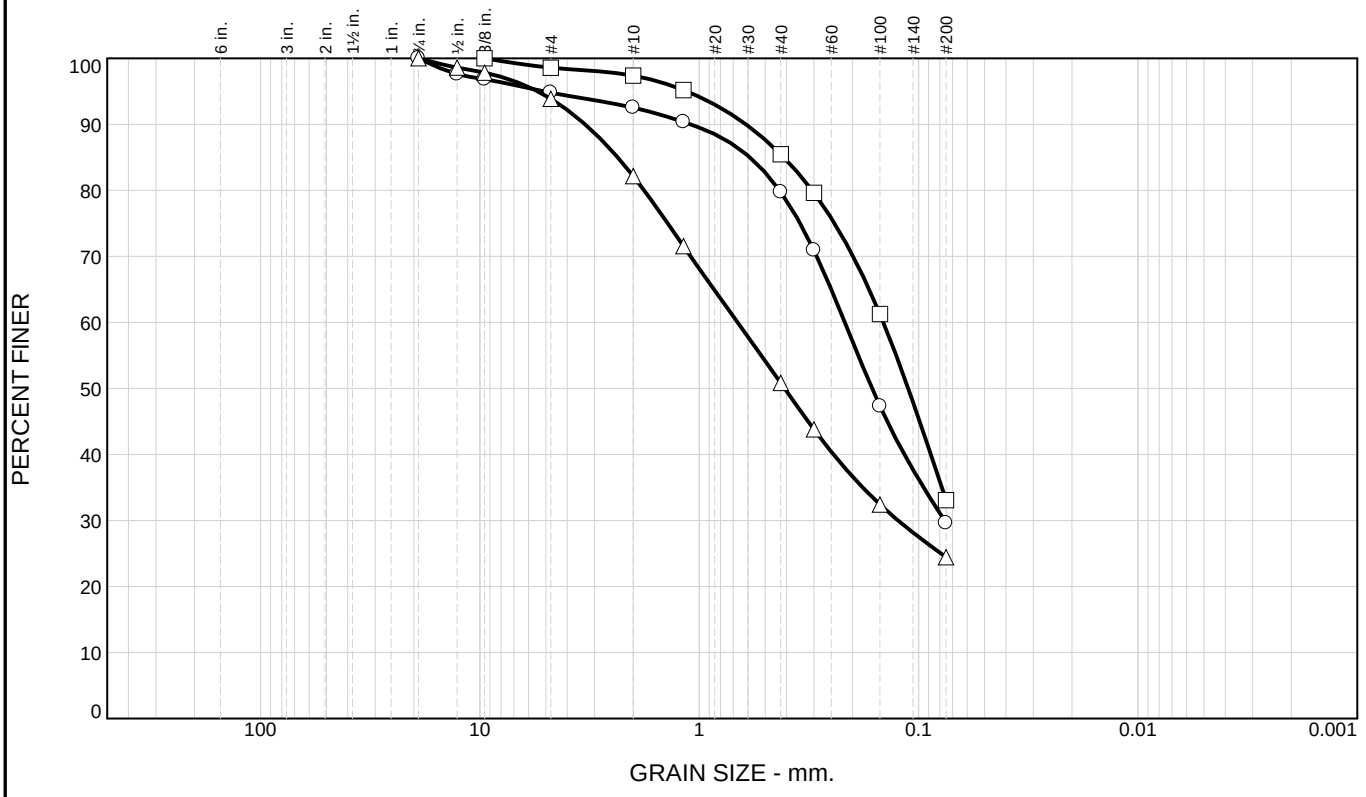
REMARKS:
○
□
△

○ Source of Sample: CV1 Depth: 47.8' Sample Number: K2
□ Source of Sample: CV1 Depth: 48.3' Sample Number: K3
△ Source of Sample: CV1 Depth: 57.0' Sample Number: L

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 5.2 | 65.2 | 29.6 | | SC | | 21 | 29 |
| □ | 0.0 | 1.4 | 65.5 | 33.1 | | SM | | 23 | 26 |
| △ | 0.0 | 6.1 | 69.5 | 24.4 | | SM | | | |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 3/4 | 100.0 | | 100.0 |
| 1/2 | 97.6 | | 98.6 |
| 3/8 | 96.8 | 100.0 | 97.8 |
| | GRAIN SIZE | | |
| $D_{60}$ | 0.2168 | 0.1446 | 0.6685 |
| $D_{30}$ | 0.0763 | | 0.1241 |
| $D_{10}$ | | | |
| | COEFFICIENTS | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 94.8 | 98.6 | 93.9 |
| #10 | 92.5 | 97.4 | 82.2 |
| #16 | 90.4 | 95.2 | 71.5 |
| #40 | 79.8 | 85.5 | 50.8 |
| #50 | 70.9 | 79.6 | 43.8 |
| #100 | 47.3 | 61.3 | 32.4 |
| #200 | 29.6 | 33.1 | 24.4 |

Material Description
○ Clayey sand
□ Silty sand
△ Silty sand

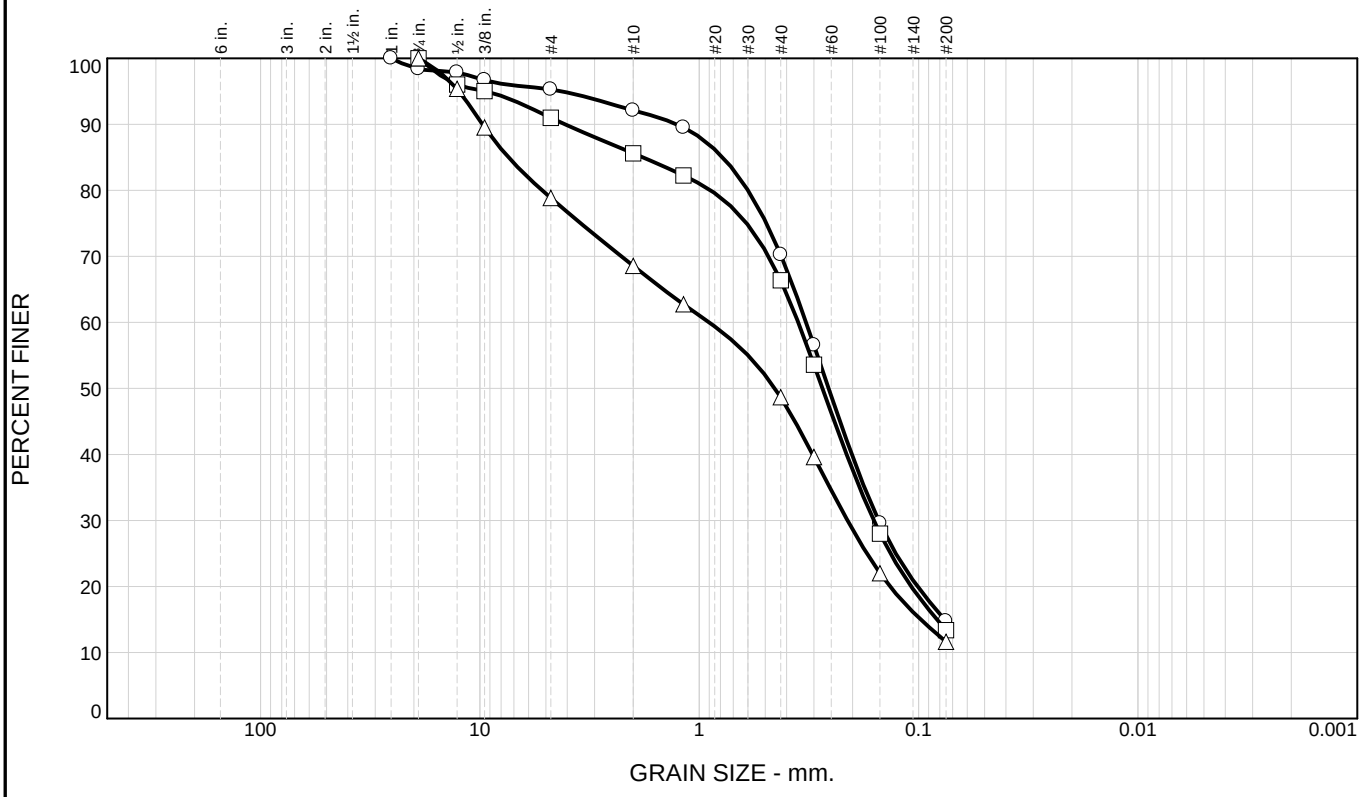
REMARKS:
○
□
△

○ Source of Sample: CV1 Depth: 67.0' Sample Number: M
□ Source of Sample: CV1 Depth: 77.0' Sample Number: N
△ Source of Sample: CV1 Depth: 87.0' Sample Number: O

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 4.7 | 80.6 | 14.7 | | SM | | NP | 15 |
| □ | 0.0 | 9.0 | 77.6 | 13.4 | | SM | | | |
| △ | 0.0 | 21.1 | 67.3 | 11.6 | | SP-SM | | | |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 1 | 100.0 | | |
| 3/4 | 98.4 | 100.0 | 100.0 |
| 1/2 | 97.9 | 96.0 | 95.4 |
| 3/8 | 96.7 | 95.0 | 89.5 |
| | GRAIN SIZE | | |
| $D_{60}$ | 0.3258 | 0.3537 | 0.9012 |
| $D_{30}$ | 0.1522 | 0.1602 | 0.2108 |
| $D_{10}$ | | | |
| | COEFFICIENTS | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 95.3 | 91.0 | 78.9 |
| #10 | 92.1 | 85.6 | 68.6 |
| #16 | 89.5 | 82.3 | 62.7 |
| #40 | 70.3 | 66.4 | 48.7 |
| #50 | 56.5 | 53.6 | 39.6 |
| #100 | 29.6 | 28.0 | 22.0 |
| #200 | 14.7 | 13.4 | 11.6 |

Material Description
○ Silty sand

□ Silty sand

△ Poorly graded sand with silt and gravel

REMARKS:
○

□

△

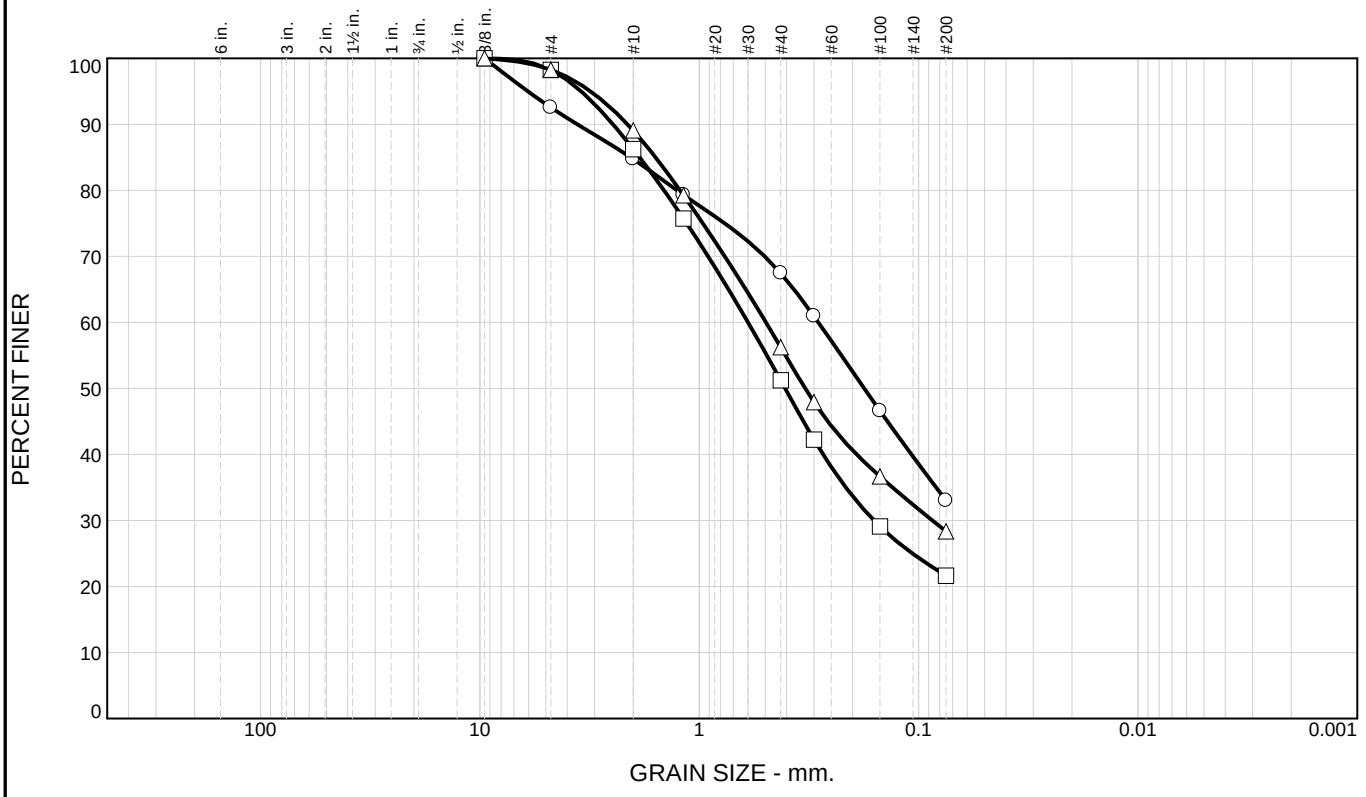
○ Source of Sample: CV2 Depth: 1.0' Sample Number: A
□ Source of Sample: CV2 Depth: 2.3' Sample Number: B1
△ Source of Sample: CV2 Depth: 2.8' Sample Number: B2

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1

Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 7.5 | 59.5 | 33.0 | | SC-SM | | 18 | 22 |
| □ | 0.0 | 1.8 | 76.6 | 21.6 | | SM | | | |
| △ | 0.0 | 1.7 | 70.0 | 28.3 | | SM | | | |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 3/8 | 100.0 | 100.0 | 100.0 |
| GRAIN SIZE | | | |
| $D_{60}$ | 0.2863 | 0.5990 | 0.4961 |
| $D_{30}$ | | 0.1598 | 0.0865 |
| $D_{10}$ | | | |
| COEFFICIENTS | | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 92.5 | 98.2 | 98.3 |
| #10 | 84.7 | 86.2 | 89.1 |
| #16 | 79.3 | 75.7 | 79.3 |
| #40 | 67.4 | 51.2 | 56.2 |
| #50 | 60.9 | 42.2 | 47.9 |
| #100 | 46.6 | 29.1 | 36.7 |
| #200 | 33.0 | 21.6 | 28.3 |

Material Description
○ Silty, clayey sand
□ Silty sand
△ Silty sand

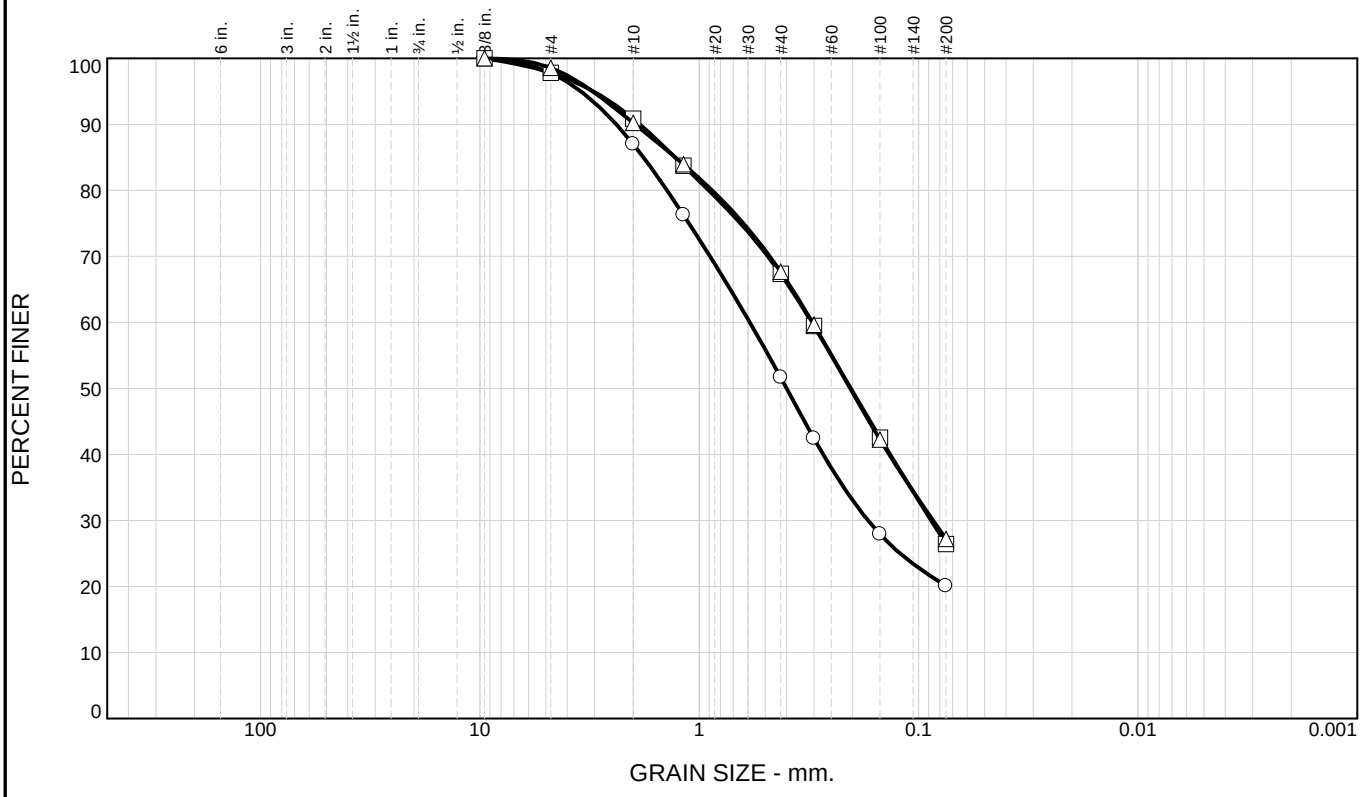
REMARKS:
○
□
△

○ Source of Sample: CV2 Depth: 4.5' Sample Number: C
□ Source of Sample: CV2 Depth: 8.1' Sample Number: D1
△ Source of Sample: CV2 Depth: 8.6' Sample Number: D2

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 2.2 | 77.7 | 20.1 | | SC | | 17 | 25 |
| □ | 0.0 | 2.2 | 71.4 | 26.4 | | SC | | | |
| △ | 0.0 | 1.4 | 71.4 | 27.2 | | SC | | | |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 3/8 | 100.0 | 100.0 | 100.0 |
| GRAIN SIZE | | | |
| $D_{60}$ | 0.5878 | 0.3068 | 0.3045 |
| $D_{30}$ | 0.1702 | 0.0877 | 0.0859 |
| $D_{10}$ | | | |
| COEFFICIENTS | | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 97.8 | 97.8 | 98.6 |
| #10 | 87.0 | 90.9 | 90.2 |
| #16 | 76.3 | 83.7 | 83.9 |
| #40 | 51.7 | 67.4 | 67.7 |
| #50 | 42.4 | 59.5 | 59.6 |
| #100 | 27.9 | 42.5 | 42.3 |
| #200 | 20.1 | 26.4 | 27.2 |

Material Description
○ Clayey sand
□ Clayey sand
△ Clayey sand

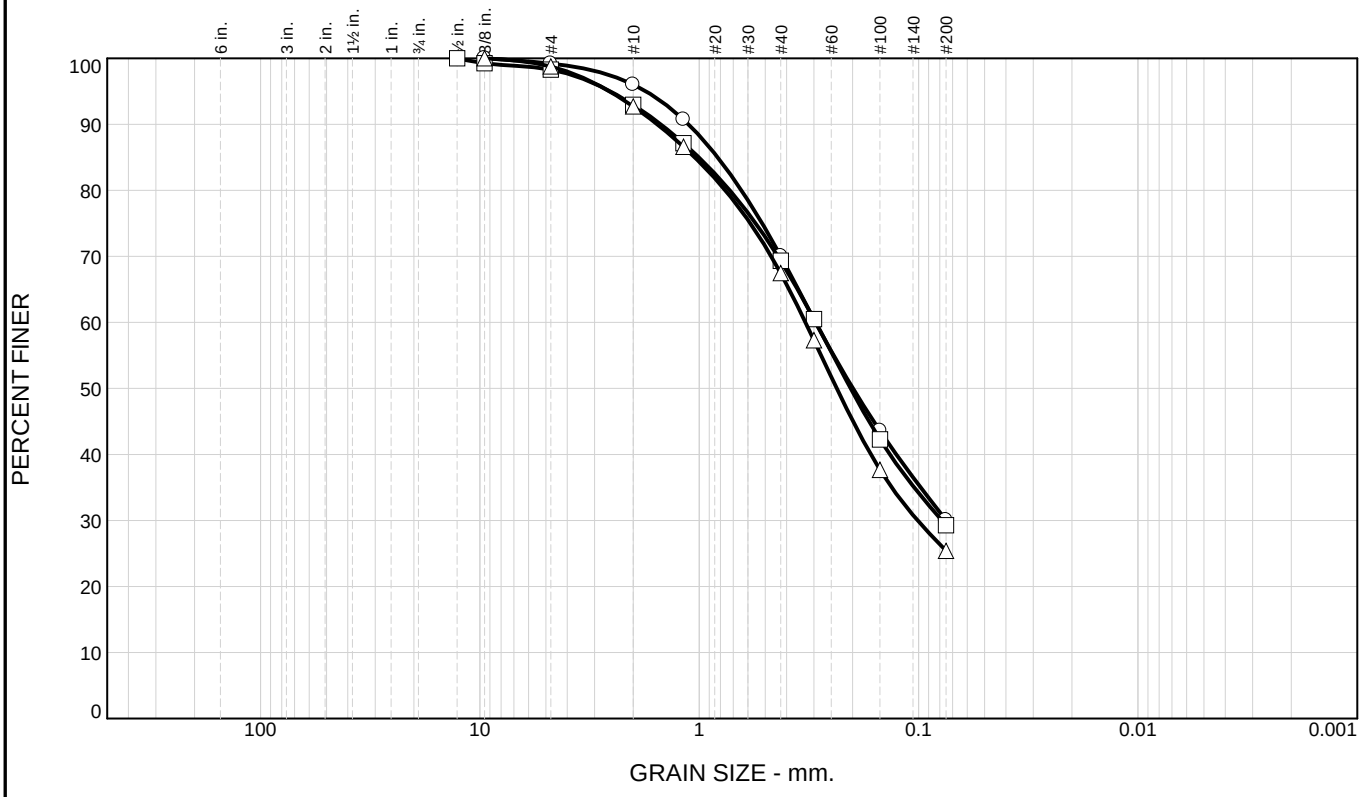
REMARKS:
○
□
△

○ Source of Sample: CV2 Depth: 13.0' Sample Number: E
□ Source of Sample: CV2 Depth: 18.1' Sample Number: F1
△ Source of Sample: CV2 Depth: 18.6' Sample Number: F2

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 0.8 | 69.2 | 30.0 | | SC | | 16 | 24 |
| □ | 0.0 | 1.7 | 69.0 | 29.3 | | SC-SM | | 16 | 23 |
| △ | 0.0 | 1.2 | 73.4 | 25.4 | | SC | | 17 | 26 |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 1/2 | | 100.0 | |
| 3/8 | 100.0 | 99.3 | 100.0 |
| | GRAIN SIZE | | |
| $D_{60}$ | 0.2950 | 0.2944 | 0.3278 |
| $D_{30}$ | | 0.0783 | 0.1009 |
| $D_{10}$ | | | |
| | COEFFICIENTS | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 99.2 | 98.3 | 98.8 |
| #10 | 96.0 | 93.0 | 92.7 |
| #16 | 90.7 | 87.1 | 86.6 |
| #40 | 70.0 | 69.3 | 67.5 |
| #50 | 60.5 | 60.5 | 57.3 |
| #100 | 43.6 | 42.3 | 37.7 |
| #200 | 30.0 | 29.3 | 25.4 |

Material Description
○ Clayey sand
□ Silty, clayey sand
△ Clayey sand

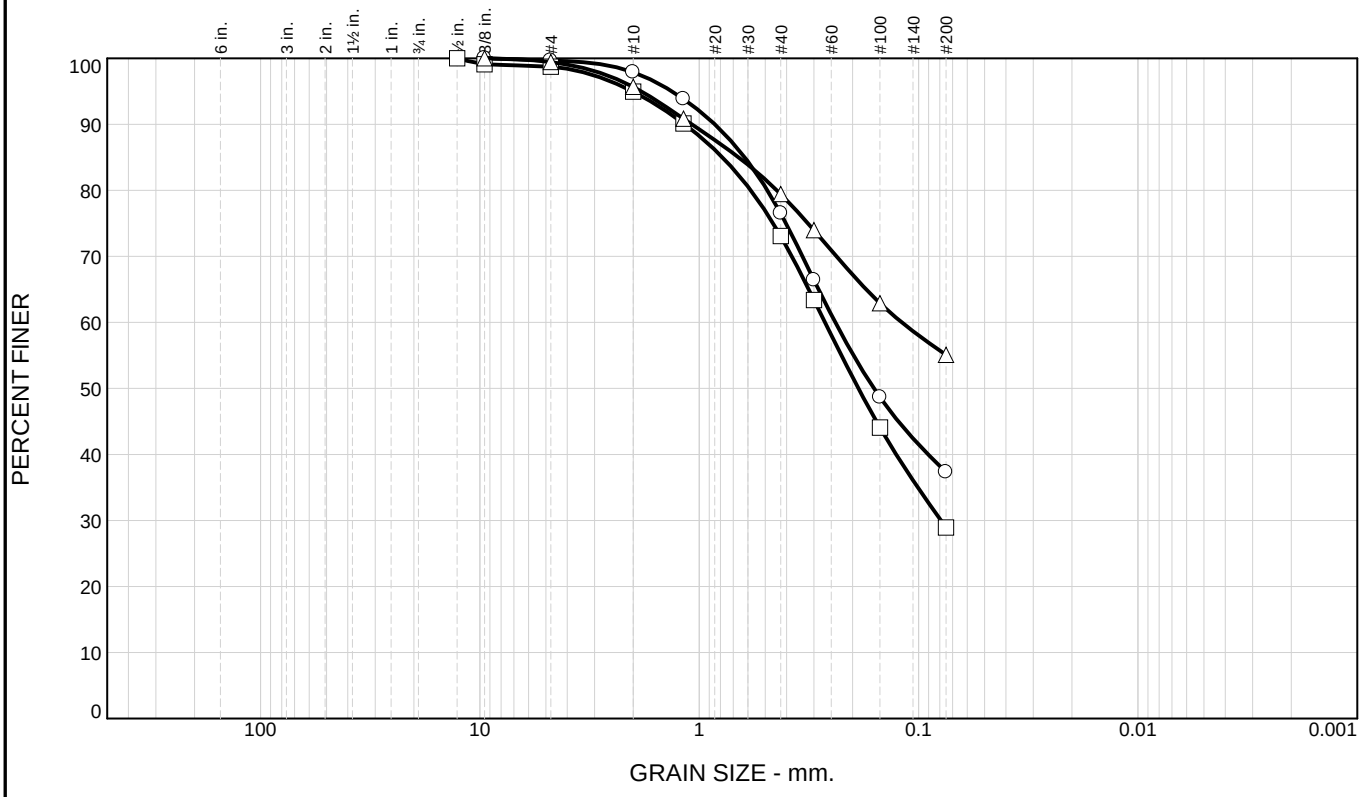
REMARKS:
○
□
△

○ Source of Sample: CV2 Depth: 23.0' Sample Number: G
□ Source of Sample: CV2 Depth: 28.0' Sample Number: H
△ Source of Sample: CV2 Depth: 35.0' Sample Number: I

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 0.3 | 62.4 | 37.3 | | SC | | 19 | 30 |
| □ | 0.0 | 1.3 | 69.8 | 28.9 | | SC-SM | | 18 | 25 |
| △ | 0.0 | 0.6 | 44.3 | 55.1 | | CL | | 22 | 45 |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 1/2 | | 100.0 | |
| 3/8 | 100.0 | 99.1 | 100.0 |
| **GRAIN SIZE** | | | |
| $D_{60}$ | 0.2397 | 0.2671 | 0.1193 |
| $D_{30}$ | | 0.0791 | |
| $D_{10}$ | | | |
| **COEFFICIENTS** | | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 99.7 | 98.7 | 99.4 |
| #10 | 97.9 | 95.0 | 95.7 |
| #16 | 93.8 | 90.1 | 90.9 |
| #40 | 76.5 | 73.1 | 79.4 |
| #50 | 66.4 | 63.4 | 74.0 |
| #100 | 48.7 | 44.1 | 62.9 |
| #200 | 37.3 | 28.9 | 55.1 |

Material Description
○ Clayey sand
□ Silty, clayey sand
△ Sandy lean clay

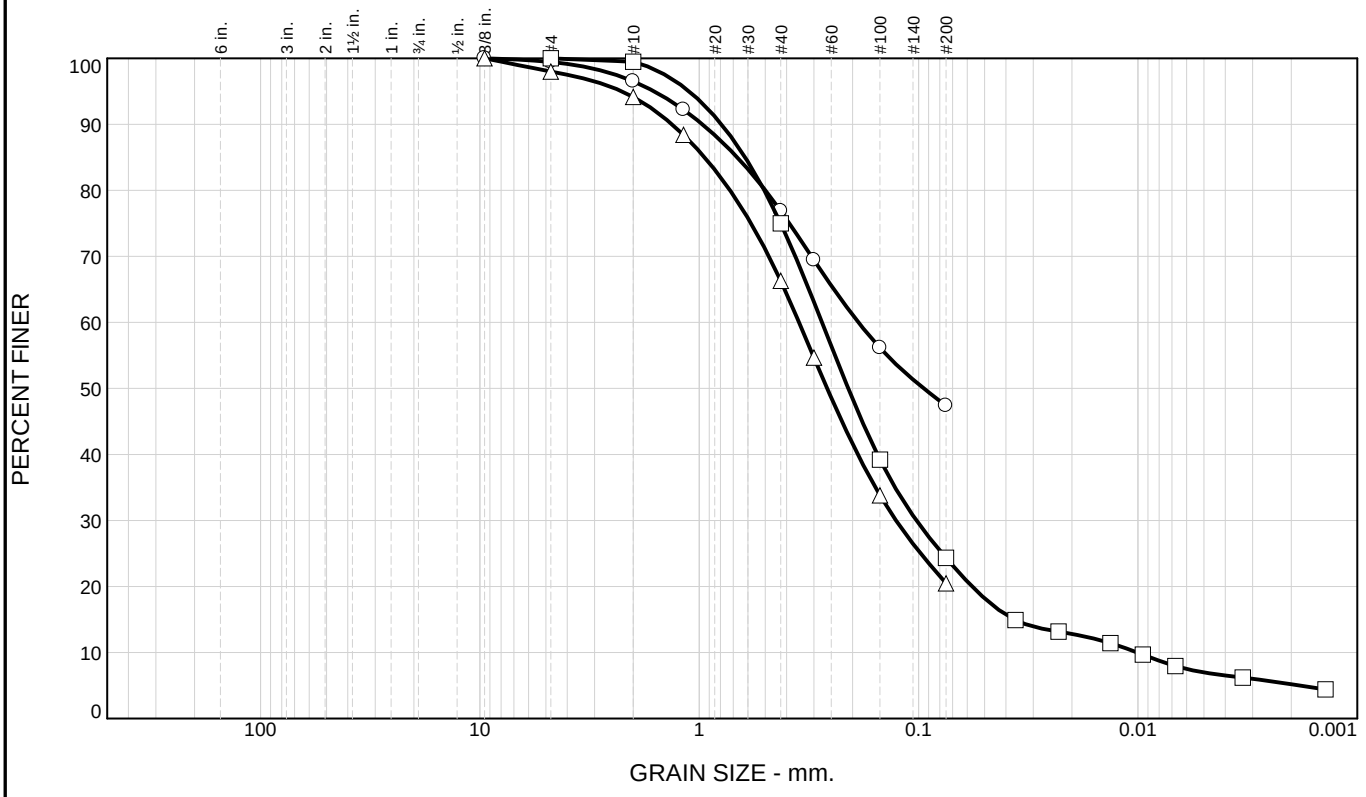
REMARKS:
○
□
△

○ Source of Sample: CV3 Depth: 7.0' Sample Number: A
□ Source of Sample: CV3 Depth: 17.0' Sample Number: B
△ Source of Sample: CV3 Depth: 27.3' Sample Number: C1

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 0.6 | 52.0 | 47.4 | | SC | | 23 | 44 |
| □ | 0.0 | 0.0 | 75.7 | 17.3 | 7.0 | SC-SM | | 17 | 23 |
| △ | 0.0 | 2.0 | 77.5 | 20.5 | | SM | | NP | 18 |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 3/8 | 100.0 | | 100.0 |
| GRAIN SIZE | | | |
| $D_{60}$ | 0.1881 | 0.2755 | 0.3508 |
| $D_{30}$ | | 0.1022 | 0.1268 |
| $D_{10}$ | | 0.0101 | |
| COEFFICIENTS | | | |
| $C_c$ | | 3.77 | |
| $C_u$ | | 27.37 | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 99.4 | 100.0 | 98.0 |
| #10 | 96.5 | 99.5 | 94.1 |
| #16 | 92.2 | | 88.4 |
| #40 | 76.9 | 75.0 | 66.3 |
| #50 | 69.4 | | 54.7 |
| #100 | 56.1 | 39.2 | 33.8 |
| #200 | 47.4 | 24.3 | 20.5 |

Material Description
○ Clayey sand
□ Silty, clayey sand
△ Silty sand

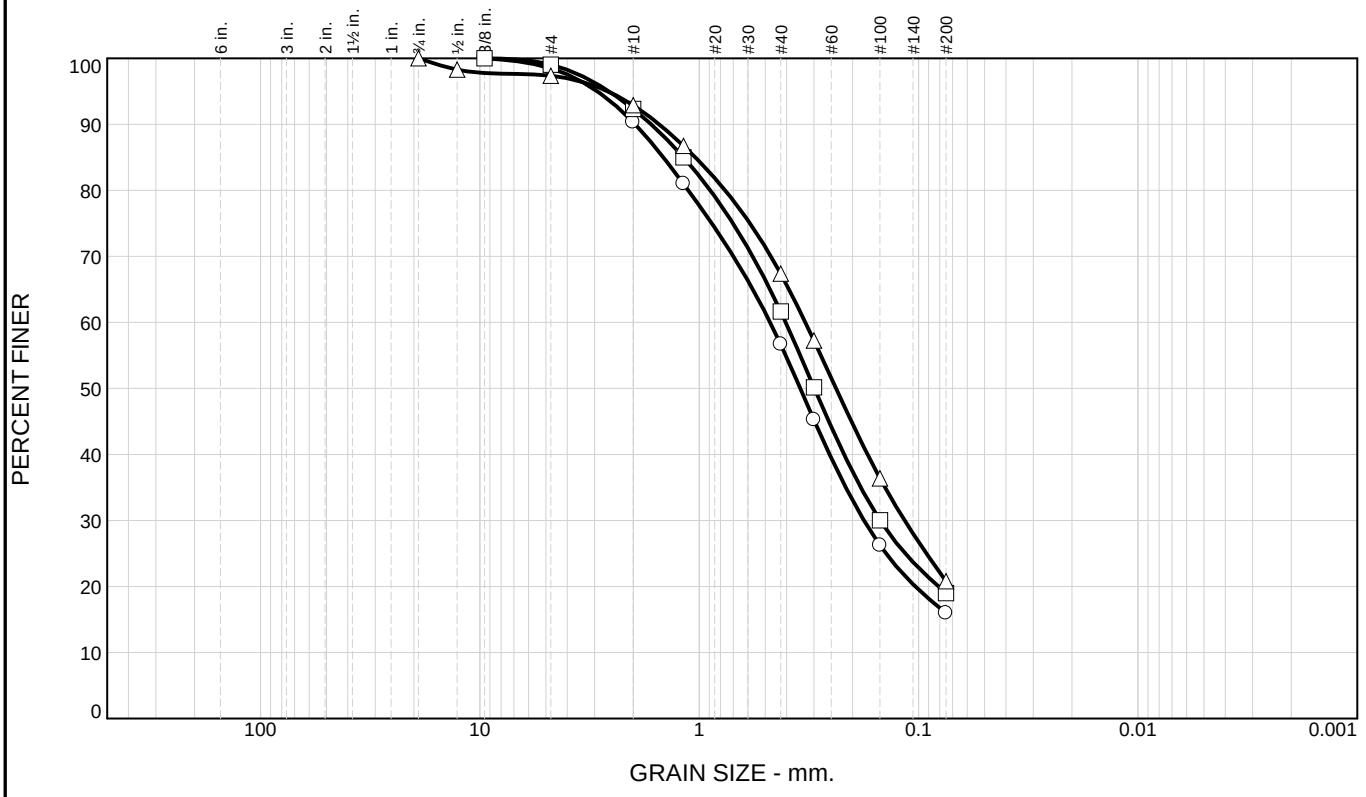
REMARKS:
○
□
△

○ Source of Sample: CV3 Depth: 27.8' Sample Number: C2
□ Source of Sample: CV3 Depth: 28.3' Sample Number: C3
△ Source of Sample: CV3 Depth: 28.5' Sample Number: D

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 1.5 | 82.5 | 16.0 | | SM | | NP | 17 |
| □ | 0.0 | 1.0 | 80.0 | 19.0 | | SM | | | |
| △ | 0.0 | 2.6 | 76.6 | 20.8 | | SM | | | |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 3/4 | | | 100.0 |
| 1/2 | | | 98.3 |
| 3/8 | 100.0 | 100.0 | |
| | GRAIN SIZE | | |
| $D_{60}$ | 0.4746 | 0.4033 | 0.3282 |
| $D_{30}$ | 0.1775 | 0.1498 | 0.1158 |
| $D_{10}$ | | | |
| | COEFFICIENTS | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 98.5 | 99.0 | 97.4 |
| #10 | 90.3 | 92.3 | 92.9 |
| #16 | 81.0 | 85.0 | 86.7 |
| #40 | 56.7 | 61.7 | 67.4 |
| #50 | 45.2 | 50.2 | 57.3 |
| #100 | 26.2 | 30.0 | 36.4 |
| #200 | 16.0 | 19.0 | 20.8 |

Material Description
○ Silty sand
□ Silty sand
△ Silty sand

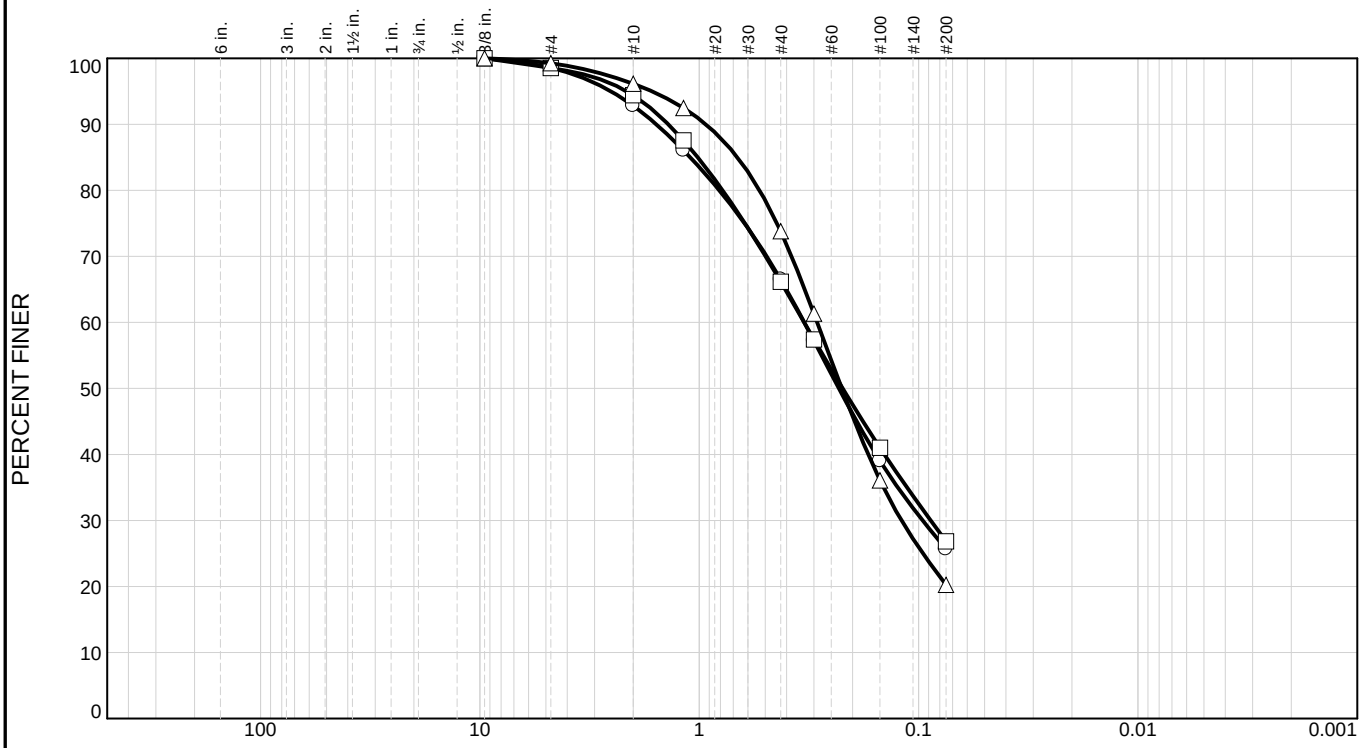
REMARKS:
○
□
△

○ Source of Sample: CV3 Depth: 32.1' Sample Number: E1
□ Source of Sample: CV3 Depth: 32.6' Sample Number: E2
△ Source of Sample: CV3 Depth: 37.0' Sample Number: F

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 1.4 | 72.9 | 25.7 | | SM | | | |
| □ | 0.0 | 1.5 | 71.7 | 26.8 | | SM | | | |
| △ | 0.0 | 0.7 | 79.1 | 20.2 | | SM | | | |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 3/8 | 100.0 | 100.0 | 100.0 |
| GRAIN SIZE | | | |
| $D_{60}$ | 0.3319 | 0.3324 | 0.2899 |
| $D_{30}$ | 0.0958 | 0.0880 | 0.1197 |
| $D_{10}$ | | | |
| COEFFICIENTS | | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 98.6 | 98.5 | 99.3 |
| #10 | 92.8 | 94.4 | 96.1 |
| #16 | 86.1 | 87.6 | 92.5 |
| #40 | 66.5 | 66.2 | 73.8 |
| #50 | 57.2 | 57.4 | 61.3 |
| #100 | 39.0 | 41.0 | 36.1 |
| #200 | 25.7 | 26.8 | 20.2 |

Material Description
○ Silty sand
□ Silty sand
△ Silty sand

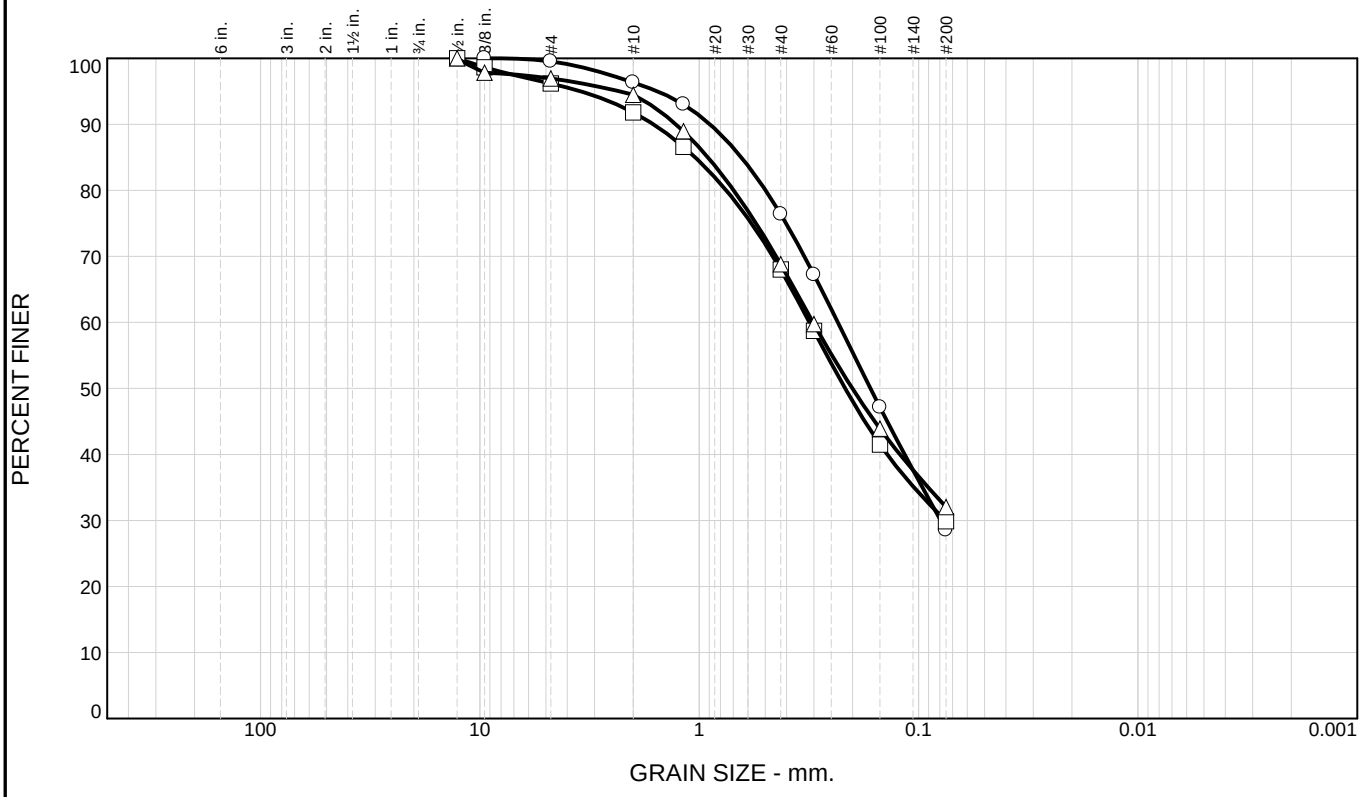
REMARKS:
○
□
△

○ Source of Sample: CV3 Depth: 42.0' Sample Number: G
□ Source of Sample: CV3 Depth: 47.0' Sample Number: H
△ Source of Sample: CV3 Depth: 52.0' Sample Number: I

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 0.5 | 71.0 | 28.5 | | SC | | 17 | 28 |
| □ | 0.0 | 3.8 | 66.3 | 29.9 | | SC | | 17 | 36 |
| △ | 0.0 | 3.1 | 64.9 | 32.0 | | SC | | 16 | 36 |

| SIEVE inches size | ○ | □ | △ |
|---|---|---|---|
| 1/2 | | 100.0 | 100.0 |
| 3/8 | | 98.6 | 97.8 |
| GRAIN SIZE | | | |
| $D_{60}$ | 0.2333 | 0.3144 | 0.3031 |
| $D_{30}$ | 0.0793 | 0.0756 | |
| $D_{10}$ | | | |
| COEFFICIENTS | | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | ○ | □ | △ |
|---|---|---|---|
| #4 | | 96.2 | 96.9 |
| #10 | | 91.8 | 94.5 |
| #16 | | 86.6 | 89.0 |
| #40 | | 68.0 | 68.8 |
| #50 | | 58.7 | 59.7 |
| #100 | | 41.5 | 43.9 |
| #200 | | 29.9 | 32.0 |

Material Description
○ Clayey sand
□ Clayey sand
△ Clayey sand

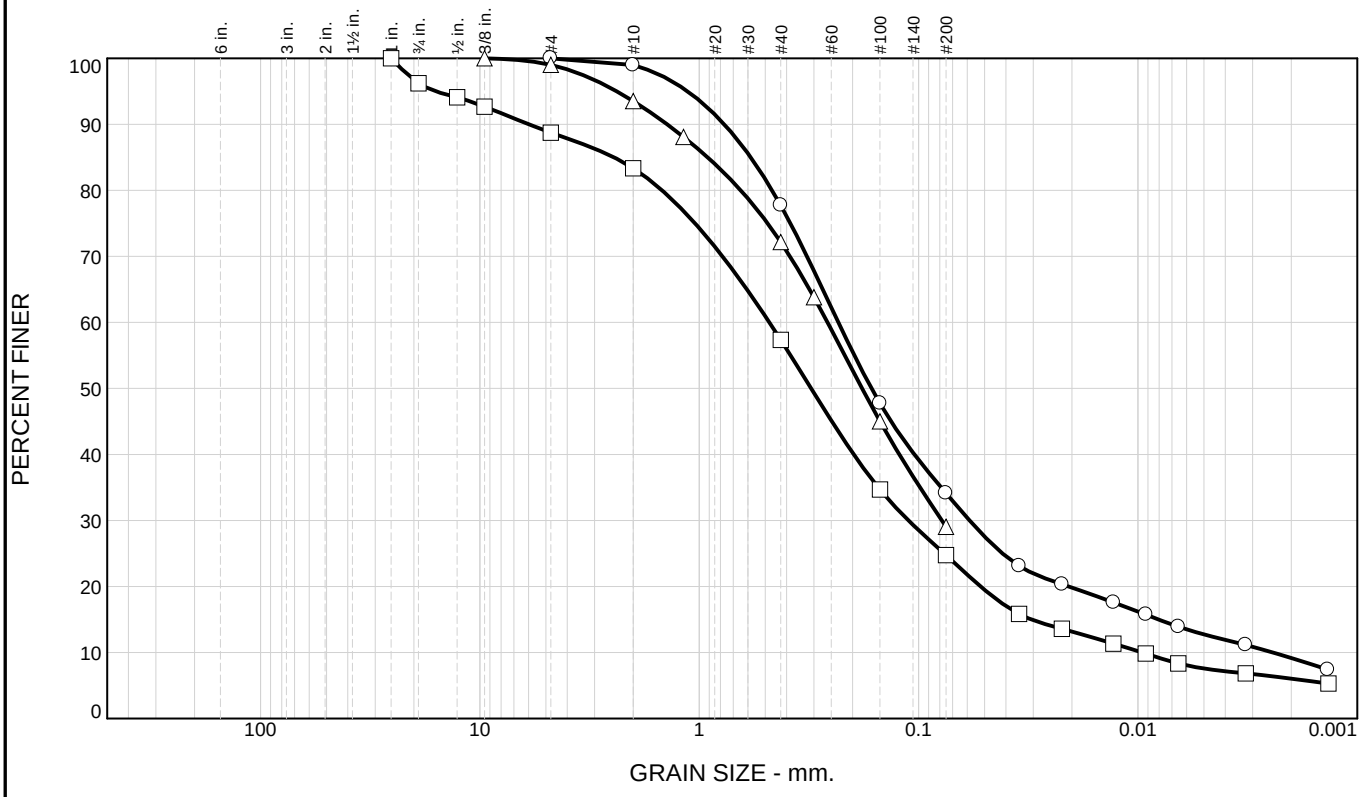
REMARKS:
○
□
△

○ Source of Sample: CV3 Depth: 57.0' Sample Number: J
□ Source of Sample: CV3 Depth: 62.2' Sample Number: K1
△ Source of Sample: CV3 Depth: 62.7' Sample Number: K2

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 0.0 | 65.9 | 21.4 | 12.7 | SC | | 19 | 36 |
| □ | 0.0 | 11.3 | 63.9 | 17.2 | 7.6 | SC | | 19 | 32 |
| △ | 0.0 | 1.0 | 70.0 | 29.0 | | SC | | | |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 1 | | 100.0 | |
| 3/4 | | 96.2 | |
| 1/2 | | 94.1 | |
| 3/8 | | 92.7 | 100.0 |
| | GRAIN SIZE | | |
| $D_{60}$ | 0.2321 | 0.4787 | 0.2600 |
| $D_{30}$ | 0.0586 | 0.1112 | 0.0784 |
| $D_{10}$ | 0.0024 | 0.0095 | |
| | COEFFICIENTS | | |
| $C_c$ | 6.08 | 2.71 | |
| $C_u$ | 95.56 | 50.20 | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 100.0 | 88.7 | 99.0 |
| #10 | 99.0 | 83.3 | 93.5 |
| #16 | | | 88.1 |
| #40 | 77.7 | 57.4 | 72.2 |
| #50 | | | 63.8 |
| #100 | 47.7 | 34.7 | 45.0 |
| #200 | 34.1 | 24.8 | 29.0 |

Material Description
○ Clayey sand
□ Clayey sand
△ Clayey sand

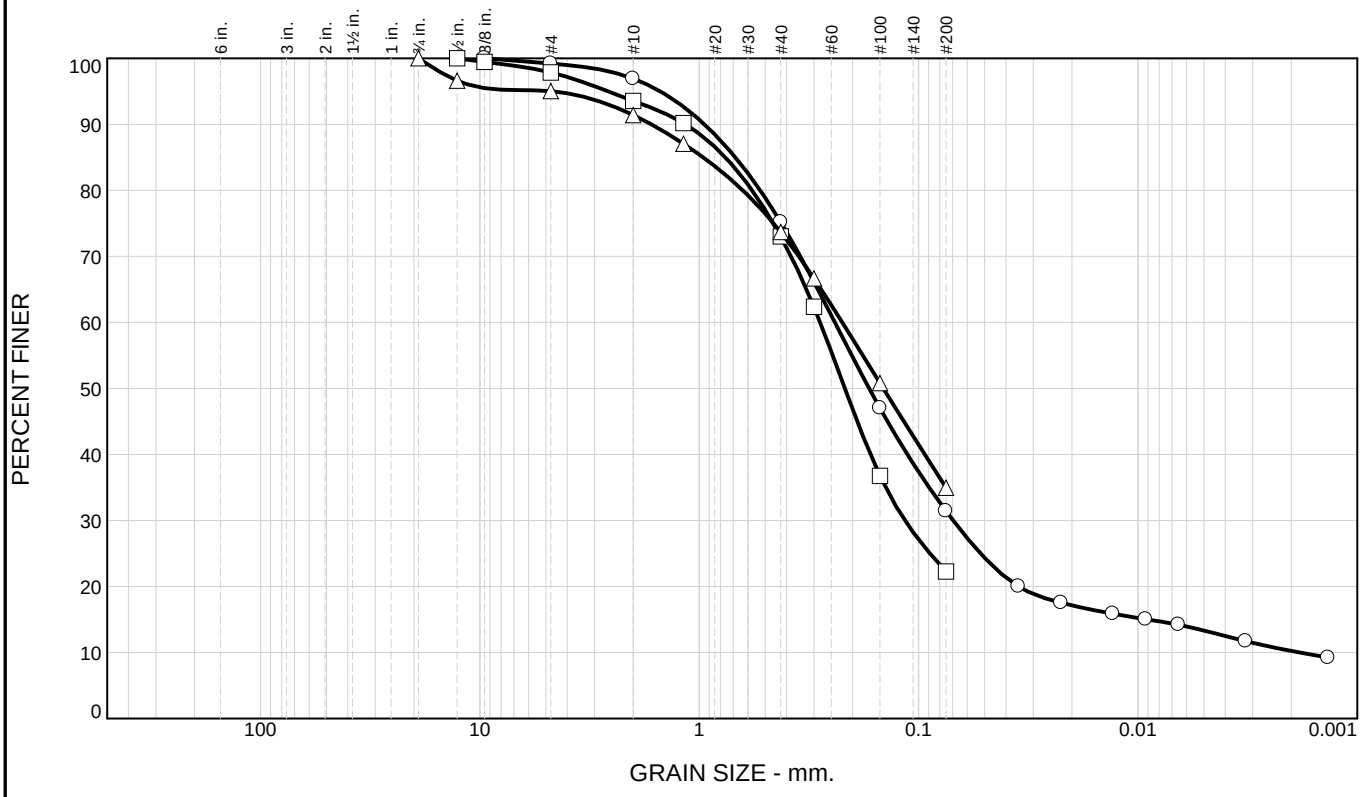
REMARKS:
○
□
△

○ Source of Sample: CV3 Depth: 63.2' Sample Number: K3
□ Source of Sample: CV3 Depth: 67.0' Sample Number: L
△ Source of Sample: CV3 Depth: 72.0' Sample Number: M

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 0.8 | 67.8 | 18.1 | 13.3 | SC | | 17 | 34 |
| □ | 0.0 | 2.1 | 75.6 | 22.3 | | SC | | | |
| △ | 0.0 | 5.0 | 60.0 | 35.0 | | SC | | 18 | 31 |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 3/4 | | | 100.0 |
| 1/2 | | 100.0 | 96.6 |
| 3/8 | 100.0 | 99.5 | |
| **GRAIN SIZE** | | | |
| $D_{60}$ | 0.2408 | 0.2809 | 0.2227 |
| $D_{30}$ | 0.0696 | 0.1154 | |
| $D_{10}$ | 0.0018 | | |
| **COEFFICIENTS** | | | |
| $C_c$ | 11.01 | | |
| $C_u$ | 131.69 | | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 99.2 | 97.9 | 95.0 |
| #10 | 96.9 | 93.5 | 91.4 |
| #16 | | 90.2 | 87.1 |
| #40 | 75.2 | 73.0 | 73.7 |
| #50 | | 62.4 | 66.7 |
| #100 | 47.0 | 36.8 | 50.8 |
| #200 | 31.4 | 22.3 | 35.0 |

Material Description

○ Clayey sand

□ Clayey sand

△ Clayey sand

REMARKS:

○

□

△

○ Source of Sample: CV3 Depth: 77.0' Sample Number: N

□ Source of Sample: CV3 Depth: 82.0' Sample Number: O

△ Source of Sample: CV3 Depth: 87.3' Sample Number: P1

**NEVADA DEPARTMENT OF TRANSPORTATION**

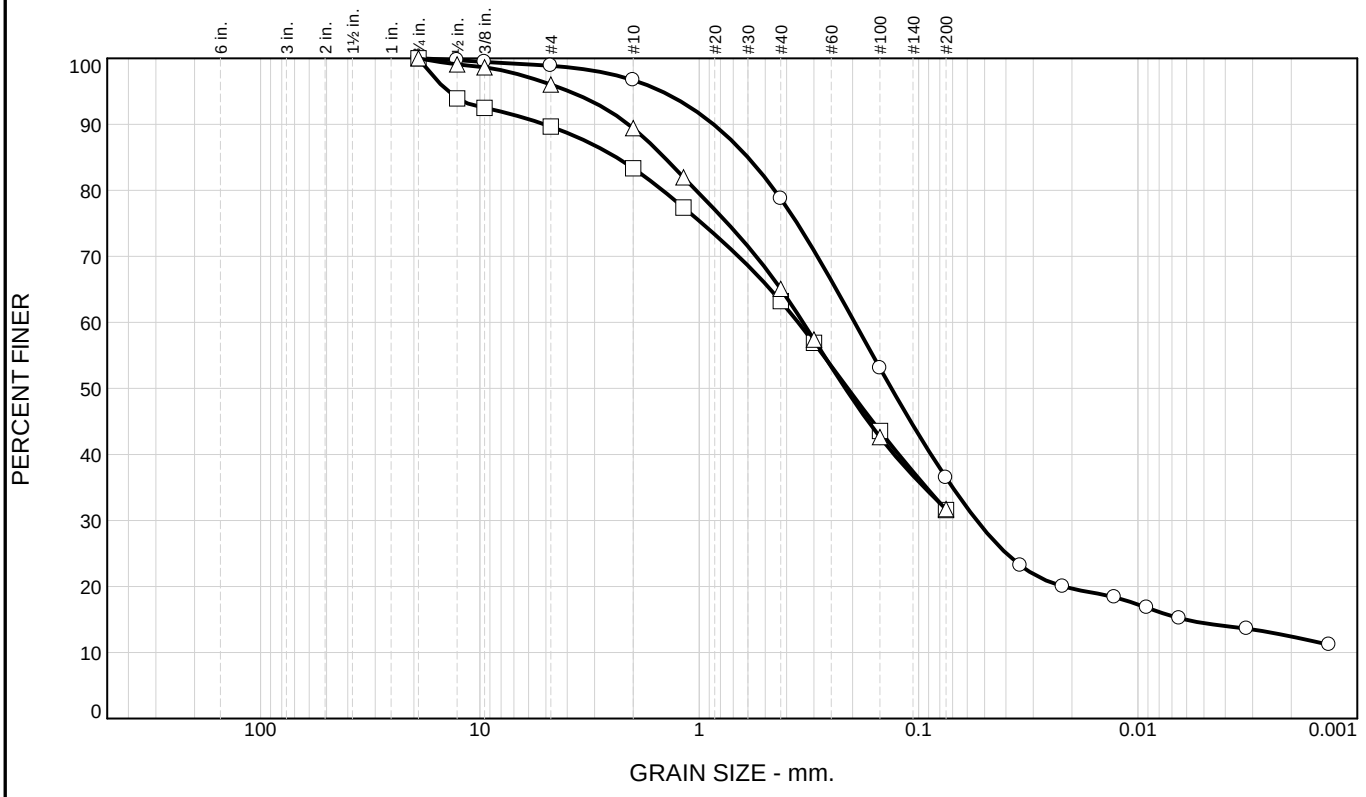
Client:

Project: Carson City Freeway @ Clearview Dr.

Project No.: 72781-1

Figure

# Particle Size Distribution Report




| | +3" | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 0.0 | 1.1 | 62.4 | 22.1 | 14.4 | SC | | 17 | 30 |
| □ | 0.0 | 10.3 | 58.1 | 31.6 | | SC | | | |
| △ | 0.0 | 4.0 | 64.3 | 31.7 | | SC | | 17 | 35 |

| SIEVE inches size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| 3/4 | 100.0 | 100.0 | 100.0 |
| 1/2 | 99.7 | 93.9 | 99.1 |
| 3/8 | 99.4 | 92.5 | 98.6 |
| GRAIN SIZE | | | |
| $D_{60}$ | 0.1957 | 0.3540 | 0.3363 |
| $D_{30}$ | 0.0543 | | |
| $D_{10}$ | | | |
| COEFFICIENTS | | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | □ | △ |
|---|---|---|---|
| #4 | 98.9 | 89.7 | 96.0 |
| #10 | 96.7 | 83.4 | 89.4 |
| #16 | | 77.4 | 82.0 |
| #40 | 78.8 | 63.2 | 65.1 |
| #50 | | 56.9 | 57.4 |
| #100 | 53.1 | 43.6 | 42.6 |
| #200 | 36.5 | 31.6 | 31.7 |

Material Description
○ Clayey sand
□ Clayey sand
△ Clayey sand

REMARKS:
○
□
△

○ Source of Sample: CV3 Depth: 87.8' Sample Number: P2
□ Source of Sample: CV3 Depth: 88.3' Sample Number: P3
△ Source of Sample: CV3 Depth: 92.0' Sample Number: Q

**NEVADA DEPARTMENT OF TRANSPORTATION**

Client:
Project: Carson City Freeway @ Clearview Dr.
Project No.: 72781-1
Figure

# SUMMARY OF RESULTS
# N.D.O.T. GEOTECHNICAL SECTION

**EA/Cont #** 72781-1 **Job Description** Carson City Freeway @ Clearview Dr.

**Boring No.** CV1 **Elevation (ft)** 4743.03' **Station** "CV" 16+51 43' RT.

| SAMPLE NO. | SAMPLE DEPTH (ft) | SAMP-LER TYPE | N BLOWS per ft. | SOIL GROUP | W% | DRY UW pcf | % PASS #200 | LL % | PL % | PI % | STRENGTH TEST | | | | | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | TEST TYPE | Φ deg. (Peak) | C psi (Peak) | Φ deg. (Residual) | C psi (Residual) | |
| A1 | 2.1 - 2.6 | CMS | | SM | 6.7 | 123.6 | 32.5 | | | | | | | | | |
| A2 | 2.6 - 2.9 | CMS | | SM | | | 26.0 | 19 | 18 | 1 | | | | | | |
| B | 2.9 - 3.8 | SPT | | SM | | | 27.6 | 20 | 18 | 2 | | | | | | |
| C1 | 7.2 - 7.7 | CMS | | SC-SM | 8.58* | 113.25* | 21.9* | 24* | 17* | 7* | DS | 37 | 4.26 | 37 | -0.07 | |
| a | 1.1" | | | | | | | | | | | | | | | |
| b | 1.1" | | | | 7.6 | 113.3 | | | | | | | | | | |
| c | 1.1" | | | | 8.2 | 112.3 | | | | | | | | | | |
| d | 1.1" | | | | 9.2 | 111.9 | | | | | | | | | | |
| e | 1.42" | | | | 9.3 | 115.5 | | | | | | | | | | |
| C2 | 7.7 - 7.9 | CMS | | | | | | 26 | 19 | 7 | | | | | | |
| D | 7.9 - 8.7 | SPT | | SC | | | 39.7 | 28 | 19 | 9 | | | | | | |
| E | 12.0 - 13.25+B45 | SPT | | SM | | | 33.2 | | | | | | | | | |

CMS = California Modified Sampler 61mm ID
SPT = Standard Penetration 35mm ID
CS = Continuous Sample 82mm ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 61.5mm ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 73 mm ID

U = Unconfined Compressive
UU = Unconsolidated Undrained
CD = Consolidated Drained
CU = Consolidated Undrained
DS = Direct Shear
Φ = Friction
C = Cohesion
N = No. of blows per 0.3m, sampler

N = Field SPT $N = (N_{css})(0.62)$

H = Hydrometer
S = Sieve
G = Specific Gravity
PI = Plasticity Index
LL = Liquid Limit
PL = Plastic Limit
NP = Non-Plastic
OC = Consolidation
Ch = Chemical
RV = R - Value
MD = Moisture Density

CM = Compaction
E = Swell/Pressure on Expansive Soils
SL = Shrinkage Limit
UW= Unit Weight
W = Moisture Content
K = Permeability
O = Organic Content
D = Dispersive
RQD = Rock Quality Designation
X = X-Ray Defraction
HCpot = Hydro-Collapse Potential

*** = Average of subsamples**

# SUMMARY OF RESULTS
# N.D.O.T. GEOTECHNICAL SECTION

**EA/Cont #** 72781-1 **Job Description** Carson City Freeway @ Clearview Dr.

**Boring No.** CV1 **Elevation (ft)** **Station**

| SAMPLE NO. | SAMPLE DEPTH (ft) | SAMP-LER TYPE | N BLOWS pcf | SOIL GROUP | W% | DRY UW pcf | % PASS #200 | LL % | PL % | PI % | STRENGTH TEST | | | | | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | TEST TYPE | Φ deg. (Peak) | C psi (Peak) | Φ deg. (Residual) | C psi (Residual) | |
| F | 17.0 - 18.4 | SPT | | SM | | | 21.7 | | | | | | | | | |
| G | 22.0 - 23.3 | SPT | | SM | | | 29.0 | | | | | | | | | |
| H | 27.0 - 27.75 | SPT | | SM | | | 24.4 | | | | | | | | | |
| I | 32.0 - 33.5 | SPT | | SM | | | 21.1 | | | | | | | | | |
| J | 37.0 - 38.4 | SPT | | SM | | | 24.1 | | | | | | | | | |
| K1 | 47.3 - 47.8 | CMS | | SC-SM | 10.25* | 116.33* | 24.2* | 26* | 20* | 6* | DS | 36 | 5.69 | 32 | 1.8 | |
| a | 1.15" | | | | 10.8 | 114.7 | | | | | | | | | | |
| b | 1.15" | | | | 10.6 | 116.3 | | | | | | | | | | |
| c | 1.15" | | | | 10.2 | 117.2 | | | | | | | | | | |
| d | 2.55" | | | | 9.4 | 117.1 | | | | | | | | | | |
| K2 | 47.8 - 48.3 | CMS | | SC | 9.7 | 120.8 | 29.6 | 26 | 18 | 8 | | | | | | |
| K3 | 48.3 - 48.5 | CMS | | SC | | | 28.6 | | | | | | | | | |

CMS = California Modified Sampler 61mm ID
SPT = Standard Penetration 35mm ID
CS = Continuous Sample 82mm ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 61.5mm ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 73 mm ID

U = Unconfined Compressive
UU = Unconsolidated Undrained
CD = Consolidated Drained
CU = Consolidated Undrained
DS = Direct Shear
Φ = Friction
C = Cohesion
N = No. of blows per 0.3m, sampler

N = Field SPT $N = (N_{css})(0.62)$

*** = Average of subsamples**

H = Hydrometer
S = Sieve
G = Specific Gravity
PI = Plasticity Index
LL = Liquid Limit
PL = Plastic Limit
NP = Non-Plastic
OC = Consolidation
Ch = Chemical
RV = R - Value
MD = Moisture Density

CM = Compaction
E = Swell/Pressure on Expansive Soils
SL = Shrinkage Limit
UW= Unit Weight
W = Moisture Content
K = Permeability
O = Organic Content
D = Dispersive
RQD = Rock Quality Designation
X = X-Ray Defraction
HCpot = Hydro-Collapse Potential

# SUMMARY OF RESULTS
# N.D.O.T. GEOTECHNICAL SECTION

**EA/Cont #** 72781-1 **Job Description** Carson City Freeway @ Clearview Dr.

**Boring No.** CV1 **Elevation (ft)** **Station**

| SAMPLE NO. | SAMPLE DEPTH (ft) | SAMP-LER TYPE | N BLOWS ft | SOIL GROUP | W% | DRY UW pcf | % PASS #200 | LL % | PL % | PI % | STRENGTH TEST | | | | | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | TEST TYPE | Φ deg. (Peak) | C psi (Peak) | Φ deg. (Residual) | C psi (Residual) | |
| L | 57.0 - 58.25 | SPT | | SC-SM | | | 27.2 | 24 | 19 | 5 | | | | | | |
| M | 67.0 - 68.5 | SPT | | SC | | | 29.6 | 29 | 21 | 8 | | | | | | |
| N | 77.0 - 78.5 | SPT | | SM | | | 33.1 | 26 | 23 | 3 | | | | | | |
| O | 87.0 - 88.5 | SPT | | SM | | | 24.4 | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | |

CMS = California Modified Sampler 61mm ID
SPT = Standard Penetration 35mm ID
CS = Continuous Sample 82mm ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 61.5mm ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
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U = Unconfined Compressive
UU = Unconsolidated Undrained
CD = Consolidated Drained
CU = Consolidated Undrained
DS = Direct Shear
Φ = Friction
C = Cohesion
N = No. of blows per 0.3m, sampler

N = Field SPT $N = (N_{css})(0.62)$

*** = Average of subsamples**

H = Hydrometer
S = Sieve
G = Specific Gravity
PI = Plasticity Index
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W = Moisture Content
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O = Organic Content
D = Dispersive
RQD = Rock Quality Designation
X = X-Ray Defraction
HCpot = Hydro-Collapse Potential

# SUMMARY OF RESULTS
# N.D.O.T. GEOTECHNICAL SECTION

**EA/Cont #** 72781-1 **Job Description** Carson City Freeway @ Clearview Dr.

**Boring No.** CV2 **Elevation (ft)** 4736.95' **Station** "CV" 15+21 50' RT.

| SAMPLE NO. | SAMPLE DEPTH (ft) | SAMP-LER TYPE | N BLOWS ft | SOIL GROUP | W% | DRY UW pcf | % PASS #200 | LL % | PL % | PI % | STRENGTH TEST | | | | | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | TEST TYPE | Φ deg. (Peak) | C psi (Peak) | Φ deg. (Residual) | C psi (Residual) | |
| A | 1.0 - 2.3 | bulk | | SM | | | 14.7 | 15 | NP | NP | | | | | | Ch |
| B1 | 2.3 - 2.8 | CMS | | SM | 3.2 | 114.9 | 13.4 | | | | | | | | | |
| B2 | 2.8 - 3.3 | CMS | | SP-SM | | | 11.6 | | | | | | | | | |
| C | 4.5 - 5.7 | SPT | | SC-SM | | | 33.0 | 22 | 18 | 4 | | | | | | |
| D1 | 8.1 - 8.6 | CMS | | SM | 5.5 | 109.1 | 21.6 | | | | | | | | | |
| D2 | 8.6 - 8.9 | CMS | | SM | | | 28.4 | | | | | | | | | |
| E | 13.0 - 14.5 | SPT | | SC | | | 20.1 | 25 | 17 | 8 | | | | | | |
| F1 | 18.1 - 18.6 | CMS | | SC | | | 26.4 | | | | | | | | | |
| F2 | 18.6 - 18.8 | CMS | | SC | | | 27.2 | | | | | | | | | |
| G | 23.0 - 24.5 | SPT | | SC | | | 30.0 | 24 | 16 | 8 | | | | | | |
| H | 28.0 - 29.5 | SPT | | SC-SM | | | 29.3 | 23 | 16 | 7 | | | | | | |
| I | 35.0 - 36.5 | SPT | | SC | | | 25.4 | 26 | 17 | 9 | | | | | | |

CMS = California Modified Sampler 61mm ID
SPT = Standard Penetration 35mm ID
CS = Continuous Sample 82mm ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 61.5mm ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 73 mm ID

U = Unconfined Compressive
UU = Unconsolidated Undrained
CD = Consolidated Drained
CU = Consolidated Undrained
DS = Direct Shear
Φ = Friction
C = Cohesion
N = No. of blows per 0.3m, sampler

N = Field SPT N = $(N_{css})(0.62)$

H = Hydrometer
S = Sieve
G = Specific Gravity
PI = Plasticity Index
LL = Liquid Limit
PL = Plastic Limit
NP = Non-Plastic
OC = Consolidation
Ch = Chemical
RV = R - Value
MD = Moisture Density

CM = Compaction
E = Swell/Pressure on Expansive Soils
SL = Shrinkage Limit
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HCpot = Hydro-Collapse Potential

*** = Average of subsamples**

# SUMMARY OF RESULTS
# N.D.O.T. GEOTECHNICAL SECTION

**EA/Cont #** 72781-1 **Job Description** Carson City Freeway @ Clearview Dr.

**Boring No.** CV3 **Elevation (ft)** 4739.86' **Station** "CV" 15+83 44' RT.

| SAMPLE NO. | SAMPLE DEPTH (ft) | SAMP-LER TYPE | N BLOWS ft | SOIL GROUP | W% | DRY UW pcf | % PASS #200 | LL % | PL % | PI % | STRENGTH TEST | | | | | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | TEST TYPE | Φ deg. (Peak) | C psi (Peak) | Φ deg. (Residual) | C psi (Residual) | |
| A | 7.0 - 7.9 | SPT | | SC | | | 37.3 | 30 | 19 | 11 | | | | | | |
| B | 17.0 - 18.5 | SPT | | SC-SM | | | 28.9 | 25 | 18 | 7 | | | | | | |
| C1 | 27.3 - 27.8 | CMS | | CL | 22.15* | 98.5* | 55.1* | 45* | 22* | 23* | DS | 26 | 16.78 | 20 | 7.82 | |
| a | 1.1" | | | | 16.1 | 111.3 | | | | | | | | | | |
| b | 1.1" | | | | 18.6 | n/a | | | | | | | | | | |
| c | 1.1" | | | | 21.9 | 99.4 | | | | | | | | | | |
| d | 2.66" | | | | 32.0 | 84.8 | | | | | | | | | | |
| C2 | 27.8 - 28.3 | CMS | | SC | 24.7 | 96.4 | 47.4 | 44 | 23 | 21 | | | | | | |
| C3 | 28.3 - 28.5 | CMS | | SC-SM | | | 24.3 | 23 | 17 | 6 | | | | | | |
| D | 28.5 - 29.3 | SPT | | SM | | | 20.5 | 18 | NP | NP | | | | | | |
| E1 | 32.1 - 32.6 | CMS | | SM | 8.33* | 120.85* | 16* | 17* | NP* | NP* | DS | 43 | 12.34 | 31 | 6.73 | |
| a | 1.1" | | | | 8.4 | 119.7 | | | | | | | | | | |

CMS = California Modified Sampler 61mm ID
SPT = Standard Penetration 35mm ID
CS = Continuous Sample 82mm ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 61.5mm ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 73 mm ID

U = Unconfined Compressive
UU = Unconsolidated Undrained
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CU = Consolidated Undrained
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Φ = Friction
C = Cohesion
N = No. of blows per 0.3m, sampler

N = Field SPT $N = (N_{css})(0.62)$

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RQD = Rock Quality Designation
X = X-Ray Defraction
HCpot = Hydro-Collapse Potential

*** = Average of subsamples**

# SUMMARY OF RESULTS
# N.D.O.T. GEOTECHNICAL SECTION

**EA/Cont #** 72781-1 **Job Description** Carson City Freeway @ Clearview Dr.

**Boring No.** CV3 **Elevation (ft)** **Station**

| SAMPLE NO. | SAMPLE DEPTH (ft) | SAMP-LER TYPE | N BLOWS ft | SOIL GROUP | W% | DRY UW pcf | % PASS #200 | LL % | PL % | PI % | STRENGTH TEST | | | | | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | TEST TYPE | Φ deg. (Peak) | C psi (Peak) | Φ deg. (Residual) | C psi (Residual) | |
| b | 1.1" | | | | 8.6 | 118.0 | | | | | | | | | | |
| c | 1.1" | | | | 8.0 | 122.0 | | | | | | | | | | |
| d | 2.68" | | | | 8.3 | 123.7 | | | | | | | | | | |
| E2 | 32.6 - 32.8 | CMS | | SM | | | 19.0 | | | | | | | | | |
| F | 37.0 - 38.3 | SPT | | SM | | | 20.8 | | | | | | | | | |
| G | 42.0 - 43.5 | SPT | | SM | | | 25.7 | | | | | | | | | |
| H | 47.0 - 48.5 | SPT | | SM | | | 26.8 | | | | | | | | | |
| I | 52.0 - 52.9 | SPT | | SM | | | 20.2 | | | | | | | | | |
| J | 57.0 - 58.5 | SPT | | SC | | | 30.0 | 28 | 17 | 11 | | | | | | |
| K1 | 62.2 - 62.7 | CMS | | SC | 14.4 | 117.8 | 29.9 | 36 | 17 | 19 | | | | | | |
| K2 | 62.7 - 63.2 | CMS | | SC | 14.9* | 115.7* | 32* | 36* | 16* | 20* | DS | 30 | 13.7 | 34 | 0.71 | |
| a | 1.1" | | | | 15.0 | 115.2 | | | | | | | | | | |

CMS = California Modified Sampler 61mm ID
SPT = Standard Penetration 35mm ID
CS = Continuous Sample 82mm ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 61.5mm ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 73 mm ID

U = Unconfined Compressive
UU = Unconsolidated Undrained
CD = Consolidated Drained
CU = Consolidated Undrained
DS = Direct Shear
Φ = Friction
C = Cohesion
N = No. of blows per 0.3m, sampler

N = Field SPT $N = (N_{css})(0.62)$

*** = Average of subsamples**

H = Hydrometer
S = Sieve
G = Specific Gravity
PI = Plasticity Index
LL = Liquid Limit
PL = Plastic Limit
NP = Non-Plastic
OC = Consolidation
Ch = Chemical
RV = R - Value
MD = Moisture Density

CM = Compaction
E = Swell/Pressure on Expansive Soils
SL = Shrinkage Limit
UW= Unit Weight
W = Moisture Content
K = Permeability
O = Organic Content
D = Dispersive
RQD = Rock Quality Designation
X = X-Ray Defraction
HCpot = Hydro-Collapse Potential

# SUMMARY OF RESULTS
# N.D.O.T. GEOTECHNICAL SECTION

**EA/Cont #** 72781-1 **Job Description** Carson City Freeway @ Clearview Dr.

**Boring No.** CV3 **Elevation (ft)** **Station**

| SAMPLE NO. | SAMPLE DEPTH (ft) | SAMP-LER TYPE | N BLOWS ft | SOIL GROUP | W% | DRY UW pcf | % PASS #200 | LL % | PL % | PI % | STRENGTH TEST | | | | | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | TEST TYPE | Φ deg. (Peak) | C psi (Peak) | Φ deg. (Residual) | C psi (Residual) | |
| b | 1.1" | | | | 14.6 | n/a | | | | | | | | | | |
| c | 1.1" | | | | 15.0 | 115.0 | | | | | | | | | | |
| d | 2.58" | | | | 15.0 | 116.9 | | | | | | | | | | |
| K3 | 63.2 - 63.5 | CMS | | SC | | | 34.1 | 36 | 19 | 17 | | | | | | |
| L | 67.0 - 68.5 | SPT | | SC | | | 24.7 | 32 | 19 | 13 | | | | | | |
| M | 72.0 - 73.5 | SPT | | SC | | | 29.0 | | | | | | | | | |
| N | 77.0 - 78.5 | SPT | | SC | | | 31.4 | 34 | 17 | 17 | | | | | | |
| O | 82.0 - 83.5 | SPT | | SC | | | 22.3 | | | | | | | | | |
| P1 | 87.3 - 87.8 | CMS | | SC | 14.0 | 119.8 | 35.0 | 31 | 18 | 13 | | | | | | |
| P2 | 87.8 - 88.3 | CMS | | SC | 15.2 | 118.0 | 36.5 | 30 | 17 | 13 | | | | | | |
| P3 | 88.3 - 88.5 | CMS | | SC | | | 31.6 | | | | | | | | | |
| Q | 92.0 - 93.3 | SPT | | SC | | | 31.7 | 35 | 17 | 18 | | | | | | |

CMS = California Modified Sampler 61mm ID
SPT = Standard Penetration 35mm ID
CS = Continuous Sample 82mm ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 61.5mm ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 73 mm ID

U = Unconfined Compressive
UU = Unconsolidated Undrained
CD = Consolidated Drained
CU = Consolidated Undrained
DS = Direct Shear
Φ = Friction
C = Cohesion
N = No. of blows per 0.3m, sampler

N = Field SPT $N = (N_{css})(0.62)$

*** = Average of subsamples**

H = Hydrometer
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