GEOTECHNICAL REPORT

PAVEMENT DISTRESS
SR 430 (US 395) MILEPOST WA 8.57 to WA 11.70
WASHOE COUNTY, NEVADA

E.A. 73274-9
SEPTEMBER 2008

NEVADA DOT
GEOTECHNICAL ENGINEERING

MATERIALS DIVISION

STATE OF NEVADA

DEPARTMENT OF TRANSPORTATION

MATERIALS DIVISION

GEOTECHNICAL SECTION

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September 2008

WASHOE COUNTY, NEVADA

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INTRODUCTION

NDOT is preparing a Contract to preserve and rehabilitate SR 430 (US 395) from the end of the barrier rail North of Bowers Mansion Road (SR 429) to Pagni Lane, from Milepost WA 8.57 to WA 11.70 (Cumulative Mileage 7.964 to 11.037). The scope of the project includes cold milling to a depth of 4 inches and overlaying 3 inches of Plantmix Bituminous Surface (PBS) with 1 inch of Open Grade for both Northbound and Southbound outside travel lanes, and cold milling to a depth of 1 inch and placing 1 inch of Open Grade for the remaining roadway. The District II Maintenance staff identified three areas within the project limits where base failure is suspected because of the deteriorated condition of the pavement in those areas. The District II Maintenance Staff requested that the Geotechnical Section evaluate these concerned areas. The Boring Location Map in Appendix A provides a map of the project area and depicts boring locations and locations of suspected base failure.

A field visit at the project site was arranged on June 2, 2008 with Jerry Conners from the District II office, Tom Lumpkin from the District II Maintenance Division, Ashley Ablahani and Abbas Bafghi from the Geotechnical Section, and Kevin Marshall and Maynard Hinton from the Materials Division Field Exploration Crew. During the field visit, pavement distress in several areas was observed. The most notable distressed pavement areas were located on the outside travel lane in the Northbound direction between stations “Pe” 23+00 and “Pe” 45+00, and on the outside travel lane in the Southbound direction between stations “Ge” 107+00 and “Pe” 14+00. These limits include the areas of suspected base failure identified by the District II Maintenance staff. No signs of severe pavement distress on the inside travel lanes in either direction were noted.

PROJECT HISTORY

The historical record of pavement construction and resurfacing in this area is shown in the Project History Table in Appendix B. It shows that the last time any work was performed in the area of pavement distress was in 1995, with 3 inches of cold milling followed by the placement of 3 inches of PBS with Open Grade.

FIELD INVESTIGATION

On June 16 through 19, 2008, the NDOT Geotechnical Section conducted a subsurface site investigation in the aforementioned areas of pavement distress. The subsurface soil conditions were explored by drilling twelve dry auger borings with a diameter of 10 inches each to a maximum depth of 14 feet, using a Diedrich 120 drilling rig equipped with 6-inch hollow stem auger flights. Continuous logs of the subsurface conditions as encountered during the investigation were recorded at the time of drilling. Representative soil samples were obtained using SPT (Standard Penetration Testing) and CMS (California Modified Sampler) equipment and procedures. All soil samples were classified using the Unified Soil Classification System (USCS) in accordance with ASTM D 2487. The Boring Location Map, the Key to Boring Logs, and copies of the Boring Logs are provided in Appendix A.

The boreholes were inspected for water seepage shortly after drilling. Water was observed in boreholes LBM5 located approximately at station “Pe” 10+00, LBM6 located approximately at station “Ge” 123+90, LBM7 located approximately at station “Ge” 121+65, LBM9 located approximately at station “Ge” 114+40, and LBM10 located approximately at station “Ge” 112+75 in the Southbound outside travel lane. No boreholes were capped to allow for periodic water monitoring.

LABORATORY TESTING

Laboratory testing of selected samples consisted of:

- Natural Moisture Content (ASTM D 2216 and AASHTO T-265);
- Atterberg Limits (AASHTO T-89 and T-90);
- Particle Size Gradations (ASTM D 1140 and AASHTO T-88); and
- Resistance Value (R-Value – Nevada T115). R-Value testing is a measure of subgrade strength and expansion potential and is used in design of flexible pavements.

Results from these laboratory tests are presented in the Summary of Results Tables, Particle Size Distribution Reports and Line Sampling Data Results in Appendix C.

DISCUSSION

Northbound Lanes

Pavement distress was observed in the outside travel lane wheel paths in the Northbound direction between stations "Pe" 23+00 and "Pe" 45+00. This distress can be classified as fatigue cracking, a series of interconnected longitudinal cracks located in one or both wheel path(s) caused by repeated traffic loadings on the pavement surface. An unstable base, inadequate drainage, insufficient pavement thickness, degradation and/or stripping in the asphalt concrete combined with the traffic loadings will accelerate this type of distress. The longitudinal cracks observed in the Northbound lanes were up to 2 inches wide and pieces of asphalt have begun to break away from the crack edges through the action of traffic. Photo 1 below shows both fatigue cracking and patching at station "Pe" 40+00. Patching has been performed on this section of roadway in an effort to keep the pavement surface intact. Photo 1 was taken at one of the three areas where District II Maintenance staff suspected base failure.

Photo 1

Geotechnical field investigation indicated that the subgrade soils in both cut and fill areas in the outside travel lane in the Northbound direction between stations “Pe” 23+00 and “Pe” 45+00 have high R-Values from 72 to 78 and non to low plastic fines with Plasticity Indices (P.I.) of 1 to 3. Groundwater was not encountered in any of the three boreholes in the Northbound lanes. The asphalt and base thicknesses were measured at each borehole. The asphalt thickness ranged from 7 to 9 inches and the base thickness ranged from 4 to 6 inches.

Southbound Lanes

Fatigue cracking, longitudinal cracking, rutting and transverse cracking were observed in the outside travel lane in the Southbound direction between stations “Ge” 107+00 and “Pe” 14+00. The most prevalent pavement distress can be described as interconnected longitudinal cracks accompanied with pavement depressions, as shown in Photo 2 at station “Ge” 124+00. Photo 2 was taken at the second location where District II Maintenance staff suspected base failure. The interconnected longitudinal cracks in the Southbound lanes come in the form of both fatigue cracking in the wheel paths and a poorly constructed pavement lane joint running parallel along the skip line. The maximum width of the cracks was five inches and pieces of asphalt have begun to break away from the crack edges. These cracks are considered high severity cracks.

Fatigue cracking and rutting in the wheel paths in the Southbound outside travel lane at station “Ge” 115+80 is depicted in Photo 3. Photo 3 was taken at the third location where District II Maintenance staff suspected base failure.

Transverse cracks, which are at approximately right angles to the center line, could be found in a few isolated areas in the Southbound lanes. This type of cracking is primarily caused by expansion and contraction of the pavement binder due to temperature changes or by age hardening of the asphalt. The transverse cracks found on the Southbound lanes were hairline or very narrow cracks which can allow only a small amount of the infiltration of moisture into the structural pavement section. Therefore, these cracks are considered low severity cracks.

Photo 2

Photo 3

Roadway drainage is a problem in the Southbound outside travel lane between stations "Ge" 115+50 and "Pe"13+00. According to the District II Maintenance Staff, water puddles in this travel lane area after rain and snow events, and the surface water run-off drains into the depressed and cracked pavement areas causing damage to the roadway structural section. The variations in roadway cross slopes, low points along the roadway alignment and rutting in the wheel paths in the Southbound outside travel lane can be seen in Photo 4. Photo 4 was taken at station "Ge" 122+00 looking Northbound.

Photo 4

Geotechnical field investigation indicated that the subgrade soils in the outside travel lane in the Southbound direction between stations "Ge" 107+00 and "Pe" 14+00 are mostly clayey soils with varying R-Values as low as 12 to as high as 78 and low to medium plastic fines with P.I. ranging from 2 to 17. Shallow groundwater, up to 5 feet below the surface, was encountered in several boreholes. The asphalt and base thicknesses were measured at each borehole. The asphalt thickness ranged from 6 to 8 inches and the base thickness ranged from 8 to 20 inches.

CONCLUSIONS

Severe pavement distress was observed only on the outside travel lanes in either direction. Heavy trucks usually travel in the outside lane ("the slow lane"). Consequently, the heavy wheel loads apply more pressure on the pavement and contribute to the deterioration of the pavement section in the outside lanes. In addition, the longitudinal cracks running parallel along the skip line indicate a poorly constructed pavement lane joint. Furthermore, as the Project History Table in Appendix B shows, the inside travel lanes were constructed before the outside travel lanes as this section of road was widened on both sides after the original construction. The difference in the design, materials, and quality of construction may have contributed to the variation in the performance of the pavement sections of the inside and outside lanes.

Once the asphalt layer exhibits distresses such as fatigue and pieces of asphalt break away from the roadway surface, traffic loadings are transmitted to the base layer more directly and with more impact. This can eventually cause the base section to weaken and deform. An unstable base, inadequate drainage, insufficient pavement thickness, inconsistent pavement structural section, poor quality of material and/or degradation of the asphalt combined with traffic loadings will accelerate pavement distress.

Northbound Lanes

Existing fatigue cracks are the results of pavement wear and pavement distress due to aging and heavy traffic loading. Pavement cracks usually start as hairline or vary narrow cracks and widen with age. Existing cracks were more than ½ inch wide and can allow the infiltration of moisture into the structural pavement section. Therefore, these cracks must be repaired to prevent the base section from weakening or deforming.

Southbound Lanes

The existing combination of fatigue cracking, longitudinal cracking, rutting, and transverse cracking observed in the Southbound lane is considered high severity pavement distress. Aging of pavement and heavy traffic loading in combination with ponding of roadway surface water run-off on the outside travel lane, presence of clayey subgrade soils with low strengths, an inconsistent pavement structural section and the existence of shallow groundwater have contributed to the pavement distress in this area. The severity of this combination of detrimental factors may have caused weakening and/or deformation of the base section.

Water can be considered as one of the main causes of progressing pavement distress. The worst pavement distressed locations exist where the cross slope of the road directs the pavement surface water run-off into those areas and causes saturation of the structural pavement section. The depressed pavement sections in the Southbound outside travel lane have created low spots in the cross slope of the roadway. Water flows into the pavement section from the ponding surface water run-off. Since the water has no way to drain out, it remains within the structural section for an extended time creating a "bathtub" condition. Free water within the pavement section weakens the pavement structure. The ability of the structural section to support wheel loads is severely reduced when the pavement section becomes saturated. A drainable pavement system is needed to remove infiltrated water which can not be prevented from entering the pavement structure.

RECOMMENDATIONS

A pavement's ability to carry heavy traffic loads depends on both the pavement materials (asphalt surfacing and granular base) and the strength of the underlying soils. Following are our recommendations for Repair Strategies based on the severity and extent of the pavement distress.

Northbound Lanes

Existing fatigue cracks in the Northbound outside travel lane are greater than 1/2 inch wide and are numerous. These cracks are considered to be high severity cracks. These cracks allow moisture to infiltrate into the pavement structural section causing structural failure. Without crack filling, asphalt pieces can break away and additional cracks can develop and become wide enough to require patching. Filling and sealing cracks will reduce moisture penetration and prevent further subgrade weakening. Fatigue cracking indicates a need for strengthening with an overlay or reconstruction. Because the subgrade soils have high R-Values with non to low plasticity, we recommend milling and replacing the cracked pavement layer with an overlay. We recommend no change or additions to the scope of the project for the repair strategy for the Northbound lanes.

Southbound Lanes

Water remaining for a long time within the pavement structural section and presence of clayey subgrade soils are recognized as the primary causes of the pavement distress in the Southbound outside travel lane. Clayey subgrade soils lose strength when they become saturated due to ponding of the surface water run-off. Therefore, it is important to prevent ponding of the water within the travel lanes. A properly designed pavement structural section to accommodate the presence of the low R-Values of the clayey subgrade soils and providing an effective pavement drainage system are the recommended solutions.

The most severe pavement distress has developed between stations "Ge" 114+00 and "Pe" 13+50, approximately 1,600 feet in the Southbound outside travel lane. Analysis of this section of roadway determined that 8 inches of new Plantmix on top of 20 inches of Base is needed to provide a stable pavement structural section. Details presenting the parameters used in this analysis and the results are in Appendix D. We recommend removing the existing structural pavement section to a depth of 28 inches below the surface and placing a nonwoven geotextile followed by 10 inches of millings, 10 inches of Aggregate Base, 8 inches of PBS, and 1 inch of Open Grade. It is important that proper cross slope for this section of roadway be constructed to allow sufficient surface water run-off.

Ponding of the surface water run-off on the Southbound outside travel lane seems to occur between stations "Ge" 115+50 and "Pe" 13+00, approximately 1,400 feet in length. Ponding of the surface water run-off must be prevented by either providing a subsurface drainage system (such as Edge Drain or Trench Drain) to drain the water away or by raising the roadway profile grade. Paved roadway surfaces will need to be constructed having a minimum of 2% cross slope or crown across the roadway. The 2% cross slope will provide approximately 3 inches of fall on a 12 foot wide travel lane. Shoulders should be constructed to have a greater slope to improve surface drainage. This can be accomplished by raising the roadway profile grade. Due to the presence of commercial businesses in this area and the necessity of having access driveways, establishing a roadside ditch does not appear to be practical. If the decision is made to construct a subsurface drainage system, details will be provided at a later date.

We advise that the limits of our recommendations be verified by District II Maintenance Staff.

Construction for this project is scheduled to begin in the summer of 2009. Because the condition of the existing pavement may deteriorate further before the start of the construction, we recommend temporarily repairing severely distressed areas. Following is the repair strategy that is recommended for the full width of the Southbound outside lane from stations “Ge” 111+25 to “Ge” 111+75, from stations “Ge” 115+60 to “Ge” 116+10, and from stations “Ge” 119+40 to “Pe” 14+00, for an approximate cumulative length of 1,200 feet :

a) Mill 3 inches of the existing roadway surface;
b) In areas with severe distressed pavement, most likely more than 3 inches and up to the full thickness of the pavement will be removed. In areas where the full pavement thickness has been removed, moisture condition and compact the aggregate base as much as practical. Patch and compact these areas with hot asphalt plantmix to the level of the remaining milled sections.
c) Pave the milled surface with 3 inches of dense graded hot asphalt plantmix (Type 2C, PG 64-28NV). If possible, provide a proper cross slope that directs surface water run-off towards the shoulder.

The above recommended limits may be adjusted based on the condition of the roadway surface at the time of repair. In addition, seal the remaining extensive cracks with appropriate asphalt sealant and patch any areas where extensive pavement deterioration exists with plantmix bituminous surface on the northbound and southbound lanes within the project limits.

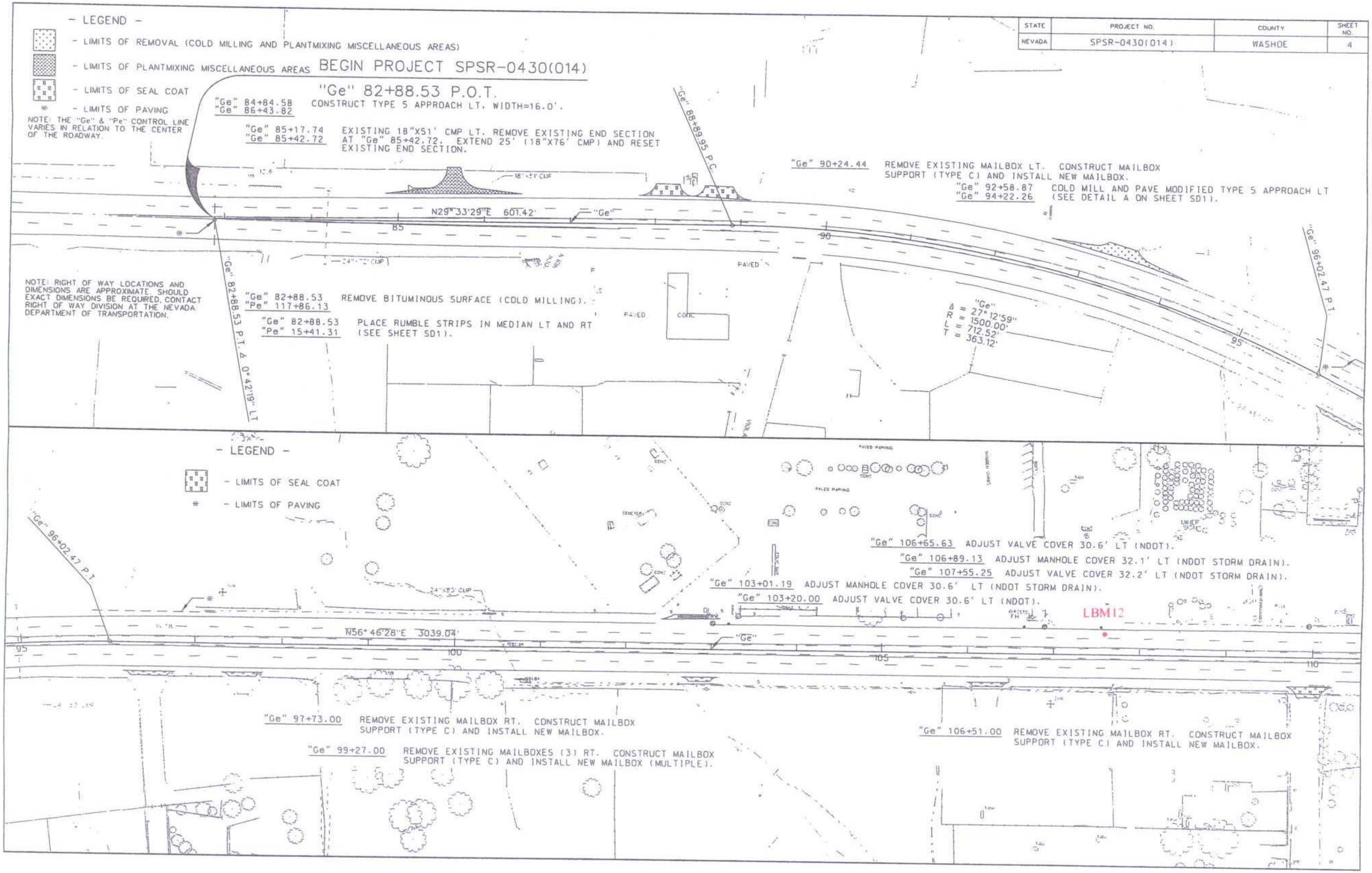
<u>REFERENCES</u>

1. AASHTO, "Standard Specifications for Highway Bridges," 17th Edition, 2002. Washington D.C., 1996. Includes Interims published in 1997 through 2002.

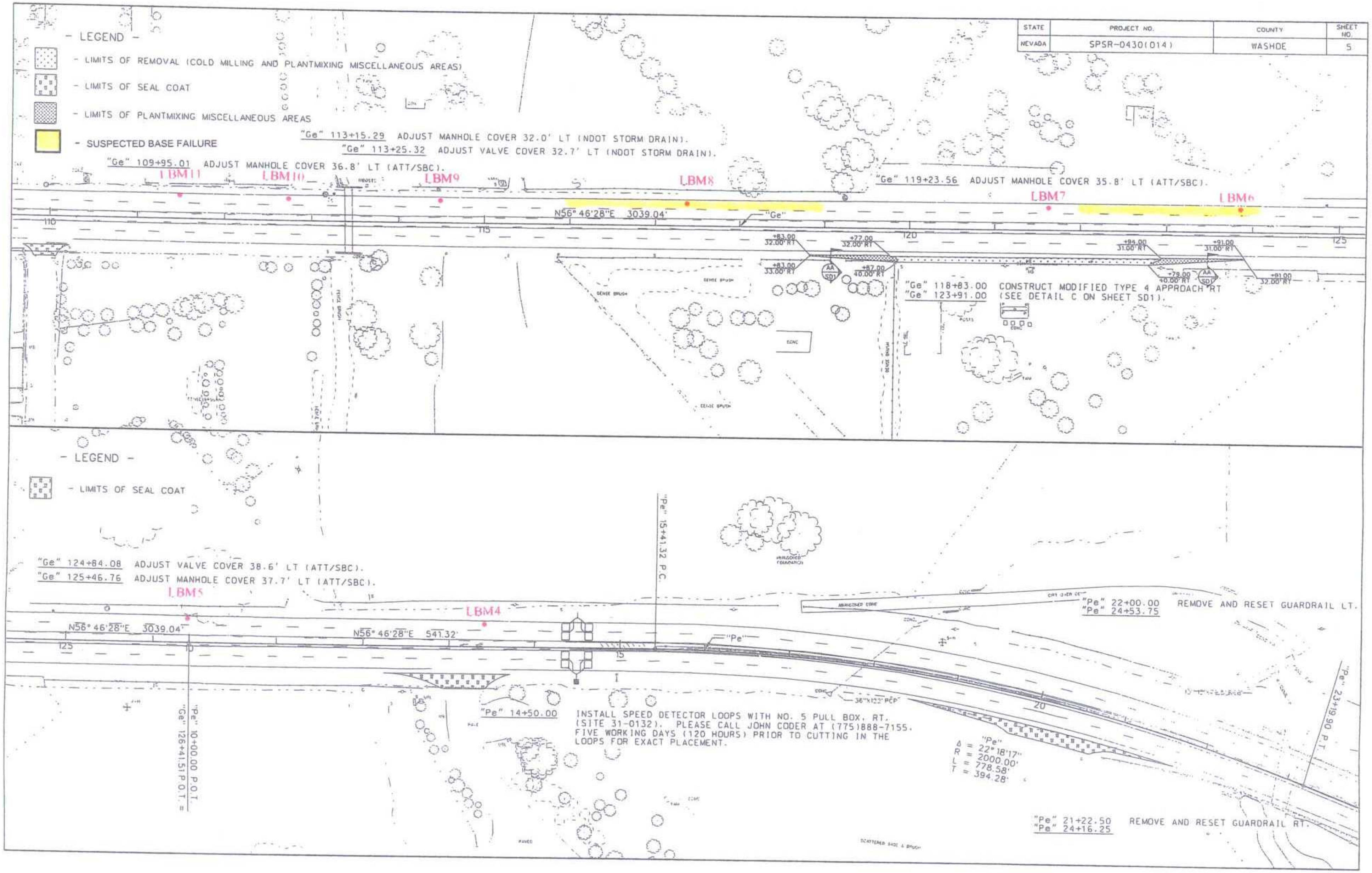
2. NDOT Materials Division, "Flexible Pavement Distress Identification Manual," May 2007.

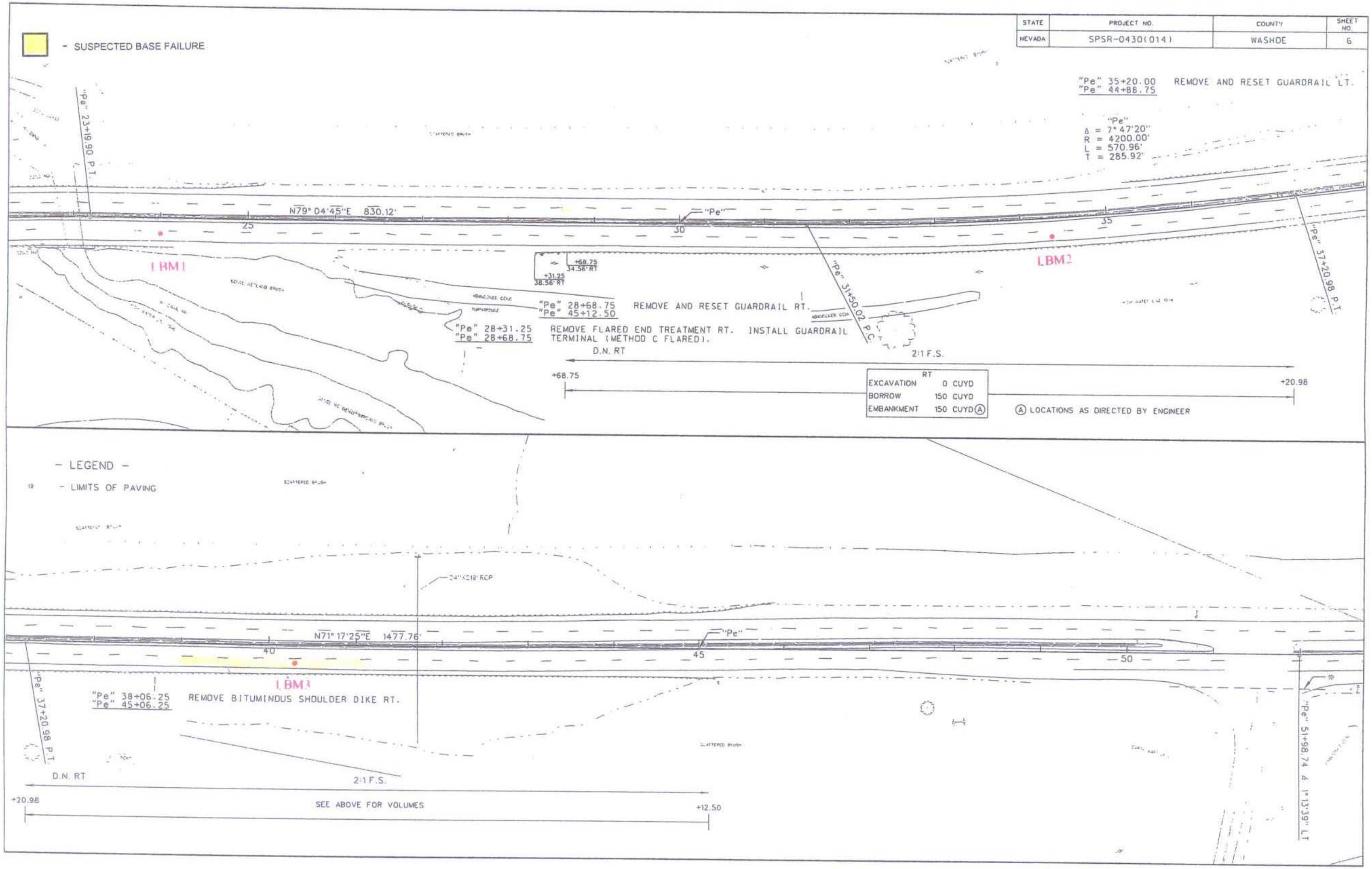
APPENDIX A

Boring Location Map
Key to Boring Logs
Boring Logs



STATE NEVADA
PROJECT NO. SPSR-0430(014)
COUNTY WASHOE
SHEET NO. 4
- LEGEND -
- LIMITS OF REMOVAL (COLD MILLING AND PLANTMIXING MISCELLANEOUS AREAS)
- LIMITS OF PLANTMIXING MISCELLANEOUS AREAS
- LIMITS OF SEAL COAT
- LIMITS OF PAVING
NOTE: THE "Ge" & "Pe" CONTROL LINE VARIES IN RELATION TO THE CENTER OF THE ROADWAY.
BEGIN PROJECT SPSR-0430(014)
"Ge" 82+88.53 P.O.T.
"Ge" 84+84.58 "Ge" 86+43.82 CONSTRUCT TYPE 5 APPROACH LT, WIDTH=16.0'.
"Ge" 85+17.74 "Ge" 85+42.72 EXISTING 18"X51' CMP LT. REMOVE EXISTING END SECTION AT "Ge" 85+42.72. EXTEND 25' (18"X76' CMP) AND RESET EXISTING END SECTION.
"Ge" 88+89.95 P.C.
"Ge" 90+24.44 REMOVE EXISTING MAILBOX LT. CONSTRUCT MAILBOX SUPPORT (TYPE C) AND INSTALL NEW MAILBOX.
"Ge" 92+58.87 "Ge" 94+22.26 COLD MILL AND PAVE MODIFIED TYPE 5 APPROACH LT (SEE DETAIL A ON SHEET SD1).
N29°33'29"E 601.42'
"Ge"
85
90
95
"Ge" 96+02.47 P.T.
NOTE: RIGHT OF WAY LOCATIONS AND DIMENSIONS ARE APPROXIMATE. SHOULD EXACT DIMENSIONS BE REQUIRED, CONTACT RIGHT OF WAY DIVISION AT THE NEVADA DEPARTMENT OF TRANSPORTATION.
"Ge" 82+88.53 P.T. Δ 0°42'19" LT
"Ge" 82+88.53 "Pe" 117+86.13 REMOVE BITUMINOUS SURFACE (COLD MILLING).
"Ge" 82+88.53 "Pe" 15+41.31 PLACE RUMBLE STRIPS IN MEDIAN LT AND RT (SEE SHEET SD1).
PAVED
CONC
"Ge" Δ = 27°12'59" R = 1500.00' L = 712.52' T = 363.12'
- LEGEND -
- LIMITS OF SEAL COAT
- LIMITS OF PAVING
"Ge" 96+02.47 P.T.
"Ge" 106+65.63 ADJUST VALVE COVER 30.6' LT (NDOT).
"Ge" 106+89.13 ADJUST MANHOLE COVER 32.1' LT (NDOT STORM DRAIN).
"Ge" 107+55.25 ADJUST VALVE COVER 32.2' LT (NDOT STORM DRAIN).
"Ge" 103+01.19 ADJUST MANHOLE COVER 30.6' LT (NDOT STORM DRAIN).
"Ge" 103+20.00 ADJUST VALVE COVER 30.6' LT (NDOT).
LBM12
N56°46'28"E 3039.04'
"Ge"
95
100
105
110
"Ge" 97+73.00 REMOVE EXISTING MAILBOX RT. CONSTRUCT MAILBOX SUPPORT (TYPE C) AND INSTALL NEW MAILBOX.
"Ge" 99+27.00 REMOVE EXISTING MAILBOXES (3) RT. CONSTRUCT MAILBOX SUPPORT (TYPE C) AND INSTALL NEW MAILBOX (MULTIPLE).
"Ge" 106+51.00 REMOVE EXISTING MAILBOX RT. CONSTRUCT MAILBOX SUPPORT (TYPE C) AND INSTALL NEW MAILBOX.


STATE
PROJECT NO.
COUNTY
SHEET NO.
NEVADA
SPSR-0430(014)
WASHOE
5
- LEGEND -
- LIMITS OF REMOVAL (COLD MILLING AND PLANTMIXING MISCELLANEOUS AREAS)
- LIMITS OF SEAL COAT
- LIMITS OF PLANTMIXING MISCELLANEOUS AREAS
- SUSPECTED BASE FAILURE
"Ge" 113+15.29 ADJUST MANHOLE COVER 32.0' LT (NDOT STORM DRAIN).
"Ge" 113+25.32 ADJUST VALVE COVER 32.7' LT (NDOT STORM DRAIN).
"Ge" 109+95.01 ADJUST MANHOLE COVER 36.8' LT (ATT/SBC).
"Ge" 119+23.56 ADJUST MANHOLE COVER 35.8' LT (ATT/SBC).
LBM11
LBM10
LBM9
LBM8
LBM7
LBM6
N56° 46'28"E 3039.04'
"Ge"
110
115
120
125
"Ge" 118+83.00 CONSTRUCT MODIFIED TYPE 4 APPROACH RT
"Ge" 123+91.00 (SEE DETAIL C ON SHEET SD1).
- LEGEND -
- LIMITS OF SEAL COAT
"Ge" 124+84.08 ADJUST VALVE COVER 38.6' LT (ATT/SBC).
"Ge" 125+46.76 ADJUST MANHOLE COVER 37.7' LT (ATT/SBC).
LBM5
LBM4
N56° 46'28"E 3039.04"
N56° 46'28"E 541.32'
"Pe" 15+41.32 P.C.
"Pe"
"Pe" 22+00.00
"Pe" 24+53.75
REMOVE AND RESET GUARDRAIL LT.
"Pe" 10+00.00 P.O.T. = "Ge" 126+41.51 P.O.T.
"Pe" 14+50.00
INSTALL SPEED DETECTOR LOOPS WITH NO. 5 PULL BOX, RT. (SITE 31-0132). PLEASE CALL JOHN CODER AT (775)888-7155, FIVE WORKING DAYS (120 HOURS) PRIOR TO CUTTING IN THE LOOPS FOR EXACT PLACEMENT.
"Pe"
Δ = 22°18'17"
R = 2000.00'
L = 778.58'
T = 394.28'
"Pe" 23+19.90 P.T.
"Pe" 21+22.50
"Pe" 24+16.25
REMOVE AND RESET GUARDRAIL RT.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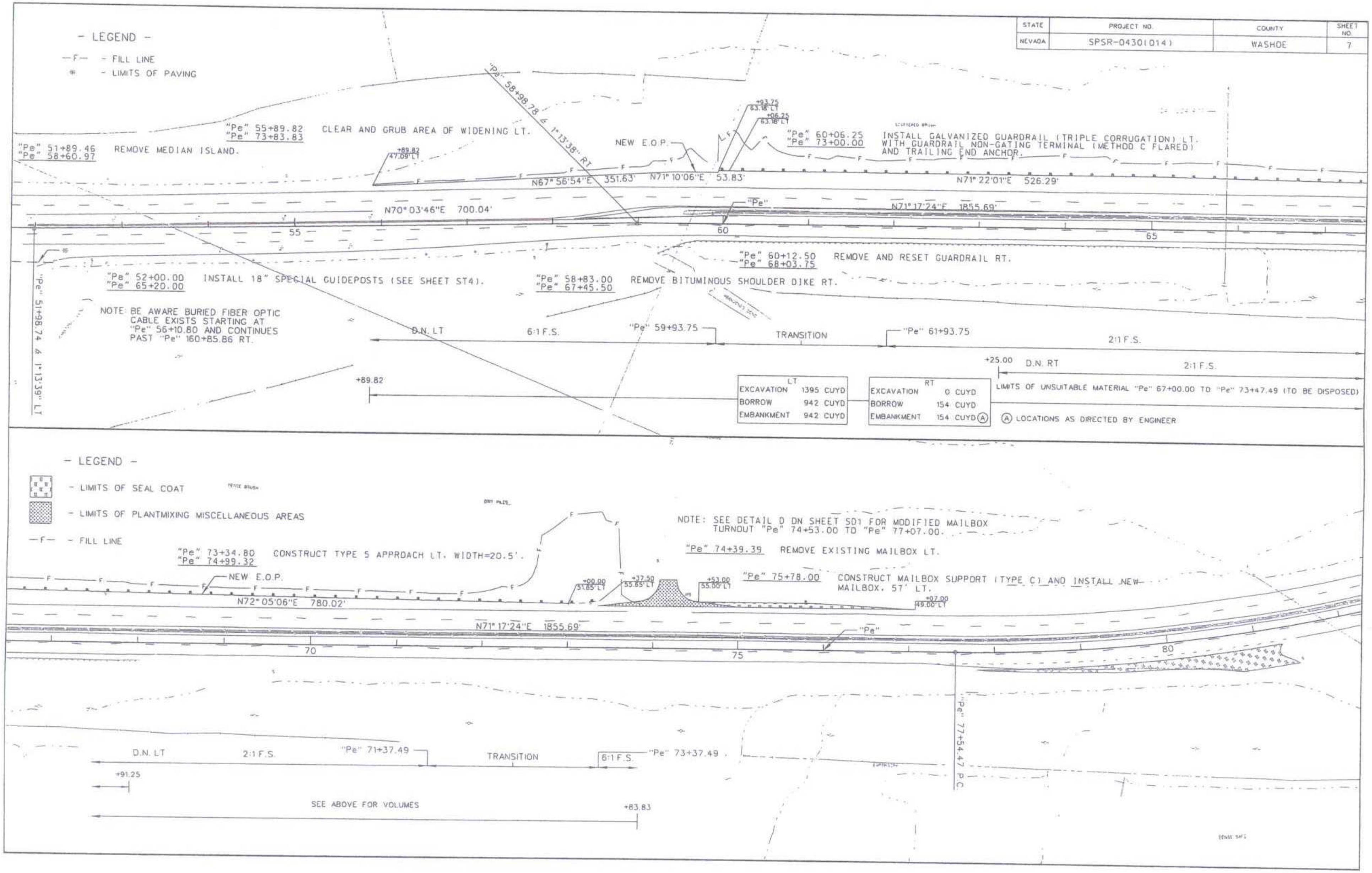
- SUSPECTED BASE FAILURE
"Pe" 35+20.00 "Pe" 44+88.75 REMOVE AND RESET GUARDRAIL LT.
"Pe"
Δ = 7° 47'20"
R = 4200.00'
L = 570.96'
T = 285.92'
"Pe" 23+19.90 P.T.
N79° 04'45"E 830.12'
"Pe"
25
30
35
LBM1
LBM2
"Pe" 31+50.02 P.C.
"Pe" 37+20.98 P.T.
+68.75 34.56' RT
+31.25 38.56' RT
"Pe" 28+68.75 "Pe" 45+12.50 REMOVE AND RESET GUARDRAIL RT.
"Pe" 28+31.25 "Pe" 28+68.75 REMOVE FLARED END TREATMENT RT. INSTALL GUARDRAIL TERMINAL (METHOD C FLARED).
D.N. RT
2:1 F.S.
+68.75
+20.98
RT
EXCAVATION 0 CUYD
BORROW 150 CUYD
EMBANKMENT 150 CUYD (A)
(A) LOCATIONS AS DIRECTED BY ENGINEER
- LEGEND -
- LIMITS OF PAVING
24"X218' RCP
N71° 17'25"E 1477.76'
"Pe"
40
45
50
LBM3
"Pe" 37+20.98 P.T.
"Pe" 38+06.25 "Pe" 45+06.25 REMOVE BITUMINOUS SHOULDER DIKE RT.
D.N. RT
2:1 F.S.
+20.98
SEE ABOVE FOR VOLUMES
+12.50
"Pe" 51+98.74 Δ 1°13'39" LT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7
- LEGEND -
-F- - FILL LINE
* - LIMITS OF PAVING
"Pe" 51+89.46
"Pe" 58+60.97
REMOVE MEDIAN ISLAND.
"Pe" 55+89.82
"Pe" 73+83.83
CLEAR AND GRUB AREA OF WIDENING LT.
"Pe" 58+98.78 Δ 1°13'38" RT
NEW E.O.P.
"Pe" 60+06.25
"Pe" 73+00.00
INSTALL GALVANIZED GUARDRAIL (TRIPLE CORRUGATION) LT. WITH GUARDRAIL NON-GATING TERMINAL (METHOD C FLARED) AND TRAILING END ANCHOR.
N67° 56'54"E 351.63'
N71° 10'06"E 53.83'
N71° 22'01"E 526.29'
N70° 03'46"E 700.04'
N71° 17'24"E 1855.69'
"Pe" 60+12.50
"Pe" 68+03.75
REMOVE AND RESET GUARDRAIL RT.
"Pe" 52+00.00
"Pe" 65+20.00
INSTALL 18" SPECIAL GUIDEPOSTS (SEE SHEET ST4).
"Pe" 58+83.00
"Pe" 67+45.50
REMOVE BITUMINOUS SHOULDER DIKE RT.
NOTE: BE AWARE BURIED FIBER OPTIC CABLE EXISTS STARTING AT "Pe" 56+10.80 AND CONTINUES PAST "Pe" 160+85.86 RT.
"Pe" 51+98.74 Δ 1°13'39" LT
D.N. LT
6:1 F.S.
"Pe" 59+93.75
TRANSITION
"Pe" 61+93.75
2:1 F.S.
+25.00 D.N. RT
2:1 F.S.
+89.82
LT
EXCAVATION 1395 CUYD
BORROW 942 CUYD
EMBANKMENT 942 CUYD
RT
EXCAVATION 0 CUYD
BORROW 154 CUYD
EMBANKMENT 154 CUYD (A)
LIMITS OF UNSUITABLE MATERIAL "Pe" 67+00.00 TO "Pe" 73+47.49 (TO BE DISPOSED)
(A) LOCATIONS AS DIRECTED BY ENGINEER
- LEGEND -
- LIMITS OF SEAL COAT
- LIMITS OF PLANTMIXING MISCELLANEOUS AREAS
-F- - FILL LINE
NOTE: SEE DETAIL D ON SHEET SD1 FOR MODIFIED MAILBOX TURNOUT "Pe" 74+53.00 TO "Pe" 77+07.00.
"Pe" 73+34.80
"Pe" 74+99.32
CONSTRUCT TYPE 5 APPROACH LT. WIDTH=20.5'.
"Pe" 74+39.39 REMOVE EXISTING MAILBOX LT.
NEW E.O.P.
"Pe" 75+78.00 CONSTRUCT MAILBOX SUPPORT (TYPE C) AND INSTALL NEW MAILBOX, 57' LT.
N72° 05'06"E 780.02'
N71° 17'24"E 1855.69'
"Pe" 77+54.47 P.C.
D.N. LT
2:1 F.S.
"Pe" 71+37.49
TRANSITION
6:1 F.S.
"Pe" 73+37.49
+91.25
SEE ABOVE FOR VOLUMES
+83.83

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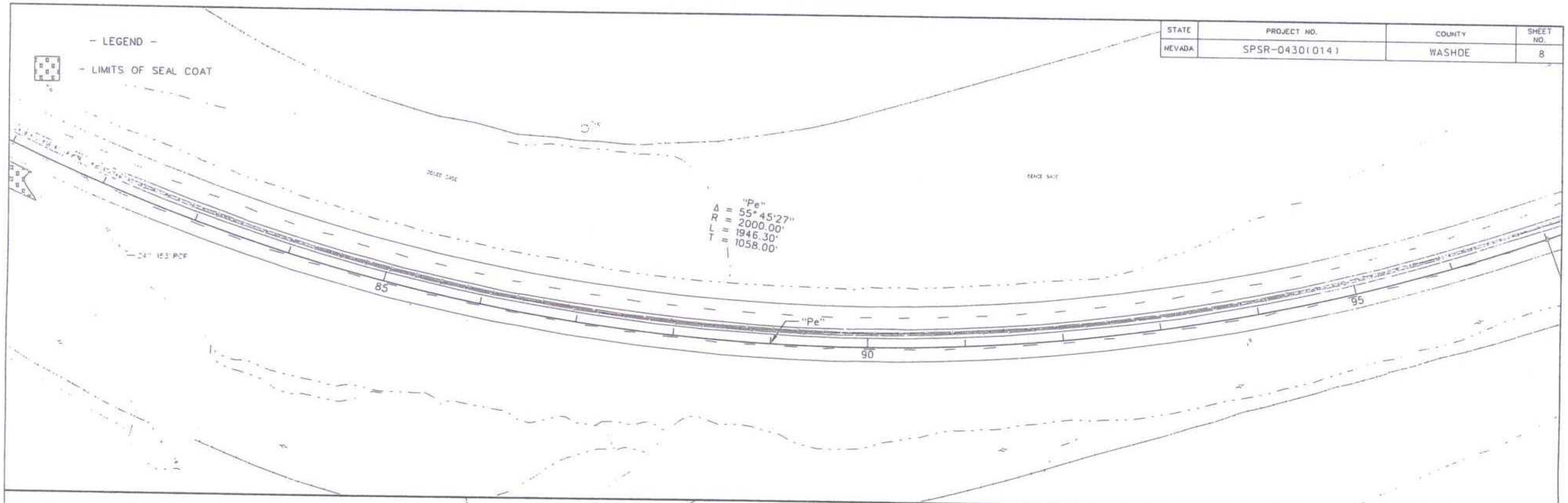

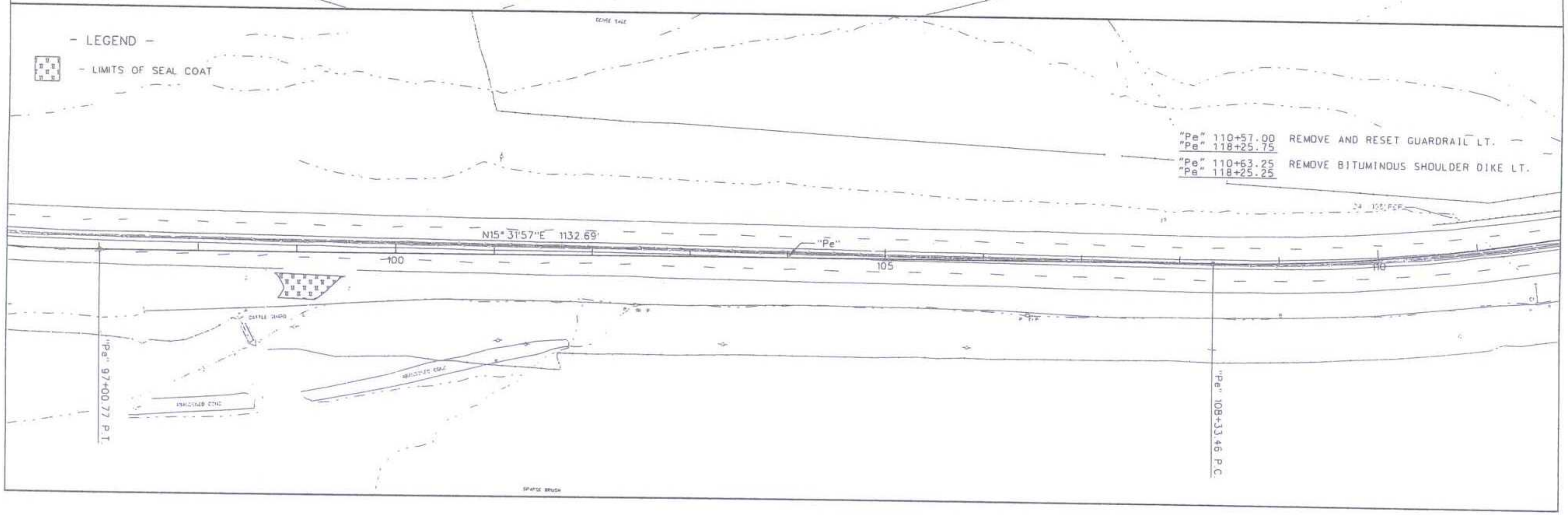

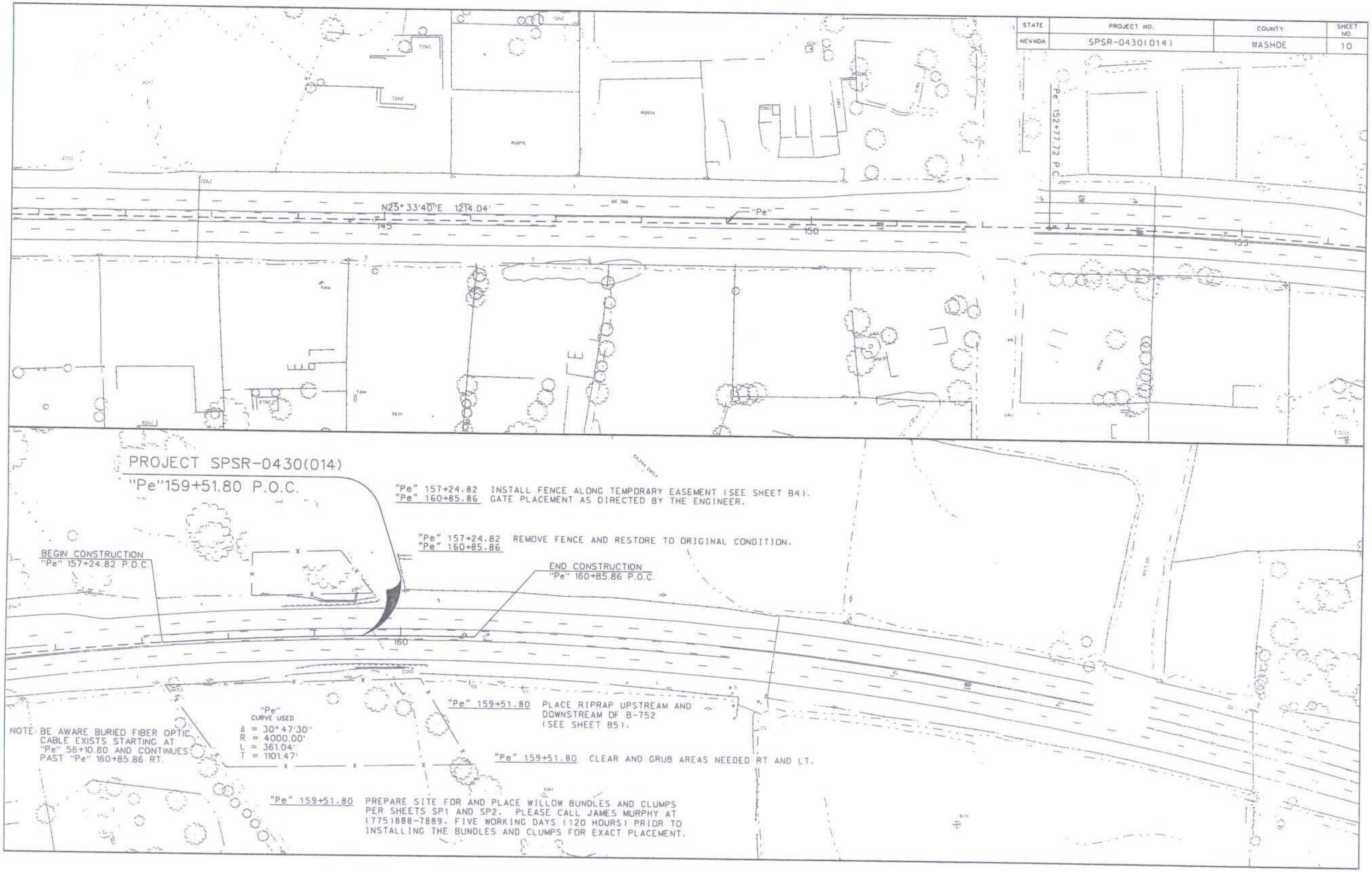

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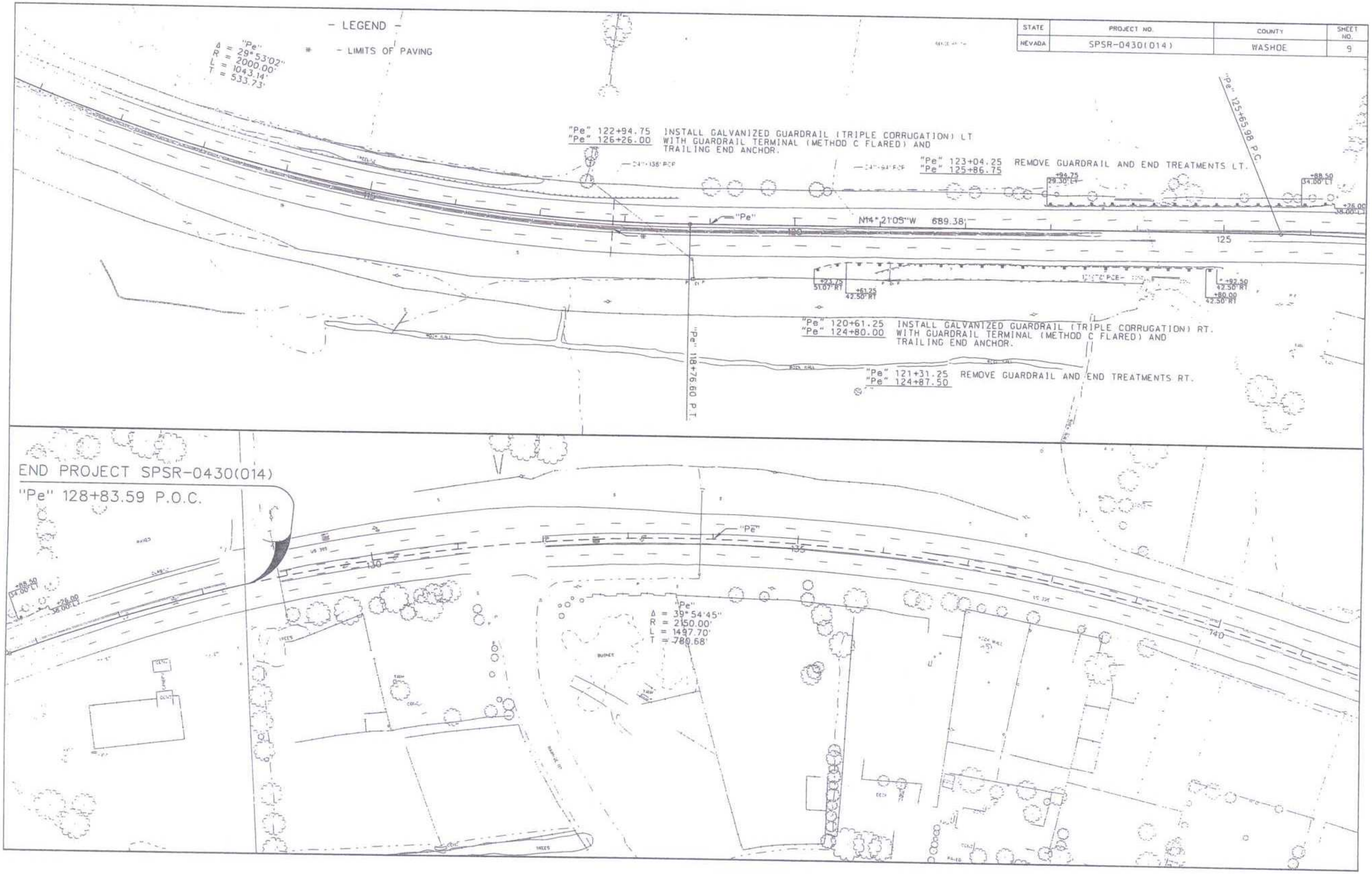
SHEET NO.
10
N25° 33'40"E 1214.04'
"Pe"
145
150
155
"Pe" 152+77.72 P.C.
PROJECT SPSR-0430(014)
"Pe"159+51.80 P.O.C.
"Pe" 157+24.82 INSTALL FENCE ALONG TEMPORARY EASEMENT (SEE SHEET B4).
"Pe" 160+85.86 GATE PLACEMENT AS DIRECTED BY THE ENGINEER.
"Pe" 157+24.82 REMOVE FENCE AND RESTORE TO ORIGINAL CONDITION.
"Pe" 160+85.86
BEGIN CONSTRUCTION
"Pe" 157+24.82 P.O.C.
END CONSTRUCTION
"Pe" 160+85.86 P.O.C.
160
"Pe" 159+51.80 PLACE RIPRAP UPSTREAM AND DOWNSTREAM OF B-752 (SEE SHEET B5).
"Pe"
CURVE USED
Δ = 30° 47'30"
R = 4000.00'
L = 361.04'
T = 1101.47'
NOTE: BE AWARE BURIED FIBER OPTIC CABLE EXISTS STARTING AT "Pe" 56+10.80 AND CONTINUES PAST "Pe" 160+85.86 RT.
"Pe" 159+51.80 CLEAR AND GRUB AREAS NEEDED RT AND LT.
"Pe" 159+51.80 PREPARE SITE FOR AND PLACE WILLOW BUNDLES AND CLUMPS PER SHEETS SP1 AND SP2. PLEASE CALL JAMES MURPHY AT (775)888-7889, FIVE WORKING DAYS (120 HOURS) PRIOR TO INSTALLING THE BUNDLES AND CLUMPS FOR EXACT PLACEMENT.



STATE | NEVADA
PROJECT NO. | SPSR-0430(014)
COUNTY | WASHOE
SHEET NO. | 9
- LEGEND -
* - LIMITS OF PAVING
"Pe" Δ = 29°53'02" R = 2000.00' L = 1043.14' T = 533.73'
"Pe" 122+94.75 "Pe" 126+26.00 INSTALL GALVANIZED GUARDRAIL (TRIPLE CORRUGATION) LT WITH GUARDRAIL TERMINAL (METHOD C FLARED) AND TRAILING END ANCHOR.
"Pe" 123+04.25 "Pe" 125+86.75 REMOVE GUARDRAIL AND END TREATMENTS LT.
"Pe" 125+65.98 P.C.
N14°21'05"W 689.38'
"Pe" 118+76.60 P.T.
"Pe" 120+61.25 "Pe" 124+80.00 INSTALL GALVANIZED GUARDRAIL (TRIPLE CORRUGATION) RT. WITH GUARDRAIL TERMINAL (METHOD C FLARED) AND TRAILING END ANCHOR.
"Pe" 121+31.25 "Pe" 124+87.50 REMOVE GUARDRAIL AND END TREATMENTS RT.
END PROJECT SPSR-0430(014)
"Pe" 128+83.59 P.O.C.
"Pe" Δ = 39°54'45" R = 2150.00' L = 1497.70' T = 780.68'

KEY TO BORING LOGS

PARTICLE SIZE LIMITS								
CLAY	SILT	SAND			GRAVEL		COBBLES	BOULDERS
		FINE	MEDIUM	COARSE	FINE	COARSE		

.002 mm | #200 | #40 | #10 | #4 | ¾ 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
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.

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

▽ ▼ Groundwater Elevation Symbols

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 converte[d] 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	CONSOLIDATION
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 SAMPLER ①
CPT	CONE PENETRATION TEST
CS	CONTINUOUS SAMPLER ②
CSS	CALIFORNIA SPLIT SPOON
P	PUSHED (NOT DRIVEN)
PB	PITCHER BARREL
RC	ROCK CORE ③
SH	SHELBY TUBE ④
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: October 11, 2004

EXPLORATION LOG

NEVADA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING

START DATE	6/16/08	STATION	"Pe" 24+00 +/-
END DATE	6/16/08	OFFSET	24' RT +/-
JOB DESCRIPTION	US 395 Pavement Distress	ENGINEER	Bafghi
LOCATION	Washoe City	EQUIPMENT	Diedrich D-120
BORING	LBM1	OPERATOR	Marshall
E.A. #		DRILLING METHOD	6" H.S.A.
GROUND ELEV.	5038.89 (ft)	BACKFILLED	Yes DATE 6/16/2008
HAMMER DROP SYSTEM	Automatic		

GROUNDWATER LEVEL

DATE	DEPTH ft	ELEV. ft
	N/A	

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
									AC = 7", Base = 6"	Started 9:30 a.m. Finished 11:00 a.m.
	1.00								1.10	
		A	CMS	8 / 6 / 10	16	100	PI, S, W	GP GC	1.50 **Gravel with Silty Clay and Sand**, medium dense, poorly graded, 56% Gravel, 32% Sand and 12% fines. PI = 5.	
								SP SM	2.00 **Sand with Silt and Gravel**, medium dense, poorly graded, 46% Gravel, 46% Sand and 8% Silt. Non-plastic.	Bedrock outcrop exposed on side of roadway at a depth of 2' - 3'.
	2.50							SC	2.50 **Clayey Sand with Gravel**, medium dense, 26% Gravel, 48% Sand and 26% fines. PI = 14.	Very hard drilling, no penetration.
	3.50 / 3.70	B	CMS	50/2.5"	50/2.5"	14	S, W	GM	**Silty Gravel with Sand**, very dense, 45% Gravel, 38% Sand, 17% fines. Bulk Sample from 1' to 6', Silty Sand with Gravel (SM), 18% Gravel. 57% Sand and 25% fines. PI = 1 and R-value = 78.	
	4.50 / 4.60	C	SPT	50/1"	50/1"	0				(C) No sample recovered.
5033.9	5									
	6.00 / 6.10	D	SPT	50/0.7"	50/0.7"	0			6.00 **B.O.H.** Groundwater was not encountered.	Refusal (D) No sample recovered.
5028.9	10									
5023.9	15									

EXPLORATION LOG

NEVADA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING

START DATE	6/16/08	STATION	"Pe" 34+40 +/-
END DATE	6/16/08	OFFSET	24' RT +/-
JOB DESCRIPTION	US 395 Pavement Distress	ENGINEER	Bafghi
LOCATION	Washoe City	EQUIPMENT	Diedrich D-120
BORING	LBM2	OPERATOR	Marshall
E.A. #		DRILLING METHOD	6" H.S.A.
GROUND ELEV.	5072.68 (ft)	BACKFILLED	Yes DATE 6/16/2008
HAMMER DROP SYSTEM	Automatic		

GROUNDWATER LEVEL

DATE	DEPTH ft	ELEV. ft
	N/A	

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
	0–1.67								**AC = 9", Base = 4"** (to 1.10)	Started 11:50 a.m. Finished 1:30 p.m. Hammer broke, 30 minutes down time.
	1.67–3.17	A	CMS	7, 12, 7	19	100	PI, S, W	SP SM	1.10 – **Sand with Silt**, light brown, medium dense, moist and poorly graded, 7% Gravel, 82% Sand and 11% Silt. PI = 3. (to 2.50)	
	3.17–4.50							SC SM	2.50 – **Silty, Clayey Sand** light brown, medium dense and moist. PI = 4 to 7. Bulk Sample from 1' to 6', Silty Sand with Gravel (SM). 22% Gravel, 58% Sand and 20% fines. PI = 3 and R-value = 72. Some rocks and gravels at 8'.	
5067.7	4.50–6.00 (5)	B	SPT	5, 8, 7	15	100	PI, S, W	SC SM		
	6.00–7.50	C	SPT	6, 14, 12	26	100	PI, S, W	SC SM		
	7.50–9.00	D	SPT	9, 11, 7	18	100	PI, S, W	SC SM	(to 9.00)	
5062.7	10								9.00 – **B.O.H.** Groundwater was not encountered.	
5057.7	15									

EXPLORATION LOG

NEVADA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING

START DATE	6/16/08	STATION	"Pe" 40+25 +/-
END DATE	6/16/08	OFFSET	24' RT +/-
JOB DESCRIPTION	US 395 Pavement Distress	ENGINEER	Bafghi
LOCATION	Washoe City	EQUIPMENT	Diedrich D-120
BORING	LBM3	OPERATOR	Marshall
E.A. #		DRILLING METHOD	6" H.S.A.
GROUND ELEV.	5080.81 (ft)	BACKFILLED	Yes DATE 6/16/2008
HAMMER DROP SYSTEM	Automatic		

GROUNDWATER LEVEL

DATE	DEPTH ft	ELEV. ft
	N/A	

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
	0–1.50								**AC = 9", Base = 6"** (to 1.25)	Started 1:30 p.m. Finished 2:30 p.m.
	1.50–3.00	A	CMS	10, 11, 10	21	100	PI, S, W, UW	SP SM	**Silty Sand**, brown, medium dense and moist. 2% Gravel, 89% Sand and 9% Silt. Non-plastic. (1.25–2.50)	
								SW SM	**Sand with Silt**, brown, medium dense, moist and well graded, 13% Gravel, 79% Sand and 8% Silt. Non-plastic. (2.50–3.00)	
	3.00–4.50	B	SPT	3, 8, 8	16	100	PI, S, W	SC SM	**Silty, Clayey Sand**, medium dense, 3% Gravel, 76% Sand and 21% fines. PI = 5. (3.00–4.00)	
								SW	**Sand with Gravel**, medium dense, 38% Gravel, 59% Sand and 3% fines. (4.00–4.50)	(B2) Old apshalt chunks in sample.
5075.8	4.50–5.00 (5)							SC SM	**Silty, Clayey Sand**, medium dense, 5% Gravel, 76% Sand and 19% fines. PI = 4. Bulk Sample 1' to 6', Silty Sand (SM). 14% Gravel, 68% Sand and 18% fines. PI = 2 and R-value = 73. (4.50–7.00)	
	5.00–6.50	C	SPT	5, 7, 8	15	100	PI, S, W			
	6.50–7.00									
	7.00–8.50	D	SPT	7, 16, 10	26	100	PI, S, W	SC	**Clayey Sand with Gravel**, dense, 40% Gravel, 41% Sand and 19% fines. PI = 8. (7.00–8.50)	(D) Presence of rock.
	8.50								**B.O.H.** Groundwater was not encountered.	
5070.8	10									
5065.8	15									

EXPLORATION LOG

NEVADA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING

START DATE 6/17/08
END DATE 6/17/08
JOB DESCRIPTION US 395 Pavement Distress
LOCATION Washoe City
BORING LBM4
E.A. #
GROUND ELEV. 5039.78 (ft)
HAMMER DROP SYSTEM Automatic

GROUNDWATER LEVEL		
DATE	DEPTH ft	ELEV. ft
	N/A	

STATION "Pe" 13+30 +/-
OFFSET 26' LT +/-
ENGINEER Bafghi/Ablahani
EQUIPMENT Diedrich D-120
OPERATOR Altamirano
DRILLING METHOD 6" H.S.A.
BACKFILLED Yes DATE 6/17/2008

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	Depth	MATERIAL DESCRIPTION	REMARKS
	0 – 1.50								1.40	**AC = 7", Base = 10"**	Started 9:30 a.m. Finished 10:30 a.m.
	1.50 – 3.00	A	CMS	5, 14, 30/5.5"	30/5.5"	100	PI, S, W, UW	SM	2.50	**Silty Sand**, very dense, 6% Gravel, 72% Sand and 22% Silt. Non-plastic.	
	3.00 – 4.00							SP SM	3.50	**Sand with Silt and Gravel**, very dense, 26% Gravel, 63% Sand and 11% Silt. Non-plastic. Presence of cobble between 2.75' and 3.5'.	
5034.8	4.00 – 5.50 (5)	B	SPT	10, 9, 5	14	100	PI, S, W	SM	5.00	**Silty Sand**, medium dense, 1% Gravel, 75% Sand and 24% Silt. Non-plastic. Bulk Sample from 1' to 5', Silty Sand with Gravel (SM). 19% Gravel, 61% Sand and 20% fines. PI = 3 and R-value = 78.	
	5.50 – 6.00							CH	7.00	**Fat Clay with Sand** brown, stiff and moist. 9 to 22% Sand, 77 to 91% Clay. PI = 30 to 44. Bulk Sample from 5' to 8', Sandy Lean Clay (CL). 5% Gravel, 35% Sand and 60% fines. PI = 16 and R-value = 29.	
	6.00 – 7.50	C	CMS	4, 7, 14	21	100	PI, S, W, UW				
	7.50 – 8.00							ML	8.00	**Silt**, brown and medium dense, 12% Sand and 88% Silt. Non-plastic.	
	8.00 – 9.50	D	SPT	13, 14, 10	24	100	PI, S, W	SP SM	9.50	**Sand with Silt** poorly graded, brownish-gray, dense and moist. 1% Gravel, 92% Sand and 7% Silt. Non-plastic.	
5029.8	10									**B.O.H.** Groudwater was not encountered.	
5024.8	15										

EXPLORATION LOG

NEVADA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING

START DATE 6/17/08
END DATE 6/17/08
JOB DESCRIPTION US 395 Pavement Distress
LOCATION Washoe City
BORING LBM5
E.A. #
GROUND ELEV. 5047.10 (ft)
HAMMER DROP SYSTEM Automatic

GROUNDWATER LEVEL		
DATE	DEPTH ft	ELEV. ft
6/17/08	5'	

STATION "Pe" 10+00 +/-
OFFSET 26' LT +/-
ENGINEER Bafghi/Ablahani
EQUIPMENT Diedrich D-120
OPERATOR Altamirano
DRILLING METHOD 6" H.S.A.
BACKFILLED Yes DATE 6/17/2008

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
	0 – 1.50								**AC = 7", Base = 11"**	Started 11:00 a.m. Finished 1:00 p.m.
	1.50 – 9.00							SC	**Clayey Sand**, dark brown, stiff to medium stiff and moist. 0-2% Gravel, 58-69% Sand and 31-42% Clay. Clay of medium plasticity, PI = 11 to 16. (A) Pocket Penetrometer measured 1 - 2.5 ton/sf. (C) Pocket Penetrometer measured 1 - 1.25 ton/sf. Moisture is slightly above plastic limit. Bulk Sample from 1' - 5', Clayey Sand (SC). 2% Gravel, 64% Sand and 34% fines. PI = 10 and R-value = 18. Bulk Sample from 5' - 10.5', Sandy Lean Clay (CL). 5% Gravel, 57% Sand and 38% fines, PI = 17 and R-value = 32.	
	2.00 – 3.50	A	SPT	5, 5, 5	10	100	PI, S, W			
	3.50 – 5.00	B	CMS	4, 7, 8	15	100	PI, S, W, UW			
5042.1	5									Groundwater @ 5'.
	5.00 – 6.50	C	SPT	4, 3, 4	7	100	PI, S, W			
	6.50 – 7.00									
	7.00 – 7.60	D	CMS	4, 6, 9	15	40	PI, S, W			(D) Recovery = 7". (D1) Empty. (D2) Recovered.
	9.00 – 10.00							SM	**Silty Sand**, dense, coarse sand and wet, 7% Gravel, 81% Sand and 12% Silt. Non-plastic.	
	9.00 – 10.50	E	CMS	9, 15, 16	31	100	PI, S, W, UW			
5037.1	10									
	10.00 – 10.50							SW SM	**Sand with Silt**, dense and well-graded with free water. 7% Gravel, 87% Sand and 6% Silt. Non-plastic. **B.O.H.**	
5032.1	15									

NEVADA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING

EXPLORATION LOG

SHEET 1 OF 1

START DATE 6/17/08
END DATE 6/17/08
JOB DESCRIPTION US 395 Pavement Distress
LOCATION Washoe City
BORING LBM6
E.A. #
GROUND ELEV. 5054.18 (ft)
HAMMER DROP SYSTEM Automatic

GROUNDWATER LEVEL		
DATE	DEPTH ft	ELEV. ft
6/17/08	7.5'	

STATION "Ge" 123+90 +/-
OFFSET 26' LT +/-
ENGINEER Bafghi/Ablahani
EQUIPMENT Diedrich D-120
OPERATOR Altamirano
DRILLING METHOD 6" H.S.A.
BACKFILLED Yes DATE 6/17/2008

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
									AC = 7", Base = 11"	Started 1:15 p.m. Finished 2:50 p.m.
									1.50	
	2.00							SC SM	**Silty, Clayey Sand<<B>,> dark brown, medium dense and moist. 70% Sand and 30% fines. PI = 6.**	
	2.00–3.50	A	SPT	8, 8, 7	15	100	PI, S, W	SC SM	**Bulk Sample from 1' to 4', Silty, Clayey Sand (SC-SM). 7% Gravel, 62% Sand and 31% fines. PI = 5 and R-value = 28.**	
	4.00								4.00	
5049.2 (5)	4.00–5.50	B	CMS	7, 12, 12	24	100	PI, S, W, UW	SM	**Silty Sand**, dark brown, medium dense and moist. 53% Sand and 47% Silt. Non-plastic. 5.00	
								ML	**Sandy Silt**, dark brown, medium dense and moist. 49% Sand and 51% Silt. Non-plastic. 5.50	
	6.00							SC	**Clayey Sand**, dark brown, medium dense and moist to wet. 0-1% Gravel, 68-82% Sand and 18-32% fines. PI = 8 to 14.	
	6.00–7.50	C	SPT	3, 5, 5	10	100	PI, S, W	SC		
	8.00–9.50	D	CMS	7, 11, 9	20	100	PI, S, W, UW	SC	(D) Trace of mica. 9.50	Groundwater @ 7.5'.
5044.2	10									
									B.O.H.	
5039.2	15									

EXPLORATION LOG

NEVADA DEPARTMENT OF TRANSPORTATION — GEOTECHNICAL ENGINEERING

START DATE	6/18/08	STATION	"Ge" 121+65 +/-
END DATE	6/18/08	OFFSET	26' LT +/-
JOB DESCRIPTION	US 395 Pavement Distress	ENGINEER	Bafghi/Ablahani
LOCATION	Washoe City	EQUIPMENT	Diedrich D-120
BORING	LBM7	OPERATOR	Altamirano
E.A. #		DRILLING METHOD	6" H.S.A.
GROUND ELEV.	5056.04 (ft)	BACKFILLED	Yes DATE 6/18/2008
HAMMER DROP SYSTEM	Automatic		

GROUNDWATER LEVEL

DATE	DEPTH ft	ELEV. ft
6/18/08	8'	

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
									AC = 7", Base = 11"	Started 9:15 a.m. Finished 10:30 a.m.
	1.50									
	2.00 – 3.50	A	SPT	4, 4, 6	10	100	PI, S, W	SC	**Clayey Sand** dark brown, stiff and moist. Moisture above plastic limit. 0-2% Gravel, 58-83% Sand and 17-40% fines. PI = 12-27. (A) Pocket Penetrometer measured 3 - 3.5 ton/sf. Bulk Sample from 1' to 5', Clayey Sand (SC). 13% Gravel, 57% Sand and 30% fines. PI = 14 and R-value = 19. Bulk Sample from 5' to 8', Brown Silty Sand with Gravel (SM). 18% Gravel, 58% Sand and 24% fines. PI = 4 and R-value = 22.	
5051.0	4.00 – 5.50 (5)	B	CMS	5, 10, 14	24	100	PI, S, W, UW	SC		
	6.00 – 7.50	C	SPT	7, 7, 7	14	100	PI, S, W	SC		
	8.00 – 9.50	D	SPT	4, 6, 7	13	100	PI, S, W	SP SC	**Sand with Clay** poorly graded, brown, medium dense and saturated. 2% Gravel, 87% Sand and 11% fines. PI = 14. (D) Coarse to fine to medium sand. Particles up to 5 mm.	Groundwater @ 8'.
	9.50								**B.O.H.**	
5046.0	10									
5041.0	15									

EXPLORATION LOG

NEVADA DEPARTMENT OF TRANSPORTATION — GEOTECHNICAL ENGINEERING

SHEET 1 OF 1

START DATE	6/18/08	STATION	"Ge" 117+35 +/-
END DATE	6/18/08	OFFSET	26' LT +/-
JOB DESCRIPTION	US 395 Pavement Distress	ENGINEER	Bafghi/Ablahani
LOCATION	Washoe City	EQUIPMENT	Diedrich D-120
BORING	LBM8	OPERATOR	Altamirano
E.A. #		DRILLING METHOD	6" H.S.A.
GROUND ELEV.	5055.22 (ft)	BACKFILLED	Yes DATE 6/18/2008
HAMMER DROP SYSTEM	Automatic		

GROUNDWATER LEVEL

DATE	DEPTH ft	ELEV. ft
	N/A	

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
									AC = 8", Base/Platform = 18"	Started 10:40 a.m. Finished 12:00 p.m.
	3.00							SC	2.20 **Clayey Sand** medium dense. With coarse sand from 3.8' to 4.5'. 1-4% Gravel, 75-85% Sand and 11-24% fines. PI = 8. (A1) Pocket Penetrometer measured 1.5 - 2 ton/sf. Bulk Sample from 2' to 5', Silty, Clayey Sand (SC-SM). 7% Gravel, 62% Sand and 31% fines. PI = 14 and R-value = 57.	Drilling was grinding due to the presence of up to 3" rock, 2' - 3'.
	4.50	A	SPT	6, 6, 7	13	100	PI, S, W			
5050.2	5							CL	4.50 **Sandy Lean Clay** light green and stiff. 35% Sand and 65% Clay. PI = 32.	
								SC	5.00 **Clayey Sand** light brown and dense, 76% Sand and 24% fines. PI = 9.	
	6.00	B	CMS	8, 11, 18	29	100	PI, S, W, UW	SM	5.50 **Silty Sand**, light brown and dense, 83% Sand and 16% Silt. Non-plastic.	
								SC SM	6.00 **Silty, Clayey Sand** light brown and medium dense, 81% Sand and 19% fines. PI = 4. Bulk Sample from 5' to 8', Clayey Sand (SC). 1% Gravel, 68% Sand and 31% fines. PI = 11 and R-value = 38.	
	7.50	C	SPT	9, 9, 6	15	100	PI, S, W	SC	7.00 **Clayey Sand** light brown with trace of mica and medium dense, 61% Sand and 40% fines. PI = 19.	
	8.00									
	9.50	D	SPT	5, 7, 7	14	100	PI, S, W	SM	8.00 **Silty Sand** light brown with trace of mica and medium dense, 84% Sand and 16% fines. PI = 1.	
5045.2	10									
								CL	11.00 Very moist Silty Clay, determined from cuttings.	
									14.00 **B.O.H.** Groundwater was not encountered.	
5040.2	15									

NEVADA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING

EXPLORATION LOG

START DATE 6/18/08
END DATE 6/18/08
JOB DESCRIPTION US 395 Pavement Distress
LOCATION Washoe City
BORING LBM9
E.A. #
GROUND ELEV. 5064.64 (ft)
HAMMER DROP SYSTEM Automatic

GROUNDWATER LEVEL		
DATE	DEPTH ft	ELEV. ft
6/18/08	13'	

STATION "Ge" 114+40 +/-
OFFSET 26' LT +/-
ENGINEER Bafghi/Ablahani
EQUIPMENT Diedrich D-120
OPERATOR Altamirano
DRILLING METHOD 6" H.S.A.
BACKFILLED Yes DATE 6/18/2008

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
	0–2.00								**AC = 8", Base = 8"** (to 1.30)	Started 1:25 p.m. Finished 3:00 p.m.
	2.00–3.50	A	SPT	4, 6, 8	14	100	PI, S, W	SC	1.30 – **Clayey Sand** light brown, medium dense and moisture near Plastic Limit. 0-3% Gravel, 63-85% Sand and 14-37% fines. PI = 8 to 21. (A) Sample came out in one piece. Pocket Penetrometer measured 3.5 - 4.5 ton/sf. (C) Pocket Penetrometer measured 3 - 3.5 ton/sf. (D) Course to medium Sand with trace of mica. 8" of silty sand in the middle of sample, 7.4' to 8.1'. Bulk Sample from 1' to 5', Clayey Sand (SC). 13% Gravel, 56% Sand and 31% fines. PI = 15 and R-value = 20. Bulk Sample from 5' to 9', Clayey Sand (SC). 1% Gravel, 58% Sand and 41% fines. PI = 16 and R-value = 18.	
	3.50–4.00									
5059.6	4.00–5.50 (5)	B	CMS	4, 7, 12	19	100	PI, S, W, UW			
	5.50–7.00	C	SPT	5, 7, 11	18	100	PI, S, W			
	7.00–8.50	D	SPT	6, 11, 15	26	100	PI, S, W			
5054.6	8.50–10.00 (10)	E	SPT	7, 8, 7	15	100	PI, S, W	SC SM	8.50 – **Silty, Clayey Sand** coarse to medium sand with trace of mica and moist, 86% Sand and 14% fines. PI = 6.	
	11.00							CH	11.00 – Saturated Clay, determined from cuttings.	Groundwater @ 13'.
5049.6	15								15.00 – **B.O.H.**	

EXPLORATION LOG

NEVADA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING

SHEET 1 OF 1

START DATE	6/19/08	STATION	"Ge" 112+75 +/-
END DATE	6/19/08	OFFSET	26' LT +/-
JOB DESCRIPTION	US 395 Pavement Distress	ENGINEER	Bafghi/Ablahani
LOCATION	Washoe City	EQUIPMENT	Diedrich D-120
BORING	LBM10	OPERATOR	Altamirano
E.A. #		DRILLING METHOD	6" H.S.A.
GROUND ELEV.	5051.93 (ft)	BACKFILLED	Yes DATE 6/19/2008
HAMMER DROP SYSTEM	Automatic		

GROUNDWATER LEVEL

DATE	DEPTH ft	ELEV. ft
6/19/08	11.25'	

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
	0 – 2.00								**AC = 8", Base/Platform = 20"**	Started 8:30 a.m. Finished 9:45 a.m.
	2.00 – 3.50	A	SPT	9, 10, 9	19	100	PI, S, W		3.00	AC and base material to a depth of 3'.
	3.50 – 4.00							CH	**Clay**, brown, very stiff, and moisture slightly above Plastic Limit. PI = 21.	
	4.00 – 5.50	B	CMS	6, 10, 12	22	100	PI, S, W, UW	SC	4.00 **Clayey Sand**, brown, medium dense, moist, 3% Gravel, 81% Sand and 16% fines. PI = 12. Bulk Sample from 2' to 5', Silty Sand with Gravel (SM). 41% Gravel, 45% Sand and 15% fines. PI = 2 and R-value = 78.	
5046.9	5							SC SM	5.00 – 5.50 **Silty, Clayey Sand**, brown, medium dense, moist, 3% Gravel, 82% Sand and 15% fines. PI = 7.	
	5.50 – 7.00	C	SPT	5, 9, 6	15	100	PI, S, W	SC	5.50 **Clayey Sand**, brown, medium dense, moist, 1% Gravel, 71% Sand and 28% fines. PI = 9. Bulk sample from 5' to 8', Clayey Sand (SC), 2% Gravel, 64% Sand and 34% fines. PI = 12 and R-value = 14.	
	7.00 – 8.00									
	8.00 – 9.50	D	SPT	7, 9, 13	22	100	PI, S, W	SC SM	8.00 **Silty, Clayey Sand** brown, medium dense, moist to wet and fine to medium sand. 2% Gravel, 81% Sand and 17% fines. PI = 5.	
5041.9	10									
	11.00 – 14.00							CH	11.00 Saturated Clay, determined from cuttings.	Groundwater @ 11.25'.
	14.00								**B.O.H.**	
5036.9	15									

NEVADA DEPARTMENT OF TRANSPORTATION GEOTECHNICAL ENGINEERING

EXPLORATION LOG

START DATE 6/19/08
END DATE 6/19/08
JOB DESCRIPTION US 395 Pavement Distress
LOCATION Washoe City
BORING LBM11
E.A. #
GROUND ELEV. 5050.57 (ft)
HAMMER DROP SYSTEM Automatic

GROUNDWATER LEVEL		
DATE	DEPTH ft	ELEV. ft
	N/A	

STATION "Ge" 111+50 +/-
OFFSET 26' LT +/-
ENGINEER Bafghi/Ablahani
EQUIPMENT Diedrich D-120
OPERATOR Altamirano
DRILLING METHOD 6" H.S.A.
BACKFILLED Yes DATE 6/19/2008

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
	0–2.00								**AC = 6", Base/Platform = 17"**	Started 10:25 a.m. Finished 11:15 a.m.
	2.00–3.50	A	SPT	8, 7, 5	12	100	PI, S, W		3.00	AC and base material to a depth of 3'.
	3.50–4.00							CH	**Clay** brown, stiff, and moisture at Plastic Limit. PI = 25. 4.00	
5045.6 (5)	4.00–5.50	B	CMS	4, 10, 17	27	100	PI, S, W, UW	SC	**Clayey Sand** brown, dense, and moisture slightly below Plastic Limit. 0-1% Gravel, 51-72% Sand and 27-49% fines. PI = 15 to 25. Bulk Sample from 2' to 5', Silty, Clayey Sand with Gravel (SC-SM). 35% Gravel, 42% Sand and 23% fines. PI = 5 and R-value = 44. 5.50	
	5.50–7.00	C	SPT	8, 11, 12	23	100	PI, S, W	SC SM	**Silty, Clayey Sand** brown, medium dense and moist. 75% Sand and 25% fines. PI = 7. Bulk Sample from 5' to 9', Clayey Sand (SC). 1% Gravel, 63% Sand and 36% fines. PI = 12 and R-value = 12. 7.50	
	7.00–8.00									
	8.00–9.50	D	SPT	7, 10, 9	19	100	PI, S, W	SC	**Clayey Sand**, light brown to brown, medium dense and moist. 74% Sand and 26% fines. PI = 8. (D) Trace of oxidation. 9.50	
5040.6 (10)									**B.O.H.** Groundwater was not encountered.	
5035.6 (15)										

NEVADA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING

EXPLORATION LOG

START DATE 6/19/08
END DATE 6/19/08
JOB DESCRIPTION US 395 Pavement Distress
LOCATION Washoe City
BORING LBM12
E.A. #
GROUND ELEV. 5077.65 (ft)
HAMMER DROP SYSTEM Automatic

GROUNDWATER LEVEL		
DATE	DEPTH ft	ELEV. ft
	N/A	

STATION "Ge" 107+60 +/-
OFFSET 26' LT +/-
ENGINEER Bafghi/Ablahani
EQUIPMENT Diedrich D-120
OPERATOR Altamirano
DRILLING METHOD 6" H.S.A.
BACKFILLED Yes DATE 6/19/2008

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
									AC = 7", Base/Platform = 18"	Started 12:30 p.m. Finished 1:40 p.m.
	2.00								(A1) Base material with trace of asphalt.	AC and base material to a depth of 3'.
	3.50	A	SPT			100	PI, S, W		3.00	
	4.00							SC	**Clayey Sand** brown, moist and trace of mica. 1-7% Gravel, 54-80% Sand and 13-29% fines. PI = 20-24. (B1) Contained chunck of asphalt.	
5072.7	5 / 5.50	B	CMS	5, 13, 17	30	100	PI, S, W, UW	SC	Bulk Sample from 2' to 5', Silty, Clayey Sand with Gravel (SC-SM). 30% Gravel, 49% Sand and 21% fines. PI = 5 and R-value = 24.	
	7.00	C	SPT	8, 8, 7	15	100	PI, S, W	SC	7.00	
									B.O.H. Groundwater was not encountered.	
5067.7	10									
5062.7	15									

APPENDIX B

Project History Table

Project History Table

Award Date	Contract Number	Cumulative Mile	Work Performed
1960	1078	From 8.767 To 10.831	Chip Seal 4" PBS 11" Base
1968	1274	From 7.964 To 10.831	OG 2" PBS Widened from 2 lanes to 4 lanes Lt & Rt: 4" PBS 3" Plantmix Base 15" Base
1976	1604	From 8.971 To 9.399	OG Widen Area: 7" PBS 7" Base
		From 9.399 To 9.779	OG Taper from CL to Shoulder 1.5" - 7" PBS Widen Area: 7" Base
		From 9.779 To 9.989	OG 1.5" PBS Widen Area: 5.5" PBS 7" Base
		From 9.989 To 10.189	OG Taper from CL to Shoulder 1.5" - 7" PBS Widen Area: 7" Base
		From 10.189 To 10.279	OG 1.5" PBS Widen Area: 5.5" PBS 7" Base
		From 10.279 To 10.319	OG Widen Area: 7" PBS 7" Base
1983	1970	From 8.890 To 10.831	OG Widen Area: 8" PBS 4" Base
1995	2720	From 7.964 To 10.831	OG 3" PBS 3" Coldmill

APPENDIX C

Summary of Results Tables
Particle Size Distribution Reports
Line Sampling Data Results

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

EA/Cont # **Job Description** US 395 Washoe City Pavement Distress

Boring No. LBM 1 **Elevation (ft)** **Station** **Date** 6/19/2008

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: TEST TYPE	Peak: Φ deg.	Peak: C psi	Residual: Φ deg.	Residual: C psi	COMMENTS
A1	1.0 - 1.5	CMS		GP-GC	10.3		11.9	27	22	5						
A2	1.5 - 2.0	CMS		SP-SM	4.8		8.1	21	NP	NP						
A3	2.0 - 2.5	CMS		SC	12.3		26.1	32	18	14						
B	3.0 - 4.5	CMS			8.6		16.7									

CMS = California Modified Sampler 2.42" ID
SPT = Standard Penetration 1.38" ID
CS = Continuous Sample 3.23" ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 2.42" ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 2.87" 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 ft., 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 # **Job Description** US 395 Washoe City Pavement Distress

Boring No. LBM 2 **Elevation (ft)** **Station** **Date** 6/19/2008

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: TEST TYPE	Peak Φ deg.	Peak C psi	Residual Φ deg.	Residual C psi	COMMENTS
A1	2.0 - 2.5	CMS		SP-SM	6.5		11.2	24	21	3						
A2	2.5 - 3.0	CMS		SC-SM	7.2		15.9	23	19	4						
B	4.5 - 6.0	SPT		SC-SM	7.4		19.6	23	19	4						
C	6.0 - 7.5	SPT		SC-SM	11.1		23.4	23	19	4						
D	7.5 - 9.0	SPT		SC-SM	10.6		19.4	26	19	7						

CMS = California Modified Sampler 2.42" ID
SPT = Standard Penetration 1.38" ID
CS = Continuous Sample 3.23" ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 2.42" ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 2.87" 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 ft., 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 # **Job Description** US 395 Washoe City Pavement Distress

Boring No. LBM 3 **Elevation (ft)** **Station** **Date** 6/19/2008

SAMPLE NO.	SAMPLE DEPTH (ft)	SAMPLER TYPE	N BLOWS per ft.	SOIL GROUP	W%	DRY UW pcf	% PASS #200	LL %	PL %	PI %	STRENGTH TEST: TEST TYPE	Peak Φ deg.	Peak C psi	Residual Φ deg.	Residual C psi	COMMENTS
A1	2.0 - 2.5	CMS		SP-SM	7.0	102.0	9.4	21	NP	NP						
A2	2.5 - 3.0	CMS		SW-SM	6.6	104.3	8.5	23	NP	NP						
B1	3.0 - 4.0	SPT		SC-SM	10.1		21.0	24	19	5						
B2	4.0 - 4.5	SPT			10.1		2.9									
C	5.0 - 6.5	SPT		SC-SM	7.5		19.1	22	18	4						
D	7.0 - 8.5	SPT		SC	9.9		18.6	28	20	8						

CMS = California Modified Sampler 2.42" ID
SPT = Standard Penetration 1.38" ID
CS = Continuous Sample 3.23" ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 2.42" ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 2.87" 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 ft., 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 # **Job Description** US 395 Washoe City Pavement Distress

Boring No. LBM 4 **Elevation (ft)** **Station** **Date** 6/19/2008

SAMPLE NO.	SAMPLE DEPTH (ft)	SAMPLER TYPE	N BLOWS per ft.	SOIL GROUP	W%	DRY UW pcf	% PASS #200	LL %	PL %	PI %	STRENGTH TEST: TEST TYPE	Peak Φ deg.	Peak C psi	Residual Φ deg.	Residual C psi	COMMENTS
A1	2.0 - 2.5	CMS		SM	10.2	106.3	21.6	23	NP	NP						
A2	2.5 - 3.0	CMS		SP-SM	7.5	111.5	10.7	21	NP	NP						
B1	4.0 - 5.0	SPT		SM	10.5		24.2	19	NP	NP						
B2	5.0 - 5.5	SPT			21.6			48	18	30						
C1	6.0 - 6.5	CMS		CH	26.1		77.2	53	21	32						
C2	6.5 - 7.0	CMS		CH	54.7	63.0	90.7	73	29	44						
C3	7.0 - 7.5	CMS		ML	64.4	57.8	87.7	34	NP	NP						
D	8.0 - 9.5	SPT		SP-SM	7.6		7.0	20	NP	NP						

CMS = California Modified Sampler 2.42" ID
SPT = Standard Penetration 1.38" ID
CS = Continuous Sample 3.23" ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 2.42" ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 2.87" 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 ft., 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 #

Job Description US 395 Washoe City Pavement Distress

Boring No. LBM 5

Elevation (ft)

Station

Date 6/19/2008

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: TEST TYPE	Peak Φ deg.	Peak C psi	Residual Φ deg.	Residual C psi	COMMENTS
A	2.0 - 3.5	SPT		SC	12.7		31.2	29	15	14						
B1	4.0 - 4.5	CMS		SC	18.9	103.7	36.3	33	17	16						
B2	4.5 - 5.0	CMS		SC	21.2		41.8	35	19	16						
C	5.0 - 6.5	SPT		SC	17.4		32.2	29	18	11						
D2	8.0 - 8.5	CMS		SC	20.9		39.4	33	18	15						
E1	9.5 - 10.0	CMS		SM	18.0	110.3	12.4	23	NP	NP						
E2	10.0 - 10.5	CMS		SW-SM	15.3	111.5	5.9	22	NP	NP						

CMS = California Modified Sampler 2.42" ID
SPT = Standard Penetration 1.38" ID
CS = Continuous Sample 3.23" ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 2.42" ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 2.87" 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 ft., 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 # **Job Description** US 395 Washoe City Pavement Distress

Boring No. LBM 6 **Elevation (ft)** **Station** **Date** 6/19/2008

SAMPLE NO.	SAMPLE DEPTH (ft)	SAMPLER TYPE	N BLOWS per ft.	SOIL GROUP	W%	DRY UW pcf	% PASS #200	LL %	PL %	PI %	STRENGTH TEST: TEST TYPE	Peak Φ deg.	Peak C psi	Residual Φ deg.	Residual C psi	COMMENTS
A	2.0 - 3.5	SPT		SC-SM	10.7		29.5	24	18	6						
B1	4.5 - 5.0	CMS		SM	22.4	93.2	47.2	32	NP	NP						
B2	5.0 - 5.5	CMS		ML	22.3	97.8	40.0	29	NP	NP						
C	6.0 - 7.5	SPT		SC	17.9		31.2	27	19	8						
D1	8.5 - 9.0	CMS		SC	17.1	107.9	17.7	26	12	14						
D2	9.0 - 9.5	CMS		SC	21.1	102.4	32.5	27	19	8						

CMS = California Modified Sampler 2.42" ID
SPT = Standard Penetration 1.38" ID
CS = Continuous Sample 3.23" ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 2.42" ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 2.87" 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 ft., 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 # **Job Description** US 395 Washoe City Pavement Distress

Boring No. LBM 7 **Elevation (ft)** **Station** **Date** 6/19/2008

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: TEST TYPE	Φ deg. (Peak)	C psi (Peak)	Φ deg. (Residual)	C psi (Residual)	COMMENTS
A	2.0 - 3.5	SPT		SC	15.2		40.1	43	16	27						
B1	4.5 - 5.0	CMS		SC	12.6	108.2	27.2	33	18	15						
B2	5.0 - 5.5	CMS		SC	10.6	113.2	24.2	32	16	16						
C	6.0 - 7.5	SPT		SC	9.4		17.3	29	17	12						
D	8.0 - 9.5	SPT		SP-SC	16.6		11.1	30	16	14						

CMS = California Modified Sampler 2.42" ID
SPT = Standard Penetration 1.38" ID
CS = Continuous Sample 3.23" ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 2.42" ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 2.87" 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 ft., 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 # **Job Description** US 395 Washoe City Pavement Distress

Boring No. LBM 8 **Elevation (ft)** **Station** **Date** 6/19/2008

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: TEST TYPE	Peak Φ deg.	Peak C psi	Residual Φ deg.	Residual C psi	COMMENTS
A1	3.0 - 3.8	SPT		SC	11.8		24.4	27	19	8						
A2	3.8 - 4.5	SPT			6.6		11.2									
A3	4.5 - 5.0	SPT		CL	17.9		65.4	48	16	32						
B1	5.0 - 5.5	CMS		SC	11.3	111.1	24.0	29	20	9						
B2	5.5 - 6.0	CMS		SM	8.1	109.0	16.1	22	NP	NP						
C1	6.0 - 7.0	SPT		SC-SM	8.0		18.5	25	21	4						
C2	7.0 - 7.5	SPT		SC	17.4		39.8	39	20	19						
D	8.0 - 9.5	SPT		SM	8.8		15.4	27	26	1						

CMS = California Modified Sampler 2.42" ID
SPT = Standard Penetration 1.38" ID
CS = Continuous Sample 3.23" ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 2.42" ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 2.87" ID

U = Unconfined Compressive
UU = Unconsolidated Undrained
CD = Consolidated Drained
CU = Consolidated Undrained
DS = Direct Shear
Φ = Fri Φ = Friction
C = Cohesion
N = No. of blows per ft., 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 # **Job Description** US 395 Washoe City Pavement Distress

Boring No. LBM 9 **Elevation (ft)** **Station** **Date** 6/19/2008

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: TEST TYPE	Peak: Φ deg.	Peak: C psi	Residual: Φ deg.	Residual: C psi	COMMENTS
A	2.0 - 3.5	SPT		SC	12.2		32.0	39	18	21						
B1	4.5 - 5.0	CMS		SC	14.0	108.7	29.6	32	17	15						
B2	5.0 - 5.5	CMS		SC	17.2	109.2	36.5	33	17	16						
C	5.5 - 7.0	SPT		SC	13.4		29.6	32	17	15						
D	7.0 - 8.5	SPT		SC	9.5		17.9	29	21	8						
E	8.5 - 10.0	SPT		SC-SM	13.6		14.2	28	22	6						

CMS = California Modified Sampler 2.42" ID
SPT = Standard Penetration 1.38" ID
CS = Continuous Sample 3.23" ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 2.42" ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 2.87" 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 ft., 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 # **Job Description** US 395 Washoe City Pavement Distress

Boring No. LBM 10 **Elevation (ft)** **Station** **Date** 6/19/2008

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: TEST TYPE	Peak Φ deg.	Peak C psi	Residual Φ deg.	Residual C psi	COMMENTS
A	3.0 - 3.5	SPT			12.6			35	14	21						
B1	4.5 - 5.0	CMS		SC	9.5	115.4	16.2	29	17	12						
B2	5.0 - 5.5	CMS		SC-SM	8.5	113.5	14.7	27	20	7						
C	5.5 - 7.0	SPT		SC	12.8		27.8	29	20	9						
D	8.0 - 9.5	SPT		SC-SM	15.1		17.1	27	22	5						

CMS = California Modified Sampler 2.42" ID
SPT = Standard Penetration 1.38" ID
CS = Continuous Sample 3.23" ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 2.42" ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 2.87" 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 ft., 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 #

Job Description US 395 Washoe City Pavement Distress

Boring No. LBM 11

Elevation (ft)

Station

Date 6/19/2008

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: TEST TYPE	Peak Φ deg.	Peak C psi	Residual Φ deg.	Residual C psi	COMMENTS
A	3.0 - 3.5	SPT			16.3			41	16	25						
B1	4.5 - 5.0	CMS		SC	19.0	104.9	48.7	42	17	25						
B2	5.0 - 5.5	CMS		SC	12.4	113.4	27.0	33	18	15						
C	5.5 - 7.0	SPT		SC-SM	10.8		25.0	28	21	7						
D	8.0 - 9.5	SPT		SC	11.4		26.2	28	20	8						

CMS = California Modified Sampler 2.42" ID
SPT = Standard Penetration 1.38" ID
CS = Continuous Sample 3.23" ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 2.42" ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 2.87" 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 ft., 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 #

Job Description US 395 Washoe City Pavement Distress

Boring No. LBM 12

Elevation (ft)

Station

Date 6/19/2008

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: TEST TYPE	Peak: Φ deg.	Peak: C psi	Residual: Φ deg.	Residual: C psi	COMMENTS
A1	2.0 - 3.0	SPT		SM	6.0		12.6	21	NP	NP						
A2	3.0 - 3.5	SPT			14.0		23.7									
B1	4.5 - 5.0	CMS		SC	12.1	115.5	24.8	41	17	24						
B2	5.0 - 5.5	CMS		SC	11.0	111.9	15.1	40	16	24						
B3	5.5 - 5.8	CMS			10.3		15.8									
C	5.8 - 7.0	SPT		SC	13.6		28.6	40	20	20						

CMS = California Modified Sampler 2.42" ID
SPT = Standard Penetration 1.38" ID
CS = Continuous Sample 3.23" ID
RC = Rock Core
PB = Pitcher Barrel
CSS = Calif. Split Spoon 2.42" ID
CPT = Cone Penetration Test
TP = Test Pit
P = Pushed, not driven
R = Refusal
Sh = Shelby Tube 2.87" ID

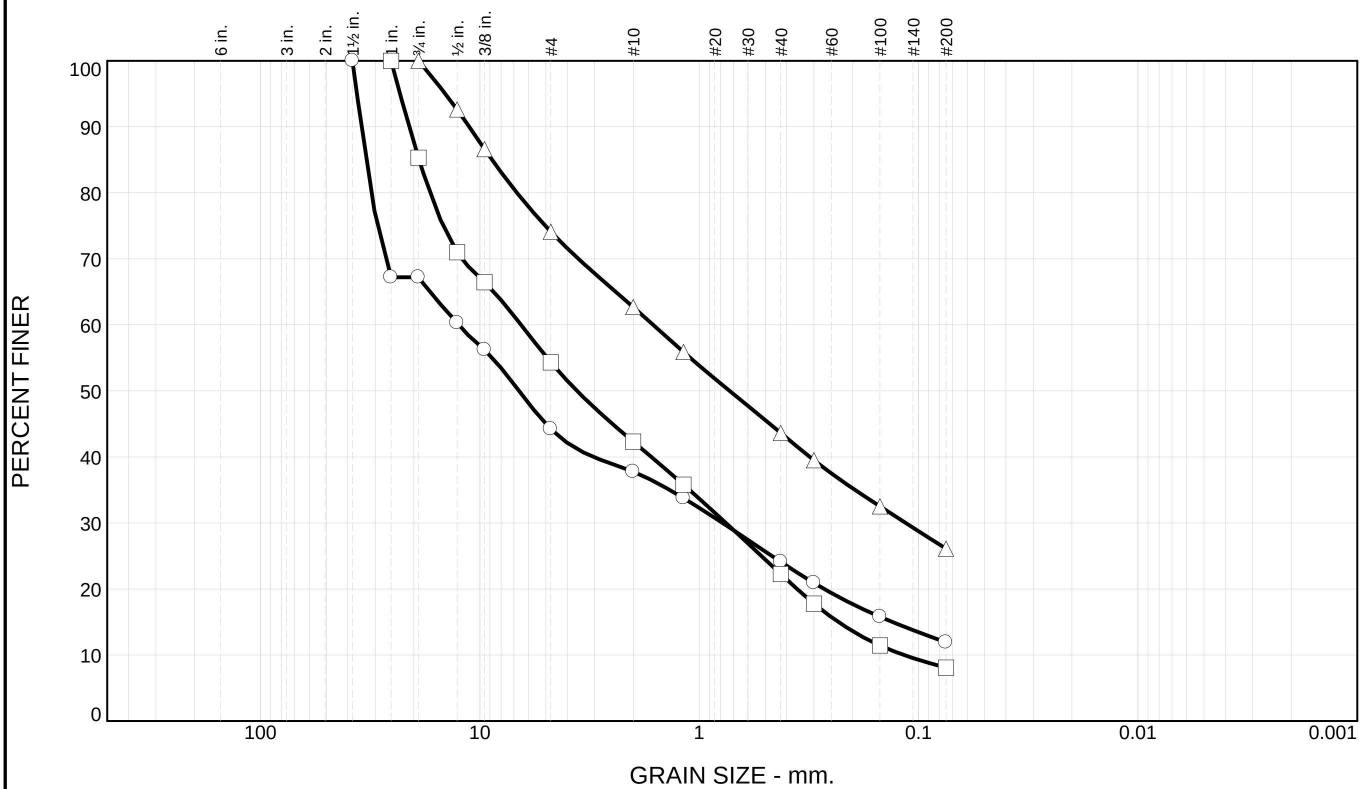
U = Unconfined Compressive
UU = Unconsolidated Undrained
CD = Consolidated Drained
CU = Consolidated Undrained
DS = Direct Shear
Φ = Friction
C = Cohesion
N = No. of blows per ft., sampler
N = Field SPT $N = (N_{css})(0.62)$

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**

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	55.8	32.3	11.9		GP-GC	A-1-a	22	27
□	0.0	45.7	46.2	8.1		SP-SM	A-1-a	NP	
△	0.0	25.9	48.0	26.1		SC	A-2-6(0)	18	32

SIEVE inches size	PERCENT FINER ○	□	△
1 1/2"	100.0		
1"	67.2	100.0	
3/4"	67.2	85.3	100.0
1/2"	60.3	71.0	92.6
3/8"	56.2	66.5	86.6
	GRAIN SIZE		
D_{60}	12.4863	6.4899	1.6219
D_{30}	0.7833	0.7553	0.1144
D_{10}		0.1166	
	COEFFICIENTS		
C_c		0.75	
C_u		55.68	

SIEVE number size	PERCENT FINER ○	□	△
#4	44.2	54.3	74.1
#10	37.8	42.3	62.7
#16	33.8	35.8	55.9
#40	24.1	22.3	43.6
#50	20.9	17.8	39.5
#100	15.8	11.4	32.5
#200	11.9	8.1	26.1

Material Description

○ poorly graded gravel with siltyclay and sand

□ poorly graded sand with silt and gravel

△ clayey sand with gravel

REMARKS:

○

□

△

○ Source of Sample: LBM 1 Depth: 1-1.5' Sample Number: A1

□ Source of Sample: LBM 1 Depth: 1.5-2' Sample Number: A2

△ Source of Sample: LBM 1 Depth: 2-2.5' Sample Number: A3

NEVADA DEPARTMENT OF TRANSPORTATION

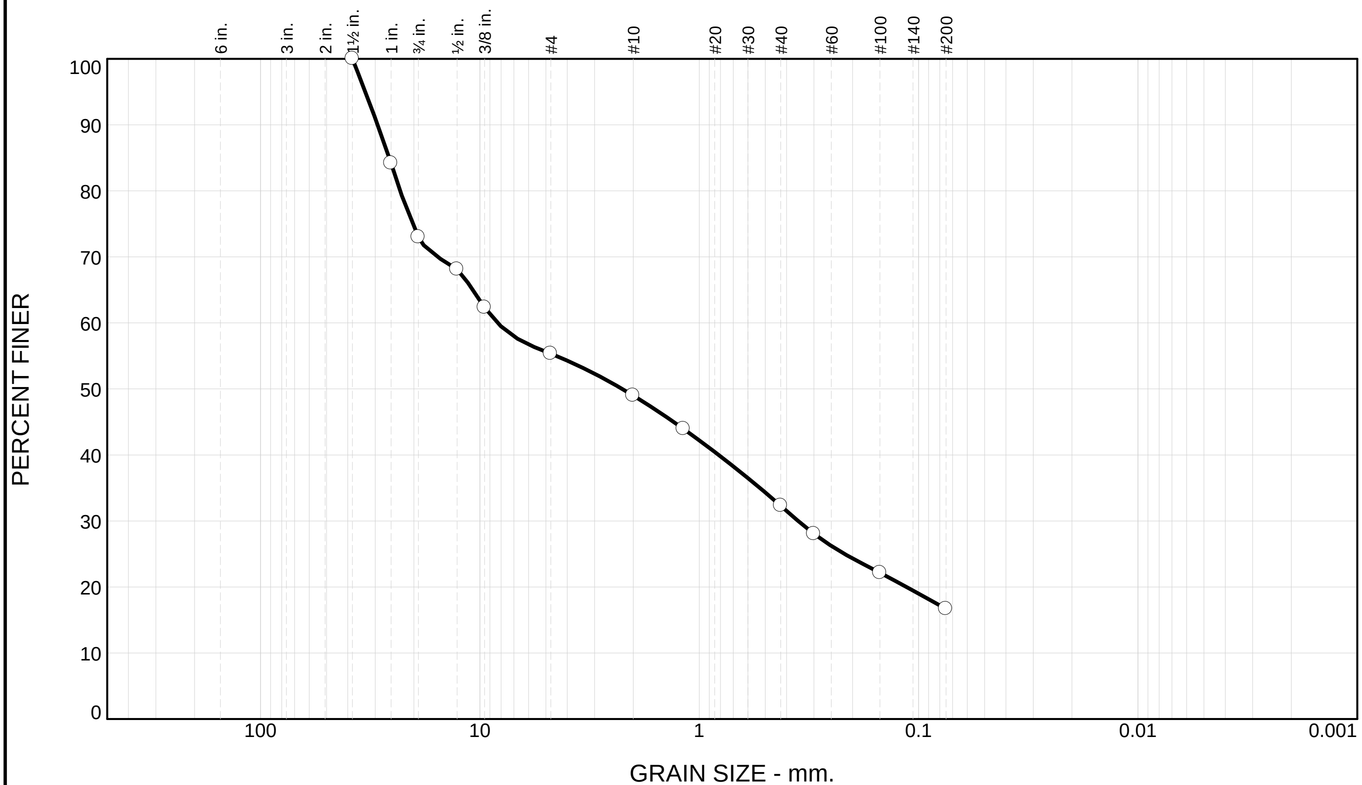
Client: A.Ablahani

Project: US 395 Washoe City Pavement Distress

Project No.: FL-3-08

Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	44.7	38.6	16.7					

SIEVE inches size	PERCENT FINER ○		
1 1/2"	100.0		
1"	84.2		
3/4"	73.0		
1/2"	68.1		
3/8"	62.3		

	GRAIN SIZE		
D_{60}	8.3208		
D_{30}	0.3540		
D_{10}			

	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○		
#4	55.3		
#10	49.0		
#16	43.9		
#40	32.3		
#50	28.0		
#100	22.2		
#200	16.7		

Material Description
○

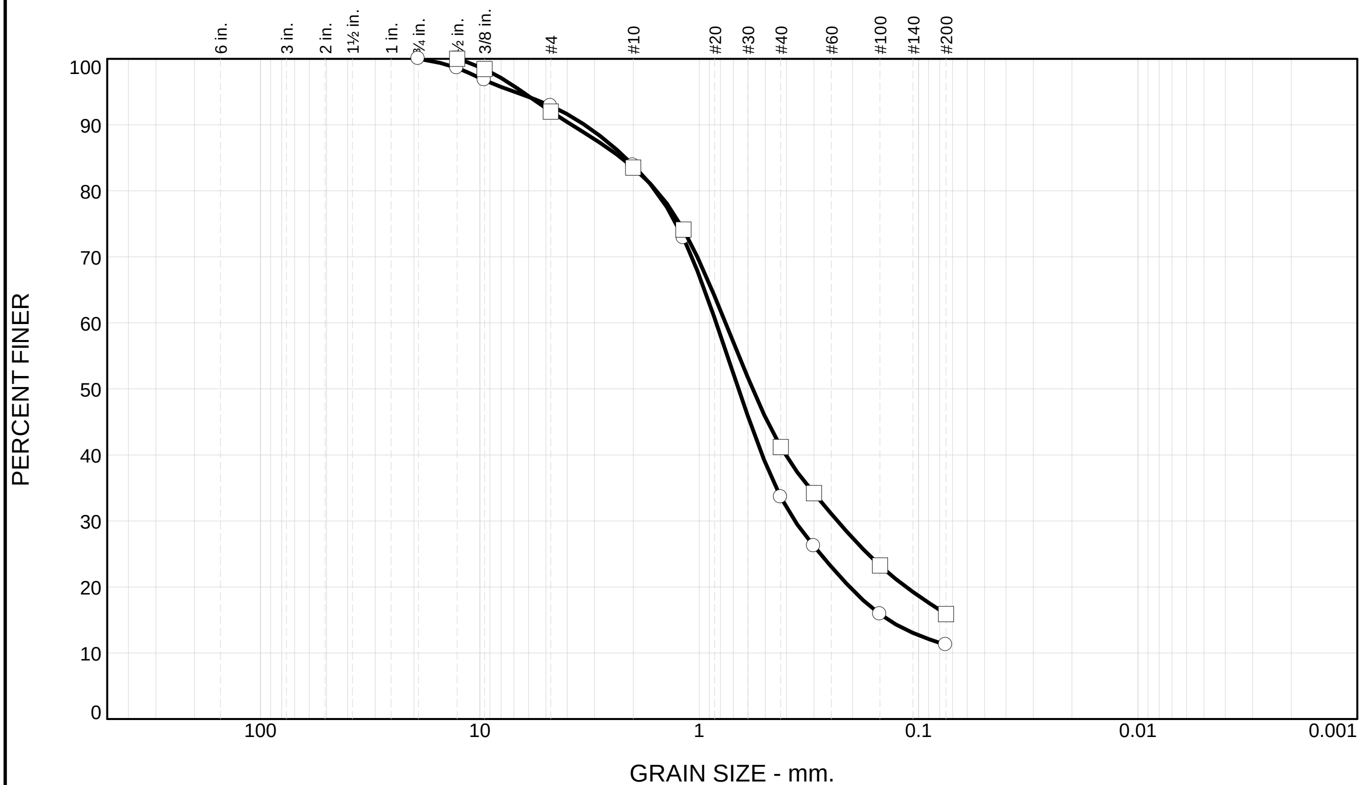
REMARKS:
○

○ Source of Sample: LBM 1 Depth: 3-4.5' Sample Number: B

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	7.1	81.7	11.2		SP-SM	A-1-b	21	24
□	0.0	8.0	76.1	15.9		SC-SM	A-1-b	19	23

SIEVE inches size	PERCENT FINER ○	PERCENT FINER □	
3/4"	100.0		
1/2"	98.6	100.0	
3/8"	96.8	98.4	
	GRAIN SIZE		
D_{60}	0.8366	0.7585	
D_{30}	0.3667	0.2345	
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	PERCENT FINER □	
#4	92.9	92.0	
#10	83.9	83.5	
#16	72.9	74.1	
#40	33.6	41.2	
#50	26.2	34.2	
#100	15.9	23.3	
#200	11.2	15.9	

Material Description
○ poorly graded sand with silt
□ silty, clayey sand

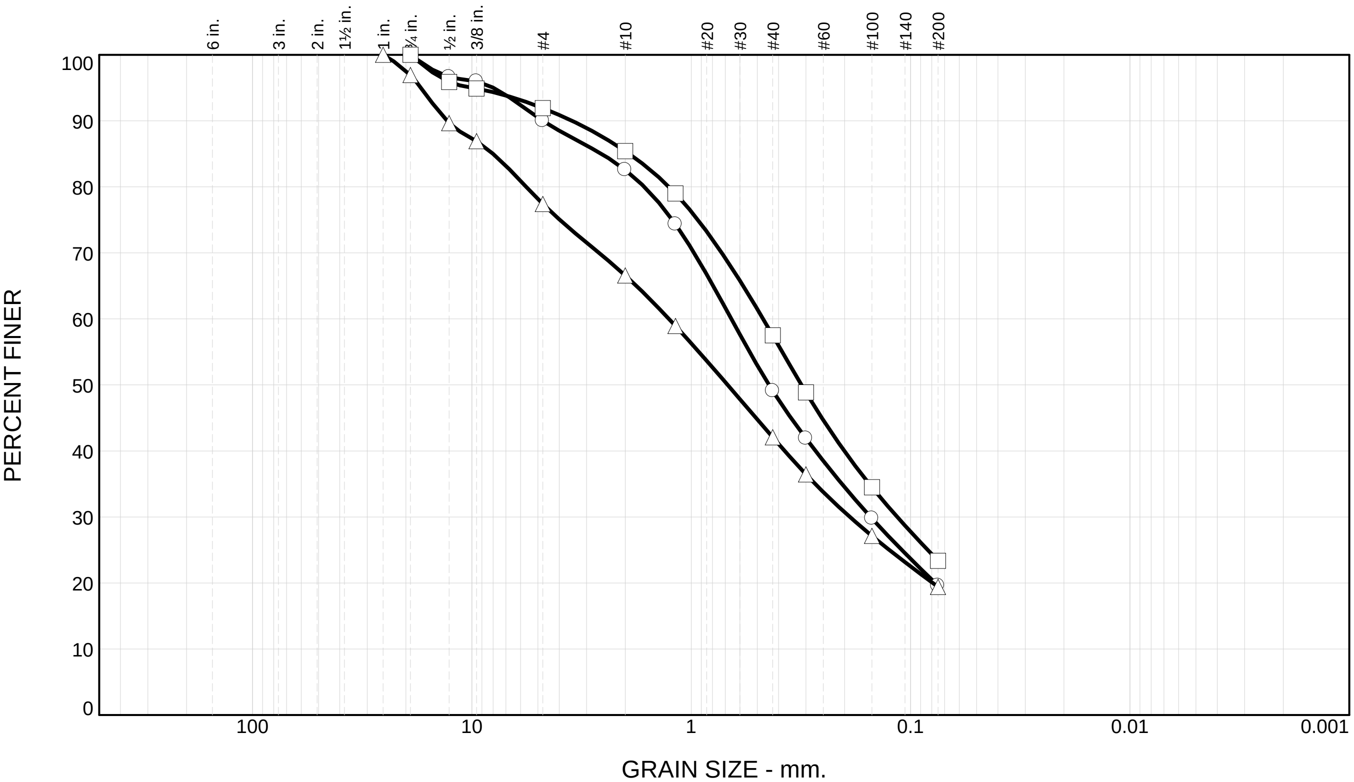
REMARKS:
○
□

○ Source of Sample: LBM 2 Depth: 2-2.5' Sample Number: A1
□ Source of Sample: LBM 2 Depth: 2.5-3' Sample Number: A2

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT / % CLAY	USCS	AASHTO	PL	LL
○	0.0	10.0	70.4	19.6	SC-SM	A-1-b	19	23
□	0.0	8.1	68.5	23.4	SC-SM	A-2-4(0)	19	23
△	0.0	22.6	58.0	19.4	SC-SM	A-2-4(0)	19	26

SIEVE inches size	PERCENT FINER ○	□	△
1"			100.0
3/4"	100.0	100.0	96.9
1/2"	96.6	95.9	89.6
3/8"	96.0	94.9	86.9

	GRAIN SIZE ○	□	△
D_{60}	0.6564	0.4700	1.2644
D_{30}	0.1522	0.1150	0.1892
D_{10}			

	COEFFICIENTS ○	□	△
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	90.0	91.9	77.4
#10	82.6	85.4	66.6
#16	74.3	79.0	58.9
#40	49.1	57.5	42.1
#50	41.9	48.9	36.5
#100	29.8	34.5	27.1
#200	19.6	23.4	19.4

Material Description
○ silty, clayey sand
□ silty, clayey sand
△ silty, clayey sand with gravel

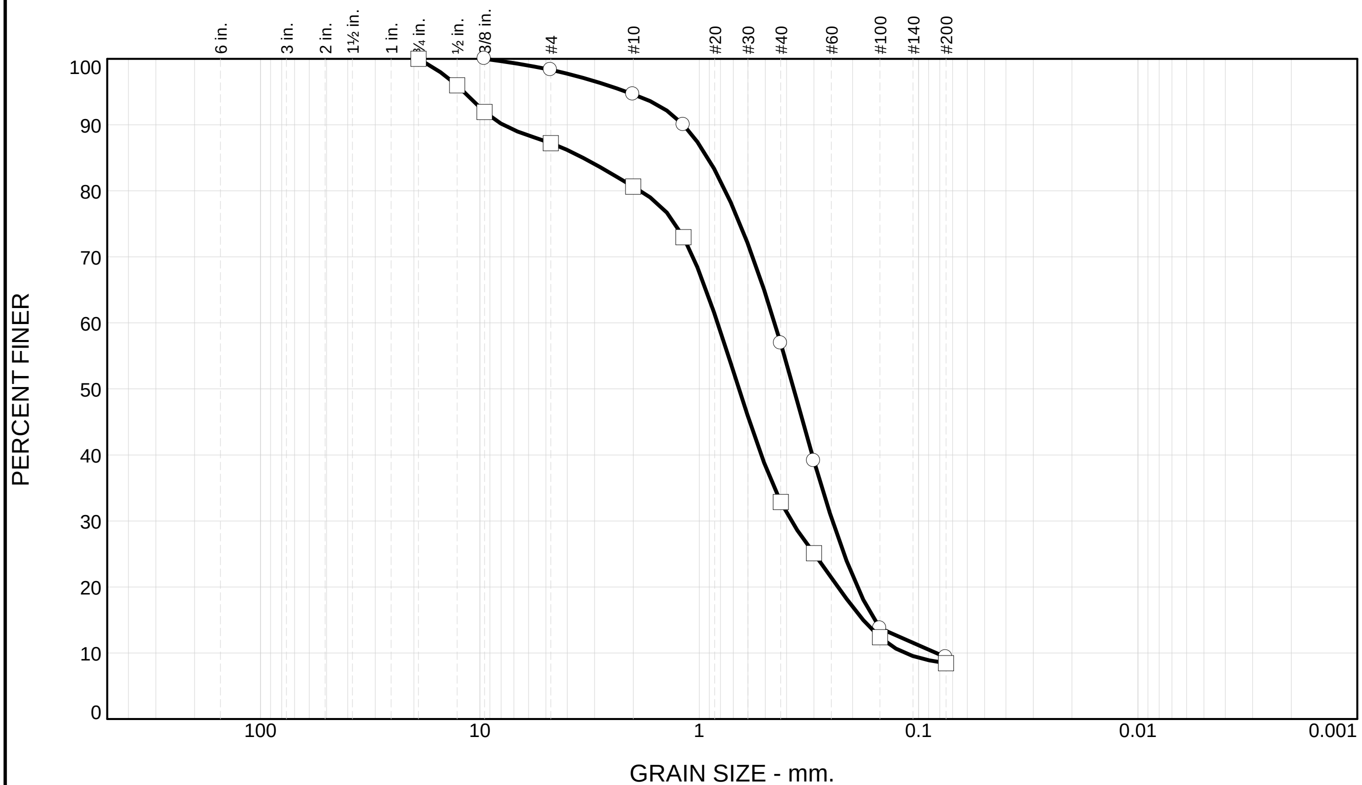
REMARKS:
○
□
△

○ Source of Sample: LBM 2 Depth: 4.5-6' Sample Number: B
□ Source of Sample: LBM 2 Depth: 6-7.5' Sample Number: C
△ Source of Sample: LBM 2 Depth: 7.5-9' Sample Number: D

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	1.7	88.9	9.4		SP-SM	A-3	NP	
□	0.0	12.8	78.7	8.5		SW-SM	A-1-b	NP	23

SIEVE inches size	PERCENT FINER ○	□	
3/4"		100.0	
1/2"		96.0	
3/8"	100.0	92.0	
	GRAIN SIZE		
D_{60}	0.4531	0.8247	
D_{30}	0.2470	0.3807	
D_{10}	0.0830	0.1156	
	COEFFICIENTS		
C_c	1.62	1.52	
C_u	5.46	7.14	

SIEVE number size	PERCENT FINER ○	□	
#4	98.3	87.2	
#10	94.6	80.6	
#16	90.0	73.0	
#40	56.9	32.9	
#50	39.1	25.1	
#100	13.7	12.4	
#200	9.4	8.5	

Material Description

○ poorly graded sand with silt

□ well-graded sand with silt

REMARKS:

○

□

○ Source of Sample: LBM 3 Depth: 2-2.5' Sample Number: A1

□ Source of Sample: LBM 3 Depth: 2.5-3' Sample Number: A2

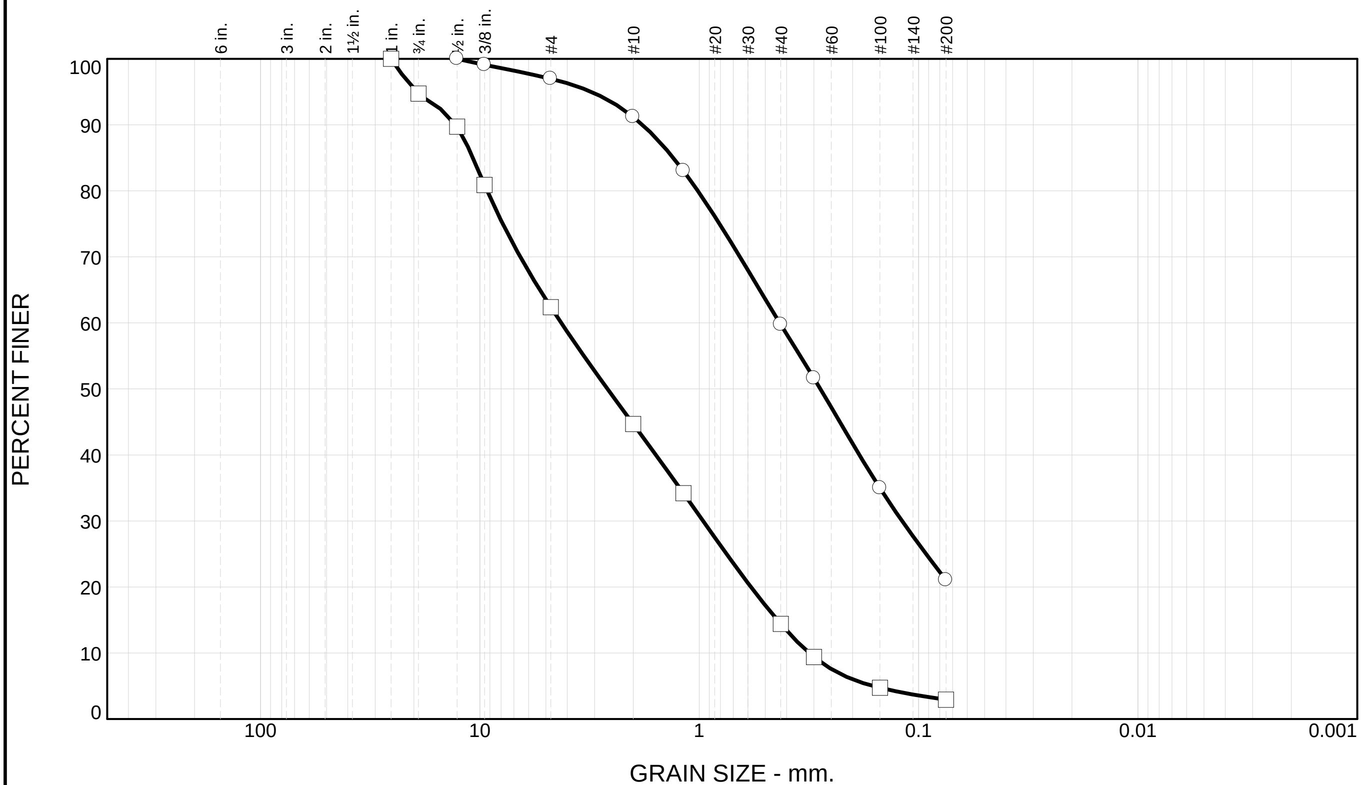
NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani

Project: US 395 Washoe City Pavement Distress

Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	3.0	76.0	21.0		SC-SM	A-2-4(0)	19	24
□	0.0	37.6	59.5	2.9		SP			

SIEVE inches size	PERCENT FINER ○	PERCENT FINER □	
1"		100.0	
3/4"		94.7	
1/2"	100.0	89.7	
3/8"	99.1	80.9	
	GRAIN SIZE		
D_{60}	0.4296	4.2603	
D_{30}	0.1189	0.9601	
D_{10}		0.3154	
	COEFFICIENTS		
C_c		0.69	
C_u		13.51	

SIEVE number size	PERCENT FINER ○	PERCENT FINER □	
#4	97.0	62.4	
#10	91.2	44.7	
#16	83.0	34.2	
#40	59.7	14.4	
#50	51.6	9.4	
#100	35.0	4.7	
#200	21.0	2.9	

Material Description
○ silty, clayey sand
□

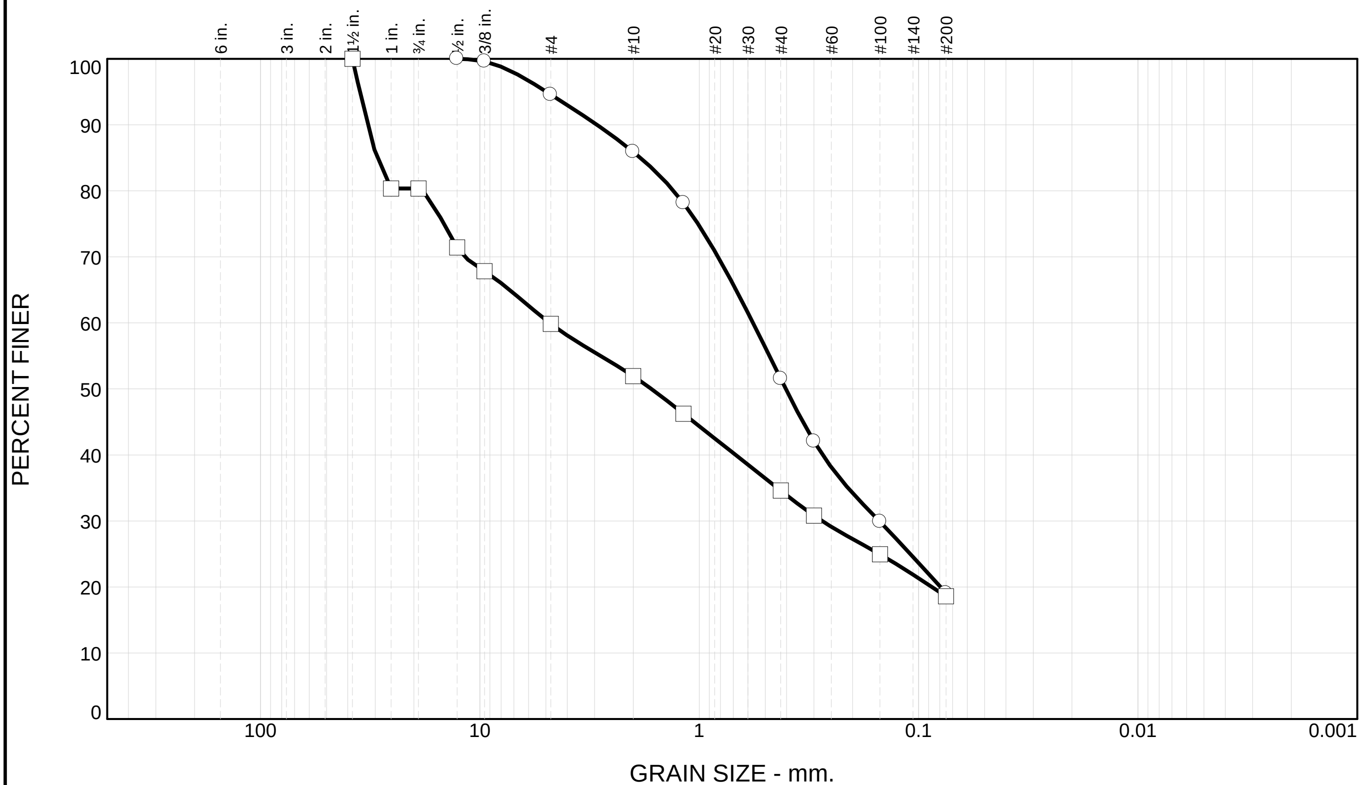
REMARKS:
○
□

○ Source of Sample: LBM 3 Depth: 3-4' Sample Number: B1
□ Source of Sample: LBM 3 Depth: 4-4.5' Sample Number: B2

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	5.4	75.5	19.1		SC-SM	A-2-4(0)	18	22
□	0.0	40.1	41.3	18.6		SC	A-2-4(0)	20	28

SIEVE inches size	PERCENT FINER ○	PERCENT FINER □	
1 1/2"		100.0	
1"		80.4	
3/4"		80.4	
1/2"	100.0	71.4	
3/8"	99.6	67.8	
GRAIN SIZE			
D_{60}	0.5685	4.8131	
D_{30}	0.1511	0.2755	
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	PERCENT FINER □	
#4	94.6	59.9	
#10	85.9	51.9	
#16	78.1	46.2	
#40	51.5	34.6	
#50	42.0	30.8	
#100	29.9	25.0	
#200	19.1	18.6	

Material Description

○ silty, clayey sand

□ clayey sand with gravel

REMARKS:

○

□

○ Source of Sample: LBM 3 Depth: 5-6.5' Sample Number: C

□ Source of Sample: LBM 3 Depth: 7-8.5' Sample Number: D

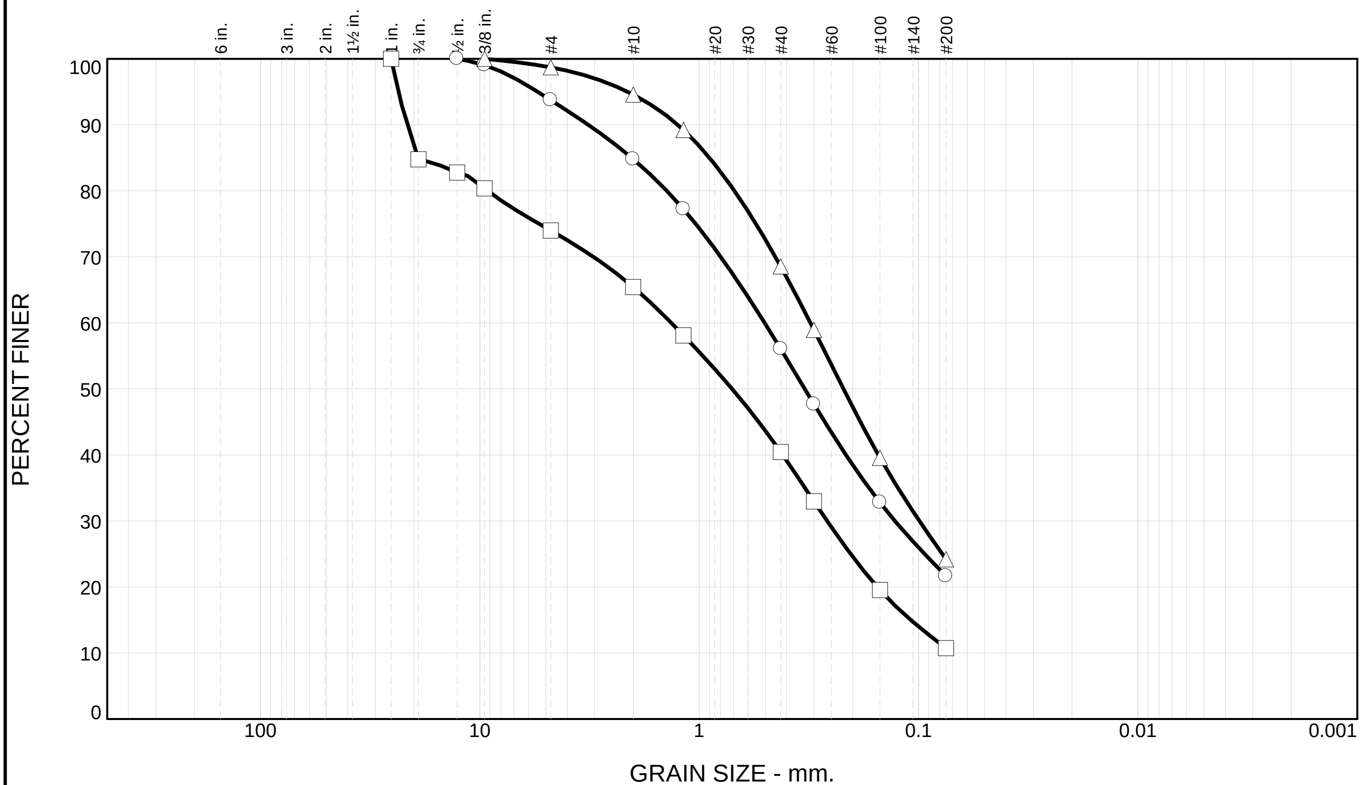
NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani

Project: US 395 Washoe City Pavement Distress

Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT / % CLAY	USCS	AASHTO	PL	LL
○	0.0	6.3	72.1	21.6	SM	A-2-4(0)	NP	
□	0.0	26.0	63.3	10.7	SP-SM	A-1-b	NP	
△	0.0	1.3	74.5	24.2	SM	A-2-4(0)	NP	

SIEVE inches size	PERCENT FINER ○	□	△
1"		100.0	
3/4"		84.8	
1/2"	100.0	82.8	
3/8"	99.1	80.4	100.0
GRAIN SIZE			
D_{60}	0.5030	1.3409	0.3112
D_{30}	0.1281	0.2612	0.0991
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	93.7	74.0	98.7
#10	84.8	65.4	94.6
#16	77.2	58.1	89.2
#40	56.1	40.4	68.6
#50	47.7	33.0	59.0
#100	32.8	19.5	39.6
#200	21.6	10.7	24.2

Material Description

○ silty sand

□ poorly graded sand with silt and gravel

△ silty sand

REMARKS:

○

□

△

○ Source of Sample: LBM 4 Depth: 2-2.5' Sample Number: A1

□ Source of Sample: LBM 4 Depth: 2.5-3' Sample Number: A2

△ Source of Sample: LBM 4 Depth: 4-5' Sample Number: B1

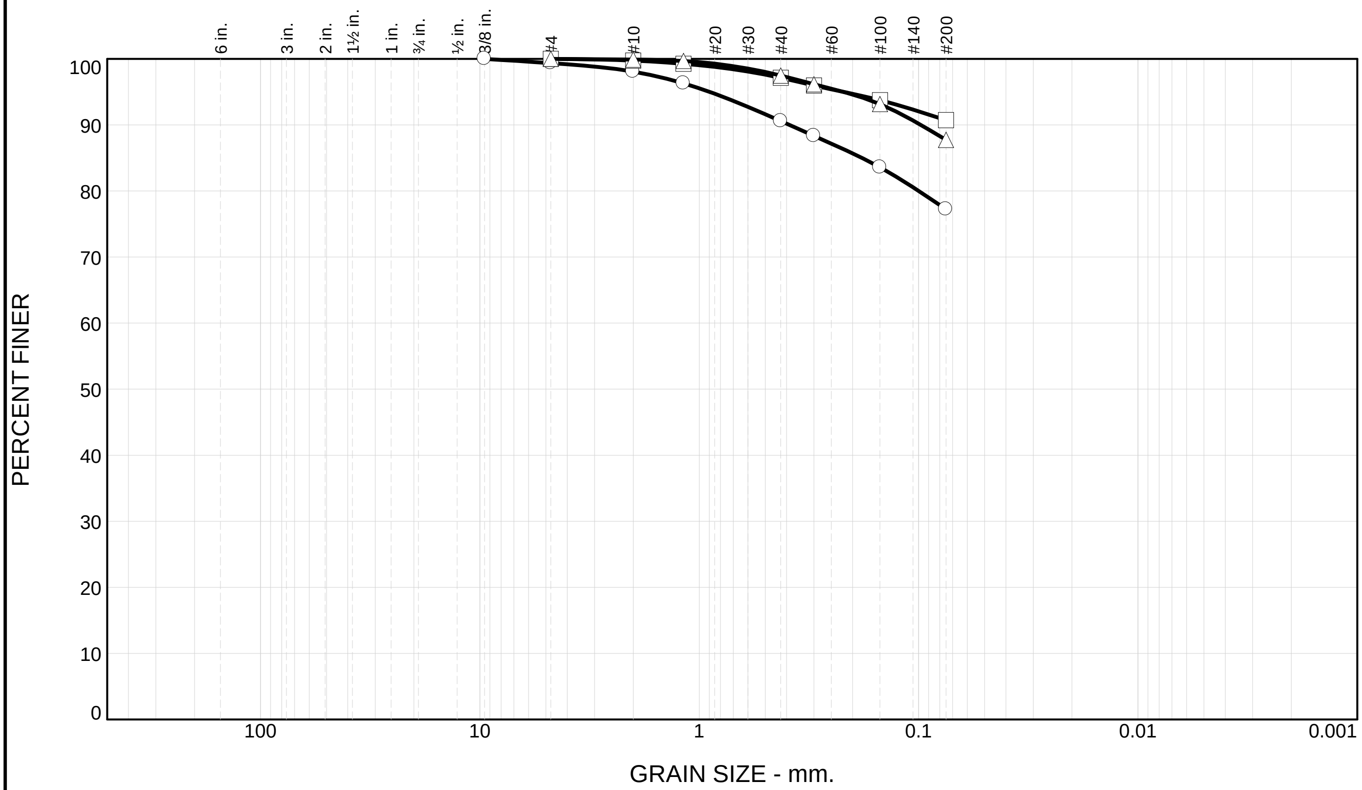
NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani

Project: US 395 Washoe City Pavement Distress

Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	0.6	22.2	77.2		CH	A-7-6(25)	21	53
□	0.0	0.0	9.3	90.7		CH	A-7-6(46)	29	73
△	0.0	0.0	12.3	87.7		ML	A-4(2)	NP	

SIEVE inches size	PERCENT FINER ○	□	△
3/8"	100.0		
	GRAIN SIZE		
D_{60}			
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	99.4	100.0	100.0
#10	98.1	99.7	99.9
#16	96.3	99.3	99.7
#40	90.6	97.1	97.5
#50	88.3	96.0	96.2
#100	83.6	93.7	93.2
#200	77.2	90.7	87.7

Material Description

○ fat clay with sand

□ fat clay

△ silt

REMARKS:

○

□

△

○ Source of Sample: LBM 4 Depth: 6-6.5' Sample Number: C1

□ Source of Sample: LBM 4 Depth: 6.5-7' Sample Number: C2

△ Source of Sample: LBM 4 Depth: 7-7.5' Sample Number: C3

NEVADA DEPARTMENT OF TRANSPORTATION

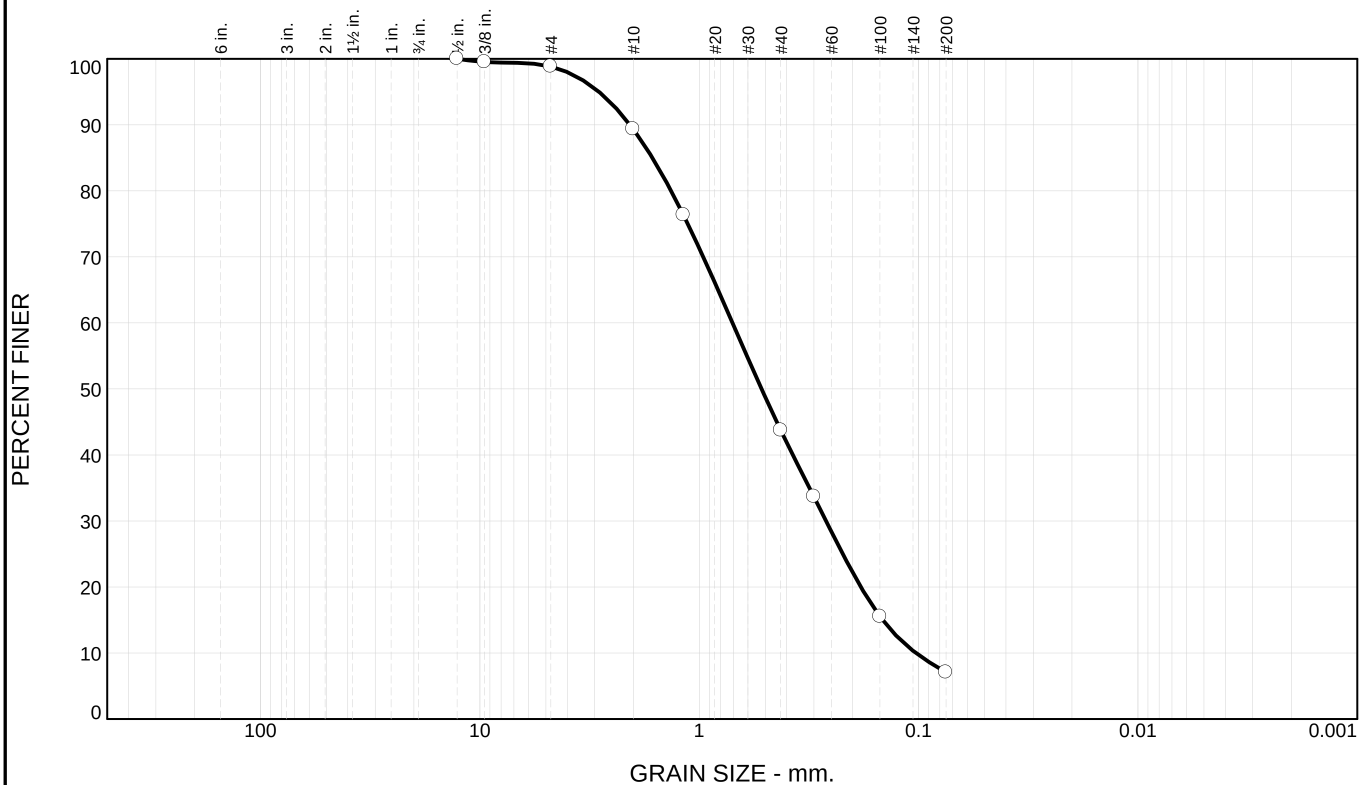
Client: A.Ablahani

Project: US 395 Washoe City Pavement Distress

Project No.: FL-3-08

Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	1.2	91.7	7.1		SP-SM	A-1-b	NP	20

SIEVE inches size	PERCENT FINER ○		
1/2"	100.0		
3/8"	99.5		
	GRAIN SIZE		
D_{60}	0.7052		
D_{30}	0.2641		
D_{10}	0.1027		
	COEFFICIENTS		
C_c	0.96		
C_u	6.86		

SIEVE number size	PERCENT FINER ○		
#4	98.8		
#10	89.4		
#16	76.3		
#40	43.7		
#50	33.7		
#100	15.5		
#200	7.1		

Material Description
○ poorly graded sand with silt

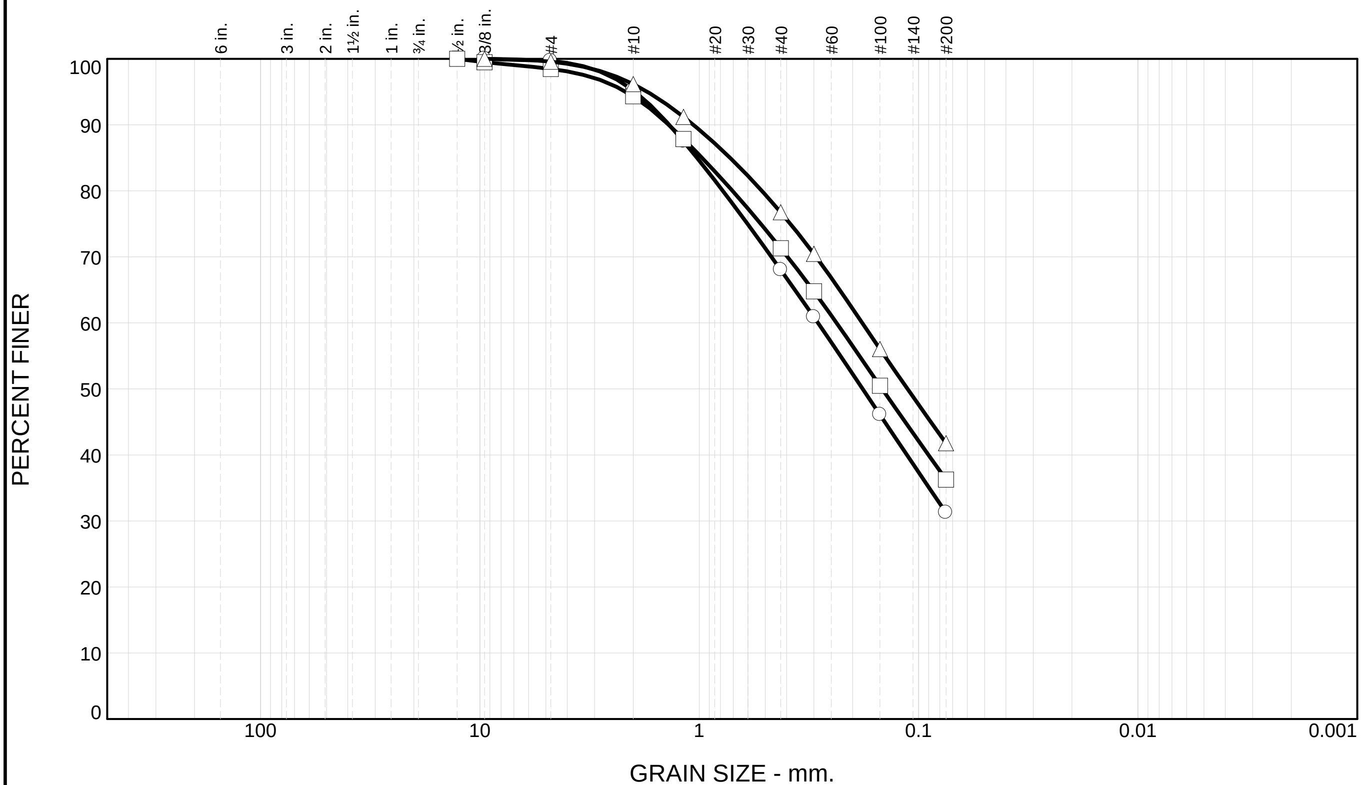
REMARKS:
○

○ Source of Sample: LBM 4 Depth: 8-9.5' Sample Number: D

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	0.3	68.5	31.2		SC	A-2-6(1)	15	29
□	0.0	1.5	62.2	36.3		SC	A-6(1)	17	33
△	0.0	0.4	57.8	41.8		SC	A-6(3)	19	35

SIEVE inches size	PERCENT FINER ○	□	△
1/2"		100.0	
3/8"	100.0	99.5	100.0
	GRAIN SIZE		
D_{60}	0.2875	0.2366	0.1807
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	99.7	98.5	99.6
#10	95.2	94.3	96.2
#16	87.5	87.9	91.2
#40	68.0	71.3	76.8
#50	60.9	64.8	70.5
#100	46.1	50.5	56.0
#200	31.2	36.3	41.8

Material Description
○ clayey sandclay
□ clayey sand
△ clayey sand

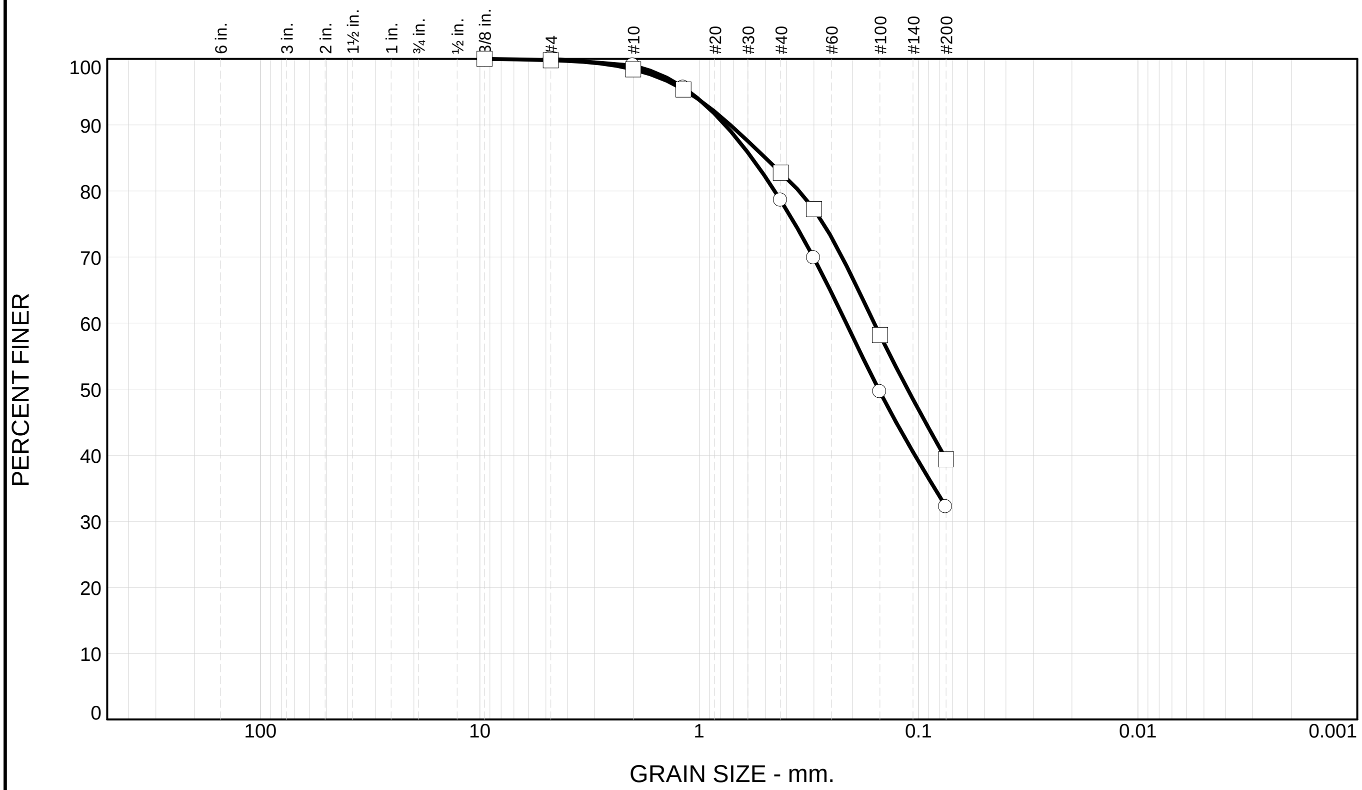
REMARKS:
○
□
△

○ Source of Sample: LBM 5 Depth: 2-3.5' Sample Number: A
□ Source of Sample: LBM 5 Depth: 4-4.5' Sample Number: B1
△ Source of Sample: LBM 5 Depth: 4.5-5' Sample Number: B2

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	0.0	67.8	32.2		SC	A-2-6(0)	18	29
□	0.0	0.2	60.4	39.4		SC	A-6(2)	18	33

SIEVE inches size	PERCENT FINER ○	□	
3/8"		100.0	
	GRAIN SIZE		
D_{60}	0.2138	0.1594	
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	
#4	100.0	99.8	
#10	99.0	98.4	
#16	95.7	95.4	
#40	78.6	82.8	
#50	69.8	77.3	
#100	49.6	58.2	
#200	32.2	39.4	

Material Description
○ clayey sand

□ clayey sand

REMARKS:
○

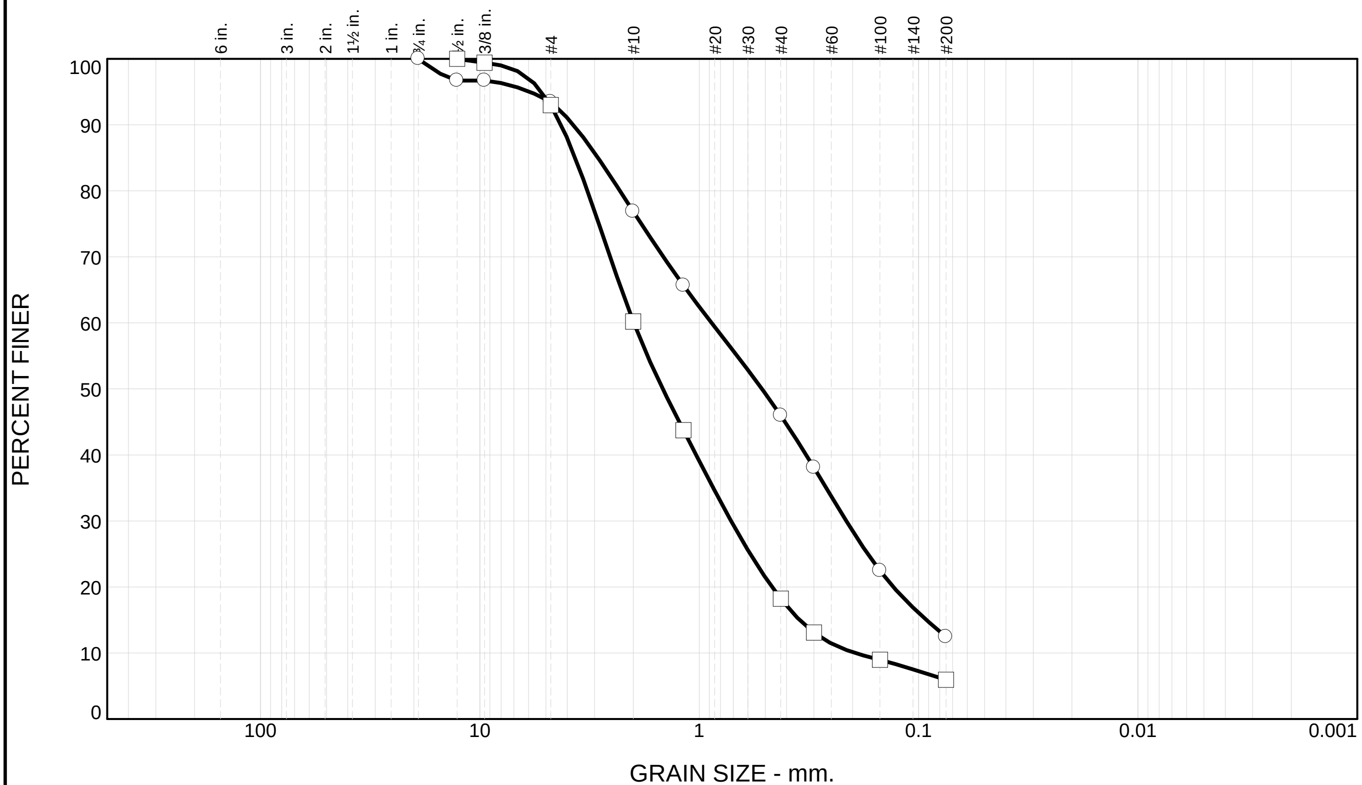
□

○ Source of Sample: LBM 5 Depth: 5-6.5' Sample Number: C
□ Source of Sample: LBM 5 Depth: 8-8.5' Sample Number: D2

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	6.5	81.1	12.4		SM	A-1-b	NP	23
□	0.0	7.0	87.1	5.9		SW-SM	A-1-b	NP	22

SIEVE inches size	PERCENT FINER ○	PERCENT FINER □	
3/4"	100.0		
1/2"	96.7	100.0	
3/8"	96.7	99.4	
	GRAIN SIZE		
D_{60}	0.8783	1.9889	
D_{30}	0.2135	0.7157	
D_{10}		0.1945	
	COEFFICIENTS		
C_c		1.32	
C_u		10.23	

SIEVE number size	PERCENT FINER ○	PERCENT FINER □	
#4	93.5	93.0	
#10	76.9	60.2	
#16	65.7	43.7	
#40	46.0	18.2	
#50	38.1	13.1	
#100	22.5	9.0	
#200	12.4	5.9	

Material Description

○ silty sand

□ well-graded sand with silt

REMARKS:

○

□

○ Source of Sample: LBM 5 Depth: 9.5-10' Sample Number: E1

□ Source of Sample: LBM 5 Depth: 10-10.5' Sample Number: E2

NEVADA DEPARTMENT OF TRANSPORTATION

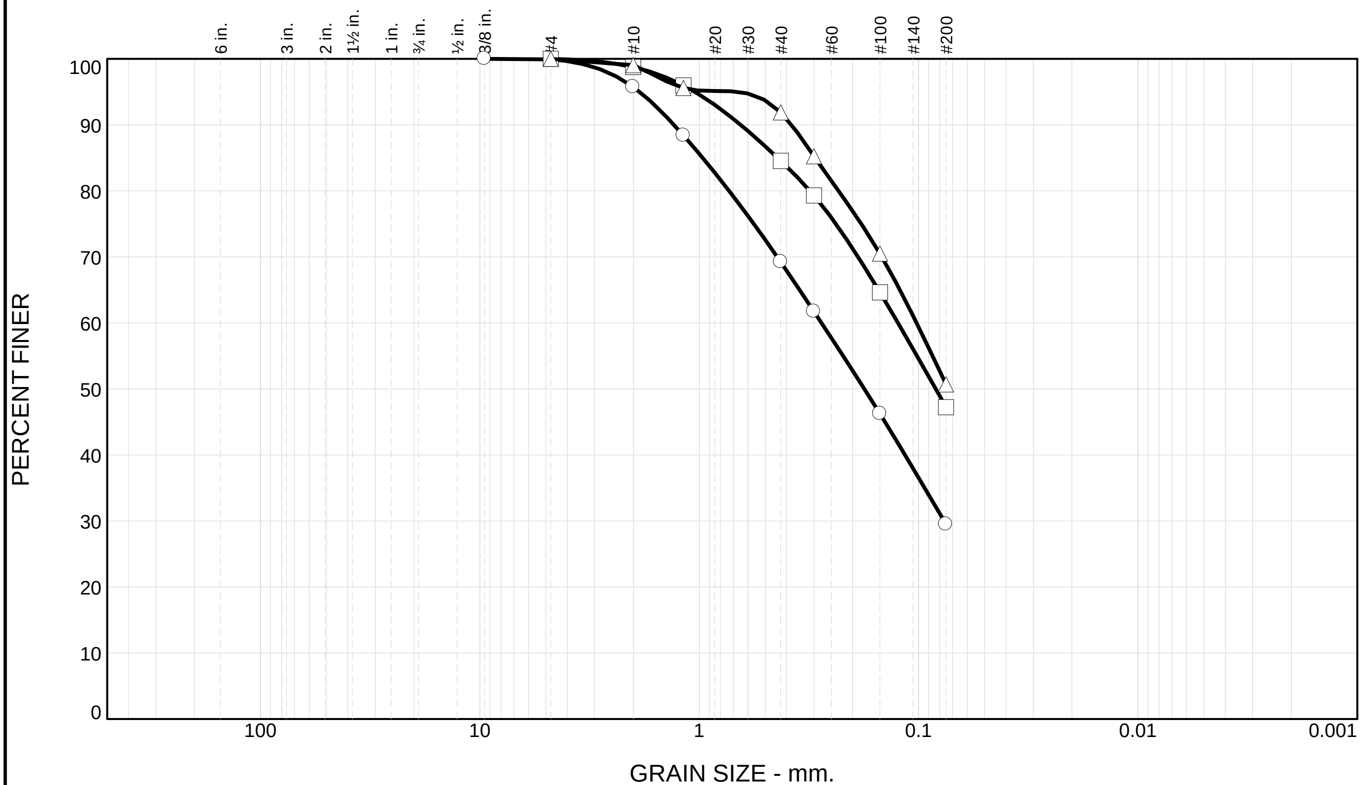
Client: A.Ablahani

Project: US 395 Washoe City Pavement Distress

Project No.: FL-3-08

Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT / % CLAY	USCS	AASHTO	PL	LL
○	0.0	0.1	70.4	29.5	SC-SM	A-2-4(0)	18	24
□	0.0	0.0	52.8	47.2	SM	A-4(0)	NP	32
△	0.0	0.0	49.3	50.7	ML	A-4(0)	NP	

SIEVE inches size	PERCENT FINER ○	□	△
3/8"	100.0		
	GRAIN SIZE		
D_{60}	0.2773	0.1241	0.1021
D_{30}	0.0765		
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	99.9	100.0	100.0
#10	95.7	98.7	99.0
#16	88.4	96.0	95.6
#40	69.2	84.5	91.9
#50	61.7	79.3	85.2
#100	46.2	64.6	70.5
#200	29.5	47.2	50.7

Material Description
○ silty, clayey sand
□ silty sand
△ sandy silt

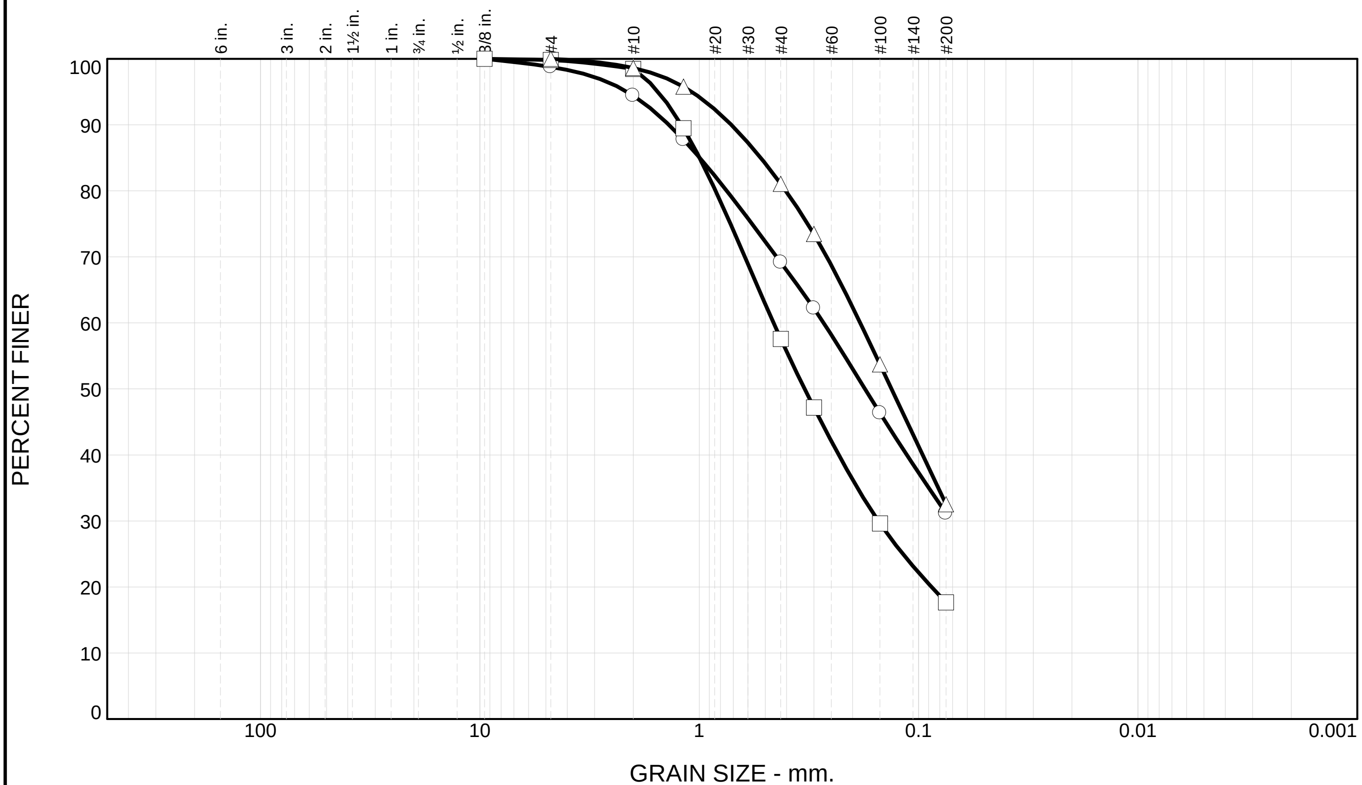
REMARKS:
○
□
△

○ Source of Sample: LBM 6 Depth: 2-3.5' Sample Number: A
□ Source of Sample: LBM 6 Depth: 4.5-5' Sample Number: B1
△ Source of Sample: LBM 6 Depth: 5-5.5' Sample Number: B2

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	1.2	67.6	31.2		SC	A-2-4(0)	19	27
□	0.0	0.2	82.1	17.7		SC	A-2-6(0)	12	26
△	0.0	0.0	67.5	32.5		SC	A-2-4(0)	19	27

SIEVE inches size	PERCENT FINER ○	□	△
3/8"	100.0	100.0	
	GRAIN SIZE		
D_{60}	0.2709	0.4585	0.1845
D_{30}		0.1527	
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	98.8	99.8	100.0
#10	94.4	98.5	98.6
#16	87.8	89.5	95.8
#40	69.2	57.6	81.1
#50	62.2	47.2	73.5
#100	46.3	29.6	53.7
#200	31.2	17.7	32.5

Material Description
○ clayey sand
□ clayey sand
△ clayey sand

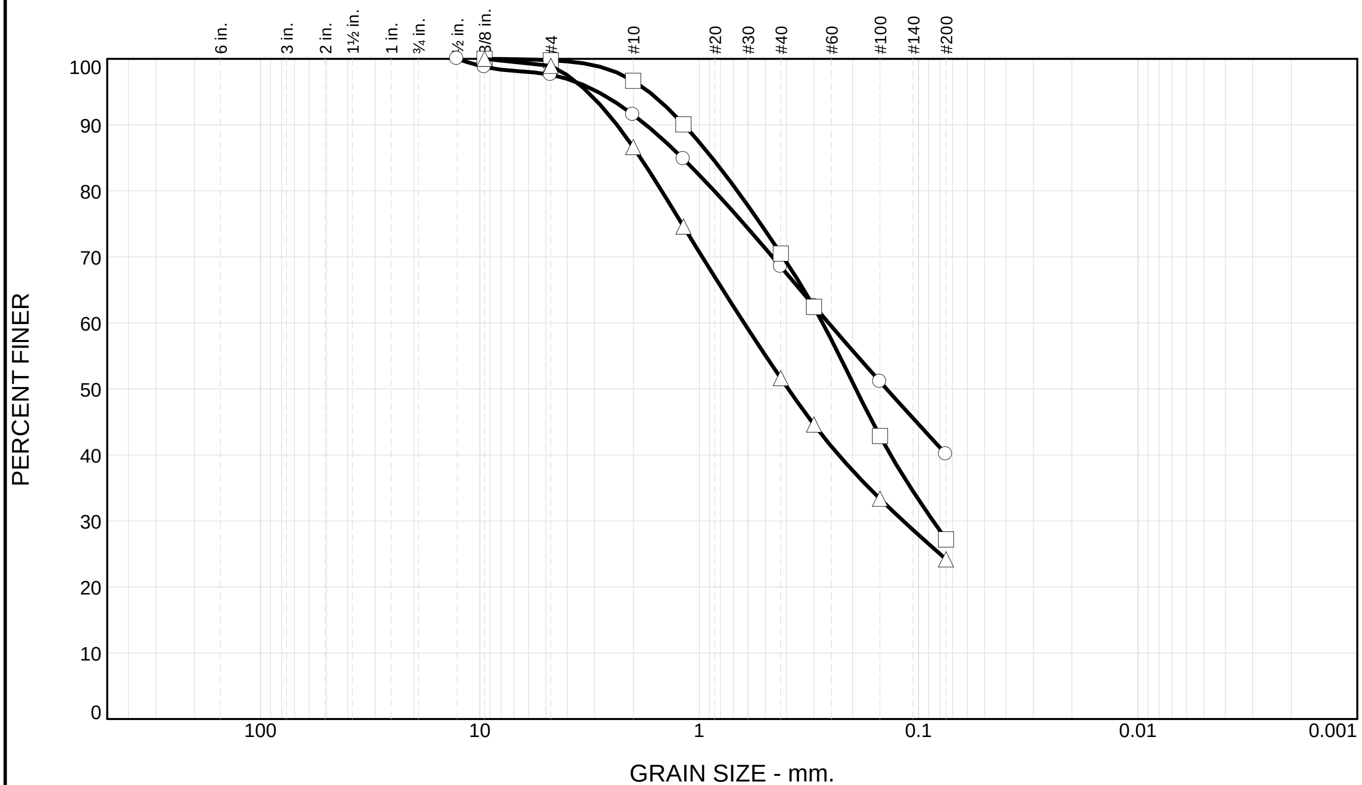
REMARKS:
○
□
△

○ Source of Sample: LBM 6 Depth: 6-7.5' Sample Number: C
□ Source of Sample: LBM 6 Depth: 8.5-9' Sample Number: D1
△ Source of Sample: LBM 6 Depth: 9-9.5' Sample Number: D2

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	2.4	57.5	40.1		SC	A-7-6(5)	16	43
□	0.0	0.2	72.6	27.2		SC	A-2-6(1)	18	33
△	0.0	1.1	74.7	24.2		SC	A-2-6(1)	16	32

SIEVE inches size	PERCENT FINER ○	□	△
1/2"	100.0		
3/8"	98.8	100.0	100.0
	GRAIN SIZE		
D_{60}	0.2573	0.2737	0.6246
D_{30}		0.0858	0.1174
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	97.6	99.8	98.9
#10	91.5	96.7	86.6
#16	84.8	90.1	74.6
#40	68.5	70.5	51.6
#50	62.6	62.4	44.6
#100	51.1	42.9	33.4
#200	40.1	27.2	24.2

Material Description
○ clayey sand
□ clayey sand
△ clayey sand

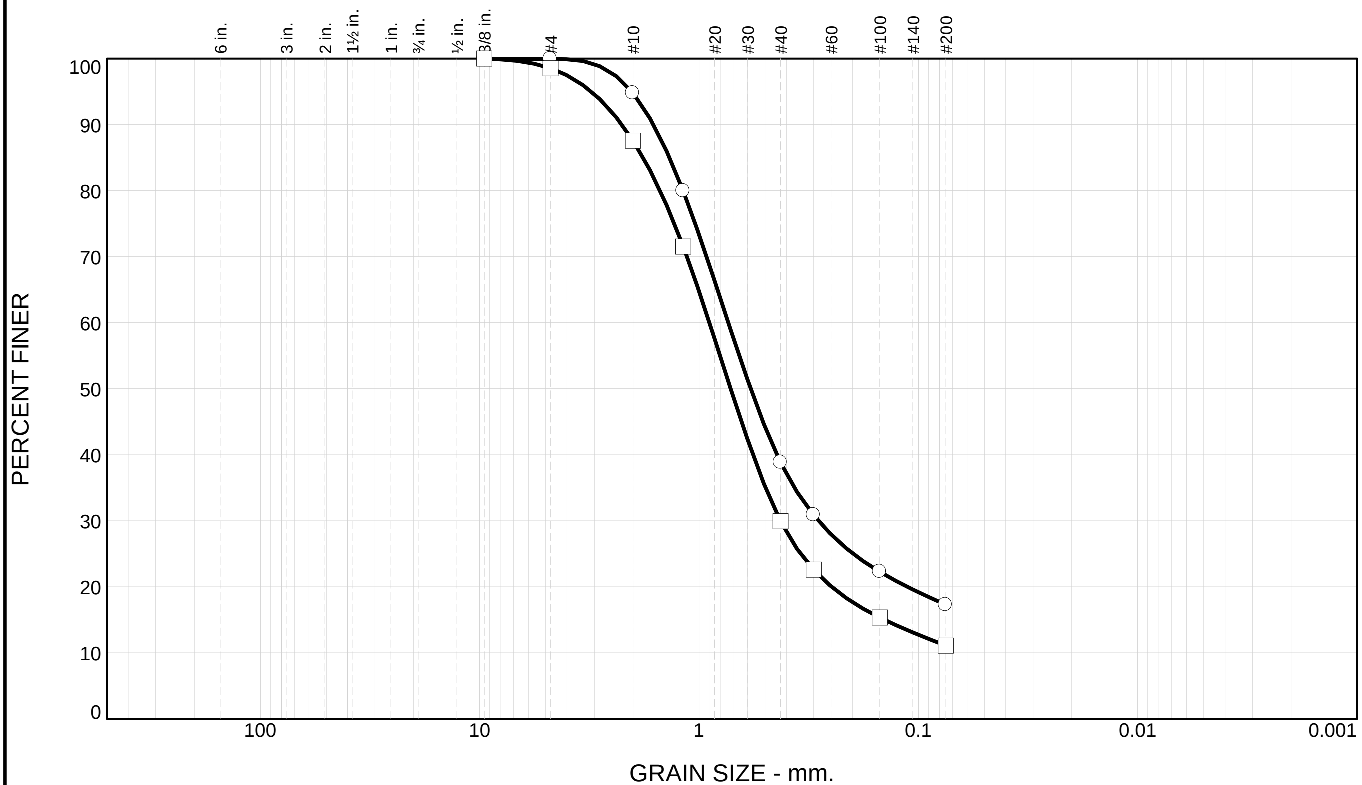
REMARKS:
○
□
△

○ Source of Sample: LBM 7 Depth: 2-2.5' Sample Number: A
□ Source of Sample: LBM 7 Depth: 4.5-5' Sample Number: B1
△ Source of Sample: LBM 7 Depth: 5-5.5' Sample Number: B2

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	0.1	82.6	17.3		SC	A-2-6(0)	17	29
□	0.0	1.5	87.4	11.1		SP-SC	A-2-6(0)	16	30

SIEVE inches size	PERCENT FINER ○	PERCENT FINER □	
3/8"	100.0	100.0	

	GRAIN SIZE ○	GRAIN SIZE □	
D_{60}	0.7351	0.8967	
D_{30}	0.2855	0.4261	
D_{10}			

	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	PERCENT FINER □	
#4	99.9	98.5	
#10	94.8	87.6	
#16	79.9	71.5	
#40	38.8	29.9	
#50	30.9	22.6	
#100	22.3	15.3	
#200	17.3	11.1	

Material Description

○ clayey sand

□ poorly graded sand with clay

REMARKS:

○

□

○ Source of Sample: LBM 7 Depth: 6-7.5' Sample Number: C

□ Source of Sample: LBM 7 Depth: 8-9.5' Sample Number: D

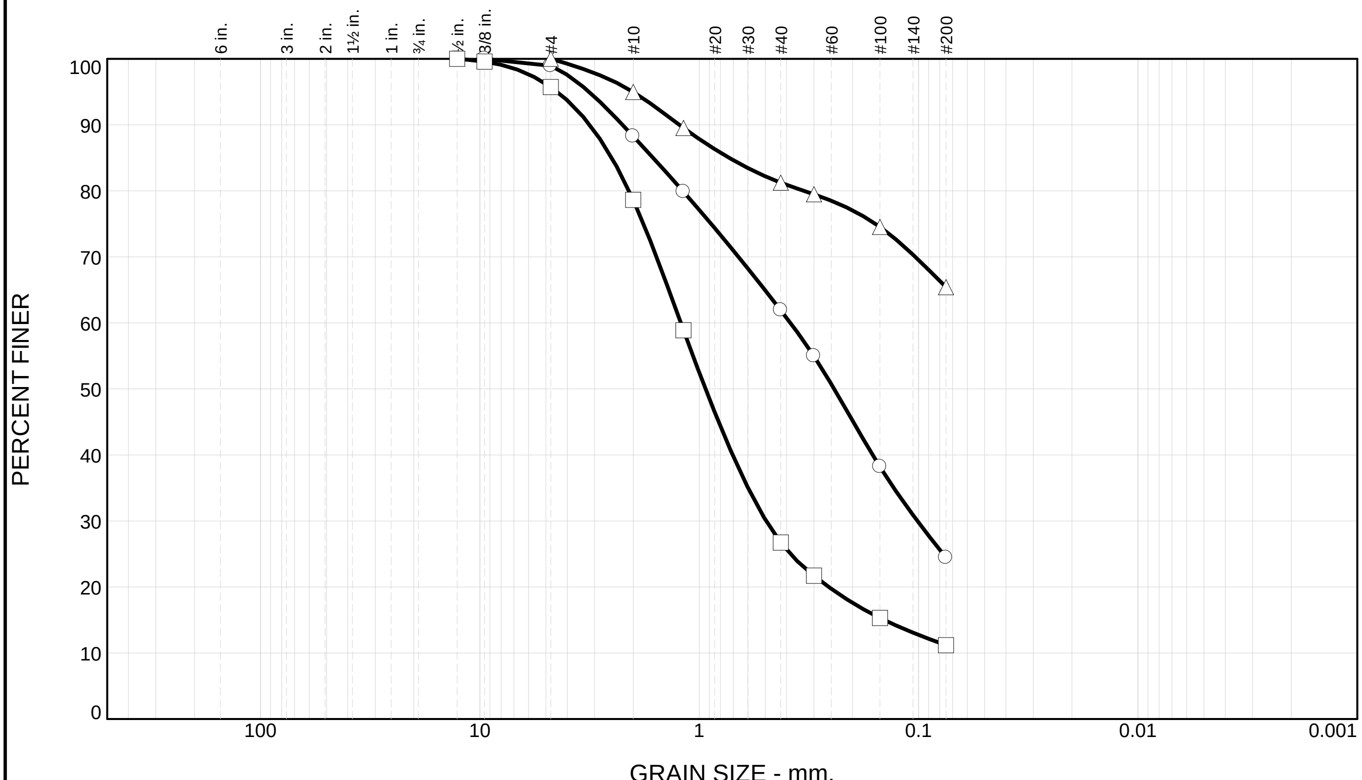
NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani

Project: US 395 Washoe City Pavement Distress

Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	1.1	74.5	24.4		SC	A-2-4(0)	19	27
□	0.0	4.3	84.5	11.2					
△	0.0	0.0	34.6	65.4		CL	A-7-6(18)	16	48

SIEVE inches size	PERCENT FINER ○	□	△
1/2"		100.0	
3/8"	100.0	99.6	

GRAIN SIZE	○	□	△
D_{60}	0.3841	1.2137	
D_{30}	0.1012	0.4955	
D_{10}			

COEFFICIENTS	○	□	△
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	98.9	95.7	100.0
#10	88.3	78.6	95.0
#16	79.9	58.9	89.5
#40	61.9	26.7	81.2
#50	55.0	21.7	79.5
#100	38.2	15.3	74.5
#200	24.4	11.2	65.4

Material Description

○ clayey sand

□

△ sandy lean clay

REMARKS:

○

□

△

○ Source of Sample: LBM 8 Depth: 3-3.8' Sample Number: A1

□ Source of Sample: LBM 8 Depth: 3.8-4.5' Sample Number: A2

△ Source of Sample: LBM 8 Depth: 4.5-5' Sample Number: A3

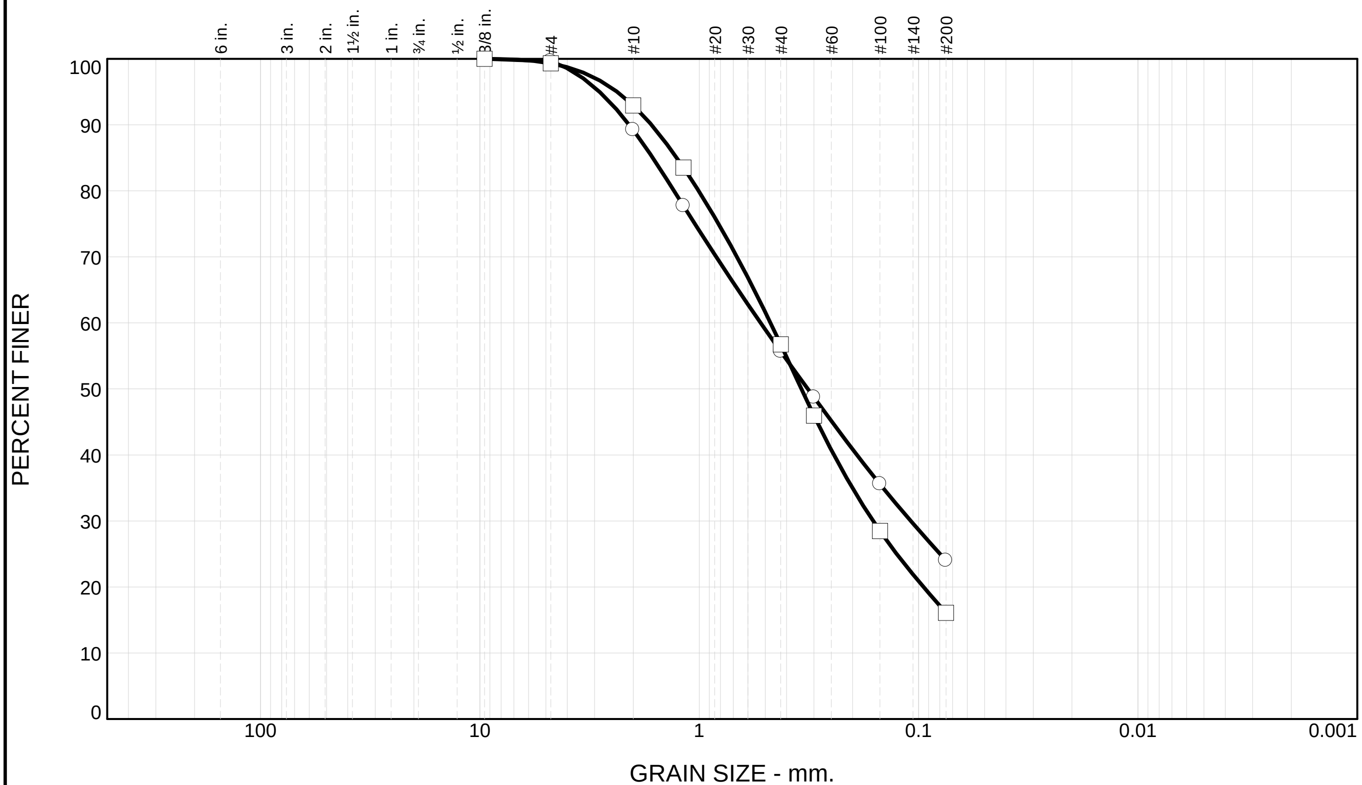
NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani

Project: US 395 Washoe City Pavement Distress

Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	0.4	75.6	24.0		SC	A-2-4(0)	20	29
□	0.0	0.7	83.2	16.1		SM	A-2-4(0)	NP	22

SIEVE inches size	PERCENT FINER ○	□	
3/8"	100.0	100.0	

	GRAIN SIZE		
D_{60}	0.5249	0.4731	
D_{30}	0.1084	0.1612	
D_{10}			

	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	
#4	99.6	99.3	
#10	89.2	92.9	
#16	77.7	83.5	
#40	55.7	56.7	
#50	48.7	46.0	
#100	35.6	28.5	
#200	24.0	16.1	

Material Description

○ clayey sand

□ silty sand

REMARKS:

○

□

○ Source of Sample: LBM 8 Depth: 5-5.5' Sample Number: B1

□ Source of Sample: LBM 8 Depth: 5.5-6' Sample Number: B2

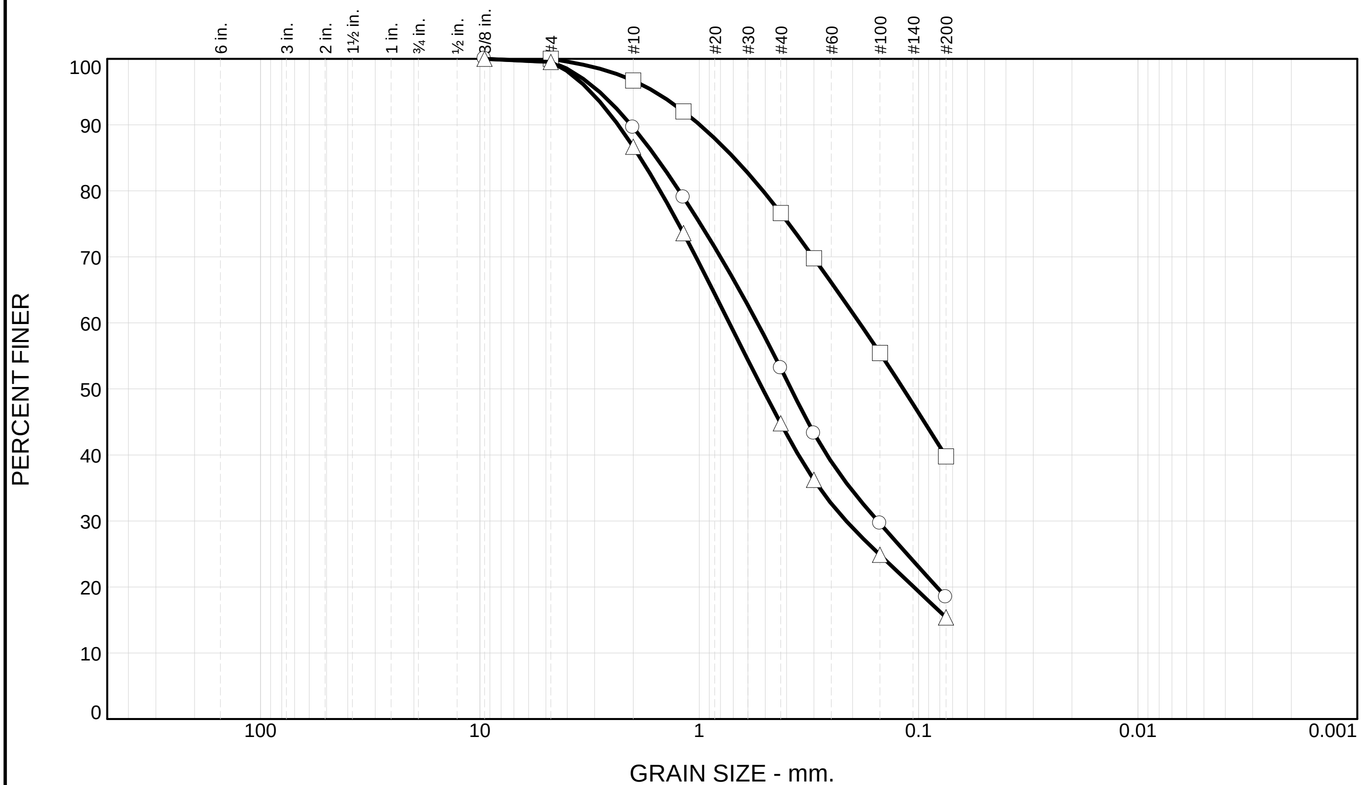
NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani

Project: US 395 Washoe City Pavement Distress

Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	0.5	81.0	18.5		SC-SM	A-2-4(0)	21	25
□	0.0	0.0	60.2	39.8		SC	A-6(3)	20	39
△	0.0	0.5	84.1	15.4		SM	A-1-b	26	27

SIEVE inches size	PERCENT FINER ○	□	△
3/8"	100.0		100.0
	GRAIN SIZE		
D_{60}	0.5427	0.1858	0.7295
D_{30}	0.1534		0.2139
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	99.5	100.0	99.5
#10	89.6	96.7	86.7
#16	79.0	92.0	73.6
#40	53.2	76.6	44.8
#50	43.3	69.8	36.2
#100	29.6	55.4	24.9
#200	18.5	39.8	15.4

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

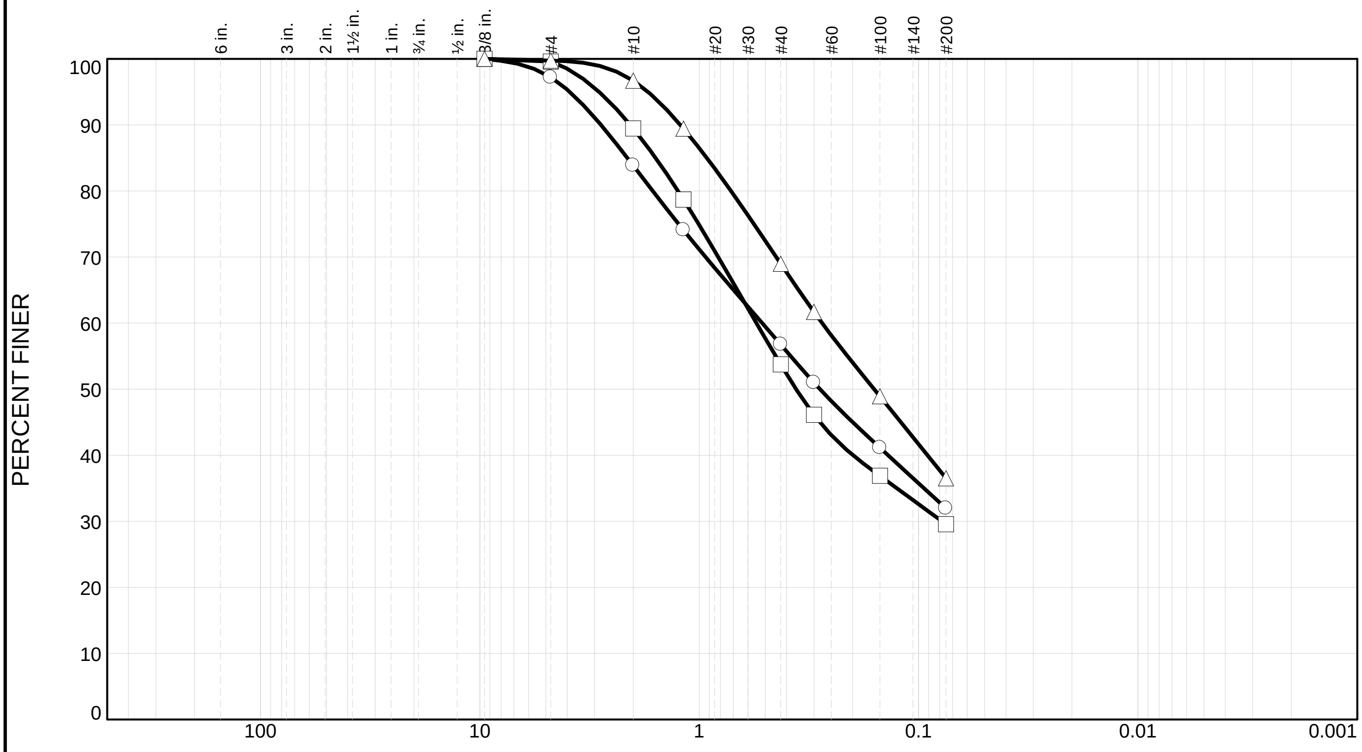
REMARKS:
○
□
△

○ Source of Sample: LBM 8 Depth: 6-7' Sample Number: C1
□ Source of Sample: LBM 8 Depth: 7-7.5' Sample Number: C2
△ Source of Sample: LBM 8 Depth: 8-9.5' Sample Number: D

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	2.8	65.2	32.0		SC	A-2-6(2)	18	39
□	0.0	0.4	70.0	29.6		SC	A-2-6(1)	17	32
△	0.0	0.3	63.2	36.5		SC	A-6(1)	17	33

SIEVE inches size	PERCENT FINER ○	□	△
3/8"	100.0	100.0	100.0
GRAIN SIZE			
D_{60}	0.5161	0.5486	0.2753
D_{30}		0.0781	
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	97.2	99.6	99.7
#10	83.8	89.5	96.7
#16	74.1	78.7	89.4
#40	56.8	53.8	69.0
#50	51.0	46.1	61.7
#100	41.1	36.9	48.9
#200	32.0	29.6	36.5

Material Description
○ clayey sand
□ clayey sand
△ clayey sand

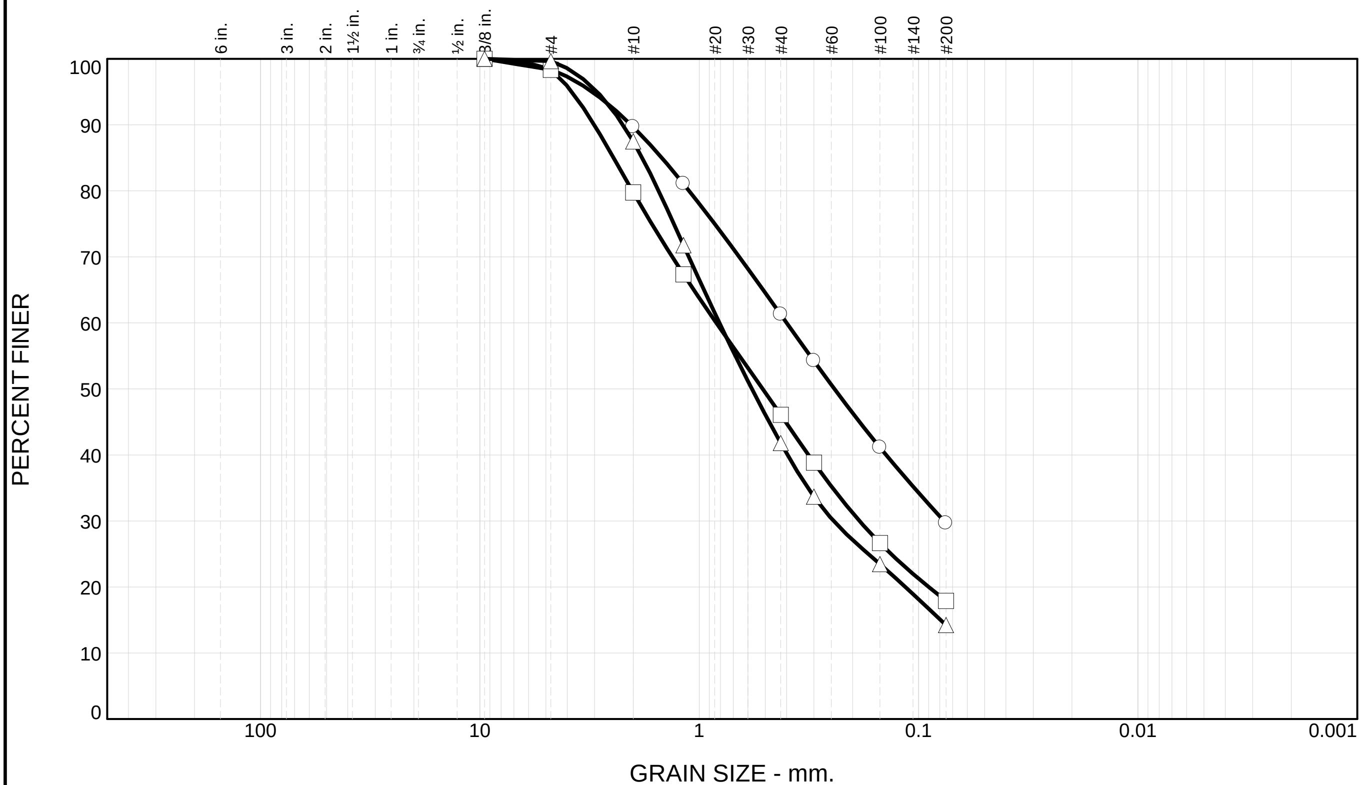
REMARKS:
○
□
△

○ Source of Sample: LBM 9 Depth: 2-3.5' Sample Number: A
□ Source of Sample: LBM 9 Depth: 4.5-5' Sample Number: B1
△ Source of Sample: LBM 9 Depth: 5-5.5' Sample Number: B2

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT / % CLAY	USCS	AASHTO	PL	LL
○	0.0	1.6	68.8	29.6	SC	A-2-6(1)	17	32
□	0.0	1.7	80.4	17.9	SC	A-2-4(0)	21	29
△	0.0	0.4	85.4	14.2	SC-SM	A-1-b	22	28

SIEVE inches size	PERCENT FINER ○	□	△
3/8"	100.0	100.0	100.0
GRAIN SIZE			
D_{60}	0.3992	0.8361	0.8090
D_{30}	0.0767	0.1859	0.2440
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	98.4	98.3	99.6
#10	89.7	79.8	87.5
#16	81.1	67.4	71.8
#40	61.3	46.1	41.8
#50	54.2	38.8	33.7
#100	41.1	26.6	23.5
#200	29.6	17.9	14.2

Material Description

○ clayey sand

□ clayey sand

△ silty, clayey sand

REMARKS:

○

□

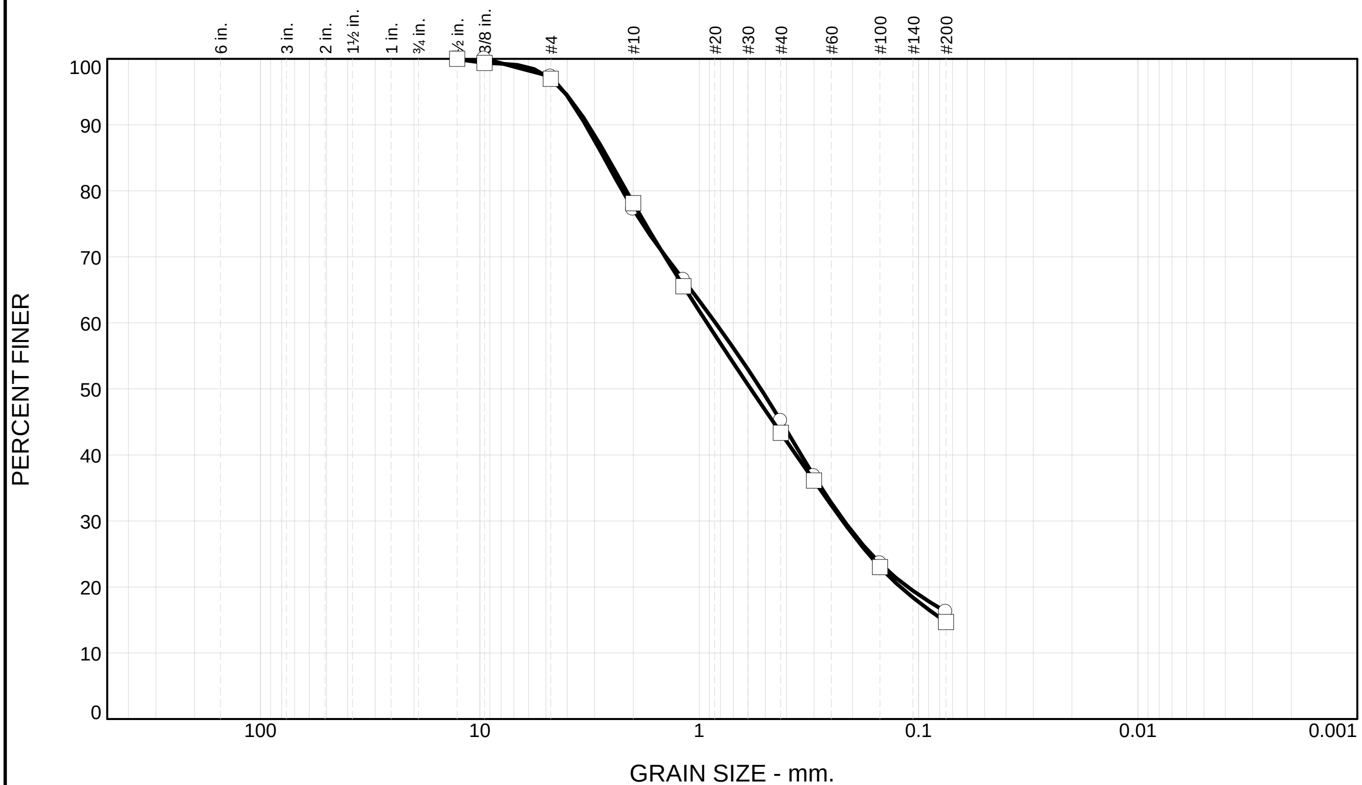
△

○ Source of Sample: LBM 9 Depth: 5.5-7' Sample Number: C
□ Source of Sample: LBM 9 Depth: 7-8.5' Sample Number: D
△ Source of Sample: LBM 9 Depth: 8.5-10' Sample Number: E

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	2.7	81.1	16.2		SC	A-2-6(0)	17	29
□	0.0	3.0	82.3	14.7		SC-SM	A-2-4(0)	20	27

SIEVE inches size	PERCENT FINER ○	PERCENT FINER □	
1/2"		100.0	
3/8"	100.0	99.4	
GRAIN SIZE			
D_{60}	0.8426	0.9217	
D_{30}	0.2186	0.2220	
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	PERCENT FINER □	
#4	97.3	97.0	
#10	77.2	78.1	
#16	66.5	65.6	
#40	45.2	43.4	
#50	36.8	36.1	
#100	23.6	23.0	
#200	16.2	14.7	

Material Description
○ clayey sand
□ silty, clayey sand

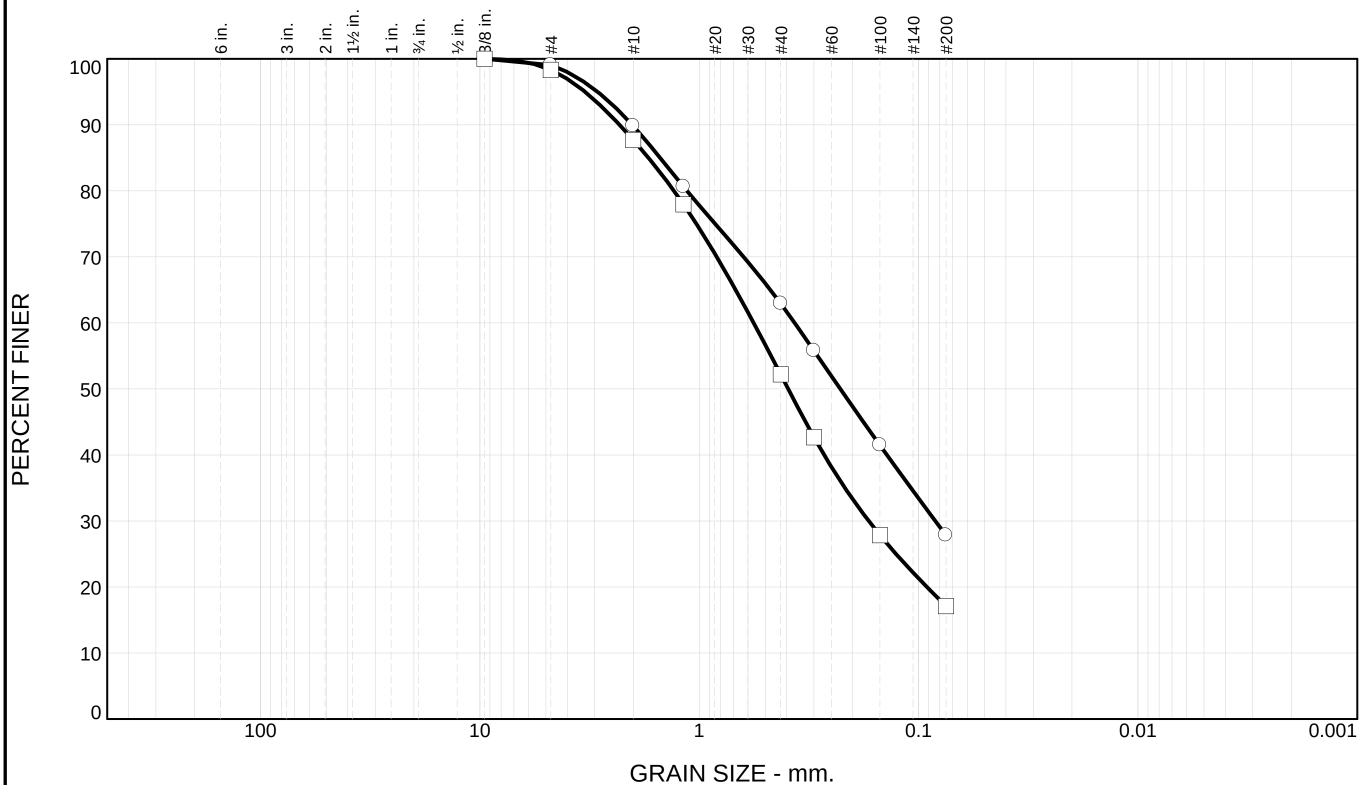
REMARKS:
○
□

○ Source of Sample: LBM 10 Depth: 4.5-5' Sample Number: B1
□ Source of Sample: LBM 10 Depth: 5-5.5' Sample Number: B2

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	1.0	71.2	27.8		SC	A-2-4(0)	20	29
□	0.0	1.7	81.2	17.1		SC-SM	A-2-4(0)	22	27

SIEVE inches size	PERCENT FINER ○	PERCENT FINER □	
3/8"	100.0	100.0	
	GRAIN SIZE		
D_{60}	0.3670	0.5645	
D_{30}	0.0839	0.1689	
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	PERCENT FINER □	
#4	99.0	98.3	
#10	89.8	87.7	
#16	80.6	78.0	
#40	62.9	52.2	
#50	55.8	42.7	
#100	41.5	27.8	
#200	27.8	17.1	

Material Description
○ clayey sand
□ silty, clayey sand

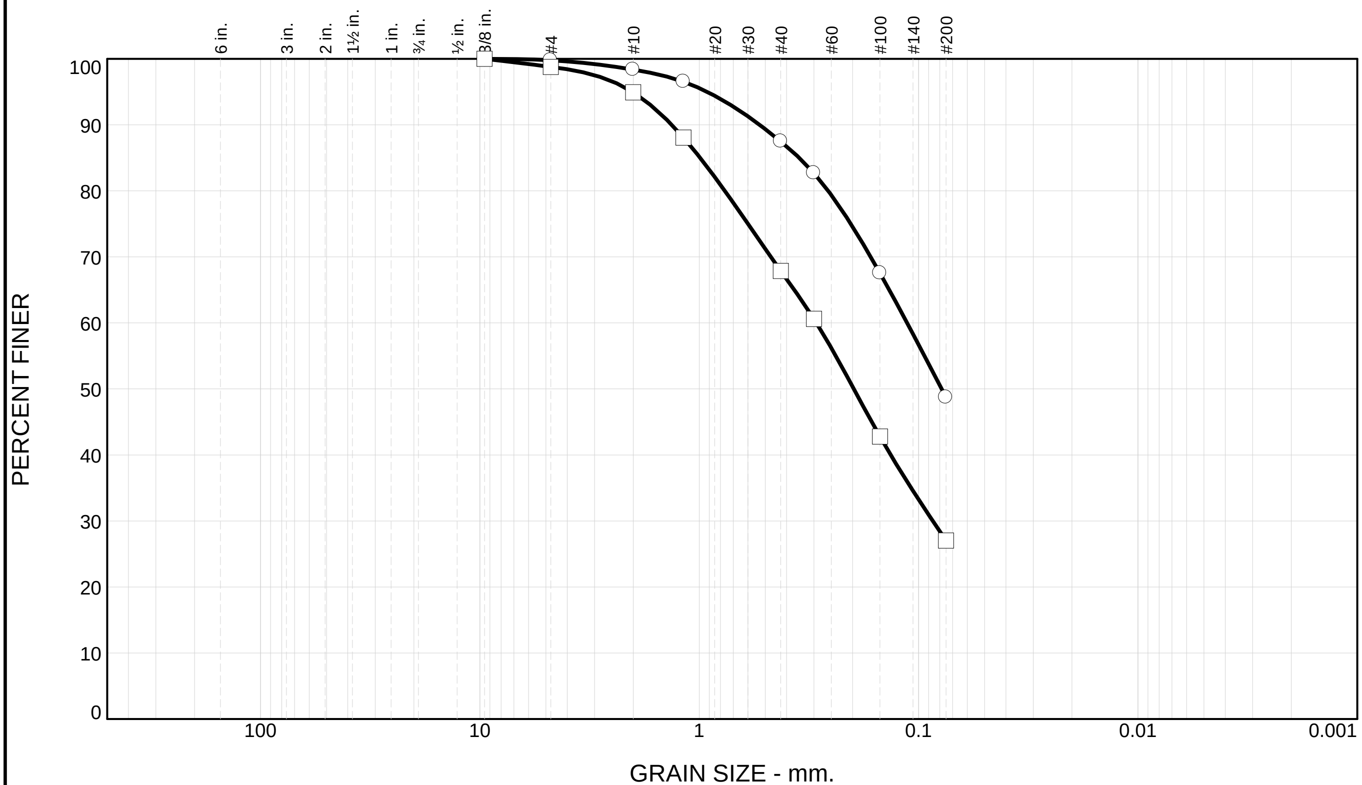
REMARKS:
○
□

○ Source of Sample: LBM 10 Depth: 5.5-7' Sample Number: C
□ Source of Sample: LBM 10 Depth: 8-9.5' Sample Number: D

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	0.2	51.1	48.7		SC	A-7-6(8)	17	42
□	0.0	1.2	71.8	27.0		SC	A-2-6(1)	18	33

SIEVE inches size	PERCENT FINER ○	PERCENT FINER □	
3/8"	100.0	100.0	
GRAIN SIZE			
D_{60}	0.1128	0.2921	
D_{30}		0.0861	
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	PERCENT FINER □	
#4	99.8	98.8	
#10	98.4	94.9	
#16	96.5	88.1	
#40	87.5	67.9	
#50	82.7	60.6	
#100	67.5	42.8	
#200	48.7	27.0	

Material Description
○ clayey sand
□ clayey sand

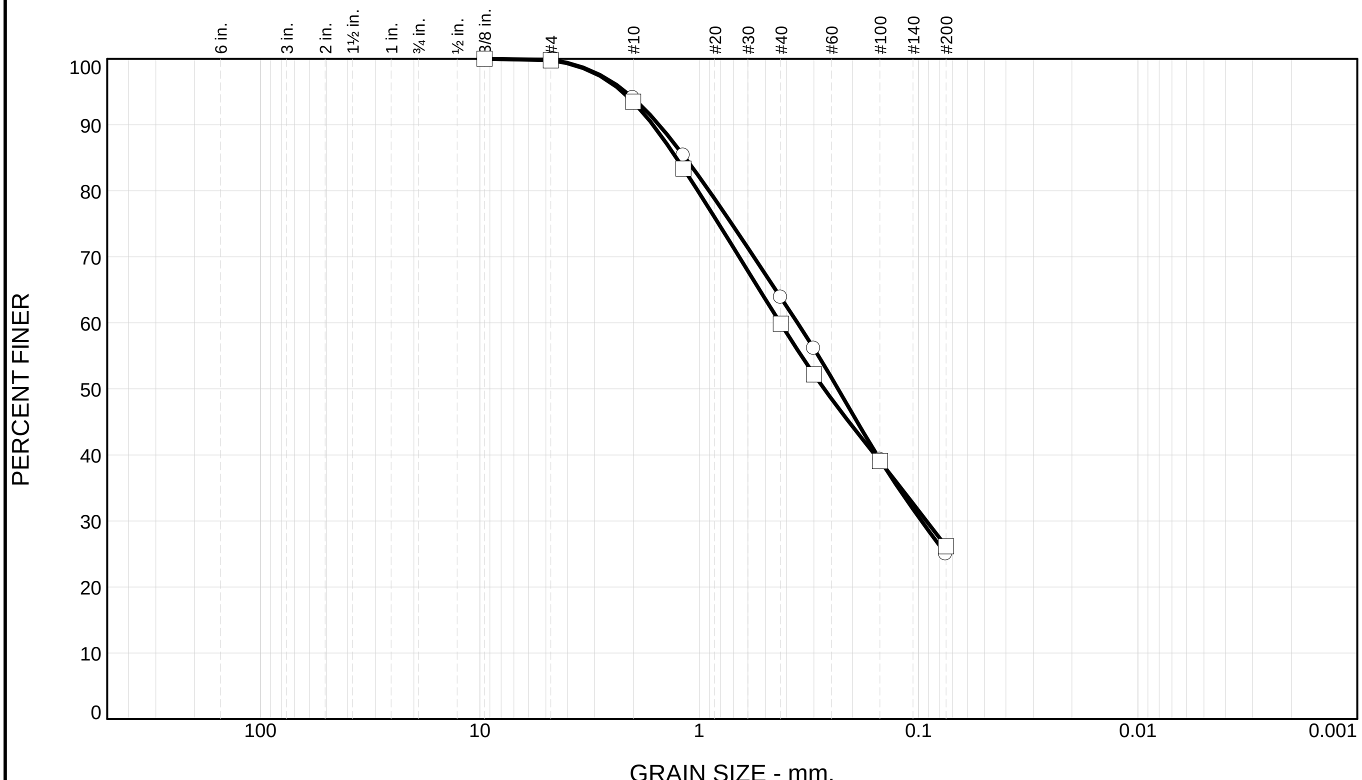
REMARKS:
○
□

○ Source of Sample: LBM 11 Depth: 4.5-5' Sample Number: B1
□ Source of Sample: LBM 11 Depth: 5-5.5' Sample Number: B2

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	0.1	74.9	25.0		SC-SM	A-2-4(0)	21	28
□	0.0	0.2	73.6	26.2		SC	A-2-4(0)	20	28

SIEVE inches size	PERCENT FINER ○	PERCENT FINER □	
3/8"	100.0	100.0	

	GRAIN SIZE ○	GRAIN SIZE □	
D_{60}	0.3563	0.4273	
D_{30}	0.0969	0.0920	
D_{10}			

	COEFFICIENTS ○	COEFFICIENTS □	
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	PERCENT FINER □	
#4	99.9	99.8	
#10	94.1	93.5	
#16	85.4	83.4	
#40	63.8	59.9	
#50	56.1	52.2	
#100	39.3	39.1	
#200	25.0	26.2	

Material Description

○ silty, clayey sand

□ clayey sand

REMARKS:

○

□

○ Source of Sample: LBM 11 Depth: 5.5-7' Sample Number: C

□ Source of Sample: LBM 11 Depth: 8-9.5' Sample Number: D

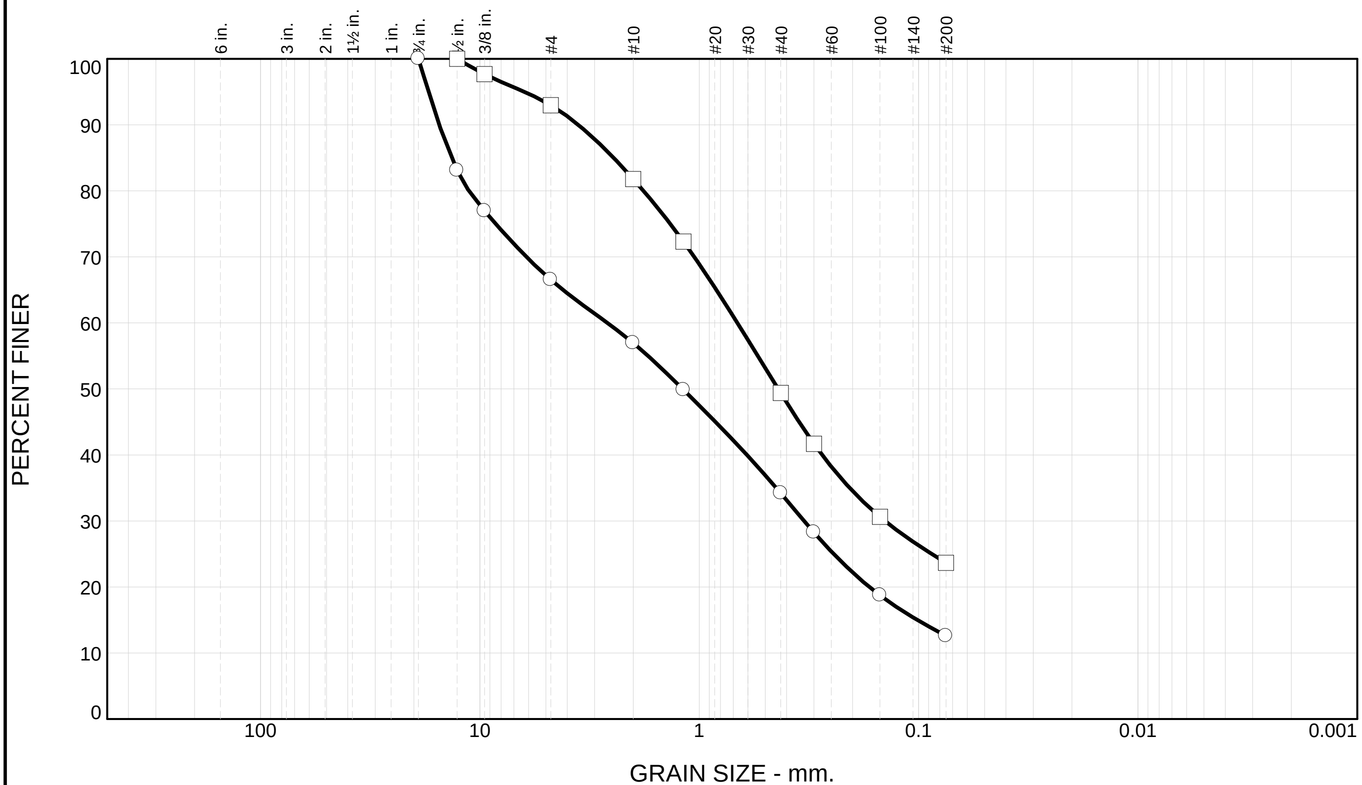
NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani

Project: US 395 Washoe City Pavement Distress

Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	33.5	53.9	12.6		SM	A-1-b	NP	
□	0.0	7.0	69.3	23.7					

SIEVE inches size	PERCENT FINER ○	□	
3/4"	100.0		
1/2"	83.1	100.0	
3/8"	77.0	97.7	
	GRAIN SIZE		
D_{60}	2.6243	0.6702	
D_{30}	0.3326	0.1424	
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	
#4	66.5	93.0	
#10	57.0	81.8	
#16	49.9	72.3	
#40	34.2	49.4	
#50	28.3	41.7	
#100	18.7	30.6	
#200	12.6	23.7	

Material Description
○ silty sand with gravel
□

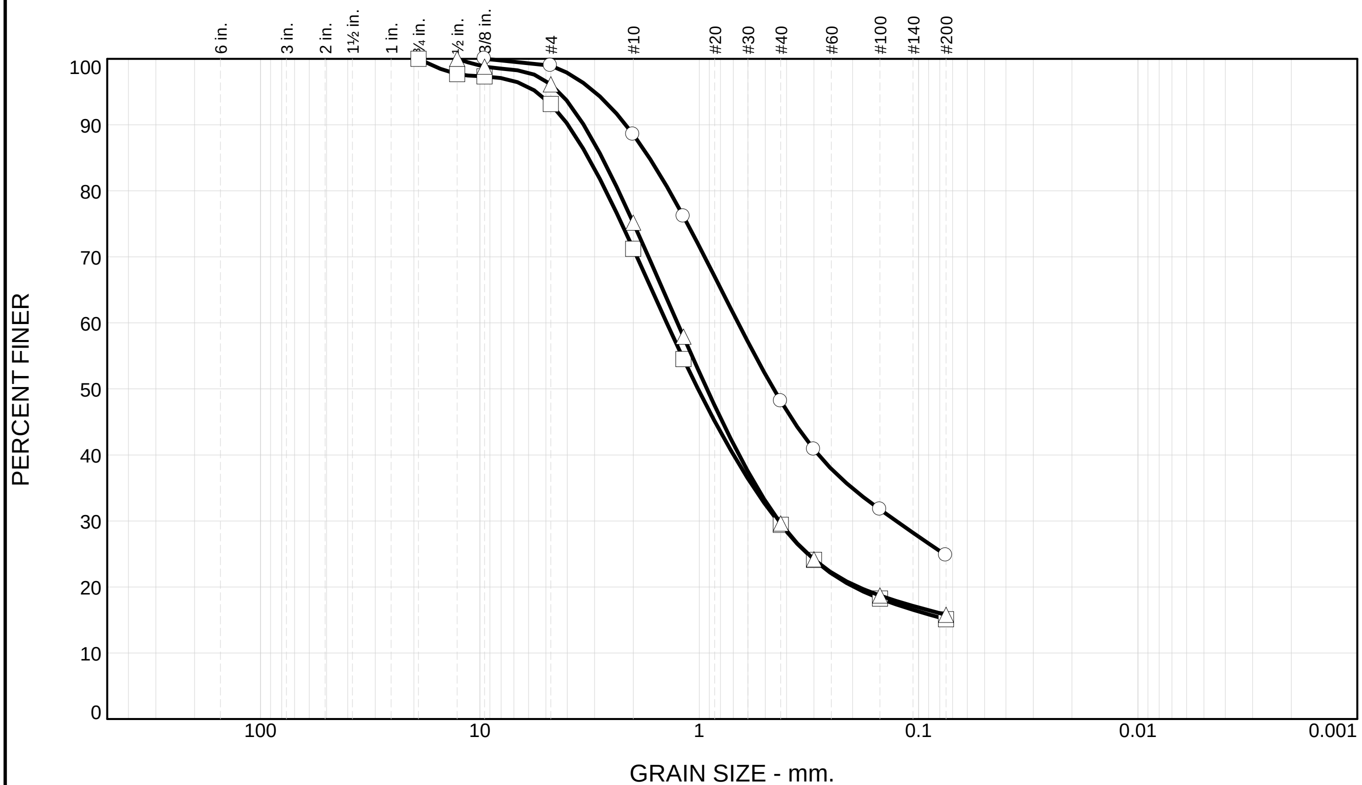
REMARKS:
○
□

○ Source of Sample: LBM 12 Depth: 2-3' Sample Number: A1
□ Source of Sample: LBM 12 Depth: 3-3.5' Sample Number: A2

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	1.0	74.2	24.8		SC	A-2-7(1)	17	41
□	0.0	6.8	78.1	15.1		SC	A-2-6(0)	16	40
△	0.0	3.9	80.3	15.8					

SIEVE inches size	PERCENT FINER ○	□	△
3/4"		100.0	
1/2"		97.7	100.0
3/8"	100.0	97.3	98.8
GRAIN SIZE			
D_{60}	0.6650	1.4074	1.2575
D_{30}	0.1264	0.4390	0.4335
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	99.0	93.2	96.1
#10	88.6	71.2	75.2
#16	76.1	54.5	57.9
#40	48.2	29.4	29.6
#50	40.8	24.1	24.2
#100	31.8	18.2	18.7
#200	24.8	15.1	15.8

Material Description
○ clayey sand
□ clayey sand
△

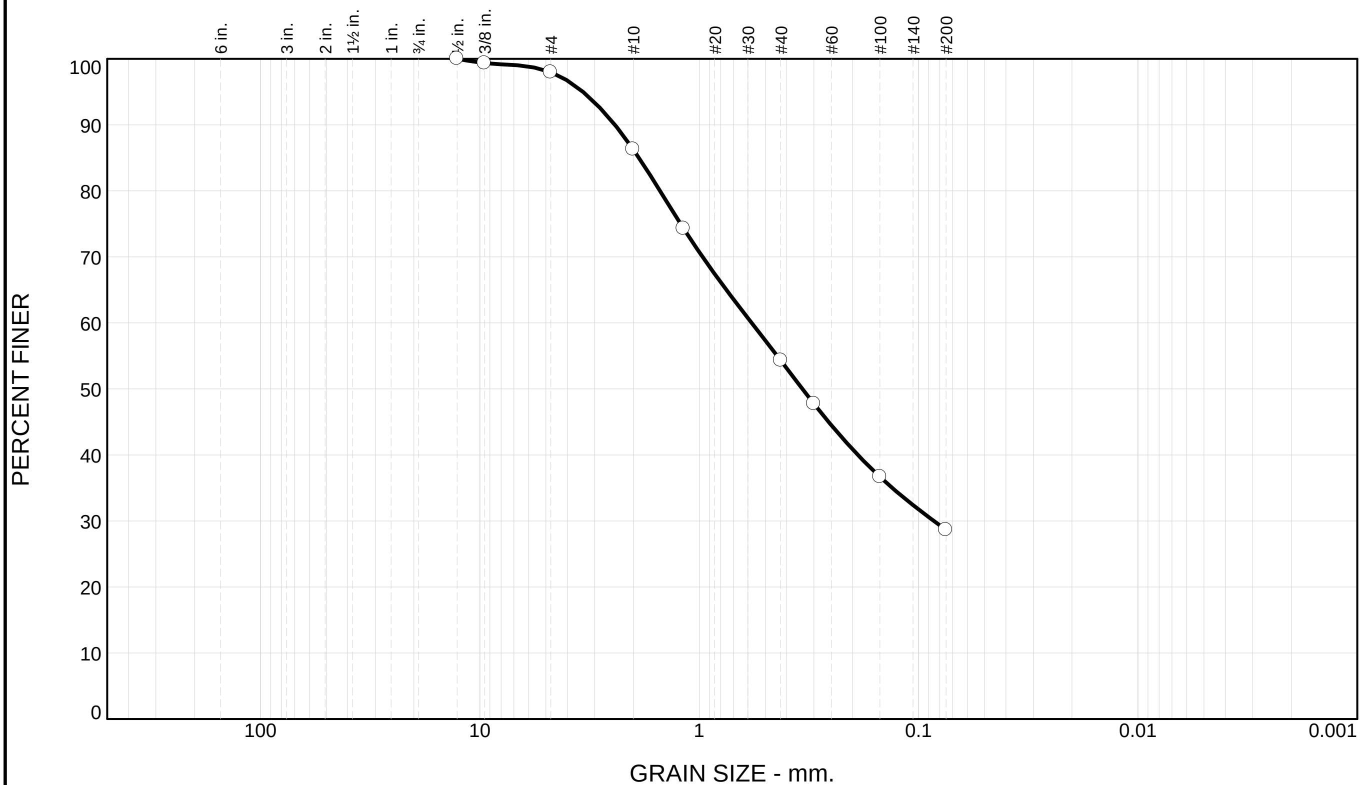
REMARKS:
○
□
△

○ Source of Sample: LBM 12 Depth: 4.5-5' Sample Number: B1
□ Source of Sample: LBM 12 Depth: 5-5.5' Sample Number: B2
△ Source of Sample: LBM 12 Depth: 5.5-5.8' Sample Number: B3

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani
Project: US 395 Washoe City Pavement Distress
Project No.: FL-3-08 Figure

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	2.0	69.4	28.6		SC	A-2-6(1)	20	40

SIEVE inches size	PERCENT FINER ○		
1/2"	100.0		
3/8"	99.3		
	GRAIN SIZE		
D_{60}	0.5767		
D_{30}	0.0852		
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○		
#4	98.0		
#10	86.3		
#16	74.3		
#40	54.3		
#50	47.7		
#100	36.7		
#200	28.6		

Material Description

○ clayey sand

REMARKS:

○

○ Source of Sample: LBM 12 Depth: 5.8-7' Sample Number: C

NEVADA DEPARTMENT OF TRANSPORTATION

Client: A.Ablahani

Project: US 395 Washoe City Pavement Distress

Project No.: FL-3-08 Figure

LINE SAMPLING DATA

Date Reported: **07/24/08**
Lab No.: **Soils 06-08, RV-236-08, C-312-08**
E.A.: **9100** Job Description: **US 395 (WASHOE VALLEY)**
Date Rec'd **06/19/08**
Samplers: **Hinton, Geary, Blake** Station **NORTH BOUND** Route **US 395**
Location from C/L (ft) Lt. ____ Rt. **7**
Sample No.: **LBM 1** County: **WASHOE**

Sample Type: RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐
Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐
Cut Section ■ Fill Section ☐
Taken Through Oil ■ Taken on Shoulder ☐
Gravel Depth (in) **7** Oil Depth (in) **7**
Remarks: FROM 3.5 TO 6 FEET WE COULD NOT DRIVE THE SAMPLER MORE THAN 1 INCH WITH 50 BLOWS.

Submitted By: **O. ALTAMIRANO**
Title: **ENGR. TECH III**

Depth (ft)	Boring Description	PSI
0--		0--
2--		2--
4--	Refusal (Bedrock Outcrop) (from 2 to 6 ft)	4--
6--		6--
8--		8--
10--		10--
12--		12--
14--		14--
16--		16--
18--		18--
20--		20--

Sieve Size	% Passing
3"	
2"	
1.5"	
1"	**100**
3/4"	**97**
1/2"	**94**
3/8"	**91**
No. 4	**82**
No. 10	**69**
No. 16	**60**
No. 40	**44**
No. 50	**39**
No. 100	**31**
No. 200	**25**

Liquid Limit **19**
Plastic Index **1**
Specific Gravity
Resistance Value **78**
Cover Thickness — Stabilometer **4.5** — Expansion Pressure ____

Sand Equivalent **44**
Natural Moisture, %
Resistivity **3,049**
pH Factor **8.0**
HRB Classification

Remarks:

NDOT 027, Rev. 05-01

LINE SAMPLING DATA

Date Reported: **07/24/08**

Lab No.: **Soils 06-08, RV-237-08, C-313-08**

E.A.: **9100** Job Description: **US 395 (WASHOE VALLEY)**

Date Rec'd **06/19/08**

Samplers: **Hinton, Geary, Blake** Station **NORTH BOUND** Route **US 395**

Location from C/L (ft) Lt. ____ Rt. **7**

Sample No.: **LBM 2** County: **WASHOE**

Sample Type:

RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐

Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐

Cut Section ☐ Fill Section ■

Taken Through Oil ■ Taken on Shoulder ☐

Gravel Depth (in) **4** Oil Depth (in) **9**

Remarks:

Submitted By: **O. ALTAMIRANO**

Title: **ENGR. TECH III**

Depth (ft)	Boring Description	PSI
0--		0--
2--	Brown Silty Sand (2–6 ft)	2--
4--		4--
6--		6--
8--		8--
10--		10--
12--		12--
14--		14--
16--		16--
18--		18--
20--		20--

Sieve Size	% Passing
3"	
2"	
1.5"	**100**
1"	**95**
3/4"	**95**
1/2"	**87**
3/8"	**85**
No. 4	**78**
No. 10	**69**
No. 16	**62**
No. 40	**43**
No. 50	**37**
No. 100	**27**
No. 200	**20**

Liquid Limit **22**

Plastic Index **3**

Specific Gravity

Resistance Value **72**

Cover Thickness — Stabilometer **6.8** — Expansion Pressure ____

Sand Equivalent **21**

Natural Moisture, %

Resistivity **2,740**

pH Factor **7.1**

HRB Classification

Remarks:

NDOT 027, Rev. 05-01

LINE SAMPLING DATA

Date Reported: **07/24/08**

Lab No.: **Soils 06-08, RV-238-08, C-314-08**

E.A.: **9100** Job Description: **US 395 (WASHOE VALLEY)**

Date Rec'd **06/19/08**

Samplers: **Hinton, Geary, Blake** Station **NORTH BOUND** Route **US 395**

Location from C/L (ft) Lt. ______ Rt. **7**

Sample No.: **LBM 3** County: **WASHOE**

Sample Type:

RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐

Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐

Cut Section ☐ Fill Section ■

Taken Through Oil ■ Taken on Shoulder ☐

Gravel Depth (in) **7** Oil Depth (in) **7**

Remarks:

Submitted By: **O. ALTAMIRANO**

Title: **ENGR. TECH III**

Depth (ft)	Boring Description	PSI
0--		0--
2--	Silty Sand (2–6 ft)	2--
4--		4--
6--		6--
8--		8--
10--		10--
12--		12--
14--		14--
16--		16--
18--		18--
20--		20--

Sieve Size	% Passing
3"	
2"	
1.5"	
1"	
3/4"	**100**
1/2"	**98**
3/8"	**95**
No. 4	**86**
No. 10	**76**
No. 16	**69**
No. 40	**45**
No. 50	**37**
No. 100	**24**
No. 200	**18**

Liquid Limit **22**

Plastic Index **2**

Specific Gravity

Resistance Value **73**

Cover Thickness — Stabilometer **6.4** — Expansion Pressure ______

Sand Equivalent **26**

Natural Moisture, %

Resistivity **3,290**

pH Factor **7.2**

HRB Classification

Remarks:

NDOT 027, Rev. 05-01

LINE SAMPLING DATA

Date Reported: **07/24/08**
Lab No.: **Soils 06-08,**
E.A.: **9100**
Job Description: **US 395 (WASHOE VALLEY)**
Date Rec'd **06/19/08**
Samplers: **Hinton, Geary, Altamirano**
Station **SOUTH BOUND**
Route **US 395**
Location from C/L (ft) Lt. **6** Rt.
Sample No.: **LBM 4**
County: **WASHOE**

Sample Type: RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐

Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐

Cut Section ■ Fill Section ☐

Taken Through Oil ■ Taken on Shoulder ☐

Gravel Depth (in) **10** Oil Depth (in) **7**

Remarks:

Submitted By: **O. ALTAMIRANO**
Title: **ENGR. TECH III**

Depth (ft)	Boring Description	PSI
0--		0--
2--	Silt, Sand, Lt Gravel (2–6)	2--
4--		4--
6--		6--
8--		8--
10--		10--
12--		12--
14--		14--
16--		16--
18--		18--
20--		20--

Sieve Size	% Passing
3"	
2"	
1.5"	**100**
1"	**99**
3/4"	**99**
1/2"	**91**
3/8"	**89**
No. 4	**81**
No. 10	**70**
No. 16	**62**
No. 40	**45**
No. 50	**38**
No. 100	**28**
No. 200	**20**

Liquid Limit **24**
Plastic Index **3**
Specific Gravity
Resistance Value **78**

Cover	Stabilometer	Expansion Pressure
Thickness	**4.5**	

Sand Equivalent **24**
Natural Moisture, %
Resistivity **1,934**
pH Factor **10.2**
HRB Classification

Remarks:

LINE SAMPLING DATA

Date Reported: **07/24/08**

Lab No.: **Soils 06-08, RV-240-08, C-316-08**

E.A.: **9100**   Job Description: **US 395 (WASHOE VALLEY)**

Date Rec'd **06/19/08**

Samplers: **Hinton, Geary, Altamirano**   Station **SOUTH BOUND**   Route **US 395**

Location from C/L (ft)   Lt. **6**   Rt.

Sample No.: **LBM 4B**   County: **WASHOE**

Sample Type: RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐

Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐

Cut Section ■   Fill Section ☐

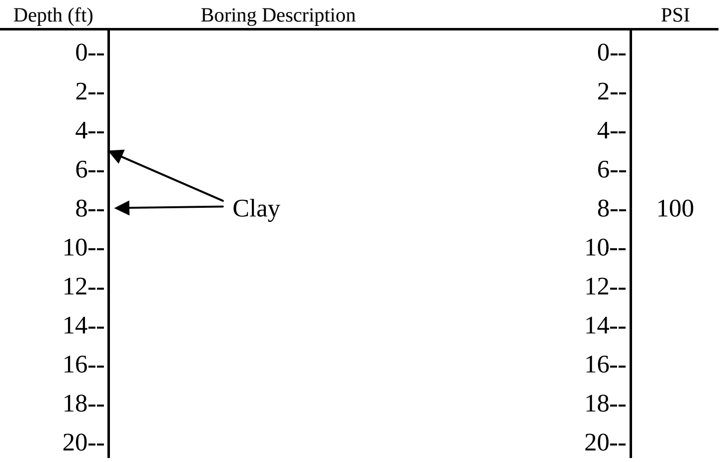
Taken Through Oil ■   Taken on Shoulder ☐

Gravel Depth (in) **10**   Oil Depth (in) **7**

Remarks:

Submitted By: **O. ALTAMIRANO**

Title: **ENGR. TECH III**



Sieve Size	% Passing
3"	
2"	
1.5"	
1"	**100**
3/4"	**96**
1/2"	**96**
3/8"	**96**
No. 4	**95**
No. 10	**93**
No. 16	**91**
No. 40	**81**
No. 50	**77**
No. 100	**69**
No. 200	**60**

Liquid Limit **39**

Plastic Index **16**

Specific Gravity

Resistance Value **29**

Cover Thickness: Stabilometer **23.0**   Expansion Pressure

Sand Equivalent **9**

Natural Moisture, %

Resistivity **1,821**

pH Factor **8.4**

HRB Classification

Remarks:

NDOT 027, Rev. 05-01

LINE SAMPLING DATA

Date Reported: **07/24/08**

Lab No.: **Soils 06-08, RV-241-08, C-317-08**

E.A.: **9100** Job Description: **US 395 (WASHOE VALLEY)**

Date Rec'd **06/19/08**

Samplers: **Hinton, Geary, Altamirano** Station **SOUTH BOUND** Route **US 395**

Location from C/L (ft) Lt. **7** Rt.

Sample No.: **LBM 5** County: **WASHOE**

Sample Type:

RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐

Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐

Cut Section ■ Fill Section ☐

Taken Through Oil ■ Taken on Shoulder ☐

Gravel Depth (in) **11** Oil Depth (in) **7**

Remarks: WATER AT 5 FEET

Submitted By: **O. ALTAMIRANO**

Title: **ENGR. TECH III**

Depth (ft)	Boring Description		PSI
0--		0--	
2--	Silty Sand (2–4 ft)	2--	
4--		4--	
6--		6--	
8--		8--	100
10--		10--	
12--		12--	
14--		14--	
16--		16--	
18--		18--	
20--		20--	

Sieve Size	% Passing
3"	
2"	
1.5"	
1"	
3/4"	
1/2"	
3/8"	**100**
No. 4	**98**
No. 10	**92**
No. 16	**85**
No. 40	**66**
No. 50	**59**
No. 100	**46**
No. 200	**34**

Liquid Limit **26**

Plastic Index **10**

Specific Gravity

Resistance Value **18**

Cover Thickness — Stabilometer **27.1** — Expansion Pressure

Sand Equivalent **15**

Natural Moisture, %

Resistivity **2,532**

pH Factor **7.9**

HRB Classification

Remarks:

LINE SAMPLING DATA

Date Reported: **07/24/08**
Lab No.: **Soils 06-08, RV-242-08, C-318-08**
E.A.: **9100** Job Description: **US 395 (WASHOE VALLEY)**
Date Rec'd **06/19/08**
Samplers: **Hinton, Geary, Altamirano** Station **SOUTH BOUND** Route **US 395**
Location from C/L (ft) Lt. **7** Rt.
Sample No.: **LBM 5B** County: **WASHOE**

Sample Type: RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐

Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐

Cut Section ■ Fill Section ☐

Taken Through Oil ■ Taken on Shoulder ☐

Gravel Depth (in) **11** Oil Depth (in) **7**

Remarks: POSSIBLY AN ACTIVE AQUAFER AT THESE DEPTHS.

Submitted By: **O. ALTAMIRANO**
Title: **ENGR. TECH III**

Depth (ft)	Boring Description	Depth (ft)	PSI
0--		0--	0
2--		2--	
4--		4--	
6--	Clay (Water) (6–10 ft)	6--	
8--		8--	
10--		10--	
12--		12--	
14--		14--	
16--		16--	
18--		18--	
20--		20--	

Sieve Size	% Passing
3"	
2"	
1.5"	
1"	
3/4"	**100**
1/2"	**96**
3/8"	**96**
No. 4	**95**
No. 10	**93**
No. 16	**89**
No. 40	**74**
No. 50	**68**
No. 100	**53**
No. 200	**38**

Liquid Limit **34**
Plastic Index **17**
Specific Gravity
Resistance Value **32**
Cover Thickness: Stabilometer **21.8**; Expansion Pressure

Sand Equivalent **9**
Natural Moisture, %
Resistivity **2,381**
pH Factor **7.5**
HRB Classification

Remarks:

NDOT 027, Rev. 05-01

LINE SAMPLING DATA

Date Reported: **07/24/08**
Lab No.: **Soils 06-08, RV-243-08, C-319-08**
E.A.: **9100** Job Description: **US 395 (WASHOE VALLEY)**
Date Rec'd **06/19/08**
Samplers: **Hinton, Geary, Altamirano** Station **SOUTH BOUND** Route **US 395**
Location from C/L (ft) Lt. **7** Rt.
Sample No.: **LBM 6** County: **WASHOE**

Sample Type: RV ■ Sub □ Chem □ DC □ Other □

Vegetation: None ■ Trees □ Shrubs □ Brushy □ Grassy □

Cut Section ■ Fill Section □
Taken Through Oil ■ Taken on Shoulder □
Gravel Depth (in) **11** Oil Depth (in) **7**
Remarks: WATER AT 8 FEET DEPTHS.

Submitted By: **O. ALTAMIRANO**
Title: **ENGR. TECH III**

Depth (ft)	Boring Description		PSI
0--		0--	0
2--		2--	
4--	Silt, Sand, Lt Gravel (2-- to 4--)	4--	
6--		6--	
8--		8--	
10--		10--	
12--		12--	
14--		14--	
16--		16--	
18--		18--	
20--		20--	

Sieve Size	% Passing
3"	
2"	
1.5"	
1"	**100**
3/4"	**97**
1/2"	**97**
3/8"	**96**
No. 4	**93**
No. 10	**86**
No. 16	**79**
No. 40	**62**
No. 50	**56**
No. 100	**44**
No. 200	**31**

Liquid Limit **22**
Plastic Index **5**
Specific Gravity
Resistance Value **28**
Cover Thickness — Stabilometer **23.3** — Expansion Pressure

Sand Equivalent **16**
Natural Moisture, %
Resistivity **4,673**
pH Factor **7.2**
HRB Classification

Remarks:

LINE SAMPLING DATA

Date Reported: **07/24/08**

Lab No.: **Soils 06-08, RV-244-08, C-320-08**

E.A.: **9100** Job Description: **US 395 (WASHOE VALLEY)**

Date Rec'd **06/19/08**

Samplers: **Hinton, Geary, Altamirano** Station **SOUTH BOUND** Route **US 395**

Location from C/L (ft) Lt. **7** Rt.

Sample No.: **LBM 6B** County: **WASHOE**

Sample Type:

RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐

Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐

Cut Section ■ Fill Section ☐

Taken Through Oil ■ Taken on Shoulder ☐

Gravel Depth (in) **11** Oil Depth (in) **7**

Remarks: WATER AT 8 FEET DEPTHS.

Submitted By: **O. ALTAMIRANO**

Title: **ENGR. TECH III**

Depth (ft)	Boring Description		PSI
0--		0--	0
2--		2--	
4--	Moist Clay (4–8 ft)	4--	
6--		6--	
8--		8--	
10--		10--	
12--		12--	
14--		14--	
16--		16--	
18--		18--	
20--		20--	

Sieve Size	% Passing
3"	
2"	
1.5"	
1"	
3/4"	
1/2"	
3/8"	**100**
No. 4	**99**
No. 10	**96**
No. 16	**91**
No. 40	**74**
No. 50	**68**
No. 100	**53**
No. 200	**38**

Liquid Limit **29**

Plastic Index **10**

Specific Gravity

Resistance Value **18**

Cover Thickness — Stabilometer **27.1** — Expansion Pressure

Sand Equivalent **11**

Natural Moisture, %

Resistivity **5,666**

pH Factor **7.0**

HRB Classification

Remarks:

NDOT 027, Rev. 05-01

LINE SAMPLING DATA

Date Reported: **07/24/08**
Lab No.: **Soils 06-08, RV-245-08, C-321-08**
E.A.: **9100**
Job Description: **US 395 (WASHOE VALLEY)**
Date Rec'd **06/19/08**
Samplers: **Blake, Geary, Altamirano**
Station **SOUTH BOUND**
Route **US 395**
Location from C/L (ft) Lt. **8** Rt.
Sample No.: **LBM 7**
County: **WASHOE**

Sample Type: RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐

Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐

Cut Section ☐ Fill Section ☐

Taken Through Oil ■ Taken on Shoulder ☐

Gravel Depth (in) **11** Oil Depth (in) **7**

Remarks: WATER AT 8 FEET DEPTHS.

Submitted By: **O. ALTAMIRANO**
Title: **ENGR. TECH III**

Depth (ft)	Boring Description	Depth (ft)	PSI
0--		0--	0
2--	Clay & Sand (2–4)	2--	
4--		4--	
6--		6--	
8--		8--	
10--		10--	
12--		12--	
14--		14--	
16--		16--	
18--		18--	
20--		20--	

Sieve Size	% Passing
3"	
2"	
1.5"	**100**
1"	**97**
3/4"	**97**
1/2"	**97**
3/8"	**94**
No. 4	**87**
No. 10	**79**
No. 16	**71**
No. 40	**53**
No. 50	**48**
No. 100	**39**
No. 200	**30**

Liquid Limit **30**
Plastic Index **14**
Specific Gravity
Resistance Value **19**

Cover Thickness: Stabilometer **26.7** Expansion Pressure

Sand Equivalent **15**
Natural Moisture, %
Resistivity **3,333**
pH Factor **7.3**
HRB Classification

Remarks:

NDOT 027, Rev. 05-01

LINE SAMPLING DATA

Date Reported: **07/24/08**
Lab No.: **Soils 06-08, RV-246-08, C-322-08**
E.A.: **9100** Job Description: **US 395 (WASHOE VALLEY)**
Date Rec'd **06/19/08**
Samplers: **Blake, Geary, Altamirano** Station **SOUTH BOUND** Route **US 395**
Location from C/L (ft) Lt. **8** Rt.
Sample No.: **LBM 7B** County: **WASHOE**

Sample Type: RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐
Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐
Cut Section ☐ Fill Section ☐
Taken Through Oil ■ Taken on Shoulder ☐
Gravel Depth (in) **11** Oil Depth (in) **7**
Remarks: WATER AT 8 FEET DEPTHS.

Submitted By: **O. ALTAMIRANO**
Title: **ENGR. TECH III**

Depth (ft)	Boring Description	Depth (ft)	PSI
0--		0--	
2--		2--	
4--		4--	
6--	Silt & Sand (6 to 8)	6--	100
8--		8--	
10--		10--	
12--		12--	
14--		14--	
16--		16--	
18--		18--	
20--		20--	

Sieve Size	% Passing
3"	
2"	
1.5"	**100**
1"	**95**
3/4"	**92**
1/2"	**89**
3/8"	**88**
No. 4	**82**
No. 10	**72**
No. 16	**65**
No. 40	**48**
No. 50	**43**
No. 100	**32**
No. 200	**24**

Liquid Limit **23**
Plastic Index **4**
Specific Gravity
Resistance Value **22**
Cover Thickness — Stabilometer **25.6** — Expansion Pressure

Sand Equivalent **18**
Natural Moisture, %
Resistivity **2,604**
pH Factor **7.5**
HRB Classification

Remarks:

NDOT 027, Rev. 05-01

LINE SAMPLING DATA

Date Reported: **07/24/08**
Lab No.: **Soils 06-08, RV-247-08, C-323-08**
E.A.: **9100** Job Description: **US 395 (WASHOE VALLEY)**
Date Rec'd **06/19/08**
Samplers: **Blake, Geary, Altamirano** Station **SOUTH BOUND** Route **US 395**
Location from C/L (ft) Lt. **8** Rt.
Sample No.: **LBM 8** County: **WASHOE**

Sample Type:
RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐

Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐

Cut Section ☐ Fill Section ☐
Taken Through Oil ■ Taken on Shoulder ☐
Gravel Depth (in) **18** Oil Depth (in) **8**
Remarks:
DEPTHS.

Submitted By: **O. ALTAMIRANO**
Title: **ENGR. TECH III**

Depth (ft)	Boring Description		PSI
0--		0--	
2--	Silt, Sand & Gravel (2–4)	2--	
4--		4--	100
6--		6--	
8--		8--	
10--		10--	
12--		12--	
14--		14--	
16--		16--	
18--		18--	
20--		20--	

Sieve Size	% Passing
3"	
2"	
1.5"	**100**
1"	**99**
3/4"	**99**
1/2"	**96**
3/8"	**95**
No. 4	**93**
No. 10	**88**
No. 16	**79**
No. 40	**54**
No. 50	**48**
No. 100	**39**
No. 200	**31**

Liquid Limit **29**
Plastic Index **14**
Specific Gravity
Resistance Value **57**
Cover Thickness — Stabilometer **12.4** — Expansion Pressure

Sand Equivalent **17**
Natural Moisture, %
Resistivity **2,273**
pH Factor **7.0**
HRB Classification

Remarks:

LINE SAMPLING DATA

Date Reported: **07/24/08**
Lab No.: **Soils 06-08, RV-248-08, C-324-08**
E.A.: **9100** Job Description: **US 395 (WASHOE VALLEY)**
Date Rec'd **06/19/08**
Samplers: **Blake, Geary, Altamirano** Station **SOUTH BOUND** Route **US 395**
Location from C/L (ft) Lt. **8** Rt.
Sample No.: **LBM 8B** County: **WASHOE**

Sample Type:
RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐

Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐

Cut Section ☐ Fill Section ☐
Taken Through Oil ■ Taken on Shoulder ☐
Gravel Depth (in) **18** Oil Depth (in) **8**
Remarks:
DEPTHS.

Submitted By: **O. ALTAMIRANO**
Title: **ENGR. TECH III**

Depth (ft)	Boring Description	Depth (ft)	PSI
0--		0--	
2--		2--	
4--		4--	
6--	Silty Sand (6-- to 8--)	6--	100
8--		8--	
10--		10--	
12--		12--	
14--		14--	
16--		16--	
18--		18--	
20--		20--	

Sieve Size	% Passing
3"	
2"	
1.5"	
1"	
3/4"	
1/2"	
3/8"	**100**
No. 4	**99**
No. 10	**91**
No. 16	**82**
No. 40	**61**
No. 50	**54**
No. 100	**41**
No. 200	**31**

Liquid Limit **27**
Plastic Index **11**
Specific Gravity
Resistance Value **38**
Cover Thickness — Stabilometer **19.6** — Expansion Pressure

Sand Equivalent **16**
Natural Moisture, %
Resistivity **2,793**
pH Factor **7.2**
HRB Classification

Remarks:

NDOT 027, Rev. 05-01

LINE SAMPLING DATA

Date Reported: **07/24/08**

Lab No.: **Soils 06-08, RV-249-08, C-325-08**

E.A.: **9100** | Job Description: **US 395 (WASHOE VALLEY)**

Date Rec'd **06/19/08**

Samplers: **Blake, Geary, Altamirano** | Station **SOUTH BOUND** | Route **US 395**

Location from C/L (ft) Lt. **8** Rt.

Sample No.: **LBM 9** | County: **WASHOE**

Sample Type: RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐

Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐

Cut Section ☐ Fill Section ☐

Taken Through Oil ■ Taken on Shoulder ☐

Gravel Depth (in) **10** Oil Depth (in) **8**

Remarks: WATER AT 13 FEET DEPTHS.

Submitted By: **O. ALTAMIRANO**

Title: **ENGR. TECH III**

Depth (ft)	Boring Description	Depth (ft)	PSI
0--		0--	
2--	Silt & Sand (2–4)	2--	
4--		4--	
6--		6--	100
8--		8--	
10--		10--	
12--		12--	
14--		14--	
16--		16--	
18--		18--	
20--		20--	

Sieve Size	% Passing
3"	
2"	
1.5"	**100**
1"	**96**
3/4"	**96**
1/2"	**92**
3/8"	**90**
No. 4	**87**
No. 10	**78**
No. 16	**72**
No. 40	**56**
No. 50	**50**
No. 100	**40**
No. 200	**31**

Liquid Limit **32**

Plastic Index **15**

Specific Gravity

Resistance Value **20**

Cover Thickness: Stabilometer **26.4** Expansion Pressure

Sand Equivalent **15**

Natural Moisture, %

Resistivity **2,392**

pH Factor **7.0**

HRB Classification

Remarks:

NDOT 027, Rev. 05-01

LINE SAMPLING DATA

Date Reported: **07/24/08**

Lab No.: **Soils 06-08, RV-250-08, C-326-08**

E.A.: **9100**

Job Description: **US 395 (WASHOE VALLEY)**

Date Rec'd **06/19/08**

Samplers: **Blake, Geary, Altamirano**

Station **SOUTH BOUND**

Route **US 395**

Location from C/L (ft) Lt. **8** Rt.

Sample No.: **LBM 9B**

County: **WASHOE**

Sample Type: RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐

Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐

Cut Section ☐ Fill Section ☐

Taken Through Oil ■ Taken on Shoulder ☐

Gravel Depth (in) **10** Oil Depth (in) **8**

Remarks: WATER AT 13 FEET DEPTHS.

Submitted By: **O. ALTAMIRANO**

Title: **ENGR. TECH III**

Depth (ft)	Boring Description	PSI
0--		0--
2--		2--
4--		4--
6--	Silt & Sand (6–8)	6--
8--		8--
10--		10--
12--		12--
14--		14--
16--		16--
18--		18--
20--		20--

Sieve Size	% Passing
3"	
2"	
1.5"	
1"	
3/4"	
1/2"	
3/8"	**100**
No. 4	**99**
No. 10	**92**
No. 16	**85**
No. 40	**68**
No. 50	**62**
No. 100	**51**
No. 200	**41**

Liquid Limit **32**

Plastic Index **16**

Specific Gravity

Resistance Value **18**

Cover Thickness: Stabilometer **27.1**; Expansion Pressure

Sand Equivalent **13**

Natural Moisture, %

Resistivity **2,342**

pH Factor **6.7**

HRB Classification

Remarks:

NDOT 027, Rev. 05-01

LINE SAMPLING DATA

Date Reported: **07/24/08**
Lab No.: **Soils 06-08, RV-251-08, C-327-08**
E.A.: **9100**
Job Description: **US 395 (WASHOE VALLEY)**
Date Rec'd **06/19/08**
Samplers: **Blake, Geary, Altamirano**
Station **SOUTH BOUND**
Route **US 395**
Location from C/L (ft) Lt. **7** Rt.
Sample No.: **LBM 10**
County: **WASHOE**

Sample Type:
RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐

Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐

Cut Section ☐ Fill Section ☐
Taken Through Oil ■ Taken on Shoulder ☐
Gravel Depth (in) **20** Oil Depth (in) **8**
Remarks: WATER AT 13 FEET DEPTHS.

Submitted By: **O. ALTAMIRANO**
Title: **ENGR. TECH III**

Depth (ft)	Boring Description	Depth (ft)	PSI
0--		0--	
2--	Silt & Sand (2–6 ft)	2--	
4--		4--	100
6--		6--	
8--		8--	
10--		10--	
12--		12--	
14--		14--	
16--		16--	
18--		18--	
20--		20--	

Sieve Size	% Passing
3"	
2"	
1.5"	
1"	**100**
3/4"	**92**
1/2"	**79**
3/8"	**72**
No. 4	**59**
No. 10	**48**
No. 16	**42**
No. 40	**31**
No. 50	**27**
No. 100	**20**
No. 200	**15**

Liquid Limit **22**
Plastic Index **2**
Specific Gravity
Resistance Value **78**
Cover Thickness: Stabilometer **4.5**, Expansion Pressure

Sand Equivalent **25**
Natural Moisture, %
Resistivity **2,571**
pH Factor **7.1**
HRB Classification

Remarks:

NDOT 027, Rev. 05-01

LINE SAMPLING DATA

Date Reported: **07/24/08**

Lab No.: **Soils 06-08, RV-252-08, C-328-08**

E.A.: **9100** Job Description: **US 395 (WASHOE VALLEY)**

Date Rec'd **06/19/08**

Samplers: **Blake, Geary, Altamirano** Station **SOUTH BOUND** Route **US 395**

Location from C/L (ft) Lt. **7** Rt.

Sample No.: **LBM 10B** County: **WASHOE**

Sample Type: RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐

Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐

Cut Section ☐ Fill Section ☐

Taken Through Oil ■ Taken on Shoulder ☐

Gravel Depth (in) **20** Oil Depth (in) **8**

Remarks: WATER AT 13 FEET DEPTHS.

Submitted By: **O. ALTAMIRANO**

Title: **ENGR. TECH III**

Depth (ft)	Boring Description	Depth (ft)	PSI
0--		0--	
2--		2--	
4--		4--	
6--	Silt & Sand (6–8 ft)	6--	100
8--		8--	
10--		10--	
12--		12--	
14--		14--	
16--		16--	
18--		18--	
20--		20--	

Sieve Size	% Passing
3"	
2"	
1.5"	
1"	
3/4"	
1/2"	
3/8"	**100**
No. 4	**98**
No. 10	**87**
No. 16	**80**
No. 40	**63**
No. 50	**58**
No. 100	**47**
No. 200	**34**

Liquid Limit **30**

Plastic Index **12**

Specific Gravity

Resistance Value **14**

Cover Thickness — Stabilometer **28.6** Expansion Pressure

Sand Equivalent **15**

Natural Moisture, %

Resistivity **2,283**

pH Factor **6.7**

HRB Classification

Remarks:

LINE SAMPLING DATA

Date Reported: **07/24/08**

Lab No.: **Soils 06-08, RV-253-08, C-329-08**

E.A.: **9100**   Job Description: **US 395 (WASHOE VALLEY)**

Date Rec'd **06/19/08**

Samplers: **Blake, Geary, Altamirano**   Station **SOUTH BOUND**   Route **US 395**

Location from C/L (ft) Lt. **7** Rt. ____

Sample No.: **LBM 11**   County: **WASHOE**

Sample Type: RV ■ Sub □ Chem □ DC □ Other □

Vegetation: None ■ Trees □ Shrubs □ Brushy □ Grassy □

Cut Section □   Fill Section □

Taken Through Oil ■   Taken on Shoulder □

Gravel Depth (in) **17**   Oil Depth (in) **6**

Remarks:

DEPTHS.

Submitted By: **O. ALTAMIRANO**

Title: **ENGR. TECH III**

Depth (ft)	Boring Description	PSI
0--		
2--	Clay (2–4 ft)	
4--		100
6--		
8--		
10--		
12--		
14--		
16--		
18--		
20--		

Sieve Size	% Passing
3"	
2"	**100**
1.5"	**95**
1"	**94**
3/4"	**90**
1/2"	**80**
3/8"	**75**
No. 4	**65**
No. 10	**57**
No. 16	**52**
No. 40	**43**
No. 50	**39**
No. 100	**31**
No. 200	**23**

Liquid Limit **24**

Plastic Index **5**

Specific Gravity ____

Resistance Value **44**

Cover Thickness — Stabilometer **17.3**   Expansion Pressure ____

Sand Equivalent **20**

Natural Moisture, % ____

Resistivity **2,725**

pH Factor **7.1**

HRB Classification ____

Remarks:

LINE SAMPLING DATA

Date Reported: **07/24/08**

Lab No.: **Soils 06-08, RV-254-08, C-330-08**

E.A.: **9100** Job Description: **US 395 (WASHOE VALLEY)**

Date Rec'd **06/19/08**

Samplers: **Blake, Geary, Altamirano** Station **SOUTH BOUND** Route **US 395**

Location from C/L (ft) Lt. **7** Rt.

Sample No.: **LBM 11B** County: **WASHOE**

Sample Type: RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐

Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐

Cut Section ☐ Fill Section ☐

Taken Through Oil ■ Taken on Shoulder ☐

Gravel Depth (in) **17** Oil Depth (in) **6**

Remarks:

DEPTHS.

Submitted By: **O. ALTAMIRANO**

Title: **ENGR. TECH III**

Depth (ft)	Boring Description	PSI
0--		
2--		
4--		
6--	Silt & Clay (6--8)	
8--		100
10--		
12--		
14--		
16--		
18--		
20--		

Sieve Size	% Passing
3"	
2"	
1.5"	
1"	
3/4"	
1/2"	
3/8"	**100**
No. 4	**99**
No. 10	**92**
No. 16	**83**
No. 40	**65**
No. 50	**59**
No. 100	**48**
No. 200	**36**

Liquid Limit **29**

Plastic Index **12**

Specific Gravity

Resistance Value **12**

Cover Thickness: Stabilometer **29.4**; Expansion Pressure

Sand Equivalent **13**

Natural Moisture, %

Resistivity **2,801**

pH Factor **7.1**

HRB Classification

Remarks:

NDOT 027, Rev. 05-01

LINE SAMPLING DATA

Date Reported: **07/24/08**
Lab No.: **Soils 06-08, RV-255-08, C-331-08**
E.A.: **9100** Job Description: **US 395 (WASHOE VALLEY)**
Date Rec'd **06/19/08**
Samplers: **Blake, Geary, Altamirano** Station **SOUTH BOUND** Route **US 395**
Location from C/L (ft) Lt. **7** Rt.
Sample No.: **LBM 12** County: **WASHOE**

Sample Type: RV ■ Sub ☐ Chem ☐ DC ☐ Other ☐
Vegetation: None ■ Trees ☐ Shrubs ☐ Brushy ☐ Grassy ☐
Cut Section ☐ Fill Section ☐
Taken Through Oil ■ Taken on Shoulder ☐
Gravel Depth (in) **18** Oil Depth (in) **7**
Remarks:
DEPTHS.

Submitted By: **O. ALTAMIRANO**
Title: **ENGR. TECH III**

Depth (ft)	Boring Description		PSI
0--		0--	
2--	← (sample interval 2–4 ft)	2--	
4--		4--	100
6--		6--	
8--		8--	
10--		10--	
12--		12--	
14--		14--	
16--		16--	
18--		18--	
20--		20--	

Sieve Size	% Passing
3"	
2"	
1.5"	
1"	**100**
3/4"	**93**
1/2"	**84**
3/8"	**80**
No. 4	**70**
No. 10	**60**
No. 16	**54**
No. 40	**41**
No. 50	**36**
No. 100	**27**
No. 200	**21**

Liquid Limit **24**
Plastic Index **5**
Specific Gravity
Resistance Value **24**
Cover Thickness: Stabilometer **24.9**; Expansion Pressure

Sand Equivalent **18**
Natural Moisture, %
Resistivity **2,000**
pH Factor **7.5**
HRB Classification

Remarks:

NDOT 027, Rev. 05-01

<u>APPENDIX D</u>

Pavement Design and Analysis Report

1993 AASHTO Pavement Design

DARWin Pavement Design and Analysis System

A Proprietary AASHTOWare
Computer Software Product

Flexible Structural Design Module

SR 430, AADT Projected out to 2009
1.0 Mile South of Mount Rose Highway
Used R-Value of 20

Flexible Structural Design

18-kip ESALs Over Initial Performance Period	6,197,485
Initial Serviceability	4.5
Terminal Serviceability	2.5
Reliability Level	80 %
Overall Standard Deviation	0.45
Roadbed Soil Resilient Modulus	4,845 psi
Stage Construction	1
Calculated Design Structural Number	4.79 in

Simple ESAL Calculation

Performance Period (years)	20
Two-Way Traffic (ADT)	44,000
Number of Lanes in Design Direction	2
Percent of All Trucks in Design Lane	80 %
Percent Trucks in Design Direction	50 %
Percent Heavy Trucks (of ADT) FHWA Class 5 or Greater	4.05 %
Average Initial Truck Factor (ESALs/truck)	0.93
Annual Truck Factor Growth Rate	2.52 %
Annual Truck Volume Growth Rate	0 %
Growth	Compound
Total Calculated Cumulative ESALs	6,197,485

Specified Layer Design

Layer	Material Description	Struct Coef. (Ai)	Drain Coef. (Mi)	Thickness (Di)(in)	Width (ft)	Calculated SN (in)
1	New Plantmix	0.35	1	8	-	2.80
2	Base	0.1	1	20	-	2.00
Total	-	-	-	28.00	-	4.80