Geotechnical Data Report

US 97/US 20: Bend North Corridor Deschutes County Key No. 21229 EA No. PE003210-021

August 10, 2021

Oregon Department of Transportation

Region 4 Tech Center
Geo/Environmental Unit



Table of Contents

1.0 Introduction	4
2.0 Site Description	4
3.0 Subsurface Exploration	5
4.0 Geology	5
4.1 Hydrology	8
5.0 Laboratory Testing	8
6.0 Material Sources	9
7.0 Limitations	9
8 0 Closure	11

FIGURES

Figure 1: Vicinity Map (NCGDR-01 to -23)

Figure 2: Boring Locations (NCGDR-01 to -06, -20)

Figure 3: Boring Locations (NCGDR-07 to -19)

Figure 4: Boring Locations (NCGDR-21 to -23)

APPENDICES

Appendix A: Boring Logs

Appendix B: Laboratory Test Results

Appendix C: Historical Data

1.0 Introduction

This report presents and summarizes the geotechnical data obtained as part of the Request for Proposals

(RFP) stage of the Design/Build process for the U.S.97/U.S. 20 Bend North Corridor project. The data

acquired during the field investigation were based on the project understanding at the time. Initial project

alignments and concepts were provided by WSP, a consultant to ODOT. The exploration program was laid

out using WSP and ODOT's project understanding as of April 2021. The project area is shown in Figure 1.

The purpose of this report is to provide preliminary, factual geotechnical information for conceptual design

guidance, preliminary project estimating, and risk evaluation at an early project stage. The subsurface

exploration and laboratory testing results presented here are intended to supplement design efforts, but are

not intended to be sufficient for design.

The data in this report include boring logs (Appendix A) and laboratory test results (Appendix B) from the

subsurface exploration described in Section 3. All new data collected for this report follows ODOT standards

based on the GDM. Historical data (Appendix C) from previous ODOT projects in the area have also been

provided. The data included in Appendix C only represents the conditions at the time the data were collected

and may not meet contemporary ODOT subsurface exploration requirements and reporting standards;

therefore these data are included for reference only and should only be used to supplement the design

investigation required by the GDM.

2.0 Site Description

The project is located in Northern Bend in an area that is currently contains various commercial and retail

properties. In this area uncontrolled fills have been used to level large parcels of land. These fills can contain

rubble varying from basalt cobbles and boulders, to concrete, and rebar; as seen both exposed at the surface

and through subsurface exploration. Voids may also be present within these fills. The contacts with the

underlying soil and rock are often variable.

Shallow basalt bedrock is common in the project area, with several outcrops appearing along the proposed

alignment. The basalt is described in greater detail in Section 4, however, the nature of basalt is variable.

While the basalt bedrock may be rippable in some areas, agency experience indicates that controlled blasting

is often required to excavate the basalt efficiently.

Geotechnical Data Report US 97/US 20: Bend North Corridor Deschutes County

Key No. 21229

August 10, 2021

3.0 Subsurface Exploration

The preliminary subsurface exploration for the design phase of the U.S. 97 / U.S. 20 North Corridor project was completed May 3 - 20, 2021 by Crisman Pacific Strata Drilling (CPSD) under Procurement No. GEO4-2021-02. Drilling locations and depths were determined in advance of the exploration based on the anticipated site conditions and the proposed preliminary design plans available at the time. A one-call utility locate request was submitted to the Oregon Utility Notification Center on April 15, 2021 (Ticket No. 21108054), and underground utilities within 25 feet of each borehole location were located by the private utility locate company Advanced Underground Utility Locating (AUUL) on April 21, 2021. The location(s) of individual borings were subsequently adjusted within the locate area as needed to avoid potential utility conflicts and advance the drill hole(s) to the required exploration depth. The exploration area included highway right of way (R/W), ODOT-owned land, and private property on U.S. 97 extending from approximately MP 134.02 in the north to MP 135.04 at Empire Ave. in the south and on U.S. 20 from MP 17.47 at Cooley Road in the north to MP 18.46 in the south. Final drill hole locations are shown on the attached figures (Figures 1 – 4). Note that proposed boring NCGDR-15 was omitted from the drilling program due to right of entry limitations.

A track-mounted CME 850 drill rig was used to advance a total of twenty-two (22) geotechnical borings (NCGDR-01 through -23) from the ground surface to depths ranging from 12.5 to 35.0 feet below ground surface (bgs) using 8.5-inch Hollow Stem Augur (HSA) or 4.875-inch mud rotary drilling methods and Type HQ triple tube wireline rock coring assembly. Standard penetration tests (SPTs) were performed at 2.5-foot intervals to bedrock using an automatic trip hammer in general accordance with ASTM D1586. All SPT and rock core samples were visually classified and described in the field by the ODOT Region 4 engineering geologist in general accordance with the ODOT Soil and Rock Classification Manual. Whenever water that was added to the hole during drilling was retained by the formation, the water level was measured upon completion of drilling activities and at regular intervals thereafter as permitted by drilling progress. The subsurface hydrologic conditions encountered in the project vicinity are briefly summarized in Section 4.1. Final exploration logs are attached to the Geologic Data Report in Appendix A.

4.0 Geology

The generalized stratigraphy within the exploration area consists of variable thicknesses of granular uncontrolled fill and/or unconsolidated native silty sand topsoil derived from volcanic ash and weathered

pyroclastic material (USCS Classification: SP, SP-SM) overlying basalt bedrock, which was encountered in

all borings at depths ranging from 2.0 - 20.0 feet bgs across the exploration area. Regional geologic mapping

indicates that the bedrock unit within the U.S. 97 / U.S. 20 North Corridor project area is comprised of basaltic

lava flows from the Newberry volcano (Qbn)¹. This Quaternary-age unit erupted from vents on the northern

flank of Newberry volcano and flowed north, covering a broad geographic area east of the Deschutes River

that includes much of Bend and Redmond.

The relatively thick deposits of uncontrolled fill encountered at many of the drill hole locations, including

NCGDR-07 through -13 and NCGDR-17 through -20, were notable due to the predominance of cobble and

boulder-size basalt rubble and the occasional presence of voids and/or loose unconsolidated material within

the respective fill deposits. The abundant large basalt clasts in the fill material often resulted in SPT refusal

or artificially inflated blow counts and poor sample recovery. Deleterious fill materials, including wood, metal,

concrete rubble, and/or other building materials, were encountered immediately below the ground surface at

NCGDR-13, NCGDR-14, and NCGDR-19 and could be present at varying depths and locations elsewhere

within the uncontrolled fill unit.

NEWBERRY BASALT

The Newberry basalt rock fabric is predominantly gray and slightly weathered to fresh. Qualitative field

strength testing of intact rock core indicates a hardness of R3 to R4; occurrences of moderately to highly

weathered rock were associated with discrete, localized zones of red, highly vesicular to scoriaceous, and

occasionally brecciated basalt that were encountered at and around interpreted flow contacts. The abundance

and size of vesicles was observed to vary both within and between flows, from some vesicles (5 - 25%) to

highly vesicular (15 - 50%) to locally scoriaceous (\geq 50%) and from pinhole (<1/16") to roughly equal to the

core diameter (<2 $\frac{1}{2}$ ") in size. Vesicles $\frac{1}{4}$ " - $\frac{3}{4}$ " in size or larger were common throughout the unit and

sometimes appeared to be coated with silty residue and/or mineralized infill. Small voids or cavities (generally

≤1.0' vertical) were encountered in some boreholes and were associated with highly vesicular rock where

large-diameter vesicles were predominant.

_

¹ Sherrod, D. R., Taylor, E. M., Ferns, M. L., Scott, W. E., Conrey, R. M., & Smith, G. A. (2004). Geologic map of the

Bend 30- x 60-minute Quadrangle, Central Oregon. U.S. Department of the Interior, U.S. Geological Survey.

The unit exhibits very close to moderately close discontinuity spacing (<0.1' to \leq 3.0'), although instances of wide joint spacing (>3.0) were encountered over some core intervals. Joints and fractures were typically less than ~1/16"in aperture and often contained brown silty (occasionally sandy or clayey) residue or infill, mineralization, staining, or slight alteration. Trace organic root material was occasionally observed ingrown into some joints and/or vesicles. Field estimates of the Geological Strength Index (GSI) 2 of the rock mass indicate a range of 20 – 90; rock at the lower end of the range was typified by a disintegrated or brecciated texture associated with very close discontinuity spacing and smooth and/or infilled joints and fractures, while rock at the upper end of the range was characteristically dense and competent, with a massive texture, moderately close to wide discontinuity spacing, rough to slightly smooth joint and fracture surfaces, and trace to no infill – these core specimens also tended to be less vesicular than rock with lower GSI ratings, which was often highly vesicular (15 – 50%).

UNCONTROLLED FILL

Uncontrolled fill deposits within the exploration area were observed to contain a variety of disturbed, unconsolidated coarse-grained soil types, including non-plastic silty sand, sand with silt and gravel, poorly graded gravel with sand, and silty gravel (USCS Classifications: SM, SP-SM, GP, GP-GM, respectively) in addition to boulder and/or cobble-size clasts, predominantly basalt in composition, which were present in varying abundances ranging from ~10% to greater than 50% by volume. Deleterious fill materials, including concrete, wood, and metal, were encountered at shallow depths at some locations. The relative in-situ density of the uncontrolled fill was highly variable, ranging from very loose to very dense. Voids and/or very loose deposits of unconsolidated material were encountered in the uncontrolled fill at some locations, as indicated by observed changes in drill action and drill rate and caving or excess backfill volumes during hole abandonment. Variable subsurface conditions should be anticipated wherever uncontrolled fill is identified.

AEOLIAN SILTY SAND

Unconsolidated native silty sand soil (USCS Classifications: SM, SP-SM) was encountered overlying bedrock at some locations with the exploration area. The soil is brown, non-plastic, loose to medium dense in-situ, and sometimes contains visible pumice or ash, which may appear as light-colored lenticular inclusions within the soil matrix.

_

² Marinos, Paul, and Hoek, Evert (2000). GSI: A geologically friendly tool for rock mass strength estimation. ISRM International Symposium. International Society for Rock Mechanics and Rock Engineering.

4.1 Hydrology

The drilling methods employed during the subsurface exploration, which included mud rotary and wireline rock coring, preclude the reliable detection and measurement of groundwater (including perched or ponded groundwater) due to the large volume of water and/or drilling fluid pumped downhole at the time of drilling. However, groundwater in the U.S. 97 / U.S. 20 North Corridor project area vicinity is known to occur at elevations significantly below the maximum depths achieved during the exploration. Regional United States Geological Survey (USGS) potentiometric surface mapping of the upper Deschutes Basin suggests that the groundwater table is approximately 550 – 650 feet below ground surface in the vicinity of the exploration area, with a local flow gradient in the east-northeast direction³. Water well reports filed with the Oregon Water Resources Department (OWRD) generally support this mapping data, with first groundwater reported at depths ranging from 480 to 775 feet bgs in wells drilled most proximate to the exploration area. Based on this information, the water level measurements obtained during the exploration are understood to represent the depth(s) at which water and/or drilling fluids that were introduced into the formation at the time of drilling were retained in the borehole, rather than the depth to naturally occurring groundwater.

5.0 Laboratory Testing

The following laboratory testing was performed by the ODOT Central Materials Lab on selected representative soil samples to determine general soil index properties:

- Particle Size Analysis (ASTM C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates)
- Atterberg Limits (ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

³ Gannett, M. W. (2001). Ground-Water Hydrology of the Upper Deschutes Basin, Oregon (No. 4162). US Department of the Interior, US Geological Survey.

Unconfined compressive strength (UCS) testing was performed on representative intact rock core specimens

in accordance with ASTM D7012 - Standard Test Methods for Compressive Strength and Elastic Moduli of

Intact Rock Core Specimens under Varying States of Stress and Temperatures (Method B). Core specimens

which failed to meet the dimensional requirements for UCS testing or that contained natural fractures or other

defects that precluded laboratory strength testing were necessarily excluded from the laboratory testing

sample array. Laboratory testing results are presented in Appendix B.

6.0 Material Sources

ODOT manages a network of material source properties across the state that are offered for use on

transportation projects. From these sites, ODOT or contractors working for ODOT obtain needed materials

for construction, reconstruction, and maintenance of the transportation system. Based on the concepts for

the North Corridor project, it appears that the team designing and constructing this project will potentially need

a source of borrow material for embankments, a place to dispose/stockpile excess excavation that meets the

definition of clean fill, and a source for high quality aggregate.

ODOT controls several properties that might be considered to meet the material and disposal site needs on

this project. ODOT controls a high quality aggregate source referred to as Barr Road (Site N) Quarry (OR-

09-127-4), located 8 miles west of Redmond off Hwy OR126 in Section 13, T. 15 S., R. 11 E. and Section 18,

T. 15 S., R. 12 E., W.M. ODOT also controls a borrow source known as Peterson Rock Garden (Young's) Pit

(OR-09-071-4), located approximately 6.5 miles north of Bend in the SW1/4 SE1/4 of Section 11, T. 16 S., R.

12 E., W.M. This source has also been considered for use as a disposal / stockpile location for clean excess

excavation off of other projects.

7.0 Limitations

The data presented in this report are representative of field observations and other sources of information, as

discussed in this report. These data represent only the conditions at the time and place of observation, spatial

and temporal changes may result in conditions that differ from those observed and discussed in this report. Any

interpretation or evaluation of this report by individuals outside of the Department is done so at the sole risk of

that individual. The nature and extent of any variations in subsurface materials or conditions may not become

evident until construction. The historical data included represents the conditions that existed at the time and

Geotechnical Data Report US 97/US 20: Bend North Corridor August 10, 2021

may not meet current requirements for data collection. Historical data is to be used as reference only and not

for design.

Drill hole locations were recorded in the field at the time of drilling using a DT Research DT391-P303 duel

frequency GNSS module with embedded antenna. Horizontal spatial coordinates (northing/easting) are

provided in the Oregon Coordinate Reference System (OCRS) Bend-Redmond-Prineville Zone, and all

elevations are in NAVD 88 with units in U.S. survey feet. A qualitative comparison of the points relative to

structures and physiographic features observed in the field suggests an acceptable level of accuracy for

conceptual design applications; however, no guarantee regarding the internal accuracy of the measurements

or the positional accuracy of the drill hole locations relative to proposed design features is expressed or implied.

The data collected for this report are intended to provide guidance during the initial project stages. The

exploration is not sufficient for design and it is the responsibility of the Design/Build contractor to acquire the

data required for design in accordance with the ODOT GDM.

Geotechnical Data Report US 97/US 20: Bend North Corridor Deschutes County

Key No. 21229

August 10, 2021

8.0 Closure

Prepared by:





RENEWS: 06-30-2023

Tom Grummon, P.E. Region 4 Geotechnical Engineer Reviewed by:

Scott Billings, C.E.G Region 4 Senior Engineering Geologist



EXPIRES: 10-01-2021

Micah Gregory-Lederer, C.E.G. Region 4 Geologist

FIGURES

Figure 1: Site Vicinity Map (NCGDR-01 to -23)

Figure 2: Boring Locations (NCGDR-01 to -06, -20)

Figure 3: Boring Locations (NCGDR-07 to -19)

Figure 4: Boring Locations (NCGDR-21 to -23)

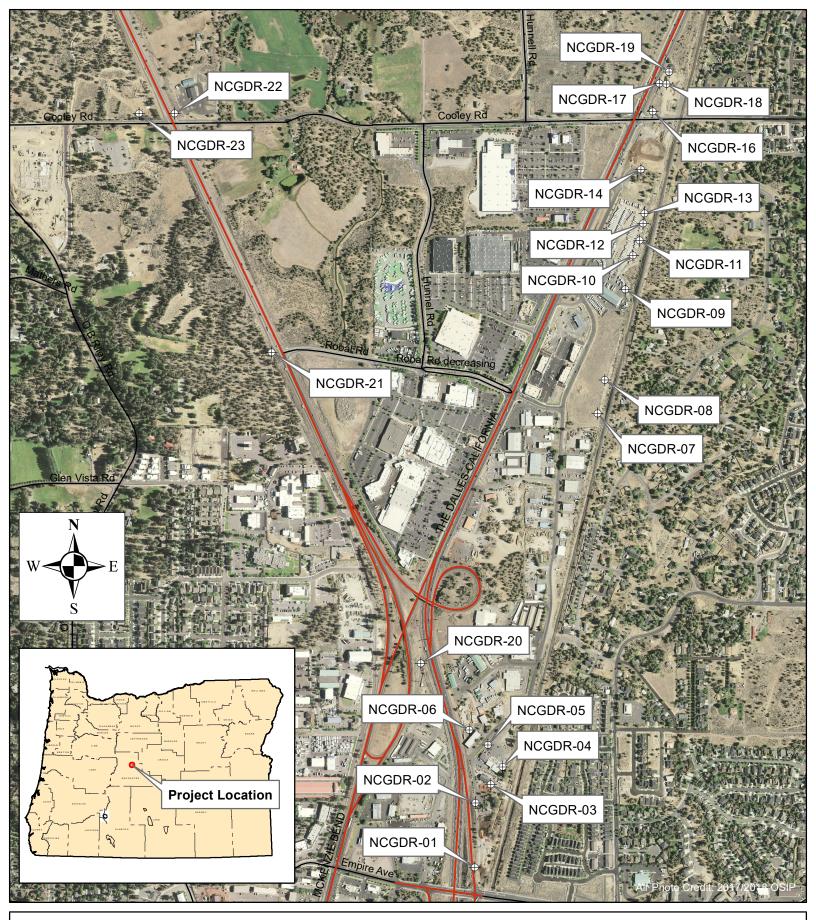




Figure 1: Vicinity Map (NCGDR-01 to -23) K21229 - U.S. 97/U.S. 20 North Corridor City of Bend Deschutes County

Feet 0 500 1,000 2,000

DISCLAIMER:

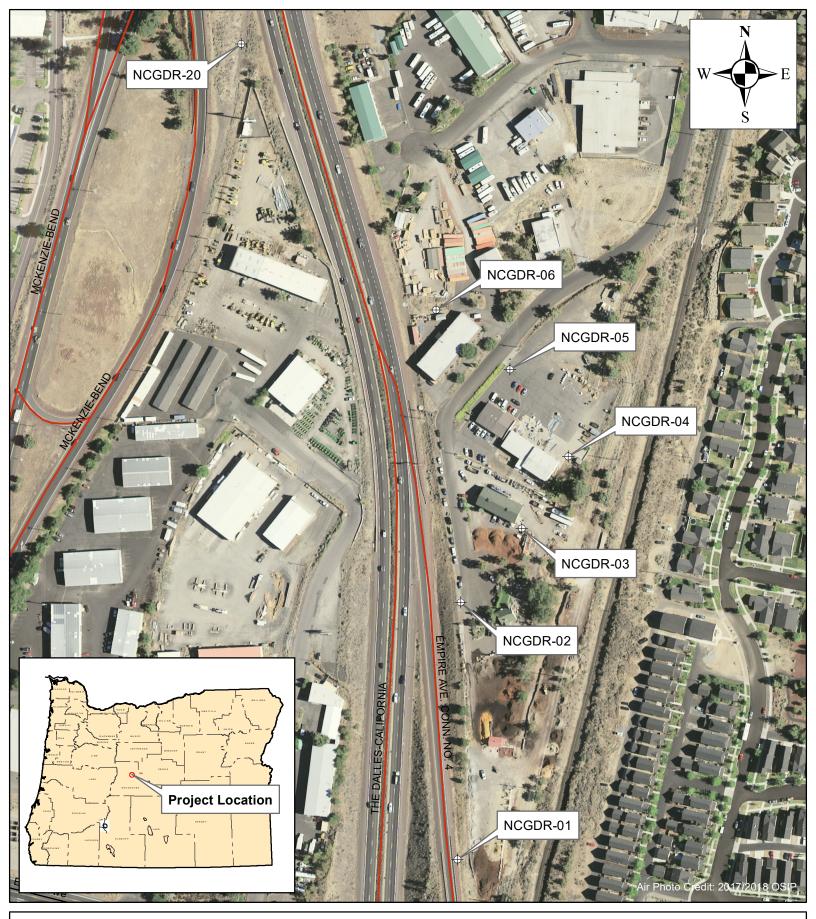




Figure 2: Boring Locations (NCGDR-01 to -06, -20) K21229 - U.S. 97/U.S. 20 North Corridor City of Bend Deschutes County

			Feet
0	100	200	400

DISCLAIMER:

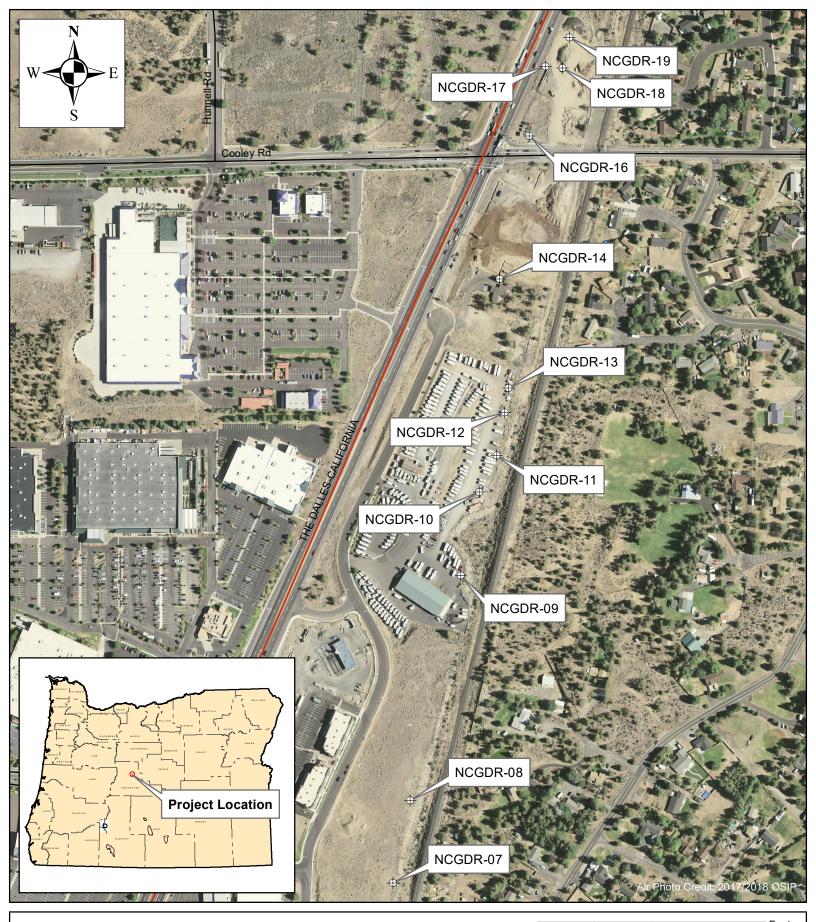




Figure 3: Boring Locations (NCGDR-07 to -19) K21229 - U.S. 97/U.S. 20 North Corridor City of Bend Deschutes County

				⊢eet
0	20	00 40	00 80	0

DISCLAIMER:

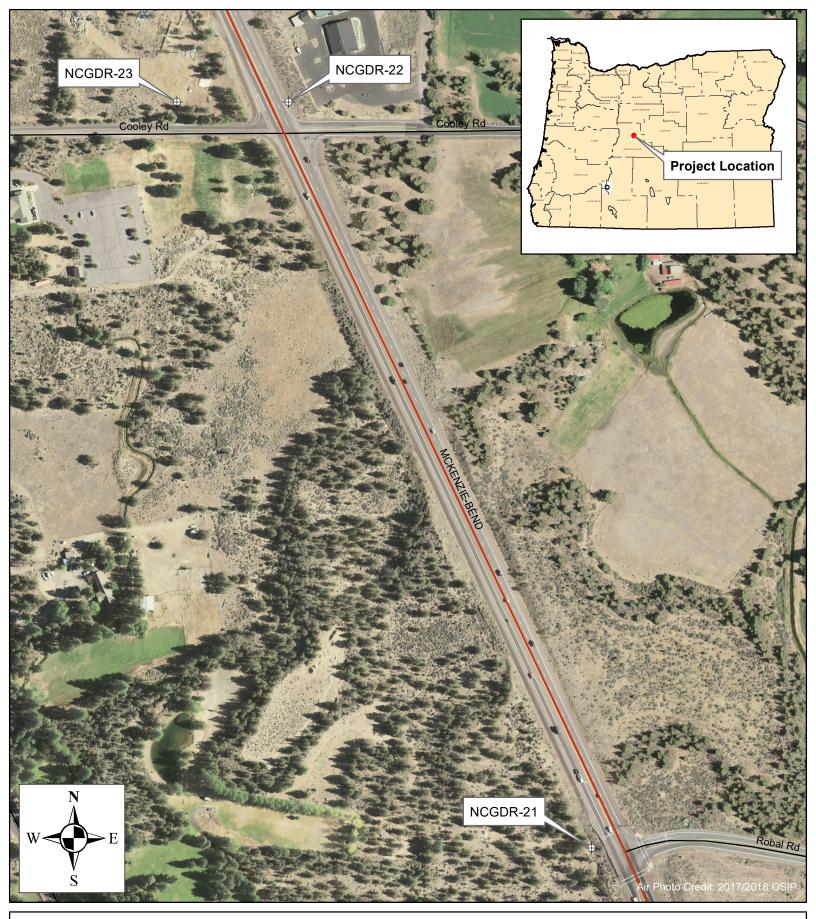




Figure 4: Boring Locations (NCGDR-21 to -23) K21229 - U.S. 97/U.S. 20 North Corridor City of Bend Deschutes County

			Feet
0	150	300	600

DISCLAIMER:

APPENDIX A - Boring Logs

NCGDR-01 to NCGDR-23

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-01 Project U.S. 97/U.S. 20 Bend North Corridor PE003210 Geotechnical E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 216,794.42 Easting: 249,230.37 Start Card No. Equipment CME-850 Bridge No. Driller Jeff Crisman/CPSD Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3546.8' Start Date May 19, 2021 End Date May 19, 2021 Total Depth 19.0 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations** Drilling Methods **Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger J - Joint Pl - Planar P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Data Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation Discontinuity I Or RQD% ž Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. 0.0 - 4.0 X1 X- 1 (0.0-2.5) Silty GRAVEL sand and cobbles (≤15% Begin drilling with 8 1/2' cobbles); Boulder-size rip-rap located proximate to hole at surface; GM; Possibly small boulder; (Fill) OD Hollow Stem Auger; Silty gravel with DR slow; DA very rough sand, 15 - 25% arindina cobbles and occasional boulders; GM, GP-GM; Brown; Non-plastic; Dry to moist; SPT refusal on basalt clasts, relative N-1 (2.5-2.6) Silty GRAVEL with sand; GM; Brown; NP; Moist; Cobbles, possibly boulders not represented in N1 100 11-50/0" DA very rough; DR very density slow, grinding sample; Some small cobble-sized clasts in auger indeterminate; (FILL) Salliple, Some Small considerates an about cuttings; (Fill)

X- 2 (2.6-3.5) Gravelly fill with cobble and boulder-sized clasts; Estimated >25% cobble-sized material; (Fill)

C-1 (3.5-6.5) BASALT; Gray; Slightly Weathered; R3;

Very close to close joint spacing (<0.1' - ~0.5'); Some staining, trace sitty residue in some joints and some Switch to Type HQ3T coring assembly at 3.5' bgs; DR moderately fast, C1 80 R3 RQD = 33 4.0 - 19.0 Basalt; Gray; Slightly weathered; R3; Very irregular; DA smooth; No WR to BOH vesicles, trace mineralization; Highly vesicular (~30 - 40%), <1/2" in size; GSI = 30; Drilled through small 5 close to moderately boulder over bedrock, represented in C-1 core interval, close joint spacing discordant with top of bedrock at 4.0' bgs (±0.5'); Some (<0.1' to ~2.0) with washout over interval silty residue infill, occasionally trace C- 2 (6.5-11.5) BASALT; Gray; Slightly Weathered to locally Moderately Weathered; R3; Very close to close joint spacing (<0.1' - ~0.65'); Silty infill and trace to some mineralization; Up to ~1/8" joint aperture; Highly vesicular mineralized infill in C2 84 R3 DR moderately fast, some joints; Some ROD = 28irregular; DA smooth; No vesicles to highly 8/10/21 vesicular (15 - 40%), (25 - 40%), pinhole to ~3/4" diameter in size; Possible void over interval; GSI = 25 - 30; Some highly fractured and brecciated core, possibly associated with void pinhole to ~3/4" diameter in size; GSI ODOT MAN.GDT 25 - 45; (NEWBERRY BASALT) Void encountered from ~9.0' to 9.75'; possibly infilled 01.GPJ 10 K21229_NCGDR_GLOGS_ C3 93 C-3 (11.5-16.5) BASALT; Gray; Slightly Weathered; R3; DR moderate: DA R3 C-3 (11.5-10.3) BASAL1, clay, Slightly Weatherlet, RS. Close to moderately close joint spacing (~0.1 - ~2.0"), some sitty residue infill, trace mineralization; Some vesicles (≥15%) to highly vesicular (≤30%), predominantly 1/16" - 1/4" in size, occasionally large (~1 1/4"); GSI = 45 **RQD** = 82 smooth; No WR FOG DRILL ODOT (

rojec	t Name	U.S. 97	/U.S. 20 Be	end Nor	th Corri	dor Hole No. NCGDR-01			Page	2 0	f 2
G Depth (ft)	Test Type, No.	Percent Recovery		Discontinuity Data So Or RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks	Water Level/ Date	Backfill/ Instrumentation
15	C4	100	R3 RQD =	- 96		C- 4 (16.5-19.0) BASALT; Gray; Slightly Weathered; R3; Close joint spacing (~0.2' - 1.0'); Trace mineralized infill; Some vesicles (15 - 25%), pinhole in size to occasionally large (~3/4"); GSI = 45					
20 -						(19.0) Bottom of Hole			Ponded water f drilling measure 18.9' bgs at end drilling (EOD)	ed at	<i>Y.y.</i> ,
25 -											
30 -											
35 -											

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 1 Hole No. NCGDR-02 Project U.S. 97/U.S. 20 Bend North Corridor Geotechnical E.A. No. PE003210 Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 217,352.46 Easting: 249,237.24 Start Card No. Equipment CME-850 Bridge No. Driller Jeff Crisman/CPSD Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3539.3' Start Date May 14, 2021 End Date May 14, 2021 Total Depth 17.0 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations** Drilling Methods **Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger J - Joint Pl - Planar P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure R - Rough "U" - Undisturbed Sample Fo - Foliation St - Stepped CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Discontinuity Data Or RQD% Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation Ś. Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X1 X-1 (0.0-0.6) GRAVEL; aggragate base course; GP; 0.0 - 2.0 Begin drilling with 8 1/2' (Fill) X-2 (0.6-2.0) GRAVEL with silt and sand; GP-GM; (Fill) 0.6' Gravel base OD Hollow Stem Auger X2 at edge of pavement aggregate over 1.4' gravel with silt and sand; GP, GP-GM; N-1 (2.0-2.2) C-1 (2.2-6.5) BASALT; Gray; Slightly Weathered to Fresh; R3; Close joint spacing (0.2 - 0.95'); Some staining, trace silty residue infill, trace mineralized infill coating some joint surfaces; Highly vesicular (~1/16" -~1.5"), some mineralization in vesicles; GSI = 55 Gray/brown; (FILL) Switch to Type HQ3T N1 100 50/3" R3 coring assembly at 2.0' C.1 2.0 - 17.0 RQD = 82Basalt; Gray; Slightly weathered; R3; Very DR moderate; DA smooth; WC gray close to moderately close joint spacing (<0.1' to 1.8'), often with silty residue infill; occasional 5 DR moderate; DA smooth; WC brown to staining, trace gray-brown mineralized infill in C2 100 R3 C-2 (6.5-11.5) BASALT; Gray; Slightly Weathered; R3; some joints and Very close to medium close joint spacing (<0.1' - 1.8'); Stained surfaces, some silty residue infill; Some vesicles RQD = 72 vesicles; Some vesicles to highly (~5 - 10%) to highly vesicular in upper interval (~25%), bimodal, pinhole and large vesicles (~1.0" - 1.75") common; GSI = 55 vesicular (5 - 25%), pinhole to ~1.5" diameter in size; GSI = 35 - 55: (NEWBERRY 8/10/21 **BASALT**) 10 ODOT_MAN.GDT C-3 (11.5-16.0) BASALT; Gray; Slightly Weathered; R3; Very close to close joint spacing (<0.1' to 1.4'); Stained joint surfaces w/ some silty residue infill common, occasional trace mineralization; Some vesicles (10 -C3 100 R3 DR moderate: DA smooth WC greyish RQD = 67 brown Water level consistant at 15%), locally up to 25%; Predominantly pinhole in size, occasionally 1/4" and weathered, some silty residue; GSI 01.GPJ ~4.0' bgs, including when pumping GLOGS 15 K21229 NCGDR C-4 (16.0-17.0) BASALT; Gray; Slightly Weathered; R3; Insufficient run length for joint spacing and characterization (massive); Some vesicles (5 - 10%), C4 100 R3 DR moderate. DA RQD = 100smooth predominantly pinhole in size, occasionally ~1/8"; Insufficient sample for GSI Ponded water from drilling measured at FOG (17.0) Bottom of Hole 12.8' bgs at end of drilling (EOD), 13.0' bgs at EOD + 30 mins DRILL ODOTI

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-03 Project U.S. 97/U.S. 20 Bend North Corridor Geotechnical PE003210 E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 217,512.35 Easting: 249,369.76 Start Card No. Equipment CME-850 Bridge No. Driller Jeff Crisman/CPSD Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3534.0' Start Date May 17, 2021 End Date May 17, 2021 Total Depth 31.0 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations Drilling Methods Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger J - Joint Pl - Planar P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Data Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation Discontinuity I Or RQD% ž Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X- 1 (0.0-2.5) GRAVEL with silt and sand; GP; (Fill) X1 0.0 - 6.0 Begin drilling with 8 1/2' OD Hollow Stem Auger; Gravel with silt, sand. DR slow; DA very rough and some cobbles; GP, SP-SM; Brown; Non-plastic; Dry to moist; Loose to medium dense; N-1 (2.5-4.0) GRAVEL with silt, sand, and some cobble N1 40 18-8-6 (UNCONTROLLED sized clasts; (Fill) FILL) X-2 (4.0-5.0) X2 5 N2 73 2-3-50/5" N-2 (5.0-6.4) Silty SAND; SM; Brown; Nonplastic; Moist; DR moderate; DA Over BASALT; Gray; R3; Highly to Moderately Weathered; Some vesicles (~20%); Top of Bedrock at slightly rough 6.0' bgs; (Fill over Bedrock) 6.0 - 31.0 Switch to Type HQ3T Core at 6.0' (top of C1 C-1 (6.4-11.0) BASALT; Gray; Slightly Weathered; R3; R3 Basalt; Gray to Very close to close joint spacing (<0.1' - ~1.0'); Some silty bedrock); DR moderate; red/gray at and residue infill, trace mineralization on some fracture surfaces; Highly vesicular (~25 - 40%) ~1/8" to large DA smooth; WC brown around flow contact at 25.3'; Slightly (~1.0" diameter); Highly fractured locally over interval; GSI = 20 - 25 weathered with discrete moderately weathered zones; R3 LW at 9.0' bgs - R4; Very close to moderately close 8/10/21 10 joint spacing (<0.1' to 1.8'); Some silty ODOT_MAN.GDT residue infill, C-2 (11.0-16.0) BASALT; Gray; Slightly Weathered; C2 100 DA smooth: DR staining, and trace mineralized infill in Very close to moderately close joint spacing (<0.1' to 1.4'); stained joint surfaces common, trace silty residue **RQD** = 86 moderate; no WR on some joint surfaces, predominantly no infill; Highly some joints and vesicular to some vesicles (15 - 50%), slight decrease in size and abundance with depth, predominantly pinhole in vesicles; Some vesicles to locally 01.GPJ size, some large (≥ core diameter); GSI = 50 scoriacious (5 - 60%), pinhole to ~1.5" GLOGS diameter in size; GSI = 20 - 60; (NEWBERRY 15 K21229 NCGDR BASALT) C- 3 (16.0-21.0) BASALT; Gray; Slightly Weathered; R3-R4; Close to moderately close joint spacing (~0.4' -C3 100 R3-R4 DR moderate; DA RQD = 76smooth ~1.8'); Trace silty residue, some staining on joint surfaces; Highly vesicular (~25%) in upper interval, ≤1/4" in size, decreasing to ~5% in lower interval, predominantly pinhole to <1/8" in size; GSI = 60 FOG DRILL ODOT (

roject	Name	U.S. 97	/U.S. 20 Bend Nor	rth Corri	dor Hole No. NCGDR-03			Page 2 o	f 2
Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance Discontinuity Data and Or RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks Water Level/ Date	Backfill/
20	C4	96	RQD = 30		C- 4 (21.0-25.7) BASALT; Gray to Red; Slightly Weathered; Very close to close joint spacing (0.1' - 0.8'); Trace silty residue coating some joint surfaces; Some vesicles (~5%) in upper 1.5', predominantly pinhole in size, increase in abundance and size with depth to highly vesicular (~45%) at 25.3' bgs; GSI = 35; Persistant sub-vertical joint (moderately smooth) captured over interval; Flow contact observed at 25.3' bgs			Ended core run 3.5" short due to very rough DA at bottom of interval; Highly fractured rock over interval DR moderate; DA smooth — Possible flow contact at 25.3'	
25 -	C5 C6	100 100	R3 RQD = n/a R3 RQD = 31		C- 5 (25.7-26.0) BASALT; Gray and Red Mottled; Slightly to Moderately Weathered; R3; Insufficient run length for joint characterization; Some silty infill of vesicles; Highly vesicular (~40 - 50%), predominantly ~1/4" in size; Insufficient length to estimate GSI C- 6 (26.0-28.3) BASALT; Red/Gray to Gray; Slightly to Moderately Weathered; R3; Very close to close joint			DA rough at 25.3' DR fast; DA rough DR moderate to slow; DA very rough; Core run stopped at 28.25 over C-6 interval due to very rough DA	
30 -	C7	100	R3 RQD = 74		spacing (<0.4'); Some staining and alteration of joint surfaces; Highly fractured and brecciated locally; Highly vesicular (~40%) to locally scoriaceous (~60% vesicles); GSI = 20 C-7 (28.3-30.6) BASALT; Gray; Slightly Weathered; R3; Close to moderately close joint spacing (~0.1' to ~1.1'); Trace silty residue on some joint surfaces; Highly vesicular (~25%), predominantly 1/4" to 1.5" in diameter;			DR moderate to slow; DA irregular, smooth DR fast; DA smooth; No WR to BOH	
	C8	100	R3-R4 RQD = n/a		GSI = 35 C- 8 (30.6-31.0) BASALT; Gray, Slightly Weathered; R3-R4; Insufficient run length for joint characterization; Trace silty residue on joint surfaces; Some vesicles (-5 - 10%), pinhole to <1/4" in size; Insufficient core to estimate GSI (31.0) Bottom of Hole			Ponded water from drilling measured at 30.0' bgs 15 and 30 mins after end of drilling (EOD)	
35 -									
40 -									
45 -									
50									

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-04 Project U.S. 97/U.S. 20 Bend North Corridor PE003210 Geotechnical E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 217,669.44 Easting: 249,471.03 Start Card No. Equipment CME-850 Bridge No. Driller Jeff Crisman/CPSD Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3532.5' Start Date May 15, 2021 End Date May 15, 2021 Total Depth 27.5 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations Drilling Methods Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger Pl - Planar J - Joint P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Discontinuity Data Or RQD% Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation ž Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. 1 1/2 X1 X-1 (0.0-2.5) 0.0 - 3.0 Begin drilling with 8 1/2' OD Hollow Stem Auger Silty sand with trace 1/ . 11 gravel; SM; Brown; Non-plastic; Moist; Loose; (AEOLIAN SILTY SAND) <u>. d i j</u> 2-50/1" N-1 (2.5-3.1) Silty SAND with trace gravel; SM; Brown; N1 67 Auger refusal; Begin Nonplastic; Moist; Loose; Refusal on bedrock; Trace angular fractured basalt in shoe; Some cobbles over Type HQ3T Core at 2.5' 3.0 - 27.5 C1 R3 Basalt; Gray to bedrock contact bedrock contact C-1 (3.1-6.5) BASALT; Gray; Slightly Weathered; R3; Very close to close joint spacing (0.1' to 1.1'); Some silty residue infill, mineralized infill, ~1/8" aperture; Highly vesicular (~25 - 40%), predominantly 1/8" - 1/4" in size with occasional 1/4" - 3/4" vugs; GSI = 50 DR moderate; DA red/gray at and smooth; WC brown around interpreted flow contact; Slightly 5 weathered to fresh with discrete moderately weathered zones; R3 C2 100 R3 C-2 (6.5-11.5) BASALT; Gray; Slightly Weathered; R3; - R4; Very close to RQD = 41 Very close to moderately close joint spacing (0.1' - 1.3'); Some silty residue infill, trace mineralization in horizontal wide joint spacing joints; Predominantly oriented horizontal and sub-vertical; Some vesicles (~15%) to highly vesicular (~40%) in upper interval, decreasing in size and abundance with (<0.1' to >5.0'), predominantly with silty residue infill, depth, pinhole to occasionally large (3/4" - ~1.0" diameter); GSI = 50 staining, and/or trace mineralized infill, occasionally no infill; 8/10/21 10 Some vesicles to highly vesicular (5 -50%), pinhole to ~1.0" ODOT_MAN.GDT diameter in size; GSI C- 3 (11.5-16.5) BASALT; Gray; Slightly Weathered to Fresh in lower interval; R3-R4; Very close to moderately close joint spacing (~0.1- 2.0'); Trace silty residue and staining, generally tight aperture (<1/16") especially at bottom of interval; Highly vesicular in upper 1.2', decreasing from ~25% to some vesicles (~5% to locally = 45 - 90;R3-R4 C3 100 DR moderate: DA (NEWBERRY smooth; WC gray RQD = 90**BASALT**) 01.GPJ ~25%) in lower interval, predominantly pinhole in size at depth, occasionally ~1/4" - 1/2" in size; GSI = 70 GLOGS DR decrease over interval; DA smooth; Full WR 15 K21229 NCGDR C-4 (16.5-21.5) BASALT; Gray; Fresh; R4; Wide joint spacing (≥5.0'); No joints/fractures over interval; Some C4 98 R4 DR moderate; DA RQD = 100smooth; WC gray vesicles (~5%), pinhole to occasionally ~1/8" in size; GSI FOG DRILL ODOTI

Projec	t Name	U.S. 97	/U.S. 20 Bend Nor	rth Corri	dor Hole No. NCGDR-04			Page 2	of 2
Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance Discontinuity Data as your RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks Water Level/	Backfill/ Instrumentation
20	C5	98	R3-R4 RQD = 64		C- 5 (21.5-26.5) BASALT; Gray to Red-Gray; Fresh to Moderately Weathered; R3-R4; Very close to moderately close joint spacing in lower interval (23.6' - 26.5') (<0.1' - 1.1'), moderately close in upper interval (21.5' - 23.6') (2.1'); No infill; Some vesicles (~5%, predominantly pinhole size) in upper interval, increasing with depth to highly vesicular (~25% - 50%) at 23.0' bgs, increasing in size up to ~3/4"; GSI = 45; Possible flow contact (gradational) at 23.6' bgs			DR moderate; DA smooth LW over interval, no Wf to BOH - Possible flow contact at 23.6' Several inch drop over	10/0/
	C6	100	R3 RQD = 75		C- 6 (26.5-27.5) BASALT; Reddish Gray; Slightly Weathered; R3; Close joint spacing (~0.75'); some alteration, mineralized infill (~1/8" aperture); Some vesicles (~20%), pinhole to ~1.0" diameter; GSI = 45 (27.5) Bottom of Hole			interval, possibly small cavity DR fast; DA smooth; No WR No ponded water at enc of drilling (EOD), hole drained rapidly at ~24.0	<u> </u>
- 30 -								bgs	
- 35 -									
- 40 -									
· 45 -									
50									

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-05 Project U.S. 97/U.S. 20 Bend North Corridor PE003210 Geotechnical E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 217,858.29 Easting: 249,344.54 Start Card No. Equipment CME-850 Driller Jeff Crisman/CPSD Bridge No. Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3527.3' Start Date May 15, 2021 End Date May 15, 2021 Total Depth 31.5 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations** Drilling Methods **Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger J - Joint Pl - Planar P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough DR - Drill Rate CA - Casing Advancer "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Data Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation Discontinuity I Or RQD% ž Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X1 X- 1 (0.0-0.2) Asphalt X- 2 (0.2-0.8) Gravel Base: GP 0.0 - 0.2 Begin drilling with 8 1/2' (ASPHALT) OD Hollow Stem Auger X2 X- 3 (0.8-1.5) SAND with silt; SP/SP-SM; Brown; Nonplastic; Dry; Loose; Refusal on boulder/cobble sized X3 0.2 - 0.8 Poorly-graded gravel; (AGGREGATE BASE) clast at 1.5' bgs C1 40 clast at 1.5' bgs C-1 (1.5-6.5) 0.75' basalt BOULDER over 0.75' black and red scoriaceous basalt COBBLES overlying BASALT bedrock at 6.0' bgs: BASALT; Gray; Slightly to Moderately Weathered; R3; Highly vesicular (~35%), vesicles ranging Auger refusal on large RQD = N/Acobble or small boulder 0.8 - 6.0 at 1.5' bgs; Begin Type Poorly graded silty sand (SM) with basalt HQ3T Core DR slow for 1.0', fast for 1/16" to ~ 1/2" in size, silty infill ~3.5', moderate for cobbles/boulders; ~0.5'; DA rough to Augur refused on smooth over interval: coarse basalt WC = Brown clast(s); (UNCONTROLLED 5 FILL) 6.0 - 31.5 Basalt; Gray to C2 60 R3 C-2 (6.5-11.5) BASALT; Gray; Slightly to Moderately DR moderate: DA Weathered; R3; Very close to close joint spacing (<0.1' - ~0.5'); Abundant silty residue coating joint surfaces and RQD = 17 red/gray at slightly rough; WC interpreted flow brown some vesicles, staining common; Highly vesicular (30 - 40%), 1/16" to ~1.0" in size; GSI = 20; Some gravel sized contact; Slightly weathered with discrete moderately weathered zones; Ŕ3 - R4; Very close to moderately close 8/10/21 10 joint spacing (<0.1' to ~2.0'), predominantly ODOT_MAN.GDT with silty residue infill, staining, and/or trace mineralized C- 3 (11.5-16.5) BASALT; Gray; Slightly Weathered; R3-R4; Close to moderately close joint spacing (0.5' - ~2.0'); Some silty residue coating joint surfaces, occasional trace mineralized infill; Highly vesicular (~25 -R3-R4 C3 100 DR moderate: DA smooth; WC gray RQD = 100infill; Some vesicles to highly vesicular (5 - 40%), pinhole to ~1.0" diameter in 30%) in upper ~1.3' and often large (up to entire core diameter in size), decreasing in size and abundance with 01.GPJ depth to some vesicles (\sim 5%) at bottom of interval, predominantly pinhole to \sim 1/8" in size; GSI = 55 size; GSI = 20 - 55; (NEWBERRY GLOGS **BASALT**) 15 DR moderate; DA K21229 NCGDR smooth C-4 (16.5-21.5) BASALT; Gray to Red-Gray; Slightly Weathered; R3-R4; Very close to close joint spacing (<0.1' to 1.2'); Stained surfaces, trace silty residue; Some C4 96 R3-R4 RQD = 42Possible flow contact vesicles in upper 1.0°, increasing in size and abundance over interval to highly vesicular (25 - 40%), commonly 1/4" - 1/2" in size from 17.5' - 21.5' bgs; GSI = 30; Possible flow contact at ~17.5' bgs FOG at ~17.5' DRILL Partial returns, LW at end of C-4 core interval ODOT

Projec	t Name	U.S. 97	/U.S. 20 Bend Nor	rth Corri	dor Hole No. NCGDR-05		Page 2	of 2
Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance Discontinuity Data as Or RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log Drilling Methods, Size and Remarks	Water Level/ Date Backfill/
20	C5	88	R3-R4 RQD = 21		C- 5 (21.5-26.5) BASALT; Red-Gray to Gray; Moderately to Slightly Weathered; R3-R4; Very close joint spacing (<0.1' - ~1.0'); Some silty residue infill (most abundant in upper interval), trace mineralized infill and alteration of some joint surfaces and vesicles; Highly vesicular (~40%), predominantly ~1/8" in upper interval decreasing in abundance and increasing in size with depth to some vesicles (~10%), predominantly pinhole in size, occasionally ~1.0"; GSI = 25 - 30		DR moderate; DA smooth; No WR	
20	C6	100	R4 RQD = 66		C- 6 (26.5-31.5) BASALT; Gray; Fresh; R4; Very close to moderately close joint spacing (<0.2' axial to ~1.3'); Trace sity residue, predominantly no infill; Some vesicles (~5 - 15%), pinhole to <1/4" in size; GSI = 65		DR moderate; DA smooth; No WR	
- 30 -					(31.5) Bottom of Hole		No ponded water at end of drilling (I	in hole
- 35 -								
- 40 -								
- 40 - - 45 -								

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-06 Project U.S. 97/U.S. 20 Bend North Corridor PE003210 Geotechnical E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 217,986.56 Easting: 249,183.85 Start Card No. Equipment CME-850 Driller Jeff Crisman/CPSD Bridge No. Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3528.7' Start Date May 14, 2021 End Date May 14, 2021 Total Depth 29.5 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations Drilling Methods Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger Pl - Planar J - Joint P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough DR - Drill Rate CA - Casing Advancer "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Data Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation ž Discontinuity Dr RQD% Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) and Remarks Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X1 X-1 (0.0-2.5) 0.0 - 5.0 Begin drilling with 8 1/2' OD Hollow Stem Auger Silty sand (SM) with gravel, cobbles and DR slow; DA rough some boulders, trace woody organic debris; Brown; Dry; Non-plastic; N- 1 (2.5-4.0) SAND with some silt (0.2') over N1 46 24-19-30 concussion fractured basalt GRAVEL (0.4'); SM; Brown; Nonplastic; Dry; Dense; Sand is fine; Trace organics; (UNCONTROLLED FILL) Blow count inflated by cobble to boulder-sized clasts; Predominantly cobble-sized basalt clasts and soil; (Fill) X2 DR moderate; DA rough X- 2 (4.0-5.0) Auger cuttings predominantly coarse GRAVEL with some cobble-sized clasts 5 N- 2 (5.0-6.5) SAND with silt and trace gravel; SP-SM; Brown; Nonplastic; Dry; Loose; Sand is fine to medium N2 33 6-3-4 5.0 - 14.5 Silty sand with trace gravel; SM; Brown; Non-plastic; Dry to Х3 X-3 (6.5-7.5) DR moderate: DA rough moist: Loose to medium dense: (AEOLIAN SILTY N3 80 3-5-5 N- 3 (7.5-9.0) SAND with silt; SP-SM; Brown; Nonplastic; Dry; Loose; Sand is fine to Medium SAND) X4 X-4 (9.0-10.0) DA moderate: DA smooth 8/10/21 10 N- 4 (10.0-11.5) Silty SAND with trace gravel; SM; N4 93 4-8-10 Brown; Nonplastic; Moist; Medium Dense; Sand is fine, ODOT_MAN.GDT gravel is fine DR fast; DA smooth X5 X-5 (11.5-12.5) N5 N- 5 (12 5-14 0) Silty SAND: SM: Brown: Nonplastic: 100 13-9-10 Moist; Medium Dense; Slight increase in fines with depth 01.GPJ X-6 (14.0-14.5) GLOGS X6 C-1 (14.5-19.5) BASALT; Gray; Slightly Weathered; R4; Very close to medium close joint spacing (0.1' - 2.2'); Silty residue coating some joint surfaces, trace mineralized infill and staining; some vesicles (5 - ~25%), pinhole to ~3/4" in size; GSI = 60 Switch to Type HQ3T Core at 14.5' bgs DR moderate; DA C1 92 R4 14.5 - 29.5 15 ROD = 66 Basalt; Gray to K21229 NCGDR gray/red; Slightly smooth: WC brown weathered with discrete moderately weathered zones; Ŕ3 - R4; Very close to moderately close FOG joint spacing (<0.1' to 2.2') with some silty DRILL residue infill, staining, and/or trace ODOT (mineralized infill or C-2 (19.5-24.5) BASALT; Gray to Red; Slightly to DR moderate to fast; DA C2 96 R3

Projec	t Name	U.S. 97	/U.S. 20 Bend No	rth Corri	dor Hole No. NCGDR-06	I	T	Page 2 of	2
Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance 1995 Discontinuity Data 28 Or RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks Water Level/ Date	Backfill/ Instrumentation
20			RQD = 52		Moderately Weathered; R3; Very close to close joint spacing (<0.2* - 0.9*); Moderately weathered joint surfaces, highly stained with some alteration and mineral crystal growth; Highly vesicular (25 - 50%), locally scoriaceous (~75%), pinhole to ~1/2" diameter in size; GSI = 25 - 30; Locally brecciated and very rough texture	alteration; Some vesicles to highly vesicular (5 - 40%), pinhole to ~3/4" diameter in size; GSI = 25 - 60; (NEWBERRY BASALT)		smooth; Approx. 3" drop over interval, possible small void LW at 20.0' bgs, no WR to BOH	
- 25 -	C3	100	R3 RQD = 70		C- 3 (24.5-29.5) BASALT; Gray; Slightly Weathered; R3; Very close to medium close joint spacing, (<0.1' - 1.4'); Staining and ≤1/8" silty infill in some joints, occasional infill; Highly vesicular (10 - 25%), pinhole to ~3/4" in size; GSI = 45				
- 30 -					(29.5) Bottom of Hole			Ponded water from drilling measured at	<i>77</i> ,
								28.0' bgs at end of drilling, 28.0' bgs 15 mins after drilling, and 28.0' bgs 30 mins after drilling	
- 35 -									
GPJ ODOT_MAN.GDT 8/10/21									
0D0T DRILL LOG K21229_NCGDR_GLOGS_01.GPJ_0D0T_MAN.GDT_8/10/21 5 6 7 6 7 6 7 7									
ODOT DRILL LO									

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-07 Project U.S. 97/U.S. 20 Bend North Corridor PE003210 Geotechnical E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 220,734.06 Easting: 250,297.56 Start Card No. Equipment CME-850 Driller Jeff Crisman/CPSD Bridge No. Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3497.2' Start Date May 12, 2021 End Date May 12, 2021 Total Depth 25.0 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations** Drilling Methods **Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger J - Joint Pl - Planar P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Data Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation Discontinuity I Or RQD% ž Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X1 X-1 (0.0-2.5) 0.0 - 10.0 Begin drilling with 4 7/8' OD tri-cone bit (mud Silty sand (SM) and rotary); 1.5' boulder from angular basalt gravel, 0.5' to 2.0' bas: DA very cobble, and boulder-size clasts; Brown; Wet (water DR moderate; DA rough; added during WC brown N- 1 (2.5-4.0) No recovery; Cuttings in shoe, single N1 0 5-3-4 gravel-sized basalt clast drilling); Non-plastic; WR intermittent from Loose to medium 2.5' to 5.0' bgs dense; X-2 (4.0-5.0) (UNCONTROLLED X2 FILL) 5 N2 40 3-9-11 N- 2 (5.0-6.5) Silty SAND with gravel; SM; Brown; NP; LW at 5.0' Wet; Medium Dense; Gravel is basalt clasts; Approx. 0.2' of cuttings on top of sample; (Fill) Х3 X-3 (6.5-7.5) No WR N3 40 24-50/2" N-3 (7.5-9.0) GRAVEL with silty sand; GP; Brown-Gray; NP; Wet to Dry; Very Dense; Concussion fractured basalt, rock flour, and angular gravel-sized clasts; blow counts inflated due to presence of cobbles/boulders, DR slow; DA rough DA grinding from 8.5' to 9.75' bgs (boulder) some gravel and silty sand; (Fill) X- 4 (9.0-10.0) X4 8/10/21 10 8-50/5" N- 4 (10.0-10.5) Silty SAND; SM; Brown; NP; Dry to N4 60 10.0 - 10.5 Switch to Type HQ3T Moist; Medium Dense; Contains fine lenticular inclusions Silty sand; SM; Core at 10.0' bgs C1 75 R3 RQD = 0 ODOT_MAN.GDT of ash or pumice oriented roughly parallel to ground surface; Native soil overlying basalt bedrock C-1 (10.5-11.0) BASALT; Gray; Slightly Weathered; R3; Insufficient run length for joint characterization, possibly Brown; Dry to moist; DR moderate: DA C2 100 R3-R4 refusal on bedrock: smooth; no WR **RQD** = 94 (AEOLIAN SILTY very close (vertical joint in sample); Silty residue, some SAND) silty infill of vesicles; Highly vesicular (~25%) ~1/16" to ~1/2" in size; Some organics and root material in sample 10.5 - 25.0 ingrown into vesicles Basalt; Gray; Slightly 01.GPJ 2 (11.0-16.0) BASALT; Gray; Slightly Weathered to weathered to fresh; Fresh; R3-R4; Close to wide joint spacing (0.3' - 4.2'); Silty residue coating joint surfaces in upper ~1/4 of run, R3 - R4; Close to Silty residue coating Joint surfaces in upper ~1/4 of run, some silty infill of vesicles; Highly vesicular in upper 2.6' (~25%), decreasing with depth to some vesicles (~5 - 25%), pinhole to large (~1.0) in size; GSI = 80; Trace organic root material in upper 0.1' of interval wide close joint GLOGS spacing (0.3' to 4.2') 15 with some silty to NCGDR sandy infill, staining, and trace organic C-3 (16.0-21.0) BASALT; Gray; Slightly Weathered to Fresh; R3-R4; Close to moderately close joint spacing (0.3' - 2.5'); Some silty infill with trace sand, slight staining C3 98 R3-R4 DR moderate; DA root material in some RQD = 92smooth; no WR K21229 joints and vesicles; Some vesicles to of discontinuities and some vesicles; Highly vesicular (~25%) to some vesicles (~10%), predominantly pinhole highly vesicular (5 -LOG size with occasional large vesicles ~1/2" diameter; GSI = 25%), pinhole to ~1.0" diameter in size; GSI DRILL = 50 - 80;(NEWBERRY ODOT BASALT)

Projec	t Name	U.S. 97	/U.S. 20 I	Bend No	rth Corri	dor Hole No. NCGDR-07		1	Page 2	of	f 2
B Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance lio	Discontinuity Data SOR RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks	Water Level/ Date	Backfill/ Instrumentation
	C4	100	R3 RQD	-R4) = 90		C-4 (21.0-25.0) BASALT; Gray; Slightly Weathered to Fresh; R3-R4; Some silty residue and staining of joint surfaces; Some vesicles (~10%) to highly vesicular (~25%), predominantly pinhole to ≤~1/4" in size; GSI = 50; Woody organic material in joint at ~24.0' bgs (1/8" aperture)			DR moderate; DA smooth; no WR		
25 -						(25.0) Bottom of Hole			Ponded water from drilling at 17.8' bgs end of drilling (EOE 17.8' bgs at EOD + mins	at)):	
30 -											
35 -											
40 -											
45 -											
50											

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-08 Project U.S. 97/U.S. 20 Bend North Corridor E.A. No. PE003210 Geotechnical Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 221,022.98 Easting: 250,359.24 Start Card No. Equipment CME-850 Bridge No. Driller Jeff Crisman/CPSD Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3491.9' Start Date May 12, 2021 End Date May 12, 2021 Total Depth 35.0 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations Drilling Methods Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger J - Joint Pl - Planar P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth DP - Down Pressure SA - Solid Auger R - Rough "U" - Undisturbed Sample Fo - Foliation St - Stepped CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Data Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density, Instrumentation Discontinuity I Or RQD% ž Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X1 X-1 (0.0-2.5) 0.0 - 19.5 Begin drilling with 4 7/8' Angular basalt gravel, OD tri-cone bit (mud rotary) cobble, and boulder-size clasts with silty sand (SM) soil matrix; Brown; LW at 2.0' bgs Wet (water added N-1 (2.5-4.0) Pulverized rock, concussion fractured N1 27 12-8-25 basalt fragments with some soil; Insufficient recovery to characterize; cuttings suggest predominantly during drilling); Non-plastic; Voids coarse-grained basalt rock fill, gravel to cobble-sized with some silty sand soil matrix; (Fill) Boulder from 3.5' - 5.0' and/or very loose/low X2 density material X-2 (4.0-5.0) present over interval; (UNCONTROLLED 5 N2 100 50/3" N- 2 (5.0-6.5) Concussion fractured basalt fragments; FILL) Single basalt clast in sampler shoe Х3 X-3 (6.5-7.5) DR moderately fast: DA slightly rough (<6" cobbles) N3 0 6-28-10 N-3 (7.5-9.0) No recovery over interval X4 X- 4 (9.0-11.0) Void at 9.0' to 11.25'; Rod dropped ~1.0' 8/10/21 10 ODOT_MAN.GDT N- 4 (11.0-12.5) No recovery; <0.1' concussion fractured N4 5-50/2" 0 N5 60 50/4" N- 5 (12 5-14 0) Concussion fractured basalt clasts. DR slow; DA grinding pulverized rock 01.GPJ DA smoothed out at 13.0' to 15.0' bgs X-5 (14.0-15.0) GLOGS X5 15 N- 6 (15.0-16.5) No recovery over interval; Possible void; very low driving resistance; Loose fill or void N6 0 5-3-2 DR moderate to slow; K21229 NCGDR DA grinding to ~17.0', smooth to 17.5', boulder and cobble fill suggested by DA and increase in X6 X-6 (16.5-17.5) DR to 19.5', slow to 20.0' FOG N7 0 50/4" N-7 (17.5-19.0) No recovery over interval; <0.1' basalt clast, some slough in sampler DRILL X7 X-7 (19.0-20.0) ODOT [19.5 - 35.0

roject	Name	U.S. 97	/U.S. 20 Bend Nor	rth Corri	dor Hole No. NCGDR-08	I		Page 2 o	f 2
Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance Discontinuity Data 20 Or RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks Water Level/ Date	Backfill/
20	N8 C1	0 100	50/0.5" R4 RQD = 80		N-8 (20.0-20.1) No recovery over interval; Single concussion fractured basalt in sampler; Bouldery transition to top of bedrock; Cobble/boulder fill contact at	Basalt; Gray; Slightly weathered to fresh; R3 - R4; Very close to	***	Switch to Type HQ3T Core at 20.0' bgs	//
25 -	C2	74	R3-R4 RQD = 64		19.5' bgs C- 1 (20.1-21.5) BASALT; Gray; Fresh; R4; Close joint spacing, no discontinuities over interval; No infill; Some vesicles (~10 - 20%), predominantly pinhole, up to small vugs (~1.0") in size; Insufficient run length for GSI estimation C- 2 (21.5-26.5) BASALT; Gray; Slighty Weathered to Fresh; R3-R4; Very close to moderately close joint spacing (0.2' - 1.8"); stained surfaces, some silty residue in joints and some vesicles; Some vesicles (~15%) to highly vesicular (~30 - 40%), predominantly pinhole to ~1/8", occasionally large (~1.0" diameter); GSI = 55	moderately close to moderately close joint spacing (0.2' to 2.0') with some silty infill and trace mineralized coatings on some joint surfaces; Some vesicles to highly vesicular (5 - 40%), pinhole to ~1.0" diameter in size; GSI		~1.3' void encountered at 22.0' bgs; evidenced by rapid increase in DR	
-	C3	100	R4 RQD = 74		C- 3 (26.5-31.5) BASALT; Gray; Fresh; R4; Very close to moderately close joint spacing (<0.2' - 2.0'); Staining and <1/8" silty infill observed, slightly rough surfaces, trace mineralized coating on some surfaces, <1/8" aperture; Some vesicles (5 - 10%), occasionally large (~1.0" diameter), predominantly pinhole in size; GSI = 55	= 55 - 60; void or cavity at 22.0' - 23.3', possibly inflated basalt at top of bedrock; (NEWBERRY BASALT)		DR Moderate; DA smooth; No WR	
30 -									
	C4	66	R3-R4 RQD = 49		C- 4 (31.5-35.0) BASALT; Gray; Slightly Weathered to Fresh; R3-R4; Close to moderately close joint spacing (0.2' - 1.7'); Stained surfaces, some sifty residue and trace mineralized infill; Some vesicles (5 - 15%), predominantly pinhole to 1/4" in size; GSI = 60			DR moderate; DA smooth; No WR	
35 —					(35.0) Bottom of Hole		5	Ponded water from drilling measured at 27.0' bgs at end of drilling (EOD), 27.4' bgs at EOD + 15 mins, 28.0' bgs at EOD + 30 mins; actual hole volume significantly exceeded theoretical volume, required 21 bags of bentonite chips to	
40 -								backfill	
45 -									
50									

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-09 Project U.S. 97/U.S. 20 Bend North Corridor PE003210 Geotechnical E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 221,811.60 Easting: 250,536.68 Start Card No. Equipment CME-850 Driller Jeff Crisman/CPSD Bridge No. Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3481.3' Start Date May 11, 2021 End Date May 11, 2021 Total Depth 33.0 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations** Drilling Methods **Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger Pl - Planar J - Joint P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action Material Description **Unit Description** Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Data Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation Discontinuity I Or RQD% ž Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X1 X-1 (0.0-2.5) 0.0 - 17.2 Begin drilling with 4 7/8' OD tri-cone bit (mud Silty sand (SM) and rotary). sand with silt (SP-SM), angular basalt gravel, cobbles, and some boulder-size clasts N- 1 (2.5-4.0) Silty SAND; SM; Brown; Nonplastic; Wet; N1 27 3-3-3 Loose; Some cuttings contamination in sample (upper ~1.0'), predominantly basalt rock fragments; (Fill) with trace woody debris and concrete from ground surface X-2 (4.0-5.0) X2 to ~5.0' bgs; Brown; Wet (water added DR moderately fast, DA during drilling); slightly rough Small cobble-sized 5 N2 23 8-3-2 N- 2 (5.0-6.5) Silty SAND with gravel; SM, GP; Brown; Non-plastic; Loose to Nonplastic; Wet; Loose; ~50% cuttings in sample; Abundant concrete fragments; (Fill) medium dense; clasts (≤0.3') max clast (UNCONTROLLED size from 0.0' to 5.0' bgs; Some wood debris and FILL) Х3 X-3 (6.5-7.5) concrete in cuttings over interval N3 27 7-5-2 N-3 (7.5-9.0) Silty SAND to fine SAND with some gravel; SM, SP; Brown; Nonplastic; Moist to Wet; Loose; Angular basalt clast in sample; (Fill) X4 X-4 (9.0-10.0) Approx. 1.0' boulder-sized clast from 8/10/21 9.0' to 10.0' bgs 10 N- 4 (10.0-11.5) SAND with silt; SP-SM; Brown: N4 20 7-3-2 Nonplastic; Moist; Loose; Sand is fine grained; Possible ODOT_MAN.GDT slough; (Fill) X5 X-5 (11.5-12.5) N5 N- 5 (12.5-14.0) Silty SAND with trace gravel: SM: LW at 12.5' bgs 53 26-7-13 Brown; Wet; Medium Dense; Possibly less than 12% fines (SP-SM), gravel is concussion fractured basalt 01.GPJ X-6 (14.0-15.0) GLOGS X6 15 N- 6 (15.0-16.5) Silty SAND with gravel; SM; Brown; Nonplastic; Wet; Loose; Sand is medium to coarse N6 60 7-3-3 Max clast size NCGDR encountered from 5.0' grained: Possibly disturbed native soil 15.0' bgs is approx. 1.0' K21229 X7 X-7 (16.5-17.5) DR moderately fast; DA smooth 17.2 - 33.0 DA grinding from 17.0' to 17.5' bgs FOG N- 7 (17.5-17.5) No Recovery X- 8 (17.5-18.0) N7 0 50 for 0" Basalt; Gray; Slightly X8 70 R3 weathered to fresh; Switch over to Type C-1 (18.0-22.0) BASALT; Gray; Slightly Weathered; R3; DRILL C1 RQD = 23Very close to close joint spacing (<0.1" - 0.9), stained surfaces, occasional mineralized infill and silty residue; Highly vesicular (<25%), to 3/4", decreasing slightly with depth to <1/4", predominantly pinhole to 1/8"; GSI = 45; HQ3T Core at 18.0' bgs R3 - R4; Very close to DR moderate to fast: DA moderately close ODOTI smooth joint spacing (<0.1' to No WR 2.5') with some silty

roject	Name	U.S. 97	/U.S. 20 Bend Nor	th Corri	dor Hole No. NCGDR-09	I	1	Page 2 o	f 2
Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance Discontinuity Data by Or RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks Water Level/ Date	Backfill/
20	C2	56	R3 RQD = 0		Possible small void (≤1.0') over interval indicated by increase in drill rate and decreased down pressure from approx. 19.0' to 20.0' C-2 (22.0-24.5) BASALT; Gray; Slightly Weathered; R3; Very close joint spacing (<0.3'), some mineralized infill and silty residue, staining common; Highly vesicular (-25%), predominantly 1/16" to 1/4"; GSI = 20; Small voids in top of rock evidenced by drill action, poor	infill, staining, and/or trace mineralized coatings on joint surfaces; Some vesicles to highly vesicular (5 - 25%), pinhole to ~2.0" diameter in size; GSI = 20 - 65; small void		DA rough; DR irregular	
25 -	C3	80	R4 RQD = 40		recovery over interval C- 3 (24.5-27.0) BASALT; Gray; Slightly Weathered to Fresh; R4; Close joint spacing (<1.0'), some silty residue, trace mineralized infill; Some vesicles (~20%), occasionally large (~2.0" diameter); GSI = 30	or cavity at 24.0' - 24.5', possibly inflated basalt at top of bedrock; (NEWBERRY BASALT)		Hit small void at 24.0' bgs, blocked off at 24.5' DA rough to smooth; DR moderate; no WR	
	C4	58	R4 RQD = 49		C-4 (27.0-32.0) BASALT; Gray; Slightly Weathered to Fresh; R4; Close to moderately close joint spacing (0.3'-2.5'), no infill, slightly rough joint surfaces; Some vesicles, occasionaly large (3.0") and cavity forming, predominantly pinhole to 1/4", decreasing in abundance with depth (20-5%); GSI = 60			DR moderate; DA smooth	
30 -									
-	C5	50	R4 RQD = 100		C- 5 (32.0-33.0) BASALT; Gray; Fresh; R4; Insufficient run length for joint characterization; Some stained joint surfaces, trace mineralization; Some vesicles (~10%), pinhole to <1/4"); GSI = 65 (33.0) Bottom of Hole			No water in hole at end of drilling; hole backfilled with 10x bags bentonite chips and cold mix	1
35 -								asphalt patch	
40 -									
45 -									
50									

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-10 Project U.S. 97/U.S. 20 Bend North Corridor PE003210 Geotechnical E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 222,105.36 Easting: 250,601.67 Start Card No. Equipment CME-850 Jeff Crisman/CPSD Bridge No. Driller Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3471.6' Start Date May 10, 2021 End Date May 10, 2021 Total Depth 32.0 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations** Drilling Methods **Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger Pl - Planar J - Joint P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action Material Description **Unit Description** Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Data Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation Discontinuity I Or RQD% ž Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) and Remarks Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X1 X-1 (0.0-2.5) 0.0 - 16.0 Begin drilling with 4 7/8' OD tri-cone bit (mud Coarse granular fill, rotary) predominantly angular basalt gravel, cobble, and boulder-size clasts LW at 2.0' bgs with some sand and N- 1 (2.5-4.0) No recovery over interval; DR slow; DA grinding N1 0 2-2-3 Cobbles/boulders, possible small voids suggested by drill silt, concrete, and brick material; Brown/gray; Wet X-2 (4.0-5.0) X2 (water added during drilling); Non-plastic; 5 Loose to medium N2 0 50/4.5" N- 2 (5.0-6.5) No recovery over interval; Boulder and dense, occasional cobble fill; (Fill) Slight drop in DR from SPT refusal on 5.5' to 6.5' bgs; 1.0' coarse material: diameter boulder over cobbles/boulders and Х3 X-3 (6.5-7.5) interval; Decrease in voids associated with drilling resistance from poor recovery over 6.5' to 7.5' bgs N3 27 7-17-26 N-3 (7.5-9.0) GRAVEL with some sand and silt; GP; interval: DR fast/slow; DA rough Brown/Gray; Nonplastic; Wet; Medium Dense; Some concussion fractured basalt and concrete (made ground); (UNCONTROLLED smooth to grinding Some cuttings and slough in sample; (Fill) FILL) X4 X-4 (9.0-10.0) 8/10/21 10 Tight hole from 12.5' N4 O 5-3-1 N- 4 (10.0-11.5) Very Loose; No recovery over interval, all cuttings and slough; Possible voids over interval; (Fill) bgs; DA very rough, ODOT MAN.GDT advance required multiple cleanout runs; Drilled from 12.5' to 15.0' X-5 (11.5-12.5) X5 bgs with fast DR, very little down pressure N-5 (12.5-14.0) No recovery over interval; (Fill) N5 0 1_1_0 required to advance 01.GPJ X-6 (14.0-15.0) GLOGS X6 DA rough, some binding and chatter to 16.0' bgs, then even grinding; DR slow; no WR 15 N6 51 38-50/4 5" N- 6 (15.0-16.5) Basalt rock fragments, cuttings; Some NCGDR red brick material, concrete fragments (made ground); 16.0 - 32.0 Top of rock evidenced Basalt; Gray to red by drop in DR, smooth K21229 X7 X-7 (16.5-17.0) gray at interpreted C- 1 (17.0-22.0) BASALT; Gray; Slightly Weathered to Fresh; R3-R4; Close to moderately close joint spacing C1 94 R3-R4 Switch to Type HQ3T flow contact; Slightly RQD = 58Core at 17.0 bgs LOG (0.2' - 2.0'); Staining and silty residue in upper interval weathered to fresh; decreasing with depth; Some mineralized infill; Slightty rough surfaces; Some vesicles (5-25%), decreasing with R3 - R4; Very close to DRILL moderately close depth (~0.5" to pinhole); GSI = 60 joint spacing (<0.1' to DR moderate; DA ODOT 3.0') with some silty smooth; No WR and/or mineralized

Project	Name	U.S. 97	/U.S. 20 Bend Nor	th Corri	dor Hole No. NCGDR-10			Page 2	of	2
Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance Discontinuity Data as Or RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks	Water Level/ Date	Backfill/ Instrumentation
20	C2	88	R4 RQD = 29		C- 2 (22.0-27.0) BASALT; Gray; Slightly Weathered; R4; Very close to close joint spacing (<0.1' to 0.8'); Some silty infill, <1/8" aperture; Some staining, slightly rough surfaces; Some vesicles (~5%), predominantly pinhole in size; GSI = 45	infill; Some vesicles to highly vesicular (5 - 25%), pinhole to ~2.0" diameter in size; GSI = 45 - 60; (NEWBERRY BASALT)		DR moderate; DA smooth		
25 -	C3	100	R3-R4 RQD = 90		C- 3 (27.0-32.0) BASALT; Gray to Red-Gray; Fresh to Slightly Weathered; R3-R4; Close to moderately close joint spacing (0.35' - ≤3.0'); No infill; Slightly stained, smooth to rough surfaces; Some vesicles (~5%), pinhole to 29.5' increasing in size and abundance to highly vesicular and occ. large (~1.0") at 30.0' to BOH; GSI = 55					
30 -					(32.0) Bottom of Hole			A Possible flow con at 30.0' No water in hole at of drilling.		
35 -										
40 -										
45 -										
50										

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-11 Project U.S. 97/U.S. 20 Bend North Corridor PE003210 Geotechnical E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 222,234.55 Easting: 250,661.52 Start Card No. Equipment CME-850 Bridge No. Driller Jeff Crisman/CPSD Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3470.3 Start Date May 6, 2021 End Date May 7, 2021 Total Depth 35.0 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations Drilling Methods Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger J - Joint Pl - Planar P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action Unit Description Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Data Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation Ś. Discontinuity I Or RQD% Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) and Remarks Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X1 X-1 (0.0-2.5) 0.0 - 20.0 Begin drilling with 4 7/8' OD tri-cone bit (mud Silty sand with gravel rotary) (SM), cobbles, and some boulder-size clasts with trace woody debris; Brown; Wet (water added N- 1 (2.5-4.0) Silty SAND with some gravel; SM; Brown; DR moderately fast; DA N1 57 4-6-7 during drilling); Nonplastic: Wet: Medium Dense: (Fill) irregular to smooth; WC Non-plastic; Loose to medium dense; X-2 (4.0-5.0) X2 cobbles/boulders and voids or very loose/low density 5 N2 67 24-35-22 N-2 (5.0-6.5) Silty GRAVEL with sand; GM; Brown; DR moderately fast; DA material associated Nonplastic; Wet; Very Dense; Blow count inflated on rock; Sample contains 0.2' cuttings and ~0.2' concussion smooth to choppy with poor recovery, fractured basalt clasts, likely cobble-sized material at erratic drill depth; (Fill) X-3 (6.5-7.5) action/drill rate over Х3 interval; irregular, bouldery contact with N- 3 (7.5-9.0) Silty SAND with gravel; SM; Brown; Nonplastic; Wet; Medium Dense; Some cuttings in sampler, discarded; (Fill) N3 33 6-13-15 underlying bedrock; (UNCONTROLLED FILL) X4 X-4 (9.0-10.0) Full WR to 9.0' bgs, LW at 9.0' bgs; Increase in drill resistance at 9.5' 8/10/21 10 N- 4 $\,$ (10.0-11.5) No recovery; Attempted sampling with DM sampler, drove 18" in 3x blows with no recovery N4 O 4-1-3 bgs (cobble?) Rapid 6" fall during SPT, ODOT_MAN.GDT possible void from 10.0' to 12.5' (high DR, very X-5 (11.5-12.5) X5 low resistance) N5 33 9-33-50/0" N- 5 (12.5-14.0) Silty GRAVEL: GM: Brown: Nonplastic: Begin Type HQ3T Core at 12.5'; DR very fast Wet; Very Dense; Refusal on very coarse gravel, cobble or boulder; Trace woody organics; Concussion fractured basalt; Some slough in sample; (Fill) 01.GPJ from ~13.75' to 17.0': No recovery over interval (washout) X-6 (14.0-17.0) GLOGS X6 15 NCGDR K21229 C- 1 (17.0-20.5) BASALT; Gray; Slightly Weathered to Fresh; R3-R4; Close to very close joint spacing (0.2' - 1.2'); Some vesicles (≤5%) to highly vesicular (~39%); C1 85 R3-R4 RQD = 66FOG Irregular, bouldery bedrock contact DRILL Top of bedrock at ODOT (~20.0', contact poorly

Projec	et Name	U.S. 97	/U.S. 20 Bend Nor	rth Corri	dor Hole No. NCGDR-11	T	T	Page 2	of 2
Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance Discontinuity Data by Or RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks Water Level/	Date Backfill/ Instrumentation
20	C2	66	R3 RQD = 30		C- 2 (20.5-25.5) BASALT; Gray, some Red; Slightly Weathered; R3; Very close to close joint spacing (<0.6'); rough, trace of silty infill; <1/8" aperture; Rough surfaces, staining common; Highly vesicular (25-50%), 1/16" - 1/4" in size; GSI = 50	20.0 - 35.0 Basalt; Gray to gray with some red; Slightly weathered to fresh; R3 - R4; Very close to close joint spacing (<0.1' to 1.2') with silty infill and rough, stained surfaces; Some vesicles to highly vesicular (5 - 50%),		constrained due to bouldery fill DR moderate; DA smooth	
- 25 -	C3	92	R3 RQD = 12		C- 3 (25.5-30.5) BASALT; Gray, some Red; Slightly Weathered; R3; Very close joint spacing (≤0.5'); Rough stained surfaces with trace silty infill; Some vesicles (≤25%) decreasing in size and abundance at bottom of interval (≤1/4" to pinhole, ~1/8" common); GSI = 45	pinhole size to ~1/2"; GSI = 45 - 50; Top of bedrock contact poorly constrained due to bouldery fill; (NEWBERRY BASALT)		DR moderate; DA smooth No WR	
- 30 -	C4	100	R3-R4 RQD = 38		C- 4 (30.5-35.0) BASALT; Gray; Slightly Weathered to Fresh; R3-R4; Very close to close joint spacing; Slightly rough stained surfaces with trace silty infill; Some vesicles (~5-10%), predominantly pinhole, occasionally ~1/2" diameter; GSI = 50			DR moderate; DA smooth	
- 35 -					(35.0) Bottom of Hole		5	Ponded water measured at 27.9' bgs 15 mins. after drilling, 28.87' bgs 45 mins. after drilling; No water remaining afte 72 hrs.	
- 40 -									
- 45 -									
50									

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-12 Project U.S. 97/U.S. 20 Bend North Corridor Geotechnical E.A. No. PE003210 Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 222,385.40 Easting: 250,690.49 Start Card No. Equipment CME-850 Bridge No. Driller Jeff Crisman/CPSD Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3469.5' Start Date May 6, 2021 End Date May 7, 2021 Total Depth 21.0 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations Drilling Methods Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger J - Joint Pl - Planar P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth DP - Down Pressure SA - Solid Auger R - Rough "U" - Undisturbed Sample Fo - Foliation St - Stepped CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Discontinuity Data Or RQD% Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation Ś. Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X-1 (0.0-2.5) No sample; Basalt rock cuttings over 0.0' - 1.5' interval, drilled with no returns from 1.5' bgs; (Fill) X1 0.0 - 5.0 Begin drilling with 4 7/8' OD tri-cone bit (mud Silty sand (SM) and sand with silt rotary) (SP-SM), angular basalt gravel, cobbles, and some Lost circulation at 1.5' boulder-size clasts; Brown; Wet (water X- 2 (2.5-4.0) No sample; Rock Fill; Void from 3.5' to 4.0'; (Fill) added during X2 DR slow; DA grinding drilling); Non-plastic; Loose to medium dense; Voids and/or DR irregular; DA very loose/low grinding, chatter density material Х3 X-3 (4.0-5.0) present over interval; (UNCONTROLLED FILL) 5 N- 1 (5.0-6.0) Silty SAND with basalt fragments; SM; Brown; Nonplastic; Wet; Very Dense; Presumed native N1 4-16-50/2" 5.0 - 6.0 Silty sand; SM; Wet material (SM) with some concussion fractured basalt bedrock in sampler shoe (water added during Begin Type HQ3T Core at 6.0' C- 1 (6.0-7.0) BASALT; Gray; Slightly Weathered; 90 R3-R4 C1 drilling); Brown; R3-R4; Close to very close discontinuity spacing (0.3' - 0.6'); Rough joint surfaces with staining, no infill; RQD = 60Non-plastic; Medium dense to very dense Insufficient sample for GSI estimate C2 100 R3-R4 C-2 (7.0-12.0) BASALT; Gray; Slightly Weathered; (SPT refused on DR moderate; DA R3-R4; Close to moderately close joint spacing (~0.3' - 1.8'); Predominantly no infill, occasional trace mineralized **RQD** = 86 bedrock); (AEOLIAN smooth SILTY SÁND) infill and stained surfaces; Slightly rough, <1/16" aperture; Highly vesicular (~25%) to some vesicles (~5%), generally decreasing with depth; Pinhole to ~1/2" in size; GSI = 65 6.0 - 21.0 Basalt; Gray; Slightly weathered to fresh; R3 - R4; Close to moderately close joint spacing (0.3' to 1.9') with no infill or 10 some staining and/or trace mineralized infill; Some vesicles to highly vesicular (5 - 25%), pinhole size to ~1/2"; GSI = 65 - 70; (NEWBERRY C-3 (12.0-17.0) BASALT; Gray; Slightly Weathered to Fresh; R4; Close to moderately close joint spacing (0.7'-1.6'); Slightly rough surfaces with minor staining; Some joints appear closed, possibly mechanical breaks; Highly vesicular (~25%) to some vesicles (~5%), decreasing in size and abundance in lower interval; Pinhole to ~1/4" in C3 100 R4 DR Slow; DA Smooth BASALT) RQD = 100size; GSI = 70

8/10/21

ODOT MAN.GDT

01.GPJ

K21229 NCGDR GLOGS

FOG

DRILL ODOT (

Projec	t Name	U.S. 97	/U.S. 20 Bend No	rth Corri	dor Hole No. NCGDR-12	,		Page 2	of	2
Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance in Discontinuity Data 20 Previous Page 100 Previous Prev	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks	Water Level/ Date	Backfill/ Instrumentation
15 20 -	C4	100	R3-R4 RQD = 95		C- 4 (17.0-21.0) BASALT; Gray; Fresh; R3-R4; Close to medium close joint spacing (0.3' - 1.9'); No infill or staining; Fracture surfaces slightly to moderately rough, possibly some mechanical breaks; Some to highly vesicular locally (5 - 20%, pinhole to 1/4" size); GSI = 70					
					(21.0) Bottom of Hole			Ponded water froi drilling measured bgs at end of drilli (EOD); 4.3' bgs at + 1 hour; 5.3' bgs EOD + 24 hrs; Ho abandoned 5/7/2'	at 4 3'	
25 -										
30 -										
35 -										
38										

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-13 Project U.S. 97/U.S. 20 Bend North Corridor PE003210 Geotechnical E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 222,470.27 Easting: 250,703.62 Start Card No. Equipment CME-850 Driller Jeff Crisman/CPSD Bridge No. Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3470.5 Start Date May 5, 2021 End Date May 6, 2021 Total Depth 25.0 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations** Drilling Methods **Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger Pl - Planar J - Joint P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Data Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation Discontinuity I Or RQD% ž Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. 0.0 - 9.5 X1 X-1 (0.0-2.5) Cobble to boulder-sized angular basalt Begin drilling with 8 1/4" rubble, concrete, some metal; Voids common (Fill) OD Hollow Stem Auger; Coarse granular fill in DA very rough, refusal loose silty sand on concrete and metal matrix, predominantly fill at 1.7' bgs; Adjusted location 3.0' S, 3.0' E, angular basalt gravel, cobble, and refusal in basalt cobble boulder-size clasts X-2 (2.5-5.0) Angular cobble-sized fill material rubble at 1.5' bgs; X2 with some concrete Moved 3.0' S, 7.5' W of and metal building original location; Begin drilling from materials; surface with 4 7/8" OD Brown/gray; Wet (water added during tri-cone bit (mud rotary); LW at 2.5', drilled ahead 5 drilling); Non-plastic; N1 6 4-30-13 N- 1 (5.0-6.5) GRAVEL with coarse sand and some silt; to 5.0' bgs with no returns; DA very rough; Loose to very dense GP; Nonplastic; Dry to Moist; Dense; Gravel is concussion fractured basalt; Likely basalt rubble in loose (SPT refusal); Temporarily abandoned hole on 5/5/2021 with 8x silt/sand matrix; Voids common; (Fill) cobbles/boulders and Х3 X-3 (6.5-7.5) voids associated with bags bentonite chips; poor recovery over drilled out bentonite plug on 5/6/2021 to resume interval; N2 73 50/5 N-2 (7.5-9.0) SAND with basalt rock fragments; SP; (UNCONTROLLED drilling w/ 4 7/8" OD Brown; Nonplastic; Wet; Very Dense; Blows inflated on rock rubble; (Fill) tri-cone bit (mud rotary) FILL) from 5.0' bgs X4 X-4 (9.0-10.0) DR slow to 9.5'; DA rough to 9.5' 9.5 - 25.0 8/10/21 10 C-1 (10.0-11.0) Basalt; Gray; Slightly Weathered; R3; Very close joint spacing (<0.4'); Some stainging and alteration of fractre surfaces, no infill; Highly vesicular (<20%), pinhole to approx. 1/2" in size; Insufficient Basalt; Gray; Slightly C1 8 R3 Switch to Type HQ3T weathered to fresh; RQD = 0Core at 10.0 ODOT_MAN.GDT R3 - R4; Very close to R3-R4 C2 98 wide joint spacing recovery for GSI C- 2 (11.0-16.0) Basalt; Gray; Slightly Weathered; RQD = 92(<0.1' to 4.0') with no R3-R4; Close to moderately close joint spacing (0.5' - 2.0'); Staining and minor alteration of fracture surfaces infill or some DR moderately slow; DA staining, alteration, smooth: LW over C-2 and some vesicles; Some mineralized infill; Joint surfaces smooth to rough, 1/8" aperture; Some vesicles (5 - 25%), decreasing in size and abundance with depth over and/or trace interval 01.GPJ mineralized infill; interval; Approx. pinhole to 1/2" diameter in size, occasionally large (~1.5" diameter); GSI = 65 Some vesicles to highly vesicular (5 -GLOGS 25%), pinhole to ~1.5" diameter in size; GSI = 55 - 90; 15 No WR to bottom of hole NCGDR (NEWBERRY BASALT) C3 100 R3-R4 C- 3 (16.0-21.0) Basalt; Gray; Slightly Weathered to Fresh; R3-R4; No infill; Joint surfaces smooth to slightly RQD = 19K21229 rough, some staining; Approx. 45° shear failures common: GSI = 55 LOG DRILL ODOT

Projec	t Name	U.S. 97	/U.S. 20	Bend No	rth Corri	dor Hole No. NCGDR-13			Page	2 of	f 2
Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance lio	Discontinuity Data 80 Or RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks	Water Level/ Date	Backfill/ Instrumentation
	C4	100	F RQD	R4 = 100		C- 4 (21.0-25.0) Basalt; Grey; Fresh; R4; No natural fractures, mechanical break in lower 1.0' during core retreival; Some vesicles (5-10%), predominantly pinhole; Massive; GSI = 90					
25 -						(25.0) Bottom of Hole			Ponded water drilling measur 23.0' bgs at en drilling (EOD) - 23.2' bgs at EC mins; 22.7' bgs + 1 hr	ed at d of + 15 mins; DD + 30	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
30 -											
35 -											
40 -											
45 -											
50											

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-14 Project U.S. 97/U.S. 20 Bend North Corridor E.A. No. PE003210 Geotechnical Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 222,853.62 Easting: 250,672.61 Start Card No. Equipment CME-850 Bridge No. Driller Jeff Crisman/CPSD Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3472.2 ft Start Date May 11, 2021 End Date May 11, 2021 Total Depth 20.0 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations Drilling Methods Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger J - Joint Pl - Planar P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough DR - Drill Rate CA - Casing Advancer "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Discontinuity Data Or RQD% Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation Ś. Texture, Cementation, Structure, Origin. Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X1 X-1 (0.0-2.5) 0.0 - 2.7 Begin with 4 7/8" OD tri-cone mud rotary Silty sand (SM) with angular cobble-sized basalt clasts and some woody debris; Brown/gray; Moist (water added during drilling); Non-plastic; SPT refusal, N1 N- 1 (2.5-4.0) Silty SAND with cobbles; SM; Brown; Nonplastic; Moist; Concussion fractured basalt fragments; 75 50/5" Increase in down cobbles/boulders pressure, decrease in Blow count inflated; Wood fragments in cuttings over associated with poor DR at 2.5'; DA smooth; interval: (Fill) recovery over WC brown interval; (UNCONTROLLED X2 X-2 (4.0-5.0) FILL) 2.7 - 20.0 Basalt; Gray to red at 5 N2 0 50/0" N- 2 (5.0-5.1) No Recovery; Basalt fragments in sampler Switch to HQ3T core at interpreted flow C1 snoe
C-1 (5.1-7.0) BASALT; Gray; Slightly Weathered; R4;
Very close joint spacing (<0.3'); Stained joint surfaces,
some silty residue, trace infill; Highly vesicular (≤25%),
1/16" to 3/4" in size; GSI = 35; Very rough drilling over contact; Slightly weathered to fresh; DA very rough over R3 - R4; Very close to interval moderately close interval, inferred rubbly/irregular top of rock joint spacing (<0.1' to ~3.0') with no infill to C2 C-2 (7.0-11.0) BASALT; Gray; Slightly Weathered to DA smooth; DR R4 8/10/21 Fresh; R4; Close to moderate joint spacing (<2.0"); Some staining, trace mineralized infill in joints, decreased some silty residue moderate; WC gray infill, staining and/or alteration with depth; Highly vesicular (~25-35%) in upper interval, decreasing to some vesicles (~5%, trace mineralized ODOT MAN.GDT infill in some joints; predominantly pinhole in size) at depth, max observed vesicle size ~1.0", predominantly ≤1/4" over interval; GSI Some vesicles to highly vesicular (5 -50%), pinhole to ~1.0" diameter in size; GSI = 35 - 80; 01.GPJ 10 (NEWBERRY BASALT) K21229_NCGDR_GLOGS_ C3 C-3 (11.0-16.0) BASALT; Gray; Fresh; R4; Moderately DA rough; DR moderate; 100 close joint spacing, possibly wide (drill break at 12.0'); Joint surfaces slightly rough; Slight staining of joint **RQD** = 100 WC gray surfaces, no infill; Some vesicles (~5%), predominantly pinhole to occasionally 1/4" in size; GSI = 80 FOG DRILL ODOT (

roject	Name	U.S. 97	/U.S. 20 Bend No	rth Corri	dor Hole No. NCGDR-14		Τ	Page 2	of	2
5 Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance Discontinuity Data	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks	Water Level/ Date	Backfill/
_	C4	100	R4 RQD = 100		C- 4 (16.0-20.0) BASALT; Gray to Red; Fresh to Slighty Weathered; R4; Moderately close joint spacing (0.4' to ~3.0', possible mechanical breaks); No infill or staining; Some pinhole vesicles (~5%) to highly vesicular (25 - 50%) at 19.0'; GSI = 80; Possible flow contact at 19.0' bgs indicated by increase in vesicle size and abundance, color change from gray to red, and alteration			DA smooth; DR moderatly fast (in in lower interval); gray	crease WC	
20 —					(20.0) Bottom of Hole			Possible flow of at 19.0' bgs. Ponded water fro drilling at 11.0' bg end of drilling (EC mins, 12.5' bgs a + 30 mins	m	
25 -										
30 -										
35 -										

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-16 Project U.S. 97/U.S. 20 Bend North Corridor PE003210 Geotechnical E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 223,356.35 Easting: 250,776.42 Start Card No. Equipment CME-850 Bridge No. Driller Jeff Crisman/CPSD Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3464.1' Start Date May 5, 2021 End Date May 5, 2021 Total Depth 27.0 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations Drilling Methods Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger J - Joint Pl - Planar P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Discontinuity Data Or RQD% Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density, Instrumentation ž Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X- 1 (0.0-2.0) Silty GRAVEL with some sand; GM; Brown; Nonplastic; Dry; Medium Dense; (Alluvium) X1 0.0 - 2.0 Began drilling with 8 1/4" Silty gravel with sand; GM; Brown; OD Hollow Stem Auger Non-plastic; Dry; Medium dense; (FILL) C- 1 (2.0-6.0) BASALT; Gray; Fresh to Slightly Augur refusal at 2.0' C1 95 R4 2.0 - 27.0 Weathered; R4; Close joint spacing; No infill, some alteration and secondary mineralization in vesicles; Highly bgs; Switch to Type RQD = 95Basalt; Gray; Slightly HQ3T core at 2.0 bgs weathered to fresh: vesicular (~25%), pinhole to ~1.0' in size, 1/8" - 1/4" common; GSI = 75 No WR from 3.0' to total R3 - R4; Very close to depth moderately close joint spacing (<0.1' to ~1.5') with no infill to 5 some staining, alteration, trace silty residue infill, and/or C2 28 R4 C-2 (6.0-11.0) BASALT; Gray; Slightly Weathered; R4; trace mineralized **RQD** = 10 Close to very close joint spacing (\leq 0.5'); Some staining, no infill; Highly vesicular (25-50%), predominantly < 1/8"; infill in some joints: Some vesicles to highly vesicular (5 -Rapid increase in DR 50%), pinhole to ~1.0" from 7.5' to 11.0'; DA diameter in size; GSI rough, then smooth; = 35 - 75; Small Likely void over interval void(s) or cavity in (7.5' - 10.0') upper region of 8/10/21 formation between 10 7.5' - ~10.0' bgs; (NEWBERRY ODOT_MAN.GDT BASALT) C-3 (11.0-16.0) BASALT; Gray; Slightly Weathered; R4; C3 100 R4 DR moderate: DA Close to moderately close joint spacing (0.6' - 1.4'); Stained surfaces common, some mineralized infill; Highly **RQD** = 92 smooth vesicular (15 - 50%), pinhole to occasionally ~3/4" in size; 01.GPJ GLOGS 15 K21229 NCGDR C- 4 (16.0-21.0) BASALT; Gray; Slightly Weathered to Fresh; R4; Moderately close joint spacing (~1.0' - 1.5'); Some mineralized infill; Joints tight (\leq 1/16" aperture); Highly vesicular, predominantly pinhole (10%) and 1/4" (<5%) in size; GSI = 70 C4 100 R4 RQD = 90FOG DRILL ODOTI

Project	t Name	U.S. 97	/U.S. 20 Bend Nor	rth Corri	dor Hole No. NCGDR-16			Page 2	of 2
Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance Discontinuity Data as Or RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks Water Level/	Date Backfill/ Instrumentation
20	C5	100	R4 RQD = 5		C- 5 (21.0-26.0) BASALT; Gray; Slightly Weathered to Fresh; R4; Moderately close joint spacing (0.4' - 1.5'); Stained joint surfaces with trace sifty residue, moderately rough; Tight joint aperature; Some vesicles, predominantly pinhole in size (<10%) with occasional <1/4" vesicles; GSI = 70			DR moderate; DA smooth	
25 -	C6	100	R4 RQD = 100		C- 6 (26.0-27.0) BASALT; Gray; Fresh; R4; Moderately close joint spacing (>1.0'), no joints in sample; Pinhole vesicles throughout sample (≤5%); olivine phenocrists in fine groundmass; Insufficient run length for GSI estimate (27.0) Bottom of Hole			Ponded water from drilling measured at 9. bgs at end of drilling (EOD) + 15 mins; Hole	
30 -								partially collapsed at 10.0' bgs at EOD, no water measured at 10. bgs at EOD + 30 mins	0'
35 -									
40 -									
45 -									
50									

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-17 Project U.S. 97/U.S. 20 Bend North Corridor PE003210 Geotechnical E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 223,598.72 Easting: 250,834.25 Start Card No. Equipment CME-850 Bridge No. Driller Jeff Crisman/CPSD Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3461.0' Start Date May 3, 2021 End Date May 4, 2021 Total Depth 31.5 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations** Drilling Methods **Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger J - Joint Pl - Planar P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Data Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation Discontinuity I Or RQD% ž Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X- 1 (0.0-2.5) Silty GRAVEL with cobbles; GP-GM; Brown; Nonplastic; Dry; Very Dense; Angular basalt X1 0.0 - 4.5 Began drilling with 8 1/4" OD Hollow Stem Auger Silty gravel with angular basalt cobbles; possibly small boulders; Gray/brown; Dry; Refusal on large cobble or boulder at 2.0'; Began Non-plastic; Very N- 1 (2.5-4.0) No sample recovery; Basalt rock chips in N1 0 drilling with 4 7/8" OD dense (SPT refusal); cuttings; (Fill) tri-cone mud rotary; DA (UNCONTROLLED rough; DR slow; WC FILL) brown X-2 (4.0-5.0) X2 Some water loss from 4.5 - 31.5 2.5' - 5.0'. 5 Irregular, bouldery Basalt; Gray to N- 2 (5.0-5.1) Concussion fractured basalt; Insufficient N2 100 R4 sample recovery C- 1 (5.1-6.5) BASALT; Gray; Slightly Weathered; R4; gray/red to brown; Slightly weathered bedrock contact, C1 RQD = 0possible small (<0.5') Sample insufficient to classify joint character; Highly vesicular (~15%), pinhole to 1/4" in size; Trace secondary mineralization in vesicles, trace silty infill of vesicles; voids from 2.0' to 4.5' with discrete Type HQ3T core from moderately weathered zones; R3 C2 R3-R4 5.0' to BOH; DA smooth; Insufficient sample for GSI; Poor recovery over interval; DR slow: WC grav Possible cobble/boulder or rubbly top of rock - R4; Very close to C- 2 (6.5-10.2) BASALT; Gray; Ślightly Weathered to Fresh; R3-R4; Close to moderately close joint spacing moderately close Fresh; R3-R4; Lose to moderately close joint spacing (0.5' - 1.5'); No joint infill, slight staining of surfaces; Highly vesicular (~15%) in upper 1.8', occasionally large vesicles (~1.0" diameter), generally decreasing with depth to some vesicles (~5 - 15%), decrease in size to pinhole diameter at depth; Some silty vesicle infill, decreasing joint spacing (<0.1' to 1.8') with some silty residue infill, staining, and/or trace 8/10/21 mineralized infill or 10 with depth; GSI = 80 alteration: Some 100 R3-R4 C-3 (10.2-15.2) BASALT; Gray; Slightly Weathered; DR slow; DA smooth; **RQD** = 92 R3-R4; Close to moderately close joint spaceing (.03' - 1.3'); No infill, oxidation, or staining; Some vesicles vesicles to highly WC gray ODOT_MAN.GDT vesicular to locally LW at ~11.5'; No WR to (~15%) to highly vesicular (50%), increasing size with depth from pinhole to 0.5" in lower interval; GSI = 65; scoriaceous (5 to BOH. >60%), pinhole to ~1.0" diameter in Increased weathering in vesicular lower portion of interval size; GSI = 45 - 80; (NEWBERRY 01.GPJ BASALT) GLOGS 15 C4 C-4 (15.2-20.2) BASALT; Gray to Red; Slightly to DR slow; DA smooth, 84 R3 K21229 NCGDR Moderately Weathered; R3; Close joint spacing (0.3' - 0.8'); Trace silty sand infill; Highly vesicular (15-50%), **RQD** = 44 occasionally choppy; Possible small voids 1/16" to ≤1/2" in size, alteration and weathering of vesicles common; GSI = 55; Some vitrified, botrodial over interval texture infill of vesicles in lower interval LOG DRILL ODOT

roject	t Name	U.S. 97	/U.S. 20 Bend Nor	rth Corri	dor Hole No. NCGDR-17			Page 2 o	f 2
Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance Discontinuity Data as Or RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks Water Level/ Date	Backfill/
20 -	C5	100	R3-R4 RQD = 100		C- 5 (20.2-21.5) BASALT; Red-Gray; Slightly to Moderately Weathered; R3-R4; Moderately close joint spacing (>1.0'); No infill; Highly vesicular (~50%) up to			DR slow; DA smooth	
25 -	C6	88	R3-R4 RQD = 30		1/2" in size, localized scoriaceous texture; GSI = 55 C-6 (21.5-26.5) BASALT; Red-Gray; Slightly to Moderately Weathered; R3-R4; Very close to close joint spacing (<1.0'); No infill; Highly vesicular to (>25%) to scoriaceous, espically in lower 1.0' of interval; GSI = 45			Small voids over interval	
_	C7	83	R4 RQD = 0		C- 7 (26.5-29.5) BASALT; Red-Gray; Slightly to Moderately Weathered; R4; Very close joint spacing (<0.3'); No infill; Highly vesicular (15 - 50%), localized scoriaceous vugs; GSI = 45; Trace clayey residue on fracture surface, possible washout interval			DR slow; DA smooth	
30 -	C8	100	R4 RQD = 40		C- 8 (29.5-31.5) BASALT; Red-Brown; Slightly to Moderately Weathered; R4; Very close joint spacing (<0.45'); No infill; Some vesicles (<15%) to locally scoriaceous				
					(31.5) Bottom of Hole			No ponded water from drilling, dry hole observed at end of drilling (EOD) + 15 mins	
35 -									
40 -									
45 -									
50									

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-18 Project U.S. 97/U.S. 20 Bend North Corridor PE003210 Geotechnical E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 223,595.05 Easting: 250,893.95 Start Card No. Equipment CME-850 Driller Jeff Crisman/CPSD Bridge No. Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3460.1' Start Date May 20, 2021 End Date May 20, 2021 Total Depth 32.0 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations** Drilling Methods **Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger Pl - Planar J - Joint P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Data Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation Discontinuity I Or RQD% ž Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X1 X-1 (0.0-2.5) 0.0 - 6.0 Begin drilling with 4 7/8' Gravel with sand, silt, OD tri-cone (mud rotary) angular basalt cobbles, and some boulders; Gray/brown; Moist; Fill ~25% cobble sized clasts (~0.4' - 1.0'), Non-plastic; Very N-1 (2.5-4.0) Silty GRAVEL and COBBLES, some N1 100 50/1 1/2" some boulders exposed dense (SPT refusal); boulders; Basalt clasts, concussion fractured angular basalt rock fragments and pulverized rock in sampler; at gound surface in drill (UNCONTROLLED Boulder from ~2.25' - 3.8' bgs (~1.7' diameter); (Fill) hole vicinity FILL) X- 2 (4.0-5.0) ~0.5' sized cobble at 4.0' bgs X2 5 N2 100 50/2" N- 2 (5.0-6.5) 0.4' SAND; SP; Brown; Nonplastic; Wet; (Slough) over 0.1' SILT with some gravel; ML; Brown; Nonplastic; Moist; over 0.1' angular concussion fractured BASALT; SPT blows inflated by cobble/boulder material 6.0 - 32.0 DR slow, DA rough to Basalt; Gray; Slightly smooth, grinding at 6.0' Х3 X-3 (6.5-7.0) weathered to fresh; C1 100 R3-R4 C-1 (7.0-12.0) BASALT; Gray; Slightly Weathered; Switch to Type HQ3T Core at 7.0' bgs; DR R3 - R4; Very close to R3-R4; Close to moderately close joint spacing (0.75' - 2.15'); Some silty infill with trace mineralization on some RQD = 90moderately close moderate, DA smooth, joint surfaces; ≤1/8" aperture; highly vesicular (~15 - 25%), predominantly ~1/8" to 1 1/4" in size; GSI = 50 joint spacing (<0.1' to No WR to BOH 3.0') with some to trace silty or clayey residue infill, 8/10/21 staining, and/or trace 10 mineralized infill; Some vesicles to ODOT_MAN.GDT highly vesicular (5 to ~25%), pinhole to ~1.25" diameter in size; GSI = 45 - 75; C2 C-2 (12.0-17.0) BASALT; Gray; Slightly Weathered; R4; 98 R4 DR moderate: DA **RQD** = 97 Single 0.05' joint, predominantly moderately close (1.9' smooth: No WR (NEWBERRY 3.0') joint spacing; Trace mineralization, no infill; Some vesicles (~5 - 10%), predominantly pinhole and 1/4" to BASALT) 01.GPJ 1/2" diameter in size (bimodal), occasionally ~1.0" diameter; GSI = 70 GLOGS 15 K21229 NCGDR C- 3 (17.0-22.0) BASALT; Gray; Fresh; R4; Single joint, moderately close spacing (2.1' ~2.9'); No infill, slightly rough surfaces with some staining and trace mineralization; Some vesicles (~5 - 25%), predominantly pinhole in size, locally abundant and 1/8" - 1/4" diameter in size (51 - 78 C3 100 DR moderate; DA **RQD** = 100 smooth; No WR FOG DRILL in size: GSI = 75 ODOT (

Projec	t Name	U.S. 97	/U.S. 20 Bend Nor	rth Corri	dor Hole No. NCGDR-18			Page 2	of 2
Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance Discontinuity Data about Nor RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks Weter I anal/	Date Backfill/ Instrumentation
20	C4	98	R4 RQD = 56		C- 4 (22.0-27.0) BASALT; Gray; Fresh; R4; Very close to moderately close fractures (<0.1' - ~1.0'), decrease in spacing over interval; Trace clayey residue on some joint surfaces, predominantly smooth with tight aperture; Some vesicles (<5%), locally ≤10%, predominantly pinhole in size; GSI = 45			DR moderate; DA smooth; No WR	
30 -	C5	99	R4 RQD = 46		C- 5 (27.0-32.0) BASALT; Gray; Fresh to Slightly Weathered; R4; Very close to moderately close joint spacing (<0.1' - 2.3'); Slight staining, no infill, predominantly smooth surfaces; Some vesicles (~5%), pinhole in size; GSI = 45			DR moderate; DA smooth; No WR	
35 -					(32.0) Bottom of Hole			Ponded water from drilling measured at 18.0' bgs at end of drilling (EOD); 9.4' bg at EOD + 30 mins; 10 bgs at EOD + 2.75 hrs 19.6' bgs at EOD + 5	s 7.7' 5; hhrs
40 -									
45 -									
50									

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-19 Project U.S. 97/U.S. 20 Bend North Corridor PE003210 Geotechnical E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 223,701.00 Easting: 250,917.79 Start Card No. Equipment CME-850 Bridge No. Driller Jeff Crisman/CPSD Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3458.3' Start Date May 20, 2021 End Date May 20, 2021 Total Depth 35.0 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations** Drilling Methods **Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger Pl - Planar J - Joint P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Data Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation Ś. Discontinuity I Or RQD% Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X1 X- 1 (0.0-2.5) SAND; Predominantly cinders 0.0 - 6.0 Begin drilling with 4 7/8' OD tri-cone (mud Gravel with sand and rotary); DR fast; DA some silt. slightly rough; WC predominantly cinder red/brown clasts and other imported aggregate; Red/brown; Wet N- 1 (2.5-4.0) SAND and GRAVEL; SW, GP-GM; N1 60 6-5-6 (water added during Red/Brown; Nonplastic; Wet; Medium Dense; Predominantly cinder clasts, some basalt and gravel with drilling); Non-plastic; Medium dense; X-2 (4.0-5.0) X2 (UNCONTROLLED DR fast; DA rough to smooth, irregular; WC FILL) 5 N2 40 25-19-22 N- 2 (5.0-6.5) Silty SAND with gravel; SM; Brown; Nonplastic; Moist; Dense; Some coarse gravel basalt clasts in sample 6.0 - 9.0 Silty sand with trace Х3 X-3 (6.5-7.5) gravel; SM; Moist Cobble or boulder sized (water added during clast at 7.0' bgs N- 3 (7.5-9.0) Silty SAND with gravel; SM; Brown; Nonplastic; Moist; Very Dense; Basalt clast (coarse gravel sized) wedged in sampler; Some pulverized basalt; N3 97 32-32-50/4" drilling); Brown; DR slow; DA rough Non-plastic; Dense to possible cobble or rubbly, infilled top of rock over interval very dense; (AEOLIAN SILTY X4 X-4 (9.0-10.0) Top of Bedrock at 9.0' bgs WC brown to gray at 9.0 SAND) 8/10/21 9.0 - 35.0 10 C- 1 (10.0-11.0) BASALT; Gray; Slightly Weathered; R3; Close joint spacing (0.3' - 0.6'); Some silty residue infill; Some vesicles (~10%), pinhole to 1/4" in size; GSI = 30, based on full core run C-2 C-2 (11.0-16.0) BASALT; Gray to Red-Gray; Slightly Weathered to locally Moderately Weathered; R3; Very close to close joint spacing (<0.1' - 1.0'); Some silty infill, trace mineralization, alteration and weathering at 13.0' bgs: Highly vesicular (<20.45%) decreasing slightly in C1 100 R3 DR moderate: DA Basalt: Grav to RQD = 65smooth red/gray at ODOT_MAN.GDT interpreted flow C2 100 R3 contacts; Slightly **RQD** = 60 weathered with Possible flow contact at discrete moderately 13.0' bas weathered zones; Ŕ3 bgs; Highly vesicular (~20 - 45%), decreasing slightly in bottom of interval to some vesicles (~15 - 20%), predominantly 1/8" - 1/2" in size; GSI = 30; Possible flow contact observed at 13.5' bgs, indicated by color change, - R4; Very close to 01.GPJ LW at 13.0' bgs wide joint spacing (<0.1' to > 5.0') withalteration and weathering GLOGS some silty residue infill, staining, 15 alteration, and/or NCGDR trace mineralized infill; Some vesicles C3 69 R3 C- 3 (16.0-21.0) BASALT; Red-Gray to Gray over interval; Slightly Weathered; R3; Close to moderately DR moderately fast; DA to highly vesicular (5 RQD = 68smooth K21229 to ~45%), pinhole to close joint spacing (0.4' - 1.5'); Some silty residue infill, espically in high angle joints; Highly vesicular (25 - 40%), pinhole to large (~1.5" diameter) in size; GSI = 35 ~1.5" diameter in size; GSI = 30 - 90; LOG (NEWBERRY BASALT) DRILL ODOT

Project	t Name	U.S. 97	/U.S. 20 Bend Nor	rth Corri	dor Hole No. NCGDR-19	ı		Page 2	of 2
Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance iio Discontinuity Data ab	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks Water Level/	Date Backfill/ Instrumentation
20	C4	100	R3-R4 RQD = 100		C- 4 (21.0-26.0) BASALT; Gray; Slightly Weathered to Fresh; R3-R4; Close to wide joint spacing (0.85' - 4.2'); Some silty infill, <1/8" aperture, smooth surfaces; GSI = 90			DR Smooth; DA moderate; No WR	
- 25 -	C5	96	R4 RQD = 100		C- 5 (26.0-31.0) BASALT; Gray; Fresh; R4; No joints or fractures over interval, wide joint spacing; Some vesicles (~5 - ~15% locally), pinhole in size to ~1/4" in size; GSI = 90			DR Smooth; DA moderate; No WR	
- 30 -	C6	98	RQD = 49		C- 6 (31.0-35.0) BASALT; Gray to Red; Slightly Weathered to Moderately Weathered; Very close to close joint spacing (<0.1' - 1.0'); Silty clayey residue infill in high angle joint, silty residue infill and alteration at and around 33.1' bgs;; Locally brecciated; Some to highly vesicular (~40%), pinhole to large (~1.5" diameter) below 33.1' bgs; GSI = 30; Possible flow contact observed at 33.1' bgs, indicated by change in color, relative weathering, increase in abundance and size of vesicles			DR Smooth; DA moderate; No WR Possible flow conta at 33.1'	ct (3,2)
- 35 -					(35.0) Bottom of Hole		>	Ponded water from drilling measured at 22.6' bgs at end of drilling (EOD), 22.9' bg at EOD + 30	gs /
000 _ MAN.GD1 8/10/21									
000 DRILL FOG RZ1229 NGGBU GEOGS 01.6FU ODOL MAN GD 18/10/21									

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-20 Project U.S. 97/U.S. 20 Bend North Corridor PE003210 Geotechnical E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 218,564.22 Easting: 248,761.12 Start Card No. Equipment CME-850 Bridge No. Driller Jeff Crisman/CPSD Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3524.7' Start Date May 18, 2021 End Date May 18, 2021 Total Depth 30.5 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations** Drilling Methods **Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger Pl - Planar J - Joint P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure "U" - Undisturbed Sample Fo - Foliation St - Stepped R - Rough CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Data Percent Natural Moisture Percent Recovery Backfill/ Instrumentation Moisture, Consistency/Relative Density. Discontinuity I Or RQD% ž Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X1 X- 1 (0.0-2.5) GRAVEL with cobble-sized clasts, silt, and 0.0 - 15.5 Begin drilling 8 1/2" OD Hollow Stem Auger; DR Cobbles and boulders moderately slow; DA with silty sand and very rough gravel; Brown; Wet (water added during drilling); Non-plastic; Medium dense (blow N- 1 (2.5-3.4) GRAVEL with silt and sand; GP; Brown; N1 60 19-12-12 DR moderately slow; DA Nonplastic; Dry to Moist; Medium Dense; 0.2' gravel over pulverized rock, rock flour, and concussion fractured rock count inflated due to very coarse material); X2 fragments; cobble-sized clasts; Blow counts inflated due to very coarse material; (Fill) Poor recovery and X- 2 (3.4-4.6) GRAVEL with cobble-sized clasts, silt, and sand; Approximately 10% cobbles, <0.6' in size; (Fill) erratic drill action/drill rate over 80 Switch to Type HQ3T C1 C- 1 (4.6-6.6) BASALT; Gray; Slightly Weathered; R4; 5 interval associated RQD = N/ACore at 4.6 bgs; DR Close to moderately close joint spacing (0.5' - ~1.0'); No staining or infill; Some vesicles (5 - 10%), pinhole and with boulders moderately fast; DA possible voids and/or smooth; Full WR; WC 1/4" - 3/4" in size (bimodal); (BOULDER, FILL) unconsolidated grav material; irregular, C- 2 (6.6-10.5) BASALT; Gray; Slightly Weathered; R3-R4; Close joint spacing (0.2' - 0.4'); Trace staining and silty residue, predominantly no infill; Some vesicles (~10%), pinhole to large (~1.5" diameter) in size; (BOULDER, FILL) C2 R3-R4 44 bouldery contact with RQD = N/Aunderlying bedrock; (UNCONTROLLED LW at 8.0' bgs; No WR FILL) to BOH 8/10/21 10 C-3 (10.5-11.6) BASALT; Gray; Slightly Weathered; C3 14 DR moderate: DA ODOT_MAN.GDT Poor recovery; Lithology of recovered core fragment appears consistent with previous run; (BOULDER, FILL) RQD = N/Asmooth, steady C- 4 (11.6-16.6) BASALT; Gray; Slightly to Moderately C4 22 Void or very loose, R3 Weathered; R3; Close joint spacing (0.2' - 0.4'); Some silty infill with trace sand; Highly vesicular (~15 - 30%), predominantly 1/8" - 1/4" in size; GSI = 25 RQD = 8unconsolidated material from ~11.6' - 14.5'; DR very fast; DA smooth 01.GPJ GLOGS 15 Top of bedrock at K21229 NCGDR ~15.5', contact poorly 15.5 - 30.5 constrained due to Basalt; Gray to bouldery fill gray/red to brown at C- 5 (16.6-21.6) BASALT; Gray; Slightly to Moderately Weathered; R3; Very close to close joint spacing (<0.7'); Silty residue infill; Highly vesicular (<20 - 45%), predominantly 1/8" - 1/2" diameter, occasionally large DR moderate; DA C5 98 R3 interpreted flow **RQD** = 14 smooth; No WR contact; Slightly FOG weathered with (~1.5" diameter) in size; GSI = 25 discrete moderately DRILL weathered zones; R3 - R4; Very close to ODOT moderately close joint spacing (<0.1' to

Project	t Name	U.S. 97	/U.S. 20 Bend Nor	rth Corri	idor Hole No. NCGDR-20	I		Page 2	of 2
Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance Discontinuity Data 28 Or RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks Water Level/	Backfill/ Instrumentation
25 -	C6	100	R4 RQD = 58		C- 6 (21.6-26.6) BASALT; Gray; Slightly Weathered; R4; Very close to moderate joint spacing (<0.1' - ~1.75'); Trace slity residue in upper 1.0', some staining, slightly rough to smooth joint surfaces, predominantly tight aperture; Some vesicles (≤5% to 15%), pinhole to ≤1/4" in size; GSI = 55	1.75') with some silty infill (trace sandy infill at top of rock) and some staining and/or alteration; Some vesicles to highly vesicular (5 - 45%), pinhole to large (~1.5" diameter) in size; GSI = 25 - 55; Top of bedrock contact poorly constrained due to bouldery fill;		DR moderate; DA smooth, No WR	
	C7	96	RQD = 72		C-7 (26.6-30.5) BASALT; Gray to Reddish Gray Brown; Very close to close joint spacing (fractured, (<0.1' - 0.7'); Some alteration, silty infill most abundant at ~27.7' bgs; Highly vesicular (20 - 40%), predominantly ~1/16" - 3/4" in size; GSI = 35; Flow contact observed at 27.7' bgs, indicated by color change and alteration	(NEWBÉRRÝ BASALT)		■ Possible flow contact at 27.7' bgs	
30 -					(30.5) Bottom of Hole			Caving at 13.0' bgs at end of drilling (EOD), hole obstructed; No ponded water from drilling observed to 13.0' bgs at EOD.	7.9
35 -									
40 -									
45 -									
50									

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 1 Hole No. NCGDR-21 Project U.S. 97/U.S. 20 Bend North Corridor Geotechnical E.A. No. PE003210 Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 221,265.89 Easting: 247,467.71 Start Card No. Equipment CME-850 Bridge No. Driller Jeff Crisman/CPSD Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3509.4' Start Date May 18, 2021 End Date May 18, 2021 Total Depth 13.5 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations Drilling Methods Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger J - Joint Pl - Planar P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth DP - Down Pressure SA - Solid Auger "U" - Undisturbed Sample R - Rough Fo - Foliation St - Stepped DR - Drill Rate CA - Casing Advancer "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Discontinuity Data Or RQD% Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density, Instrumentation Ś. Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X- 1 (0.0-2.5) BOULDER and COBBLE with silty sand and sandy silt; (Fill) X1 0.0 - 3.5 Begin drilling with 8 1/2' OD Hollow Stem Auger; Silty sand (SM) with Angular basalt cobble angular basalt and boulder fill from cobbles and some surface, shallow boulders; boulders up to 1.2' Brown/gray; Dry; b-axis; DR slow; DA Non-plastic; Dense N- 1 (2.5-3.5) Silty SAND with gravel; SM; Brown; Nonplastic; Dry; Dense; SPT N-Value not representative; Split spoon sampler damaged (bent) over interval N1 60 11-18-14 rouah (blow count inflated due to coarse C-1 (3.5-6.5) BASALT; Gray; Slightly Weathered; R3-R4; Close joint spacing (~0.5' - 0.9'); trace slity residue infill in some joints; Trace white mineralization in C1 100 R3-R4 Auger refused at 3.5' material); est. 30% **RQD** = 83 bgs on bedrock; Switch cobbles by volume; (UNCONTROLLED over to Type HQ3T Core some vesicles; Highly vesicular (25 - 30%), predominantly 1/8" diameter to large (~1.5" diameter) in size; GSI = 35; Trace organic root material in joint at 3.5' bgs 5 FILL) DR moderate; DA 3.5 - 13.5 smooth; WC brown to gray at ~4.5' bgs Basalt; Gray; Slightly weathered with C2 97 C-2 (6.5-11.5) BASALT; Gray; Slighly Weathered, locally discrete moderately DR moderate: DA R4 RQD = 97 Moderately Weathered; R4; Very close to moderately close joint spacing (~0.1' - ~1.8'); Some silty infill, trace weathered zones; R3 smooth; Full WR; WC - R4; Very close to gray organic root material in some joints; Some vesicles (-25%) decreasing slightly in abundance with depth to ~15%, predominantly pinhole in size, occasionally large moderately close joint spacing (<0.1' to (~1.5" diameter) and sometimes containing silty infill; GSI = 50 1.8') with some silty infill and staining, trace organic root 8/10/21 material in some 10 ioints: Some vesicles to highly vesicular (15 - 30%), pinhole to ODOT_MAN.GDT C- 3 (11.5-13.5) BASALT; Gray; Slightly Weathered; R4; Close to moderately close joint spacing (0.3' - 1.3'); Some staining, silty residue infill on some joint surfaces; Some vesicles (15 - 25%), pinhole in size to ~1/2" (bimodal); GSI = 55 large (~1.5" diameter) C3 នន R4 DR moderate: DA in size; GSI = 35 - 55; **RQD** = 65 smooth; WC gray; Full (NEWBERRY BASALT) 01.GPJ (13.5) Bottom of Hole Ponded water from drilling retained in hole GLOGS at end of drilling; Very slow to drain 15 K21229 NCGDR FOG DRILL ODOT [

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 1 Hole No. NCGDR-22 Project U.S. 97/U.S. 20 Bend North Corridor Geotechnical PE003210 E.A. No. Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 223,338.27 Easting: 246,625.89 Start Card No. Equipment CME-850 Bridge No. Driller Jeff Crisman/CPSD Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3485.6' Start Date May 18, 2021 End Date May 18, 2021 Total Depth 12.5 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations Drilling Methods Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger J - Joint Pl - Planar P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure R - Rough "U" - Undisturbed Sample Fo - Foliation St - Stepped CA - Casing Advancer DR - Drill Rate "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Discontinuity Data Or RQD% Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density, Instrumentation Ś. Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X1 X-1 (0.0-1.7) 0.0 - 1.7 Begin drilling with 8 1/2 Hollow Stem Auger Coarse sand shoulder soil (cinder sanding rock) over rubbleized N- 1 (1.7-2.1) BASALT; Gravel sized concussion fractured basalt clasts and rock flour rock fill (cobbles, Auger refusal at 1.7' N1 100 50/4.5" coarse gravel, bgs; Attempted to drive SPT with refusal at X2 N-2 (2.1-2.5)
N-2 (2.5-2.6)
C-1 (2.6-6.5) BASALT; Gray; Fresh; R4; Very close to close joint spacing (<0.1' - 0.75'); occasional trace silty residue and staining, predominantly no infill; Some boulders); Red/gray; 50/2.5" 100 N2 Non-Plastic; Dry; 50/4.5" C1 DR slow; DA rough, **RQD** = 19 Loose to very dense; grinding
Switch to Type HQ3T (FILL) vesicles (15 - 25%), predominantly pinhole in size or 1/4" - 1/2" (bimodal); GSI = 50 1.7 - 12.5 Core at 2.5' bgs; DR Basalt; Gray; Fresh; moderate; DA smooth; 5 R4; Very close to WC gray wide joint spacing LW at 5.5' bgs (<0.1' to 3.75'); Predominantly no C2 99 C-2 (6.5-11.5) BASALT; Gray; Fresh; R4; Close to wide infill, trace silty infill DR slow: DA smooth: R4 RQD = 92 joint spacing (0.2' - 3.75'); No infill; Some vesicles (~15%), predominantly pinhole in size, occasionally 1/4" and staining in some No WR joints; Some vesicles ~1.5" vugs; GSI = 80 (15 - 25%), pinhole to ~1.5" diameter in size; GSI = 55 - 80; (NEWBERRY BASALT) 8/10/21 10 01.GPJ ODOT_MAN.GDT C- 3 (11.5-12.5) BASALT; Gray; Fresh; R4; Close joint spacing (0.3' - 0.75'); no infill; Some vesicles (15 - 25%), pinhole to \leq 1/4" in size; GSI = 80-85 DR moderate: DA C3 100 R4 **RQD = 75** smooth: No WR (12.5) Bottom of Hole Ponded water from drilling measured at 10.4' bgs at end of drilling (EOD); 10.6' bgs at EOD + 15 mins GLOGS 15 K21229 NCGDR FOG DRILL ODOT [

OREGON DEPARTMENT OF TRANSPORTATION

Page 1 of 2 Hole No. NCGDR-23 Project U.S. 97/U.S. 20 Bend North Corridor Geotechnical E.A. No. PE003210 Purpose Highway U.S. 97 and U.S. 20 County **Deschutes** Key No. 21229 Hole Location Northing: 223,330.50 Easting: 246,315.45 Start Card No. Equipment CME-850 Bridge No. Driller Jeff Crisman/CPSD Project Geologist Micah Gregory-Lederer Recorder Micah Gregory-Lederer Ground Elev. 3483.4' Start Date May 17, 2021 End Date May 17, 2021 Total Depth 22.0 ft Tube Height Typical Drilling Abbreviations Test Type **Rock Abbreviations Drilling Methods Drilling Remarks** "A" - Auger Core Discontinuity Shape Surface Roughness WL - Wire Line LW - Lost Water "X" - Auger J - Joint Pl - Planar P - Polished HS - Hollow Stem Auger WR - Water Return "C" - Core, Barrel Type F - Fault C - Curved Sl - Slickensided DF - Drill Fluid WC - Water Color "N" - Standard Penetration B - Bedding U - Undulating Sm - Smooth SA - Solid Auger DP - Down Pressure R - Rough "U" - Undisturbed Sample Fo - Foliation St - Stepped DR - Drill Rate CA - Casing Advancer "T" - Test Pit S - Shear Ir - Irregular VR - Very Rough HA - Hand Auger DA - Drill Action **Unit Description** Material Description Soil Rock SOIL: Soil Name, USCS, Color, Plasticity, Discontinuity Data Or RQD% Percent Natural Moisture Percent Recovery Moisture, Consistency/Relative Density. Instrumentation ž Size Texture, Cementation, Structure, Origin. Water Level/ Date Graphic Log Driving Resistance ROCK: Rock Name, Color, Weathering, Hardness, Test Type, Depth (ft) Backfill/ Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name. X-1 (0.0-2.5) Silty SAND with trace cobble-size clasts; ML; Brown; Nonplastic; Dry; Loose X1 0.0 - 3.2 Begin drilling with 8 1/2 Hollow Stem Auger Sandy SILT and silty SAND; ML, SM; Brown; Non-plastic; DA rough, grinding Dry; Loose (SPT refused on bedrock at 3.2' bgs); (AEOLIAN SILTY SAND) N-1 SPT followed with Dames & Moore U-type N- 1 (2.5-3.2) Sandy SILT; ML; Brown; Nonplastic; Dry; Loose*; Sand is fine; *Blows inflated by rock at 3.2' bgs; additional sample collected with Dames & Moore sampler, also refused at 3.2' bgs; trace basalt fragments N1 86 4-50/2" sampler over interval. C1 95 R4 3.2 - 22.0 Top of bedrock at 3.2' **RQD** = 83 Basalt; Gray to DR moderate: DA Fresh; R4; Close joint spacing (0.3' - 0.9'); Some silty residue infill, trace mineralization; Some vesicles (~25%), predominantly ~1/16" - 1/2" in size, occasionally large smooth; WC brown to gray at 4.0' bgs; Full WR over C-1 interval red/brown at interpreted flow contact; Slightly (≥1.5" diameter) with trace silty infill; GSI = 45 weathered with 5 discrete moderately weathered zones; Ŕ3 - R4; Very close to moderately close C2 100 C-2 (6.2-11.2) BASALT; Gray; Fresh; R4; Very close to DR moderate: DA joint spacing (<0.1' to R4 C-2 (0.2-11.2) BASALT, Glay, Flesh, K-, Very close to moderately close joint spaceing (<0.1' - ~2.0'); Trace alteration and staining of joint surfaces, no infill; Smooth to slightly rough joint surfaces, tight aperture (<1/16"); Some vesicles (<5%), predominantly pinhole; GSI = 55 RQD = 76 smooth; WC gray 2.2') with some silty or clayey residue infill, staining, 8/10/21 mineralization, and/or alteration; Some ODOT MAN.GDT vesicles to highly vesicular (5 to 50%), pinhole to greater than core diameter in size; GSI = 30 - 55; (NEWBERRY 01.GPJ BASALT) 10 K21229_NCGDR_GLOGS_ C-3 (11.2-16.2) BASALT; Gray to 13.7', then C3 100 R3-R4 DR moderate; DA C-3 (11.2-16.2) BASAL I; Gray to 13.7', then Red-Brown; Fresh to 13.7', then Moderately Weathered; R3-R4; Very close to close joint spacing (to 13.7' bgs, then very close to moderate joint spaceing (<0.1' - 2.2'); Trace silty residue on joint surfaces, staining with some alteration at 13.7'; Some pinhole vesicles (-55%) to 13.7 bgs then highly vesicular (~50%), predominantly 1/16" - 3/4" in size; GSI = 30 (average over interval); Flow **RQD** = 44 smooth to choppy FOG contact at 13.7' bgs, increase in vesicles and weathering, decrease in RQD and joint spacing LW at 13.5' bgs DRILL ODOT (

rojec	o i valile	0.0.0.	/U.S. 20 Bend No		idor Hole No. NCGDR-23			Page 2	of
وا Depth (ft)	Test Type, No.	Percent Recovery	Driving Resistance Discontinuity Data by Or RQD%	Percent Natural Moisture	Material Description SOIL: Soil Name, USCS, Color, Plasticity, Moisture, Consistency/Relative Density, Texture, Cementation, Structure, Origin. ROCK: Rock Name, Color, Weathering, Hardness, Discontinuity Spacing, Joint Filling, Core Recovery, Formation Name.	Unit Description	Graphic Log	Drilling Methods, Size and Remarks	Water Level/ Date
2	C4	100	R3-R4 RQD = 51		C- 4 (16.2-21.2) BASALT; Red-Brown with some Gray (Mottled); Moderately Weathered; R3-R4; Very close to close joint spacing (<0.1' to 0.9'); Trace clayey infill, especially in lower 1.5' of interval; Highly vesicular (~25% - 50%), pinhole to large in size (≥core diameter; GSI = 35			No WR	
20 –	C5	100	R4 RQD = 44		C- 5 (21.2-22.0) BASALT; Gray; Slightly Weathered; R4; Close joint spacing (≤0.35°); No infill over interval; Some vesicles (~20%), pinhole to ~1.0" in size; GSI = 35, estimated from previous core run, insufficient core length for characterization (22.0) Bottom of Hole			DR moderate; DA smooth; No WR Ponded water from drilling measured at 21.7' bgs at end of drilling (EOD); 21.8'	
25 -								at EOD + 14 hrs; wa retained from drilling operations, no groundwater encountered	ater
30 -									
35 -									

APPENDIX B - Laboratory Test Results

	SUMMARY OF LABORATORY SOIL TESTING RESULTS											
	Sample Informa	tion		Soil Classification (ASTM D 2488/2487	Natural	Gradation			Atterberg Limits			
Hole No.	Sample No.	Depth (ft)	N-Value	Description	USCS	Moisture (%)	Gravel (%)	Sand (%)	P-200 (%)	LL (%)	PI (%)	
NCGDR-01	21-001134	2.5 - 4.0	50/0"	Silty GRAVEL with sand	GM	7.83	54	28.8	17.2	NP	NP	
NCGDR-03	21-001135	5.0 - 6.5	53/11"	Silty SAND	SM	16.77	12	67	21	NP	NP	
NCGDR-06	21-000997	10.0 - 11.5	18	Silty SAND with trace gravel	SM	16.23	4	63.4	32.6	NP	NP	
NCGDR-09	21-000998	15.0-16.5	6	Silty SAND	SM	26.01	13	69.5	17.5	NP	NP	
NCGDR-11	21-000999	5.0 - 6.5	57	Silty GRAVEL with sand	GM	16.17	43	42.2	14.8	NP	NP	
NCGDR-11	21-001136	2.5 - 4.0	13	Silty SAND	SM	27.57	9	64.7	26.3	NP	NP	
NCGDR-19	21-001137	5.0 - 6.5	41	Silty SAND with gravel	SM	16.26	16	51.4	32.6	NP	NP	
NCGDR-19	21-001138	7.5 - 9.0	82/10"	Silty SAND with gravel	SM	15.07	25	46.4	28.6	NP	NP	
NCGDR-21	21-001139	2.5 - 4.0	32	Silty SAND with gravel	SM	7.18	31	44.2	24.8	NP	NP	
NCGDR-23	21-001140	2.5 - 4.0	50/2"	Sandy SILT	ML	8.39	4	33.8	62.2	22	1	

SUMMARY OF LABORATORY ROCK TESTING RESULTS													
	Sample Informati		501011 0111 110 011 120 1110 1120 210		Dry	Wet							
			Rock Type	UCS (psi)	Density	Density							
Hole No.	Sample No.	Depth (ft)	31.	(J)	(lb/ft ³)	(lb/ft ³)							
NCGDR-01	21-001141	16.0	Basalt	4,888	141.5	141.6							
NCGDR-02	21-001142A	11.5	Basalt	13,570	161.7	161.9							
NCGDR-02	21-001142B	11.5	Basalt	11,904	160.0	160.2							
NCGDR-03	21-001143	19.3	Basalt	14,990	157.3	157.6							
NCGDR-04	21-000976A	4.5	Basalt	4,455	139.7	139.8							
NCGDR-04	21-000976B	4.5	Basalt	4,215	137.4	137.5							
NCGDR-04	21-000977	15.5	Basalt	13,380	158.3	158.4							
NCGDR-05	21-000978	17.2	Basalt	5,536	122.9	123.1							
NCGDR-05	21-000979	29.3	Basalt	12,424	158.6	158.7							
NCGDR-06	21-000980	15.5	Basalt	10,426	149.7	149.9							
NCGDR-06	21-000981	25.8	Basalt	7,642	139.9	140.0							
NCGDR-07	21-000982	13.1	Basalt	4,631	142.8	142.9							
NCGDR-07	21-000983	22.9	Basalt	14,763	157.8	157.9							
NCGDR-08	21-000984	22.3	Basalt	7,249	149.2	149.6							
NCGDR-09	21-000985	26.3	Basalt	4,452	150.4	150.6							
NCGDR-10	21-000986	22.0	Basalt	15,099	161.1	161.2							
NCGDR-11	21-000987	32.4	Basalt	14,444	162.5	162.7							
NCGDR-12	21-000988	9.3	Basalt	14,405	159.4	159.6							
NCGDR-12	21-000989	20.3	Basalt	14,174	160.5	160.6							
NCGDR-13	21-000990	16.0	Basalt	18,926	169.7	169.8							
NCGDR-13	21-000991	24.3	Basalt	15,796	163.0	163.0							
NCGDR-14	21-000992	10.3	Basalt	12,230	159.4	159.5							
NCGDR-16	21-000993	12.3	Basalt	6,376	136.4	136.7							
NCGDR-16	21-000994	21.0	Basalt	14,100	159.7	159.8							
NCGDR-17	21-000995	6.5	Basalt	5,199	143.0	143.4							
NCGDR-17	21-000996	14.0	Basalt	7,555	139.1	139.3							
NCGDR-18	21-001144	10.0	Basalt	4,423	149.9	150.2							
NCGDR-19	21-001145	17.7	Basalt	6,987	139.9	140.1							
NCGDR-20*	21-001146A	4.6	Basalt	14,105	161.8	162.1							
NCGDR-20*	21-001146B	4.6	Basalt	10,913	161.3	161.5							
NCGDR-21	21-001147	7.8	Basalt	6,973	153.9	154.1							
NCGDR-22	21-001148	7.3	Basalt	8,244	157.5	157.6							

*Boulder (fill)

OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY 800 AIRPORT RD. SE SALEM, OR 97301-4792

of l Page (503)986-3000 FAX(503)986-3096

EA No.: PE003210 011 21-000997 Contract No.: Lab No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337

Contractor: ODOT R4 GEOLOGY FA No.: S004(231)

Project Manager: SCOTT BILLINGS Org Unit:

Submitted By: BOBBI CUMMISKEY Org Unit: 4630 Sample No.: N-4

Material Source: GEOTECHNICAL INVESTIGATION Qty Represented: SOIL @ DEPTH

Sampled At: NCGDR-06 @ 10.0' Sampled By:

Date Reported: 21/5/27 DATE-Sampled: Received: 21/ 5/18 Tested: 21/ 5/27

Test Results For: DISTURBED SOIL

Liquid Lim: T 89 T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen. T265 N. Moisture: 16.23 % Dry Density rec'd:

į	Dry	Density	Moist	ure
[
į				
į	Ontir	Max Dens		
i	Opti	num Moist	are:	

Sieve	Passing
3 " 2 1.5	100 8
3/4 1/2 3/8 1/4 # 4 10 40 200	100 % 99 % 99 % 97 % 96 % 94 % 79 % 32.6 %

Wet Density rec'd: D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Quantity	Method	Cost
1	T265 D1140	\$ 16.00 96.00

	Hydro	neter	Anal	ysis	St	ıbsample	Total	Sample
Coarse Medium Fine	Sand= Sand= Silt= Silt= Clay=	2.0 .42 .074 .02	to to to to	.42 .074 .02 .005	mm: mm: mm: mm: mm:	-		
	Clay=	Less	Thar	1 .002	mm:			

Bid Item:

REMARKS:

INFORMATION ONLY

TOTAL CHARGES: \$

0.00

KEVIN BROPHY - LABORATORY SERVICES MANAGER

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

800 AIRPORT RD. SE SALEM, OR 97301-4792

1 of 1 Page (503)986-3000 FAX(503)986-3096

21-000998

EA No.: PE003210 011 Lab No.: Contract No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Data Sheet No.: G 4630337 County: DESCHUTES Highway: THE DALLES-CALIFORNIA

FA No.: S004(231) Contractor: ODOT R4 GEOLOGY

Bid Item: Org Unit: Project Manager: SCOTT BILLINGS Sample No.: N-6 Org Unit: 4630 Submitted By: BOBBI CUMMISKEY

Qty Represented: SOIL @ DEPTH Material Source: GEOTECHNICAL INVESTIGATION

Sampled By: Sampled At: NCGDR-09 @ 15.0'

Date Reported: 21/ 5/27 Received: 21/ 5/18 Tested: 21/ 5/27 DATE-Sampled:

Test Results For: DISTURBED SOIL

T 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117
Torvane Shear/ Pocket Pen.
T265 N. Moisture: 26.01 % Dry Density rec'd: Wet Density rec'd: D4644 Slake Durab: Water Cont:
D2974 Pct Organic:

Dry	Density	Moisture	:
<u> </u> 			
Opti	Max Dens mum Moist		

Sieve	Passing
3 "	·
2	
1.5	100 %
1	91 %
3/4	91 %
1/2	91 %
3/8	90 %
1/4	88 %
# 4	87 %
10	81 %
40	47 %
200	17.5 %

Quantity	Method	_	Cost
1	T265 D1140	\$	16.00 96.00

Coarse Sand= 4.75 to 2.0 mm: Medium Sand= 2.0 to .42 mm: Fine Sand= .42 to .074 mm: Silt= .074 to .02 mm: Silt= .02 to .005 mm: Clay= .005 to .002 mm: Clay= Less Than .002 mm:	

REMARKS:

INFORMATION ONLY

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES ; PROJ MGR: SCOTT BILLINGS ; R ROdriguez - SOILS ; BOBBI CUMMISKEY - REGION 4 GEOLOGY TOM GRUNMON-ODOT R4 GEOLOGY

0.00

800 AIRPORT RD. SE SALEM, OR 97301-4792

Page of (503)986-3000 FAX(503)986-3096

Contract No.:

EA No.: PE003210 011

Lab No.:

21-000999

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS Highway: THE DALLES-CALIFORNIA

County: DESCHUTES

Data Sheet No.: G 4630337

Contractor: ODOT R4 GEOLOGY

FA No.: S004(231)

Bid Item:

Project Manager: SCOTT BILLINGS

Org Unit: Org Unit: 4630

Submitted By: BOBBI CUMMISKEY Material Source: GEOTECHNICAL INVESTIGATION Sample No.: N-2

Sampled At: NCGDR-11 @ 5.0'

Qty Represented: SOIL @ DEPTH

Sampled By:

DATE-Sampled:

Received: 21/ 5/18 Tested: 21/ 5/27

Date Reported: 21/ 5/27

Test Results For: DISTURBED SOIL

	T 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: T100 Spec Grav:
ŀ	
Į	Torvane Shear/ Pocket Pen.
١	T265 N. Moisture: 16.17 %
İ	Dry Density rec'd:
İ	Wet Density rec'd:
i	D4644 Slake Durab:
	Water Cont:
i	D2974 Pct Organic:

 Dry	Density	Moisture
<u> </u> 		
-	May Dongitus	9
Opti	Max Density: mum Moisture:	

 Sieve	Passing
3 "	
2	
1.5	100 %
1	83 %
3/4	77 %
1/2	69 %
3/8	65 %
1/4	60 %
# 4	57 %
10	40 %
40	29 %
200	14.8 %

0.00

D2974 Pct Organic:

Quantity	Method	Cost
1 1	T265 D1140	\$ 16.00 96.00

	Hydron	neter	Anal	ysis	Subsample	Total	Sample
Coarse	Sand=	4.75	to	2.0	mm:		
Medium	Sand=	2.0	to	.42	mm:		
Fine	Sand=	.42	to	.074	mm:		
ĺ	Silt=	.074	to	.02	mm:		
İ	Silt=	.02	to	.005	mm:		
	Clay=	.005	to	.002	mm:		
	Clay=	Less	Than	.002	mm:		

REMARKS:

INFORMATION ONLY

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

800 AIRPORT RD. SE SALEM, OR 97301-4792

Page of (503)986-3000 FAX(503)986-3096

Contract No.: EA No.: PE003210 011 Lab No.: 21-001134

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630339

FA No.: S004(231)

Org Unit: Bid Item:

Org Unit: 4630 Sample No.: N-1

Qty Represented: SOIL @ DEPTH

Sampled By:

DATE-Sampled: Received: 21/6/4 Tested: 21/8/3 Date Reported: 21/8/3

Test Results For: DISTURBED SOIL

T 89 Liquid Lim: NonDet
T 90 Plastic Ind: NonPlasti
T288 Resistivity: Ω
T289 pH:
T100 Spec Grav:
TM117
Torvane Shear/ Pocket Pen.

T265 N. Moisture: 7.83 %
Dry Density rec'd:
Wet Density rec'd:
D4644 Slake Durab:
Water Cont:

Contractor: ODOT R4 GEOLOGY

Sampled At: NCGDR-01 2.5'

Material Source:

Project Manager: SCOTT BILLINGS

Submitted By: GREGORY-LEDERER

Dry	Density	Moisture
		ļ
		į
		İ
[[Max Density:	
Optin	mum Moisture:	and the state of t

Sieve	Passing
3 "	
2	
1.5	
1	100 %
3/4	88 %
1/2	72 %
3/8	65 %
1/4	51 %
# 4	46 %
10	42 %
40	30 %
200	17.2 %

Quantity	Method	Cost
1	Т89	\$ 47.00
1	т90	58.00
1	т265	16.00
1	D1140	96.00
1	R58	75.00

D2974 Pct Organic:

Coarse Sand= 4.75 to 2.0 mm: Medium Sand= 2.0 to .42 mm: Fine Sand= .42 to .074 mm: Silt= .074 to .02 mm: Silt= .02 to .005 mm: Clay= .005 to .002 mm: Clay= Less Than .002 mm:		Hydron	meter A	Anal	ysis	Su	bsample	Total	Sample
	Medium	Sand= Sand= Silt= Silt= Clay=	2.0 .42 .074 .02 .005	to to to to	.42 .074 .02 .005	mm: mm: mm: mm:			

REMARKS:

INFORMATION ONLY

USCS Classification: GM-silty GRAVEL with sand

*

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

800 AIRPORT RD. SE SALEM, OR 97301-4792

Page of (503)986-3000 FAX(503)986-3096

Contract No.: EA No.: PE003210 011 Lab No.: 21-001135

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data She

Data Sheet No.: G 4630339

FA No.: S004(231)

Org Unit: Bid Item:

Org Unit: 4630 Sample No.: N-2

Qty Represented: SOIL @ DEPTH

Sampled By:

Received: 21/6/4 Tested: 21/8/3 Date Reported: 21/8/3

Test Results For: DISTURBED SOIL

T 89 Liquid Lim: NonDet
T 90 Plastic Ind: NonPlasti
T288 Resistivity: Ω
T289 pH:
T100 Spec Grav:
TM117
Torvane Shear/ Pocket Pen.

T265 N. Moisture: 16.77 %
Dry Density rec'd:
Wet Density rec'd:
D4644 Slake Durab:
Water Cont:

Dry	Density	Moisture	į
	-		
! 			
			[
 Optin 	Max Density: num Moisture:		

Sieve	Passing
3 "	
2	
1.5	
1	
3/4	100 %
1/2	98 %
3/8	94 %
1/4	91 %
# 4	88 %
10	78 %
40	67 %
200	21.0 %

0.00

D2974 Pct Organic:

Contractor: ODOT R4 GEOLOGY

Sampled At: NCGDR-03 5'

Material Source:

DATE-Sampled:

Project Manager: SCOTT BILLINGS

Submitted By: GREGORY-LEDERER

Quantity	Method	Cost
1	T89	\$ 47.00
1	T90	58.00
1	T265	16.00
1	D1140	96.00
1	R58	75.00

	Hydron	meter A	Anal	ysis	Sı	ubsample	Total	Sample
Coarse Medium Fine	Sand= Sand= Silt= Silt= Clay=	2.0	to to to to	.42 .074 .02 .005	mm: mm: mm: mm:			200

REMARKS:

INFORMATION ONLY

USCS Classification: SM-silty SAND

*

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

800 AIRPORT RD. SE SALEM, OR 97301-4792

Page of (503)986-3000 FAX(503)986-3096

Contract No.: EA No.: PE003210 011 Lab No.: 21-001136

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630339

FA No.: S004(231)

Org Unit: Bid Item:

Submitted By: GREGORY-LEDERER Org Unit: 4630 Sample No.: N-1

Qty Represented: SOIL @ DEPTH

Sampled At: NCGDR-11 2.5' Sampled By:

DATE-Sampled: Received: 21/6/4 Tested: 21/8/3 Date Reported: 21/8/3

Test Results For: DISTURBED SOIL

T 89 Liquid Lim: NonDet T 90 Plastic Ind: NonPlasti
T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117
Torvane Shear/ Pocket Pen.
 T265 N. Moisture: 27.57 %
Dry Density rec'd: Wet Density rec'd: Wet Density rec'd: D4644 Slake Durab:
Water Cont: D2974 Pct Organic:
DEST. 100 OLGANIZO.

Contractor: ODOT R4 GEOLOGY

Material Source:

Project Manager: SCOTT BILLINGS

Dry	Density	Moisture	
			j
	Max Density:		-
Opti	num Moisture:		

Sieve	Passing
3 "	100 %
2 1.5	97 %
1 3/4	95 %
1/2 3/8	95 %
3/8	95 %
1/4	93 %
# 4	91 %
10	82 %
40	62 %
200	26.3 %

Quantity	Method	Cost
1	T89	\$ 47.00
1	T90	58.00
1	T265	16.00
1	D1140	96.00
1	R58	75.00

	Hydro	neter A	Anal	ysis	Su	bsample	Total	Sample
Coarse Medium Fine	Sand= Sand= Silt= Silt= Clay=	2.0 .42 .074 .02 .005	to to to to	.42 .074 .02 .005	mm: mm: mm: mm: mm:			
	Clay=	Less '	Гhar	1 .002	mm:			

TOTAL CHARGES: \$ 0.00

REMARKS:

INFORMATION ONLY

USCS Classification: SM-silty SAND

*

KEVIN BROPHY - LABORATORY SERVICES MANAGER

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

800 AIRPORT RD. SE SALEM, OR 97301-4792

Page (503)986-3000 FAX(503)986-3096

EA No.: PE003210 011 21-001137 Contract No.: Lab No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630339

Contractor: ODOT R4 GEOLOGY

Project Manager: SCOTT BILLINGS

Submitted By: GREGORY-LEDERER

Sampled At: NCGDR-19 5'

DATE-Sampled:

Material Source:

Org Unit: Org Unit: 4630 FA No.: S004(231)

Bid Item:

Sample No.: N-2

Qty Represented: SOIL @ DEPTH

Sampled By:

Received: 21/6/4 Tested: 21/8/3 Date Reported: 21/8/3

Test Results For: DISTURBED SOIL

	T 89 Liquid Lim: NonDet T 90 Plastic Ind: NonPlasti
	T288 Resistivity: Ω T289 pH: T100 Spec Grav:
	TM117 Torvane Shear/ Pocket Pen.
	T265 N. Moisture: 16.26 % Dry Density rec'd: Wet Density rec'd: D4644 Slake Durab: Water Cont:

Dry	Density	Moisture
Opti	Max Density: mum Moisture:	

Sieve	Passing
3 "	
2	
1.5	100 %
1	91 %
3/4	91 %
1/2	91 %
3/8	90 %
1/4	87 %
# 4	84 %
10	81 %
40	71 %
200	32.6 %
L	

0.00

Quantity	Method	Cost
1	т89	\$ 47.00
1	Т90	58.00
1	T26	16.00
1	D1140	96.00
1	R58	75.00

D2974 Pct Organic:

	Hydron	meter A	Anal	ysis	Sub	sample	Total	Sample
Coarse Medium Fine	Sand= Sand= Silt=	2.0 .42 .074 .02 .005	to to to to	.42 .074 .02 .005	mm: mm: mm: mm: mm:			

REMARKS:

INFORMATION ONLY

USCS Classification: SM-silty SAND with gravel

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES ; PROJ MGR: SCOTT BILLINGS ; R Rodriguez - SOILS ; GREGORY-LEDERER - REGION 4 GEOLOGY TOM GRUMMON-R4 GEOLOGY

OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY 800 AIRPORT RD. SE SALEM, OR 97301-4792

Page (503)986-3000 FAX(503)986-3096

21-001138

Contract No.: EA No.: PE003210 011 Lab No.: Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Org Unit:

Data Sheet No.: G 4630339

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Contractor: ODOT R4 GEOLOGY

FA No.: S004(231)

Project Manager: SCOTT BILLINGS

Bid Item:

Submitted By: GREGORY-LEDERER

Org Unit: 4630 Sample No.: N-3

Material Source:

Sampled At: NCGDR-19 7.5'

DATE-Sampled:

Qty Represented: SOIL @ DEPTH

Sampled By:

Received: 21/6/4 Tested: 21/8/3 Date Reported: 21/8/3

Test Results For: DISTURBED SOIL

	T 89 Liquid Lim: NonDet T 90 Plastic Ind: NonPlasti T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117
İ	Torvane Shear/ Pocket Pen.
	T265 N. Moisture: 15.07 % Dry Density rec'd: Wet Density rec'd: D4644 Slake Durab: Water Cont:

Dry	Density	Moisture
<u> </u>		
Opti	Max Density: mum Moisture:	

Passing
100 %
94 % 87 %
84 % 80 %
77 % 75 %
69 %
59 % 28.6 %

D2974	Pct	Organic:
-------	-----	----------

Method Cost		Cost
T89 T90 T265 D1140 R58	\$	47.00 58.00 16.00 96.00 75.00
	T89 T90 T265 D1140	T89 \$ T90 T265 D1140

Hydron	neter A	Anal	ysis	Su	bsample	Total	Sample
 Sand= Sand= Silt= Silt= Clay=	2.0 .42 .074 .02	to to to to	.42 .074 .02 .005	mm: mm: mm: mm:			

REMARKS:

INFORMATION ONLY

USCS Classification: SM-silty SAND with gravel

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES ; PROJ MGR: SCOTT BILLINGS ; R Rodriguez - SOILS ; GREGORY-LEDERER - REGION 4 GEOLOGY TOM GRUMMON-R4 GEOLOGY

800 AIRPORT RD. SE SALEM, OR 97301-4792

(503)986-3000 FAX(503)986-3096

21-001139 EA No.: PE003210 011 Lab No.: Contract No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Data Sheet No.: G 4630339 Highway: THE DALLES-CALIFORNIA County: DESCHUTES

FA No.: S004(231)

Bid Item: Org Unit:

Org Unit: 4630 Sample No.: N-1 Qty Represented: SOIL @ DEPTH

Sampled By:

Received: 21/6/4 Tested: 21/8/3 Date Reported: 21/8/3 DATE-Sampled:

Test Results For: DISTURBED SOIL

T 89 Liquid Lim: NonDet T 90 Plastic Ind: NonPlasti T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen.
T265 N. Moisture: 7.18 % Dry Density rec'd: Wet Density rec'd: D4644 Slake Durab: Water Cont:
D2974 Pct Organic:

Contractor: ODOT R4 GEOLOGY

Sampled At: NCGDR-21 2.5'

Material Source:

Project Manager: SCOTT BILLINGS

Submitted By: GREGORY-LEDERER

	ŀ
ļ	ļ
	į
	i
	- !
	ļ
	ļ
į	İ
	ł
	ļ
	<u> </u>
Max Density:	i
nax bensity:	[
Optimum Moisture:	-
<u>i</u>	

Dry Density Moisture

Sieve	Passing
3 "	
2	
1.5	100 %
1	87 %
3/4	87 %
1/2	78 %
3/8	75 %
1/4	71 %
# 4	69 %
10	65 %
40	57 %
200	24.8 %

Quantity	Method	Cost
1 1 1 1	T89 T90 T265 D1140 R58	\$ 47.00 58.00 16.00 96.00 75.00

Coarse Sand= 4.75 to 2.0 mm: Medium Sand= 2.0 to .42 mm: Fine Sand= .42 to .074 mm: Silt= .074 to .02 mm: Silt= .02 to .005 mm: Clay= .005 to .002 mm: Clay= Less Than .002 mm:		Hydro	meter A	Anal	ysis	St	ubsample	Total	Sample
	Medium	Sand= Sand= Silt= Silt= Clay=	2.0 .42 .074 .02 .005	to to to to	.42 .074 .02 .005	mm: mm: mm: mm: mm:			

REMARKS:

INFORMATION ONLY

USCS Classification: SM-silty SAND with gravel

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE-

C: FILES ; PROJ MGR: SCOTT BILLINGS ; R ROdriguez - SOILS ; GREGORY-LEDERER - REGION 4 GEOLOGY TOM GRUMMON-R4 GEOLOGY

OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY 800 AIRPORT RD. SE SALEM, OR 97301-4792

Page $(50\overline{3})986-3000$ FAX(503)986-3096

21-001140 Contract No.: EA No.: PE003210 011 Lab No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA Data Sheet No.: G 4630339 County: DESCHUTES

Contractor: ODOT R4 GEOLOGY

Project Manager: SCOTT BILLINGS

Submitted By: GREGORY-LEDERER

Sampled At: NCGDR-23

DATE-Sampled:

Material Source:

Org Unit: Org Unit: 4630 Bid Item: Sample No.: DM-1

Qty Represented: SOIL @ DEPTH

Sampled By:

FA No.: S004(231)

Received: 21/6/4 Tested: 21/8/3 Date Reported: 21/8/3

Test Results For:

T 89 Liquid Lim: 22 T 90 Plastic Ind: 1	Dry Density	Moisture
T288 Resistivity: Ω T289 pH: T100 Spec Grav: 2.7460 TM117 Torvane Shear/ Pocket Pen.	84.59 85.96 87.78 88.94 90.05 92.11 91.31 87.47	10.82 % 12.37 % 14.75 % 17.41 % 19.62 % 21.84 % 23.43 % 26.27 %
T265 N. Moisture: 8.39 % Dry Density rec'd: Wet Density rec'd: D4644 Slake Durab: Water Cont:	Maximum Density: Maximum Density: Optimum Moisture:	1475 kg/m3

t3 13

Si	.eve	Passi	ing
3	u	100	96
2		100	8
1	. 5	100	8
1		100	ક
3	/4	100	ક
1	/2	98	8
3	/8	97	ક
1	/4	96	8
#	4	96	윰
	10	93	B
	40	89	8
2	0.0	62.	.2 %

0.00

Quantity	Method	Cos

D2974 Pct Organic: 4.06 %

Quantity	Method	Cost
1	т89	\$ 47.00
1	T90	58.00
1	T265	16.00
1	D1140	96.00
2	R58	75.00
1	Т99	275.00
2	154X	75.00
1	D2792	107.00

	Hydrometer Analysis				Subsample			Total	Sample
Coarse	Sand=	4.75	to	2.0	mm:	2.6	g	2.5	8
Medium	Sand=	2.0	to	.42	mm:	4.1	8	3.9	8
Fine	Sand=	.42	to	.074	mm:	28.3	8	27.1	8
	Silt=	.074	to	.02	mm:	42.0	ક્ર	40.2	8
Ì	Silt=	.02	to	.005	mm:	13.0	B	12.5	B
İ	Clay=	.005	to	.002	mm:	4.9	8	4.7	ક્ષ
	Clay=	Less	Than	.002	mm:	5.0	8	4.8	8

REMARKS:

INFORMATION ONLY

USCS Classification: ML-sandy SILT

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES ; PROJ MGR: SCOTT BILLINGS ; R Rodriguez - SOILS ; GREGORY-LEDERER - REGION 4 GEOLOGY TOM GRUMMON-R4 GEOLOGY

800 AIRPORT RD. SE SALEM, OR 97301-4792

Page | (503)986-3000 FAX(503)986-3096

Contract No.: EA No.: PE003210 011 21-000976 Lab No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Data Sheet No.: G 4630337 Highway: THE DALLES-CALIFORNIA County: DESCHUTES

FA No.: S004(231) Contractor: ODOT R4 GEOLOGY Bid Item:

Project Manager: Org Unit: Submitted By: BOBBI CUMMISKEY Org Unit: 4630 Sample No.: C-1

Material Source: GEOTECHNICAL INVESTIGATION Qty Represented: ROCK @ DEPTH

Sampled At: NCGDR-04 @ 4.5' Sampled By:

Received: 21/ 5/18 Tested: 21/ 6/24 Date Reported: 21/ 6/24 DATE-Sampled:

Test Results For: ROCK CORE

т 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen. T265 N. Moisture: Dry Density rec'd:

Dry	Density	Moisture
İ		
Opti	Max Density: mum Moisture:	

Sieve	Passing
3 " 2 1.5	
3/4 1/2 3/8	
1/4 # 4 10	
200	

Wet Density rec'd: D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Quantity	Method	Cost
2 1 2 2	D7012 D4543 T265 154X	\$ 75.00 112.00 16.00 75.00

Hydrometer Analysis			Subsa	mple	Total	Sample	
Sand= Sand= Silt= Silt= Clay=	2.0 .42 .074 .02	to to to to	.42 .074 .02 .005	mm: mm: mm: mm: mm:			

REMARKS:

INFORMATION ONLY

Sample A 21-976A Uniaxial compressive strength = 4,455 psi Sample B 21-976B Uniaxial compressive strength = 4,215 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. "TM" TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

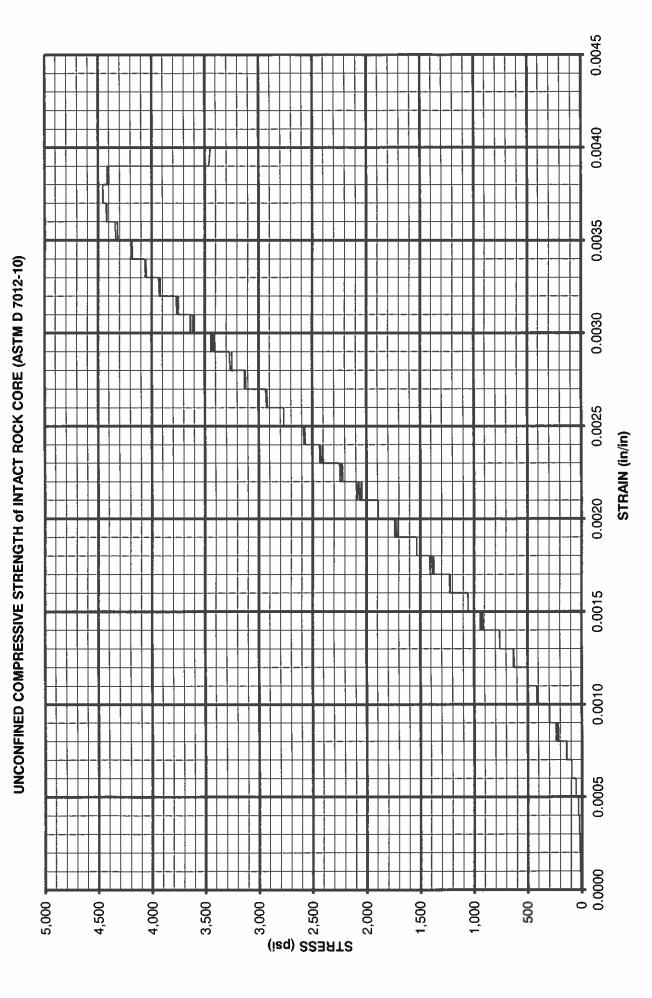
C: FILES ; R Rodriguez - SOILS ; BOBBI CUMMISKEY - REGION 4 GEOLOGY TOM.GRUMMON@ODOT.STATE.OR.US

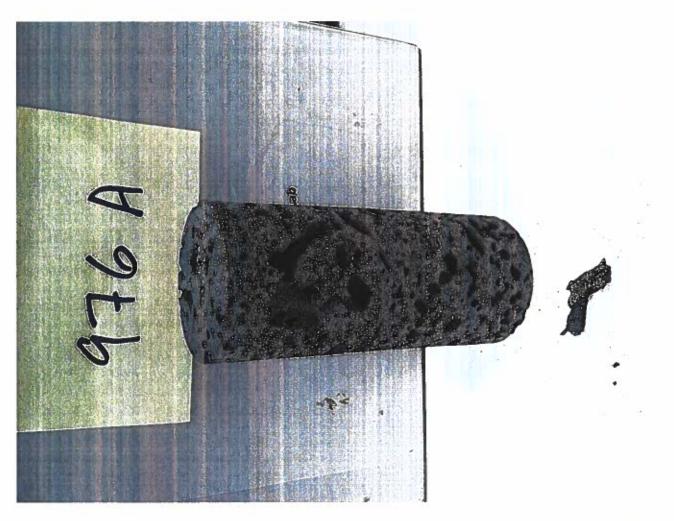
0.00

UNCONFINED COMPRESSIVE STRENGTH of INTACT ROCK CORE ASTM D 7012-14

PROJECT	US97 North Corridor	Geotechnical Data	LAB NUMBER	21-976A	
SAMPLE #	NCGDR-04, C-1		DEPTH	4.5	
HEIGHT (in)	5.4558		INITIAL WET WT. (g)	880.3	
DIAMETER (in)	2.3659		FINAL DRY WT. (g)	879.4	
AREA (in²)	4.3963		MOISTURE (%)	0.10	
Length to Diameter				•	
Ratio (L/D)	2.3	(2.0 - 2.5 Required)	WET DENSITY (lb/ft³)	139.8	
Maximum Stress (psi)	4,455		DRY DENSITY (lb/ft ³)	139.7	
Strain Rate (%/min)	0.15			•	

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.08	71	0.0217	0.0040	16.1
0.16	85	0.0015	0.0003	19.3
0.23	104	0.0020	0.0004	23.7
0.31	171	0.0026	0.0005	38.9
0.39	317	0.0032	0.0006	72.1
0.46	559	0.0040	0.0007	127.2
0.54	905	0.0045	0.0008	205.9
0.62	1,320	0.0052	0.0010	300.3
0.70	1,820	0.0057	0.0010	414.0
0.77	2,361	0.0064	0.0012	537.0
0.85	3,046	0.0071	0.0013	692.9
0.93	3,759	0.0076	0.0014	855.0
1.01	4,531	0.0083	0.0015	1030.6
1.09	5,357	0.0091	0.0017	1218.5
1.16	6,147	0.0097	0.0018	1398.2
1.24	7,039	0.0103	0.0019	1601.1
1.32	7,884	0.0109	0.0020	1793.3
1.39	8,737	0.0115	0.0021	1987.4
1.47	9,624	0.0121	0.0022	2189.1
1.55	10,505	0.0128	0.0023	2389.5
1.63	11,379	0.0134	0.0025	2588.3
1.70	12,255	0.0140	0.0026	2787.6
1.78	13,158	0.0147	0.0027	2993.0
1.86	14,075	0.0154	0.0028	3201.6
1.94	14,948	0.0159	0.0029	3400.1
2.01	15,780	0.0165	0.0030	3589.4
2.09	16,620	0.0173	0.0032	3780.5
2.17	17,419	0.0180	0.0033	3962.2
2.25	18,067	0.0185	0.0034	4109.6
2.32	18,762	0.0191	0.0035	4267.7
2.40	19,323	0.0197	0.0036	4395.3
2.48	19,561	0.0204	0.0037	4449.4
2.56	19,372	0.0210	0.0038	4406.4
2.64	14,681	0.0217	0.0040	3339.4

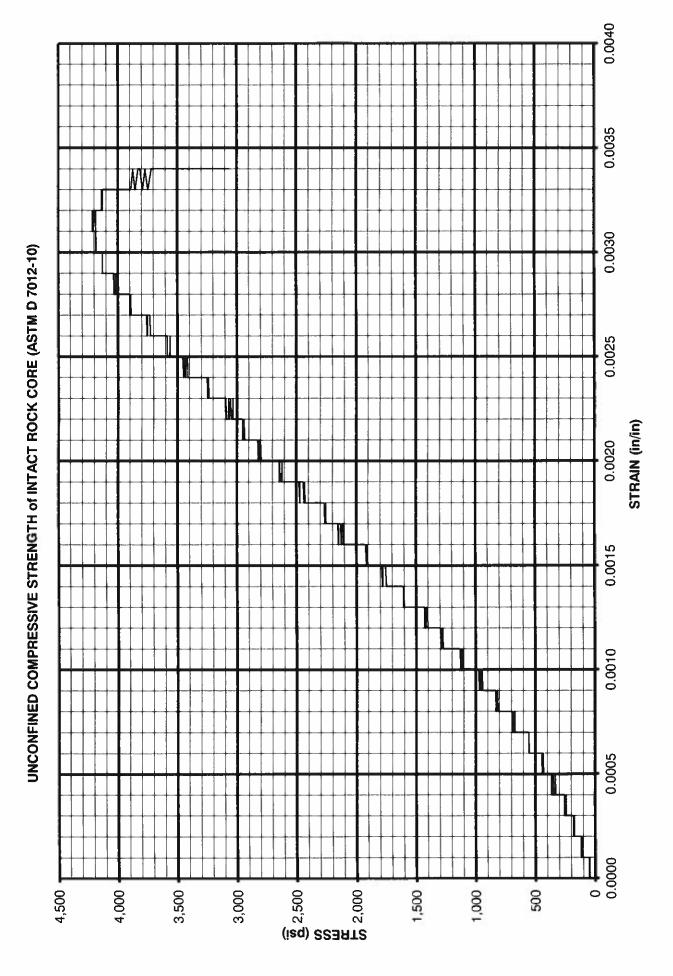






US97 North Corridor Geotechnical Data 21-976B **PROJECT** LAB NUMBER NCGDR-04, C-1 4.5 SAMPLE # **DEPTH** 5.3480 849.3 HEIGHT (in) INITIAL WET WT. (g) 2.3670 848.5 **DIAMETER (in)** FINAL DRY WT. (g) AREA (in²) 0.09 4.4003 **MOISTURE (%)** Length to Diameter Ratio (L/D) 2.3 (2.0 - 2.5 Required) WET DENSITY (lb/ft3) 137.5 DRY DENSITY (lb/ft3) 137.4 Maximum Stress (psi) 4,215 Strain Rate (%/min) 0.15

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.07	365	0.0181	0.0034	82.9
0.13	665	0.0011	0.0002	151.1
0.20	979	0.0017	0.0003	222.5
0.26	1,357	0.0023	0.0004	308.4
0.33	1,772	0.0026	0.0005	402.7
0.40	2,231	0.0033	0.0006	507.0
0.46	2,766	0.0039	0.0007	628.6
0.53	3,358	0.0043	0.0008	763.1
0.60	3,959	0.0049	0.0009	899.7
0.66	4,621	0.0054	0.0010	1050.2
0.73	5,282	0.0060	0.0011	1200.4
0.79	5,956	0.0065	0.0012	1353.5
0.86	6,653	0.0070	0.0013	1511.9
0.93	7,371	0.0075	0.0014	1675.1
0.99	8,142	0.0080	0.0015	1850.3
1.06	8,949	0.0085	0.0016	2033.7
1.13	9,661	0.0092	0.0017	2195.5
1.19	10,434	0.0096	0.0018	2371.2
1.26	11,147	0.0102	0.0019	2533.2
1.32	11,925	0.0107	0.0020	2710.0
1.39	12,710	0.0113	0.0021	2888.4
1.46	13,280	0.0116	0.0022	3018.0
1.52	13,899	0.0122	0.0023	3158.6
1.59	14,605	0.0128	0.0024	3319.1
1.65	15,353	0.0134	0.0025	3489.1
1.72	16,086	0.0138	0.0026	3655.7
1.79	16,719	0.0144	0.0027	3799.5
1.85	17,347	0.0150	0.0028	3942.2
1.92	17,915	0.0154	0.0029	4071.3
1.99	18,253	0.0160	0.0030	4148.1
2.05	18,493	0.0164	0.0031	4202.7
2.12	18,400	0.0170	0.0032	4181.5
2.18	17,976	0.0175	0.0033	4085.2
2.25	13,487	0.0181	0.0034	3065.0



ASTM D454	3 - Rock C	ore Dime	ntional ar	nd Shape T	olerance S	Summary
Lab Number:	21-976 B					
Project:	US97 Nort	th Corrido	or GDR			
Boring Number:	NCGDR-04	Sample	Number: 0	C-1 B	Depth:	4.5
		Dime	entional Da	ita		
Sample Length:	5.348		۸۷۵	Diameter:	2.367	
L/D Ratio:		Pass	AVE.	End Area:	4.40	
Volume:		r a 3 3	In	itial Mass:		
volume.	23.33		III	ILIdi Wid55.	849.29	
		End To	End Paralle	lism		
Parallelism, Dias	. 1A to 2A:	0.18	Pass	Parallelism	of each end	l of the specimen
Parallelism, Dias	. 1B to 2B:	0.07	Pass			D4543-08 9.2.1,
					•	•
				for sprier	ically seated	upper platen).
	End D	iameter To	Long Axis P	erpendicular	ity	
End 1, Dia. A:	0.0015	Pass		Bornandicu	larity of one	h diameter must
End 1, Dia. B:	0.0005	Pass			•	
End 2, Dia. A:		Pass		be $\leq \frac{1}{230}$	_o = 0.0043 (A	STM D4543-08
End 2, Dia. B:		Pass			9.3.1).	
100 - 1,000	S	ide Straight	ness And Er	nd Flatness		
Deviation from				Cida Charish	A	
cylindrical:	< 0.020"	Pass		_		not exceed 0.020" 543-08 9.1.1).
				Profile of n	neasured dat	a shall not depart
End flatness ≤ 0.001"						in excess of 0.001"
(Smoothness):	< 0.001"	Pass			STM D4543-	
			I	quipment		
				Wet Saw	✓	
Tester:	JBG			inist Block	☑	
			Fee	eler Gauge	V	
Checker:	RJR			"V" Block	✓	
			Surfa	ce Grinder	✓	
			Digital Mi	crometers	V	





OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY 800 AIRPORT RD. SE SALEM, OR 97301-4792

Page of 5 (503)986-3000 FAX(503)986-3096

21-000977

Contract No.:

EA No.: PE003210 011

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

County: DESCHUTES

Data Sheet No.: G 4630337

Lab No.:

FA No.: S004(231)

Contractor: ODOT R4 GEOLOGY
Project Manager: SCOTT BILLINGS Org Unit

Org Unit: Bid Item:
Org Unit: 4630 Sample No.: C-3

Submitted By: BOBBI CUMMISKEY Org Unit: 4630
Material Source: GEOTECHNICAL INVESTIGATION

Qty Represented: ROCK @ DEPTH

Sampled By:

Sampled At: NCGDR-04 @ 15.5'
DATE-Sampled: Rece

Highway: THE DALLES-CALIFORNIA

Received: 21/ 5/18 Tested: 21/ 6/24 Date Reported: 21/ 6/24

Test Results For: ROCK CORE

T 89 Liquid Lim:
T 90 Plastic Ind:
T288 Resistivity: Ω
T289 pH:
T100 Spec Grav:
TM117
Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.03 % Dry Density rec'd: 158.30 PC Wet Density rec'd: 158.35 PC

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture
 Opti	Max Density mum Moisture	

Sieve	Passing
3 "	
2	
1.5	
1	
3/4	
1/2	
3/8	
1/4	
# 4	
10	
40	
200	

Quantity	Method	Cost
1 1 1 1	D7012 D4543 T265 154X	\$ 75.00 112.00 16.00 75.00

	Hydro	meter A	Anal	ysis	Sub	sample	To	tal	Sample
Coarse Medium Fine	Sand= Sand= Silt= Silt= Clay=	2.0	to to to to	.42 .074 .02 .005	mm: mm: mm: mm: mm:				

TOTAL CHARGES: \$

0.00

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 13,380 psi

*

KEVIN BROPHY - LABORATORY SERVICES MANAGER

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

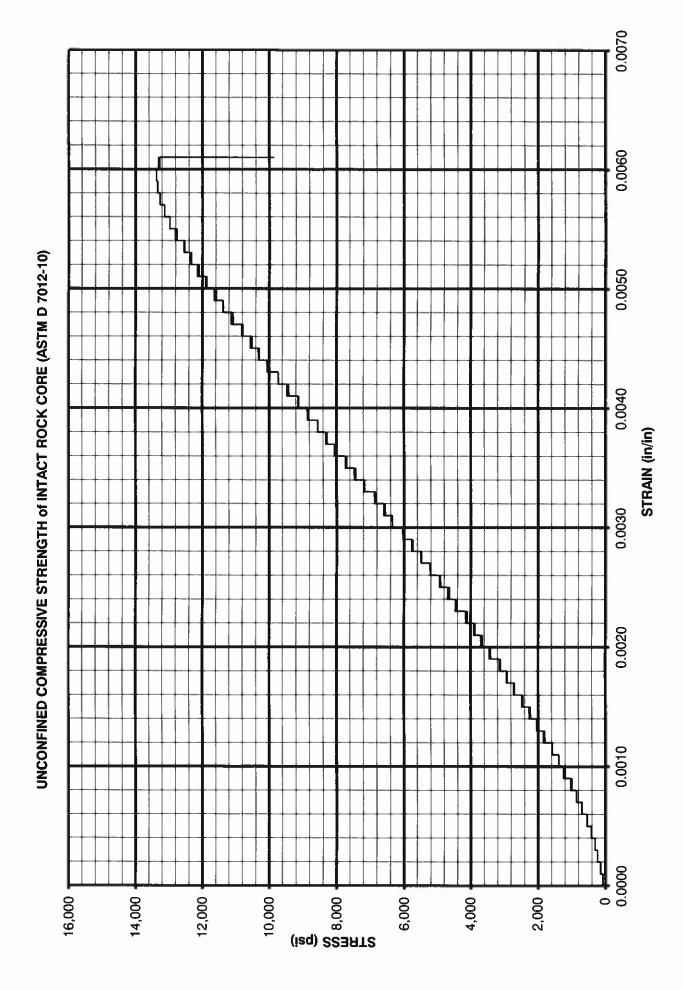
'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES: PROJ MGR: SCOTT BILLINGS ; R Rodriquez - SOILS ; BOBBI CUMMISKEY - REGION 4 GEOLOGY TOM.GRUMMON@ODOT.STATE.OR.US

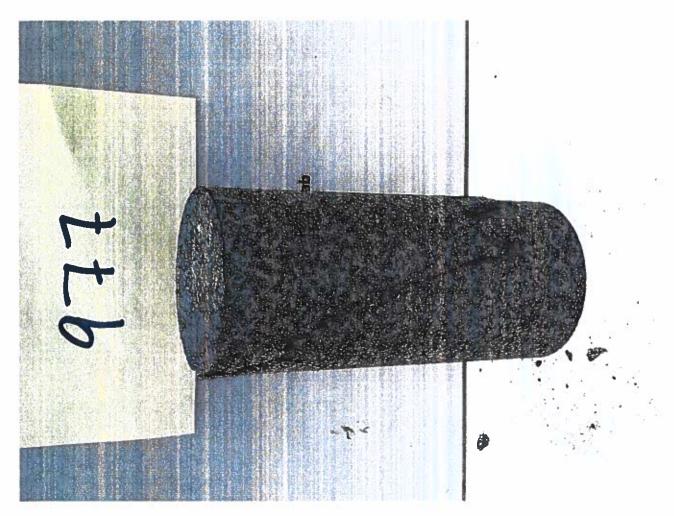
PROJECT
SAMPLE #
HEIGHT (in)
DIAMETER (in)
AREA (in²)
Length to Diameter
Ratio (L/D)
Maximum Stress (psi)
Strain Rate (%/min)

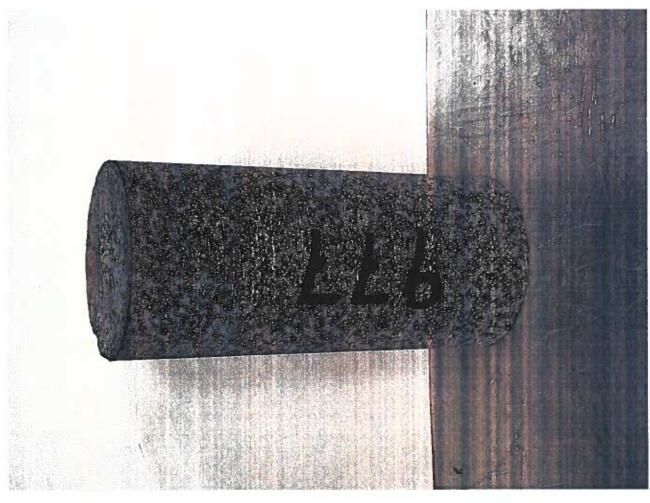
US97 North Corr	idor Geotechnical Data	LAB NUMBER	21-977
NCGDR-04, C-3		DEPTH	15.5
5.2880		INITIAL WET WT. (g)	991.1
2.3960		FINAL DRY WT. (g)	990.8
4.5088		MOISTURE (%)	0.03
2.2	(2.0 - 2.5 Required)	WET DENSITY (lb/ft3)	158.4
13,380		DRY DENSITY (lb/ft3)	158.3
0.15			

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.12	838	0.0324	0.0061	185.9
0.24	1,561	0.0020	0.0004	346.2
0.36	2,554	0.0030	0.0006	566.4
0.48	3,818	0.0039	0.0007	846.8
0.60	5,234	0.0048	0.0009	1160.8
0.72	6,786	0.0058	0.0011	1505.1
0.84	8,469	0.0068	0.0013	1878.3
0.96	10,246	0.0078	0.0015	2272.4
1.08	12,038	0.0087	0.0016	2669.9
1.20	13,961	0.0096	0.0018	3096.4
1.32	15,999	0.0106	0.0020	3548.4
1.44	18,054	0.0115	0.0022	4004.2
1.56	20,142	0.0124	0.0023	4467.3
1.68	22,258	0.0134	0.0025	4936.6
1.80	24,423	0.0145	0.0027	5416.7
1.92	26,636	0.0154	0.0029	5907.6
2.04	28,845	0.0163	0.0031	6397.5
2.16	31,128	0.0172	0.0033	6903.8
2.28	33,467	0.0182	0.0034	7422.6
2.40	35,756	0.0191	0.0036	7930.3
2.52	38,062	0.0200	0.0038	8441.7
2.64	40,358	0.0211	0.0040	8950.9
2.76	42,656	0.0219	0.0041	9460.6
2.88	44,980	0.0230	0.0043	9976.0
3.00	47,181	0.0239	0.0045	10464.2
3.11	49,423	0.0248	0.0047	10961.5
3.23	51,591	0.0259	0.0049	11442.3
3.35	53,647	0.0267	0.0050	11898.3
3.47	55,556	0.0277	0.0052	12321.7
3.59	57,304	0.0287	0.0054	12709.4
3.71	58,753	0.0296	0.0056	13030.7
3.83	59,921	0.0306	0.0058	13289.8
3.95	60,329	0.0315	0.0060	13380.3
4.07	44,473	0.0324	0.0061	9863.6



ASTM D454	13 - Rock C	ore Dime	ntional and	d Shape T	olerance	Summary		
Lab Number:	21-977							
Project:	US97 Nort	th Corrido	or GDR					
Boring Number:	NCGDR-04	Sample	Sample Number: C-3			15.5		
		Dime	entional Data	a				
Sample Length:	5.288		Ave. Diameter: 2.39		2.396			
L/D Ratio:	2.21	Pass		nd Area:	4.51			
Volume:				ial Mass:	991.1			
		End To	End Paralleli	sm				
Parallelism, Dias	. 1A to 2A:	0.05	Pass _					
Parallelism, Dias		0.12	Pace			d of the specimen		
			r		•	1 D4543-08 9.2.1,		
				for spher	ically seate	d upper platen).		
	End D	iameter To	Long Axis Per	pendiculari	ity			
End 1, Dia. A:	0.0004	Pass	ع	ernendicu	larity of ea	ch diameter must		
End 1, Dia. B:	0.0013	Pass	•		-			
End 2, Dia. A:	0.0007	Pass		be ≤ / ₂₃₀		= 0.0043 (ASTM D4543-08		
End 2, Dia. B:	0.0007	Pass			9.3.1)			
	S	ide Straight	ness And End	Flatness				
Deviation from			c	ide Straigh	tness should	not exceed 0.020"		
cylindrical:	< 0.020"	Pass	~	_		543-08 9.1.1).		
End flatness ≤ 0.001"				Profile of n	neasured da	ta shall not depart		
(Smoothness):			fr		-	in excess of 0.001"		
(ccom,	< 0.001"	Pass		(A	STM D4543-	·08 9.2.1)		
			Eq	uipment (Used:			
			•	Wet Saw	~			
Tester:	JBG		Machin	ist Block	V			
				er Gauge	V			
Checker:	RJR			V" Block	☑			
				Grinder	✓			
			Digital Micr	ometers	✓			





OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY 800 AIRPORT RD. SE SALEM, OR 97301-4792

Page (503)986-3000 FAX(503)986-3096

EA No.: PE003210 011 21-000978 Contract No.: Lab No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337

Contractor: ODOT R4 GEOLOGY

DATE-Sampled:

Org Unit:

Project Manager: SCOTT BILLINGS Submitted By: BOBBI CUMMISKEY

Org Unit: 4630

Material Source: GEOTECHNICAL INVESTIGATION

Sampled At: NCGDR-05 @ 17.2'

Received: 21/ 5/18 Tested: 21/ 6/24

Qty Represented: ROCK @ DEPTH

Sampled By:

Bid Item:

FA No.: S004(231)

Sample No.: C-4

Date Reported: 21/ 6/24

Test Results For: ROCK CORE

-	
į	T 89 Liquid Lim:
	T 90 Plastic Ind:
	T288 Resistivity: Ω
	Т289 рН:
	T100 Spec Grav:
	TM117
	Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.13 % Dry Density rec'd: 122.94 PC Wet Density rec'd: 123.10 PC D4644 Slake Durab:

Water Cont:

D2974 Pct Organic:

	Dry	Density	Moisture
_			
		Max Density:	
	Optin	mum Moisture:	

Sieve	Passing
3 "	
2	
1.5	
1	
3/4	
1/2	
3/8	
1/4	
# 4	
10	
40	
200	
i	

0.00

Quantity	Method	Cost
1	D7012	\$ 75.00
1	T265	16.00
1	154X	75.00

	Hydron	neter A	Anal	ysis	Subsamp	ole	Total	Sample
Coarse								
Medium								ļ
Fine	Sand=	.42	to	.074	mm:			ļ
	Silt=	.074	to	.02	mm:			
	Silt=	.02	to	.005	mm:			
	Clay=	.005	to	.002	mm:			
	Clay=	Less 1	Char	.002	mm:			

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 5,536 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

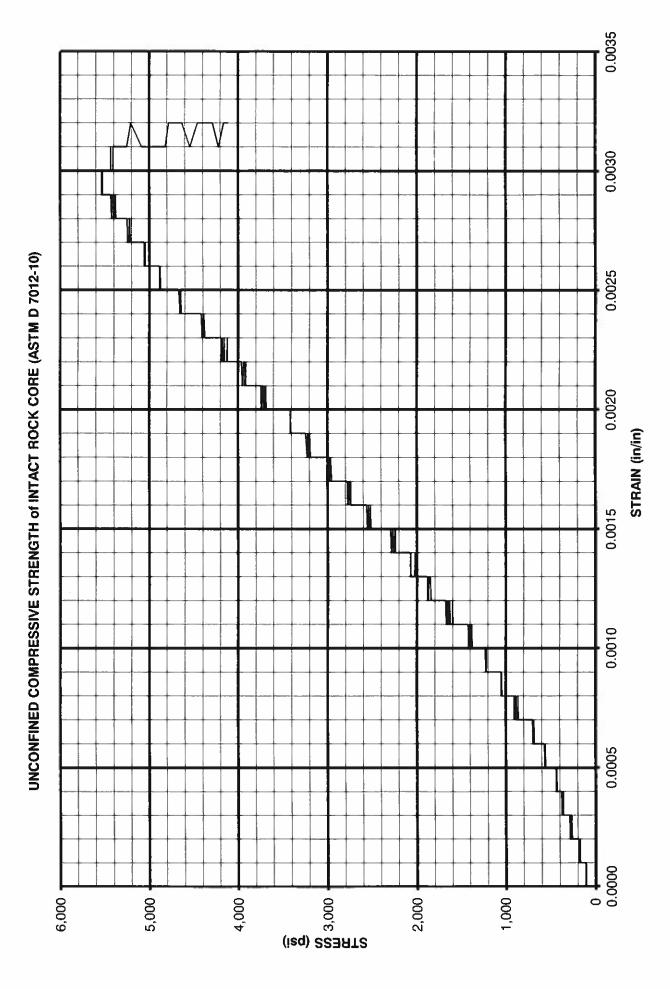
TOTAL CHARGES: \$

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

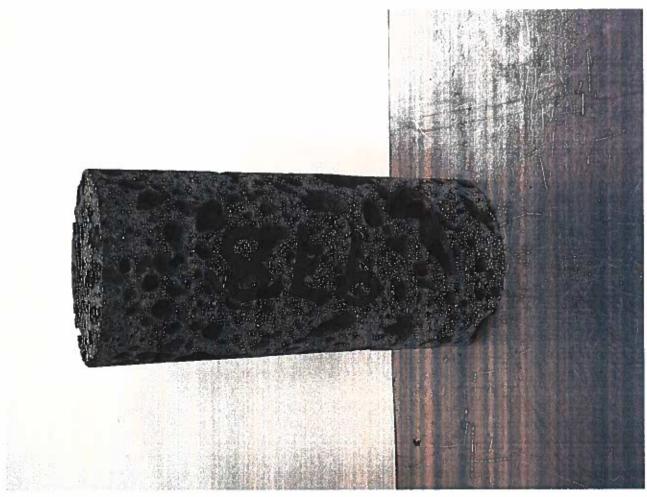
C: FILES ; PROJ MGR: SCOTT BILLINGS ; R ROdriguez - SOILS ; BOBBI CUMMISKEY - REGION 4 GEOLOGY TOM GRUMMON-ODOT R4 GEOLOGY

PROJECT	US97 North Corridor	Geotechnical Data	LAB NUMBER	21-978
SAMPLE #	NCGDR-05, C-4		DEPTH	17.2
HEIGHT (in)	5.2274		INITIAL WET WT. (g)	758.8
DIAMETER (in)	2.3916		FINAL DRY WT. (g)	757.8
AREA (in²)	4.4923		MOISTURE (%)	0.13
Length to Diameter			• •	
Ratio (L/D)	2.2	(2.0 - 2.5 Required)	WET DENSITY (Ib/ft³)	123.1
Maximum Stress (psi)	5,536		DRY DENSITY (lb/ft3)	122.9
Strain Rate (%/min)	0.15			

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.06	699	0.0166	0.0032	155.6
0.12	1,027	0.0010	0.0002	228.6
0.18	1,407	0.0016	0.0003	313.2
0.25	1,663	0.0018	0.0003	370.2
0.31	2,132	0.0026	0.0005	474.6
0.37	2,693	0.0030	0.0006	599.5
0.43	3,304	0.0035	0.0007	735.5
0.49	3,980	0.0040	0.0008	886.0
0.55	4,709	0.0046	0.0009	1048.2
0.62	5,505	0.0049	0.0009	1225.4
0.68	6,262	0.0055	0.0011	1393.9
0.74	7,130	0.0059	0.0011	1587.2
0.80	7,970	0.0063	0.0012	1774.1
0.86	8,877	0.0069	0.0013	1976.0
0.92	9,827	0.0073	0.0014	2187.5
0.99	10,791	0.0077	0.0015	2402.1
1.05	11,726	0.0083	0.0016	2610.2
1.11	12,678	0.0089	0.0017	2822.2
1.17	13,605	0.0093	0.0018	3028.5
1.23	14,650	0.0097	0.0019	3261.1
1.29	15,590	0.0102	0.0020	3470.4
1.36	16,608	0.0107	0.0020	3697.0
1.42	17,625	0.0112	0.0021	3923.4
1.48	18,648	0.0117	0.0022	4151.1
1.54	19,600	0.0121	0.0023	4363.0
1.60	20,566	0.0126	0.0024	4578.1
1.66	21,501	0.0132	0.0025	4786.2
1.73	22,411	0.0136	0.0026	4988.8
1.79	23,128	0.0142	0.0027	5148.4
1.85	23,846	0.0146	0.0028	5308.2
1.91	24,512	0.0150	0.0029	5456.4
1.97	24,638	0.0155	0.0030	5484.5
2.03	24,175	0.0160	0.0031	5381.4
2.10	18,481	0.0166	0.0032	4113.9







800 AIRPORT RD. SE SALEM, OR 97301-4792

(503)986-3000 FAX(503)986-3096

21-000979 EA No.: PE003210 011 Contract No.: Lab No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337

Contractor: ODOT R4 GEOLOGY FA No.: S004(231)

Project Manager: SCOTT BILLINGS Org Unit: Bid Item:

Org Unit: 4630 Submitted By: BOBBI CUMMISKEY Sample No.: C-6

Material Source: GEOTECHNICAL INVESTIGATION Qty Represented: ROCK @ DEPTH

Sampled At: NCGDR-05 @ 29.3' Sampled By:

DATE-Sampled: Received: 21/ 5/18 Tested: 21/ 6/24 Date Reported: 21/ 6/24

Test Results For: ROCK CORE

T 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: T289 pH: Spec Grav: T100 TM117 Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.05 % Dry Density rec'd: 158.63 PC Wet Density rec'd: 158.71 PC D4644 Slake Durab:

Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture	
[]			
Opti	Max Density: mum Moisture:		

Sieve	Passing
3 " 2 1.5 1 3/4 1/2 3/8 1/4 # 4 10 40	
200	

Quantity	Method	Cost
1 1 1 1	D7012 D4543 T265 154X	\$ 75.00 112.00 16.00 75.00

	Hydron	meter A	Anal	ysis	Sub	sample	Total	Sample
Coarse	Sand=	4.75	to	2.0	mm:			
Medium	Sand=	2.0	to	.42	mm:			ĺ
Fine	Sand=	.42	to	.074	mm:			j
	Silt=	.074	to	.02	mm:			
	Silt=	.02	to	.005	mm:			1
	Clay=	.005	to	.002	mm:			
	Clay=	Less :	Chan	.002	mm:]

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 12,424 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

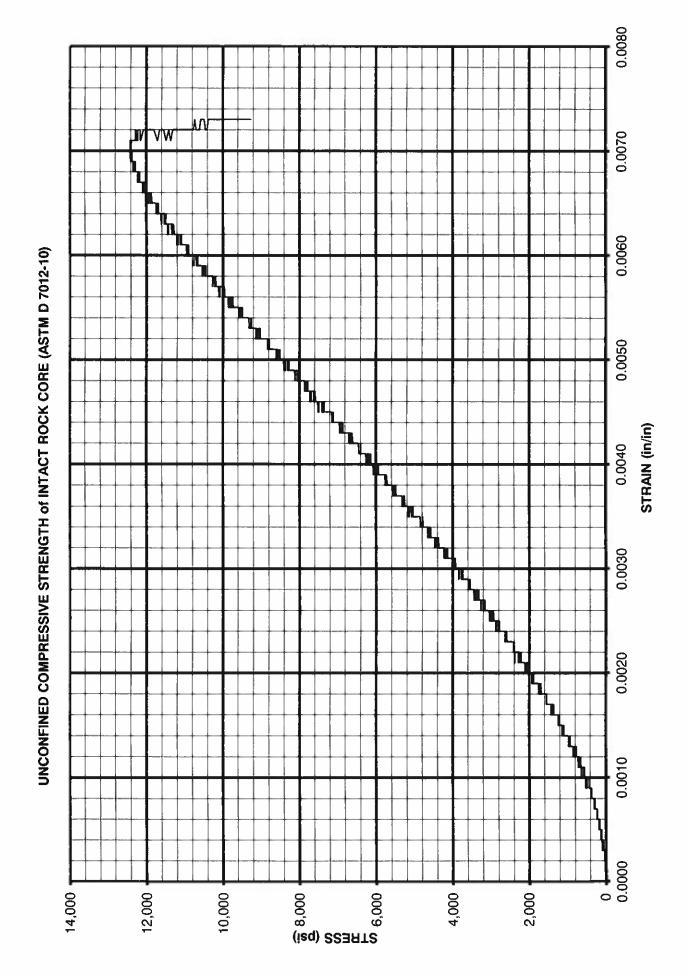
0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

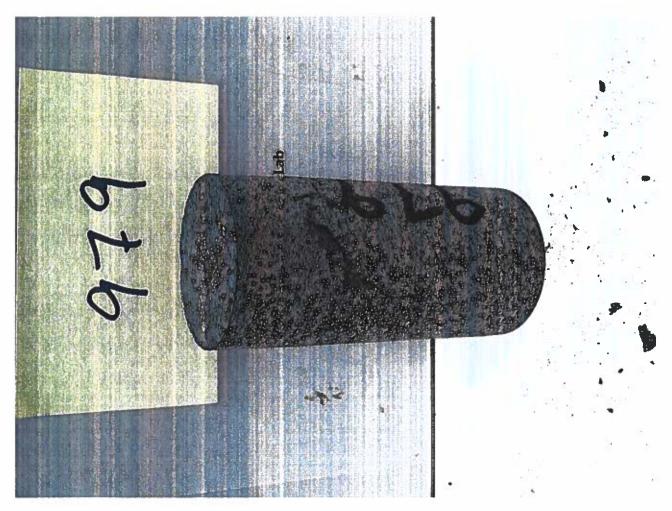
'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

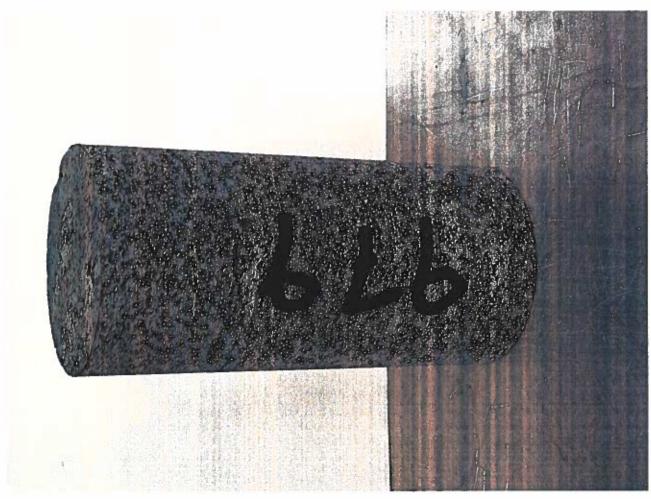
US97 North Corridor Geotechnical Data 21-979 LAB NUMBER **PROJECT** NCGDR-05, C-6 29.3 SAMPLE# DEPTH 4.9816 932.7 **HEIGHT (in)** INITIAL WET WT. (g) 2.3920 932.2 DIAMETER (in) FINAL DRY WT. (g) AREA (in²) 4.4938 0.05 **MOISTURE (%)** Length to Diameter Ratio (L/D) 2.1 (2.0 - 2.5 Required) WET DENSITY (lb/ft³) 158.7 12,424 DRY DENSITY (lb/ft3) 158.6 Maximum Stress (psi) Strain Rate (%/min) 0.15

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.14	138	0.0365	0.0073	30.7
0.29	487	0.0022	0.0004	108.4
0.43	1,014	0.0033	0.0007	225.6
0.57	1,723	0.0043	0.0009	383.4
0.72	2,649	0.0055	0.0011	589.5
0.86	3,904	0.0065	0.0013	868.8
1.01	5,280	0.0076	0.0015	1175.0
1.15	6,795	0.0084	0.0017	1512.1
1.29	8,422	0.0097	0.0019	1874.1
1.44	10,092	0.0107	0.0021	2245.8
1.58	11,853	0.0116	0.0023	2637.6
1.72	13,702	0.0129	0.0026	3049.1
1.87	15,627	0.0139	0.0028	3477.5
2.01	17,584	0.0150	0.0030	3912.9
2.15	19,696	0.0161	0.0032	4382.9
2.30	21,803	0.0171	0.0034	4851.8
2.44	23,989	0.0183	0.0037	5338.2
2.58	26,111	0.0194	0.0039	5810.4
2.73	28,304	0.0204	0.0041	6298.5
2.87	30,614	0.0215	0.0043	6812.5
3.02	32,841	0.0226	0.0045	7308.1
3.16	35,182	0.0237	0.0048	7829.0
3.30	37,559	0.0247	0.0050	8358.0
3.45	39,831	0.0257	0.0052	8863.5
3.59	42,093	0.0269	0.0054	9366.9
3.73	44,406	0.0278	0.0056	9881.6
3.88	46,680	0.0291	0.0058	10387.6
4.02	49,012	0.0300	0.0060	10906.6
4.16	50,926	0.0311	0.0062	11332.5
4.31	52,738	0.0322	0.0065	11735.7
4.45	54,354	0.0334	0.0067	12095.3
4.59	55,453	0.0343	0.0069	12339.9
4.74	55,524	0.0352	0.0071	12355.7
4.88	41,619	0.0365	0.0073	9261.4



Lab Number:	21-979				
Project:	US97 Nort	th Corrido	or GDR		
Boring Number:	NCGDR-05	Sample	Number: C-6	Depth:	29.3
		Dime	entional Data		
Sample Length:	4.982		Ave. Diameter:	2.392	
L/D Ratio:	2.08	Pass	End Area:	4.49	
Volume:	22.39		Initial Mass:	932.69	
		End To	End Parallelism		
Parallelism, Dias	. 1A to 2A:	0.11	Pass Parallelism	of each en	d of the specimen
Parallelism, Dias	a. 1B to 2B:	0.01	Dacc		1 D4543-08 9.2.1,
				*	d upper platen).
			·	•	
	End D	iameter To	Long Axis Perpendicular	ity	
End 1, Dia. A:	0.0017	Pass	Perpendicu	larity of ea	ch diameter must
End 1, Dia. B:	0.0001	Pass		•	ASTM D4543-08
End 2, Dia. A:	0.0002	Pass	DE = 723	•	
End 2, Dia. B:	0.0004	Pass		9.3.1)	•
	S	ide Straight	ness And End Flatness		
Deviation from			Side Straigh	tness should	not exceed 0.020"
cylindrical:	< 0.020"	Pass	_		543-08 9.1.1).
nd flatness ≤ 0.001"					ta shall not depart
(Smoothness):				-	in excess of 0.001"
(0001	< 0.001"	Pass	(A	\STM D4 543 -	08 9.2.1)
			Equipment	Used:	
			Wet Saw	V	
Tester:	JBG		Machinist Block	V	
			Feeler Gauge		
Checker:	RJR		"V" Block	Ø	
			Surface Grinder		
			Digital Micrometers	u	





OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY 800 AIRPORT RD. SE SALEM, OR 97301-4792

Page (503)986-3000 FAX(503)986-3096

Lab No.: EA No.: PE003210 011 21-000980 Contract No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337

Contractor: ODOT R4 GEOLOGY FA No.: S004(231)

Project Manager: SCOTT BILLINGS Org Unit: Bid Item:

Submitted By: BOBBI CUMMISKEY Org Unit: 4630 Sample No.: C-1 Material Source: GEOTECHNICAL INVESTIGATION Qty Represented: ROCK @ DEPTH

Sampled At: NCGDR-06 @ 15.5' Sampled By:

Received: 21/ 5/18 Tested: 21/ 6/24 Date Reported: 21/ 6/24 DATE-Sampled:

Test Results For: ROCK CORE

T 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: Spec Grav: T100 TM117 Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.11 % Dry Density rec'd: 149.76 PC Wet Density rec'd: 149.93 PC

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture	
Opti	Max Density mum Moisture		

Passing

Quantity	Method	Cost
1	D7012	\$ 75.00
1	D4543	112.00
1	Т265	16.00
1	154X	75.00

Hydron	meter <i>l</i>	Anal	lysis	Sub	sample	Total	Sample
Sand=	4.75	to	2.0	mm:			
Sand=	2.0	to	.42	mm:			
Sand=	.42	to	.074	mm:			
Silt=	.074	to	.02	mm:			
Silt=	.02	to	.005	mm:			
Clay=	.005	to	.002	mm:			
Clay=	Less 7	ľhar	.002	mm:			
	Sand= Sand= Sand= Silt= Silt= Clay=	Sand= 4.75 Sand= 2.0 Sand= .42 Silt= .074 Silt= .02 Clay= .005	Sand= 4.75 to Sand= 2.0 to Sand= .42 to Silt= .074 to Silt= .02 to Clay= .005 to	Sand= 4.75 to 2.0 Sand= 2.0 to .42 Sand= .42 to .074 Silt= .074 to .02 Silt= .02 to .005 Clay= .005 to .002	Sand= 4.75 to 2.0 mm: Sand= 2.0 to .42 mm: Sand= .42 to .074 mm: Silt= .074 to .02 mm: Silt= .02 to .005 mm: Clay= .005 to .002 mm: Clay= Less Than .002 mm:	Sand= 4.75 to 2.0 mm: Sand= 2.0 to .42 mm: Sand= .42 to .074 mm: Silt= .074 to .02 mm: Silt= .02 to .005 mm: Clay= .005 to .002 mm:	Sand= 4.75 to 2.0 mm: Sand= 2.0 to .42 mm: Sand= .42 to .074 mm: Silt= .074 to .02 mm: Silt= .02 to .005 mm: Clay= .005 to .002 mm:

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 10,426 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

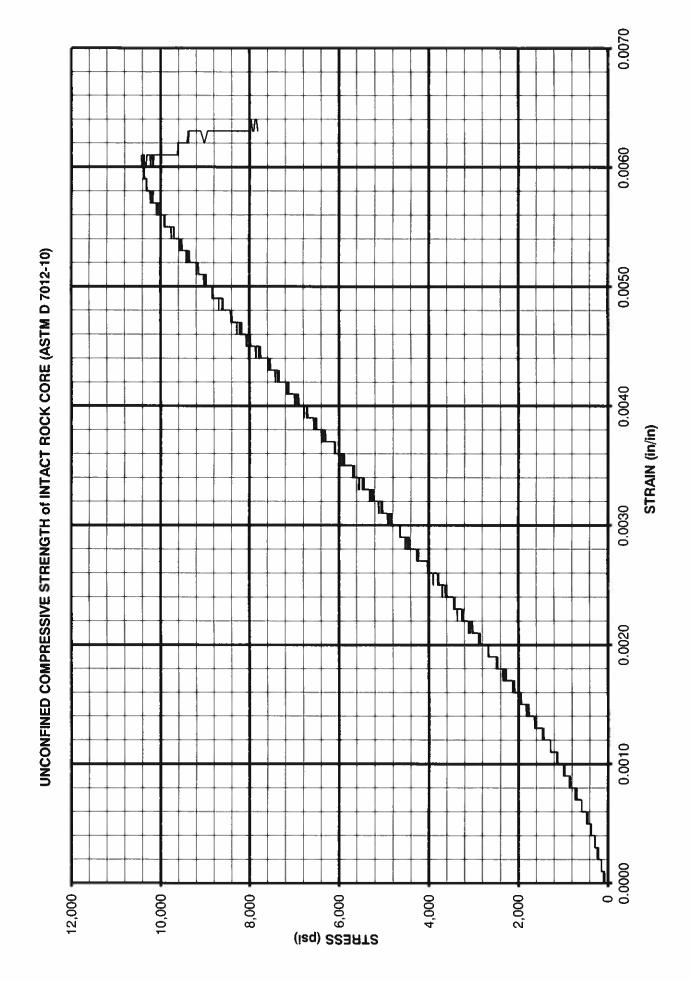
0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

US97 North Corridor Geotechnical Data 21-980 **PROJECT** LAB NUMBER NCGDR-06, C-1 DEPTH 15.5 SAMPLE # 5.0182 883.0 HEIGHT (in) INITIAL WET WT. (g) 2.3860 882.0 DIAMETER (in) FINAL DRY WT. (g) AREA (in²) 4.4713 **MOISTURE (%)** 0.11 Length to Diameter Ratio (L/D) 2.1 (2.0 - 2.5 Required) WET DENSITY (Ib/ft3) 149.9 10,426 DRY DENSITY (lb/ft3) 149.7 Maximum Stress (psi) 0.15 Strain Rate (%/min)

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.12	769	0.0317	0.0063	172.0
0.25	1,402	0.0020	0.0004	313.6
0.37	2,164	0.0029	0.0006	484.0
0.50	3,179	0.0038	0.0008	711.0
0.62	4,383	0.0048	0.0010	980.3
0.75	5,626	0.0056	0.0011	1258.2
0.87	6,998	0.0064	0.0013	1565.1
0.99	8,417	0.0073	0.0015	1882.5
1.12	9,880	0.0086	0.0017	2209.6
1.24	11,371	0.0095	0.0019	2543.1
1.37	12,904	0.0102	0.0020	2886.0
1.49	14,525	0.0113	0.0023	3248.5
1.62	16,041	0.0120	0.0024	3587.5
1.74	17,731	0.0132	0.0026	3965.5
1.86	19,453	0.0141	0.0028	4350.6
1.99	21,061	0.0151	0.0030	4710.3
2.11	22,778	0.0159	0.0032	5094.3
2.24	24,497	0.0169	0.0034	5478.7
2.36	26,291	0.0178	0.0035	5879.9
2.49	27,971	0.0188	0.0037	6255.7
2.61	29,781	0.0197	0.0039	6660.5
2.73	31,524	0.0206	0.0041	7050.3
2.86	33,315	0.0215	0.0043	7450.9
2.98	35,093	0.0225	0.0045	7848.5
3.11	36,802	0.0234	0.0047	8230.7
3.23	38,523	0.0244	0.0049	8615.6
3.36	40,102	0.0254	0.0051	8968.8
3.48	41,778	0.0261	0.0052	9343.6
3.61	43,241	0.0272	0.0054	9670.8
3.73	44,622	0.0281	0.0056	9979.6
3.85	45,843	0.0292	0.0058	10252.7
3.98	46,418	0.0299	0.0060	10381.3
4.10	42,969	0.0310	0.0062	9610.0
4.23	34,940	0.0317	0.0063	7814.3



Lab Number:	21-980				
Project:	US97 Nort	h Corrido	or GDR		
Boring Number:			Number: C-1	Depth:	15.5
		Dime	entional Data		
Sample Length:	5.018		Ave. Diameter:	2.386	
L/D Ratio:		Pass	End Area:	4.47	
Volume:			Initial Mass:	883.00	
		End To	End Parallelism		
Parallelism, Dias	1A to 2A:	0.11	Pass		
Parallelism, Dias		0.07	Parallelism		d of the specimen
r aranensin, olas	. 10 (0 20.	0.07	must be ≤	•	1 D4543-08 9.2.1,
			for spherically seated		d upper platen).
	End D	iameter To	Long Axis Perpendicula	rity	<u> </u>
End 1, Dia. A:	0.0004	Pass	Pernendici	<i>ularity</i> of ea	ch diameter must
End 1, Dia. B:	0.0010	Pass		Ť	
End 2, Dia. A:	0.0014	Pass	ne ≥ /25	-	ASTM D4543-08
End 2, Dia. B:	0.0002	Pass		9.3.1)	•
	S	ide Straight	ness And End Flatness		
Deviation from		_	Side Straigh	ntness should	not exceed 0.020"
cylindrical:	< 0.020"	Pass	•		543-08 9.1.1).
nd flatness ≤ 0.001"			Profile of	measured dat	a shall not depart
(Smoothness):				-	in excess of 0.001
(51110511111035).	< 0.001"	Pass	(,	ASTM D 4543 -	08 9.2.1)
			Equipment	Used:	
			Wet Saw	~	
Tester:	JBG		Machinist Block	V	
			Feeler Gauge	✓	
Checker:	RJR		"V" Block	✓	
			Surface Grinder	✓	
			Digital Micrometers	V	





800 AIRPORT RD. SE SALEM, OR 97301-4792

(503)986-3000 FAX(503)986-3096

21-000981 Contract No.: EA No.: PE003210 011 Lab No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337

Contractor: ODOT R4 GEOLOGY FA No.: S004(231)

Project Manager: SCOTT BILLINGS Org Unit: Bid Item: Submitted By: BOBBI CUMMISKEY Org Unit: 4630 Sample No.: C-3

Material Source: GEOTECHNICAL INVESTIGATION Oty Represented: ROCK @ DEPTH

Sampled At: NCGDR-06 @ 25.8' Sampled By:

DATE-Sampled: Received: 21/ 5/18 Tested: 21/ 6/24 Date Reported: 21/ 6/24

Test Results For: ROCK CORE

т 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.10 % Dry Density rec'd: 139.83 PC Wet Density rec'd: 139.97 PC

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

į	Dry	Density	Moisture	
	Optir	Max Dens		

Optimum Moisture:

 Sieve	Passing
3 "	
2	
1.5	
1	
3/4	
1/2	
3/8	
1/4	
# 4	
10	
40	
200	

Quantity	Method	Cost
1 1 1 1	D7012 D4543 T265 154X	\$ 75.00 112.00 16.00 75.00

Coarse Sand= 4.75 to 2.0 mm: Medium Sand= 2.0 to .42 mm: Fine Sand= .42 to .074 mm: Silt= .074 to .02 mm: Silt= .02 to .005 mm:		Hydron	neter <i>l</i>	Anal	ysis	Sub	sample	Total	Sample
Clay= .005 to .002 mm: Clay= Less Than .002 mm:	Medium	Sand= Sand= Silt= Silt= Clay=	2.0 .42 .074 .02 .005	to to to to	.42 .074 .02 .005	mm: mm: mm: mm:			

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 7,642 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

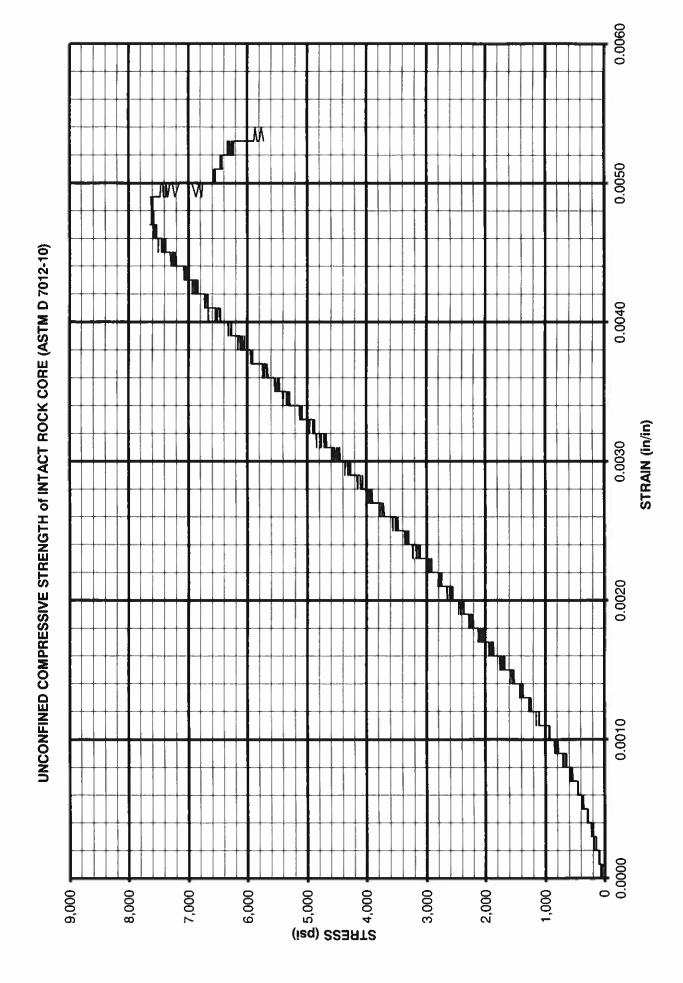
TOTAL CHARGES: \$

0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

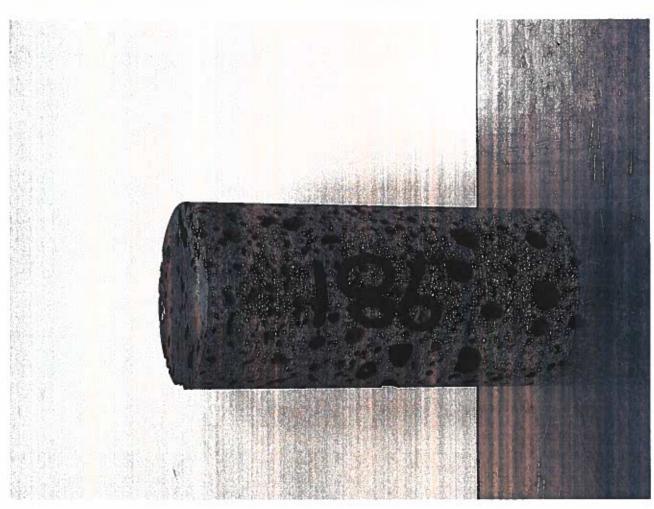
US97 North Corridor Geotechnical Data 21-981 PROJECT LAB NUMBER DEPTH SAMPLE # NCGDR-06, C-3 25.8 4.9977 823.2 HEIGHT (in) INITIAL WET WT. (g) 2.3890 822.4 DIAMETER (in) FINAL DRY WT. (g) AREA (in²) 4.4825 0.10 **MOISTURE (%)** Length to Diameter Ratio (L/D) 2.1 (2.0 - 2.5 Required) 140.0 WET DENSITY (lb/ft3) 7,642 DRY DENSITY (lb/ft3) 139.9 Maximum Stress (psi) Strain Rate (%/min) 0.12

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.13	445	0.0267	0.0053	99.3
0.26	857	0.0016	0.0003	191.2
0.39	1,337	0.0025	0.0005	298.3
0.52	1,909	0.0032	0.0006	425.9
0.65	2,642	0.0039	0.0008	589.4
0.79	3,552	0.0046	0.0009	792.4
0.92	4,580	0.0053	0.0011	1021.8
1.05	5,615	0.0064	0.0013	1252.6
1.18	6,614	0.0071	0.0014	1475.5
1.31	7,816	0.0079	0.0016	1743.7
1.44	8,974	0.0084	0.0017	2002.0
1.57	10,196	0.0092	0.0018	2274.6
1.70	11,467	0.0103	0.0021	2558.2
1.83	12,707	0.0111	0.0022	2834.8
1.96	14,039	0.0117	0.0023	3132.0
2.10	15,382	0.0124	0.0025	3431.6
2.23	16,823	0.0134	0.0027	3753.0
2.36	18,155	0.0139	0.0028	4050.2
2.49	19,585	0.0148	0.0030	4369.2
2.62	20,965	0.0158	0.0032	4677.1
2.75	22,460	0.0165	0.0033	5010.6
2.88	23,788	0.0174	0.0035	5306.9
3.01	25,242	0.0180	0.0036	5631.2
3.14	26,654	0.0189	0.0038	5946.2
3.27	28,019	0.0195	0.0039	6250.8
3.41	29,351	0.0205	0.0041	6547.9
3.54	30,642	0.0211	0.0042	6835.9
3.67	32,044	0.0220	0.0044	7148.7
3.80	33,216	0.0227	0.0045	7410.2
3.93	34,170	0.0236	0.0047	7623.0
4.06	34,147	0.0243	0.0049	7617.8
4.19	29,503	0.0250	0.0050	6581.8
4.32	28,749	0.0259	0.0052	6413.6
4.45	25,647	0.0267	0.0053	5721.6



Lab Number:	21-981				
Project:	US97 Nort	h Corrido	r GDR		
Boring Number:			Number: C-3	Depth:	25.8
		Dime	entional Data		
Sample Length:	4,998		Ave. Diameter:	2.389	
L/D Ratio:		Pass	End Area:	4.48	
Volume:			Initial Mass:	823.20	
		End To	End Parallelism		
Parallelism, Dias	. 1A to 2A:	0.21	Pass a		d - 6 kb
Parallelism, Dias		0.18 Pass Parallelism of each end		•	
·				•	1 D4543-08 9.2.1,
			for sphe	rically seated	d upper platen).
	End D	iameter To	Long Axis Perpendicula	rity	
End 1, Dia. A:	0.0014	Pass	Perpendic	ularity of ea	ch diameter must
End 1, Dia. B:	0.0021	Pass		•	ASTM D4543-08
End 2, Dia. A:		Pass	WG = 72	9.3.1)	
End 2, Dia. B:	0.0006	Pass		5.5.1	•
	S	ide Straight	ness And End Flatness		2000-2000
Deviation from	-		Side Straig	htness should	not exceed 0.020"
cylindrical:	< 0.020"	Pass	_		543-08 9.1.1).
End flatness ≤ 0.001"					ta shall not depart
(Smoothness):	11	_		_	in excess of 0.001'
,	< 0.001"	Pass	(ASTM D4543-	08 9.2.1)
			Equipment	: Used:	
			Wet Saw	V	
Tester:	JBG		Machinist Block	V	
			Feeler Gauge		
Checker:	RJR		"V" Block	☑	
			Surface Grinder		
			Digital Micrometers	V	





Page (503)986-3000 FAX(503)986-3096

21-000982

800 AIRPORT RD. SE SALEM, OR 97301-4792

Contract No.: EA No.: PE003210 011 Lab No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

County: DESCHUTES Data Sheet No.: G 4630337

Contractor: ODOT R4 GEOLOGY FA No.: S004(231) Bid Item:

Project Manager: SCOTT BILLINGS Org Unit:

Submitted By: BOBBI CUMMISKEY Org Unit: 4630 Sample No.: C-2

Material Source: GEOTECHNICAL INVESTIGATION Oty Represented: ROCK @ DEPTH

Sampled At: NCGDR-07 @ 13.1' Sampled By:

Received: 21/5/18 Tested: 21/6/24 DATE-Sampled: Date Reported: 21/6/24

Test Results For: ROCK CORE

T 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: Ω T289 :Hq T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen.

Highway: THE DALLES-CALIFORNIA

T265 N. Moisture: 0.13 % Dry Density rec'd: 142.76 PC Wet Density rec'd: 142.95 PC

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

	-
Dry Density	Moisture
Max Density Optimum Moisture	

Sieve	Passing
3 "	•
2	
1.5	
1	
3/4	
1/2	
3/8	
1/4	
# 4	
10	
40	
200	

	Quantity	Method	Cost
 	1 1	D7012 T265	\$ 75.00 16.00
	1	154X	75.00
ļ			

l I	Hydron	meter A	Anal	ysis.	Subsample	Total	Sample
Coarse	Sand=	4.75	to	2.0	mm:		
Medium	Sand=	2.0	to	.42	mm:		
Fine	Sand=	.42	to	.074	mm:		
	Silt=	.074	to	.02	mm:		- 1
	Silt=	.02	to	.005	mm:		Ì
	Clay=	.005	to	.002	mm:		ĺ
	Clay=	Less :	l'har	.002	mm:		

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 4,631 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

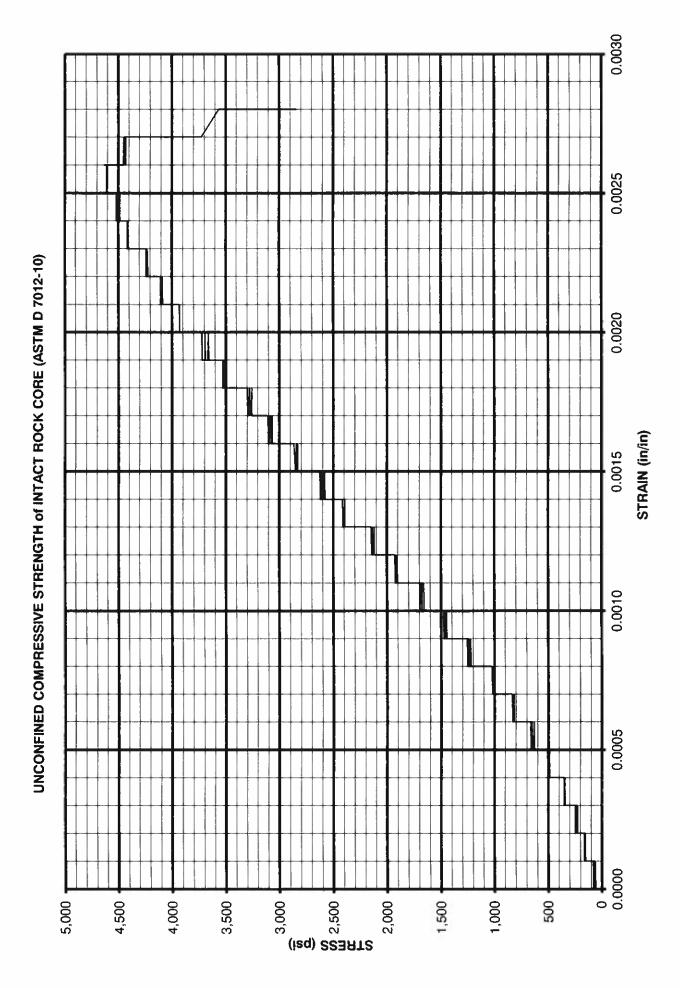
'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTN, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES; PROJ MGR: SCOTT BILLINGS ; R Rodriguez - SOILS; BOBBI CUMMISKEY - REGION 4 GEOLOGY TOM GRUMMON-ODOT R4 GEOLOGY

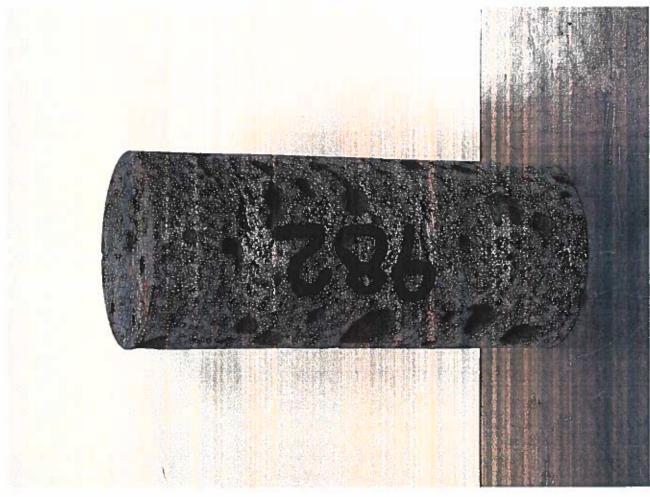
US97 North Corridor Geotechnical Data PROJECT NCGDR-07, C-2 SAMPLE # HEIGHT (in) 5.5829 2.3849 DIAMETER (in) AREA (in²) 4.4671 Length to Diameter 2.3 (2.0 - 2.5 Required) Ratio (L/D) Maximum Stress (psi) 4,631 Strain Rate (%/min) 0.12

LAB NUMBER	21-982
DEPTH	13.1
INITIAL WET WT. (g)	935.8
FINAL DRY WT. (g)	934.6
MOISTURE (%)	0.13
	1400
WET DENSITY (lb/ft³)	142.9
DRY DENSITY (lb/ft³)	142.8

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.07	503	0.0155	0.0028	112.6
0.13	800	0.0011	0.0002	179.1
0.20	1,140	0.0014	0.0003	255.2
0.27	1,530	0.0019	0.0003	342.5
0.33	1,972	0.0023	0.0004	441.4
0.40	2,537	0.0028	0.0005	567.9
0.46	3,104	0.0032	0.0006	694.9
0.53	3,788	0.0037	0.0007	848.0
0.60	4,489	0.0041	0.0007	1004.9
0.66	5,207	0.0045	0.0008	1165.6
0.73	5,978	0.0049	0.0009	1338.2
0.80	6,766	0.0055	0.0010	1514.6
0.86	7,570	0.0058	0.0010	1694.6
0.93	8,399	0.0063	0.0011	1880.2
0.99	9,281	0.0067	0.0012	2077.6
1.06	10,071	0.0072	0.0013	2254.5
1.13	10,957	0.0076	0.0014	2452.8
1.19	11,784	0.0081	0.0015	2638.0
1.26	12,629	0.0086	0.0015	2827.1
1.33	13,372	0.0090	0.0016	2993.4
1.39	14,179	0.0095	0.0017	3174.1
1.46	14,931	0.0099	0.0018	3342.4
1.53	15,715	0.0103	0.0018	3517.9
1.59	16,461	0.0107	0.0019	3684.9
1.66	17,186	0.0113	0.0020	3847.2
1.72	17,811	0.0117	0.0021	3987.2
1.79	18,376	0.0121	0.0022	4113.6
1.86	18,925	0.0125	0.0022	4236.5
1.92	19,523	0.0130	0.0023	4370.4
1.99	19,936	0.0135	0.0024	4462.9
2.06	20,366	0.013 9	0.0025	4559.1
2.12	20,664	0.0143	0.0026	4625.8
2.19	19,793	0.0148	0.0027	4430.8
2.26	12,685	0.0155	0.0028	2839.6







800 AIRPORT RD. SE SALEM, OR 97301-4792

Page $(50\overline{3})986-3000$ FAX(503)986-3096

Lab No.: 21-000983 EA No.: PE003210 011 Contract No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337

Contractor: ODOT R4 GEOLOGY

Project Manager: SCOTT BILLINGS Org Unit:

Submitted By: BOBBI CUMMISKEY

Material Source: GEOTECHNICAL INVESTIGATION

Sampled At: NCGDR-07 @ 22.9'

DATE-Sampled:

Received: 21/ 5/18 Tested: 21/ 6/24

Org Unit: 4630

Sample No.: C-4

FA No.: S004(231)

Qty Represented: ROCK @ DEPTH

Sampled By:

Bid Item:

Date Reported: 21/ 6/24

Test Results For: ROCK CORE

1	
	T 89 Liquid Lim:
	T 90 Plastic Ind:
	T288 Resistivity: Ω
	т289 рн:
	T100 Spec Grav:
	TM117
	Torvane Shear/ Pocket Pen.
Į	
	T265 N. Moisture: 0.10 %
	Dry Density rec'd: 157.78 PC

Wet Density rec'd: 157.94 PC D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture	
Opti	Max Densit mum Moistur		

Sieve	Passing
3 "	
2	
1.5	
1	
3/4	
1/2	
3/8	
1/4	
# 4	
10	
40	
200	

Quantity	Method	Cost
1	D7012	\$ 75.00
1	D4543	112.00
1	T265	16.00
1	154X	75.00

	Hydron	meter i	Anal	ysis	Subsampl	e Tot	al	Sample
Coarse	Sand=	4.75	to	2.0	mm:			
Medium	Sand=	2.0	to	.42	mm:			
Fine	Sand=	.42	to	.074	mm:			
	Silt=	.074	to	.02	mm:			
	Silt=	.02	to	.005	mm:			
	Clay=	.005	to	.002	mm:			
	Clay=	Less '	Than	.002	mm:			
						-		

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 14,763 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

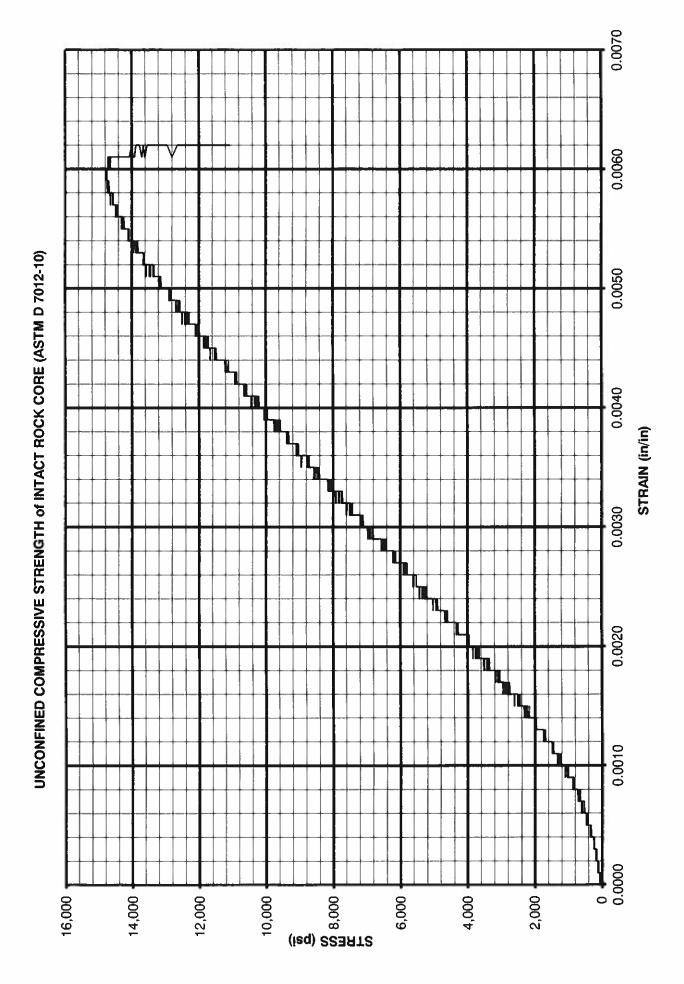
0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

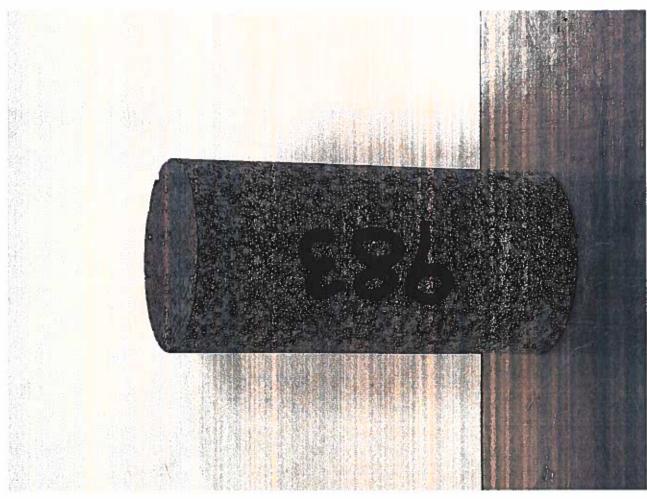
US97 North Corridor Geotechnical Data PROJECT LAB NUMBER 21-983 NCGDR-07, C-4 22.9 **DEPTH** SAMPLE # 5.0148 933.5 HEIGHT (in) INITIAL WET WT. (g) 2.3910 DIAMETER (in) FINAL DRY WT. (g) 932.6 AREA (in²) 4.4900 **MOISTURE (%)** 0.09 Length to Diameter Ratio (L/D) 2.1 (2.0 - 2.5 Required) WET DENSITY (lb/ft3) 157.9 14,763 157.8 DRY DENSITY (lb/ft³) Maximum Stress (psi) 0.12 Strain Rate (%/min)

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.15	647	0.0311	0.0062	144.1
0.30	1,226	0.0019	0.0004	273.1
0.45	1,968	0.0028	0.0006	438.3
0.60	3,056	0.0038	0.0008	680.6
0.76	4,517	0.0048	0.0010	1006.0
0.91	6,204	0.0057	0.0011	1381.7
1.06	8,219	0.0065	0.0013	1830.5
1.21	10,340	0.0074	0.0015	2302.9
1.36	12,705	0.0081	0.0016	2829.6
1.51	15,159	0.0092	0.0018	3376.2
1.66	17,657	0.0102	0.0020	3932.5
1.81	20,165	0.0111	0.0022	4491.1
1.97	22,702	0.0119	0.0024	5056.1
2.12	25,221	0.0128	0.0026	5617.1
2.27	27,887	0.0138	0.0028	6210.9
2.42	30,358	0.0146	0.0029	6761.2
2.57	32,943	0.0156	0.0031	7337.0
2.72	35,513	0.0165	0.0033	7909.4
2.87	38,056	0.0175	0.0035	8475.7
3.02	40,614	0.0184	0.0037	9045.4
3.18	43,060	0.0193	0.0038	9590.2
3.33	45,579	0.0202	0.0040	10151.2
3.48	48,021	0.0211	0.0042	10695.1
3.63	50,443	0.0219	0.0044	11234.5
3.78	52,839	0.0229	0.0046	11768.2
3.93	55,177	0.0239	0.0048	12288.9
4.08	57,413	0.0248	0.0049	12786.9
4.23	59,579	0.0256	0.0051	13269.3
4.39	61,509	0.0266	0.0053	13699.1
4.54	63,309	0.0274	0.0055	14100.0
4.69	64,762	0.0284	0.0057	14423.6
4.84	65,825	0.0293	0.0058	14660.4
4.99	66,214	0.0301	0.0060	14747.0
5.14	49,701	0.0311	0.0062	11069.3



ASTM D4543 - Rock Core Dimentional and Shape Tolerance Summary						
Lab Number:	21-983					
Project:	US97 Nort	h Corrido	r GDR			
Boring Number:	NCGDR-07	Sample	Number:	C-4	Depth:	22.9
		Dime	entional [Data	12	
Sample Length:	5.015		Δ.,	e. Diameter:	2.391	
L/D Ratio:	2.10	Pass	End Area: 4.49			
•		ra33		Initial Mass:		
Volume:	22.52			initiai iviass:	933.47	
		End To	End Para	llelism		
Parallelism, Dias	. 1A to 2A:	0.09	Pass	Parallelism	of each end	d of the specimen
Parallelism, Dias	. 1B to 2B:	0.06	$_{06}$ Pass must be $\leq 0.25^{\circ}$ (ASTM D4543-08 9.2.1		•	
			must be ≤ 0.25° (ASTM D4543-08 9.2.1 for spherically seated upper platen).			
				tor spner	ically seated	i upper platen).
	End C	iameter To	Long Axis	Perpendicular	ity	
End 1, Dia. A:	0.0005	Pass		Pernendicu	larity of ea	ch diameter must
End 1, Dia. B:	0.0008	Pass			-	
End 2, Dia. A:	0.0012	Pass		be ≤ ⁻ / ₂₃₀	_o = 0.0043 (A	ASTM D4543-08
End 2, Dia. B:		Pass			9.3.1)	•
	S	ide Straight	ness And	End Flatness		
Deviation from						
cylindrical:	< 0.020"	Pass		-		not exceed 0.020"
•				deviatio	on (ASTM D4	543-08 9.1.1).
				Profile of r	neasured dat	a shall not depart
End flatness ≤ 0.001"						in excess of 0.001"
(Smoothness):	< 0.001"	Pass			STM D4543-	
				•		·
				Equipment	Used:	
				Wet Saw	\checkmark	
Tester:	JBG		Ma	chinist Block	$\overline{\checkmark}$	
			F	eeler Gauge	V	
Checker:	RJR			"V" Block	V	
			Sur	face Grinder	\Box	
			Digital I	Micrometers	V	





800 AIRPORT RD. SE SALEM, OR 97301-4792

Page ! (503)986-3000 FAX(503)986-3096

21-000984 EA No.: PE003210 011 Contract No.: Lab No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337

Contractor: ODOT R4 GEOLOGY

Bid Item: Org Unit:

Project Manager: SCOTT BILLINGS

Org Unit: 4630

Submitted By: BOBBI CUMMISKEY

Sample No.: C-2

FA No.: S004(231)

Material Source: GEOTECHNICAL INVESTIGATION

Qty Represented: ROCK @ DEPTH

Sampled At: NCGDR-08 @ 22.3'

Sampled By:

DATE-Sampled:

Received: 21/ 5/18 Tested: 21/ 6/24 Date Reported: 21/ 6/24

Test Results For: ROCK CORE

т 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen.

Dry Density Moisture

Max Density:

Optimum Moisture:

Sieve Passing 3 " 2 1.5 1 3/4 1/2 3/8 1/4 4 10 40 200

T265 N. Moisture: 0.29 % Dry Density rec'd: 149.16 PC Wet Density rec'd: 149.59 PC D4644 Slake Durab:

Water Cont:

D2974 Pct Organic:

Quantity	Method	Cost
1 1 1	D7012 T265 154X	\$ 75.00 16.00 75.00

		Hydron	meter .	Anal	ysis	Subsample	Total	Sample
		Sand=						
Me	edium	Sand=	2.0	to	. 42	mm:		
	Fine	Sand=	.42	to	.074	mm:		
		Silt=	.074	to	.02	mm:		
		Silt=	.02	to	.005	mm:		
		Clay=	.005	to	.002	mm:		
		Clay=	Less	Than	.002	mm:		

TOTAL CHARGES: \$

0.00

REMARKS:

INFORMATION ONLY

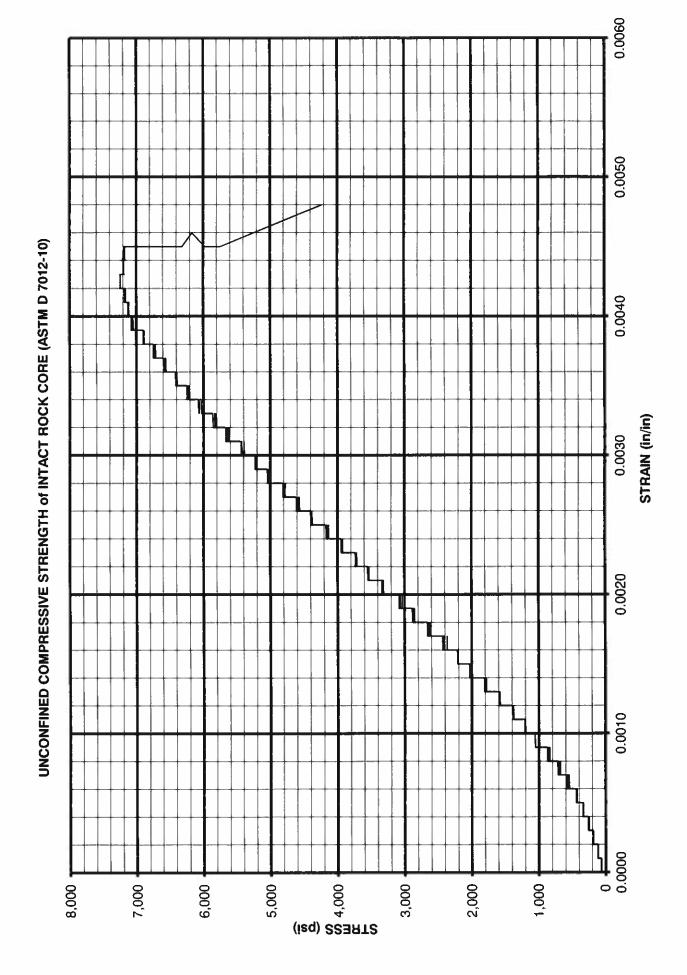
Uniaxial compressive strength = 7,249 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

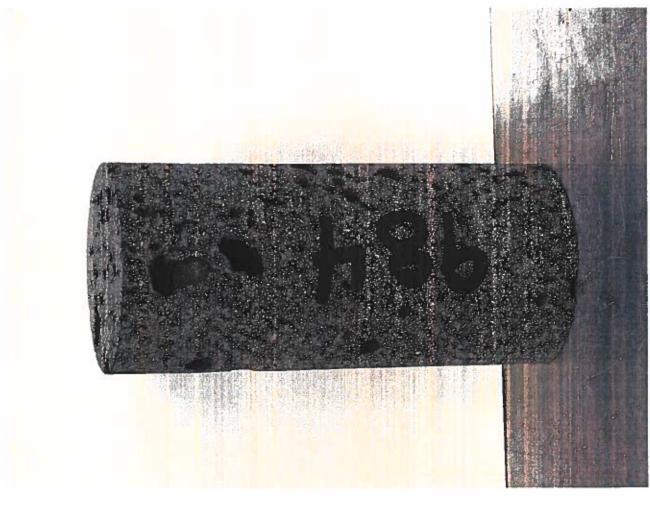
REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

US97 North Corridor Geotechnical Data **LAB NUMBER** 21-984 **PROJECT** 22.3 NCGDR-08, C-2 **DEPTH** SAMPLE # 921.8 5.2705 INITIAL WET WT. (g) HEIGHT (in) 2.3813 919.1 DIAMETER (in) FINAL DRY WT. (g) 4.4537 0.29 AREA (in²) **MOISTURE (%)** Length to Diameter Ratio (L/D) 2.2 (2.0 - 2.5 Required) WET DENSITY (lb/ft³) 149.6 149.2 7,249 DRY DENSITY (lb/ft³) Maximum Stress (psi) 0.13 Strain Rate (%/min)

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.11	535	0.0254	0.0048	120.1
0.22	910	0.0014	0.0003	204.3
0.33	1,399	0.0022	0.0004	314.1
0.44	1,977	0.0029	0.0006	443.9
0.55	2,721	0.0036	0.0007	611.0
0.66	3,581	0.0042	0.0008	804.1
0.77	4,560	0.0050	0.0009	1023.9
0.88	5,603	0.0058	0.0011	1258.1
1.00	6,747	0.0064	0.0012	1514.9
1.11	7,917	0.0071	0.0013	1777.6
1.22	9,197	0.0078	0.0015	2065.0
1.33	10,442	0.0085	0.0016	2344.6
1.44	11,732	0.0092	0.0017	2634.2
1.55	13,034	0.0100	0.0019	2926.6
1.66	14,339	0.0107	0.0020	3219.6
1.77	15,643	0.0113	0.0021	3512.4
1.88	16,871	0.0120	0.0023	3788.1
1.99	18,143	0.0127	0.0024	4073.7
2.10	19,460	0.0133	0.0025	4369.4
2.21	20,738	0.0142	0.0027	4656.4
2.32	21,991	0.0148	0.0028	4937.7
2.43	23,154	0.0156	0.0030	5198.8
2.54	24,451	0.0163	0.0031	5490.0
2.65	25,606	0.0169	0.0032	5749.4
2.76	26,737	0.0176	0.0033	6003.3
2.88	27,889	0.0183	0.0035	6262.0
2.99	28,930	0.0190	0.0036	6495.7
3.10	29,874	0.0196	0.0037	6707.7
3.21	30,856	0.0204	0.0039	6928.2
3.32	31,643	0.0211	0.0040	7104.9
3.43	31,903	0.0219	0.0042	7163.3
3.54	32,273	0.0226	0.0043	7246.3
3.65	32,095	0.0231	0.0044	7206.4
3.76	18,830	0.0254	0.0048	4227.9







800 AIRPORT RD. SE SALEM, OR 97301-4792

Page (503)986-3000 FAX(503)986-3096

21-000985 Contract No.: EA No.: PE003210 011 Lab No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337

FA No.: S004(231)

Bid Item:

Org Unit:

Submitted By: BOBBI CUMMISKEY Org Unit: 4630 Sample No.: C-3 Material Source: GEOTECHNICAL INVESTIGATION

Qty Represented: ROCK @ DEPTH

Sampled By:

DATE-Sampled: Received: 21/ 5/18 Tested: 21/ 6/24 Date Reported: 21/ 6/24

Test Results For: ROCK CORE

T 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: T289 pH: T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen.

Contractor: ODOT R4 GEOLOGY

Sampled At: NCGDR-09 @ 26.3'

Project Manager: SCOTT BILLINGS

T265 N. Moisture: 0.16 % Dry Density rec'd: 150.38 PC

Wet Density rec'd: 150.62 PC D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture
Optin	Max Density num Moisture	

i		
	Sieve	Passing
	3 "	
İ	2	
İ	1.5	
İ	1	
	3/4	
	1/2	
	3/8	
	1/4	
	# 4	
	10	
1	40	
	200	

Quantity	Method	Cost
1	D7012	\$ 75.00
1	D4543	112.00
1	T265	16.00
1	154X	75.00

	Hydron	neter A	Anal	ysis	Subsampl	e Total	Sample
Coarse Medium Fine	Sand= Sand= Silt= Silt=	2.0	to to to	.42 .074 .02 .005	mm: mm: mm: mm:		
	Clay=	Less :	Chan	.002	mm:		

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 4,452 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

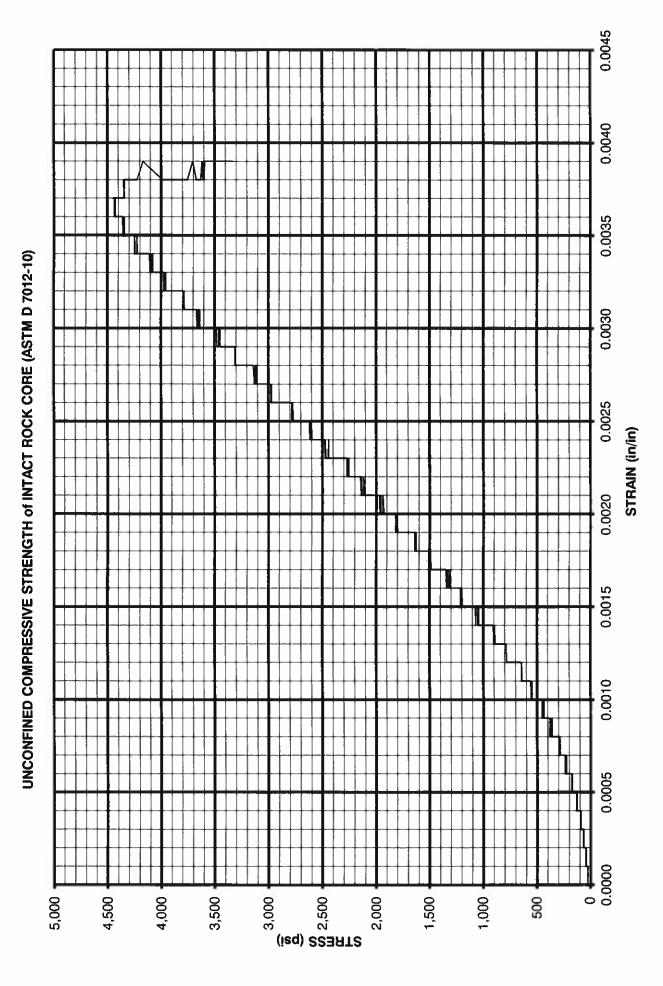
TOTAL CHARGES: \$

0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

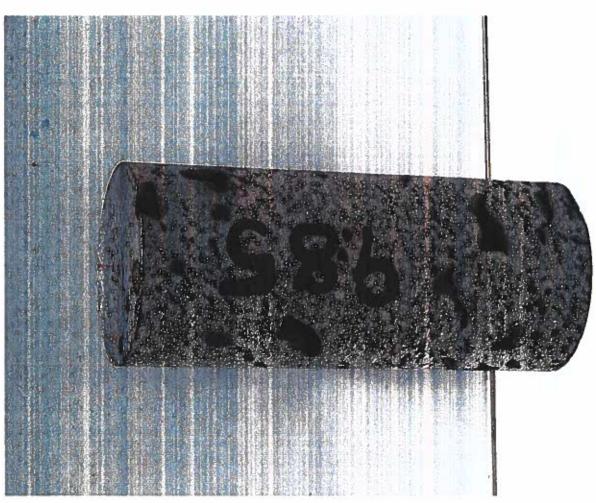
US97 North Corridor Geotechnical Data 21-985 PROJECT LAB NUMBER NCGDR-09, C-3 **DEPTH** 26.3 SAMPLE # 5.5492 988.4 HEIGHT (in) INITIAL WET WT. (g) 2.3950 986.8 DIAMETER (in) FINAL DRY WT. (g) AREA (in²) 4.5051 MOISTURE (%) 0.16 Length to Diameter Ratio (L/D) 2.3 (2.0 - 2.5 Required) WET DENSITY (Ib/ft3) 150.6 Maximum Stress (psi) 4,452 DRY DENSITY (Ib/ft3) 150.4 0.12 Strain Rate (%/min)

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.10	185	0.0219	0.0039	41.1
0.19	303	0.0015	0.0003	67.3
0.29	449	0.0021	0.0004	99.7
0.38	656	0.0028	0.0005	145.6
0.48	908	0.0033	0.0006	201.5
0.58	1,205	0.0040	0.0007	267.5
0.67	1,554	0.0046	0.0008	344.9
0.77	1,988	0.0053	0.0010	441.3
0.86	2,496	0.0058	0.0010	554.0
0.96	3,087	0.0065	0.0012	685.2
1.06	3,719	0.0072	0.0013	825.5
1.15	4,443	0.0078	0.0014	986.2
1.25	5,156	0.0085	0.0015	1144.5
1.34	5,901	0.0092	0.0017	1309.8
1.44	6,689	0.0097	0.0017	1484.8
1.54	7,458	0.0103	0.0019	1655.5
1.63	8,310	0.0110	0.0020	1844.6
1.73	9,155	0.0115	0.0021	2032.1
1.82	10,009	0.0123	0.0022	2221.7
1.92	10,903	0.0129	0.0023	2420.1
2.02	11,731	0.0136	0.0025	2603.9
2.11	12,615	0.0143	0.0026	2800.2
2.21	13,513	0.0148	0.0027	2999.5
2.30	14,350	0.0154	0.0028	3185.3
2.40	15,273	0.0161	0.0029	3390.2
2.50	16,154	0.0168	0.0030	3585.7
2.59	17,011	0.0174	0.0031	3775.9
2.69	17,828	0.0181	0.0033	3957.3
2.78	18,558	0.0187	0.0034	4119.3
2.88	19,252	0.0194	0.0035	4273.4
2.98	19,822	0.0200	0.0036	4399.9
3.07	20,055	0.0206	0.0037	4451.6
3.17	19,042	0.0212	0.0038	4226.8
3.27	15,027	0.0219	0.0039	3335.6



ASTM D4543 - Rock Core Dimentional and Shape Tolerance Summary Lab Number: 21-985 **Project: US97 North Corridor GDR Boring Number: NCGDR-09** Sample Number: C-3 Depth: 26.3 **Dimentional Data** Sample Length: 5.549 Ave. Diameter: 2.395 L/D Ratio: 2.32 End Area: 4.50 Pass Volume: 24.99 Initial Mass: 988.41 End To End Parallelism Parallelism, Dias. 1A to 2A: 0.16 Pass Parallelism of each end of the specimen Parallelism, Dias. 1B to 2B: 0.15 **Pass** must be $\leq 0.25^{\circ}$ (ASTM D4543-08 9.2.1, for spherically seated upper platen). **End Diameter To Long Axis Perpendicularity** End 1, Dia. A: 0.0022 Pass Perpendicularity of each diameter must End 1, Dia. B: 0.0007 Pass be $\leq \frac{1}{230} = 0.0043$ (ASTM D4543-08 End 2, Dia. A: 0.0005 Pass 9.3.1). End 2, Dia. B: 0.0015 Pass Side Straightness And End Flatness Deviation from Side Straightness should not exceed 0.020" < 0.020" cylindrical: Pass deviation (ASTM D4543-08 9.1.1). Profile of measured data shall not depart End flatness ≤ 0.001" from best fit straight line in excess of 0.001" (Smoothness): < 0.001" Pass (ASTM D4543-08 9.2.1) **Equipment Used:** \checkmark **Wet Saw** \square Tester: JBG Machinist Block 4 Feeler Gauge Checker: RJR "V" Block \Box Surface Grinder \square 1 **Digital Micrometers**





800 AIRPORT RD. SE SALEM, OR 97301-4792

(503)986 - 3000FAX(503)986-3096

Contract No.: EA No.: PE003210 011 21-000986 Lab No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337

Contractor: ODOT R4 GEOLOGY FA No.: S004(231)

Bid Item: Project Manager: SCOTT BILLINGS Org Unit:

Submitted By: BOBBI CUMMISKEY Org Unit: 4630 Sample No.: C-2 Material Source: GEOTECHNICAL INVESTIGATION Qty Represented: ROCK @ DEPTH

Sampled At: NCGDR-10 @ 22.0' Sampled By:

DATE-Sampled: Received: 21/ 5/18 Tested: 21/ 6/24 Date Reported: 21/ 6/24

Test Results For: ROCK CORE

Liquid Lim: T 89 Plastic Ind: т 90 T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.05 % Dry Density rec'd: 161.14 PC Wet Density rec'd: 161.22 PC

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry	Density	Moist	ure
 Opti	Max Dens: mum Moistu		

Sieve	Passing
3 "	
2	
1.5	
1	
3/4	
1/2	
3/8	
1/4	
# 4	
10	
40	
200	

Quantity	Method	Cost
1	D7012	\$ 75.00
1	Т265	16.00
1	D154X	75.00
1		
İ		
İ		
İ		
1		

	Hydron	neter A	Anal	ysis	Sul	osample	Total	Sample
Coarse	Sand=	4.75	to	2.0	mm:			
Medium	Sand=	2.0	to	.42	mm:			j
Fine	Sand=	.42	to	.074	mm:			ļ
	Silt=	.074	to	.02	mm:			Ì
	Silt=	.02	to	.005	mm:			ĺ
	Clay=	.005	to	.002	mm:			
	Clay=	Less 7	rhar	.002	mm:			

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 15,099 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

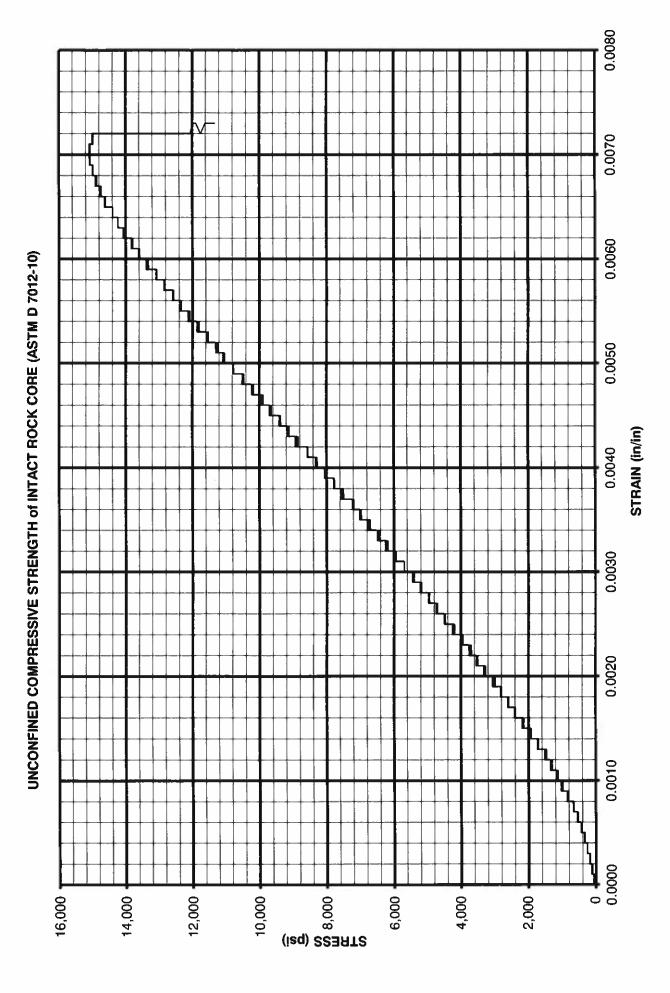
0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES ; PROJ MGR: SCOTT BILLINGS ; R Rodriguez - SOILS ; BOBBI CUMMISKEY - REGION 4 GEOLOGY TOM GRUMMON-ODOT R4 GEOLOGY

PROJECT US97 North Corridor Geotechnical Data LAB NUMBER 21-986 NCGDR-10, C-2 **DEPTH** 22 SAMPLE# 5.1777 981.9 HEIGHT (in) INITIAL WET WT. (g) DIAMETER (in) 2.3886 FINAL DRY WT. (g) 981.4 AREA (in²) 4.4810 **MOISTURE (%)** 0.05 Length to Diameter Ratio (L/D) (2.0 - 2.5 Required) 2.2 WET DENSITY (lb/ft3) 161.2 Maximum Stress (psi) 15,099 DRY DENSITY (lb/ft3) 161.1 0.12 Strain Rate (%/min)

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.18	837	0.0376	0.0073	186.8
0.35	1,572	0.0025	0.0005	350.8
0.53	2,588	0.0035	0.0007	577.5
0.71	3,925	0.0046	0.0009	875.9
0.88	5,512	0.0057	0.0011	1230.1
1.06	7,336	0.0067	0.0013	1637.1
1.24	9,408	0.0079	0.0015	2099.5
1.41	11,534	0.0089	0.0017	2574.0
1.59	13,670	0.0101	0.0020	3050.7
1.77	15,822	0.0111	0.0021	3530.9
1.94	18,023	0.0122	0.0024	4022.1
2.12	20,383	0.0134	0.0026	4548.8
2.30	22,681	0.0145	0.0028	5061.6
2.48	25,000	0.0155	0.0030	5579.1
2.65	27,466	0.0166	0.0032	6129.4
2.83	29,868	0.0178	0.0034	6665.5
3.01	32,377	0.0188	0.0036	7225.4
3.18	34,908	0.0199	0.0038	7790.2
3.36	37,449	0.0210	0.0041	8357.3
3.54	40,054	0.0222	0.0043	8938.6
3.71	42,606	0.0232	0.0045	9508.1
3.89	45,191	0.0244	0.0047	10085.0
4.07	47,824	0.0254	0.0049	10672.6
4.24	50,288	0.0267	0.0052	11222.5
4.42	52,876	0.0277	0.0053	11800.0
4.60	55,334	0.0288	0.0056	12348.6
4.77	57,778	0.0298	0.0058	12894.0
4.95	60,052	0.0310	0.0060	13401.5
5.13	62,321	0.0321	0.0062	13907.8
5.30	64,214	0.0330	0.0064	14330.3
5.48	65,785	0.0342	0.0066	14680.9
5.66	67,069	0.0353	0.0068	14967.4
5.83	67,623	0.0364	0.0070	15091.1
6.01	50,730	0.0376	0.0073	11321.1







800 AIRPORT RD. SE SALEM, OR 97301-4792

Page (503)986-3000 FAX(503)986-3096

21-000987

Contract No.:

Contractor: ODOT R4 GEOLOGY

Project Manager: SCOTT BILLINGS

Submitted By: BOBBI CUMMISKEY

EA No.: PE003210 011

Lab No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS Highway: THE DALLES-CALIFORNIA

Material Source: GEOTECHNICAL INVESTIGATION

County: DESCHUTES

Data Sheet No.: G 4630337

FA No.: S004(231)

Org Unit:

Bid Item:

Org Unit: 4630

Sample No.: C-4

Qty Represented: ROCK @ DEPTH

Sampled By:

Sampled At: NCGDR-11 @ 32.4' DATE-Sampled:

Received: 21/ 5/18 Tested: 21/ 6/24

Date Reported: 21/ 6/24

Test Results For: ROCK CORE

T 90 Pla T288 Res T289	quid Lim: stic Ind: istivity: pH: pec Grav:	Ω
	hear/ Pock	et Pen.

T265 N. Moisture: 0.13 % Dry Density rec'd: 162.49 PC Wet Density rec'd: 162.70 PC

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry Density	Moisture
Max Densit Optimum Moistur	

Max	Density:
Optimum	Moisture:

Sieve	Passing
3 "	
2	
1.5	
1	
3/4	
1/2	
3/8	
1/4	
# 4	
10	
40	
200	

Quantity	Method	Cost
1 1 1	D7012 T265 D154X	\$ 75.00 16.00 75.00

ļ		Hydro	meter	Anal	ysis	Subsample	Total	. Sample
	Coarse	Sand=	4.75	to	2.0	mm:		
	Medium	Sand=	2.0	to	.42	mm:		1
1	Fine	Sand=	.42	to	.074	mm:		
ĺ		Silt=	.074	to	.02	mm:		
Ì		Silt=	.02	to	.005	mm:		
Ì		Clay=	.005	to	.002	mm:		
-		Clay=	Less	Than	.002	mm:		

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 14,444 psi

0.00

TOTAL CHARGES: \$

KEVIN BROPHY - LABORATORY SERVICES MANAGER

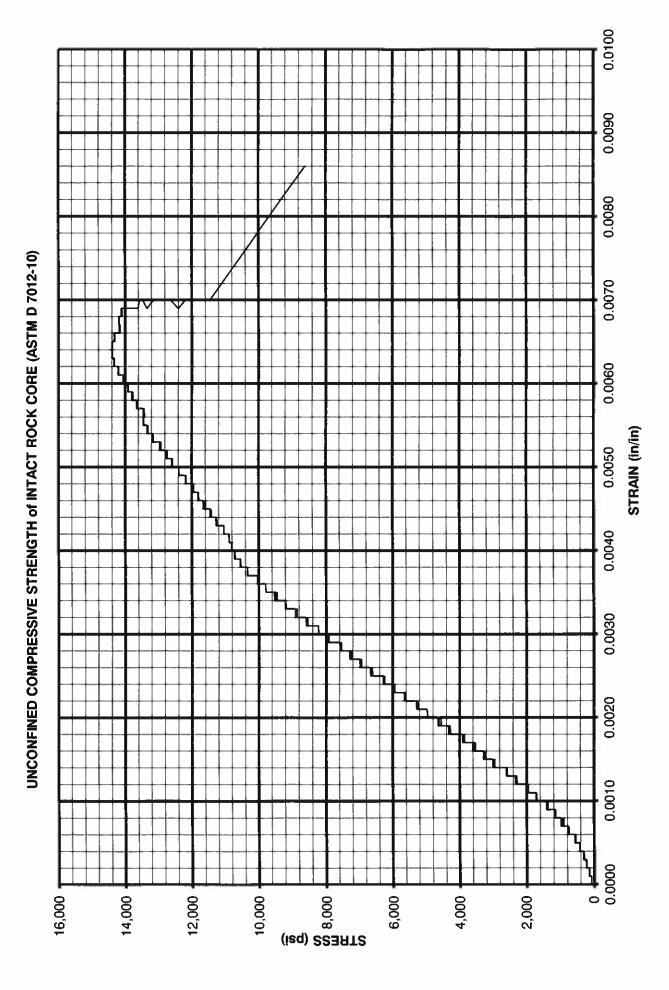
REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

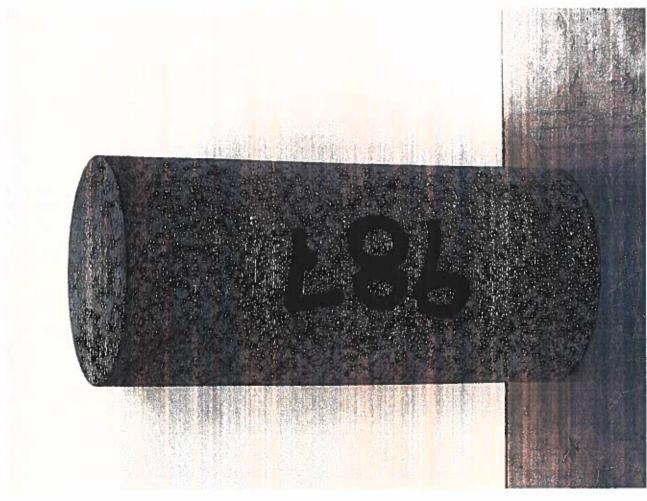
C: FILES; PROJ MGR: SCOTT BILLINGS ; R Rodriguez - SOILS; BOBBI CUMMISKEY - REGION 4 GEOLOGY TOM GRUMMON-ODOT R4 GEOLOGY

PROJECT US97 North Corridor Geotechnical Data LAB NUMBER 21-987 32.4 NCGDR-11, C-4 **DEPTH** SAMPLE # 5.2557 1,008.3 HEIGHT (in) INITIAL WET WT. (g) DIAMETER (in) 2.3914 FINAL DRY WT. (g) 1,007.0 AREA (in²) 4.4915 0.12 MOISTURE (%) Length to Diameter (2.0 - 2.5 Required) 2.2 162.7 Ratio (L/D) WET DENSITY (lb/ft3) Maximum Stress (psi) 14,444 DRY DENSITY (lb/ft3) 162.5 Strain Rate (%/min) 0.15

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.17	937	0.0453	0.0086	208.6
0.34	1,840	0.0023	0.0004	409.7
0.51	3,265	0.0034	0.0006	726.9
0.68	5,175	0.0045	0.0009	1152.2
0.85	7,538	0.0054	0.0010	1678.3
1.02	10,322	0.0065	0.0012	2298.1
1.19	13,251	0.0076	0.0014	2950.2
1.36	16,317	0.0088	0.0017	3632.9
1.53	19,393	0.0098	0.0019	4317.7
1.70	22,536	0.0108	0.0021	5017.5
1.87	25,527	0.0119	0.0023	5683.4
2.04	28,590	0.0130	0.0025	6365.4
2.21	31,625	0.0141	0.0027	7041.1
2.38	34,619	0.0153	0.0029	7707.7
2.55	37,545	0.0162	0.0031	8359.1
2.72	40,451	0.0173	0.0033	9006.1
2.89	43,155	0.0183	0.0035	9608.1
3.06	45,701	0.0194	0.0037	10175.0
3.23	47,956	0.0206	0.0039	10677.1
3.40	48,606	0.0216	0.0041	10821.8
3.58	50,206	0.0227	0.0043	11178.0
3.75	51,986	0.0238	0.0045	11574.3
3.92	53,560	0.0248	0.0047	11924.7
4.09	55,290	0.0259	0.0049	12309.9
4.26	57,161	0.0269	0.0051	12726.5
4.43	58,822	0.0281	0.0053	13096.3
4.60	60,337	0.0291	0.0055	13433.6
4.77	61,236	0.0303	0.0058	13633.8
4.94	62,523	0.0312	0.0059	13920.3
5.11	63,802	0.0323	0.0061	14205.1
5.28	64,693	0.0333	0.0063	14403.4
5.45	64,328	0.0344	0.0065	14322.2
5.62	63,724	0.0355	0.0068	14187.7
5.79	38,662	0.0453	0.0086	8607.8







OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY 800 AIRPORT RD. SE SALEM, OR 97301-4792

(503)986-3000FAX(503)986-3096

Contract No.: EA No.: PE003210 011 Lab No.: 21-000988

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337 FA No.: S004(231)

Org Unit:

Contractor: ODOT R4 GEOLOGY

DATE-Sampled:

Project Manager: SCOTT BILLINGS

Submitted By: BOBBI CUMMISKEY Org Unit: 4630

Material Source: GEOTECHNICAL INVESTIGATION

Sampled At: NCGDR-12 @ 9.3'

Received: 21/ 5/18 Tested: 21/ 6/24

Sampled By:

Sample No.: C-2

Bid Item:

Date Reported: 21/6/24

Qty Represented: ROCK @ DEPTH

Test Results For: ROCK CORE

т 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.09 % Dry Density rec'd: 159.43 PC Wet Density rec'd: 159.57 PC

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture
Opti	Max Density: mum Moisture:	

	Sieve	Passing
Γ	3 "	
ļ	2	
	1.5	
	1	
	3/4	
1	1/2	
ĺ	3/8	
İ	1/4	
İ	# 4	
İ	10	
ĺ	40	
İ	200	
i		

Quantity	Method	Cost
1	D7012	\$ 75.00
1	T265	16.00
1	154X	75.00

	Hydro	meter .	Anal	ysis	Subsample	Total	Sample
	Sand=						
Medium	Sand=	2.0	to	.42	mm:		
Fine	Sand=	.42	to	.074	mm:		
	Silt=	.074	to	.02	mm:		
j	Silt=	.02	to	.005	mm:		
	Clay=	.005	to	.002	mm:		
	Clay=	Less	Than	.002	mm:		

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 14,405 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

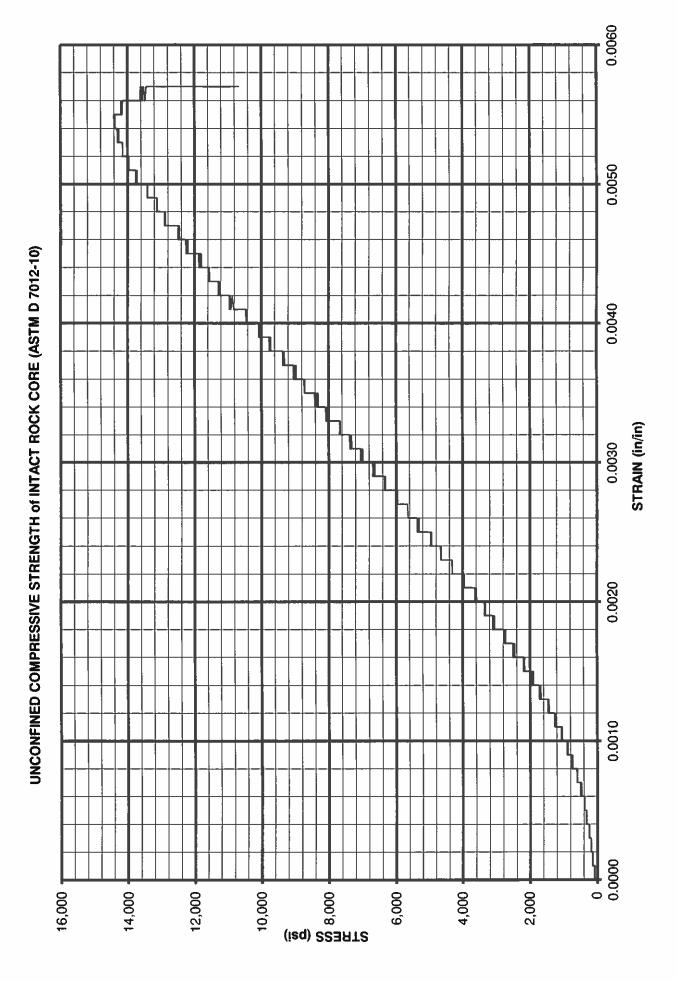
REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES; PROJ MGR: SCOTT BILLINGS; R Rodriguez - SOILS; BOBBI CUMMISKEY - REGION 4 GEOLOGY TOM GRUMMON-ODOT R4 GEOLOGY

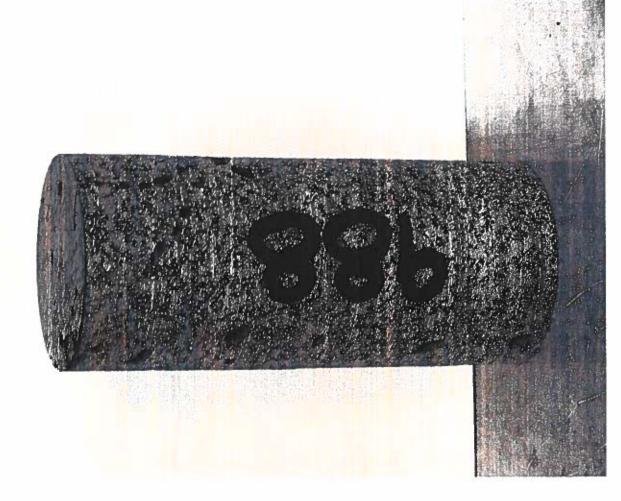
0.00

US97 North Corridor Geotechnical Data 21-988 LAB NUMBER **PROJECT** NCGDR-12, C-2 DEPTH 9.3 SAMPLE # 1,001.9 HEIGHT (in) 5.4128 INITIAL WET WT. (g) 2.3721 FINAL DRY WT. (g) 1,001.0 DIAMETER (in) AREA (in²) 4.4193 0.09 MOISTURE (%) Length to Diameter Ratio (L/D) 2.3 (2.0 - 2.5 Required) WET DENSITY (Ib/ft3) 159.6 DRY DENSITY (Ib/ft3) 14,405 159.4 Maximum Stress (psi) Strain Rate (%/min) 0.12

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.14	697	0.0309	0.0057	157.7
0.28	1,116	0.0020	0.0004	252.5
0.42	1,625	0.0029	0.0005	367.7
0.56	2,385	0.0038	0.0007	539.7
0.70	3,271	0.0046	0.0008	740.2
0.84	4,449	0.0056	0.0010	1006.7
0.98	5,863	0.0065	0.0012	1326.7
1.12	7,528	0.0074	0.0014	1703.4
1.25	9,361	0.0082	0.0015	2118.2
1.39	11,421	0.0092	0.0017	2584.3
1.53	13,613	0.0102	0.0019	3080.4
1.67	15,834	0.0110	0.0020	3582.9
1.81	18,316	0.0119	0.0022	4144.5
1.95	20,749	0.0128	0.0024	4695.1
2.09	23,226	0.0137	0.0025	5255.6
2.23	25,611	0.0146	0.0027	5795.3
2.37	28,167	0.0155	0.0029	6373.6
2.51	30,652	0.0165	0.0030	6935.9
2.65	33,149	0.0173	0.0032	7501.0
2.79	35,676	0.0183	0.0034	8072.8
2.93	38,209	0.0191	0.0035	8645.9
3.07	40,782	0.0201	0.0037	9228.2
3.21	43,346	0.0209	0.0039	9808.3
3.35	45,859	0.0219	0.0040	10377.0
3.49	48,941	0.0228	0.0042	11074.4
3.62	51,266	0.0237	0.0044	11600.5
3.76	53,682	0.0246	0.0045	12147.2
3.90	56,075	0.0255	0.0047	12688.7
4.04	58,315	0.0264	0.0049	13195.5
4.18	60,534	0.0273	0.0050	13697.6
4.32	62,407	0.0282	0.0052	14121.5
4.46	63,364	0.0291	0.0054	14338.0
4.60	62,876	0.0300	0.0055	14227.6
4.74	47,098	0.0309	0.0057	10657.3







OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY 800 AIRPORT RD. SE SALEM, OR 97301-4792

Page (503)986-3000 FAX(503)986-3096

Contract No.: EA No.: PE003210 011 Lab No.: 21-000989

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337

Contractor: ODOT R4 GEOLOGY Project Manager: SCOTT BILLINGS

Submitted By: BOBBI CUMMISKEY

Org Unit:

Org Unit: 4630

Bid Item: Sample No.: C-4

Material Source: GEOTECHNICAL INVESTIGATION

Qty Represented: ROCK @ DEPTH

Sampled At: NCGDR-12 @ 20.3'

Sampled By:

FA No.: S004(231)

DATE-Sampled:

Received: 21/5/18 Tested: 21/6/24 Date Reported: 21/6/24

Test Results For: ROCK CORE

T 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.03 % Dry Density rec'd: 160.54 PC Wet Density rec'd: 160.59 PC

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture
	Max Density:	

Optimum Moisture:

Sieve	Passing	
3 "		
2		
1.5		
1		
3/4		
1/2		
3/8		
1/4		
# 4		
10		
40		
200		
L		

Quantity	Method	Cost
1 1 1	D7012 T265 154X	\$ 75.00 16.00 75.00

ole	Sampl	Total	ubsample	S	lysis	Anal	meter	Hydron	
				mm:	2.0	to	4.75	Sand=	Coarse
				mm:	.42	to	2.0	Sand=	Medium
ĺ				mm:	.074	to	.42	Sand=	Fine
				mm:	.02	to	.074	Silt=	
ĺ				mm:	.005	to	.02	Silt=	
j				mm:	.002	to	.005	Clay=	
Ì				mm:	.002	Thar	Less	Clay=	
				mm: mm: mm: mm:	.42 .074 .02 .005	to to to to	2.0 .42 .074 .02	Sand= Sand= Silt= Silt= Clay=	Medium

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 14,174 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

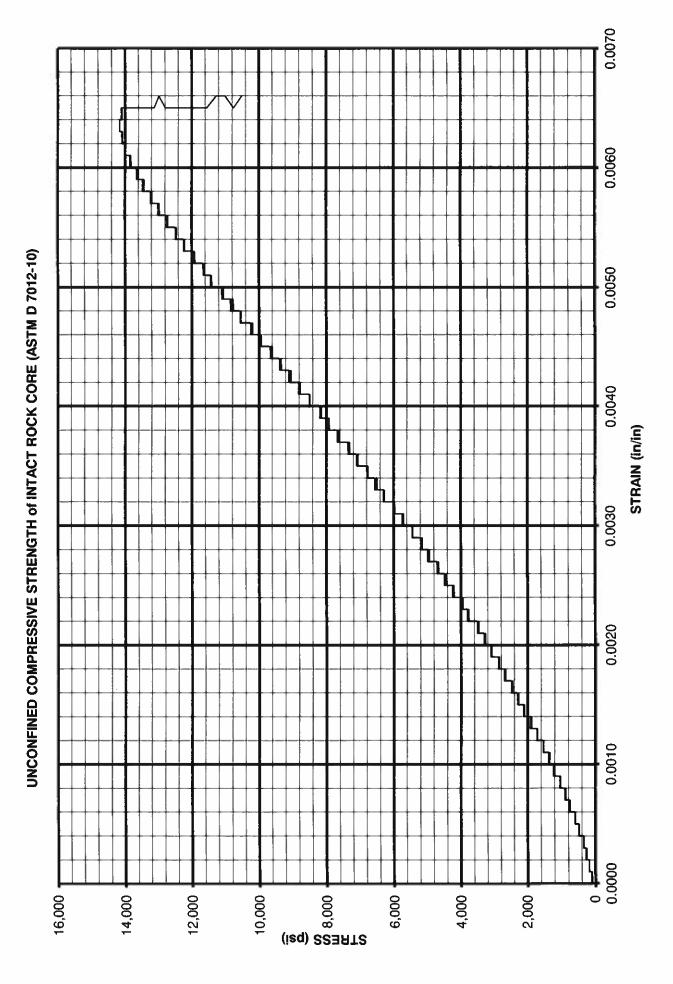
0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES | PROJ MGR: SCOTT BILLINGS | R ROdriguez - SOILS ; BOBBI CUMMISKEY - REGION 4 GEOLOGY TOM GRUMMON-ODOT R4 GEOLOGY

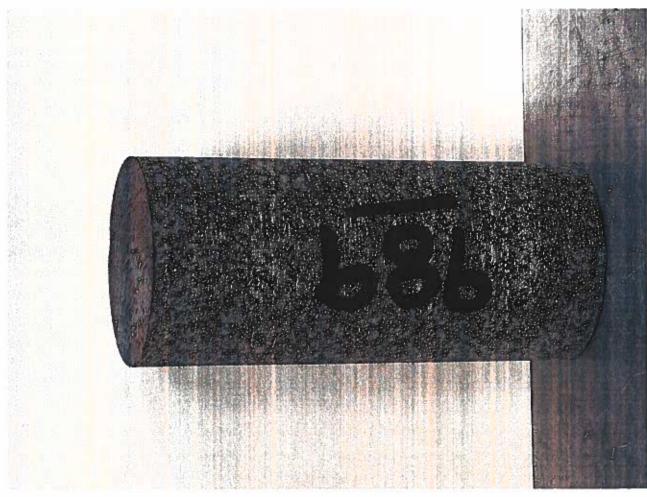
PROJECT	US97 North Corrido	r Geotechnical Data	LAB NUMBER	21-989	
SAMPLE #	NCGDR-12, C-4		DEPTH	20.3	
HEIGHT (in)	5.3897		INITIAL WET WT. (g)	1,019.7	
DIAMETER (in)	2.3905		FINAL DRY WT. (g)	1,019.4	
AREA (in²)	4.4882		MOISTURE (%)	0.03	
Length to Diameter					
Ratio (L/D)	2.3	(2.0 - 2.5 Required)	WET DENSITY (Ib/ft ³)	160.6	
Maximum Stress (psi)	14,174		DRY DENSITY (lb/ft ³)	160.5	
Strain Bate (%/min)	0.12				

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.16	1,128	0.0354	0.0066	251.3
0.32	2,026	0.0023	0.0004	451.4
0.48	3,119	0.0033	0.0006	694.9
0.64	4,395	0.0044	0.0008	979.2
0.80	5,756	0.0054	0.0010	1282.5
0.96	7,252	0.0064	0.0012	1615.8
1.12	8,828	0.0074	0.0014	1966.9
1.28	10,463	0.0086	0.0016	2331.2
1.44	12,192	0.0096	0.0018	2716.5
1.60	13,929	0.0106	0.0020	3103.5
1.76	15,741	0.0115	0.0021	3507.2
1.92	17,731	0.0126	0.0023	3950.6
2.08	19,793	0.0137	0.0025	4410.0
2.24	21,933	0.0147	0.0027	4886.8
2.39	24,089	0.0157	0.0029	5367.2
2.55	26,345	0.0168	0.0031	5869.8
2.71	28,651	0.0178	0.0033	6383.6
2.87	30,971	0.0189	0.0035	6900.5
3.03	33,417	0.0198	0.0037	7445.5
3.19	35,824	0.0209	0.0039	7981.8
3.35	38,292	0.0219	0.0041	8531.7
3.51	40,809	0.0229	0.0042	9092.5
3.67	43,311	0.0239	0.0044	9650.0
3.83	45,795	0.0250	0.0046	10203.4
3.99	48,297	0.0260	0.0048	10760.9
4.15	50,770	0.0270	0.0050	11311.9
4.31	53,254	0.0281	0.0052	11865.3
4.47	55,578	0.0292	0.0054	12383.1
4.63	57,801	0.0302	0.0056	12878.4
4.79	59,750	0.0311	0.0058	13312.7
4.95	61,543	0.0323	0.0060	13712.2
5.11	62,888	0.0333	0.0062	14011.9
5.27	63,576	0.0343	0.0064	14165.1
5.43	47,190	0.0354	0.0066	10514.2



Lab Number:	21-989				
Project:	US97 Nort	th Corrido	or GDR		
Boring Number:	NCGDR-12	Sample	Number: C-4	Depth:	20.3
		Dime	entional Data		
Sample Length:	5.390		Ave. Diameter:	2.391	
L/D Ratio:	2.25	Pass	End Area:	4.49	
Volume:	24.19		Initial Mass:	1019.68	
		End To	End Parallelism		
Parallelism, Dias	. 1A to 2A:	0.07	Pass Barallalian	m of anch and	of the specimen
Parallelism Dias 1R to 2R* 0.03 Page		Dacc		•	
			must be ≤ 0.25° (ASTM D4543-08 9.2.1) for spherically seated upper platen).		
			ioi spite	rically seated	upper platell).
	End D	iameter To	Long Axis Perpendicula	arity	
End 1, Dia. A:	0.0002	Pass	Perpendic	cularity of eac	h diameter must
End 1, Dia. B:	0.0005	Pass			STM D4543-08
End 2, Dia. A:	0.0009	Pass	DC 3 /2		
End 2, Dia. B:	0.0002	Pass		9.3.1).	
	S	ide Straight	ness And End Flatness		
Deviation from			Side Straig	ihtness should	not exceed 0.020"
cylindrical:	< 0.020"	Pass	_	tion (ASTM D45	
End flatness ≤ 0.001"			Profile of	measured data	a shall not depart
(Smoothness):				_	in excess of 0.001'
(0.1100 1.1110 1.111	< 0.001"	Pass	•	(ASTM D4 5 43-0	08 9.2.1)
			Equipment	: Used:	
			Wet Saw	✓	
Tester:	JBG		Machinist Block	V	
			Feeler Gauge	✓	
Checker:	RJR		"V" Block	abla	
			Surface Grinder		
			Digital Micrometers		





OREGON DEPARTMENT OF TRANSPORTATION

MATERIALS LABORATORY

Page (503)986-3000 FAX(503)986-3096

21-000990

800 AIRPORT RD. SE SALEM, OR 97301-4792

Contract No.:

EA No.: PE003210 011

Lab No.: Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA

County: DESCHUTES

Data Sheet No.: G 4630337 FA No.: S004(231)

Contractor: ODOT R4 GEOLOGY

Org Unit:

Bid Item:

Project Manager: SCOTT BILLINGS Submitted By: BOBBI CUMMISKEY

Sample No.: C-3

Material Source: GEOTECHNICAL INVESTIGATION

Org Unit: 4630

Qty Represented: ROCK @ DEPTH

Sampled At: NCGDR-13 @ 16.0'

Sampled By:

DATE-Sampled:

Received: 21/ 5/18 Tested: 21/ 6/24

Date Reported: 21/ 6/24

Test Results For: ROCK CORE

т 89	Liquid Lim:
т 90	Plastic Ind:
T288	Resistivity: Ω
T289	pH:
T100	Spec Grav:
TM117	
Torvan	e Shear/ Pocket Pen.

T265 N. Moisture: 0.09 % Dry Density rec'd: 169.70 PC

Wet Density rec'd: 169.85 PC D4644 Slake Durab:

Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture
Optiu	Max Density:	

Max	Density:	
Optimum	Moisture:	

 Sieve	Passing
3 "	
2	
1.5	
1	
3/4	
1/2	
3/8	
1/4	
# 4	
10	
40	
200	

Quantity	Method	Cost
1 1	D7012 D4543	\$ 75.00 112.00
1 1	T265 154X	16.00 75.00

	Hydron	meter A	Anal	ysis	Subs	ample	Total	Sample
Coarse								
Medium	Sand=	2.0	to	.42	mm:			
Fine	Sand=	.42	to	.074	mm:			}
	Silt=	.074	to	.02	mm:			
	Silt=	.02	to	.005	mm:			
	Clay=	.005	to	.002	mm:			
	Clay=	Less :	Than	.002	turu :			

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 18,926 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

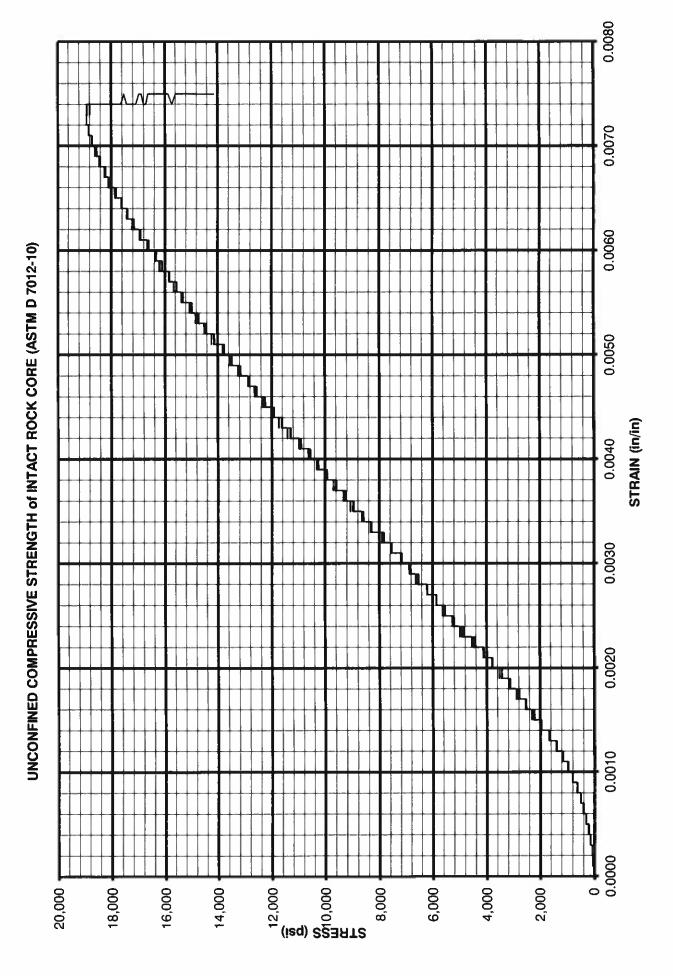
TOTAL CHARGES: \$

0.00

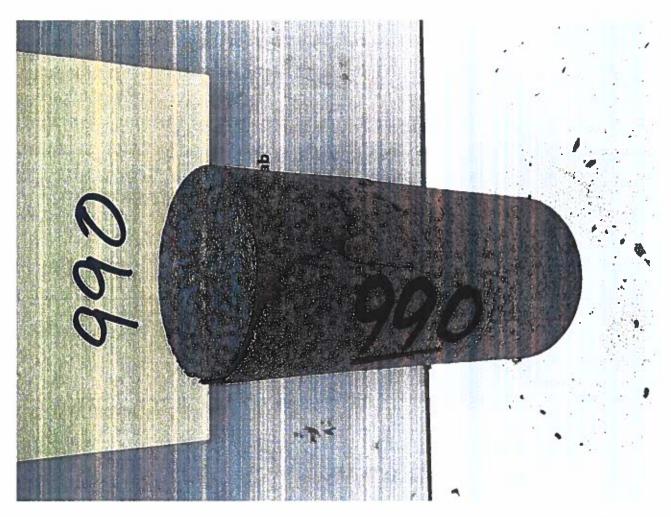
REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

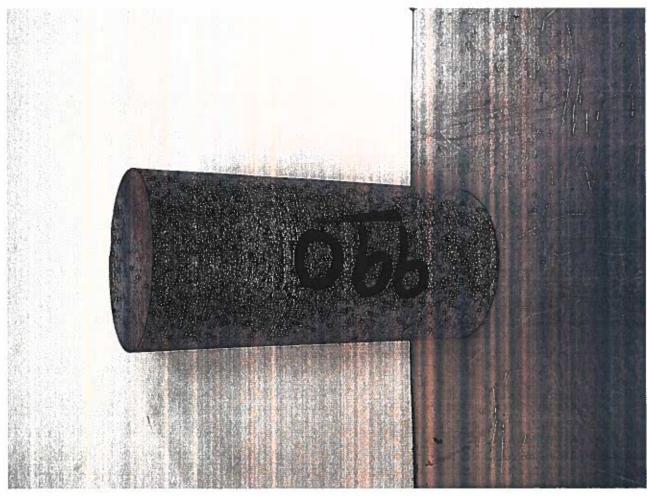
US97 North Corridor Geotechnical Data 21-990 **PROJECT** LAB NUMBER NCGDR-13, C-3 **DEPTH** 16 SAMPLE # 5.1071 1,001.9 HEIGHT (in) INITIAL WET WT. (g) 2.3670 1,001.0 DIAMETER (in) FINAL DRY WT. (g) AREA (in²) 4.4003 MOISTURE (%) 0.09 Length to Diameter Ratio (L/D) 2.2 (2.0 - 2.5 Required) WET DENSITY (lb/ft3) 169.8 169.7 18,926 DRY DENSITY (lb/ft³) Maximum Stress (psi) 0.12 Strain Rate (%/min)

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.18	393	0.0383	0.0075	89.3
0.37	979	0.0024	0.0005	222.5
0.55	1,825	0.0033	0.0006	414.7
0.73	3,127	0.0046	0.0009	710.6
0.92	4,921	0.0057	0.0011	1118.3
1.10	7,207	0.0069	0.0014	1637.8
1.28	9,876	0.0079	0.0015	2244.4
1.47	12,872	0.0091	0.0018	2925.3
1.65	15,926	0.0102	0.0020	3619.3
1.83	19,348	0.0114	0.0022	4397.0
2.02	22,711	0.0125	0.0024	5161.2
2.20	25,835	0.0136	0.0027	5871.2
2.38	29,239	0.0148	0.0029	6644.8
2.57	32,517	0.0159	0.0031	7389.7
2.75	35,873	0.0169	0.0033	8152.4
2.93	39,199	0.0180	0.0035	8908.3
3.12	42,457	0.0192	0.0038	9648.7
3.30	45,749	0.0204	0.0040	10396.8
3.48	48,842	0.0214	0.0042	11099.7
3.67	52,064	0.0226	0.0044	11831.9
3.85	55,111	0.0236	0.0046	12524.4
4.03	58,240	0.0248	0.0049	13235.5
4.22	61,208	0.0260	0.0051	13910.0
4.40	64,098	0.0271	0.0053	14566.7
4.58	67,036	0.0282	0.0055	15234.4
4.77	69,622	0.0293	0.0057	15822.1
4.95	72,300	0.0305	0.0060	16430.7
5.13	74,839	0.0316	0.0062	17007.7
5.32	77,046	0.0327	0.0064	17509.3
5.50	79,182	0.0339	0.0066	17994.7
5.68	80,970	0.0350	0.0069	18401.0
5.87	82,417	0.0361	0.0071	18729.9
6.05	83,275	0.0371	0.0073	18924.8
6.24	62,218	0.0383	0.0075	14139.5



Lab Number:	21-990				
	US97 Nort	th Corrida	or GDR		
Boring Number:			Number: C-3	Depth:	16.0
		Dime	entional Data		
Sample Length:	5.390	Ave. Diameter: 2.391			
L/D Ratio:		Pass	End Area:	4.49	
Volume:			Initial Mass:	1001.91	
		End To	End Parallelism		
Parallelism, Dias	. 1A to 2A:	0.16	Pass		
Parallelism, Dias		0.16	Parallelism		d of the specimen
i di diiciisiii, bids	. 10 (0 20.	0.10	must be ≤	•	D4543-08 9.2.1,
			for sphe	rically seated	l upper platen).
	End D	lameter To	Long Axis Perpendicula	rity	
End 1, Dia. A:	0.0013	Pass	Perpendici	ularity of eac	ch diameter must
End 1, Dia. B:	0.0010	Pass		·	ASTM D4543-08
End 2, Dia. A:	0.0014	Pass	DE 2 /29		
End 2, Dia. B:	0.0018	Pass		9.3.1).	
	S	ide Straight	ness And End Flatness		
Deviation from			Side Straigl	htness should	not exceed 0.020"
cylindrical:	< 0.020"	Pass	•		543-08 9.1.1).
End flatness ≤ 0.001"			Profile of	measured dat	a shall not depart
(Smoothness):				•	in excess of 0.001"
,	< 0.001"	Pass	(,	ASTM D4543-	08 9.2.1)
			Equipment	Used:	
			Wet Saw	V	
Tester:	JBG		Machinist Block	V	
			Feeler Gauge	/	
Checker:	RJR		"V" Block		
			Surface Grinder		
			Digital Micrometers	√	





OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY 800 AIRPORT RD. SE SALEM, OR 97301-4792

(503)986-3000 FAX(503)986-3096

Contract No.: EA No.: PE003210 011 Lab No.: 21-000991

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Data Sheet No.: G 4630337 Highway: THE DALLES-CALIFORNIA County: DESCHUTES

Contractor: ODOT R4 GEOLOGY

Project Manager: SCOTT BILLINGS

Submitted By: BOBBI CUMMISKEY

Material Source: GEOTECHNICAL INVESTIGATION

Sampled At: NCGDR-13 @ 24.3'

DATE-Sampled:

Org Unit:

Org Unit: 4630

Sample No.: C-4 Qty Represented: ROCK @ DEPTH

Sampled By:

Bid Item:

FA No.: S004(231)

Received: 21/ 5/18 Tested: 21/ 6/24 Date Reported: 21/ 6/24

Test Results For: ROCK CORE

т 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.02 % Dry Density rec'd: 162.98 PC Wet Density rec'd: 163.01 PC

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture

Max Density: Optimum Moisture:

 Sieve	Passing
3 "	·
2	
1.5	
1	
3/4	
1/2	
3/8	
1/4	
# 4	
10	
40	
200	
i	

Quantity	Method	Cost
1 1 1	D7012 D4543 T265 154X	\$ 75.00 112.00 16.00 75.00

	Hydron	meter A	Anal	ysis	Subsample	Total	Sample
Coarse	Sand=	4.75	to	2.0	mm:		
Medium	Sand=	2.0	to	.42	mm:		ŀ
Fine	Sand=	.42	to	.074	mm:		
	Silt=	.074	to	.02	mm:		l
	Silt=	.02	to	.005	mm:		j
	Clay=	.005	to	.002	mm:		İ
	Clay=	Less	ſhan	.002	mm:		

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 15,796 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

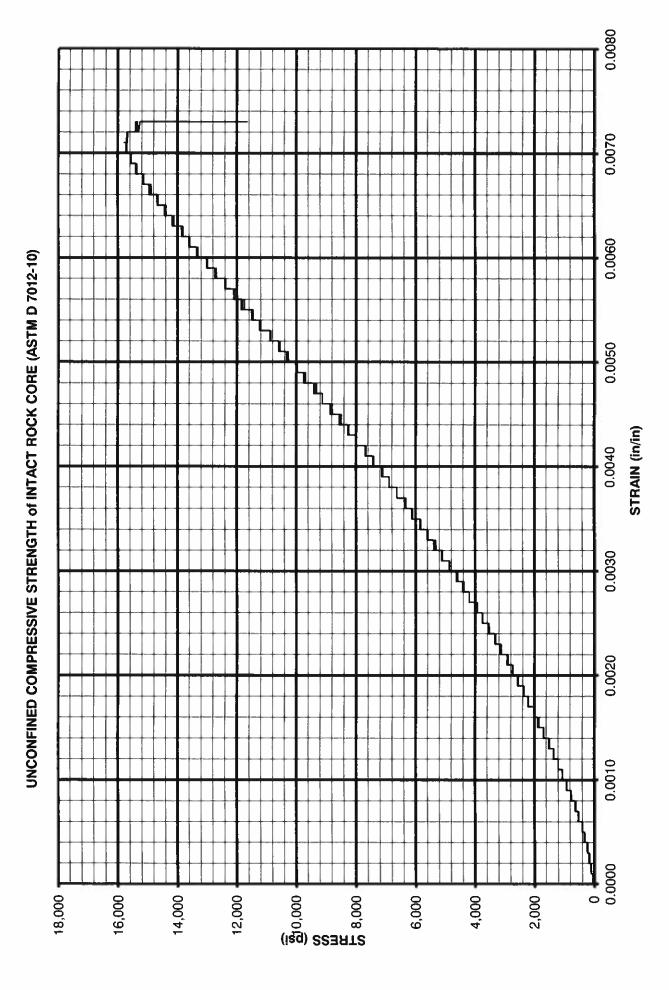
0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

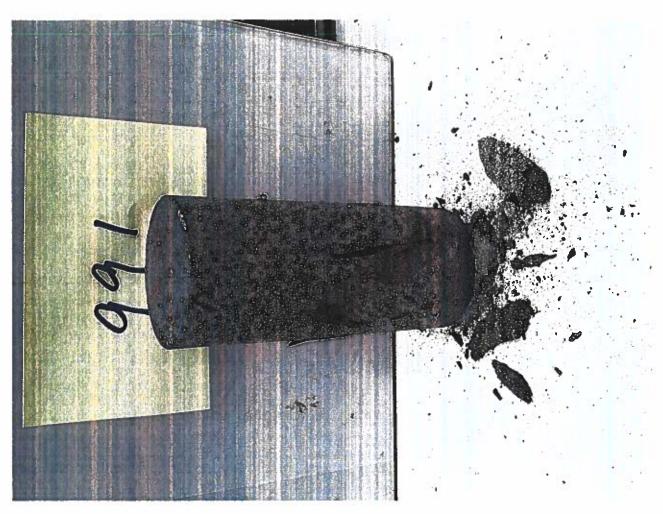
C: FILES; PROJ MGR: SCOTT BILLINGS ; R ROdriguez - SOILS; BOBBI CUMMISKEY - REGION 4 GEOLOGY TOM GRUMMON-ODOT R4 GEOLOGY

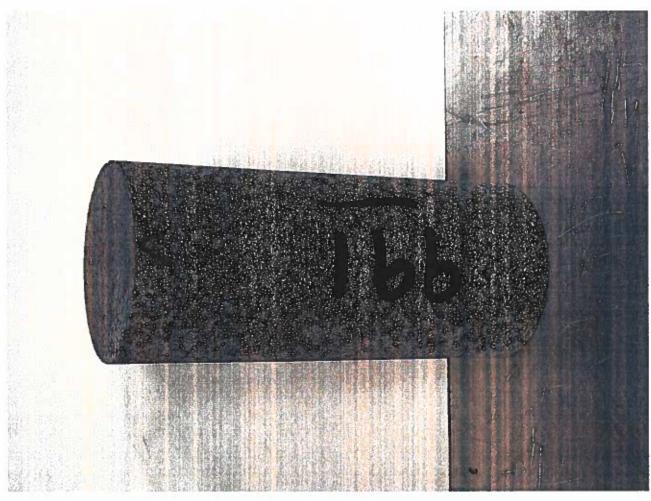
US97 North Corridor Geotechnical Data **PROJECT** 21-991 LAB NUMBER NCGDR-13, C-4 DEPTH 24.3 SAMPLE # HEIGHT (in) 5.3892 INITIAL WET WT. (g) 1,015.1 2.3675 DIAMETER (in) 1,014.9 FINAL DRY WT. (g) AREA (in²) 4.4022 0.02 **MOISTURE (%)** Length to Diameter Ratio (L/D) 2.3 (2.0 - 2.5 Required) 163.0 WET DENSITY (Ib/ft3) 15,796 Maximum Stress (psi) DRY DENSITY (lb/ft3) 163.0 Strain Rate (%/min) 0.12

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.18	684	0.0394	0.0073	155.4
0.36	1,380	0.0024	0.0004	313.5
0.54	2,305	0.0035	0.0006	523.6
0.72	3,545	0.0047	0.0009	805.3
0.89	4,895	0.0059	0.0011	1111.9
1.07	6,335	0.0070	0.0013	1439.1
1.25	7,903	0.0082	0.0015	1795.2
1.43	9,534	0.0093	0.0017	2165.7
1.61	11,243	0.0105	0.0019	2554.0
1.79	13,023	0.0116	0.0022	2958.3
1.97	14,883	0.0128	0.0024	3380.8
2.15	16,867	0.0140	0.0026	3831.5
2.32	18,930	0.0152	0.0028	4300.1
2.50	21,139	0.0163	0.0030	4801.9
2.68	23,340	0.0174	0.0032	5301.9
2.86	25,742	0.0185	0.0034	5847.5
3.04	28,055	0.0198	0.0037	6372.9
3.22	30,623	0.0209	0.0039	6956.3
3.40	33,193	0.0221	0.0041	7540.1
3.58	35,841	0.0232	0.0043	8141.6
3.75	38,506	0.0244	0.0045	8747.0
3.93	41,261	0.0256	0.0048	9372.8
4.11	44,107	0.0267	0.0050	10019.3
4.29	46,906	0.0278	0.0052	10655.1
4.47	49,730	0.0290	0.0054	11296.6
4.65	52,545	0.0302	0.0056	11936.1
4.83	55,375	0.0313	0.0058	12578.9
5.01	58,229	0.0325	0.0060	13227.3
5.18	60,905	0.0337	0.0063	13835.1
5.36	63,437	0.0348	0.0065	14410.3
5.54	65,844	0.0358	0.0066	14957.1
5.72	67,899	0.0371	0.0069	15423.9
5.90	69,494	0.0383	0.0071	15786.2
6.08	51,310	0.0394	0.0073	11655.5



ASTM D454	13 - Rock Co	ore Dimei	ntional and Shape	Tolerance :	Summary
Lab Number:	21-991				
Project:	US97 Nort	h Corrido	or GDR		
Boring Number:	NCGDR-13	Sample	Number: C-4	Depth:	24.3
		Dime	entional Data		
Sample Length:	5.389		Ave. Diameter:	2.368	
L/D Ratio:		Pass	End Area:	4.40	
Volume:		1 033	Initial Mass:	1015.14	
		End To	End Parallelism		
Parallelism, Dias	. 1A to 2A:	0.14	Pass Danallalian	of each on	d of the creatmen
Parallelism, Dias	s. 1B to 2B:	0.21	Dace		d of the specimen
•				•	1 D4543-08 9.2.1,
			for spher	rically seated	d upper platen).
Annual State of Annual Annual State of	End D	iameter To	Long Axis Perpendicular	rity	
End 1, Dia. A:	0.0022	Pass	Pernendici	<i>llari</i> ty of ea	ch diameter must
End 1, Dia. B:	0.0013	Pass		•	
End 2, Dia. A:	0.0003	Pass	be ≤ / ₂₃		ASTM D4543-08
End 2, Dia. B:	0.0021	Pass		9.3.1)	
	S	ide Straight	ness And End Flatness		
Deviation from			Side Straigh	ntness should	not exceed 0.020"
cylindrical:	< 0.020"	Pass			543-08 9.1.1).
End flatness ≤ 0.001"					ta shall not depart
(Smoothness):	**			-	in excess of 0.001"
, , ,	< 0.001"	Pass	(/	ASTM D4543-	·08 9.2.1)
			Equipment	Used:	
			Wet Saw	V	
Tester	JBG		Machinist Block	V	
			Feeler Gauge	V	
Checker	RJR		"V" Block	7	
			Surface Grinder		
			Digital Micrometers	V	





OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY

of Page (503)986-3000 FAX(503)986-3096

800 AIRPORT RD. SE SALEM, OR 97301-4792

EA No.: PE003210 011 21-000992 Contract No.: Lab No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337

Contractor: ODOT R4 GEOLOGY

Org Unit:

Org Unit: 4630

Material Source: GEOTECHNICAL INVESTIGATION

Project Manager: SCOTT BILLINGS

Submitted By: BOBBI CUMMISKEY

Sampled At: NCGDR-14 @ 10.3'

DATE-Sampled:

Sample No.: C-2

Bid Item:

FA No.: S004(231)

Qty Represented: ROCK @ DEPTH

Sieve

Sampled By:

Received: 21/ 5/18 Tested: 21/ 6/24 Date Reported: 21/6/24

Test Results For: ROCK CORE

т 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.05 % Dry Density rec'd: 159.38 PC Wet Density rec'd: 159.46 PC

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture
Opti	Max Density: mum Moisture:	

İ	3 "	
ĺ	2	
	1.5	
	1	
	3/4	
	1/2	
	3/8	
	1/4	
	# 4	
ļ	10	
	40	
	200	

Passing

0.00

Quantity	Method	Cost
1 1 1	D7012 D4543 T265 154X	\$ 75.00 112.00 16.00 75.00

	Hydrometer Analysis				Subsample	Total	Sample
Coarse Medium Fine	Sand= Sand= Silt= Silt= Clay=	2.0	to to to to	.42 .074 .02 .005	mm: mm: mm: mm: mm:		
	Clay-	ress .	rnar	1 .002	nun :		

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 12,230 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

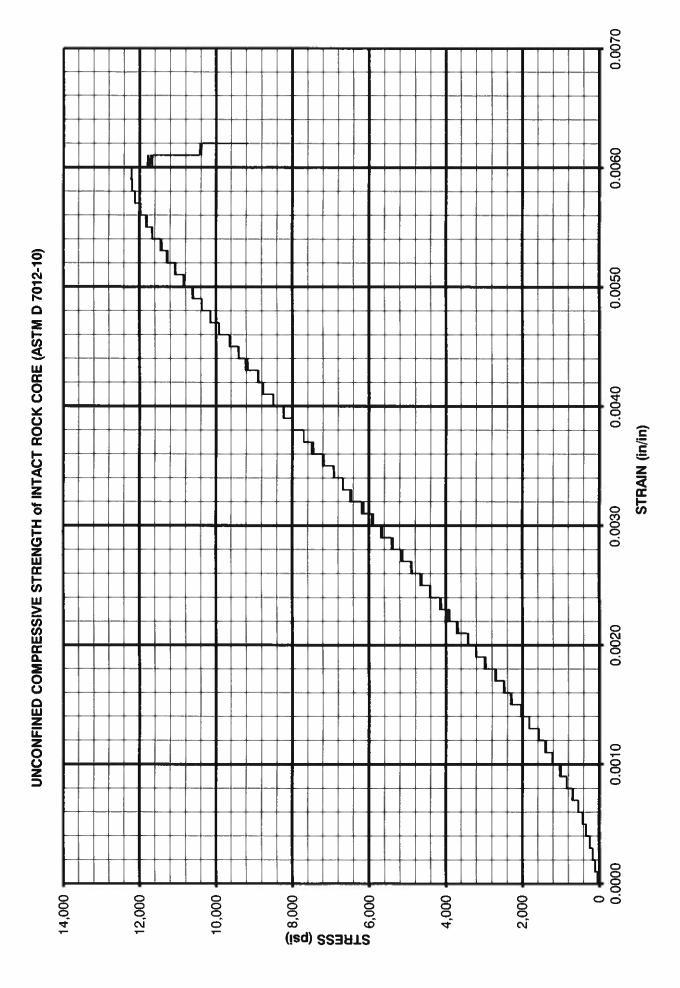
REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES ; PROJ MGR: SCOTT BILLINGS ; R Rodriguez - SOILS ; BOBBI CUMMISKEY - REGION 4 GEOLOGY TOM GRUMMON-ODOT R4 GEOLOGY

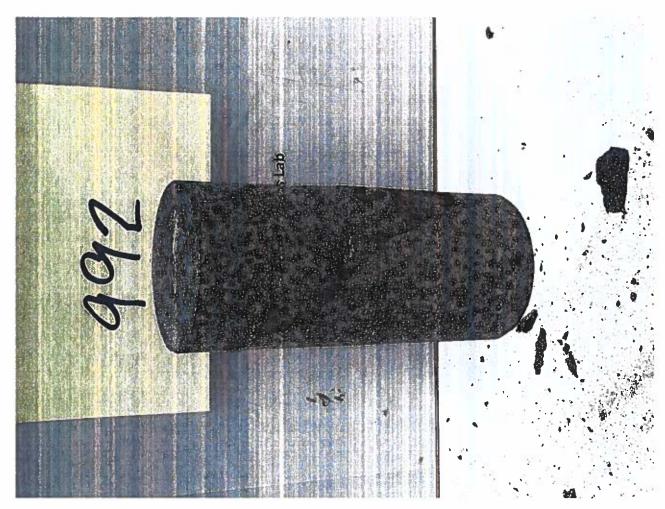
PROJECT
SAMPLE #
HEIGHT (in)
DIAMETER (in)
AREA (in²)
Length to Diameter
Ratio (L/D)
Maximum Stress (psi)
Strain Rate (%/min)

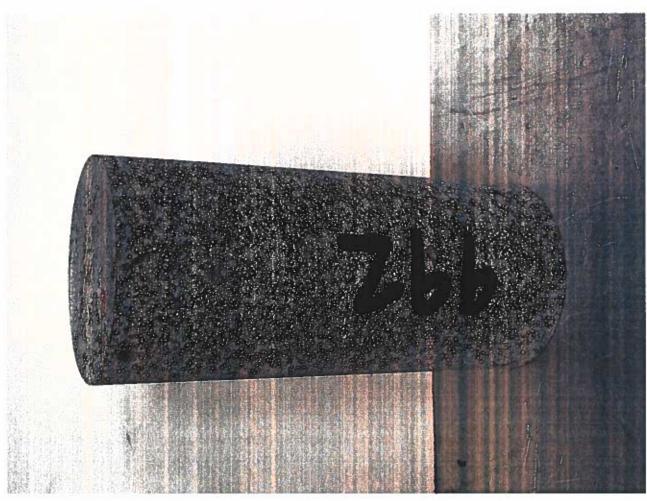
US97 North Co	rridor Geotechnical Data	LAB NUMBER	21-992
NCGDR-14, C-	2	DEPTH	10.3
5.3597		INITIAL WET WT. (g)	1,012.5
2.3970		FINAL DRY WT. (g)	1,012.0
4.5126		MOISTURE (%)	0.05
2.2	(2.0 - 2.5 Required)	WET DENSITY (lb/ft³)	159.5
12,230		DRY DENSITY (Ib/ft3)	159.4
0.12			

TiME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.15	606	0.0333	0.0062	134.3
0.30	1,215	0.0022	0.0004	269.2
0.46	2,018	0.0030	0.0006	447.2
0.61	3,130	0.0040	0.0007	693.6
0.76	4,467	0.0051	0.0010	989.9
0.91	6,028	0.0060	0.0011	1335.8
1.06	7,688	0.0070	0.0013	1703.7
1.21	9,505	0.0079	0.0015	2106.3
1.37	11,407	0.0089	0.0017	2527.8
1.52	13,349	0.0100	0.0019	2958.2
1.67	15,216	0.0108	0.0020	3371.9
1.82	17,198	0.0119	0.0022	3811.1
1.97	19,182	0.0127	0.0024	4250.8
2.12	21,244	0.0138	0.0026	4707.7
2.28	23,286	0.0148	0.0028	5160.2
2.43	25,385	0.0157	0.0029	5625.4
2.58	27,513	0.0167	0.0031	6096.9
2.73	29,621	0.0176	0.0033	6564.1
2.88	31,771	0.0186	0.0035	7040.5
3.04	33,874	0.0196	0.0037	7506.5
3.19	35,991	0.0206	0.0038	7975.7
3.34	38,149	0.0216	0.0040	8453.9
3.49	40,169	0.0226	0.0042	8901.5
3.64	41,827	0.0236	0.0044	9268.9
3.79	43,869	0.0246	0.0046	9721.4
3.95	45,911	0.0256	0.0048	10174.0
4.10	47,778	0.0264	0.0049	10587.7
4.25	49,629	0.0275	0.0051	10997.9
4.40	51,272	0.0285	0.0053	11362.0
4.55	52,816	0.0294	0.0055	11704.1
4.70	54,149	0.0303	0.0057	11999.5
4.86	54,995	0.0314	0.0059	12187.0
5.01	54,298	0.0322	0.0060	12032.5
5.16	41,329	0.0333	0.0062	9158.6



Lab Number:	21-992				
	US97 Nort	th Corrido	or GDR		
Boring Number:			Number: C-2	Depth:	10.3
		Dime	entional Data		
Sample Length:	5.360		Ave. Diameter:	2.397	
L/D Ratio:		Pass	End Area:	4.51	
Volume:	24.19		Initial Mass:	1012.47	
		End To	End Parallelism		
Parallelism, Dias	. 1A to 2A:	0.08	Pass Ograficien	of analysis	l af tha spacinson
Parallelism, Dias	s. 1B to 2B:	0.15	Dacc		of the specimen
				•	D4543-08 9.2.1,
			for spine	rically seated	upper platen).
	End D	iameter To	Long Axis Perpendicula	rity	
End 1, Dia. A:	0.0011	Pass	Perpendici	ularity of eac	:h diameter must
End 1, Dia. B:	0.0005	Pass		•	STM D4543-08
End 2, Dia. A:	0.0003	Pass	DC 2 / 23		
End 2, Dia. B:	0.0018	Pass		9.3.1).	
	S	ide Straight	ness And End Flatness		
Deviation from			Side Straigh	ntness should	not exceed 0.020"
cylindrical:	< 0.020"	Pass	•		543-08 9.1.1).
				•	•
and flatness ≤ 0.001"					a shall not depart
(Smoothness):	< 0.001"	Pass		astraight line ASTM D4543-	in excess of 0.001"
	< 0.001	rass	Ţ,	K311VI D4343-1	JO 3.2.1)
			Equipment	Used:	
			Wet Saw	V	
Tester:	JBG		Machinist Block	<u> </u>	
			Feeler Gauge	$\overline{\mathbf{v}}$	
Checker:	RJR		"V" Block		
			Surface Grinder		
			Digital Micrometers	V	





OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY

800 AIRPORT RD. SE SALEM, OR 97301-4792

Page (503)986 - 3000FAX(503)986-3096

Contract No.: EA No.: PE003210 011 Lab No.: 21-000993

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337

Contractor: ODOT R4 GEOLOGY

FA No.: S004(231)

Org Unit: Bid Item:

Submitted By: BOBBI CUMMISKEY Org Unit: 4630 Sample No.: C-3

Qty Represented: ROCK @ DEPTH

Sampled At: NCGDR-16 @ 12.3' Sampled By:

Received: 21/ 5/18 Tested: 21/ 6/24 DATE-Sampled: Date Reported: 21/ 6/24

Test Results For: ROCK CORE

T 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: T289 pH: Spec Grav: T100 TM117 Torvane Shear/ Pocket Pen.

Material Source: GEOTECHNICAL INVESTIGATION

Project Manager: SCOTT BILLINGS

T265 N. Moisture: 0.24 % Dry Density rec'd: 136.39 PC Wet Density rec'd: 136.72 PC D4644 Slake Durab:

Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture	
	Max Densit		

Optimum Moisture:

Sieve	Passing
3 "	
2	
1.5	
1	
3/4	
1/2	
3/8	
1/4	
# 4	
10	
40	
200	

Quantity Method C	ost
1 D4543 11 1 T265 1	5.00 2.00 6.00 5.00

	Hydrometer Analysis			Subsamp	le :	rotal	Sample	
Coarse	Sand=	4.75	to	2.0	mm:			
Medium	Sand=	2.0	to	.42	mm:			
Fine	Sand=	.42	to	.074	mm:			
	Silt=	.074	to	.02	mm:			
	Silt=	.02	to	.005	mm:			ĺ
	Clay=	.005	to	.002	mm:			
	Clay=	Less ?	rhan	.002	mm:			

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 6,376 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

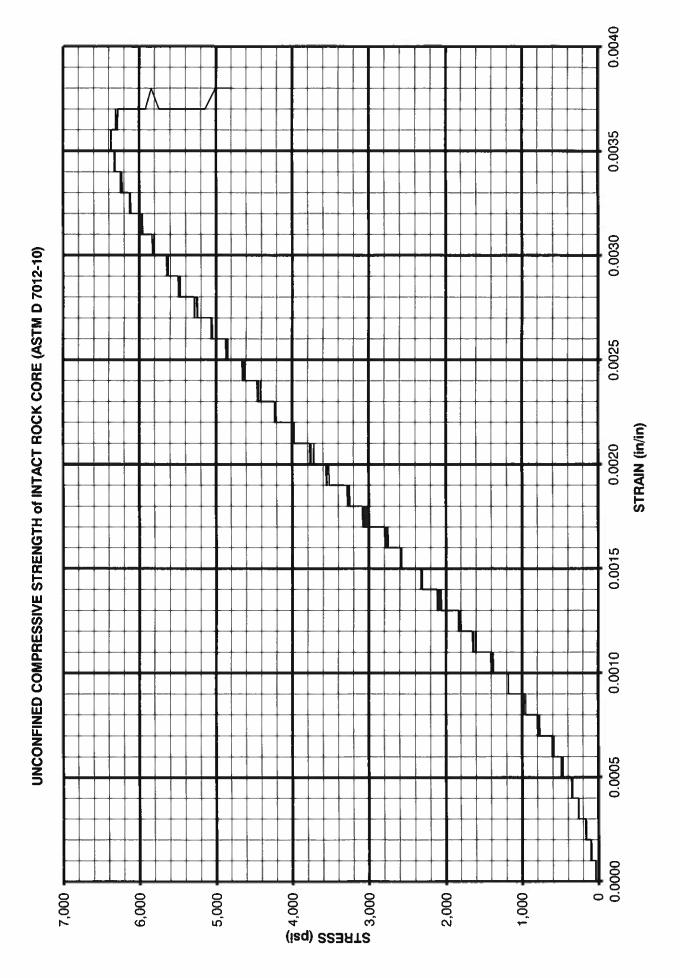
REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES ; PROJ MGR: SCOTT BILLINGS ; R Rodriguez - SOILS ; BOBBI CUMMISKEY - REGION 4 GEOLOGY TOM GRUMMON-ODOT R4 GEOLOGY

0.00

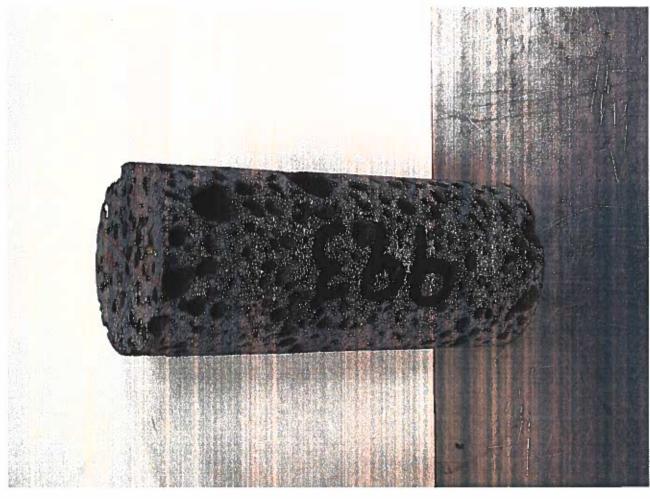
US97 North Corridor Geotechnical Data LAB NUMBER 21-993 **PROJECT** NCGDR-16, C-3 **DEPTH** 12.3 SAMPLE # 5.5090 866.0 HEIGHT (in) INITIAL WET WT. (g) DIAMETER (in) 2.3615 863.9 FINAL DRY WT. (g) AREA (in²) 4.3799 0.24 **MOISTURE (%)** Length to Diameter Ratio (L/D) 2.3 (2.0 - 2.5 Required) WET DENSITY (lb/ft3) 136.7 6,376 DRY DENSITY (lb/ft³) 136.4 Maximum Stress (psi) Strain Rate (%/min) 0.12

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.09	334	0.0209	0.0038	76.3
0.18	681	0.0013	0.0002	155.5
0.27	1,098	0.0019	0.0003	250.7
0.37	1,565	0.0025	0.0005	357.3
0.46	2,136	0.0030	0.0005	487.7
0.55	2,844	0.0037	0.0007	649.3
0.64	3,706	0.0043	0.0008	846.1
0.73	4,655	0.0049	0.0009	1062.8
0.82	5,645	0.0055	0.0010	1288.8
0.91	6,719	0.0062	0.0011	1534.1
1.01	7,802	0.0067	0.0012	1781.3
1.10	8,983	0.0073	0.0013	2051.0
1.19	10,120	0.0080	0.0015	2310.6
1.28	11,232	0.0085	0.0015	2564.4
1.37	12,448	0.0091	0.0017	2842.1
1.46	13,565	0.0098	0.0018	3097.1
1.55	14,723	0.0104	0.0019	3361.5
1.65	15,888	0.0109	0.0020	3627.5
1.74	17,029	0.0116	0.0021	3888.0
1.83	18,129	0.0121	0.0022	4139.1
1.92	19,166	0.0128	0.0023	4375.9
2.01	20,215	0.0135	0.0025	4615.4
2.10	21,211	0.0141	0.0026	4842.8
2.19	22,208	0.0146	0.0027	5070.4
2.29	23,124	0.0152	0.0028	5279.6
2.38	24,095	0.0158	0.0029	5501.3
2.47	24,900	0.0165	0.0030	5685.1
2.56	25,704	0.0169	0.0031	5868.6
2.65	26,421	0.0176	0.0032	6032.3
2.74	27,105	0.0182	0.0033	6188.5
2.83	27,616	0.0188	0.0034	6305.2
2.93	27,884	0.0194	0.0035	6366.4
3.02	27,642	0.0200	0.0036	6311.1
3.11	20,943	0.0209	0.0038	4781.6



ASTM D4543 - Rock Core Dimentional and Shape Tolerance Summary Lab Number: 21-993 **Project: US97 North Corridor GDR Boring Number: NCGDR-16** Sample Number: C-3 Depth: 12.3 **Dimentional Data** Sample Length: Ave. Diameter: 2.362 5.509 L/D Ratio: 2.33 Pass End Area: 4.38 Volume: 24.13 Initial Mass: 865.98 **End To End Parallelism** Parallelism, Dias. 1A to 2A: 0.15 Pass Parallelism of each end of the specimen Parallelism, Dias. 1B to 2B: 0.10 Pass must be $\leq 0.25^{\circ}$ (ASTM D4543-08 9.2.1, for spherically seated upper platen). **End Diameter To Long Axis Perpendicularity** End 1, Dia. A: 8000.0 **Pass** Perpendicularity of each diameter must End 1, Dia. B: 0.0007 Pass be $\leq \frac{1}{230} = 0.0043$ (ASTM D4543-08) End 2, Dia. A: 0.0016 Pass 9.3.1). End 2, Dia. B: 0.0008 Pass Side Straightness And End Flatness **Deviation from** Side Straightness should not exceed 0.020" cylindrical: < 0.020" Pass deviation (ASTM D4543-08 9.1.1). Profile of measured data shall not depart End flatness ≤ 0.001" from best fit straight line in excess of 0.001" (Smoothness): < 0.001" (ASTM D4543-08 9.2.1) **Pass Equipment Used:** ✓ Wet Saw Tester: JBG **Machinist Block** \square Feeler Gauge "V" Block \Box Checker: RJR \square Surface Grinder 7 **Digital Micrometers**





OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY 800 AIRPORT RD. SE SALEM, OR 97301-4792

Page of (503)986-3000 FAX(503)986-3096

21-000994

Contract No.: EA No.: PE003210 011 Lab No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337

Org Unit:

Contractor: ODOT R4 GEOLOGY FA No.: S004(231)

Project Manager: SCOTT BILLINGS

DATE-Sampled:

Submitted By: BOBBI CUMMISKEY Org Unit: 4630

Material Source: GEOTECHNICAL INVESTIGATION Qty Represented: ROCK @ DEPTH

Sampled At: NCGDR-16 @ 21.0'

Received: 21/ 5/18 Tested: 21/ 6/24 Date Reported: 21/ 6/24

Bid Item:

Sampled By:

Sample No.: C-5

Test Results For: ROCK CORE

T 89 Liquid Lim:
T 90 Plastic Ind:
T288 Resistivity: Ω
T289 pH:
T100 Spec Grav:
TM117
Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.11 % | Dry Density rec'd: 159.66 PC| Wet Density rec'd: 159.84 PC| D4644 Slake Durab:

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

_		
Dry	Density	Moisture
i		

Max Density: Optimum Moisture:

<u> </u>		
Sieve	Passing	
3 "		
2		
1.5		
1		
3/4		
1/2		
3/8		
1/4		
# 4		
10		
40		
200		

Quantity	Method	Cost
1	D7012	\$ 75.00
1	D4543	112.00
1	T265	16.00
1	154X	75.00

Hydrometer Analysis		Sul	osample	Total	Sample		
Sand=	2.0	to	.42	mm:			
Sand=	. 42	to	.074	mm:			
Silt=	.02	to	.005	mm:			
Clay=	.005	to	.002	mm:			ĺ
Clay=	Less :	rhan	.002	mm:			İ
	Sand= Sand= Sand= Silt= Silt= Clay=	Sand= 4.75 Sand= 2.0 Sand= .42 Silt= .074 Silt= .02 Clay= .005	Sand= 4.75 to Sand= 2.0 to Sand= .42 to Silt= .074 to Silt= .02 to Clay= .005 to	Sand= 4.75 to 2.0 Sand= 2.0 to .42 Sand= .42 to .074 Silt= .074 to .02 Silt= .02 to .005 Clay= .005 to .002	Sand= 4.75 to 2.0 mm: Sand= 2.0 to .42 mm: Sand= .42 to .074 mm: Silt= .074 to .02 mm: Silt= .02 to .005 mm: Clay= .005 to .002 mm: Clay= Less Than .002 mm:	Sand= 4.75 to 2.0 mm: Sand= 2.0 to .42 mm: Sand= .42 to .074 mm: Silt= .074 to .02 mm: Silt= .02 to .005 mm: Clay= .005 to .002 mm:	Sand= 4.75 to 2.0 mm: Sand= 2.0 to .42 mm: Sand= .42 to .074 mm: Silt= .074 to .02 mm: Silt= .02 to .005 mm: Clay= .005 to .002 mm:

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 14,100 psi

*

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES; PROJ MGR: SCOTT BILLINGS; R Rodriguez - SOILS; BOBBI CUMMISKEY - REGION 4 GEOLOGY TOM GRUMMON-ODOT R4 GEOLOGY 0.00

 SAMPLE #
 NCGDI

 HEIGHT (in)
 5.1667

 DIAMETER (in)
 2.3645

 AREA (in²)
 4.3911

 Length to Diameter
 Ratio (L/D)

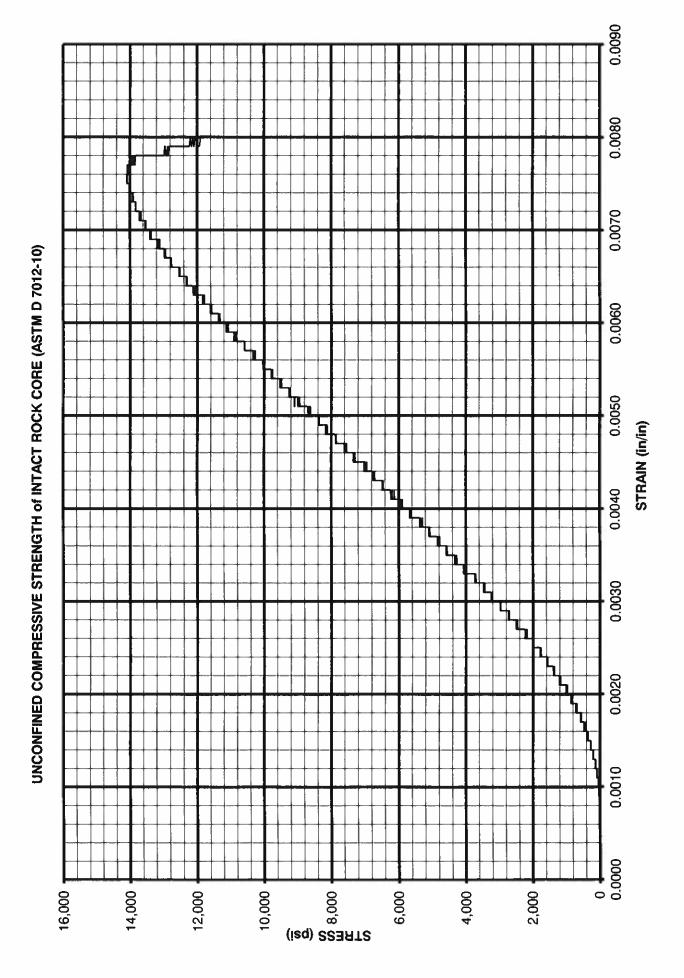
 Maximum Stress (psi)
 14,100

 Strain Rate (%/min)
 0.12

PROJECT

US97 North Corr	idor Geotechnical Data	LAB NUMBER	21-994
NCGDR-16, C-5		DEPTH	21
5.1667	_	INITIAL WET WT. (g)	951.9
2.3645		FINAL DRY WT. (g)	950.9
4.3911		MOISTURE (%)	0.10
2.2	(2.0 - 2.5 Required)	WET DENSITY (lb/ft³)	159.8
14,100		DRY DENSITY (lb/ft3)	159.7
0.12			·

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.20	48	0.0413	0.0080	10.9
0.39	51	0.0025	0.0005	11.6
0.59	61	0.0037	0.0007	13.9
0.78	118	0.0050	0.0010	26.9
0.98	444	0.0062	0.0012	101.1
1.17	1,133	0.0074	0.0014	258.0
1.37	2,056	0.0086	0.0017	468.2
1.56	3,365	0.0098	0.0019	766.3
1.76	5,027	0.0109	0.0021	1144.8
1.96	7,025	0.0122	0.0024	1599.8
2.15	9,275	0.0134	0.0026	2112.2
2.35	11,773	0.0146	0.0028	2681.1
2.54	14,335	0.0158	0.0031	3264.6
2.74	17,077	0.0170	0.0033	3889.0
2.93	19,874	0.0183	0.0035	4526.0
3.13	22,600	0.0194	0.0038	5146.8
3.33	25,511	0.0207	0.0040	5809.7
3.52	28,322	0.0219	0.0042	6449.9
3.72	31,183	0.0231	0.0045	7101.4
3.91	34,157	0.0243	0.0047	7778.7
4.11	36,923	0.0256	0.0050	8408.6
4.30	39,801	0.0269	0.0052	9064.0
4.50	42,516	0.0280	0.0054	9682.3
4.69	45,350	0.0291	0.0056	10327.7
4.89	47,973	0.0304	0.0059	10925.1
5.09	50,664	0.0316	0.0061	11537.9
5.28	53,136	0.0329	0.0064	12100.8
5.48	55,396	0.0340	0.0066	12615.5
5.67	57,582	0.0352	0.0068	13113.3
5.87	59,455	0.0365	0.0071	13539.9
6.06	60,889	0.0378	0.0073	13866.5
6.26	61,715	0.0389	0.0075	14054.6
6.45	60,810	0.0400	0.0077	13848.5
6.65	45,985	0.0413	0.0080	10472.3



ran Mallingi.	21-994				
Project:	US97 Nort	th Corrido	or GDR		
Boring Number:	NCGDR-16	Sample	Number: C-5	Depth:	21.0
		Dime	entional Data		
Sample Length:	5.167		Ave. Diameter:	2.365	
L/D Ratio:	2.19	Pass	End Area:	4.39	
Volume:	22.69		Initial Mass:	951.89	
		End To	End Parallelism		
Parallelism, Dias	. 1A to 2A:	0.09	Pass Parallalism	of oach one	i of the specimer
Parallelism, Dias	s. 1B to 2B:	0.11	Dacc		. D4543-08 9.2.1,
				•	upper platen).
			for sprier	ically seated	upper piaceii).
	End D	iameter To	Long Axis Perpendicular	rity	
End 1, Dia. A:	0.0001	Pass	Perpendicu	<i>llarity</i> of eac	ch diameter must
End 1, Dia. B:	0.0013	Pass	•	·	STM D4543-08
End 2, Dia. A:		Pass	JC 3 / 23	9.3.1).	
End 2, Dia. B:	0.0005	Pass		3.3.1).	
	· S	ide Straight	ness And End Flatness		
Deviation from cylindrical:	< 0.020"	Pass	=		not exceed 0.020" 543-08 9.1.1).
			Geviati	UII (ASTIVI D43	9.1.1 <i>j</i> .
nd flatness ≤ 0.001"					a shall not depart
(Smoothness):		_		-	in excess of 0.001
	< 0.001"	Pass	(#	ASTM D4543-0	J8 9.2.1)
			Equipment	Used:	
			Wet Saw	7	
Tester:	JBG		Machinist Block	V	
			Feeler Gauge	✓	
Checker:	RJR		"V" Block	7	
			Surface Grinder Digital Micrometers	☑	





OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY

Page (503)986-3000FAX(503)986-3096

800 AIRPORT RD. SE SALEM, OR 97301-4792

Lab No.: Contract No.: EA No.: PE003210 011 21-000995

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337

Contractor: ODOT R4 GEOLOGY FA No.: S004(231) Bid Item:

Project Manager: SCOTT BILLINGS Org Unit:

Org Unit: 4630 Sample No.: C-2 Submitted By: BOBBI CUMMISKEY Material Source: GEOTECHNICAL INVESTIGATION Qty Represented: ROCK @ DEPTH

Sampled At: NCGDR-17 @ 6.5' Sampled By:

Received: 21/ 5/18 Tested: 21/ 6/24 DATE-Sampled: Date Reported: 21/ 6/24

Test Results For: ROCK CORE

т 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen. T265 N. Moisture: 0.28 %

Dry Density rec'd: 143.01 PC Wet Density rec'd: 143.41 PC D4644 Slake Durab:

Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture
 Opti	Max Densit mum Moistur	

Sieve	Passing
3 " 2 1.5 1 3/4 1/2 3/8 1/4 # 4 10 40 200	

0.00

Q	uantity	Method	Cost	
		57010	 75.00	_
	1	D7012 D4543	\$ 75.00 112.00	
	1	T265	16.00	
	1	154X	75.00	
l E				

	Hydrometer Analysis			Subsa	mple	Total	Sample	
Coarse	Sand=	4.75	to	2.0	mm:			
Medium								
Fine	Sand=	.42	to	.074	mm:			
	Silt=	.074	to	.02	mm:			İ
	Silt=	.02	to	.005	mm:			ĺ
	Clay=	.005	to	.002	mm:			
	Clay=	Less 1	ľhan	.002	mm:			

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 5,199 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

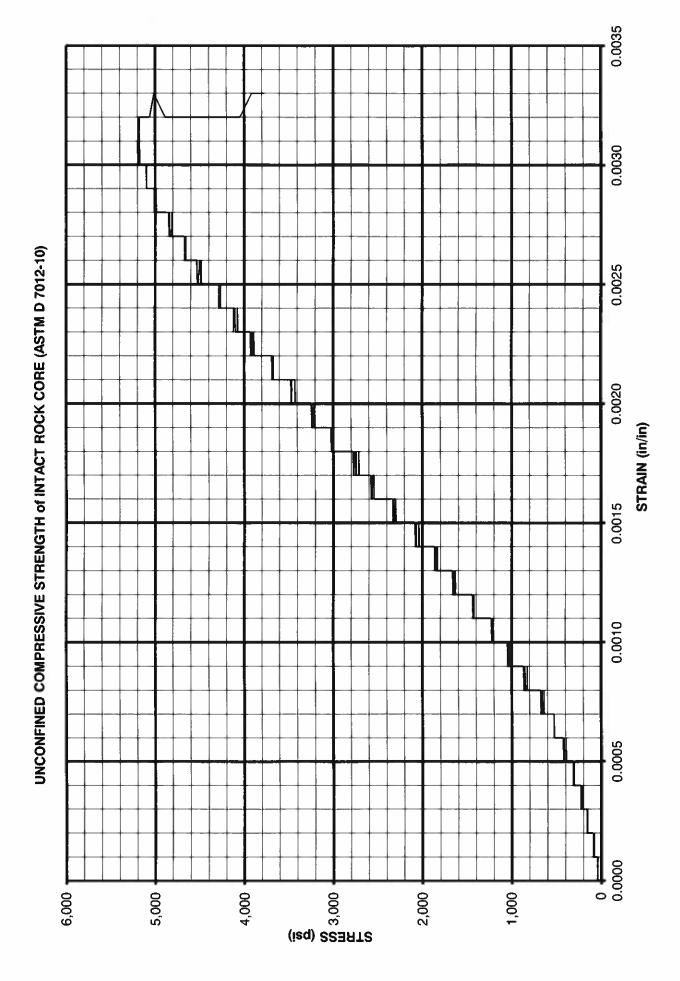
TOTAL CHARGES: \$

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES ; PROJ MGR: SCOTT BILLINGS ; R RODRIGUEZ - SOILS ; BOBBI CUMMISKEY - REGION 4 GEOLOGY TOM GRUNNON-ODOT R4 GEOLOGY

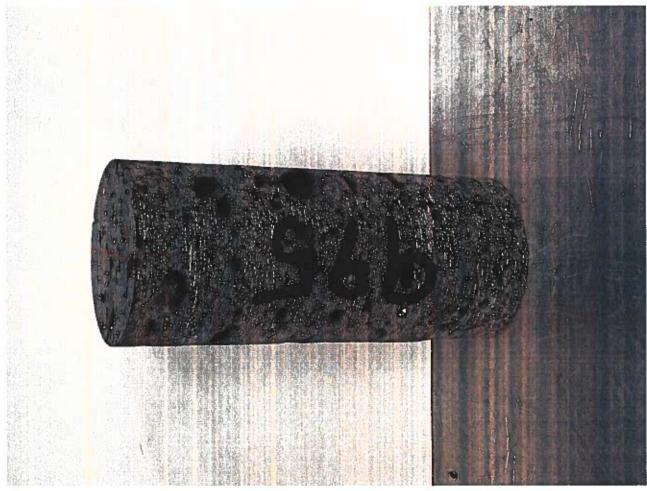
US97 North Corridor Geotechnical Data **PROJECT** LAB NUMBER 21-995 NCGDR-17, C-2 DEPTH SAMPLE # 6.5 HEIGHT (in) 5.3059 838.1 INITIAL WET WT. (g) 2.3115 **DIAMETER (in)** FINAL DRY WT. (g) 835.8 AREA (in²) 4.1964 0.28 **MOISTURE (%)** Length to Diameter WET DENSITY (Ib/ft³) Ratio (L/D) 2.3 (2.0 - 2.5 Required) 143.4 5,199 DRY DENSITY (lb/ft³) 143.0 Maximum Stress (psi) Strain Rate (%/min) 0.12

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.08	289	0.0174	0.0033	68.9
0.16	534	0.0011	0.0002	127.3
0.24	811	0.0017	0.0003	193.3
0.32	1,138	0.0022	0.0004	271.2
0.40	1,498	0.0027	0.0005	357.0
0.48	1,915	0.0031	0.0006	456.3
0.55	2,399	0.0036	0.0007	571.7
0.63	3,001	0.0041	0.0008	715.1
0.71	3,750	0.0046	0.0009	893.6
0.79	4,488	0.0052	0.0010	1069.5
0.87	5,289	0.0056	0.0011	1260.4
0.95	6,054	0.0062	0.0012	1442.7
1.03	6,938	0.0066	0.0012	1653.3
1.11	7,757	0.0072	0.0014	1848.5
1.19	8,667	0.0076	0.0014	2065.3
1.27	9,560	0.0081	0.0015	2278.1
1.35	10,524	0.0087	0.0016	2507.9
1.43	11,412	0.0092	0.0017	2719.5
1.51	12,357	0.0097	0.0018	2944.7
1.59	13,267	0.0102	0.0019	3161.5
1.66	14,204	0.0107	0.0020	3384.8
1.74	15,055	0.0113	0.0021	3587.6
1.82	15,907	0.0117	0.0022	3790.6
1.90	16,804	0.0121	0.0023	4004.4
1.98	17,590	0.0128	0.0024	4191.7
2.06	18,454	0.0133	0.0025	4397.6
2.14	19,192	0.0137	0.0026	4573.4
2.22	19,894	0.0143	0.0027	4740.7
2.30	20,523	0.0148	0.0028	4890.6
2.38	21,080	0.0152	0.0029	5023.4
2.46	21,495	0.0158	0.0030	5122.2
2.54	21,795	0.0161	0.0030	5193.7
2.62	21,722	0.0168	0.0032	5176.3
2.70	15,860	0.0174	0.0033	3779.4



Lab Number:	21-995				
	US97 Nort	th Corrido	or GDR		
Boring Number:			Number: C-2	Depth:	6.5
		Dime	entional Data		
Sample Length:	5.306		Ave. Diameter:	2.312	
L/D Ratio:		Pass	End Area:	4.20	
Volume:			Initial Mass:	838.12	
		End To	End Parallelism		
Parallelism, Dias	. 1A to 2A:	0.13	Pass Parallelis	m of each and	of the specimer
Parallelism, Dias	s. 1B to 2B:	0.12	Dace		D4543-08 9.2.1,
				•	upper platen).
			ioi spin	erically seateu	upper platerij.
**************************************	End D	iameter To	Long Axis Perpendicul	arity	
End 1, Dia. A:	0.0003	Pass	Perpendie	cularity of eac	h diameter must
End 1, Dia. B:		Pass	_	•	STM D4543-08
End 2, Dia. A:		Pass	44 - 7	9.3.1).	31 3 13 13 00
End 2, Dia. B:	0.0007	Pass		J.J.1 _j .	
	S	ide Straight	ness And End Flatness		
Deviation from cylindrical:	> 0.020" (Fail		ghtness should (tion (ASTM D45	not exceed 0.020"
				•	•
End flatness ≤ 0.001"					shall not depart
(Smoothness):	- 0 0011	Da		•	in excess of 0.001
	< 0.001"	Pass		(ASTM D4543-0	18 9.2.1)
			Equipmen	t Used:	
			Wet Saw	V	
Tester:	JBG		Machinist Block	v	
			Feeler Gauge		
Checker:	RJR		"V" Block		
			Surface Grinder		
			Digital Micrometers	☑	





OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY 800 AIRPORT RD. SE SALEM, OR 97301-4792

Page of (503)986-3000 FAX(503)986-3096

Contract No.: EA No.: PE003210 011 Lab No.: 21-000996

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630337

Contractor: ODOT R4 GEOLOGY FA No.: S004(231)
Project Manager: SCOTT BILLINGS Org Unit: Bid Item:

Project Manager: SCOTT BILLINGS Org Unit: Bid Item:
Submitted By: BOBBI CUMMISKEY Org Unit: 4630 Sample No.: C-3

Material Source: GEOTECHNICAL INVESTIGATION Qty Represented: ROCK @ DEPTH

Sampled At: NCGDR-17 @ 14.0' Sampled By:

DATE-Sampled: Received: 21/5/18 Tested: 21/6/24 Date Reported: 21/6/24

Test Results For: ROCK CORE

T 89 Liquid Lim:
T 90 Plastic Ind:
T288 Resistivity: Ω
T289 pH:
T100 Spec Grav:
TM117
Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.12 % Dry Density rec'd: 139.15 PC Wet Density rec'd: 139.32 PC

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry Density Moisture

Max Density:

Max Density: Optimum Moisture:

Sieve	Passing
3 "	
2	
1.5	
1	
3/4	
1/2	
3/8	
1/4	
# 4	
10	
40	
200	

Quantity	Method	Cost
1	D7012	\$ 75.00
1	T265	16.00
1	T154X	75.00

Coarse Sand= 4.75 to 2.0 mm:		Hydrom	eter <i>l</i>	Anal	ysis	Sı	ubsample	Total	Sample
Medium Sand= 2.0 to .42 mm: Fine Sand= .42 to .074 mm: Silt= .074 to .02 mm: Silt= .02 to .005 mm: Clay= .005 to .002 mm: Clay= Less Than .002 mm:	Medium	Sand= Sand= Silt= Silt= Clay=	2.0 .42 .074 .02 .005	to to to to	.42 .074 .02 .005	mm: mm: mm: mm: mm:			

TOTAL CHARGES: \$

0.00

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 7,555 psi

*

KEVIN BROPHY - LABORATORY SERVICES MANAGER

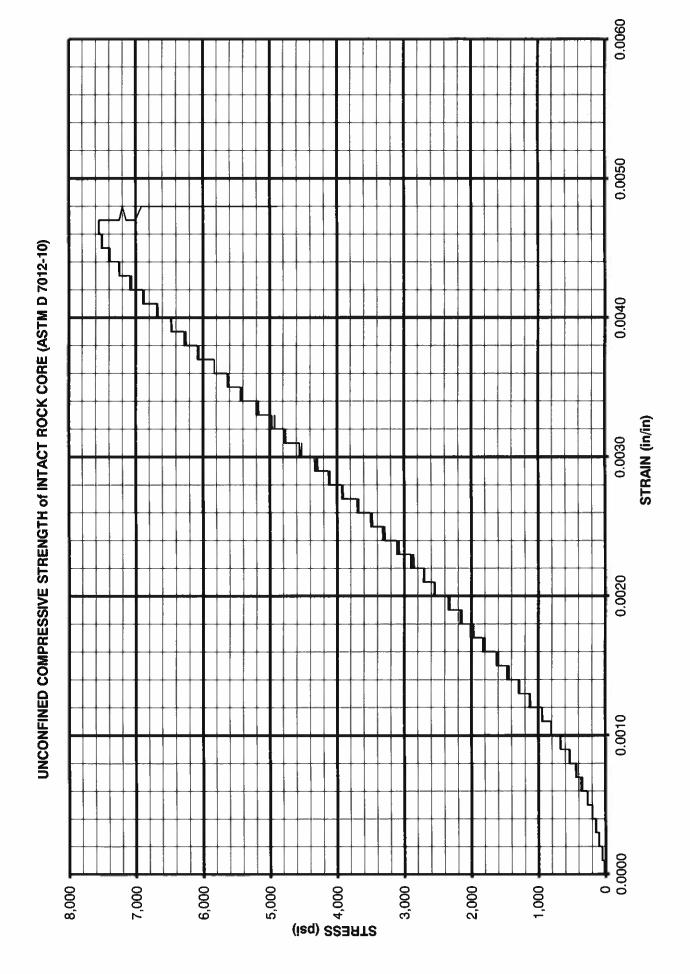
REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

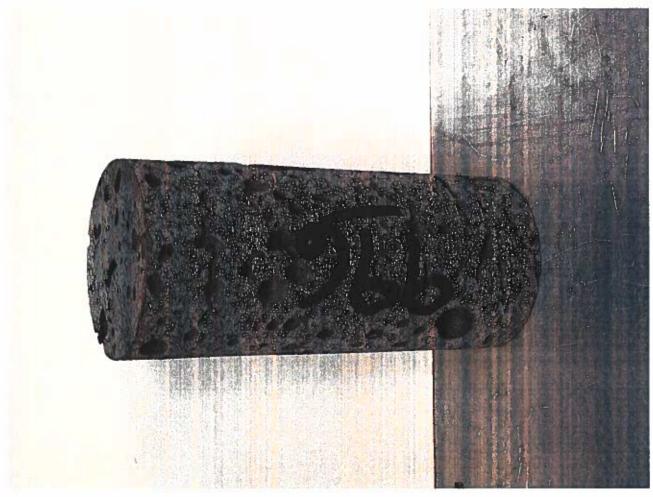
C: FILES; PROJ MGR: SCOTT BILLINGS ; R ROdriguez - SOILS; BOBBI CUMMISKEY - REGION 4 GEOLOGY
TOM GRUMMON-ODOT R4 GEOLOGY

US97 North Corridor Geotechnical Data LAB NUMBER **PROJECT** 21-996 NCGDR-17, C-3 DEPTH SAMPLE # 14 5.2806 842.8 HEIGHT (in) INITIAL WET WT. (g) 2.3573 DIAMETER (in) FINAL DRY WT. (g) 841.8 AREA (in²) 4.3644 0.12 MOISTURE (%) Length to Diameter (2.0 - 2.5 Required) 2.2 Ratio (L/D) WET DENSITY (lb/ft³) 139.3 139.1 Maximum Stress (psi) 7,555 DRY DENSITY (lb/ft3) 0.12 Strain Rate (%/min)

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.12	237	0.0254	0.0048	54.3
0.23	513	0.0016	0.0003	117.5
0.35	859	0.0024	0.0005	196.8
0.46	1,260	0.0031	0.0006	288.7
0.58	1,761	0.0037	0.0007	403.5
0.70	2,378	0.0045	0.0009	544.9
0.81	3,165	0.0052	0.0010	725.2
0.93	4,086	0.0060	0.0011	936.2
1.04	5,030	0.0067	0.0013	1152.5
1.16	6,009	0.0075	0.0014	1376.8
1.28	7,081	0.0081	0.0015	1622.4
1.39	8,214	0.0089	0.0017	1882.0
1.51	9,276	0.0097	0.0018	2125.4
1.62	10,453	0.0105	0.0020	2395.1
1.74	11,594	0.0111	0.0021	2656.5
1.86	12,657	0.0120	0.0023	2900.1
1.97	13,830	0.0125	0.0024	3168.8
2.09	15,062	0.0133	0.0025	3451.1
2.20	16,322	0.0140	0.0027	3739.8
2.32	17,589	0.0148	0.0028	4030.1
2.44	18,818	0.0156	0.0030	4311.7
2.55	20,094	0.0163	0.0031	4604.1
2.67	21,481	0.0170	0.0032	4921.9
2.78	22,775	0.0177	0.0034	5218.4
2.90	24,132	0.0185	0.0035	5529.3
3.02	25,380	0.0192	0.0036	5815.2
3.13	26,655	0.0199	0.0038	6107.4
3.25	27,967	0.0207	0.0039	6408.0
3.36	29,212	0.0214	0.0041	6693.2
3.48	30,457	0.0222	0.0042	6978.5
3.60	31,538	0.0228	0.0043	7226.2
3.71	32,476	0.0237	0.0045	7441.1
3.83	32,947	0.0244	0.0046	7549.0
3.94	21,350	0.0254	0.0048	4891.9







OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY 800 AIRPORT RD. SE SALEM, OR 97301-4792

Contract No.: EA No.: PE003210 011 Lab No.: 21-001141

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA

County: DESCHUTES

Data Sheet No.: G 4630339

FA No.: S004(231)

Org Unit: Bid Item: Sample No.:

Org Unit: 4630 Qty Represented: ROCK @ DEPTH

Sampled By:

Received: 21/ 6/ 4 Tested: 21/ 6/28 Date Reported: 21/ 6/28 DATE-Sampled:

Test Results For: ROCK CORE

Liquid Lim: T 89 T 90 Plastic Ind: T288 Resistivity: pH: T289 T100 Spec Grav: TM117

Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.07 % Dry Density rec'd: 141.55 PC Wet Density rec'd: 141.65 PC

D4644 Slake Durab:

Water Cont:

Contractor: ODOT R4 GEOLOGY

Material Source:

Project Manager: SCOTT BILLINGS

Submitted By: GREGORY-LEDERER

Sampled At: NCGDR-01 11.5-12'

D2974 Pct Organic:

Dry	Density	Moisture	
Opti	Max Densit mum Moistur		

Sieve	Passing
3 " 2 1.5 1 3/4 1/2 3/8 1/4 # 4	
40 200	

İ	Quantity	Method	Cost	
	1 1 1	D7012 T265 154X	\$ 75.00 16.00 75.00	

	Hydron	neter A	Anal	ysis	Subsample	Total	Sample
Coarse	Sand=	4.75	to	2.0	mm:		
Medium	Sand=	2.0	to	.42	mm:		
Fine	Sand=	.42	to	.074	mm:		
	Silt=	.074	to	.02	mm:		
	Silt=	.02	to	.005	mm:		
	Clay=	.005	to	.002	mm:		
	Clay=	Less	Than	.002	mm:		

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 4,888 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

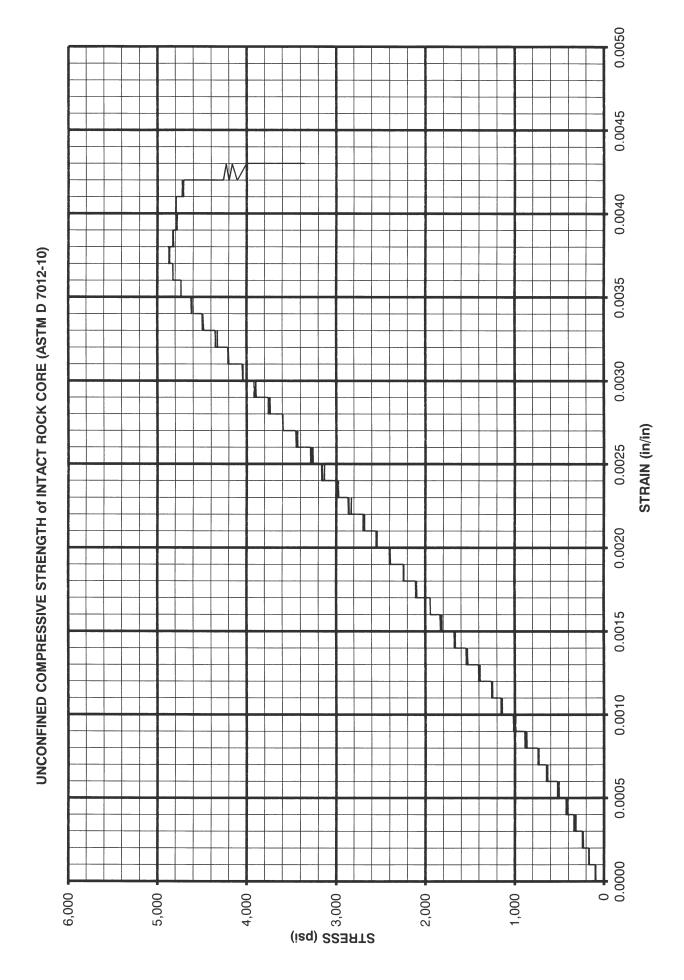
TOTAL CHARGES: \$

0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

PROJECT US97 @ Cooley (North Corridor GDR) 21-1141 LAB NUMBER NCGDR-01 DEPTH 11.5-12' SAMPLE # HEIGHT (in) 5.4397 894.2 INITIAL WET WT. (g) DIAMETER (in) 2.3726 FINAL DRY WT. (g) 893.6 AREA (in²) 4.4212 **MOISTURE (%)** 0.07 Length to Diameter Ratio (L/D) 2.3 (2.0 - 2.5 Required) WET DENSITY (lb/ft³) 141.6 Maximum Stress (psi) 4,888 DRY DENSITY (lb/ft³) 141.5 Strain Rate (%/min) 0.12

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.10	689	0.0235	0.0043	155.8
0.21	1,087	0.0015	0.0003	245.9
0.31	1,564	0.0021	0.0004	353.8
0.42	2,137	0.0028	0.0005	483.4
0.52	2,725	0.0035	0.0006	616.3
0.62	3,385	0.0041	0.0008	765.6
0.73	4,093	0.0049	0.0009	925.8
0.83	4,845	0.0056	0.0010	1095.9
0.94	5,524	0.0063	0.0012	1249.4
1.04	6,307	0.0069	0.0013	1426.5
1.14	7,007	0.0076	0.0014	1584.9
1.25	7,774	0.0081	0.0015	1758.3
1.35	8,558	0.0089	0.0016	1935.7
1.46	9,361	0.0096	0.0018	2117.3
1.56	10,151	0.0102	0.0019	2296.0
1.66	10,956	0.0110	0.0020	2478.1
1.77	11,843	0.0116	0.0021	2678.7
1.87	12,660	0.0123	0.0023	2863.5
1.98	13,461	0.0130	0.0024	3044.6
2.08	14,321	0.0137	0.0025	3239.2
2.18	15,126	0.0143	0.0026	3421.2
2.29	15,996	0.0150	0.0028	3618.0
2.39	16,815	0.0157	0.0029	3803.3
2.50	17,678	0.0163	0.0030	3998.5
2.60	18,493	0.0171	0.0031	4182.8
2.70	19,286	0.0177	0.0033	4362.2
2.81	20,058	0.0184	0.0034	4536.8
2.91	20,725	0.0191	0.0035	4687.6
3.02	21,303	0.0198	0.0036	4818.4
3.12	21,597	0.0204	0.0038	4884.9
3.22	21,300	0.0212	0.0039	4817.7
3.33	21,198	0.0219	0.0040	4794.6
3.43	20,922	0.0225	0.0041	4732.2
3.54	14,837	0.0235	0.0043	3355.9







OREGON DEPARTMENT OF TRANSPORTATION MATERIALS LABORATORY

800 AIRPORT RD. SE SALEM, OR 97301-4792

Page of 9 (503)986-3000 FAX(503)986-3096

Contract No.: EA No.: PE003210 011 Lab No.: 21-001142

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630339

Contractor: ODOT R4 GEOLOGY FA No.: S004(231)
Project Manager: SCOTT BILLINGS Org Unit: Bid Item:

Submitted By: GREGORY-LEDERER Org Unit: 4630 Sample No.:

Material Source: Qty Represented: ROCK @ DEPTH

Sampled At: NCGDR-02 16-17' Sampled By:

DATE-Sampled: Received: 21/6/4 Tested: 21/6/28 Date Reported: 21/6/28

Test Results For: ROCK CORE

T 89 Liquid Lim:
T 90 Plastic Ind:
T288 Resistivity: Ω
T289 pH:
T100 Spec Grav:
TM117
Torvane Shear/ Pocket Pen.

T265 N. Moisture:
Dry Density rec'd:
Wet Density rec'd:

Dry	Density	Moisture
 Optin	Max Density:	

Sieve Pa	ssing
3 " 2 1.5 1 3/4 1/2 3/8 1/4 # 4 10 40 200	

Wet Density rec'd: D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Quantity	Method	Cost
2 2 2 2 2	D7012 D4543 T265 154X	\$ 75.00 112.00 16.00 75.00

	Hydron	meter A	Anal	ysis	Sul	bsample	Total	Sample
Coarse	Sand=	4.75	to	2.0	mm:			
Medium	Sand=	2.0	to	.42	mm:			
Fine	Sand=	.42	to	.074	mm:			
	Silt=	.074	to	.02	mm:			
	Silt=	.02	to	.005	mm:			
	Clay=	.005	to	.002	mm:			
	Clay=	Less	Than	.002	mm:			

REMARKS:

INFORMATION ONLY

Sample A 21-1142A Uniaxial compressive strength = 13,570 psi Sample B 21-1142B Uniaxial compressive strength = 11,904 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

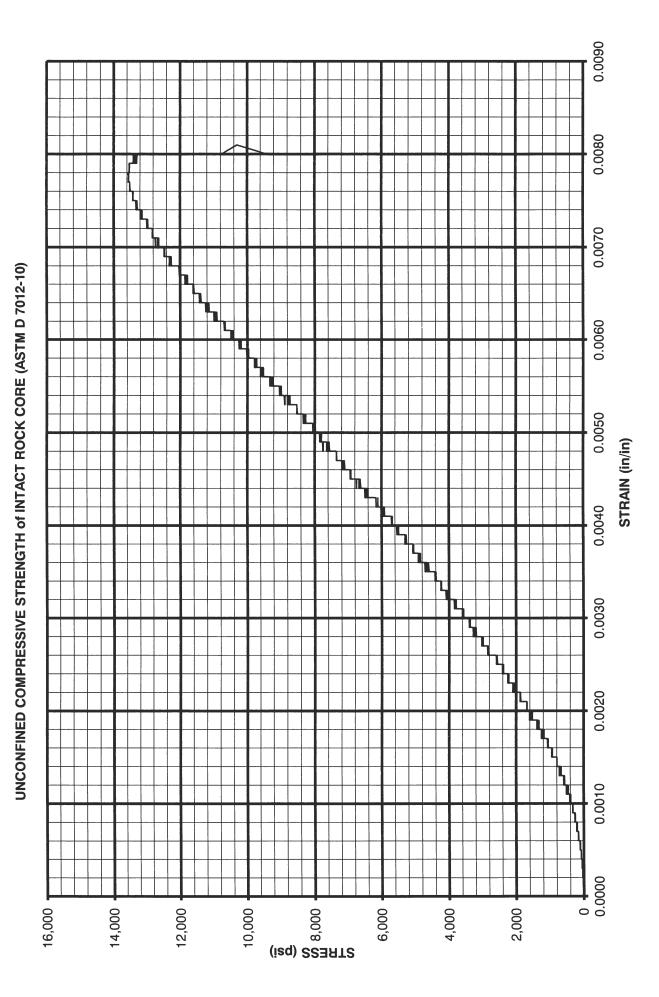
0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

PROJECT US97 @ Cooley (North Corridor GDR) 21-1142 A LAB NUMBER SAMPLE # NCGDR-02 DEPTH 16-17' 5.0806 INITIAL WET WT. (g) 968.0 HEIGHT (in) DIAMETER (in) 2.3890 966.8 FINAL DRY WT. (g) AREA (in²) 4.4825 0.12 **MOISTURE (%)** Length to Diameter Ratio (L/D) 2.1 (2.0 - 2.5 Required) WET DENSITY (lb/ft³) 161.9 Maximum Stress (psi) 13,570 DRY DENSITY (lb/ft³) 161.7 Strain Rate (%/min) 0.12

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)	
0.00	0	0.0000	0.0000	0.0	
0.20	178	0.0408	0.0080	39.7	
0.39	443	0.0026	0.0005	98.8	
0.59	879	0.0038	0.0007	196.1	
0.78	1,533	0.0050	0.0010	342.0	
0.98	2,422	0.0061	0.0012	540.3	
1.17	3,589	0.0074	0.0015	800.7	
1.37	4,993	0.0086	0.0017	1113.9	
1.56	6,588	0.0097	0.0019	1469.7	
1.76	8,337	0.0109	0.0021	1859.9	
1.96	10,182	0.0121	0.0024	2271.5	
2.15	12,453	0.0132	0.0026	2778.1	
2.35	14,383	0.0145	0.0029	3208.7	
2.54	16,473	0.0157	0.0031	3675.0	
2.74	18,608	0.0170	0.0033	4151.3	
2.93	20,881	0.0179	0.0035	4658.3	
3.13	23,114	0.0193	0.0038	5156.5	
3.32	25,389	0.0204	0.0040	5664.0	
3.52	27,790	0.0217	0.0043	6199.7	
3.72	30,314	0.0228	0.0045	6762.7	
3.91	32,760	0.0240	0.0047	7308.4	
4.11	35,201	0.0253	0.0050	7853.0	
4.30	37,817	0.0265	0.0052	8436.6	
4.50	40,252	0.0277	0.0055	8979.8	
4.69	42,773	0.0287	0.0056	9542.2	
4.89	45,319	0.0299 0.0059		10110.2	
5.08	47,812	0.0313	0.0062	10666.4	
5.28	50,297	0.0324	0.0064	11220.7	
5.48	52,683	0.0337	0.0066	11753.0	
5.67	54,886	0.0348	0.0068	12244.5	
5.87	56,939	0.0359	0.0071	12702.5	
6.06	58,691	0.0372	0.0073	13093.4	
6.26	60,102	0.0383	0.0075	13408.1	
6.45	60,801	0.0396	0.0078	13564.1	
6.65	42,067	0.0408	0.0080	9384.7	



ASTM D4543 - Rock Core Dimentional and Shape Tolerance Summary							
Lab Number:	21-1142 A						
Project:	US97 @ C	ooley (No	rth Corrid	dor GDR)			
Boring Number:	NCGDR-02	Sample Number:			Depth: 16-17'		
Dimentional Data							
Sample Length:	5.081		Ave. Diameter: 2.389		2.389		
L/D Ratio:		Pass	End Area:		4.48		
Volume:			Initial Mass:		967.96		
End To End Parallelism							
Parallelism, Dias	. 1A to 2A:	0.13	Pass	Daniella liana	-6		
Parallelism, Dias	s. 1B to 2B:	0.10	Pass		of each end of the specimen		
·					0.25° (ASTM D4543-08 9.2.1,		
				tor spneri	cally seated upper platen).		
	End D	iameter To	Long Axis Pe	erpendiculari	ty		
End 1, Dia. A:	0.0003	Pass		Pernendicul	larity of each diameter must		
End 1, Dia. B:	0.0011	Pass			= 0.0043 (ASTM D4543-08		
End 2, Dia. A:	0.0018	Pass		De ≥ / ₂₃₀			
End 2, Dia. B:	8000.0	Pass			9.3.1).		
	S	ide Straight	ness And En	d Flatness			
Deviation from				Side Straight	tness should not exceed 0.020"		
cylindrical:	< 0.020"	Pass		_	on (ASTM D4543-08 9.1.1).		
End flatness ≤ 0.001"					neasured data shall not depart		
(Smoothness):					straight line in excess of 0.001"		
(Sinostinicss).	< 0.001"	Pass		(A	STM D4543-08 9.2.1)		
			E	quipment l			
Wet Saw ☑							
Tester:	JBG			inist Block			
Ch1	DID		Fee	eler Gauge			
Checker:	KJK		C£-	"V" Block	✓		
			Surrac Digital Mic	ce Grinder			
			Digital Will	Eleis	ت		





 PROJECT
 US97 @ Coole

 SAMPLE #
 NCGDR-02

 HEIGHT (in)
 5.2094

 DIAMETER (in)
 2.3920

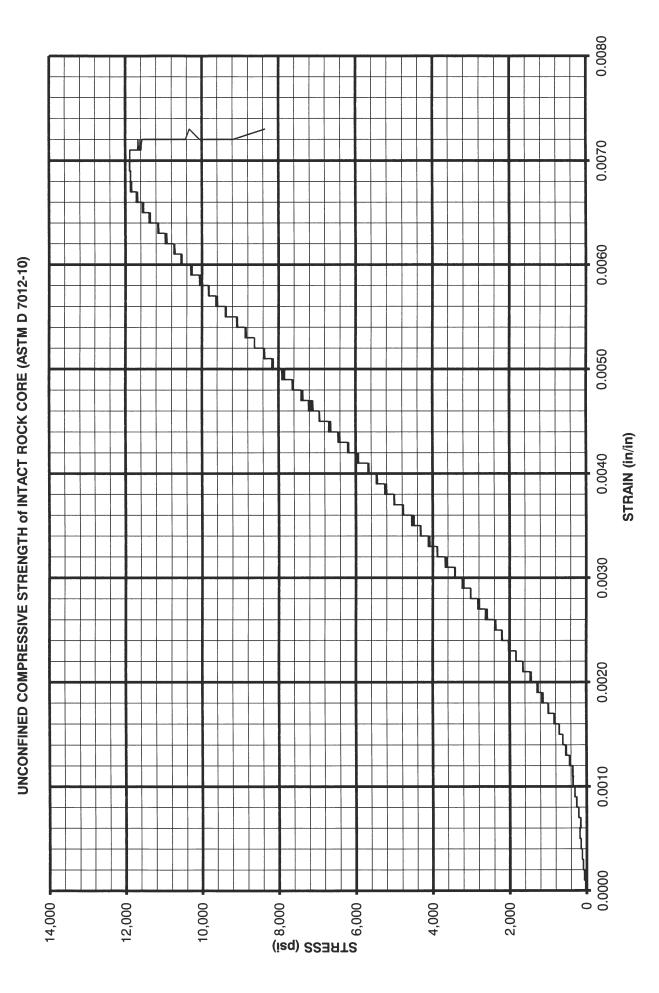
 AREA (in²)
 4.4938

 Length to Diameter
 2.2

Maximum Stress (psi) Strain Rate (%/min)

US97 @ Cooley	(North Corridor GDR)	LAB NUMBER	21-1142 B	
NCGDR-02		DEPTH	16-17'	
5.2094		INITIAL WET WT. (g)	984.6	
2.3920		FINAL DRY WT. (g)	983.3	
4.4938		MOISTURE (%)	0.13	
2.2	(2.0 - 2.5 Required)	WET DENSITY (lb/ft³)	160.2	
11,904		DRY DENSITY (lb/ft3)	160.0	
0.12				

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.18	375	0.0379	0.0073	83.4
0.35	665	0.0023	0.0004	148.0
0.53	711	0.0034	0.0007	158.2
0.71	1,175	0.0045	0.0009	261.5
0.88	1,542	0.0057	0.0011	343.1
1.06	2,104	0.0068	0.0013	468.2
1.24	3,011	0.0078	0.0015	670.0
1.41	4,207	0.0089	0.0017	936.2
1.59	5,633	0.0102	0.0020	1253.5
1.76	7,214	0.0111	0.0021	1605.3
1.94	8,994	0.0122	0.0023	2001.4
2.12	10,864	0.0133	0.0026	2417.6
2.29	12,797	0.0144	0.0028	2847.7
2.47	14,793	0.0156	0.0030	3291.9
2.65	16,840	0.0167	0.0032	3747.4
2.82	19,042	0.0177	0.0034	4237.4
3.00	21,146	0.0189	0.0036	4705.6
3.18	23,323	0.0200	0.0038	5190.0
3.35	25,600	0.0212	0.0041	5696.7
3.53	27,890	0.0222	0.0043	6206.3
3.71	30,174	0.0233	0.0045	6714.6
3.88	32,553	0.0243	0.0047	7244.0
4.06	34,820	0.0254	0.0049	7748.5
4.24	37,159	0.0267	0.0051	8268.9
4.41	39,531	0.0276	0.0053	8796.8
4.59	41,795	0.0288	0.0055	9300.6
4.76	44,075	0.0299	0.0057	9808.0
4.94	46,239	0.0309	0.0059	10289.5
5.12	48,338	0.0322	0.0062	10756.6
5.29	50,302	0.0333	0.0064	11193.6
5.47	52,145	0.0343	0.0066	11603.8
5.65	53,391	0.0354	0.0068	11881.0
5.82	53,441	0.0366	0.0070	11892.2
6.00	37,517	0.0379	0.0073	8348.6



ASTM D454	13 - Rock C	ore Dimei	ntional a	nd Shape T	Folerance Summary
Lab Number:	21-1142 B				
Project:	US97 @ C	ooley (No	rth Corri	dor GDR)	
Boring Number:	NCGDR-02	Sample	Number:		Depth: 16-17'
		Dime	entional Da	nta	
Sample Length:	5.210		Δνα	Diameter:	2.392
L/D Ratio:		Pass	Ave.	End Area:	4.49
Volume:		1 033	In	itial Mass:	984.57
voidine.	25.41			Telai IVIa33.	304.37
		End To	End Paralle	elism	
Parallelism, Dias	s. 1A to 2A:	0.14	Pass	Parallelism	of each end of the specimen
Parallelism, Dias	s. 1B to 2B:	0.10	Pass		0.25° (ASTM D4543-08 9.2.1,
					rically seated upper platen).
				TOT Spires	really scated apper platelly.
	End D	iameter To	Long Axis P	erpendicular	ity
End 1, Dia. A:	0.0004	Pass		Parnandicu	larity of each diameter must
End 1, Dia. B:		Pass		•	•
End 2, Dia. A:		Pass		be ≤ ⁻ / ₂₃₀	₀ = 0.0043 (ASTM D4543-08
End 2, Dia. B:	0.0013	Pass			9.3.1).
	S	ide Straight	ness And Er	nd Flatness	
Deviation from				Side Straigh	itness should not exceed 0.020"
cylindrical:	< 0.020"	Pass		_	on (ASTM D4543-08 9.1.1).
5 LG				Profile of r	measured data shall not depart
End flatness ≤ 0.001"				from best fit	t straight line in excess of 0.001"
(Smoothness):	< 0.001"	Pass		(A	ASTM D4543-08 9.2.1)
			1	Equipment	_
- .	IDC			Wet Saw	
Tester	IRG			inist Block	
Chaaleen	DID		re	eler Gauge "V" Block	✓
Checker	אנא א		Curfo	ce Grinder	
				crometers	✓
			DIBITAL IVII	COMETE 12	ت





800 AIRPORT RD. SE SALEM, OR 97301-4792

 $(50\overline{3})986-3000$ FAX(503)986-3096

Contract No.: EA No.: PE003210 011 Lab No.: 21-001143

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS Data Sheet No.: G 4630339 Highway: THE DALLES-CALIFORNIA County: DESCHUTES

FA No.: S004(231) Contractor: ODOT R4 GEOLOGY

Project Manager: SCOTT BILLINGS Org Unit: Bid Item: Submitted By: GREGORY-LEDERER Org Unit: 4630 Sample No.:

Qty Represented: ROCK @ DEPTH Material Source:

Sampled At: NCGDR-03 19.3-20.3' Sampled By:

Received: 21/6/4 Tested: 21/6/28 Date Reported: 21/ 6/28 DATE-Sampled:

Test Results For: ROCK CORE

T 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117

Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.23 % Dry Density rec'd: 157.27 PC Wet Density rec'd: 157.63 PC

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture
Opti	Max Density: mum Moisture:	

Sieve	Passing
3 " 2 1.5 1 3/4 1/2 3/8 1/4 # 4 10 40 200	

0.00

Quantity	Method	Cost
1	D7012	\$ 75.00
1	D4543	112.00
1	Т265	16.00
1	154X	75.00

	Hydron	meter .	Anal	ysis	Subsam	ole	Total	Sample
Coarse	Sand=	4.75	to	2.0	mm:			
Medium	Sand=	2.0	to	.42	mm:			
Fine	Sand=	.42	to	.074	mm:			
	Silt=	.074	to	.02	mm:			
	Silt=	.02	to	.005	mm:			
	Clay=	.005	to	.002	mm:			
	Clay=	Less	Than	.002	mm:			

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 14,990 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

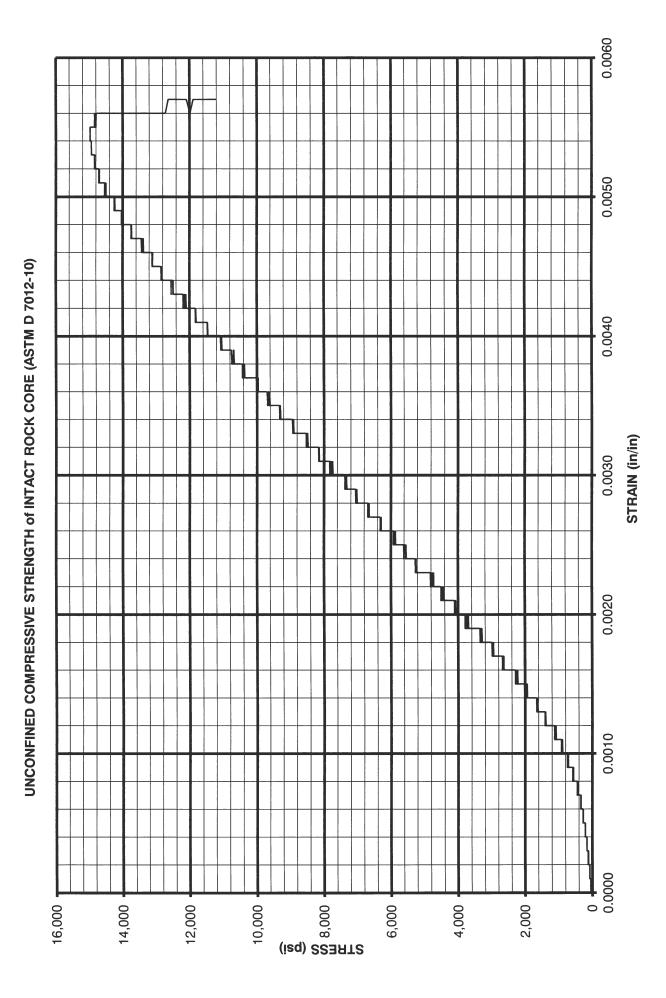
REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES ; PROJ MGR: SCOTT BILLINGS ; R ROdriguez - SOILS ; GREGORY-LEDERER - REGION 4 GEOLOGY TOM GRUMMON-R4 GEOLOGY

PROJECT	US97 @ Cooley (North C	orridor GDR)	LAB NUMBER	21-1143
SAMPLE #	NCGDR-03		DEPTH	19.3-20.3'
HEIGHT (in)	5.2876		INITIAL WET WT. (g)	986.5
DIAMETER (in)	2.3960		FINAL DRY WT. (g)	984.2
AREA (in²)	4.5088		MOISTURE (%)	0.24
Length to Diameter				
Ratio (L/D)	2.2	(2.0 - 2.5 Required)	WET DENSITY (lb/ft ³)	157.6
Maximum Stress (psi)	14,990		DRY DENSITY (lb/ft ³)	157.3
Strain Rate (%/min)	0.12			

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.14	415	0.0300	0.0057	92.0
0.28	741	0.0019	0.0004	164.3
0.42	1,133	0.0027	0.0005	251.3
0.56	1,693	0.0035	0.0007	375.5
0.69	2,548	0.0044	0.0008	565.1
0.83	3,834	0.0054	0.0010	850.3
0.97	5,392	0.0063	0.0012	1195.9
1.11	7,406	0.0072	0.0014	1642.6
1.25	9,775	0.0080	0.0015	2168.0
1.39	12,272	0.0088	0.0017	2721.8
1.53	14,990	0.0098	0.0019	3324.6
1.67	17,843	0.0107	0.0020	3957.4
1.80	20,599	0.0115	0.0022	4568.6
1.94	23,399	0.0124	0.0023	5189.6
2.08	25,914	0.0132	0.0025	5747.4
2.22	28,858	0.0141	0.0027	6400.4
2.36	31,689	0.0150	0.0028	7028.3
2.50	34,454	0.0159	0.0030	7641.5
2.64	37,285	0.0169	0.0032	8269.4
2.78	40,023	0.0177	0.0033	8876.6
2.91	42,799	0.0186	0.0035	9492.3
3.05	45,579	0.0194	0.0037	10108.9
3.19	48,376	0.0202	0.0038	10729.2
3.33	50,997	0.0213	0.0040	11310.5
3.47	53,622	0.0220	0.0042	11892.7
3.61	56,171	0.0230	0.0043	12458.1
3.75	58,614	0.0239	0.0045	12999.9
3.89	60,935	0.0248	0.0047	13514.7
4.02	63,074	0.0257	0.0049	13989.1
4.16	64,892	0.0265	0.0050	14392.3
4.30	66,441	0.0274	0.0052	14735.8
4.44	67,376	0.0283	0.0054	14943.2
4.58	67,296	0.0291	0.0055	14925.5
4.72	50,523	0.0300	0.0057	11205.4



ASTM D454	13 - Rock C	ore Dime	ntional and Shape ⁻	Tolerance Summary
Lab Number:	21-1143			
Project:	US97 @ C	ooley (No	orth Corridor GDR)	
Boring Number:	NCGDR-03	Sample	Number:	Depth: 19.3-20.3'
		Dime	entional Data	
Sample Length:	5.288		Ave. Diameter:	2.396
L/D Ratio:		Pass	End Area:	4.51
Volume:		газз	Initial Mass:	986.52
voiame.				300.32
		End To	End Parallelism	
Parallelism, Dias	s. 1A to 2A:	0.10	Pass Parallelism	of each end of the specimen
Parallelism, Dias	s. 1B to 2B:	80.0	Dacc	0.25° (ASTM D4543-08 9.2.1,
				rically seated upper platen).
			101 361161	really scated apper platery.
	End D	iameter To	Long Axis Perpendicular	rity
End 1, Dia. A:	0.0008	Pass	Pernendici	ularity of each diameter must
End 1, Dia. B:	0.0010	Pass		•
End 2, Dia. A:	0.0009	Pass	be ≤ / ₂₃	₀ = 0.0043 (ASTM D4543-08
End 2, Dia. B:	0.0004	Pass		9.3.1).
	S	ide Straight	ness And End Flatness	
Deviation from			Side Straigh	ntness should not exceed 0.020"
cylindrical:	< 0.020"	Pass	•	on (ASTM D4543-08 9.1.1).
End flatness ≤ 0.001"			Profile of r	measured data shall not depart
(Smoothness):			from best fi	t straight line in excess of 0.001"
(Simootimess).	< 0.001"	Pass	(4	ASTM D4543-08 9.2.1)
			pa . •	Hand.
			Equipment Wet Saw	Used: ☑
Tester:	JBG		Machinist Block	 ✓
			Feeler Gauge	✓
Checker:	RJR		"V" Block	
			Surface Grinder	✓
			Digital Micrometers	✓





OREGON DEPARTMENT OF TRANSPORTATION

MATERIALS LABORATORY

 $(50\overline{3})986-3000$ FAX(503)986-3096

800 AIRPORT RD. SE SALEM, OR 97301-4792

Contract No.: EA No.: PE003210 011 Lab No.: 21-001144

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630339

FA No.: S004(231) Contractor: ODOT R4 GEOLOGY

Bid Item: Project Manager: SCOTT BILLINGS Org Unit: Submitted By: GREGORY-LEDERER Org Unit: 4630 Sample No.:

Material Source: Qty Represented: ROCK @ DEPTH

Sampled At: NCGDR-18 10-10.7' Sampled By:

Received: 21/ 6/ 4 Tested: 21/ 6/28 DATE-Sampled: Date Reported: 21/ 6/28

Test Results For: ROCK CORE

Liquid Lim: т 89 T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.18 % Dry Density rec'd: 149.92 PC Wet Density rec'd: 150.19 PC

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture
 Optin	Max Density:	

Sieve	Passing
3 " 2 1.5 1 3/4 1/2 3/8 1/4 # 4 10 40 200	

0.00

Quantity	Method	Cost
1 1 1	D7012 D4543 T265 154X	\$ 75.00 112.00 16.00 75.00

Hydron	meter i	Anal	ysis	Subsample	Total	Sample
Sand= Sand= Silt= Silt=	2.0 .42 .074 .02	to to to	.42 .074 .02 .005	mm: mm: mm: mm:		
Clay= Clay=						

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 4,423 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

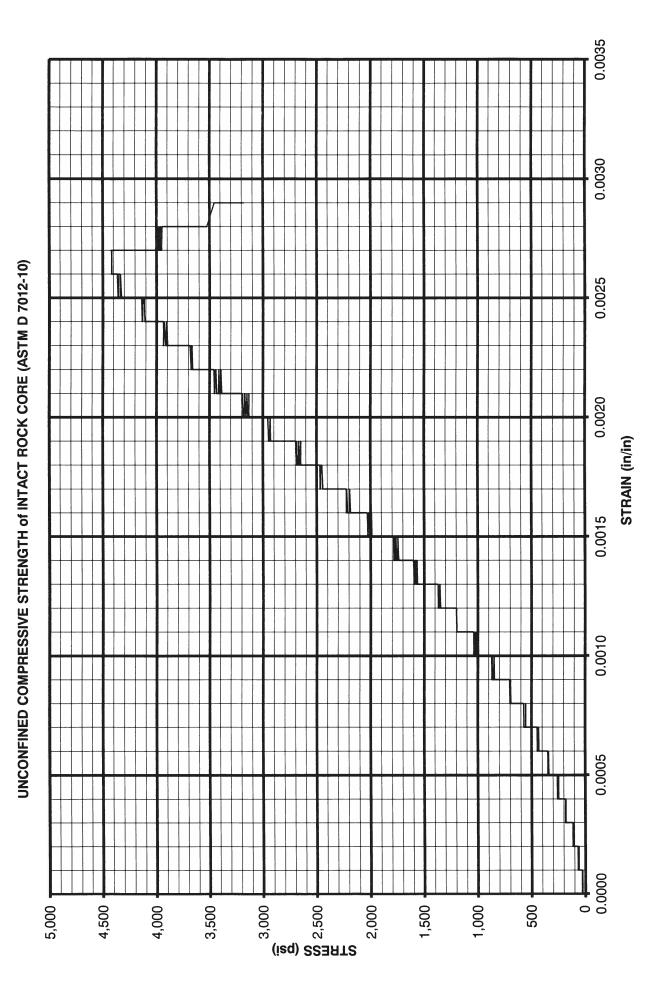
TOTAL CHARGES: \$

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES ; PROJ MGR: SCOTT BILLINGS ; R RODRIGUEZ - SOILS ; GREGORY-LEDERER - REGION 4 GEOLOGY TOM GRUMMON-R4 GEOLOGY

US97 @ Cooley (North Corridor GDR) 21-1144 **PROJECT** LAB NUMBER NCGDR-18 10-10.7' SAMPLE # **DEPTH** 5.5052 971.7 **HEIGHT (in) INITIAL WET WT. (g)** DIAMETER (in) 2.3875 FINAL DRY WT. (g) 970.0 AREA (in²) 4.4769 0.17 **MOISTURE (%)** Length to Diameter Ratio (L/D) 2.3 (2.0 - 2.5 Required) WET DENSITY (lb/ft³) 150.2 Maximum Stress (psi) 4,423 DRY DENSITY (lb/ft³) 149.9 Strain Rate (%/min) 0.12

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.07	207	0.0158	0.0029	46.2
0.14	363	0.0011	0.0002	81.1
0.21	563	0.0015	0.0003	125.8
0.28	813	0.0020	0.0004	181.6
0.34	1,091	0.0024	0.0004	243.7
0.41	1,398	0.0029	0.0005	312.3
0.48	1,758	0.0033	0.0006	392.7
0.55	2,181	0.0038	0.0007	487.2
0.62	2,628	0.0043	0.0008	587.0
0.69	3,151	0.0047	0.0009	703.8
0.76	3,721	0.0052	0.0009	831.2
0.83	4,316	0.0057	0.0010	964.1
0.89	4,949	0.0060	0.0011	1105.5
0.96	5,604	0.0065	0.0012	1251.8
1.03	6,309	0.0069	0.0013	1409.2
1.10	6,994	0.0074	0.0013	1562.2
1.17	7,818	0.0080	0.0015	1746.3
1.24	8,583	0.0084	0.0015	1917.2
1.31	9,372	0.0087	0.0016	2093.4
1.38	10,208	0.0093	0.0017	2280.1
1.45	11,077	0.0097	0.0018	2474.3
1.51	11,928	0.0102	0.0019	2664.3
1.58	12,828	0.0107	0.0019	2865.4
1.65	13,756	0.0110	0.0020	3072.7
1.72	14,669	0.0115	0.0021	3276.6
1.79	15,608	0.0120	0.0022	3486.3
1.86	16,533	0.0124	0.0023	3693.0
1.93	17,399	0.0128	0.0023	3886.4
2.00	18,297	0.0134	0.0024	4087.0
2.06	19,076	0.0137	0.0025	4261.0
2.13	19,628	0.0142	0.0026	4384.3
2.20	19,699	0.0146	0.0027	4400.1
2.27	17,732	0.0152	0.0028	3960.8
2.34	14,242	0.0158	0.0029	3181.2



ASTM D4543 - Rock Core Dimentional and Shape Tolerance Summary					
Lab Number:	21-1144				
Project: US97 @ Cooley (North Corridor GDR)					
Boring Number:			Number:	*	Depth: 10-10.7'
		Dime	entional I	Data	
Sample Length:	5.505		Ave	e. Diameter:	2.388
L/D Ratio:		Pass		End Area:	4.48
Volume				Initial Mass:	971.67
		End To	End Para	llelism	
Parallelism, Dias		80.0	Pass	Parallelism (of each end of the specimen
Parallelism, Dia	s. 1B to 2B:	80.0	Pass	must be ≤ 0	.25° (ASTM D4543-08 9.2.1,
				for spheric	cally seated upper platen).
				·	
	End D	iameter To	Long Axis	Perpendicularit	у
End 1, Dia. A	0.0010	Pass		Pernendicula	arity of each diameter must
End 1, Dia. B	0.0007	Pass		•	•
End 2, Dia. A	0.0003	Pass		be ≤ / ₂₃₀	= 0.0043 (ASTM D4543-08
End 2, Dia. B	8000.0	Pass			9.3.1).
	S	ide Straight	ness And	End Flatness	
Deviation from					
cylindrical:	< 0.020"	Pass		_	ness should not exceed 0.020"
,				deviatio	n (ASTM D4543-08 9.1.1).
End flatness ≤ 0.001"				Profile of m	easured data shall not depart
(Smoothness):				from best fit :	straight line in excess of 0.001"
(Sillootilless).	< 0.001"	Pass		(AS	STM D4543-08 9.2.1)
				Equipment U	sed:
				Wet Saw	
Tester	: JBG		Mad	chinist Block	
			F	eeler Gauge	
Checker	: RJR			"V" Block	
				face Grinder	
			Digital N	Micrometers	✓





800 AIRPORT RD. SE SALEM, OR 97301-4792

EA No.: PE003210 011

(503)986-3000FAX(503)986-3096

21-001145

Contract No.: Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630339

Org Unit:

Contractor: ODOT R4 GEOLOGY

Project Manager: SCOTT BILLINGS

Submitted By: GREGORY-LEDERER

Material Source:

Sampled At: NCGDR-19 17.7-18.9'

DATE-Sampled:

Received: 21/6/4 Tested: 21/6/28

Org Unit: 4630

Bid Item: Sample No.:

Qty Represented: ROCK @ DEPTH

Sampled By:

Lab No.:

FA No.: S004(231)

Date Reported: 21/6/28

Test Results For: ROCK CORE

Liquid Lim: T 89 T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.12 % Dry Density rec'd: 139.96 PC

Wet Density rec'd: 140.13 PC D4644 Slake Durab:

Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture
	Max Density:	
Opti	mum Moisture:	

Sieve	Passing
3 "	
2	
1.5	
1	
3/4	
1/2	
3/8	
1/4	
# 4	
10	
40	
200	
1	

0.00

Quantity	Method	Cost
1	D7012	\$ 75.00
1	T265	16.00
1	154X	75.00

	Hydron	meter A	Anal	ysis	Subsamp	ole	Total	Sample
Coarse Medium	Sand=	2.0	to	.42	mm:			
Fine	Silt=	.074	to to	.02 .005	mm: mm:			1
	4	.005 Less						

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 6,987 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

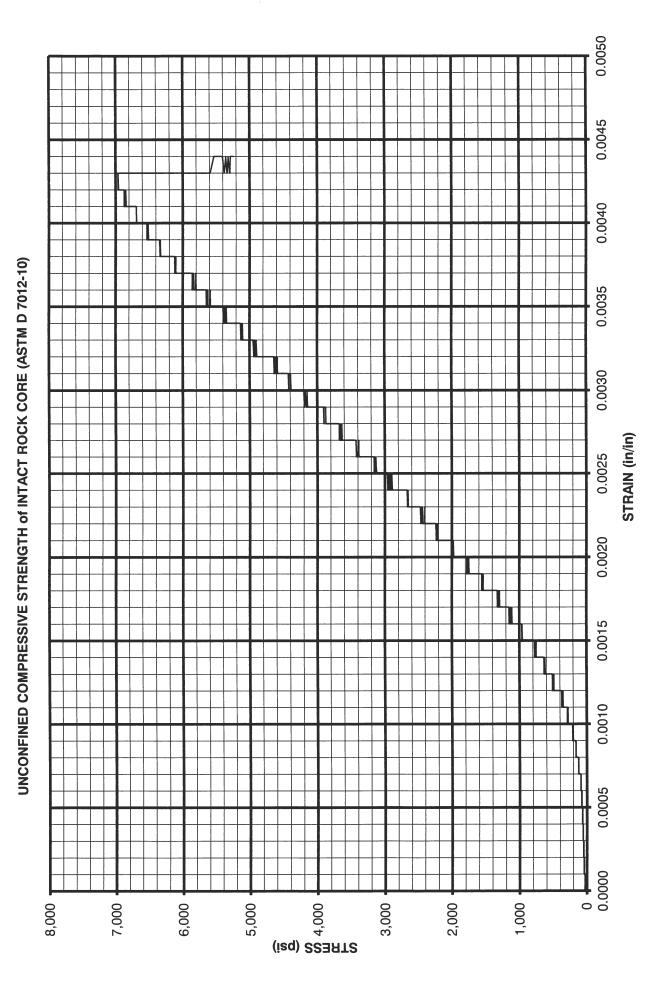
TOTAL CHARGES: \$

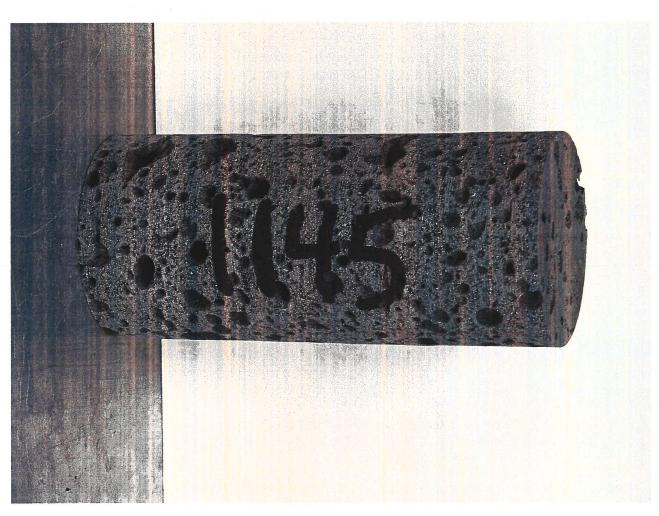
REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY. 'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES ; PROJ MGR: SCOTT BILLINGS ; R RODRIGUEZ - SOILS ; GREGORY-LEDERER - REGION 4 GEOLOGY TOM GRUMMON-R4 GEOLOGY

US97 @ Cooley (North Corridor GDR) 21-1145 **PROJECT** LAB NUMBER NCGDR-19 17.7-18.9' SAMPLE # **DEPTH** 5.3616 INITIAL WET WT. (g) 886.1 HEIGHT (in) 2.3919 FINAL DRY WT. (g) 885.0 DIAMETER (in) AREA (in²) 4.4934 0.13 MOISTURE (%) Length to Diameter 2.2 (2.0 - 2.5 Required) 140.1 Ratio (L/D) WET DENSITY (lb/ft³) 6,987 DRY DENSITY (lb/ft3) 139.9 Maximum Stress (psi) 0.12 Strain Rate (%/min)

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.11	190	0.0235	0.0044	42.3
0.21	229	0.0015	0.0003	51.0
0.32	269	0.0022	0.0004	59.9
0.43	342	0.0029	0.0005	76.1
0.53	440	0.0036	0.0007	97.9
0.64	620	0.0043	0.0008	138.0
0.75	889	0.0050	0.0009	197.8
0.85	1,259	0.0056	0.0010	280.2
0.96	1,773	0.0063	0.0012	394.6
1.07	2,490	0.0070	0.0013	554.1
1.17	3,342	0.0076	0.0014	743.8
1.28	4,333	0.0084	0.0016	964.3
1.39	5,410	0.0091	0.0017	1204.0
1.49	6,540	0.0097	0.0018	1455.5
1.60	7,802	0.0103	0.0019	1736.3
1.71	9,122	0.0111	0.0021	2030.1
1.81	10,433	0.0117	0.0022	2321.8
1.92	11,760	0.0124	0.0023	2617.2
2.03	13,149	0.0133	0.0025	2926.3
2.13	14,524	0.0138	0.0026	3232.3
2.24	15,970	0.0145	0.0027	3554.1
2.35	17,367	0.0152	0.0028	3865.0
2.45	18,784	0.0159	0.0030	4180.4
2.56	20,225	0.0166	0.0031	4501.0
2.67	21,670	0.0172	0.0032	4822.6
2.77	23,026	0.0179	0.0033	5124.4
2.88	24,472	0.0187	0.0035	5446.2
2.99	25,828	0.0194	0.0036	5748.0
3.09	27,248	0.0201	0.0037	6064.0
3.20	28,542	0.0207	0.0039	6352.0
3.31	29,574	0.0214	0.0040	6581.7
3.41	30,594	0.0220	0.0041	6808.7
3.52	31,320	0.0228	0.0043	6970.2
3.63	23,524	0.0235	0.0044	5235.2







800 AIRPORT RD. SE SALEM, OR 97301-4792

Page 0 of 9 (503)986-3000 FAX(503)986-3096

Contract No.: EA No.: PE003210 011 Lab No.: 21-001146

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630339

Contractor: ODOT R4 GEOLOGY FA No.: S004(231)

Project Manager: SCOTT BILLINGS Org Unit: Bid Item: Submitted By: GREGORY-LEDERER Org Unit: 4630 Sample No.:

Material Source: Qty Represented: ROCK @ DEPTH

Sampled At: NCGDR-20 4.6-6' Sampled By:

DATE-Sampled: Received: 21/6/4 Tested: 21/6/28 Date Reported: 21/6/28

Test Results For: ROCK CORE

T 89 Liquid Lim:
T 90 Plastic Ind:
T288 Resistivity: Ω
T289 pH:
T100 Spec Grav:
TM117
Torvane Shear/ Pocket Pen.

T265 N. Moisture: Dry Density rec'd: Wet Density rec'd: D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture
Opti	Max Density: mum Moisture:	

Sieve	Passing
3 " 2 1.5 1 3/4 1/2 3/8 1/4 # 4 10 40 200	

Quantity	Method	Cost
2 1 2	D7012 D4543 T265	\$ 75.00 112.00 16.00 75.00
2	1347	73.00

Hydrom	neter A	Anal	ysis	Subsam	ple	Total	Sample
Sand= Sand= Silt= Silt= Clay=		to to to to	.42 .074 .02 .005	mm: mm: mm: mm: mm:			

REMARKS:

INFORMATION ONLY

Sample A 21-1146A Uniaxial compressive strength = 14,105 psi Sample B 21-1146B Uniaxial compressive strength = 10,913 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

0.00

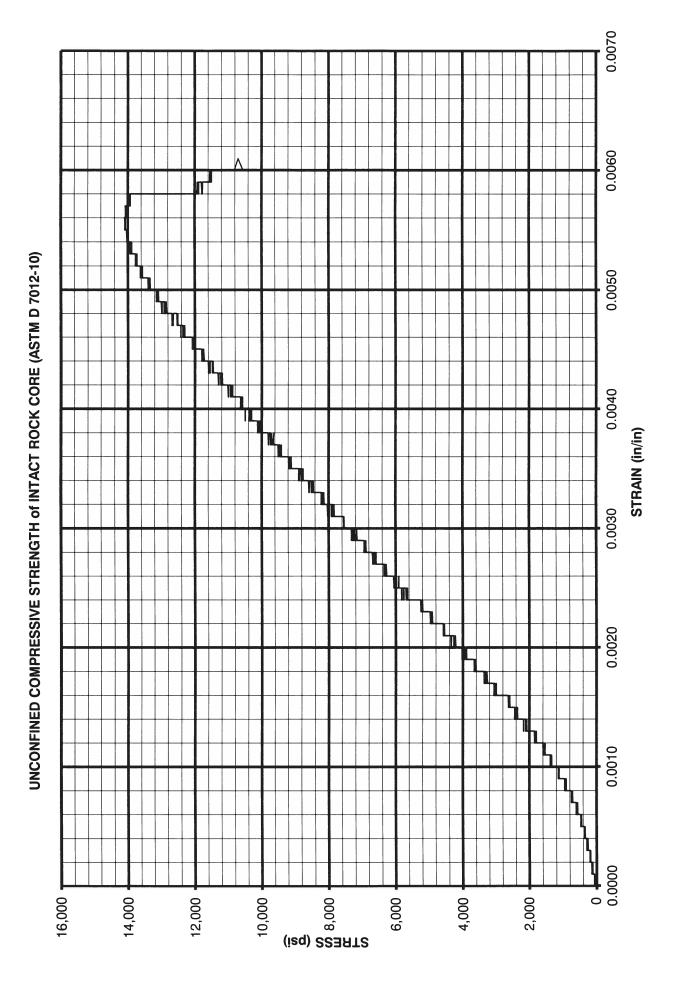
REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

C: FILES; PROJ MGR: SCOTT BILLINGS; R Rodriguez - SOILS; GREGORY-LEDERER - REGION 4 GEOLOGY TOM GRUMMON-R4 GEOLOGY

PROJECT US97 @ Cooley (North Corridor GDR) LAB NUMBER 21-1146 A SAMPLE # NCGDR-20 4.6-6.0' **DEPTH** 5.0311 INITIAL WET WT. (g) 940.9 HEIGHT (in) 2.3658 DIAMETER (in) FINAL DRY WT. (g) 939.5 AREA (in²) 4.3959 0.15 MOISTURE (%) Length to Diameter Ratio (L/D) (2.0 - 2.5 Required) 2.1 WET DENSITY (lb/ft³) 162.1 Maximum Stress (psi) 14,105 DRY DENSITY (lb/ft3) 161.8 0.12 Strain Rate (%/min)

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.15	735	0.0304	0.0060	167.2
0.29	1,323	0.0020	0.0004	301.0
0.44	2,115	0.0028	0.0006	481.1
0.59	3,260	0.0038	0.0008	741.6
0.74	4,707	0.0047	0.0009	1070.8
0.88	6,457	0.0056	0.0011	1468.9
1.03	8,386	0.0065	0.0013	1907.7
1.18	10,560	0.0071	0.0014	2402.2
1.32	12,727	0.0081	0.0016	2895.2
1.47	15,190	0.0091	0.0018	3455.5
1.62	17,651	0.0099	0.0020	4015.3
1.77	20,127	0.0108	0.0021	4578.6
1.91	22,626	0.0117	0.0023	5147.1
2.06	25,677	0.0127	0.0025	5841.1
2.21	28,043	0.0136	0.0027	6379.4
2.35	30,550	0.0143	0.0028	6949.7
2.50	32,992	0.0152	0.0030	7505.2
2.65	35,472	0.0162	0.0032	8069.3
2.80	37,839	0.0171	0.0034	8607.8
2.94	40,339	0.0179	0.0036	9176.5
3.09	42,788	0.0189	0.0038	9733.6
3.24	45,095	0.0198	0.0039	10258.4
3.38	47,357	0.0207	0.0041	10773.0
3.53	49,724	0.0216	0.0043	11311.4
3.68	51,859	0.0224	0.0045	11797.1
3.83	53,993	0.0233	0.0046	12282.6
3.97	55,991	0.0241	0.0048	12737.1
4.12	57,958	0.0250	0.0050	13184.6
4.27	59,597	0.0259	0.0051	13557.4
4.41	61,003	0.0268	0.0053	13877.2
4.56	61,760	0.0276	0.0055	14049.5
4.71	61,835	0.0286	0.0057	14066.5
4.86	52,080	0.0296	0.0059	11847.4
5.00	46,400	0.0304	0.0060	10555.3

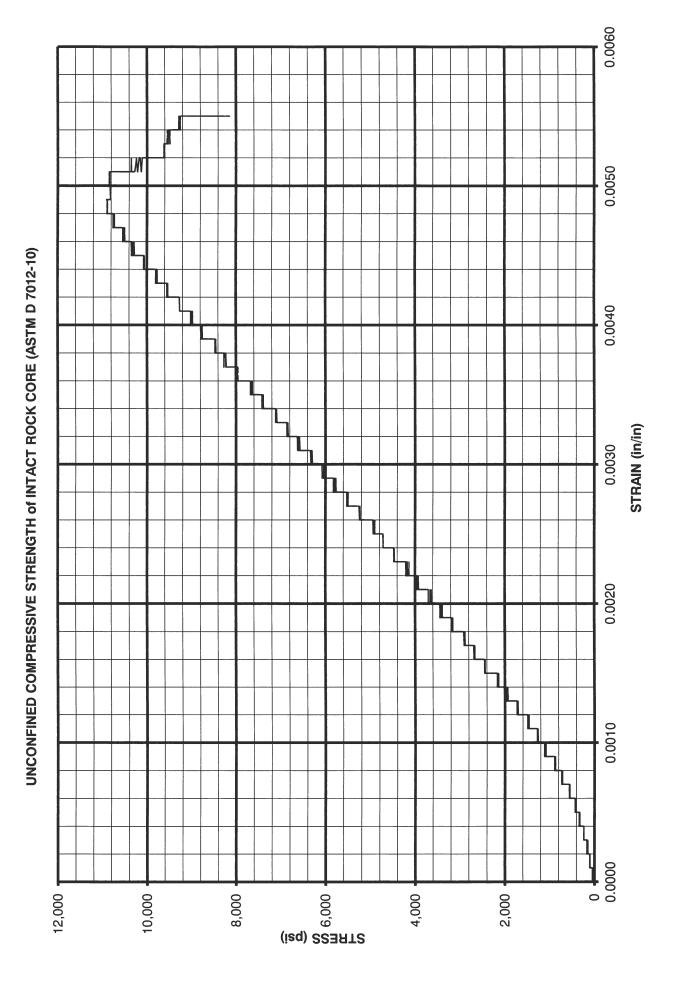






US97 @ Cooley (North Corridor GDR) **PROJECT LAB NUMBER** 21-1146 B NCGDR-20 4.6-6.0' SAMPLE # DEPTH 5.3710 INITIAL WET WT. (g) **HEIGHT (in)** 1,008.5 2.3750 DIAMETER (in) FINAL DRY WT. (g) 1,007.6 AREA (in²) 4.4301 MOISTURE (%) 0.09 Length to Diameter WET DENSITY (lb/ft³) Ratio (L/D) 2.3 (2.0 - 2.5 Required) 161.5 Maximum Stress (psi) 10,913 DRY DENSITY (lb/ft³) 161.3 0.12 Strain Rate (%/min)

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.13	566	0.0294	0.0055	127.8
0.27	1,103	0.0019	0.0004	249.0
0.40	1,772	0.0028	0.0005	400.0
0.53	2,661	0.0037	0.0007	600.7
0.67	3,829	0.0044	0.0008	864.3
0.80	5,210	0.0053	0.0010	1176.0
0.94	6,646	0.0062	0.0012	1500.2
1.07	8,276	0.0072	0.0013	1868.1
1.20	9,958	0.0080	0.0015	2247.8
1.34	11,730	0.0088	0.0016	2647.8
1.47	13,469	0.0097	0.0018	3040.3
1.60	15,346	0.0106	0.0020	3464.0
1.74	17,114	0.0114	0.0021	3863.1
1.87	18,929	0.0123	0.0023	4272.8
2.00	20,790	0.0130	0.0024	4692.9
2.14	22,674	0.0139	0.0026	5118.2
2.27	24,596	0.0148	0.0028	5552.0
2.41	26,519	0.0157	0.0029	5986.1
2.54	28,406	0.0166	0.0031	6412.0
2.67	30,323	0.0175	0.0033	6844.8
2.81	32,183	0.0183	0.0034	7264.6
2.94	34,122	0.0191	0.0036	7702.3
3.07	36,157	0.0200	0.0037	8161.7
3.21	38,024	0.0208	0.0039	8583.1
3.34	39,833	0.0217	0.0040	8991.4
3.47	41,753	0.0226	0.0042	9424.8
3.61	43,616	0.0234	0.0044	9845.4
3.74	45,362	0.0244	0.0045	10239.5
3.88	46,994	0.0252	0.0047	10607.9
4.01	48,245	0.0261	0.0049	10890.3
4.14	48,060	0.0269	0.0050	10848.5
4.28	43,726	0.0278	0.0052	9870.2
4.41	42,413	0.0287	0.0053	9573.8
4.54	36,058	0.0294	0.0055	8139.3



ASTM D454	43 - Rock C	ore Dime	ntional and Shape	Tolerance Summary
Lab Number:	21-1146B			
Project:	US97 @ C	ooley (No	orth Corridor GDR)	
Boring Number:	NCGDR-20	Sample	Number:	Depth: 4.6-6.0'
		Dime	entional Data	
Sample Length:	5.371		Ave. Diameter:	2.375
L/D Ratio:	2.26	Pass	End Area:	4.43
Volume:	23.79		Initial Mass:	1008.50
		End To	End Parallelism	
Parallelism, Dias	s. 1A to 2A:	0.22	Pass Darallolion	of each end of the specimen
Parallelism, Dias	s. 1B to 2B:	0.19	Dacc	•
				0.25° (ASTM D4543-08 9.2.1,
			for spne	rically seated upper platen).
	End D	iameter To	Long Axis Perpendicula	rity
End 1, Dia. A:	0.0013	Pass	Perpendici	ularity of each diameter must
End 1, Dia. B:	0.0014	Pass	•	₃₀ = 0.0043 (ASTM D4543-08
End 2, Dia. A:	0.0023	Pass	DC = 723	
End 2, Dia. B:	0.0016	Pass		9.3.1).
	S	ide Straight	ness And End Flatness	
Deviation from cylindrical:	< 0.020"	Pass	_	htness should not exceed 0.020" ion (ASTM D4543-08 9.1.1).
End flatness ≤ 0.001"				measured data shall not depart it straight line in excess of 0.001"
(Smoothness):	< 0.001"	Pass		ASTM D4543-08 9.2.1)
			Equipment Wet Saw	Used:
Tester:	JBG		Machinist Block	☑
	· - 		Feeler Gauge	
Checker:	RJR		"V" Block	
			Surface Grinder	$\overline{\square}$
			Digital Micrometers	✓





800 AIRPORT RD. SE SALEM, OR 97301-4792

Page of 4 (503)986-3000 FAX(503)986-3096

Contract No.: EA No.: PE003210 011 Lab No.: 21-001147

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Highway: THE DALLES-CALIFORNIA County: DESCHUTES Data Sheet No.: G 4630339

Contractor: ODOT R4 GEOLOGY

Project Manager: SCOTT BILLINGS Org Unit: Bid Item: Submitted By: GREGORY-LEDERER Org Unit: 4630 Sample No.:

Material Source:
Sampled At: NCGDR-21 7.8-8.5'

Qty Represented: ROCK @ DEPTH

Sampled By:

FA No.: S004(231)

DATE-Sampled: Received: 21/6/4 Tested: 21/6/28 Date Reported: 21/6/28

Test Results For: ROCK CORE

T 89 Liquid Lim:
T 90 Plastic Ind:
T288 Resistivity: Ω
T289 pH:
T100 Spec Grav:
TM117
Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.16 %
Dry Density rec'd: 153.90 PC
Wet Density rec'd: 154.15 PC

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry Densit	y Moisture
Max De	nsity:

Max Density:
Optimum Moisture:

Sieve	Passing
3 " 2 1.5 1 3/4 1/2 3/8 1/4 # 4 10 40 200	

Quantity	Method	Cost
1	D7012	\$ 75.00
1	T265	16.00
1	154X	75.00

		Hydron	neter 1	Anal	ysis	Suk	osample	Total	Sample
	Coarse								
	Medium	Sand=	2.0	to	.42	mm:			
	Fine	Sand=	.42	to	.074	mm:			
Ì		Silt=	.074	to	.02	mm:			
		Silt=	.02	to	.005	mm:			
		Clay=	.005	to	.002	mm:			
		Clay=	Less '	Than	.002	mm:			

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 6,973 psi

*

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

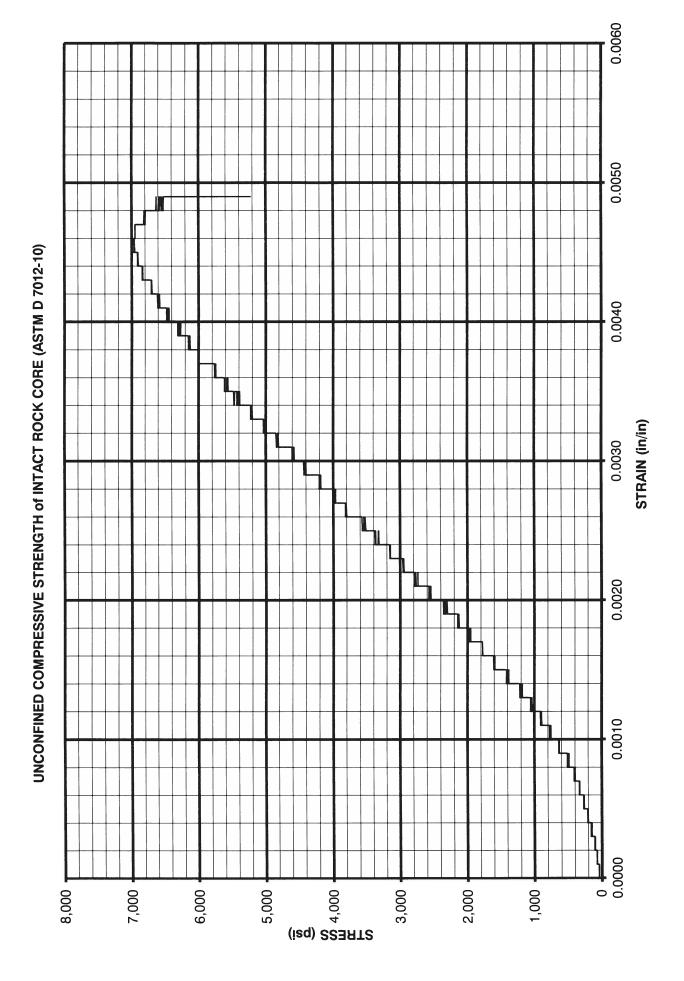
0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

US97 @ Cooley (North Corridor GDR) 21-1147 **PROJECT** LAB NUMBER NCGDR-21 SAMPLE # **DEPTH** 7.8-8.5' 5.1750 HEIGHT (in) INITIAL WET WT. (g) 931.4 DIAMETER (in) 2.3799 FINAL DRY WT. (g) 929.9 AREA (in²) 4.4484 **MOISTURE (%)** 0.16 Length to Diameter Ratio (L/D) 2.2 (2.0 - 2.5 Required) WET DENSITY (lb/ft³) 154.1 Maximum Stress (psi) 6,973 DRY DENSITY (lb/ft³) 153.9 Strain Rate (%/min) 0.12

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.12	342	0.0255	0.0049	76.9
0.24	574	0.0015	0.0003	129.0
0.36	897	0.0023	0.0004	201.6
0.48	1,298	0.0031	0.0006	291.8
0.60	1,772	0.0038	0.0007	398.3
0.72	2,432	0.0045	0.0009	546.7
0.84	3,227	0.0052	0.0010	725.4
0.96	4,146	0.0060	0.0012	932.0
1.08	5,162	0.0068	0.0013	1160.4
1.20	6,228	0.0076	0.0015	1400.1
1.32	7,419	0.0083	0.0016	1667.8
1.44	8,578	0.0090	0.0017	1928.3
1.56	9,884	0.0097	0.0019	2221.9
1.68	11,181	0.0106	0.0020	2513.5
1.80	12,423	0.0113	0.0022	2792.7
1.92	13,768	0.0120	0.0023	3095.0
2.04	15,054	0.0128	0.0025	3384.1
2.16	16,342	0.0135	0.0026	3673.7
2.28	17,626	0.0143	0.0028	3962.3
2.40	19,027	0.0150	0.0029	4277.3
2.52	20,327	0.0157	0.0030	4569.5
2.64	21,593	0.0165	0.0032	4854.1
2.76	22,939	0.0172	0.0033	5156.7
2.88	24,196	0.0180	0.0035	5439.3
3.00	25,406	0.0187	0.0036	5711.3
3.11	26,530	0.0194	0.0037	5963.9
3.23	27,650	0.0201	0.0039	6215.7
3.35	28,700	0.0210	0.0041	6451.8
3.47	29,543	0.0217	0.0042	6641.3
3.59	30,291	0.0224	0.0043	6809.4
3.71	30,837	0.0231	0.0045	6932.2
3.83	30,970	0.0239	0.0046	6962.1
3.95	30,166	0.0247	0.0048	6781.3
4.07	23,237	0.0255	0.0049	5223.7







800 AIRPORT RD. SE SALEM, OR 97301-4792

 $(50\overline{3})986-3000$ FAX(503)986-3096

EA No.: PE003210 011 21-001148 Contract No.: Lab No.:

Project: US97 AND COOLEY ROAD (BEND) MID-TERM IMPROVEMENTS

Data Sheet No.: G 4630339 Highway: THE DALLES-CALIFORNIA County: DESCHUTES

FA No.: S004(231) Contractor: ODOT R4 GEOLOGY

Bid Item: Project Manager: SCOTT BILLINGS Org Unit: Org Unit: 4630 Sample No.: Submitted By: GREGORY-LEDERER

Oty Represented: ROCK @ DEPTH Material Source:

Sampled At: NCGDR-22 7.3-7.8' Sampled By:

Received: 21/ 6/4 Tested: 21/ 6/28 Date Reported: 21/ 6/28 DATE-Sampled:

Test Results For: ROCK CORE

T 89 Liquid Lim: T 90 Plastic Ind: T288 Resistivity: Ω T289 pH: T100 Spec Grav: TM117 Torvane Shear/ Pocket Pen.

T265 N. Moisture: 0.06 % Dry Density rec'd: 157.52 PC Wet Density rec'd: 157.62 PC

D4644 Slake Durab: Water Cont:

D2974 Pct Organic:

Dry	Density	Moisture
 Opti	Max Density: mum Moisture:	

Sieve Passing		
3 "	 Sieve	Passing
2 1.5 1 3/4 1/2 3/8 1/4 # 4 10 40 200	2 1.5 1 3/4 1/2 3/8 1/4 # 4 10 40	

0.00

Quantity	Method	Cost
1	D7012	\$ 75.00
1	D4543	112.00
1	T265	16.00
1	154X	75.00

	Hydron	meter A	Anal	ysis	Subsample	Total	Sample
Coarse	Sand=	4.75	to	2.0	mm:		
Medium	Sand=	2.0	to	.42	mm:		
Fine	Sand=	.42	to	.074	mm:		
	Silt=	.074	to	.02	mm:		
	Silt=	.02	to	.005	mm:		
	Clay=	.005	to	.002	mm:		
	Clay=	Less	T han	.002	mm:		

REMARKS:

INFORMATION ONLY

Uniaxial compressive strength = 8,244 psi

KEVIN BROPHY - LABORATORY SERVICES MANAGER

TOTAL CHARGES: \$

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

'TM' TEST METHODS CAN BE CROSS-REFERENCED WITH AASHTO AND/OR ASTM, CONTACT THIS LAB FOR ASSISTANCE.

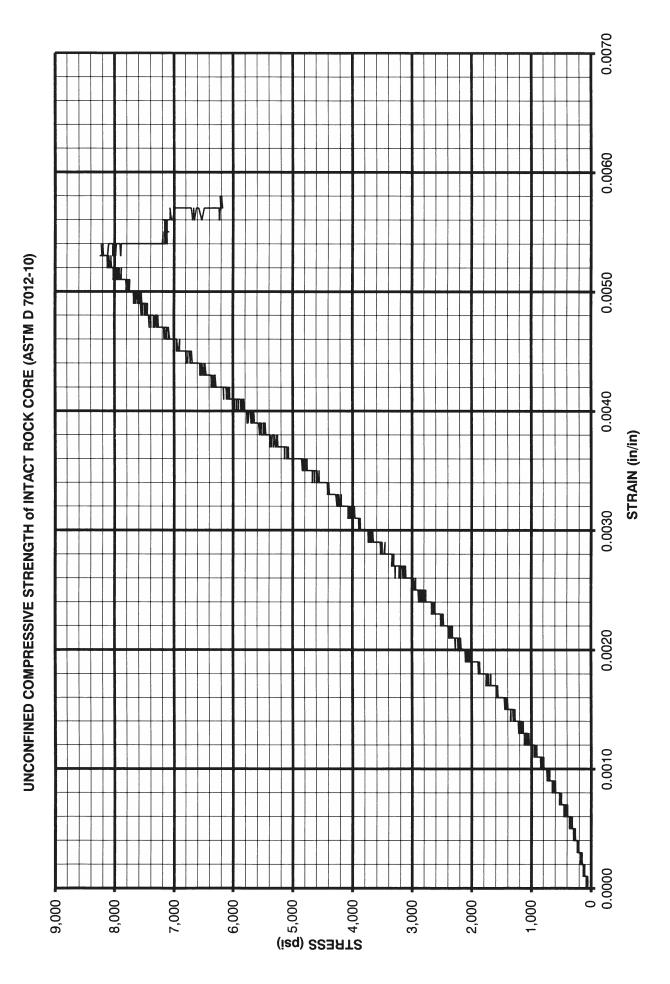
C: FILES; PROJ MGR: SCOTT BILLINGS; R RODRIQUEZ - SOILS; GREGORY-LEDERER - REGION 4 GEOLOGY TOM GRUMMON-R4 GEOLOGY

SAMPLE #
HEIGHT (in)
DIAMETER (in)
AREA (in²)
Length to Diameter
Ratio (L/D)
Maximum Stress (psi)
Strain Rate (%/min)

PROJECT

	US97 @ Cooley (Nort	h Corridor GDR)	LAB NUMBER	21-1148
	NCGDR-22		DEPTH	7.3-7.8'
	4.8885		INITIAL WET WT. (g)	909.4
	2.3925		FINAL DRY WT. (g)	908.9
	4.4957		MOISTURE (%)	0.06
_	2.0	(2.0 - 2.5 Required)	WET DENSITY (lb/ft³)	157.6
)	8,244		DRY DENSITY (lb/ft ³)	157.5
	0.12			

TIME (min)	LOAD (lb)	DEFLECTION (in)	STRAIN (in/in)	STRESS (psi)
0.00	0	0.0000	0.0000	0.0
0.14	593	0.0280	0.0057	131.9
0.28	997	0.0018	0.0004	221.8
0.42	1,468	0.0025	0.0005	326.5
0.56	2,054	0.0033	0.0007	456.9
0.70	2,776	0.0043	0.0009	617.5
0.84	3,550	0.0051	0.0010	789.6
0.99	4,498	0.0059	0.0012	1000.5
1.13	5,394	0.0067	0.0014	1199.8
1.27	6,426	0.0076	0.0016	1429.4
1.41	7,456	0.0081	0.0017	1658.5
1.55	8,621	0.0093	0.0019	1917.6
1.69	9,763	0.0100	0.0020	2171.6
1.83	10,933	0.0106	0.0022	2431.9
1.97	12,130	0.0117	0.0024	2698.1
2.11	13,364	0.0125	0.0026	2972.6
2.25	14,777	0.0134	0.0027	3286.9
2.39	16,084	0.0141	0.0029	3577.6
2.53	17,438	0.0150	0.0031	3878.8
2.68	18,794	0.0158	0.0032	4180.4
2.82	20,369	0.0168	0.0034	4530.8
2.96	21,744	0.0174	0.0036	4836.6
3.10	23,618	0.0183	0.0037	5253.5
3.24	25,191	0.0191	0.0039	5603.4
3.38	26,637	0.0200	0.0041	5925.0
3.52	28,352	0.0209	0.0043	6306.5
3.66	29,886	0.0215	0.0044	6647.7
3.80	31,456	0.0225	0.0046	6996.9
3.94	32,822	0.0233	0.0048	7300.8
4.08	33,912	0.0241	0.0049	7543.2
4.22	35,340	0.0248	0.0051	7860.8
4.37	36,577	0.0257	0.0053	8136.0
4.51	32,507	0.0265	0.0054	7230.7
4.65	32,248	0.0273	0.0056	7173.1
4.79	27,758	0.0280	0.0057	6174.3



ASTM D4543 - Rock Core Dimentional and Shape Tolerance Summary							
Lab Number:	21-1148						
Project:	US97 @ C	Cooley (No	rth Corridor GDR)				
Boring Number:	NCGDR-22	Sample	Number:	Depth: 7.3-7.8'			
Dimentional Data							
Sample Length:	4.889		Ave. Diameter:	2.393			
L/D Ratio:	2.04	Pass					
Volume:	21.98		Initial Mass:	909.41			
End To End Parallelism							
Parallelism, Dias	. 1A to 2A:	0.06	Pass Dawn Hall				
Parallelism, Dias	Parallelism of each end of the			· ·			
				0.25° (ASTM D4543-08 9.2.1, ically seated upper platen).			
			ioi spilei	ically seated upper platerly.			
	End [Diameter To	Long Axis Perpendicular	ity			
End 1, Dia. A:	8000.0	Pass	Pernendicu	larity of each diameter must			
End 1, Dia. B:	0.0007	Pass		$^{1}/_{230} = 0.0043$ (ASTM D4543-08			
End 2, Dia. A:		Pass					
End 2, Dia. B:	0.0028	Pass	9.3.1).				
		Side Straighti	ness And End Flatness				
Deviation from			Sido Straigh	tnoss should not ovecad 0 020"			
cylindrical:	< 0.020"	Pass	Side Straightness should not exceed 0.02 deviation (ASTM D4543-08 9.1.1).				
Fr. d flat			Profile of r	measured data shall not depart			
End flatness ≤ 0.001" (Smoothness):			from best fit	t straight line in excess of 0.001"			
(51110041111033).	< 0.001"	Pass	(A	ASTM D4543-08 9.2.1)			
			<u>-</u>				
			Equipment Wet Saw	Used: ✓			
Tester: JBG			Machinist Block				
			Feeler Gauge				
Checker: RJR			"V" Block				
			Surface Grinder				
Digital Micrometers							



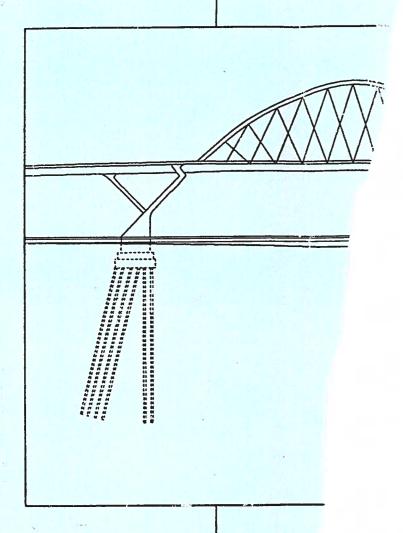


APPENDIX C - Historical Data

Bend Parkway Phase 1 Foundation Report
Bend Parkway Phase 1 Foundation Report Addendum
Bend Parkway ODOT Bridge Engineering Section - Assorted Design Sheets

Foundat

Bend Parkway, Phase 1 The Dalles-California Deschutes County Bridges 16532, 17323



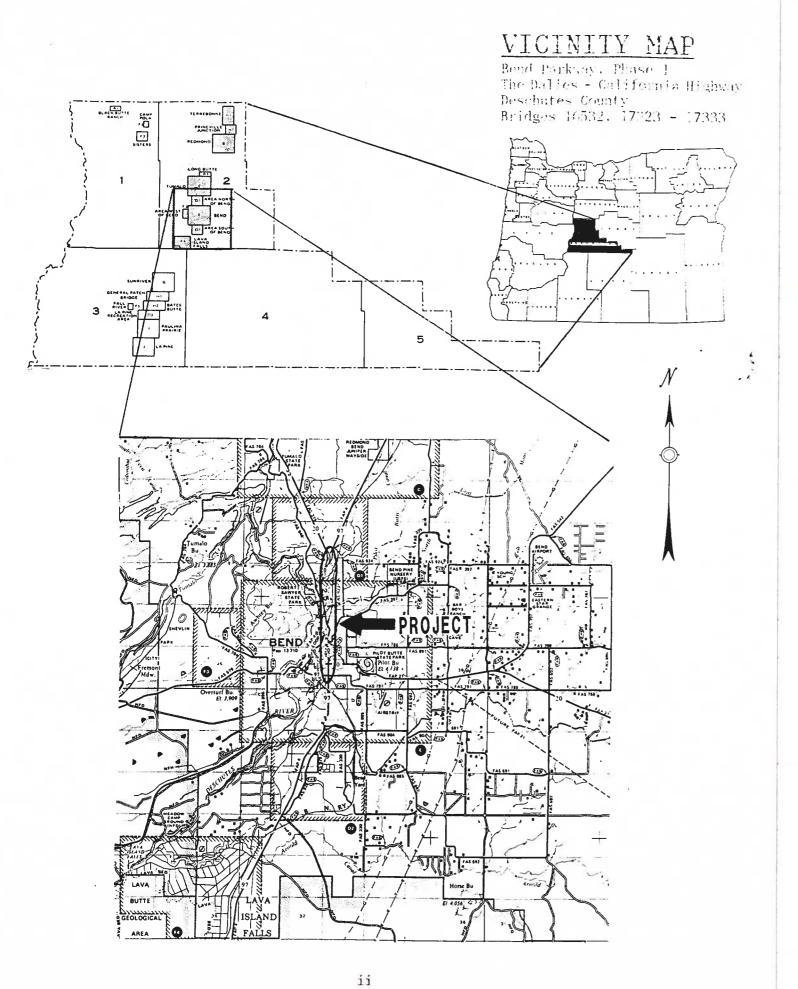
Orego

TABLE OF CONTENTS

	<u>Page</u>
Table of Contents	i
Vicinity Map	ii
Foundation Report	1
Figure 1	13
Appendix	
Foundation Data Sheets	
Exploration Logs	
Geology Report	

i





FOUNDATION REPORT

Bend Parkway, Phase 1 The Dalles-California Highway Deschutes County Bridges 16532, 17323 through 17333

INTRODUCTION

The proposed project will increase the capacity of The Dalles-California Highway by providing an alternate route through the City of Bend. The proposed project will include the widening of three existing bridges and the construction of nine new bridges. A brief description of each proposed bridge is presented in the following paragraphs.

The proposed 240-foot long, 33-foot wide, three-span Sisters Interchange structure (Bridge 17323) will consist of cast-in-place, post-tensioned box girders. The proposed structure width will accommodate one travel lane and shoulders.

The proposed 158-foot long, 79-foot wide, single-span Empire Avenue Undercrossing structure (Bridge 17325) will consist of cast-in-place, post-tensioned box girders. The proposed structure width will accommodate four travel lanes, shoulders and sidewalks.

The existing 130-foot long, 49-foot wide, three-span Empire Avenue Overcrossing B.N.R.R. structure was constructed in 1986. The structure is composed of precast, prestressed concrete slabs. The design of the existing structure was performed by OBEC Consulting Engineers. The current proposal (Bridge 17326) involves 16 and 28-foot widenings on the north and south sides of the existing structure, respectively. The resulting 92-foot structure width will accommodate four travel lanes, a median, shoulders and sidewalks.

The proposed 136-foot long, single-span Butler Market Road Overcrossing structure (Bridge 17327) will consist of cast-in-place, post-tensioned box girders. The proposed structure width will vary from 109 feet at Bent 1 to 115 feet at Bent 2.



The proposed width will accommodate four travel lanes, an on-ramp lane, a median, shoulders and sidewalks.

The proposed 195-foot long, 82-foot wide, single-span Third Street Overcrossing structure (Bridge 17328) will consist of cast-in-place, post-tensioned box girders. The proposed structure width will accommodate four travel lanes, shoulders and sidewalks.

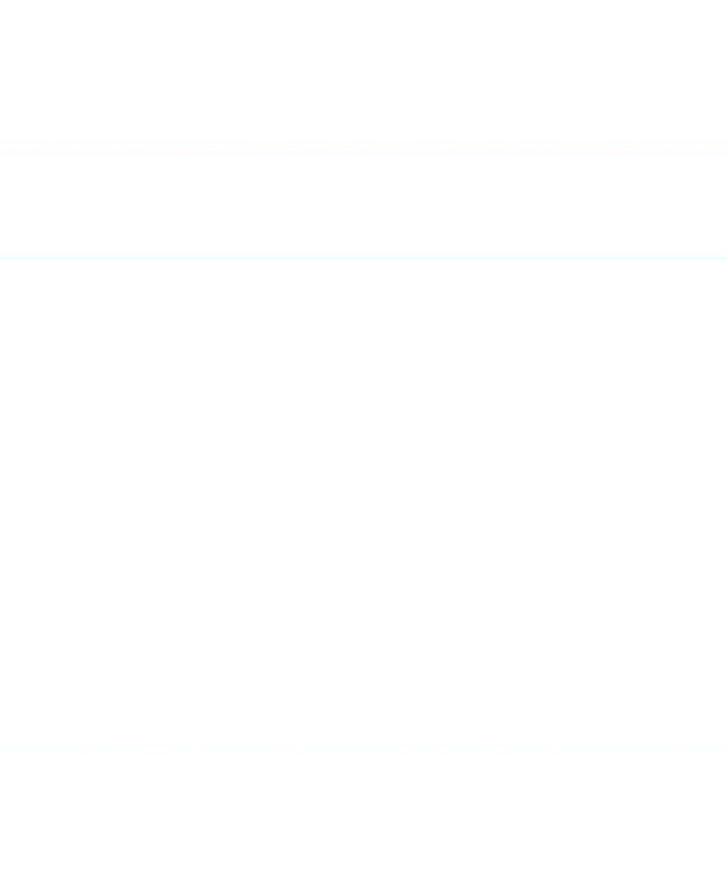
The proposed 370-foot long, 83-foot wide, three-span Division Street Overcrossing structure (Bridge 17329) will consist of cast-in-place, post-tensioned box girders and precast, prestressed Bulb-T beams with continuous post-tensioning. The proposed structure width will accommodate four travel lanes, a median and shoulders.

The proposed 121-foot long, 107-foot wide, single-span Revere Avenue Overcrossing structure (Bridge 17330) will consist of cast-in-place, post-tensioned box girders. The proposed structure width will accommodate six travel lanes, a median and shoulders.

The proposed 92-foot long, 87-foot wide, single-span Olney Avenue Overcrossing structure (Bridge 17331) will consist of cast-in-place, post-tensioned box girders. The proposed structure width will provide four travel lanes, a median, a sidewalk and shoulders.

The existing 81-foot long, 52-foot wide, two-span Greenwood Avenue Overcrossing structure was constructed in 1985. The structure is composed of precast, prestressed concrete slabs. The current proposal (Bridge 16532) involves a 44-foot widening on the east side of the existing structure. The resulting 96-foot structure width will accommodate four travel lanes, a median, shoulders and a sidewalk.

The existing 43-foot long, 52-foot wide, single-span Franklin Avenue Overcrossing structure was constructed in 1979. The structure is composed of precast, prestressed concrete slabs. The current proposal (Bridge 17324) involves a 48-foot widening on the east side of the existing structure. The resulting 100-foot structure width will accommodate four travel lanes, a median, shoulders and a sidewalk.



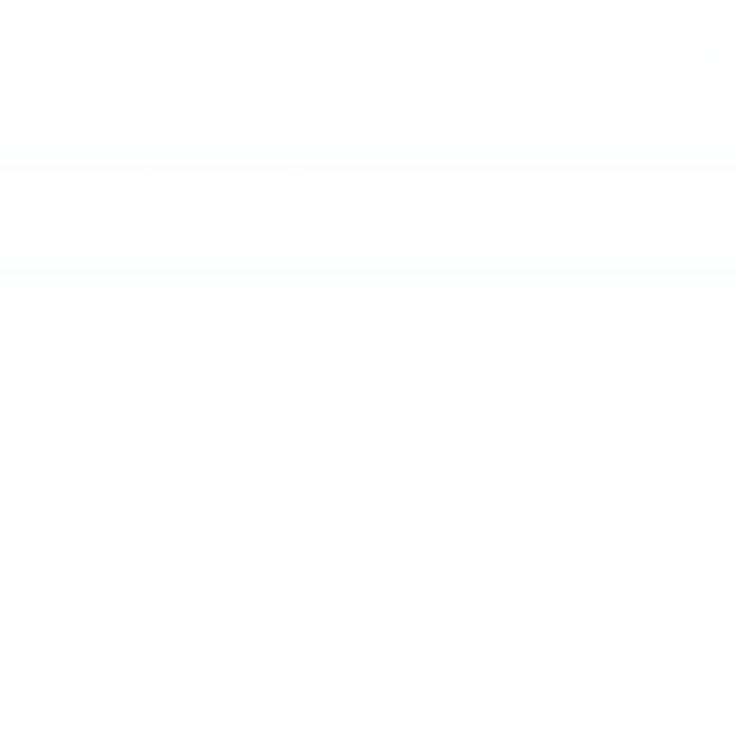
The proposed 275-foot long, two-span Colorado Avenue and B.N.R.R. Overcrossing structure (Bridge 17332) will consist of cast-in-place, post-tensioned box girders. The proposed structure width will vary from 98 feet at Bent 1 to 87 feet at Bent 3. The proposed width will accommodate four travel lanes, a median, and shoulders.

The proposed 129-foot long, 87-foot wide, two-span Central Oregon Irrigation (C.O.I.) Canal Overcrossing will consist of a composite superstructure. The main 110-foot long span over the canal will consist of precast, prestressed Bulb-T beams. The remaining 19-foot long span over the canal access road will be a cast-in-place slab. The proposed structure width will accommodate four travel lanes, a median and shoulders.

OFFICE EVALUATION

The Salem Bridge files were researched for foundation information pertaining to the existing Greenwood Avenue Overcrossing structure. Deschutes County Public Works Department was contacted about foundation information for the existing Empire Boulevard Overcrossing B.N.R.R. structure. Plans for the existing Franklin Avenue Overcrossing structure were obtained from the City of Bend. The available foundation information for the existing structures is described in the following paragraphs.

Steel H-piles (HP 10x42) with reinforced pile tips were used for foundation support at Bents 1 and 4, and spread footings were used for foundation support at Bents 2 and 3 on the existing Empire Boulevard Overcrossing B.N.R.R. structure. The steel H-piles were driven to a minimum bearing of 43 tons. The estimated pile tip elevations were 3527 and 3524 feet at Bents 1 and 4, respectively. The average "as-constructed" pile tip elevations were 3534.3 and 3531.9 feet at Bents 1 and 4, respectively. The spread footings were designed for a maximum bearing capacity of 3 tons per square foot. The "as-constructed" bottom of footing elevation at Bent 2 could not be determined from the construction documents. The design and "as-constructed" bottom of footing elevations at Bent 3 were the same, although personnel from Deschutes County Public Works Department indicated that the Bent 3 footing was constructed on approximately 2 feet of lean concrete (placed during a change work order).



Spread footings were used for foundation support at Bents 1 through 3 on the existing Greenwood Avenue Overcrossing structure. The spread footings were designed for required bearing capacities of 1.5 tsf at Bents 1 and 3 and 6.1 tsf at Bent 2. The design bottom of footing elevation was approximately 3606 feet for Bents 1 through 3. No "as-constructed" footing elevations were provided on the available information.

Spread footings were used for foundation support at Bents 1 and 2 on the existing Franklin Avenue Overcrossing structure. The design bottom of footing elevation was approximately 3627 feet for Bents 1 and 2. No design bearing capacities or "as-constructed" footing elevations were provided on the available information. The spread footings were founded on "native material" compacted to 95% relative maximum density. The depth to rock under the footings was listed as ± 2 and ± 5 feet for the east and west ends of the footings, respectively.

SUBSURFACE FIELD EXPLORATIONS

A total of 24 exploratory holes were drilled near the proposed structure locations by the Region 4 Geology Group. The exploratory holes were drilled in 1981 (2 holes), 1982 (2 holes) and 1992 (20 holes). The 1981 exploratory holes were drilled with a Mobile B-50 drill rig and related drilling equipment. The 1982 exploratory holes were drilled with a Longyear drill rig and related drilling equipment. The 1992 exploratory holes were drilled with a CME-75 drill rig and related drilling equipment. The approximate locations of the exploratory holes are shown on the respective Foundation Data Sheets in the Appendix.

The subsurface materials encountered in the exploratory holes may generally be described as follows: pumiceous sand with varying amounts of silt overlying vesicular basalt. Fill material (soil descriptions range from sand with trace silt to basalt gravel, cobbles and boulders) and man-made materials (asphalt and concrete) were encountered above the pumiceous sand layer in the exploratory holes located within developed areas of the project. The thickness of the fill materials varied from 2 feet near the Franklin Avenue Overcrossing structure to 22 feet near the proposed Empire Boulevard Undercrossing structure. The thickness of the pumiceous sand layer ranged from about 1 to 6 feet. The vesicular basalt was typically described as slightly weathered to fresh and hard.



More detailed descriptions of the materials encountered in the exploratory holes are presented on the exploration logs and in the Geology Report in the Appendix.

Groundwater was not encountered in any of the exploratory holes.

HYDRAULICS INFORMATION

The Hydraulics information for the C.O.I. Canal Overcrossing was not available at the time of writing this report. The forthcoming Hydraulics Report should be consulted for the specific hydraulic recommendations for the C.O.I. Canal Overcrossing structure.

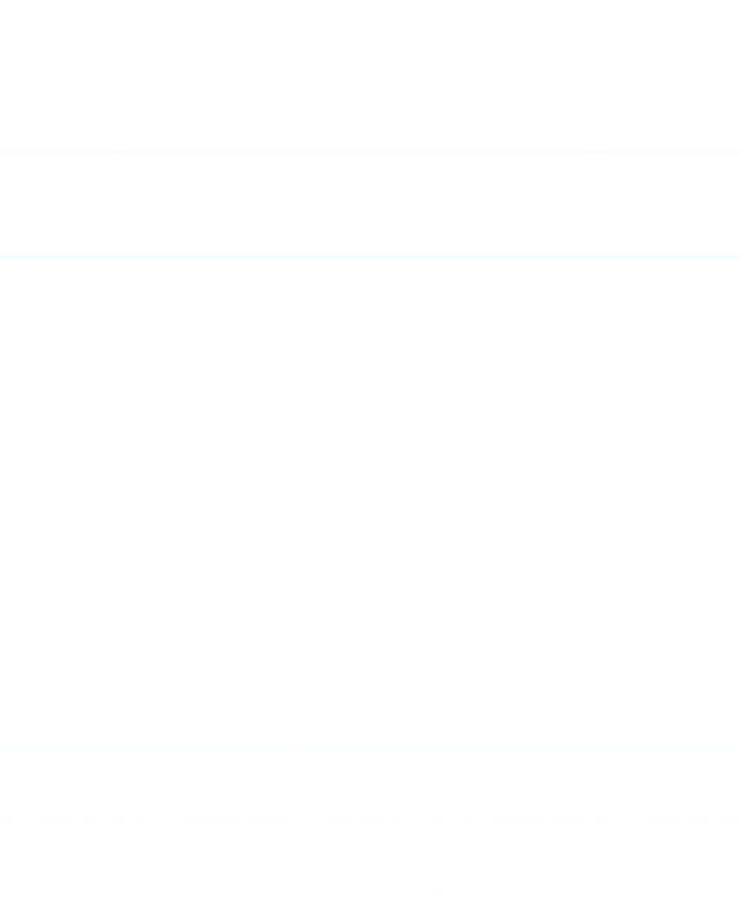
FOUNDATION RECOMMENDATIONS

General

The ideal foundation for support of the proposed structures and structure widenings would be spread footings embedded a minimum of 1 foot in the underlying basalt. However, due to the potential abutment depths, it may be more economical to support the spread footings at the end bents on the approach embankment fill material. If the structural designer determines that spread footings should be founded on fill material for economic reasons, engineered fill should be used. The typical requirements and dimensions for engineered fill are shown on Figure 1. If applicable, the specific requirements for the engineered fill will be addressed in the following subsections.

An average allowable bearing capacity of 3 tons per square foot may be used for determining the spread footing dimensions, if engineered fill is used. The edge pressures for temporary (transient) loads may be increased to 3.9 tons per square foot. It is anticipated that settlement of the spread footings founded on engineered fill will be negligible, if the engineered fill is properly constructed.

The foundation recommendations provided in the following subsections are based on the assumption that all spread footings will be founded on basalt. (The only exception to this assumption is for the widening of Empire Avenue Overcrossing



B.N.R.R. structure). The bottom of footing elevations provided for each bent are typically a minimum of 1 foot below the estimated rockline elevation.

Unless otherwise recommended in the following subsections, an average allowable bearing capacity of 5 tons per square foot may be used for determining the dimensions of spread footings founded on basalt. The edge pressures for temporary (transient) loads may be increased to 6.5 tons per square foot. It is anticipated that settlement of all spread footings founded on basalt will be negligible.

If the structural designer determines that the spread footings should be supported on basalt, then field verification of the actual footing elevations will be necessary. The footing elevations provided in the following subsections are based on rockline elevations determined from the subsurface explorations and linear interpolations (where necessary). The actual rockline elevations of the bent locations may differ from the estimated rockline elevations due to the inherent variability of the basalt flows in the Bend area.

Sisters Interchange - Bridge 17323

The approximate bottom of footing elevations for each bent are listed in the following table.

<u>Bent</u>	Approximate Bottom of Footing <u>Elevation (feet)</u>
1	3505
2	3501
3	3503
4	3504

If the end bent spread footings are founded on engineered fill, the stone backfill material should extend to a minimum depth of 3 feet below the existing ground surface.

Empire Avenue Undercrossing - Bridge 17325

The approximate bottom of footing elevations for both bents are listed in the following table.

Approximate
Bottom of Footing
Elevation (feet)

3534
2 3529

Widening of Empire Avenue Overcrossing of B.N.R.R. - Bridge 17326

The foundation for the structure widening should be the same as that used for the existing structure. The following recommendations are based on the original foundation design and the "as-constructed" information.

Steel H-piles with reinforced tips should be used to support Bents 1 and 4 for the proposed widening. The estimated lengths for the H-piles are provided in the following table.

Bent	Pile Type	Ult. Bearing (kips)	Est. C.O. Elev. (ft.)	Est. Tip Elev. (ft.)	Est. Length (ft.)	Tip Elev. for Min. Penetra- tion (ft.)
1	HP 10x42	270	3551	3531	20	3539
4	HP 10x42	270	3551	3531	20	3539

The allowable axial design loads may be calculated by dividing the ultimate bearing value by a factor of safety of 3. The H-piles should be driven based on criteria developed from the Gates Equation.

Spread footings should be used to support Bents 2 and 3 for the proposed widening. The approximate bottom of footing elevation for both bents is 3525 feet. A maximum bearing capacity of 3 tons per square foot may be used for determining the spread footing dimensions for the Bent 2 spread footings. Since basalt bedrock was not encountered during construction for the existing Bent 3 footings, the spread footings for the Bent 3 widening should be founded on a 2-foot thick layer of lean concrete. A maximum allowable bearing pressure of 1.5 tons per square foot may be used to determine the dimensions for the lean



concrete pad. However, the dimensions of the widened lean concrete pad should at least match the "as-constructed" dimensions of the existing lean concrete pad.

Butler Market Road Overcrossing - Bridge 17327

The approximate bottom of footing elevations for both bents are listed in the following table.

	Approximate				
	Bottom of Footing				
<u>Bent</u>	Elevation (feet)				
1	3553				
2	3550				

Third Street Overcrossing - Bridge 17328

The approximate bottom of footing elevations for both bents are listed in the following table.

	Approximate				
	Bottom of Footing				
<u>Bent</u>	Elevation (feet)				
1	3563				
2	3568				

Division Street Overcrossing - Bridge 17329

The approximate bottom of footing elevations for each bent are listed in the following table.

<u>Bent</u>	Bottom of Footing <u>Elevation (feet)</u>
1	3576
2	3580
3	3588
4	3592

If the Bent 1 spread footing is founded on engineered fill, the stone backfill material should extend to a minimum depth of 8 feet below the ground surface or to the top of the basalt, whichever is higher.



Revere Avenue Overcrossing - Bridge 17330

The approximate bottom of footing elevations for both bents are listed in the following table.

	Approximate				
	Bottom of Footing				
<u>Bent</u>	Elevation (feet)				
1	3610				
2	3615				

If the spread footings are founded on engineered fill, the stone embankment material should extend to a minimum depth of 2 feet below the existing ground surface.

Olney Avenue Overcrossing - Bridge 17331

The approximate bottom of footing elevations for both bents are listed in the following table.

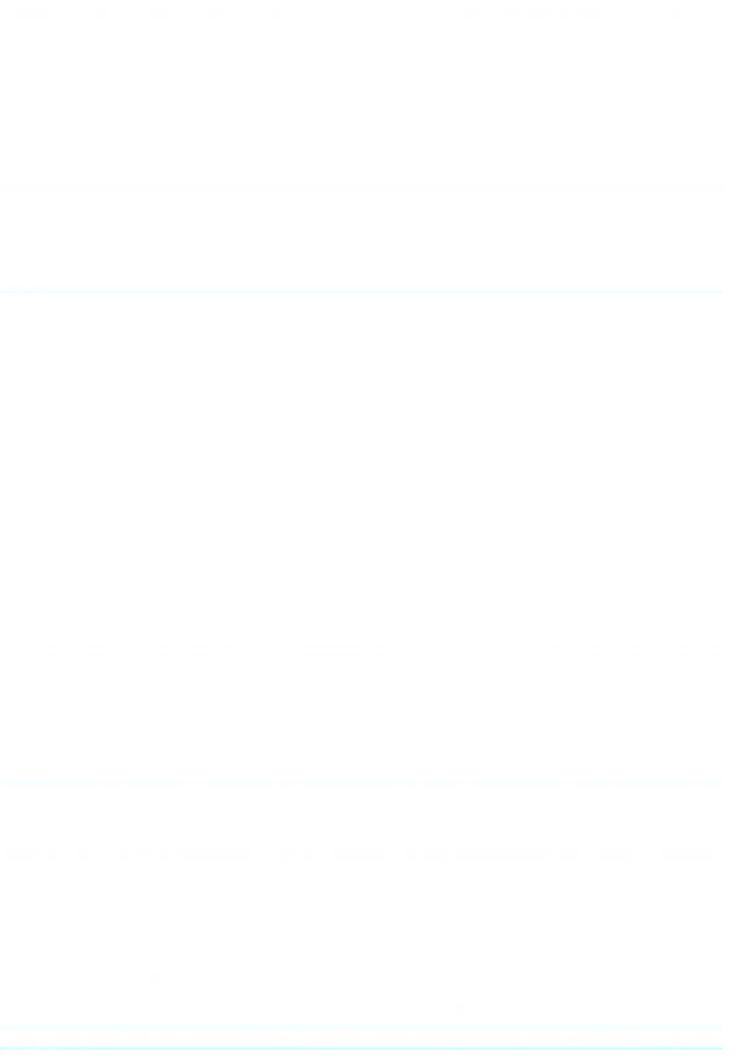
	Approximate
	Bottom of Footing
<u>Bent</u>	<u>Elevation (feet)</u>
1	3605
2	3611

Greenwood Avenue Overcrossing Widening - Bridge 16532

The proposed structure widening should be supported on spread footings at Bents 1 through 3. The bottom of footing elevations should match the existing footing elevations. The anticipated bottom of footing elevation is 3606 feet for Bents 1 through 3. The rockline elevation varies from about 3612 to 3608 feet in the general vicinity of the proposed structure widening.

Franklin Avenue Overcrossing Widening - Bridge 17324

The proposed structure widening should be supported on spread footings at Bents 1 and 2. The bottom of footing elevations should match the existing footing elevations. The anticipated approximate bottom of footing elevation is 3627 feet at both bents. The rockline elevation varies from about 3628 to 3629 feet near the west side of the proposed widening. If the spread footings are founded on engineered fill, the stone embankment material should extend to the rockline.



Colorado Avenue and B.N.R.R. Overcrossing - Bridge 17332

The approximate bottom of footing elevations for each bent are listed in the following table.

	Approximate Bottom of Footing			
<u>Bent</u>	Elevation (feet)			
1	3651			
2	3644			
3	3646			

Central Oregon Irrigation Canal Overcrossing - Bridge 17333

The approximate bottom of footing elevations for each bent are provided in the following table.

	Approximate Bottom of Footing
<u>Bent</u>	Elevation (feet)
1	3733
2	3733
3	3733

If the spread footings are founded on engineered fill, the stone embankment material should extend a minimum of 4 feet below the ground surface.

SEISMIC DESIGN

The bedrock acceleration coefficient for the proposed project location is estimated to be 0.14 g. The soil profile type is estimated to be Type I, as described in Section 3.5 of the 1983 <u>AASHTO Guide Specifications for Seismic Design of Highway Bridges</u>.

The nature of the subsurface soils encountered in the exploratory holes, the shallow depths to bedrock, and the absence of groundwater, all indicate the soils are not susceptible to liquefaction during a seismic event.

CONSTRUCTION

Excavation procedures other than blasting should be considered for spread footing construction. If it is determined that blasting is the only feasible excavation method, then strict blasting control should be specified. Uncontrolled blasting

may result in excess excavation quantities or undesirable fracturing of the basalt at the spread footing foundation level.

The estimated bottom of footing elevations should be field verified during construction to insure a minimum 1-foot embedment into basalt. All spread footings on basalt should be constructed on undisturbed material, wherever practical.

It is anticipated that groundwater will not be encountered in the spread footing excavations. If groundwater is encountered, normal dewatering techniques should effectively dewater the footing foundation material.

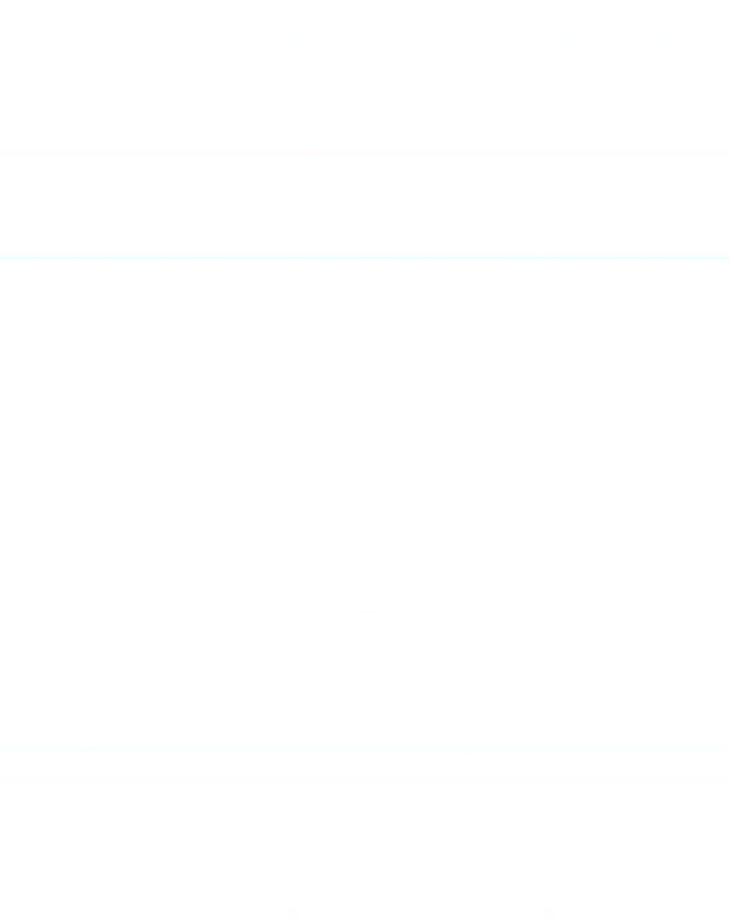
Foundation excavation for the spread footings at the C.O.I. Canal structure should be performed during the months when the canal is not in continuous operation.

A Pile Driving and Equipment Data Sheet should be completed by the contractor, checked by the inspector, and forwarded to the Bridge Foundation Unit for approval at least 14 days prior to pile driving operations.

Any falsework used to facilitate construction may be supported on mudsill foundations.

LIMITATIONS

The analyses and recommendations presented in this report are based on the data obtained from the subsurface explorations performed at the locations indicated on the Foundation Data Sheet and from other sources of information discussed in this report. The subsurface explorations have provided detailed information at specific locations in the project area. However, variations in soil conditions may exist between the exploration holes and groundwater levels may fluctuate periodically. The data shown in the log of each boring applies only to that particular boring drilled on the date(s) indicated and is not intended to be conclusive as to the character of any material or conditions between or around the test borings (see Standard Specification 00120.25). Any interpretation or evaluation of this report by individuals outside of the Bridge Section is done so at the sole risk of the individuals.



The nature and extent of any variations in subsurface materials or conditions may not become evident until construction. If subsurface conditions different from those identified in the exploration holes are observed or are encountered during construction, or appear to be present beneath or beyond excavations, we should be advised at once so that we can observe and review these conditions and reconsider our design recommendations where necessary.

Conclusions and recommendations made in this report are based on preliminary design and location data. In the event that any changes in the basic design take place, we should be given the opportunity to review the changes and to modify or reaffirm in writing our design recommendation.

The preliminary plans and special provisions should be submitted to us so that we can check that they are in substantial conformance with the conclusions and recommendations contained in this report. We recommend that construction operations relating to earthwork and foundations be observed by a Region Geologist or personnel from the Bridge Foundation Unit to determine if the work is proceeding in accordance with the intent of the geotechnical recommendations and to allow for design changes as necessary.

Prepared by:

Robert William Burns, P.E. Foundation Design Engineer

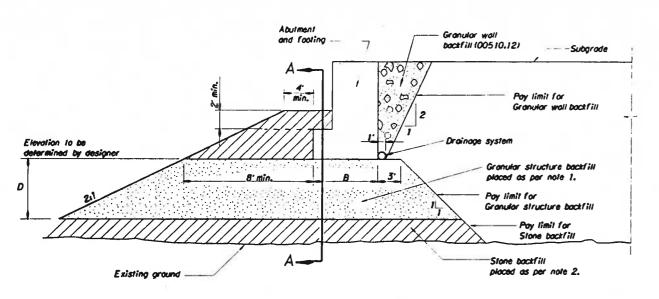
Expires: 12-31-93

Reviewed by:

Approved by:

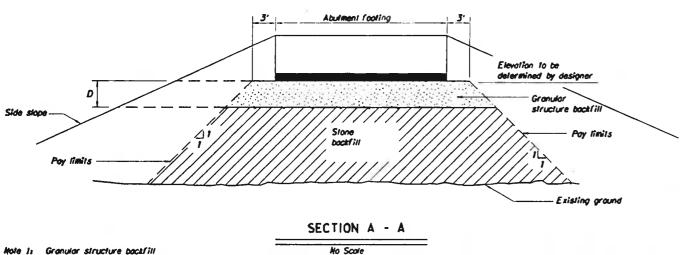
Terry J. Shike, P.E. Bridge Engineer

RWB:krm 02-24-93



ENGINEERED FILL
(TYPICAL SECTION)

D = 5' or footing width, B, whichever is greater.



Note 1: Granular structure backfill shall conform to Standard Specification 00510.13 and be compacted in accordance with subsection 00330.42.(C118),

Mote 2: Stone bookfill shall conform to Special Provision 00330,17 and be placed and compacted in accordance with subsection 00330.42,1C) (8).

OREGON DEPARTMENT OF TRANSPORTATION
BRIDGE DESIGN SECTION

ENGINEERED FILL - STANDARD DRAWING

BEND PARKWAY PHASE 1

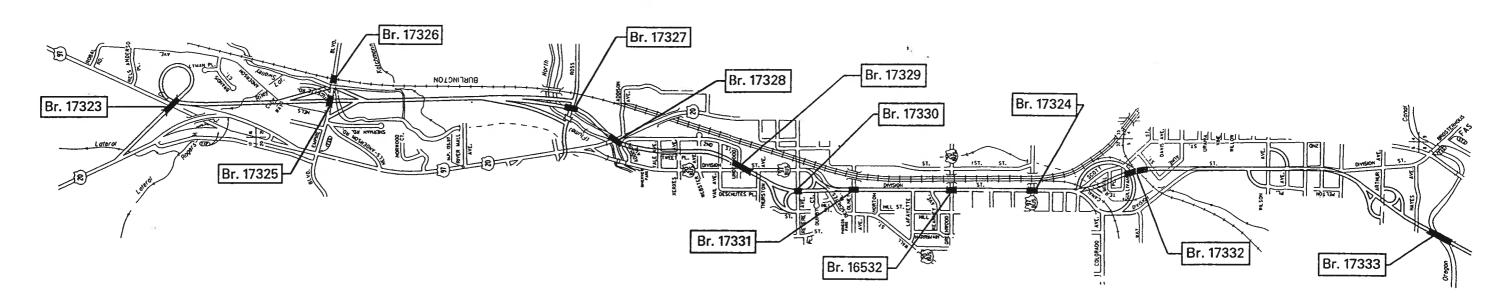
APPENDIX

Foundation Report



OREGON DEPARTMENT OF TRANSPORTATION STRUCTURAL DESIGN SECTION



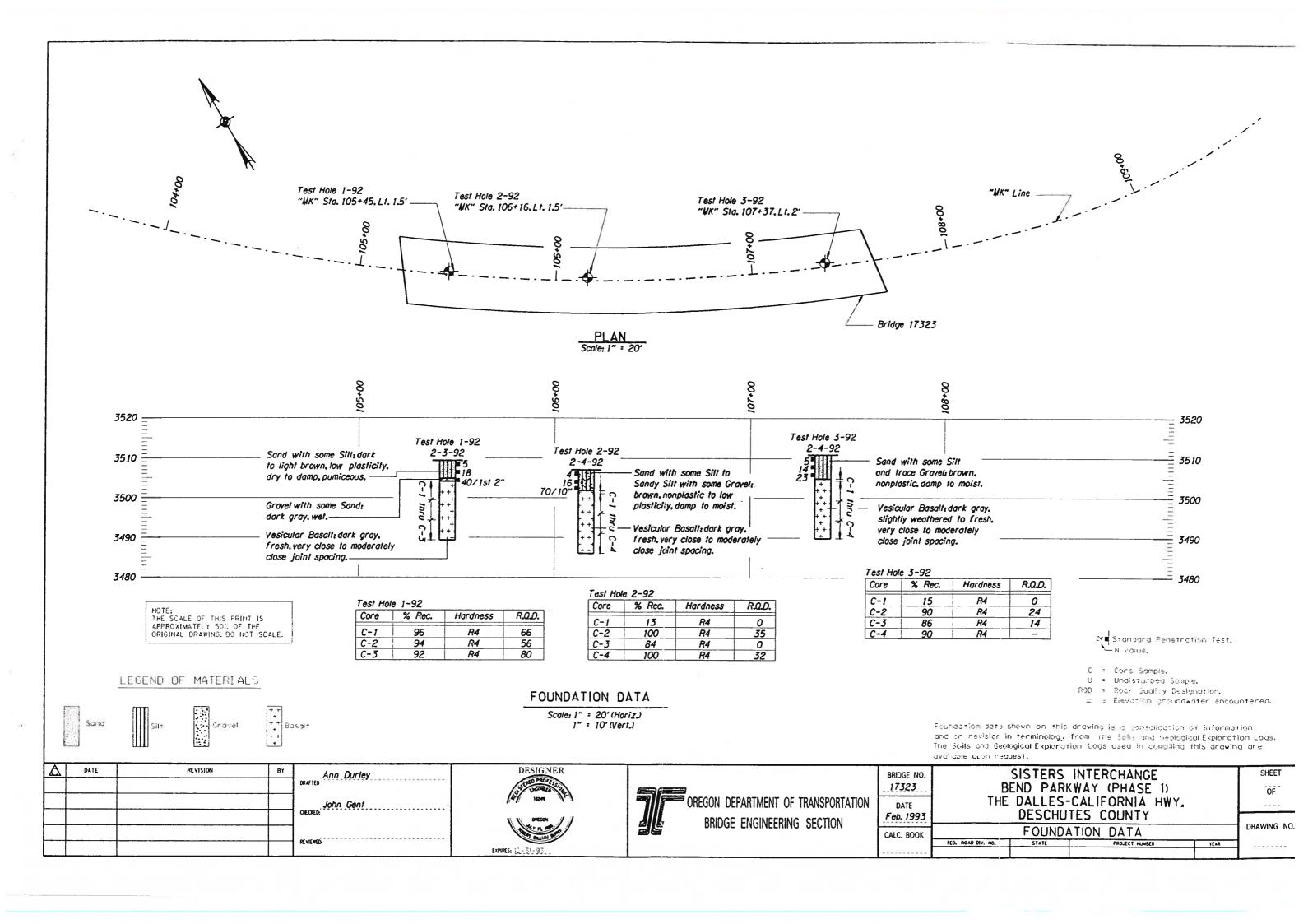


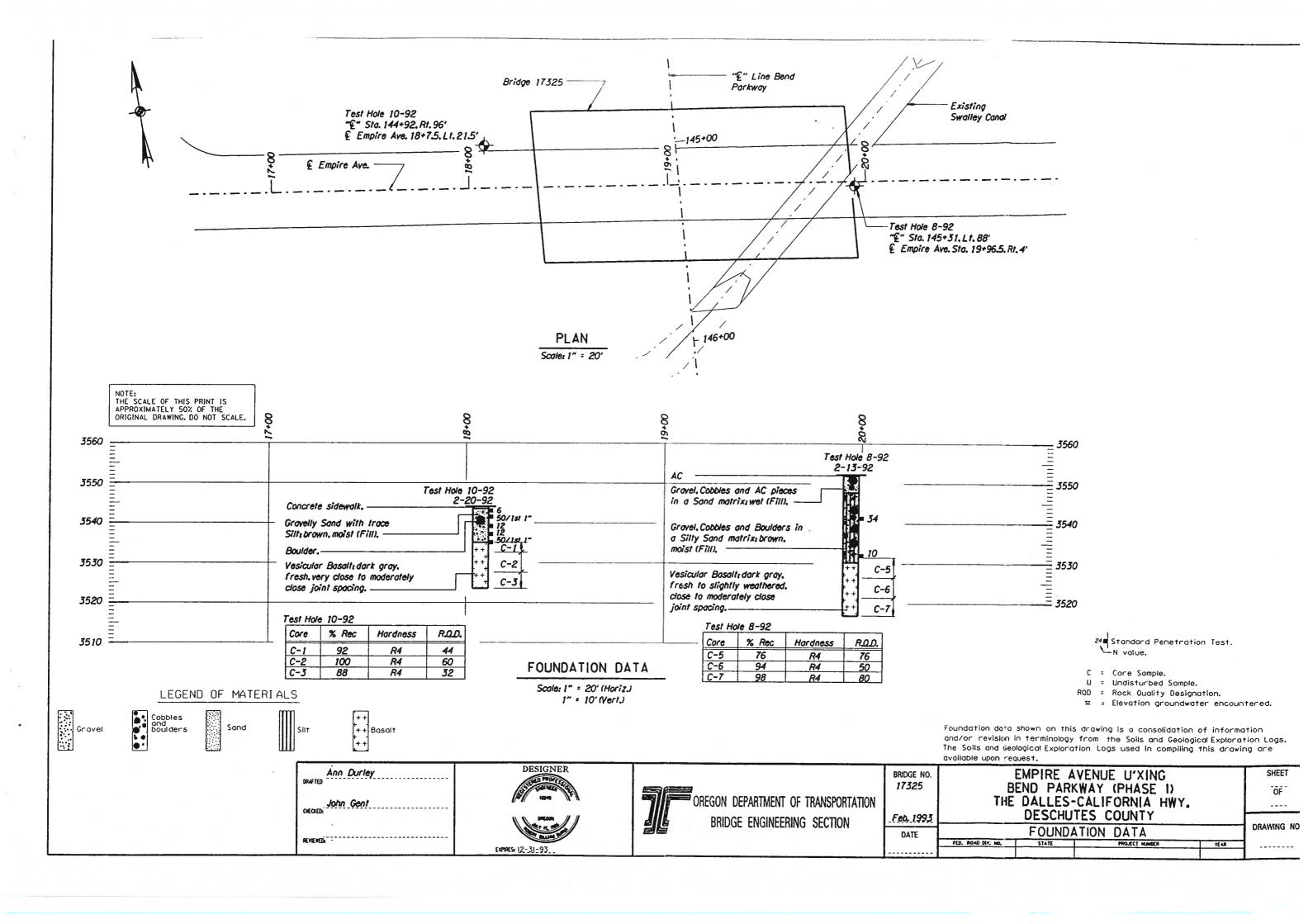
Index				
Structure Name	Structure No.			
Sisters Interchange Ramp	17323			
Empire Ave. U'xing	17325			
Empire Ave. O'xing BNRR Widening	17326			
Butler Market Road O'Xing	17327			
Third St. O'xing	17328			
Division St. O'xing	17329			
Revere St O'xing	17330			
Olney Ave. O'xing	17331			
Greenwood Ave. O'xing Widening	16532			
Franklin Ave. O'xing	17324			
Colorado Ave. and BNRR O'xing	17332			
C.O.I Canal Bridge	17333			

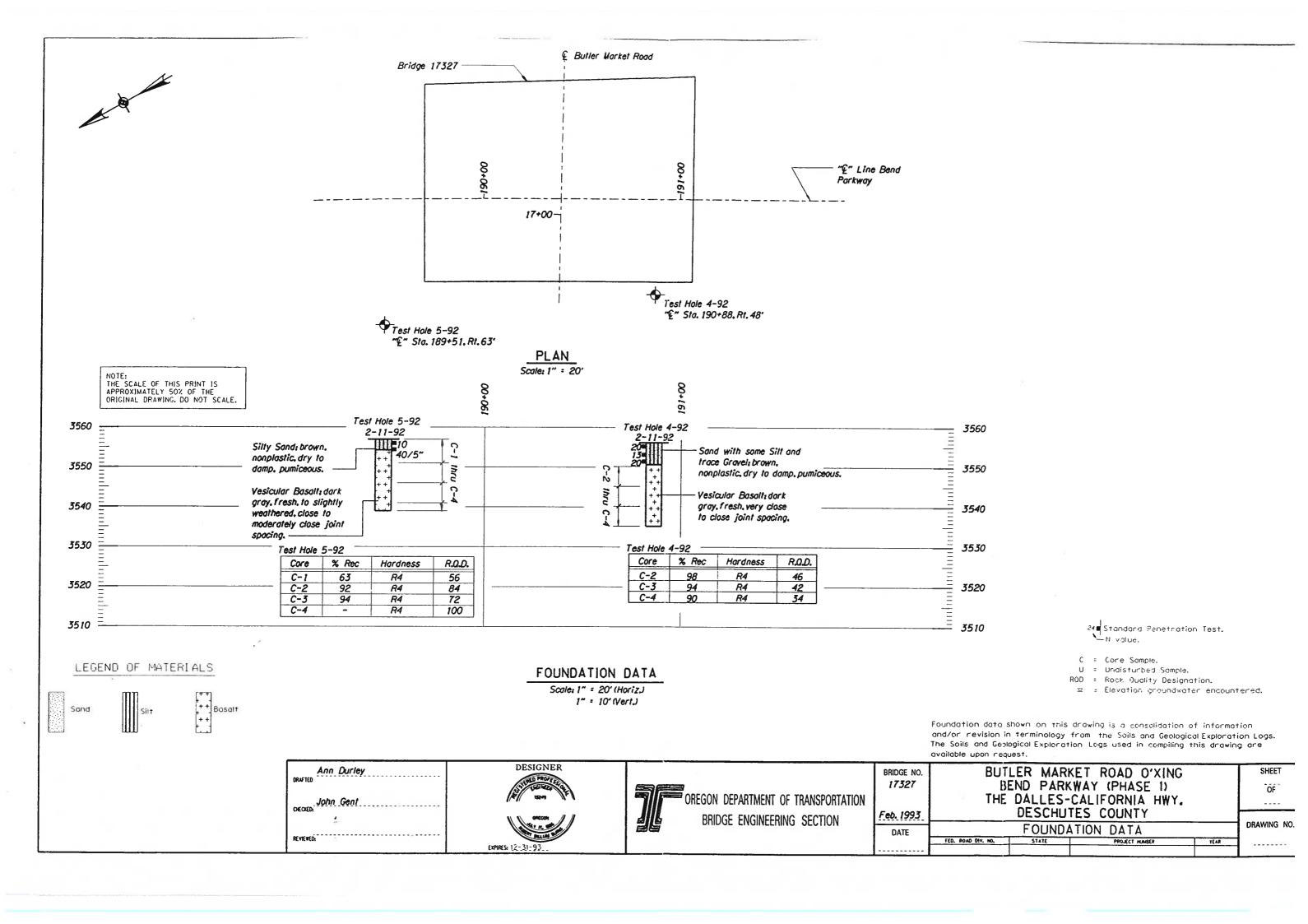
GENERAL PLAN - BEND PARKWAY

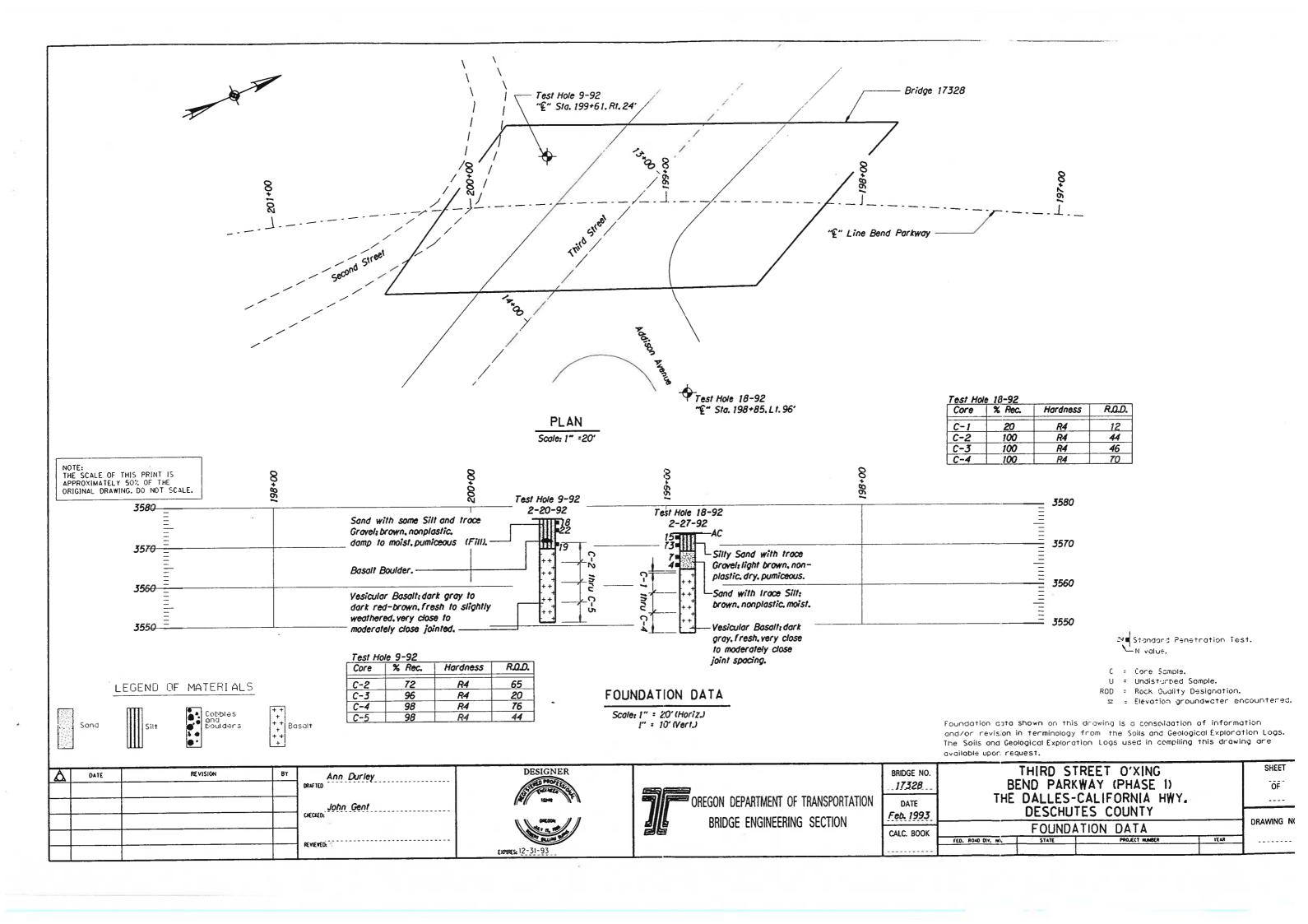
No Scale

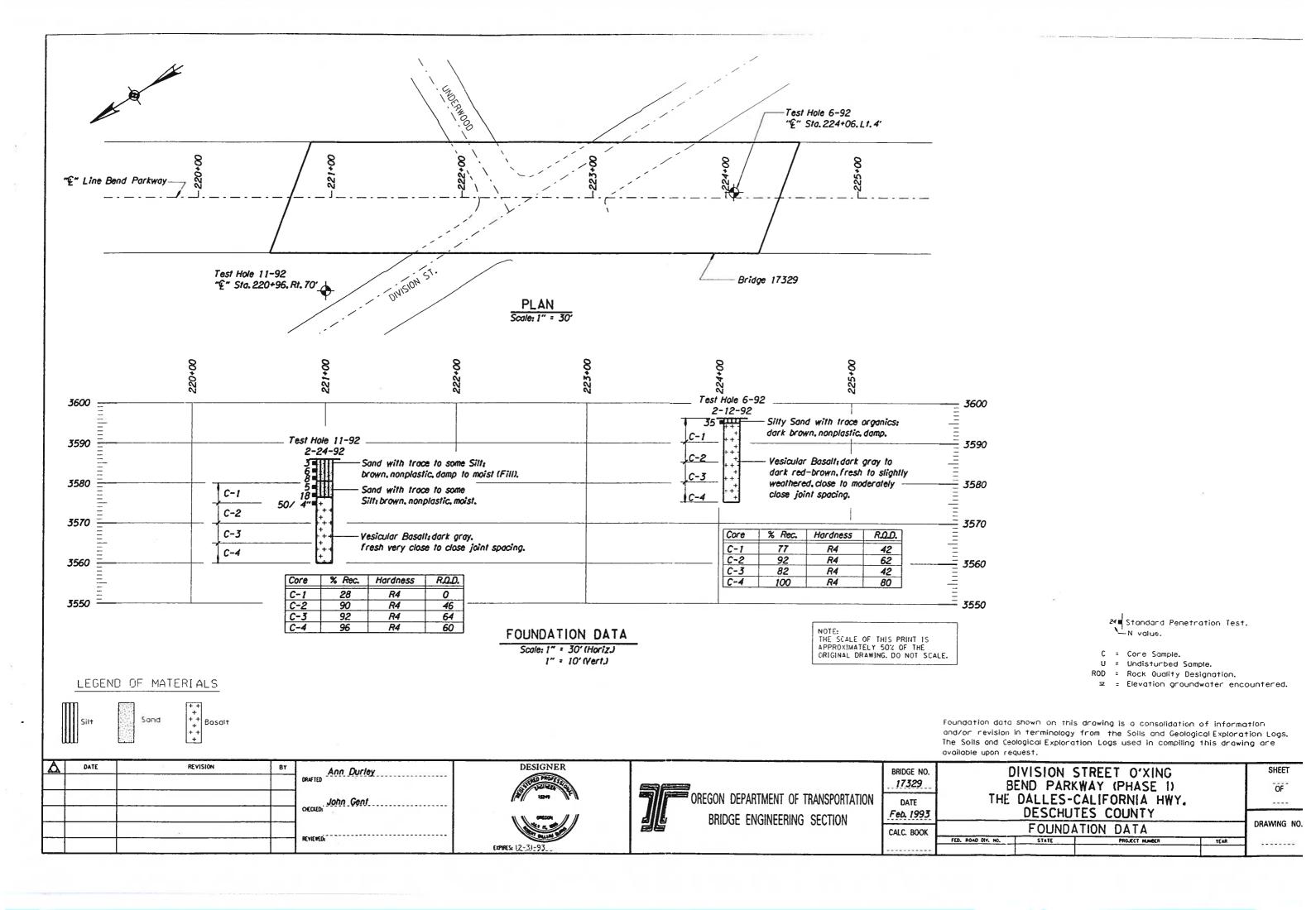
DRAFTED	DESIGNER		BRIDGE NO.		· · · · · · · · · · · · · · · · · · ·			SHEET
		OREGON DEPARTMENT OF TRANSPORTATION BRIDGE ENGINEERING SECTION		BEND PARKWAY - PHASE 1				ŌF
O-€CXED;			ALL	FOUNDATION DATA		DRAWING NO		
REVIEWED	EXPIRES:		DATE	FED. ROAD DIV. NO.	STATE	PROJECT NUMBER	YEAR	

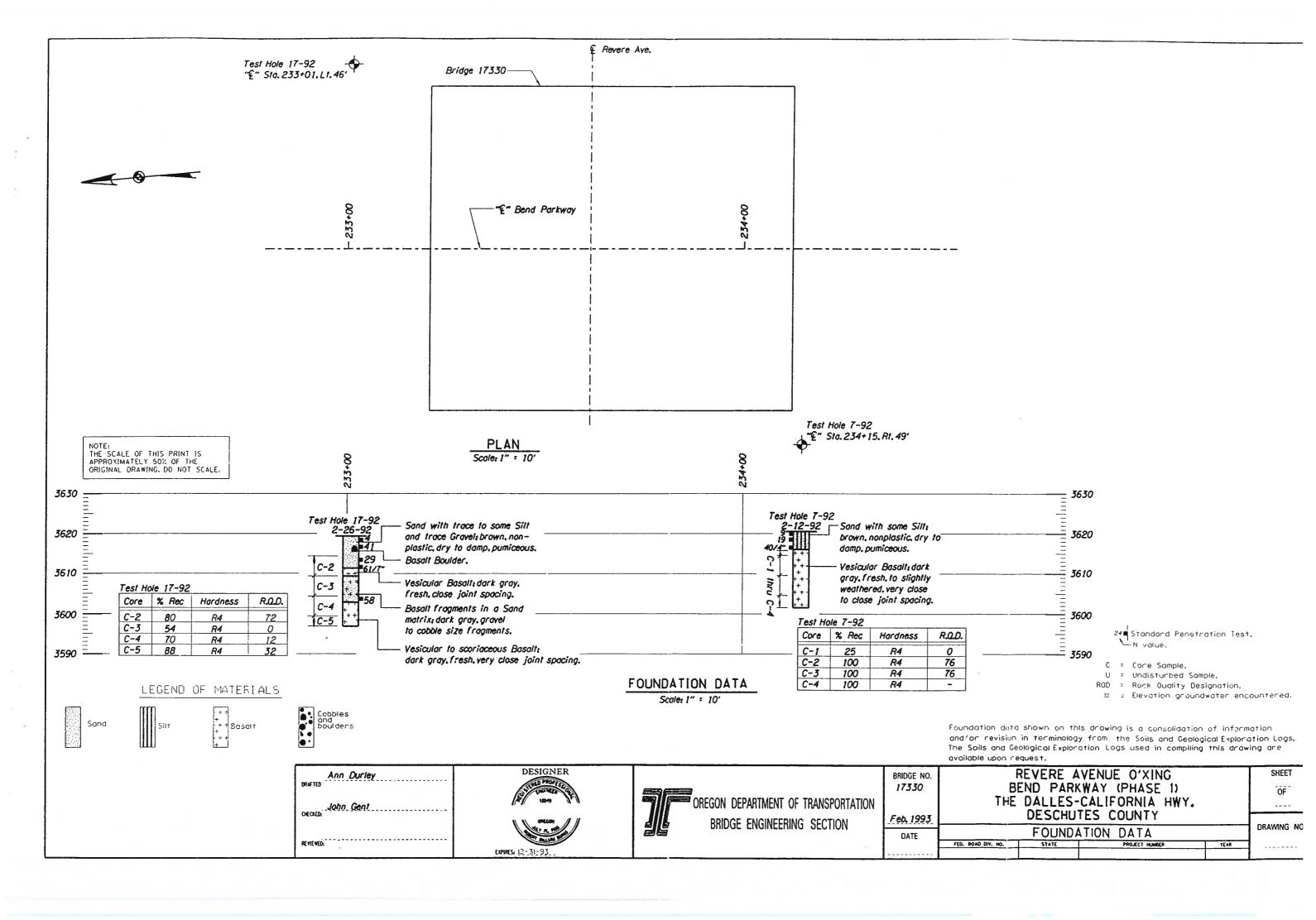


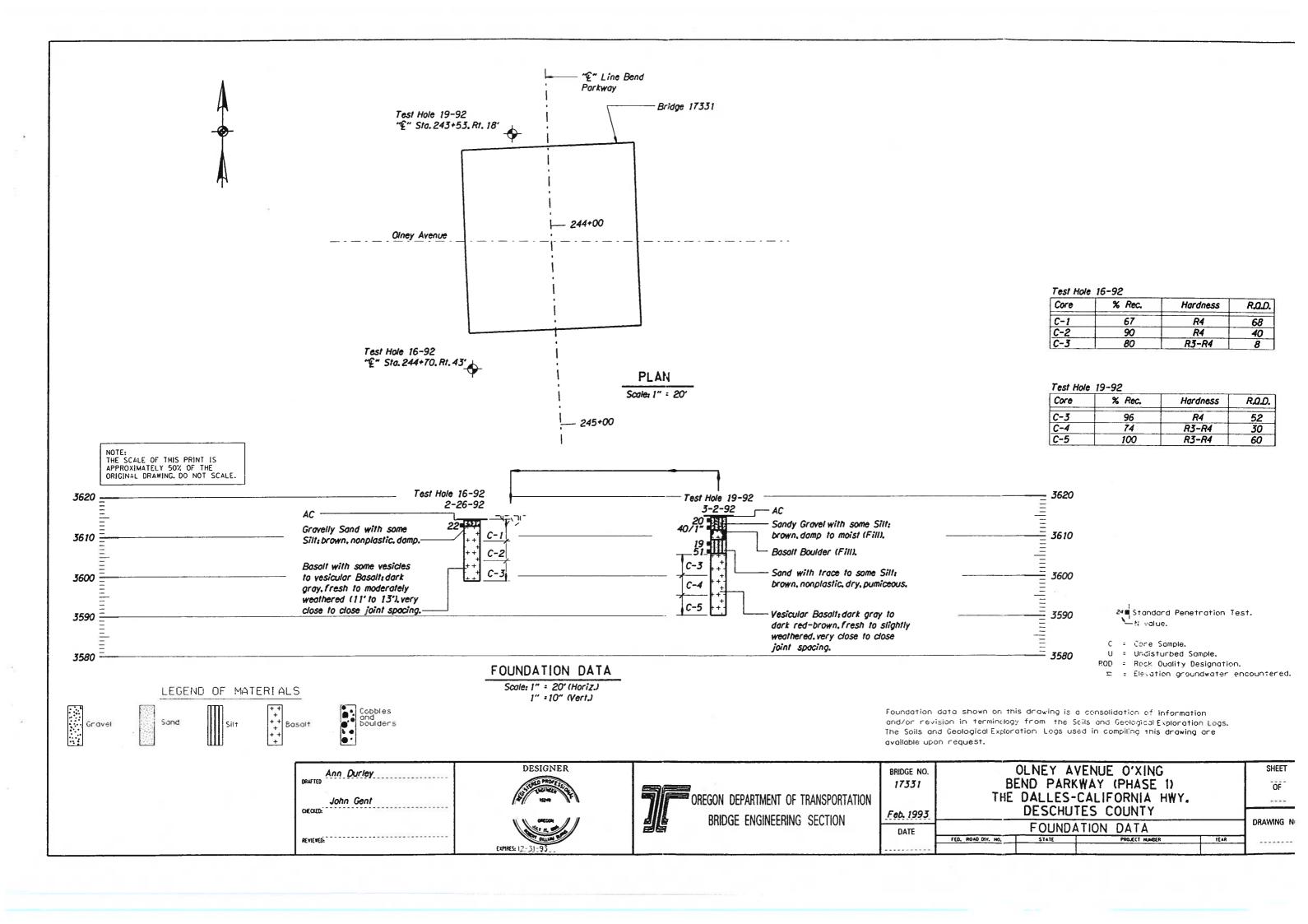


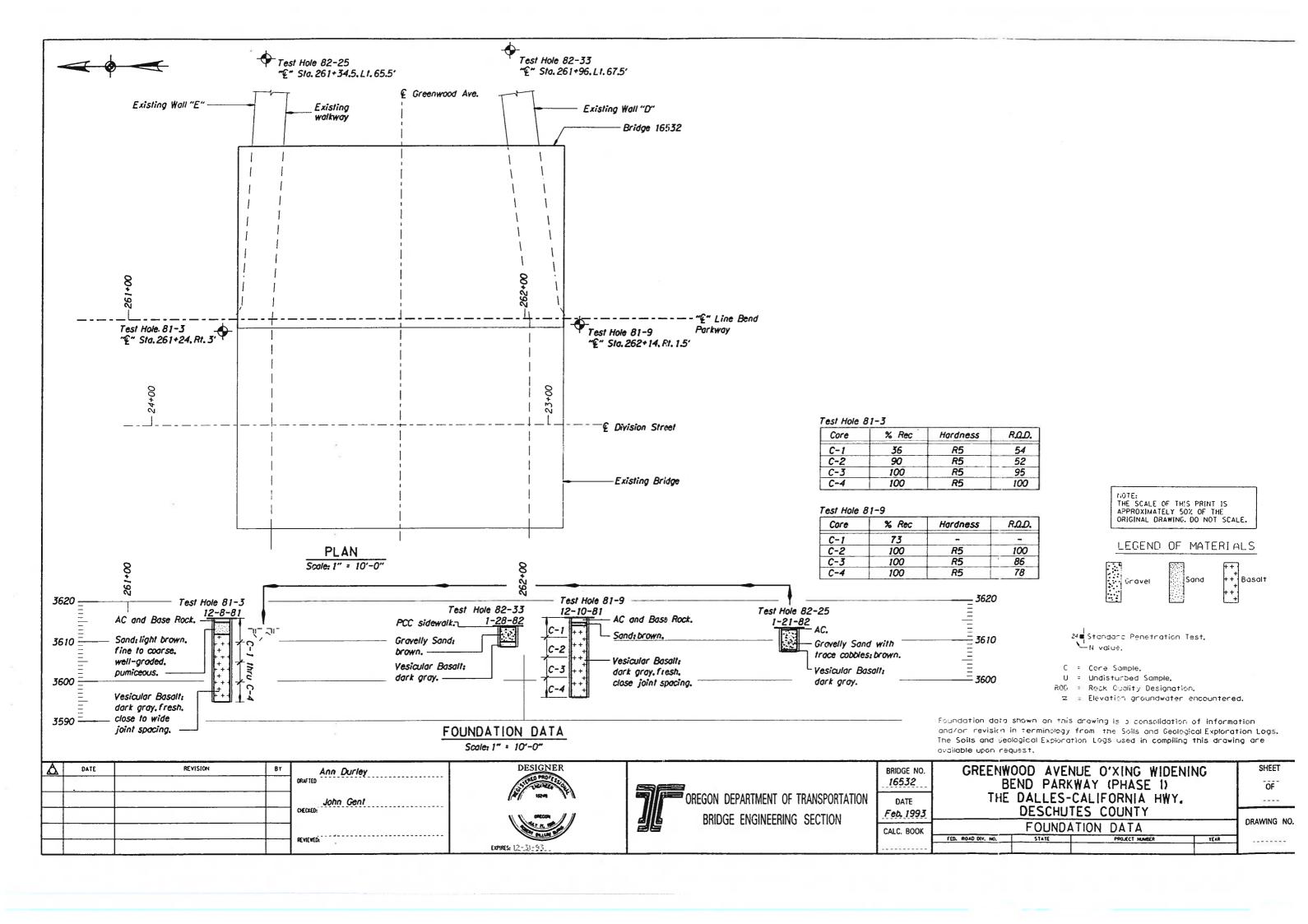


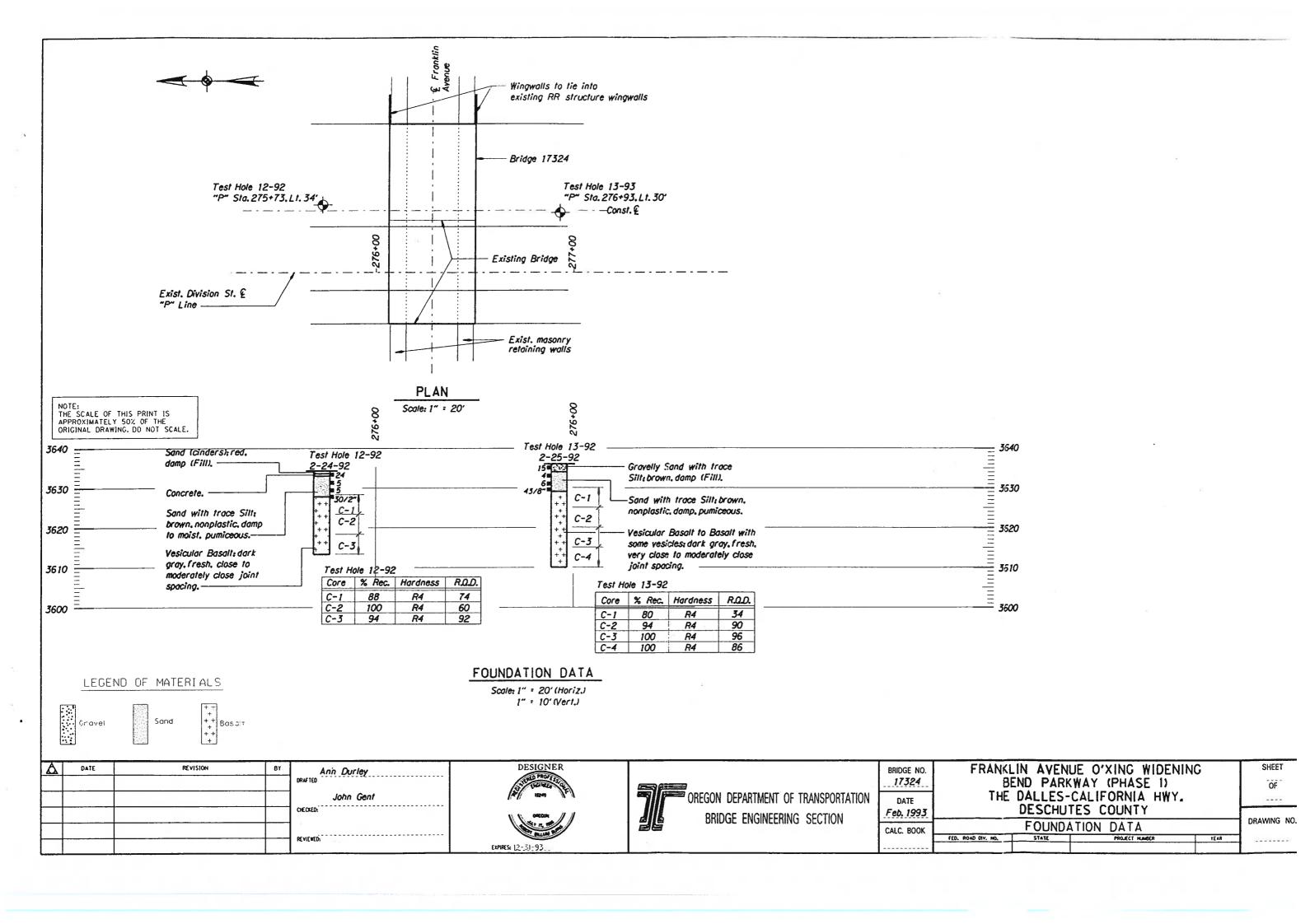


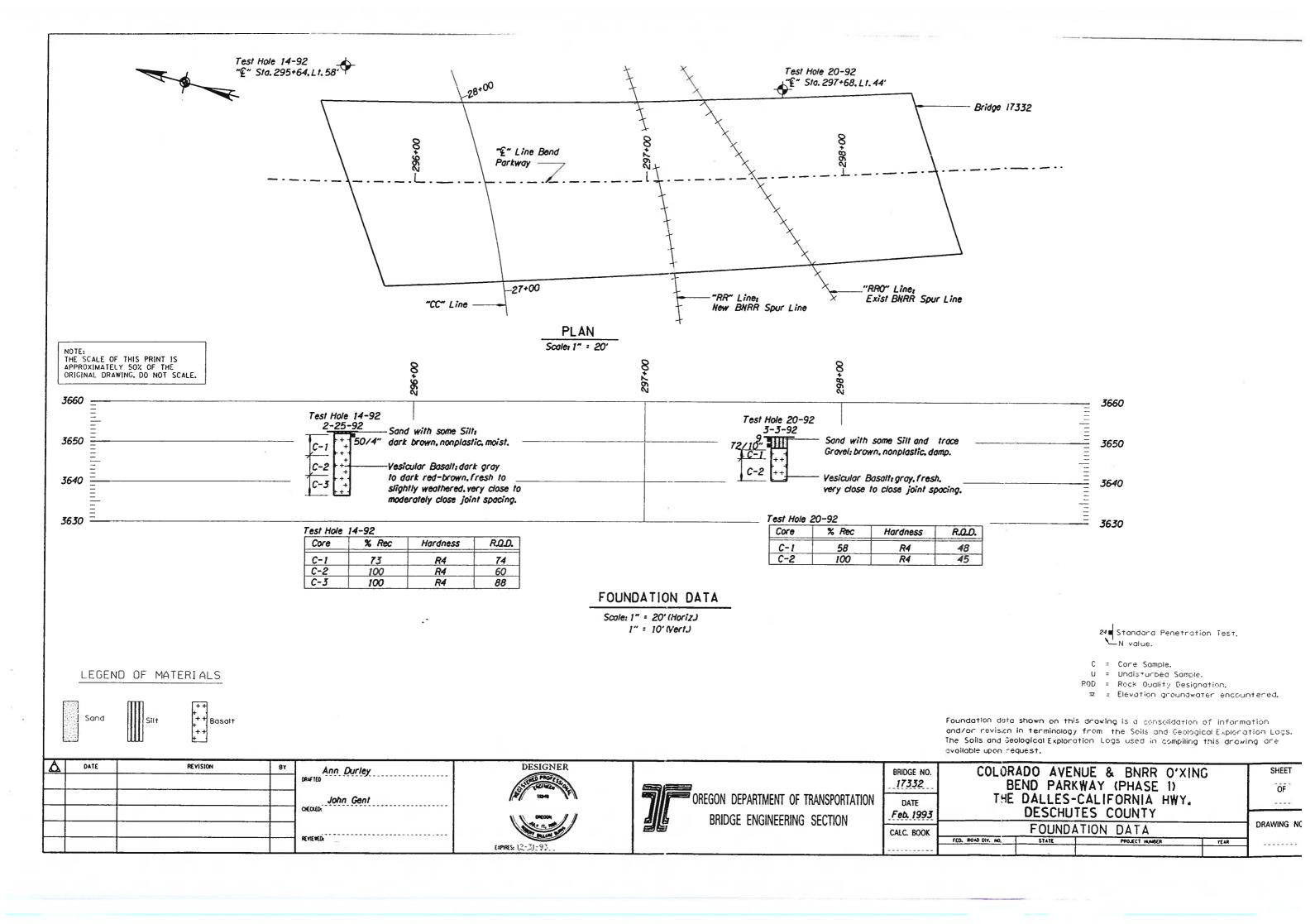


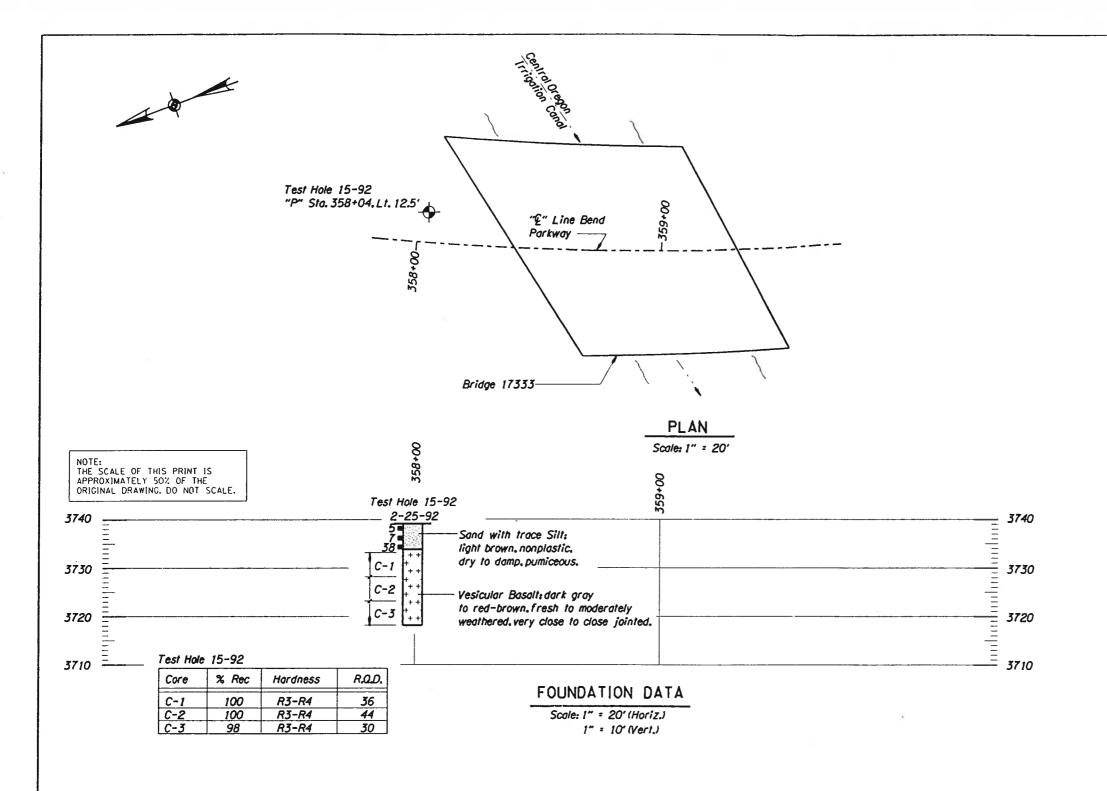












LEGEND OF MATERIALS

Sand

++ ++ ++ ++ Standard Penetration Test.
N value.

C = Core Sample.

U = Undisturbed Sample.

ROD = Rock Juality Designation.

⇒ = Elevation groundwater encountered.

Foundation data shown on this drawing is a consolidation of information and/or revision in terminology from the Soils and Geological Exploration Logs. The Soils and Geological Exploration Logs used in compiling this drawing are available upon request.

DESIGNER SHEET C.O.I. CANAL BRIDGE Ann Durley BRIDGE NO. 17333 BEND PARKWAY (PHASE 1) OF THE DALLES-CALIFORNIA HWY. OREGON DEPARTMENT OF TRANSPORTATION DESCHUTES COUNTY Feb. 1993 BRIDGE ENGINEERING SECTION DRAWING NO FOUNDATION DATA DATE STATE

Page ____of __

OREGON STATE HIGHWAY DIVISION SOILS.AND GEOLOGICAL EXPLORATION LOG

Project	Green	nwood Au	e.	U	Kin	9 (<u>ධ) </u>	Div	زي	on St. (Bend) Date Dec. B 1981				
	Cons	till Mraal	Α	5 -2	`	~ 7	F -			Deafin 7 - 1915 - 52/2				
Puroos	e of Work _	Foundatio	<u>'</u>	In	ves	joa	tio.	_ "		County Deschutes Bridge No. Ground Elev. 36/58 From Sta. 24000 Tube Elev.				
Station	Division.	St Sta. 2	3+7	9	24	<u>*</u>	· ·			Ground Elev. 36/58 From Stander Elev.				
Engine	princer Robertson Depth to Free Water Water Level at Completion													
Driller	Fish		1	Water	· I mus	I A	24 H	• 1	ひとり	Open Hole Depth 20				
Record	ecorder Davis Equipment Mobile R-50, 71-893													
Tests:	"N" - St	andard Penetratio	on, =1	No						_				
•		regon Miniature	Pile, I	No						Casing Depth HO WITE INC. ft. 21				
	"C" - Co	re, Barrel Type	1	No.	Y , H	Qi	nner	bar	re/	Open Depth ft				
	"U" - Sh	elby Tube, Size	ı	۷o						Total Depth 21'				
Sample	Data Sheet	No					Te	:st		Hole No 81-3				
r .		· .	Т	1	_		*		Г	MATERIAL DESCRIPTION				
ļ	SAMPLE		1	_	_		ă,			Color Wet-Dry				
·	·	Driving Resistance Blows/x In.	₹ g	Recovery	% Natural Moisture	=	Particle Size, Jointing	å	ي	Plasticity Joined-Broken				
e .	Depth	Driving Resistan Blows/x	Measured	3	Z is	Ę	문호	ø	å ë	G Consistency Angular—Rounded				
Type No.	å	0 . 9	Σœ	*	* ≥	2	2 3	œ	ပြီး သိ	Organic Content Sample Lab. No.				
		 	-	-	151	Ple	1. 34	15=	20.1	0-16+ Roadway materials:				
		 	┼—	-	-		lev.	214B						
		-	╫		-		.//							
			╂	-	Sca	16.	1"=	4.	SW	<u> </u>				
			┼	-	-		-1.			1Ft - 4Ft Light brown coarse-				
			+-	\vdash	 		ekv.	3611 ≥	+++	Fine arained Dumicerus sand w/				
			+-		-		-	-	++	Few Lines. Well graded & non-				
			-	 	-				++					
			\vdash	-					4 + 4	DIASTIFE (SW)				
			-	-					+ +	*. ·				
	11 - 12		1	-					++	4F+-21F+ Dark gray resignor				
			1	-					* +	and percus basalt lava rock.				
			1	\vdash					+ +	Rock O 114 mars of 11/ death				
			-			×1			+ + +					
	0-61	33	26"	2/		5		54	Rock	(C-1 0-6') 0-approx.1'				
C-1	7-6		50	عد.	-	1		<u> </u>	++4	recovered 2" A/c and a Few inches				
									F.	of 1"-0 crushed aggregate.				
									++	1'- 4'				
			ži.						+++	Water return shows light brown				
				題					+ 4 +	roatse-time grained sand w/ few				
		E =							+ +	Lives - well graded + non plastic				
									+ 4	YSW)				
	15.								+4					
									+ 4.4	Dark aren vesicular and Dorous				
									+ +	basalt lave rock. Jointing developed				
		295				1	104.3	5-540	++	In intersective Dlanes both Vertically				
12		7%							E~i					
	Ni .		\Box			\top			Hole					
			\Box			\top				rored surloces are visually Fresh.				
		<u></u>				T				Miner amounts of cloward sand				
	0.00					1	•			OVER				
ORM 7	34-3973 Rev.	3/79					Ť			2				

Hole No. 81-3 Page = of . SAMPLE MATERIAL DESCRIPTION Messured
Recovery
% Recovery
% Netural
Moisture
Hardness
Particle Size,
Jointing
R. Q. D.
Graphic
Log
Depth Color Wet-Dry Plasticity Jointed-Broken Consistency Angular-Rounded Organic Content Sample Lab, No. LL-P1, etc. nove filtered down into joints or Vesicles. Joint specing aug. 4"

apart. Joint blocks approx. 1/613

Rock is "Dent Quality" (3000-8000

/bf/in' compressive strength). and parous toget law as -2/6'-11' 54' 90 described above. Joint species avg. 4"6" aport. Joint blocks
approx. 1/2 ft3 C-3 11'-16' V26 100 C-3 11'-16') Dark gray vesicular 85 and porous bosalt becoming Visibly less vesicular but 0. remaiting perous (micro vesicles) Also Wider joint spacing (approx. 13'-24" aport). Rock Joint blocks operax1-2 ft 3 W/ Some possibly larger. Part of core between 12'4" - 13' depth Absorption: 5P. Grav. = 2.44 % Abs. = 2.61% C-4 16'-21') Dark gray porous basalt lova. Large vesicles are noticeably absent and C-4 16'-21' 100 100 5 no natural i pints in this run Some lineations of pores may indicate a plane of preferent From Shorizontal 21ft End of Hole .

& J.: J.:			
3			
- - -			

OREGON STATE HIGHWAY DIVISION
SOILS AND GEOLOGICAL EXPLORATION LOG

Page		of_	
------	--	-----	--

Project	Greenve	ood Ave U'z	riro	(a)	Di	اءار	n S	<u>., k.</u>	(3	evol) Date Dec. 10,1981
-			CV.		* -	7				· 9-1915 051
Purpos	e of Work _	Foundation	I.	Ves	tiua	4:00				County Deschutes Bridge No
Station	Division	St. Sta.	72+	89	2.5	7	+			Ground Elev. 3615 & From StaTube Elev.
E-siss	- Dober	tson	1	Depth	n to l	Free '	Water			Water Level at Completion
Deitter	Fish	920	1	Water	Leve	1 0	24 H	r. I)Y~	Open Hole Depth
Record	er Davi	د	1	Equip	ment		mo	bile		
Tests:	"N" - S1	tandard Penetratio	m. I	No						Auger Depth ft
	"M" - 0	regon Miniature F	Pile. 1	No	•					Casing Depth HG Wireline to 20'
		ore, Barrel Type	· 1	No.	4 4	Q iv	Ner	ber	iel.	Open Depth ft
	"U" - SI	helby Tube. Size	1	Vo						Total Depth _20'
Sample	Data Sheet	No					_ Te	st _		Hole No
		3		-			91			8 2
	SAMPLE									MATERIAL DESCRIPTION
		8 =	ح ۵ ا	X Recovery	Ē.		Particle Size, Jointing	۵		Color Wet-Dry
	Æ	era x	12 8	8	3 5	ş	흥분	d	욽	Plasticity Jointed—Broken Consistency Angular—Rounded Organic Content Sample Lab. No.
Type No.	Depth	Driving Relistance Blows/x in	Measured	*	% Natural Moisture	Hardness	P S	"	Graphic	Organic Content Sample Lab. No.
						_	ekv	3655		LL-F1, etc.
	M	·				52				0-13 Ft Road way waterials.
	ц.	6					ekv.	3414£	1.	537
							elev.	3613 2	SW:	133ft-2ft Brown Sand (SW)
		 		50	ak:	1'=	4'		++	
			ļ. —			95			++	2ft - 20/-+ Dark aran vesicular
									1 + + + +	2ft -20f-+ Dark grave vesicular and poices basalt leva rock. Rock
									+++	quality improves w/ Depth.
C-1	0-5'		46"	75					+	C-1 0-5') Recovered;
(-/	0-3		10	7.5			3 0]+++	4" of A11
	9.	 						ŝ	+++	2"-3" of argular - subrounded asavels
lla									Rock	no to 1" dia
						8			++4	12" PCC and one holf of this
				10					+++	12" core consists of vesicular
							-		+++	basalt. There is a line vertically
									++	down the middle of the coll
	<u> </u>						\vdash \vdash		+44	with Pcc on one side and
			-		\vdash				++	basalt on the other. Below this
			-						++	to approx. 2' there is no return
		 	\vdash		┝╌┤			200	++	but cultimas show sand,
	•								+ ++ ++	שניו נאייים לייש במימו
		<u> </u>			 				+++	At approx. 2'dopth enter Dark
	 								4++ 4-4	ITI APPINI I APPIN PWAFY DATE
					\vdash				F+	
•			\vdash						+ 4	which has a hardness of about 5.
		16							+44	This rock again is gointed
	·						ekr.	3142 <u>+</u>	End	her ; zontally and vertically in interset.
				. E	┝╼┦				Hole	planes. Joints are spered 6"12"
	3 <u>H</u>					_	- 1	22		opert and the Surform of the
					\sqcup					joints how a brown stoil w/
										Some Dortin/ Filling of joint woods
							ا			is west and player over
									لا	is west and plastic. Over
OPM 2	34-3973 Rev.	3 /79								

Hole No. 81-9 Page 2 of 2

_ an es ... a

	SAMPLE		T	T			1			MATERIAL DESCRIPTION
Type No.	Depth	Drving Relitance Blows/x in.	Messured	% Recovery	% Natural Moisture	Hardness	Perticle Size, Jointing	. O. O.	Graphic Log :	LL-P1, etc.
		·	<u> </u>	<u> </u>						Newly cored surfaces are
		ļ	-	-	-					Visually front so rock is
			├-	-						generally sound and office is * Dent Quality" rook. Joint blocks
	N .		╀—	-	-	-	-27			Dent Quality" rook Joint blocks
			-	-						would be = IDIOX. 45 FT = 1Ft 3 young
- 7	F1 1121		10"	100		5		14.0		C-2 5'-10') Dark gray
(-2	5'-10'	 	1.0	100		9		100	:#	Visicular and Poleus bosoly.
		 	 	-		1			10	Lorger vesicles are noticiably tess-
		8/1		·					25	numerous but small pors ore
		₂₀ 120								Still very fuidrat. Joint surlives are
	3									Stoined rusty brown but no charge
				1727				.50		sand veid filling is present. Nowly
			18			\perp				TOTTE SEE SEE
Œ				į.		\perp				Une fypose Very sound rock "
						4				which is " Dent Quality".
						4				(2000 - 8000 16f/in2 Congressix Strath
	<u> </u>					- 1				Joint Blocks would approximate
\dashv			-	<u> </u>		+				1/2-2/73 Volumi,
						+-1		-		Specific Growity . Absciption
						-	- 22		ł	744- 10' Dopth;
		- Ti	40)			+			·	SP Grov = .2.4/5
		•				\vdash		\neg	ŀ	% Absorp = 1.39%
		8	- 12	12.5		11		\neg	1	
2.3	10'-15'		60"	100		\sqcap		86		(-3 10'-15') Dork gray Vesicular and
						\prod			. [porous bosalt of "Dent Quality".
						\prod				Light Surfort Stoin on jointe -
										no Elayay sand intilling - gointed;
						\coprod			- 1	AS before W/ Spacing 6"-12 spart.
					_	44		_	-	Joint black probably 1/2 f+3-
_						+		S .	- 1	1f+3 Volume.
						 		_	-	(1/1/2/21/2
-4	15'-201		60	100		5		8	F	(-415'-20') Dark gray vesicular
\dashv					-+	\dashv	-+	\dashv	ŀ	above Joints intersect + are
						-+	\dashv	\dashv	ŀ	aniended destically basicantally
					\dashv	-	-	\dashv	ŀ	Speed B"-12" east. Toirt
\dashv			-	-	一十	\dashv	_	一	f	priented vertically + horizontally, Specral B"-17" aport. Joint block estimation 1/43-243
一十			\dashv	-	1	\dashv	\neg	\neg	. t	Volume.
\dashv					1	一				
				*						20ft End Hole

Page ____ of _

OREGON STATE HIGHWAY DIVISION SOILS AND GEOLOGICAL EXPLORATION LOG

	Green	wood Ave.	Ux	ina		Di	13/	on S	5t. 1	Bend) Date Jan 21,1982
oject	Cent	-al Orean	ک ۸	DU	- 4	2				Prefix 9-19/5-926 County Deschutes Bridge No. Ground Elev. 36/3- From Sta. 16450 Tube Elev.
nwa	y	oundatio	n I	nuc	sti	gat,	on		_ (County Deschutes Bridge No.
pose	Greenwo	od Aug St	a. K	5+4	14	3/5	4		_ (Ground Elev. 36/32 From Ste. 16+50
tion	Pohort	san	٦)enth	to F	reo V	Vater		_	Water Level at Completion
		F.	u	Vetu:	Leve	160 2	24 H		,	Open Hole Depth
ier	Davis		_ ;	euio:	Leve	1 4	Lon	9 4 60	24	75-893
ppro	- WAVIS		5	quipi	ment) / ·		Auras Danth ft.
ts:	"N" - Sta	ndard Penetratio	n, n	10. <u> </u>						Auger Depth ft
	"M" - Ore	gon Miniature I	'ile, N	10. <u> </u>	Λ/	, D				Open Depthft
		e, Barrel Type			-					Total Depth
	"U" - She	by Tube, Size	1	10						Hole No. 82-25
ple	Data Sheet f	No					_ Ie	sτ		Hole No. 82-25
										MATERIAL DESCRIPTION
S	AMPLE			-	_		, ez			Color Wet-Dry
İ		Drking Resistance Blows/x in.	2 g	% Recovery	is a	2	S	36/3 G G	ပ္	Plasticity Jointed-Broken
	£	ing Istai ws/x	200	Jec.	S S	å	후투	ø	ido -	Plasticity Jointed-Broken Consistency Angular-Rounded Organic Content Sample Lab. No.
Š	Depth	S S S S S S S S S S S S S S S S S S S	Measured Recovery	*	× Š	1	를 함	œ	رَدِ يُ	Organic Content Sample Lab. No
-	_						eley.	36/3		LL-T1, Etc.
一									AL	0-5" A/C
-1						0	1003	4/28		5"-51/2' Brown gravelly sands W/
					_	_	1 C W 2		. 7:1	gravels up to &"dia. Also c
_			_	1	1	, ,,				Few angular lava cobbles
			120	010	: 1	=/				(SW-3P)
			↓							At approx, 41/2 encounter
					<u> </u>					a place of lumber which
一										blocks off core barrel.
		Xá								5/2'-6' Darkgray, Vesicular, E
			+-	_	1					porous Kasalt rock
			-		├─				SW	
			-		-	-		-	- 1	6 End Hole
			-					_	S P.	D E/14 //
	29						<u> </u>			
一							L_		: ; ; ;	
-							Γ			
			1		 					
			-	 	 		\vdash			
_			-	 	-					
┙			-		-		-	-		
				L	_		<u> </u>		[4.4.E	<u> </u>
				L						
\neg					L					
-										
\dashv			1	 	—		$\overline{}$			
_			+		- 1	 	_		in F	
_			-	<u> </u>		-		 		
			100	<u> </u>		(5)	<u> </u>			
					<u>L_</u>		<u></u>	<u>,</u> ,	14	
_						e	reug	607-	++	
			T	530					Roc K	
			1			el	ev.3	6072	+	49
- 1							<u> </u>		5-0	
			T	l		1	ŧ .	ı	Hole	

Page / of /

OREGON STATE HIGHWAY DIVISION SOILS AND GEOLOGICAL EXPLORATION LOG

Project	Green	w	lood A	ve.	U	Tin	g (a	30	iVI	5 i 0	n St (Bend) Date Jon. 28, 1982 Prefix 9-1915- 926
-roject -liohwa	y Cent	nol	Drego	<u></u>	57	ur	/#	7_			Prefix 9-1915- 926
urpose	of Work	Fo	undatio	n I	NVE	sti	gat	ion		0	ounty Deschutes Bridge No. Ground Elev. 36132 from Struck Elev.
Station	Greenus	200	Hve.	5/a_	157	-46	31	Rt		(Fround Elev. 6/3 - From Tube Elev.
Enginee	- Robert	150	N		۱۸۵+h	+~ [roo V	Nator			Water Level at Completion
Driller	Prodzin	ا ک	<u> </u>	v	Vater	Leve	10,2	24 Hr		~	Open Hole Depth
Record	Tavis			=	quip	ment		D PIE	4 -		75-893
ests:	"N" - Sta	nda	rd Penetratio	on, N	lo					'	Auger Depth ft. 5'3" Casing Depth ft. 5'3"
	"M" - Ore	egor	Miniature I	Pile, N	10. <u> </u>	11					Open Depth ft
	"C" - Cor	e, E	Barrel Lype	1	10						Total Depth 53"
	"U" - She	SIDA	lube, Size	"	10			Ter	st		Hole No. 82-33
Sample	Data Sheet	NO.									
5	AMPLE	Г									MATERIAL DESCRIPTION
			<u>.</u> ج		ورح	5 _		Particle Size, Jointing			Color Wet-Dry
ļ	_	*	Driving Resistance Blows/x in.	Measured Recovery	% Recovery	% Natural Moisture	Hardness	e c	. O.	Graphic Log	Plasticity Jointed-Broken Consistency Anguisr-Rounded Organic Content Sample Lab. No.
Type No.	Depth		esis Iow	leco	Ř	Z S	le d	art	я. а.	00 J	Organic Content Sample Lab. No.
řΖ	۵		OKB	2 6	•	-	elev.	36	132		LL—P1, etc.
		-		1			-			P.C.C	0-4" P.C.C. sidewolk
		-		1			eks	34	134	131	4"- Aporox, 4' brown, gravelly
	Scol	6.	1"=/'	_							
	501	-	_/			1					Approx. 4'-5'3" Dar Kgray, Vesicular
	·	_									& Dorows U Losal+
		-									Lova rock.
		-		+	_						
		-		1		 				SW.	5'3" End Hole.
		┢╌		1						sΡ.	A
		-		+		21				P۲	
		┢		+							
		-		+-							
		-		_						. ::	(F) 34
		-		1-			Π			ļ. : : :	
		┢		1							
	91	-									
				1			1			1.2.5	
		1		192							
		_			\Box	1	Π]	
 		\vdash			Г	1	elev	36	09-7		
		_								++	
<u> </u>						\top				++	
	Či.	\vdash								Rock	
<u> </u>		╁								+	
		\vdash	13	_						++	
 		T		1	Π		elen	. 36	08 <u>5</u>	++	
		1								End	
		T				Γ				MOIE	
 											
		1								Ţ	
		\top								<u></u>	
FORM	734-3973 Rev.	3/	79								•

Page 1 of 2



SOILS AND GEOLOGICAL EXPLORATION LOG

HIGHWAY DIVISION West Abutment Project Band Parkuny@ Sisters Interchange
Highway Dalles - California (Highway #4) | County Deschutes
Purpose of Work Structure Foundation Investigation Exploration Hole No. 1-92 Prefix Co09 1803 Bridge No. Tube Elev. Equipment CME Truck mount Driller Chuck Fish Ground Elev. 3509.9 Geologist Randy Davis Hole Location "MK" Line, Sta. 105+45 (Lt.) 1.5 C.L. Groundwater Level **Drilling Method** Depth Auger Depth No. _3 "N" -- Standard Penetration, No. -_____ **Casing Depth** Not Encountered "M" - Oregon Miniature Pile, Open Depth 20.0 HQ-3 "C" --- Core, Barrel Type No. **Total Depth** 20.0 "U" - Undisturbed Sample, Size Sample Data Sheet No. Date Started 02/03/92 Date Completed 02/03/92 Material Description % Recovery Wet-Dry Color Measured Recovery. Jointed-Broken Consistency Angular-Rounded Plasticity Driving **Organic Content** Drill Remarks etc. Resistance SAND, pumiceous, with some sitt 0.5 25 plasticity, damp, dark brown N=54 SAND, pumiceous, silty, SM, slight clasticity, dry, light brown, medicin dense. 1.0 50 N= 18 26 Noted gray wash color @ 4.0ft N3 40.2 (refusal) GRAVEL, angular, with some angular 0.2 100 sand (Basalt Fragments), GW, nonplastic, wet to linter bearing (drill fluid), dark gray, very dense. BASALT vesicular, close to moderately close juinted (10 60°- irr: 10 20-25°-1 rough w/ Fe. 03 stains; 10 50°- rough w/ some calcife); tresh, dark gray, hard. 4.8 96 R4 Note: top 0.3' is grevel, mostly angular; slightly vesicular: bottom 2.00 BASALT, vesicular, very close to close jointed (2010-15°-icr, w/thin lightly cemented silty SAND infill; (0,55°-irr; possible interbed (0,12-9'-cubble zone), fresh, dark gray, hard. 4.7 94 R4 BASALT, resignar, close to moderately close jointed (10 35°-rough, w/Fe,03 1 strins; 10 10°-ics; 10 20 4.6 92 R4/ 3 hard .

734-3976 (REV. 12-82)

Bend Parkway @ Sisters Interchange: West Abutment
Hole No. 1-92

Page 2 of 2

Metabolic description Consistency Planting Resistance C.3 Continued C.3 Continued C.4 Continued C.5 Continued C.5 Continued C.6 Color Planting Plantin									Hole No
C3 continued + Advancement halted at 20.0'.									Material Description
C3 continued + Advancement halted at 20.0'.					4	2/	3	_ :	Color Wet-Dry
C3 continued + Advancement halted at 20.0'.	نو			2 8	8	\$ 0	<u>.</u>	2 6	Consistency Jointed-Broken
C3 continued + Advancement halted at 20.0'.	Ė			3 8 8	١	20	₹ E	Stu	Plasticity Angular-Rounded
C3 continued + Advancement halted at 20.0'.	jd.	ype o	Driving Resistance	S S	× .	10	ě	× ≥	Organic Content Drill Remarks etc.
Advancement halted at 20.0'.	٥	 2			•	/			
Advancement halted at 20,0'.			C3 continued				+		
						_	+		
	20,₽	· · ·							Advancement halted at 20,0'.
							1		
							1		
	L 4						1		
				-			1		
							1		
							1		
	7						1		
	- 1						1		
							1		
	├ -						1		
		-				 	1		
	ļ					-	1	 	
	_				 		1	 	
	L						1		· · · · · · · · · · · · · · · · · · ·
	Γ						1	 	
	r -	·]		
	┞ -								
	├ -						1		
				 			1		
	├ -			├──			1		
	L -			 			┨	<u> </u>	
	L.			 			┨	-	
	L.						4		
	Γ '					ļ	4		
	-			<u> </u>			1		
	┞ ‐								
	┝ -						1		
	├ -						1		
	┞ -	 					1		
	┡ -	 				 	1	_	
	Ļ.	L				 	1		
	L.	<u> </u>		├	<u> </u>	ļ	-	<u> </u>	
	L.	L	<u> </u>				4	├	
	Γ.				<u></u>	 	4	<u> </u>	
	Γ~ ΄					L	1	-	
	Γ.						1	L_	
	Γ.								
	Ի •	 			Г	T	1		
	٠ -	 		 			1		
	⊦ ⋅	 		1	 		1		
	├ .			-		+	1	<u></u>	
	┡ .				 	 	1	H	
	L.			 	├	├ ──	-	-	
	L					 	4	-	
	Γ.						1	<u></u>	
	Γ.	1]		
No. No.	Ι.						1	L	
	F :	-	 				1		
	٠ ١	 	 	1	1	 	1		
	F -	 		 	 	1	1		
	F .	 		+		1	1	-	
	L.			-			-	-	
	L '				-		4	-	
	Γ .						1	<u></u>	
	Γ.	1					1	L	
	† '	1						L	
	h .	 			1		1		
		<u> </u>		-	1000	1		-	

Page _____ of _____



SOILS AND GEOLOGICAL EXPLORATION LOG

HIGHWAY DIVISION

				Mi	ddle	Pier	/B	ent		
Proje	ct	Be	and Parkwaya	$\overline{}$	iste				hange	Hole No. 2-92
Highw	_	7	Dalles - California		chwa		7		County Deschutes	Prefix Coo9 - 1803
Purpo		4 14/0		and			104	c+:	nation Exploration	Bridge No.
						<u> </u>	101		3	Tube Elev.
Equip	_		CME truck	MIL			5	1	Driller Chuck Fish	Recorder Kris Luerson
Geolo	_		andy Davis	WK			ىب	ىربى	C.L. (R) 34 H	Ground Elev. 3507. 1
Hole	Loc	ation		119.	+42	<u> </u>	<u>.t.</u>			Groundwater Level
			Tests			_	1		Drilling Method	Date Depth
"N"	· —	Stan	dard Penetration,		1	10. <u>3</u>	-1-		Auger Depth	
"M	-	Oreg	on Miniature Pile.		1	40	: _		Casing Depth	Not Encountered
C.	· —	Core	, Barrel Type HQ -	- 3	•	40. <u>4</u>			Open Depth 21.0	
n.	· —	Undi	sturbed Sample, Size		1	ło	-		Total Depth 21.01	
Date	Sta	rted	Date	Com	pletec	1		4	Sample Data Sheet No.	
Date		(02/04/92			02/04	#	92		
	Г					/	Ø		Material Desc	cription .
20		I		اخوا	Recovery	A A S	Log	5.	Color	Wet-Dry •
Ψ.		1		Measured Recovery.	ု မို့	\$ 0	Graphic	% Natural Moisture	Consistency	Jointed-Broken Angular-Rounded
Depth.	¥	2	Driving	e a	ĸ.	1/4	rac	Z	Plasticity Organic Content	Drill Remarks etc.
٥	۱۴۰	£Ž	Resistance	≥ ₫	*	/	ט	• •	J. g Jan	
-0	78	NI	0	1.1	55				SAND , sumiceau	s, with some Silt,
├ -	H +	17 T	1 11 4	1	-				SM non plastic,	damp, brown,
├ -	₩	┥	1 N=4		$\vdash \vdash$		Hi:		10058.	, ,
├ -	₩	┥					HEI:			
20	HY		3	. 4	77-			77	SAND Silty, wir	th trace of grave.
	11	N2	2	1.4	70		IIII:			1 1 1
L _	Ш		5 N=16				IIII E	1	SM, slight to low f	elasticity, damp,
Γ ⁻	Ш		11 10 - 10				MI:	 	brown, medium de	130
, , -	ПŢ		12							
4.0-	╽╽╋	N3	21	1.1	85			L	SILT, Sandy, w	th some gravel,
├ -	₩	1	20				NH:	1	SM-GW. Slight.	to low plasticity,
5.3	₩	\vdash	50/0.3 (refuse.1)			5.2	HH		mist brown wer	udense (bounced on)
5.3	₩.		370:3 (10:02:01)	0.8	13	R4/	1	_	too of sock)	
6.0	 X	101		0.0	٠,٧_	10	١.'	\vdash	Ci (0'- (a 0'): Basal	+ Fragments with some
-	#_				 	-	+		silty sand infilling	J
L.	Щ.	C		 		24	1	⊢—		- close to very close
L.	Ш	2		5.0	100	R4/	 ` ∔	 	BASALT, vesicular	1
_	П			<u> </u>		/35	١.'	ļ	jointed (3@ 60°-in	10 1 1 1
Γ -	П		20 (%)	l			+	L	1 T T T T T T T T T T T T T T T T T T T	attem 1.0 of sample,
-	11					<u> </u>	L		middle portion: mode	enately close jointed
9.3-	#	1					Ţ		(1620°-in: 2@90°	-irr. to rough), tresh
-	#-	1					1 +		dark gray, hard.	
├ -	╫╌	1		†			۱.'		100% loss of return	flow at 9.3 H.
-	╫╴	1-		 	_		+		, , <u>, , , , , , , , , , , , , , , , , </u>	<u> </u>
H1.0	¥		<u></u>	14 -	84	01	+	_	BASALT, vesicular	(some vuas), veru
L'''-	1(عد		14.5	1 224		μΤ	19		erous 0-450-in/
L.	\coprod	3		 		/0	١.	-		u SILT infill to O.Ift.
[]	\prod	<u></u>		_	<u> </u>	<u> </u>	†		much, many w/ sand	aray hard. Noted
Γ	1	T		<u></u>			+		thick) fresh , dark ,	
Γ .	11	Т					ł		top 1.0' is gravel/co	ble size fragments
ተ	#:	1					+		lw/thin silt intill: f	ew zones toward
-	╫╌	1		1			l 1		bottom w/aravel/co	hble size fragments
-	╫╴	╂		1	\vdash	18	11 1		bottom w/gravel/co	hick), zones are 0.2ft.
-	#	-		+	 		የ ተ	1	thick.	К.
L.	#	1_		├ ─			l i	-	Thick	
1/1/2	JL.				├ ─		1	-	040017	(6 - 22 - 22 - 11 41 - 22)
H6.0	17	Y C		5.0	100	R4	1	<u></u>	BASALT, vesicular	- (Some Small Vuys),
Γ.	П	14				/32	1	L	close to very close	jointed@ top and bottom
Ι.	11	1		T			╁╀	<u></u>	1/20 90°-icc': 2045	- rough: 100 60 -151.
F -	╫	+-		1		T	ľ		most icints contain to	hin brown silt conting
F .	╫╌	+	9	1			1 _		Infill) fresh, dark q	ray hard.
-	#-	+-		+	 	 	1 T		······································	7

734-3976 (REV. 12-82)

Basedance Denking Presidence Passedance Pass		1	7	T	T			1	Massaint Consciption
Advancement halted at 21.0%	ļ			l	1	/و ا] è	l	1
Advancement halted at 21.0%	l .		1	20	£	8/	1 7	l = _	Color Wet-Dry
Advancement halted at 21.0%	- - -	1		3 6	ĺģ	8/0	ì	25	Consistency Jointed-Broken
Advancement halted at 21.0%	뒤	# 8 ·	Driving	8 8	æ	1	9	2 2	Plasticity Angular-Rounded
Advancement halted at 21.0%	٥	<u> </u>	Resistance	≥ %	*	/°	ŏ	χž	Organic Content Drill Remarks etc.
Advancement halted at 21.0'.		<u> </u>	<u> </u>		 	<u> </u>			
Advancement halted at 21.0'.	L	c	· [+		
Advancement halted at 21.0'.		4				1	+		
Advancement halted at 21.0%.	-						1+		
Advancement halted at 21.0%.	⊢ -	╫╼╂╼				 	1	 	
Havancement hasted & Elev •	21.0	<u> </u>					- -	 -	1 1 1 1 1 1 2 2 2 4
			<u> </u>		<u> </u>				Advancement halted at 21.0.
		1	<i>n</i> •		1		ł		
	r 7		1				1		
	┝╶		 				1		
	⊢ -¦		ļ						
	L		<u> </u>						
			i						
	F 1						1		
	┝╶┤		 						
						<u> </u>			
	لِ ل		<u> </u>						
					-				
			 			——	1	\vdash	
	L 4				ļ				
	73								
	۲ ۱								
				\vdash					
	_ 1								
	- 1						1 1		
							li		
	_ 4						i I		
	- 1								
	- 1								•••
	- 1								
	- 4								
	1								
	- 1								
	- 1		1						
	- 1								
	- 4								
	1								
	× .							- 1	Na .
	- 4								
	∤								
	- 4								
	1]	
	- 1								
	1571						ı	-	
	- 4		 						
	_ 1						l l		
	Ť			I	- 1				
	- †								
	- <u>.</u> +			 			ŀ		N N
	-						ŀ		
	. 1		<u> </u>	1			į	1	
	T						ļ		
	- †						Ī		
	- +						ŀ		
	- 4						1		
	. 1					i	L		
	T			[1	1	- 1	[
	- +	· · ·					ı		
	- +					——	ł	-	
	. ‡						- 1		
	. 1					1	L		
	T								9
	• †					-	ļ		
	. +				 		ŀ		

Bend Parkway @ Sisters Interchange: Middle Bent
Hole No. 2-92 Page 2 of 2

Page 1 of 2

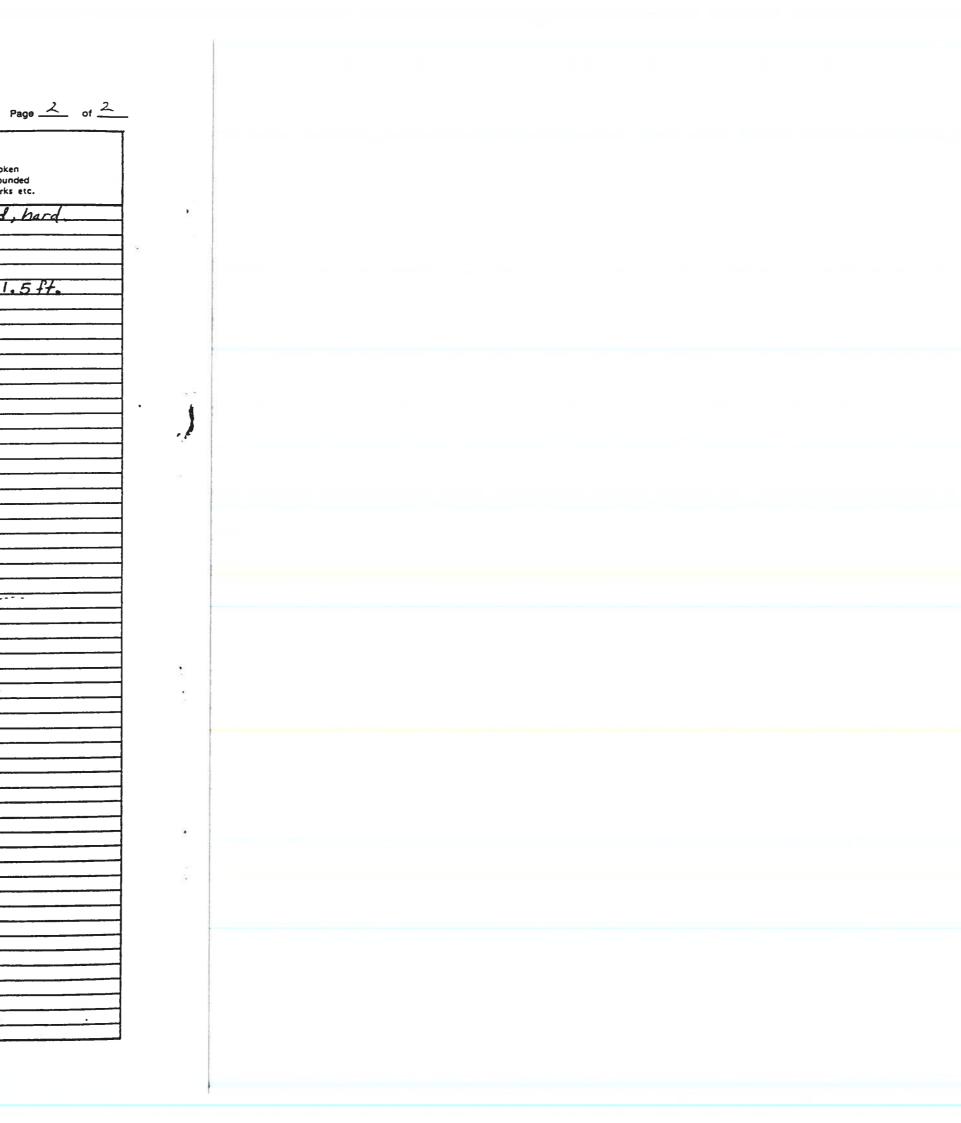


734-3976 (REV. 12-82)

SOILS AND GEOLOGICAL EXPLORATION LOG

HIGHWAY DIVISION East Abutment Project Bond Park way @ Sisters Interchange Hole No. 3-92 Highway Dalles - California (Highway #4) | County Deschutes
Purpose of Work Structure Foundation Investigation Exploration Prefix C009-1803 Bridge No. Tube Elev. Equipment CME truck-mount Driller Chuck Fish Recorder Kris Iverson Geologist Randu Davis (Lt.) 2.0 Hole Location "MK" Line, Sta. 107+37 Ground Elev. 35/0.9 C.L. Groundwater Level **Drilling Method** Depth No. 3 **Auger Depth** "N" - Standard Penetration, Not Ecountered No. 4 Casing Depth "M" - Oregon Miniature Pile. 21.5 HQ-3 Open Depth "C" - Core, Barrel Type No. "U" - Undisturbed Sample, Size Total Depth Sample Data Sheet No. Date Started 02/04/92 Date Completed 02/04/92 Material Description Wet-Dry Color % Recov Graphic Consistency Jointed-Broken Angular-Rounded Plasticity 7 4 est Organic Content Drill Remarks etc. SAND, with some silt, SM, nonplastic, PNI I 1.0 50 damp, brown, loose 2 N=5 13 2.0 1 3 13.8 SAND, with some silt, trace of grave, SM-GP, non plastic, moist, brown, medium dense. 0.9 45 8 N=14 11 4 SAND, with some silt, trace of gravel, 1 N3 3 SM-GP, nonplastic, moist, brown (top & of sample: same as N2, above) Bottom & of sample: Basalt Fragments, Gravel to sand size, angular, gray, 0.9 45 9 N = 23 14 6.0 ||+| 13 1.0 15 R4/ medium dense. CI(0'-6.5'): BASALT, vesicular 0 very close jointed (10,90°-irr; 30,45°
-irr: 1030°-rough; all with thin brown
silt coating), fresh, dark gray, hard. BASALT, vesicular, close to very clase. 4.5 90 R4 (20 50 - 550 - irr; 20 400 - irr; numerous others: all with thin brown sitt conting), fresh to slightly weathered @ bottom 1.01 dark red brown and clark gray, hard. BASALT, resignar, close to very 4.3 86 R4 close jointed (1@900 - irr, w/fe, 00 stains: 2030°-icc.: numerous others many with thin , brown silt/sand intill (3-4 mm thick), dark red-brown to dark gray @ bottom), slightly weathered to tresh, hard. BASALT, vesicular, top 3.0'; moder-4.5 90 R4 ately close jointed (10400 - icc : 10600irr.) to very close jointed (rubble-grave) Size angulor pieces @ 19.5'-20.0'), dark gray (top) to dark red brown (bottom)

			-	55			7.0		at the state of th
	Be	end	(East Parkway @ Sisi	Abu	tme In	nt) terch	ang	je	Hole No 3-92 Page 2 of 2
zi.		Type No.	Driving Resistance	Measured Recovery.	_	A CONTRACTOR		% Natural Moisture	Material Description Color Wet-Dry Consistency Jointed-Broken Plasticity Angular-Rounded Organic Content Drill Remarks etc.
			C4, continued				+		fresh to slightly weathered, hard.
	╟	-					+		
		上					+		
21.5	7						,		Advancement halted at 21.5 ft.
						<u> </u>			
	-								
	\vdash								
- -									
	-								
- -	1								
	_					59			
	-								
	-								
	-					18			
									,
	-								
	_								
					1				
	_								
	Н						2.5		
	-								
- 1									
		٠							
	-								
	H								
_ '									
	\vdash								9
	_								



Page 1 of 2



Proje	ct	£	Bend Parkwa	<u>ч:В</u>	utle	r Mar	ke:	+ Ro	ad Uxing	Hole No. 4-92
High		D	alles - Califor	hia.H	wy	*4			County Deschutes	Prefix C009-1803
Purpo) 5 0	of W	ork Structure	Found	latio	n In	ves	stige	ation Exploration	Bridge No.
Equip	me	nt ,	CME 6x6 TI	ruck 1	Mone	1 +		J		Tube Elev.
Geole	gis	t]	Randu Davis						Driller Chuck Fish	Recorder Kris Tuerson
Hole	Lo			a. 19	0+8	38	Lt.		C.L. (Rt.) 62144	Ground Elev. 3.556.2'
			Tests	•		-	T		Drilling Method	Groundwater Level
-N	٠	- Sta	ndard Penetration,	•		No. 3	- 1		Auger Depth (Date Depth
M	·	One	gon Miniature Pile,			No.	-1-		Casing Depth (
				Q-3		No. A	- -		Open Depth 21.0	
			listurbed Sample, Size		_	No.			Total Depth 21.0	
1000			-	Date Con					Sample Data Sheet No.	L
Date	50	arte	02/11/92	Date Con	npiete	02/11	/9	7	Sample Data Sheet No.	ε
├──	_		- 7.7 / 		T	1 7 7	1		Material Des	cription
			1		5	2/	3		1	•
	ĺ			Measured Recovery.	Recovery	# (V)		% Natural Moisture	Color Consistency	Wet-Dry Jointed-Broken
Ę	l _		Driving	98	ě	\$ 0	Graphic	1 2 4	Plasticity	Angular-Rounded 1
Depth.	8	No.	Resistance	N N	1	/*	ě	% ≥	Organic Content	Drill Remarks etc.
-0 -	L.,				-	γ	1.27	 -	CAALS	
L -	Цí	Ĵй	4	1,2	60	 	ļ:ji:	II—		s, with some silt.
L -	Ш	Щ'	10 "N"= 20		-	 	11:11	II	and trace of fine to	
L _	Ш	Ш	10 14 20				;; ;	<u> </u>	GW, non plastic,	damp, brown,
2.0	Шı		12					i	medium dense	
[Z,0	1	N	9	1.8	90			6.3	SAND, puniceous	s, with some silt,
Γ -	П	2	7 "1"- 12						SM, non plastic.	dry, light brown,
r -	П	Н	4 N = 13				11:1:		medium dense	1, 3
<u> ተ</u>	Η.	!!	11		1		11.1			
14,0	H	N	19	1.2	63		1:6:		SAND, puniceou	5, with some silt,
 	Н	3			100	-	l li		trace oravel SM-GU	W, NP, dry, brown, med dense
├ -	Н		8 N=20	0.5	8		11:47		(C) (0' - 6.0') Basal	It COBBLE from reaming
┡	Н.	၂ြင္	12 · · · · · · · · · · · · · · · · · · ·		<i>U</i>	5.5		1	to 6.0'. Fines wash	
5.9	\mapsto	K-	50/0.4 Refuso	40	98	R4	+.		BASALT , vesicular	
	H	Je		7.9	170		1 †	├—		
<u> </u>	Ц.	2			├	/46	+	├─	sample) to close join	1. /
L -	Щ	4-			 		+	<u> </u>	10 650 -icc w/ brow	
L _	Ш				├	<u> </u>	₁ ¹	<u> </u>	10 200 - cough/irray	, , , , , , ,
L	Ш				<u> </u>		+		coating) tresh, dar	rk gray, hard.
L		\perp			<u> </u>		1 +			
	П				<u> </u>		1.			
	П	T			<u> </u>		 ▼.			
Γ 7	П	Т] +	<u> </u>	<u> </u>	
T	T	J					H			
41.0	7	70		4.7	94	R4/	1		BASALT, vesicular	very close jointed
F -		13				1/42	י ו		Q top 2.0'), close join	ted (middle) and
├ -	\vdash	+-					13	1	very close jointed (a) !	potton 1.01 (1@90-1
Ի -	╫	+			 	· · · · · ·			in w/ slight Fe-On stains	: 1@ 30°-irr; numer-
┝╶┤	+	+-		-	 		7	1	lous icoscular in inte in	1 Fo - 0 - Strips 10 to 1 2.01
┝╶┤	+	+-			-		+		Losela darle sacre to-	O Crubbly nearly
	₩-	+-		_	-	-	١,	-	fresh dark gray, hard scoraceous 12.0 to 13.	27
┡ -	4	+-			-	-	! ₹	-	SCOPACEOUS 12.0 TO 13.	9
 	Щ.	+		_+-	-		+	<u> </u>		
┡╶┧	Ц.	4					Ι.	<u></u>		
16.0	7	<u>/</u>			<u></u>	<u> </u>	+	 		ilas alaca t alaca
Lieig		<u>) c</u>		4.5	90	R4	Į,		BASALT, vesicular,	very close to close
		4				/34	Ţ		jointed @ top 2.5')	to very close jointed
Γ 1	Т						+	L	a bottom (10,600-rou	gh; 1@. 80"-irc, w/
7		1					l '		ا مناهم من ممانات الل ^ت ما	(A) = (A) - (A)
┌ ┤	+	1					+		20 - irc; possible fre fresh, to slightly wed	w contact @ 19.00),
 	+	+-					h.		fresh to slightly wer	thered, dark gray
734-39	76	(RE	/. 12-82)				,		7	_ , ,

		ß	iend Parkway @ B	utle	r Mk	H. Rd.	u'	xing	Hole No. 4-92 Page 2 of 2
Dapth, n.	Test	No.	Driving Resistance	Measured Recovery,	% Recovery	A COMPANY	Graphic Log	% Natural Moisture	
			C.4 (continued)				+		with some dark red brown, hard.
_							+		
	Н-	H					+		
21.0-	Y	\vdash							Advancement hatted at 21.0'.
	-	-					1 1		
	一								
	_								
	-	-							
	一	_					1		
	×								
	-			-					
	<u> </u>								
	-								
		\neg							
	_	_							
.]									
	-	_							
	-	\dashv							
-									
		\Box							
	-								
	\vdash		¥						
	<u> </u>	_	18						
	-	\dashv							
	\vdash							-	
	 	Į.							
-	-	-				39			
-									
							- 12		



Page ____ of ___

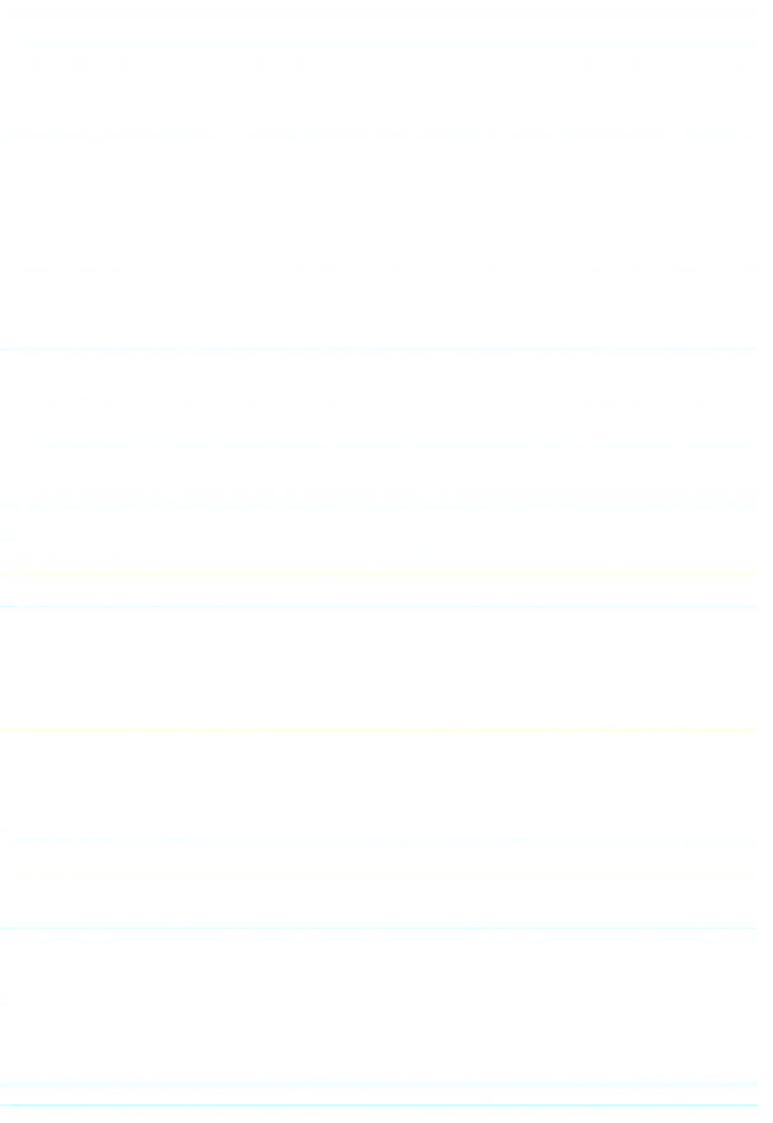


Proje	ct	127	FND PARKIN	IA	V 70), R.	Her N	14	Ro	1. U'xina Hole No. 5-92
High		4-0	alles - Calif					¥ 4	_	County Deschutes Profix Coog 1803
Purpo			7.7-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7					En	Ves-	juntion Exploration Bridge No.
Equip	_				our		11//	~	<u> </u>	Tube Elev.
Geoid					DUF	<i></i>				Driller Church Fish , Recorder Kris Iverson
-			Randy Davi€ n "P" Line, S		189	7 1	5/ 1	.t.		C.L. (RD 441) Ground Elev. 3,557.0
Hole	LOC	atio		ta.	107	Τ.	<i>)</i>	Ϋ́		Drilling Method Groundwater Level
i			Tests	-			No. 2			Auger Depth Date Depth
		_	dard Penetration,					-1-		Casing Depth Not Encountered
			on Miniature Pile,	.1.	_		No	-1-		
				Ha-	3		No. 4	-		1445
			isturbed Sample, Size			'	No			111.5
Date	Sta	rted	-1.10-	Date	Com	pletec	1/1.	10.		Sample Data Sheet No.
			02/11/92	L		02	/11/	92	—	Maria de la companya del companya de la companya del companya de la companya de l
		.	,					9	1	Material Description
Ι.		- 1			P :	Recovery	A CONTRACTOR	Log	1 5 .	Color Wet-Dry_
 	ĺ	- 1	,		Measured Recovery,	Ö	3/0	Graphic	% Natural Moisture	Consistency Jointed-Broken
5	Test	اہ	Driving		900		1/2	8	Zĕ	Plasticity Angular-Rounded Organic Content Drill Remarks etc.
Depth.	12 4	ž	Resistance		2 €	%	/	Ð	1.2	Organic content
0	1	M	2		1.5	7.5		1 1	12.5	SAND, pumiceous, sitty, SM, non-
r -	Ш	1"1	4 ", 1" 10							plastic, dama, dark brown, medium
Ի -	-	\dagger	N = 10					1:4		densa
ነ -	11		7					lt il		
-20	HX	10	7		19	100				SAND fine Silty SM magastic,
┡ 。-	HI	R	40/0.4 Refus	-	0.1	100	2.71	144	 	dry light brown medium derse.
2.9_	H₹	-	40/0.4 Refus	<u> </u>				4		Some Basalt Fragments @ hottom.
١ -	Н-	\perp			- 6	62	R4	1+	├─	Vair (a) Tag (5) Sangle : Sittle
┡ -	Ш	C			3.8	63	KY.	+		CAND 2 How 2:2's amale: RASAITT
L.	Ш						156	│ .∔		SAND DATION 313 SAMPLE DISTET
L.	Ш							+	<u> </u>	vesicular close to moderately close
								1	<u> </u>	jointed (16,700 - rough, wife, oz stains,
Γ_{λ}	T							+	<u></u>	trace Cas Cos), treth, dark gray, hard.
6.0		CZ			4.6	92	R4/	1		BASALT . Very slightly resicular,
_	П						184	+	L	moderately obse jointed (1825 -
Ι -	Н	\Box								rough; other boxing tractures), fresh
r -	\vdash	T						+'		metium aray hard.
- ا	H^-	T						ַ '⊥		7 /
<u> </u>	╫	1						٦, ا		
} -	H	+-						+.		
}-	₩	+				_		+		
- -	₩	+-						+		
- -	H-	+-					 	+		
-11.0	1				4.7	011	R4/	+		BASALT, slightly vesicular to 12,5') and
⊦ -	Н.	\C3			7.1	77	712	l +	 	highly vesicular below, close jointed (30)
Ļ.	Щ.	\perp					16	+		25°-irr.: 2010°-rough, 1@90°-rough)
H2.5	Щ.					<u> </u>	 	M	1-	First the 12 51 - 1 0/4 hall to a the call
L	Щ	╀] ,†		From 12.5 and Slightly weathered"
L -	Ш							T		trom 12.3 caown, ark rea prown, hard
L I	Ш	1						+	<u> </u>	D III C I al I la ETI deall
	\prod						L	+	<u> </u>	Possible flow contact at 12.5 ft. depth.
Γ.	П						<u> </u>	+	<u> </u>	
Γ	П						<u> </u>			
Γ,,	K							++		
16.0	7	YCA					R4/	∔'		BASALT vesicular with some vugs, close jointed (1@ 10°irr), fresh, dark
Ի -	tt	1					100	+		close jointed (10 10°irr), tresh, dark
h -	H^-	T						+'		arny hard
F -	H							+		
18.G	->							一	<u> </u>	Halted advancement (c), 18.0'
	 						 	1		
	<u></u>			_		Ь				

Jau			02/11/92	1	00	2/11/	192		· · · · · · · · · · · · · · · · · · ·	<u> </u>		_
	Т			7	T		1.		Materia	al Description	•	
1.				125		3/	١٩		Color	Wet-Dry		1
= =				Measured Recovery.	% Recov	# /V	ž	% Natura Moisture	Consistency Plasticity	Jointed-Broken Angular-Rounded		. 4
Depth.	18	Type No.	Driving Resistance	Me a	*	1/4	Į Š	* × ×	Organic Content	"		- 1
رظرا	45					<u> </u>			SAMD and a	C'LL CA	1 100 -	_
	11	ואל	2	11.5	7.5	 	-111	: 12.5	SAND, pumiced	als, sing, sin	1,100	
-	++	Н	4 "N"= 10		-	+				WALK ALDINA, I	PER IN	4
-	\parallel				+-	 	1	11				
-20) 	Lie	7		9 100		111		SAND fine S	ilty SM m	rolastic	
ه ا	++;	114	6 7 40/0.4 Refu	Sal J.	1,00	2.7/	1	4	SAND fine, S dry, light brow Some Basalt F 0'- 6-0') Top 6	un medium	derse	
2.7	++	+-	Net(C	-ui	\top		74,		Some Basalt F	maments a h	ottom.	
-	++	Cf		3.5	3 63	R4/	7,1		0'-6.0') TOD 6	0.5' sample:	Silty	
r	#	1				156	2 1		SAND . Bottom 3	7:3 Samale: Bt	45AUI	,
r	11	1					ً+۲ً		vesicular close	to moderately	close	_
٢	1						⅃ ʹͱ		jointed (16,700 -	rough where		,
[] A	兀	_				104	'+لٍ			frekh darkgra		-
6.0	\prod	CZ		4.6	6 92	R4	4		BASALT, very	slightly resigni	ac	-
Ę	\prod				-	184	4+	-	moderately clbs	e pinted (11	f 45 -	4
L	11				+	—	┦.†	·	rough; other box	LING TRACTURES	y, res	7
L	4	4			+-		┨ [‡] .		metium gray, h	ATAY.		\dashv
-	#	+			-	 	- +	-				
+	++	+-			+		+	-				
-	++	+			+-	-	 	-				
-	++	+			+	 	+					
-	#					1	7 +					
11.0	ነተን	C3		4.7	1 94	R4/	<u>]</u> †		BASALT, slightly	vesicular Ho 12	1.5/Jana	
r	#	7		- 1"	T	R4/ /12],†		highly vesicular b	elous close ioins	ted (30)	
1.	#	\top					1	1	25 Jirr. : 2016	0°- much 109	10 - cous	411
720	7						و ا	-	fresh (to 12.5)a	nd Slightly use	athered	
	I	I					#'		From 12.5' & dow	in), datk sed bo	ומת ל מחום	<u> </u>
	\blacksquare	1					4		5 41 6	1 .1 .1 12 = [1	doall	
	\coprod				4-	 	4	-	Possible flow com	tact at 12.511	· cept	-
Ĺ	\prod			_	+		+				-	
L	\prod	\bot			-		╂.	-				
16	,15	\			+	DA /	∤ ∐⊀		BACALT LOCIC	ular with son	10 VUO.	S.
16.0	44	YCA			+	R4/	҉†,	-	BASALT Vesic	@ 10°icr fres	h. dark	7
-	#	+	 		+-	100	4 <u>.</u> †	 	gray, hard	7,	,	
F	++	+	ļ		+-	+	┪ [┷]	-]	<i>y</i> / '			
18.0	9				+-	1	广	1	Halted advancem	ent (d, 18.0'		_
1	+				+-	1	1					
734-	3976	(RE	/. 12-82)	- 35								
			-									
			9									
					* (**)				in)			

								Hole No	Page of	_
		Г		1	1	_		Material De	scription	7
Depth, ft.	Test Type No.	Oriving Resistance	Measured Recovery,	% Recovery	A CO CO	Graphic Log	% Natural Moisture		Wet-Dry Jointed-Broken Angular-Rounded Drill Remarks etc.	
										1 .
			-	_						
-			 				12			
		n e								4
O/		18								-
-		(3)	-							1
]
								it.		-
	6			-						-
				-			646] .
•										1
										1 3
-			-	-						j *
-										2.0
. <u>-</u>						,				-
		(4	- 17	-				20		1
_			-]
-								G.		
_				ļ	2			• III		4
-				<u> </u>			-			1
_				 				<u> </u>		
								N N		100
-									· · · · · · · · · · · · · · · · · · ·	j
-		ж.				ž.		e. 1		1 1
			9							-
-										
-]
										1
_			$\vdash\vdash$							1
-]
										-
• -										
-			88			1]
-	C/K	(3)								0 2 3
										1
4			400	90						1
12		<i>Vi</i>				1	_			1
										1
]								E . 320		1
7	10					ŀ		1		1
-						ı]
]		2								1

1



Page 1 of 2



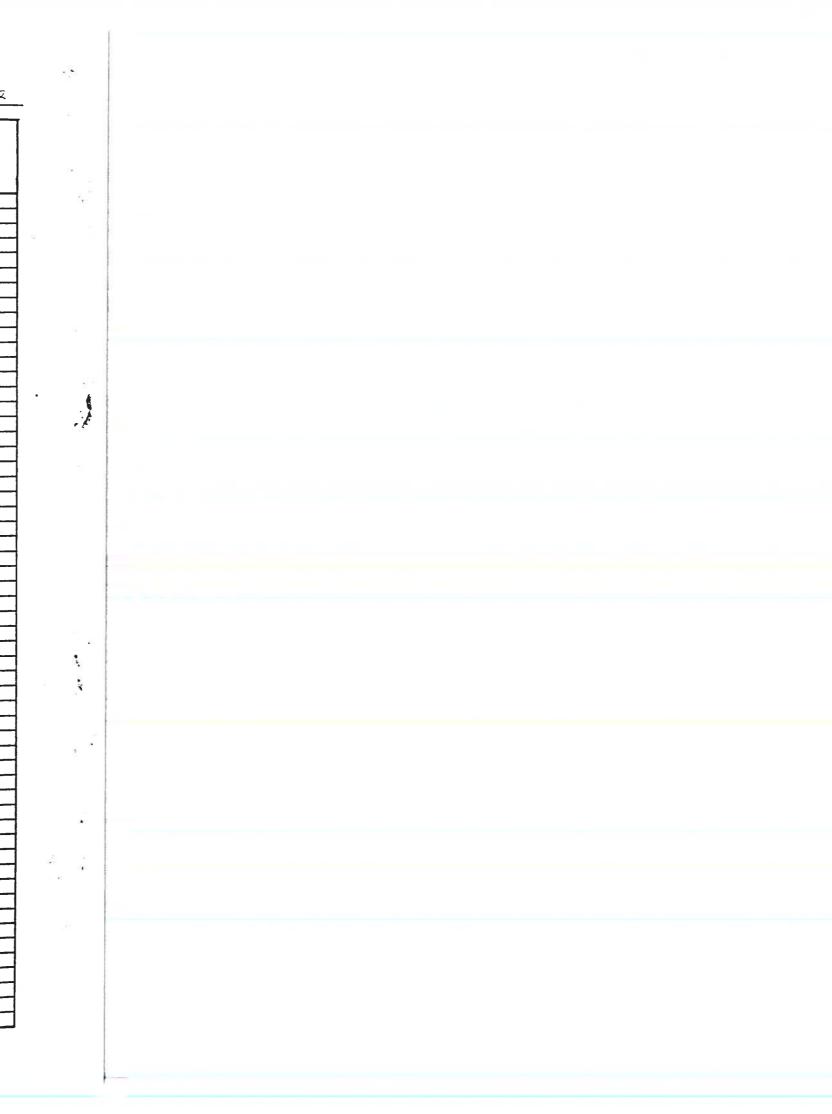
										7875 <u>N</u> 127 VA	The second secon
Proje	ct	•	٦,	ND PARKW	AV (a	Die	ision /	111.	nder	word U'xing	Hole No. 6-92
Highy					POTNIA	$\overline{}$		4)		County Deschafes	Prefix Cop 9 1803
Purpo	_		_	7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				_	Stia	ation Exploration	Bridge No.
Equip				CME Truck		ed. Viel (J	7	Tube Elev.
Geolo			- [Randy Davis						Driller Chuck Fish	Recorder Kris Iverson
Hole	_					223	+950	(i.)	94		Ground Elev. 3596.3'
HOIE		Ca		C '' Tests				-		Drilling Method	Ground water Level
***		_		dard Penetration,	_ 2	24 +	CG 41	-1		Auger Depth ()	Date Depth
							No. 0	- -		Casing Depth ()	Not Encountered
				on Miniature Pile,	HQ-3		No. 4	- -		Open Depth 21.0	-,1
				, Barrel Typeisturbed Sample, Size	ב-אף		No. 0	-		Total Depth 2(.0	
"U"	_	- u	na	sturbed Sample, Size							
Date	St	tari	ted	02/12/92	Date Co	mplet	02/1	2/4	92	Sample Data Sheet No.	·
						Ι.	1 ./	1 .	1	Material De	escription
					١.	. È		5	5.	Color	Wet-Dry_
æ.				•	Š	Recovery	\$ 00 A A A A A A A A A A A A A A A A A A	물		Consistency	Jointed-Broken
Depth,	ī	8	ان	Driving	Measured	3 4	1%	Graphic	% Natural Moisture	Plasticity Organic Content	Angular-Rounded Drill Remarks etc.
ğ	۽	Į.	ž	Resistance	Ž	*	V	۵	* 2		
0	7	不	¥(1	2	1.0	67		111	15	SAND Silty with	trace of organics, SM,
	H	H	41	10 11-25				[:]:\		non plastic dame	
	H	Ħ		25 N= 35			1.21	T-			tom 0.5ft. sample:
1.5-	H	ᅫ		<u> </u>			1	1.			nents: GRAVEL, Sandy
	H	\dashv	-					1+		5,20	
	H	\dashv	ĈI		14	677	R4	1+		Core. 0' to 6.0':	BASALT, vesicular,
	Н	\dashv	<u> </u>		 	-1-1	42	1 +			90°-icc. w/Feaco
	Н	\dashv	_				T	+		stains 20 15-20°-	inc. w/ Caz Coz crystals
	H	-	_			_		1'.	_	and Feron stains:	@ 30° - irr. w/CanCon
	H	\dashv	_			+-	1	 	 	crustals / Fe, O, Stain	
-	H	4				+-	+	1+	-	hard.	,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,,
	H	_	_			+		۱',			
6.0	Ľ	\star				/ 2.2	DA /	┥†	\vdash	BASALT Slightly	resicular, moderately
	Ц		CZ		4.	692	R4	1+	-	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	to 2.01) to close
	Ц						62	┨"	—	close jointed (2)	
L -	Ц					+		┤ +		10.45° - irc. w/ Fe	
	Ц					-		┨.		1 /	2/3 3/2/3
_	Ц						1	1+		dark gray, hard.	
	Ц						 	1			
	\coprod					4	4	↓ .†	-		
[П					-		∤ †	├		
	\coprod							┨╁	<u> </u>		
J1 5	I	V						, (<u></u>		1 1 1/10
11.0	1	\triangle	C3		4.	1 82]+	—	BASALT, vesicula	r, close jointed (10)
-	П						/42	1+	 	60" - rough w/ Caz	CO3 + Fe O3 stains;
-	П							+	<u></u>	20 30° - jes; 10,6	0° -irc, w/ Feed
	П]'		Stains), fresh to	slightly weathered
	Ħ						13.4	رن بو		dk.gray to 13.4'	and dark sed brown
-	H	H	_]+		below 13.4', hard	P. Possible flow
-	H		-			1		1.		contact noted (2)	3.4'.
-	H	Н	_					7			
	H	Н	_			-		1+	1		
	₩	Н	-			+-	+	7			
16.0	H	×	CA		5	3 100	+ R4	+		BASALT , slightle	vesicular close
-	Н	\dashv	4		 ∵	<u> </u>	30	┥╫	 	jointed (20, 60 4	650- much: 120°
-	H	Н	_		- -	+	1: 50	-1		-rough: 22 30°-i	
	₩	-	_				+	 †,	-	weathered (in top 5	
	₩	Н	_				+	1 +	 	to dack gray (both	7
	H	Щ	_		 	+	+	4	-	TO CLARE GIANT BOTH	
	Ц		Ļ	10.00				1			
734-3	976	6 (1	٦E١	/. 12-82)							

Bend Parkway

@ Division Street Lixing

Hole No. 6-92 Page 2 of 2

			اران ال			J			
Depth, ft.	Test Type	2	Driving Resistance	Measured Recovery,	% Recovery	A CONTRACTOR	Gruphic Log	% Natural Moisture	Material Description Color Wet-Dry Consistency Jointed-Broken Plasticity Angular-Rounded Organic Content Drill Remarks etc.
	+								
-	₩		C4 continued				++		2
-	H +	-				- 0			
L.	Ш	4-		L			+		
21.0	12	\bot							
721.0	I		<u> </u>				l		Advancement halted at 21.0'.
Γ -									
r -		\top							
F -		$\neg \neg$							
F -		\top							
F -	_	+-					1 1		
-	-	+-					1 1		
-	-	+							
	 						*		
-		+-				-		_	
- .	 	4-							
- -	1	4-							
]							
Γ		T					١.		100
-	Г	\top							
!		1-							
-	-	+-					H		
)		+-							
 -	-	+-							a \$1
-		+-	17					-	
<u> </u>	 	+-							
L -		4-							
		1							
L						L	- 3		
								ri:	
Γ									
-		T					=		3.2
-		\top							
<u>ት</u>		+							
-		+-							
-	-	+-							
-	-	+-		- "					
-		+							
		4							
L .	<u> </u>	-							
	<u> </u>	4_							
L									
[]			- 0						/3
Γ 1		T							
- 1		1							
		1	2						
+ +	- 17	+-			27				
F +		+-							
	_	+					1	-	
j							ŀ		
 	<u> </u>	4				55			
-		_							
				\Box					
L]									
		T							
Γ 1		1					- [
Γ 1		1					ſ		
r +		†				e.	ı		



Page ____ of ___



Proje	ct B	END Parkwa			ere l		2.1	1'xing Hole No. 7 - 92
Highy	vay D	alles - Calif	orgia	H_{W^*}	. (74	F}_		County Deschutes Prefix C009-1803
Purpo	se of Wo						stia	
			Truck				- · · · ·	Tube Elev.
-			TUCK					Driller Chuck Fish Recorder Kris Tuerson
Geolo		Randy Davis		2 1	90	1 +		C.L. (Rt.) 50 Ground Elev. 3620.6
Hole	Locatio			33+		Lt.		
		" 4 "Tests	_ 23	4+	15 4	9	Rt.	
N.	· — Stan	dard Penetration,			No. <u>3</u>	_ _		Auger Depth O Date Depth
"м"	" — Ored	on Miniature Pile.			No	- -		Casing Depth O Not Encountered
•	_		93		No	- -		Open Depth 19.0
ı		isturbed Sample, Size	, 4, 5		No. =	-		Total Depth 19.0
Date	Started	02/12/92	Date Con	plete	02/1	o /:	72	Sample Data Sheet No.
<u> </u>		17/14/12		·	37,	/_	(^-	
				١.	/		1	Material Description
			100	Recovery	3/	۱۵	a .	Calar Wet-Dry
=	1		Measured Recovery.	ĺŚ	# 0 # 0	2	% Natural Moisture	Consistency Jointed-Broken ,
Depth.	m g	Driving	2 5		1	Graphic	Z	Plasticity Angular-Rounded
8	Test Type No	Resistance	≥ €	*	/	ŏ	% ≥	Organic Content Drill Remarks etc.
1-0-1			1.5	85		1-1		SAND with some silt SM, nonplastic
L 4	TN1	2	1.7	82		11:1		, , , , , , , , , , , , , , , , , , , ,
LJ	\sqcup	4 "N=9				1111	 	damp, dark brown, loose.
L		5				₩.		
		5		l	l		L	
2.0	A NZ	4	1.4	70			4.4	SAND, puniceous, with some sitt;
⊦ ⊣		8 11-10				[3]		SM nonplastic, dry, light brown,
⊦ ⊣	┞╫╂┼╌┤	- N = 19				$ \psi\rangle$		medium dense.
┡╶┤	-1.11			 		[4]		MEGICAL BEIGE
4.0		10		 				- SECH Parents : SAND in
[''`J	1 N3	5	0.8	100	4.5			Top 0.5 ft. of sample: SAND, pumice-
4.8	₩ _	40/0.3' Refuso				+		ous, with some silt, SM, non plastic,
Г٦	CI		1.5	25	R4/	١.		dry H. brown, medium dense. Bottom
Γ . \Box					10	+	L	0.3ft of sample: Basalt Rock Fragment
6.0						+		GRAVEL Sandy Size.
├ ┤	╫╫					١.		CORE. 0' to 6.0': BASALT, vesicular.
⊦ ⊣	H + H					+		very close iginted (10,90°-irr; 10,50°-
⊢ d	╟╫╌┼╌┤					Ŀ	 	
L 4	\Box					Τ.	 	
LJ						+	_	dark gray, hard.
	C2		5.0	100	R4/	١.`		BASALT, vesicular, close jointed (tew
ГЛ					76	+		very close joints @ mid-sample) (2@45°-
F 7						I →		ling. w/Fero: stains: 10 300 Ling. w/Fero,
F 7						' ו		Hains fresh dark gray hard.
├ ┤	┝╂╌╂┈┦			سينا		+		7,
41.G	+X-		FA	100	21	l .		BASALT, resicular (w/some rugs), close
┡ ┥	C3		12.0	100	R4/	+	-	BASALT, resicular (w/some rugs), close jointed (3@0°-icc, 2 w/ silty sand intil)
	\sqcup				776	+		Jointed 1 3 (a A - ICC , 2 W/ SIIT (4 STAN 1777)
LJ						Γ.		rubble - like w/ sitty sand infill at 13.0'
Г٦						1		to 13.5), tresh to slightly weathered
Г 1						+		to 13.5'), fresh to slightly weathered (13.0' and greater), dk. gray top) to dark
						١, ا		red brown (213.0 ft. depth), hard
├ ┤	 - - 					+		
┝╶┥	┤ ╌╂╌┨				-	1		
┝╶┩	 					+		
ل ا						+		
16.0	V					Τ-		1 110
70.9	C4		3.1	100+	R4/	+		BASALT, vesicular, close jointed (10)
ΓŤ	7-1-1					'		-40°-icr w/Fe, Oz stains - 10, 60°-raigh w/
- 1			\neg			+		-40°-ice, w/Fe, Oz stains - 10, 60°-rough w/ 5mm sandy sut infill; 100°-irr, 10 50°-rough
┝╶┥	┝╅╾╃╼┦		\dashv	-		ĺ .		fresh , gray , hard .
┝╶┩			_	-		+		, The same of the
<mark>├</mark> ┧	┝╀╾╀╼┩					+		Advancement halted at 19.0' depth.
190					19.0			HAVERCEMENT PROTECT OF 11.0 REPIA
134-39	76 (REV	. 12-82)	185					

<u>i_</u>				
2				
ļ				

								Hole No Page of
	T	T	T	Т		1 _	Ι	Material Description
Depth, ft.	Test Type No.	Driving Resistance	Measured Recovery,	% Recovery	A A A A A A A A A A A A A A A A A A A	Graphic Log	% Natural Moisture	Color Wet-Dry Consistency Jointed-Broken Plasticity Angular-Rounded Organic Content Drill Remarks etc.
				├	 	-		
· -								
· -]		
-				-				
-			-					
_					14			
-			-			1		
-								
_								
-		•	-	-	-			
-						1		
					<u> </u>			
-	Ш			-				
-								N. Control of the con
							<u> </u>	
-								
4					8			
4								
4						-		
-		- /-						
]		G 1802				25	1.0	
-								
4		1						
1	i)							
4								
+		N						
1								
+								·
+								
1	11							
4								
+	53					l		
1								
+			ő .					
+						ŀ		
1				\Box				V.
4					0	-		
+						<u> </u>	3	
1								
$_{\perp}$								

1

•

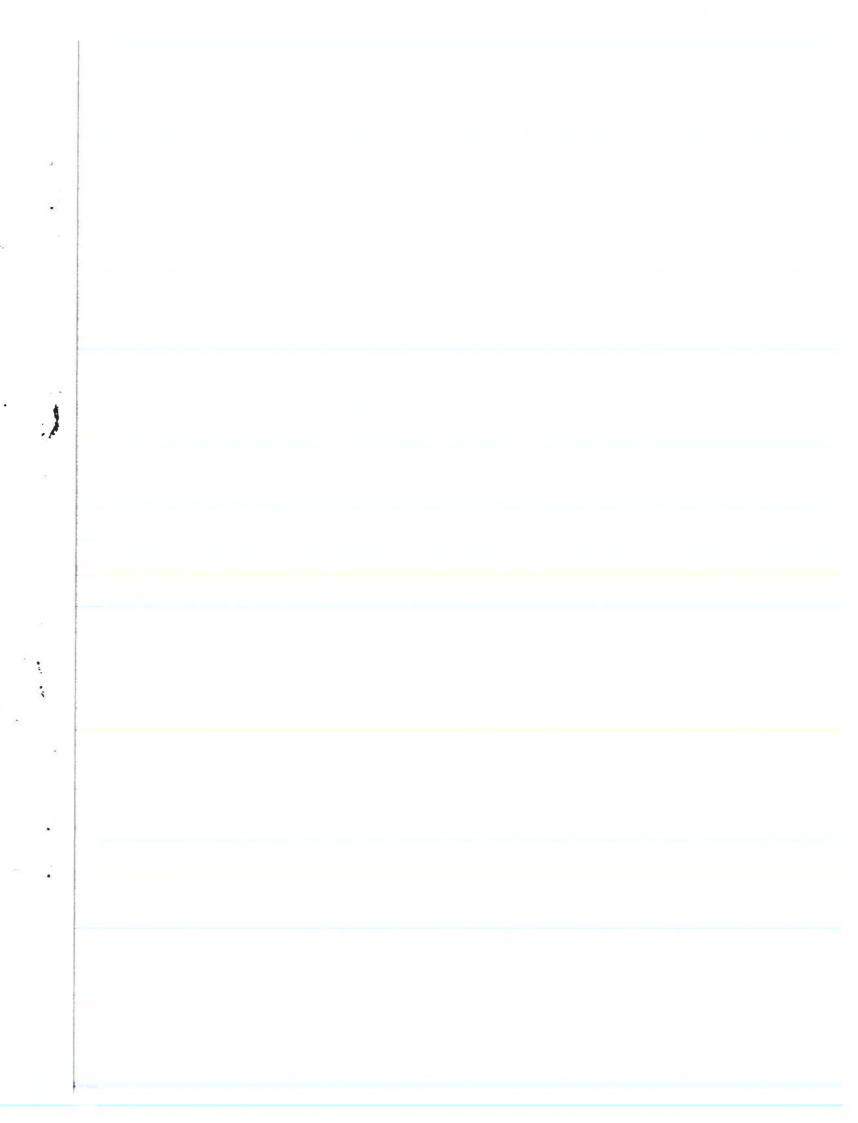
•

Page ____ of ____



Proje	ct	131	END Parkwa	in (a),	En	nigin	e Bli	vd.	0	'xina	Hole No. 8-92
Highy	_		palles - Cali	Abraia	. <i>F</i>	lwu	. (#4	.)		County Deschutes	Prefix C009 1803
Purpo					lot	inn	Inve	sti	gatio	on Exploration	Bridge No.
Equip			CME 6X					(J		Tube Elev.
Geolo	_		Rarly Davi		7.37					Driller Chuck Fish	Recorder Kris Tuerson
Hole	_				45	+.	31 /	ī.)	88	C.L. Rt.	Ground Elev. 3,552.3
Hole	LU	Catio			T.)		1	7	6///	Drilling Method	Groundwater Level
		_	Tes	LS .			. 2	1		Auger Depth ()	Date Depth
			dard Penetration,				10. 2	- -		Casing Depth 0	Not Encountered
			on Miniature Pile,	110 =			10. <u>0</u>	-1-			- INDI ENCORNIETRO
_			, Barrel Type	HQ3			10. <u>7</u>	-		Open Depth <u>35,3</u>	
n.	· –	- Und	isturbed Sampie, Size			^	ю. <u>О</u>	- _		Total Depth 35.3	
Date	St	arted	02/13/92	Date (Com	pletec	02/1	3/	92	Sample Data Sheet No.	
										Material Desc	ription
				1_		5	3/	2	- a	Color	Wet-Dry
=			G	1 5	Recovery.	Recovery	A CONTRACTOR	Graphic	% Natural Moisture	Consistency	Jointed-Broken
Ę.	=	2	Driving	Š	8		X/2	Q.	2 8	Plasticity	Angular-Rounded (1)
Depth.	Te	Type No	Resistance	Ž	2	*	/	ِ ق	* ≥	Organic Content	Drill Remarks etc.
0		300		- 13	.8	69	0/		0.3'	0' to 0.3' : Asphal-	Concrete
	Η-	नेत			•0	07	7	80		0.3' to 4.5': Bas	
┡ -	4	+-					<u> </u>	000	-	and pieces of aspha	
	Щ	4						00	 		
	Ц							20			
		\perp		E .						./ 6. =	Road base and
	П	Т			1			وك		embankment till]	
-	H	\neg						0			
r -	H	_						S		£1	
-	Н	+						000	4 =		
	H	+-	·		_		13		7.5	4.5' to 5.5' : Ba	salt BOULDER.
⊢ -	H	+					Esci		- 4	Broke Cure"@ 5.5ft	No SPI attempted.
5.5-	\Box	़⁄			. 	F /	~ /			Basalt BOULDER	. [Embankment Fill
L	Ц	702			1.0	56	9/	-	 -	Dasair DoutDER	· Concentration
L _	Ц	┸					10				
	H.							پہا			
Γ -	П							ſÌ	L		
Γ -	П		9								
├ -	H	_						<i>[.</i>			
┝ -	H	\top						₩			
├ -	Н	+			\neg			7			
	Н	-		-	-						
┡ -	H	+		 -)°			
<u> </u>	Ц.	- -						Jo.	-		
10.8	Ļ	K _	 					00	 -	GRAVEL C.	1/ 20 00 2:11
L -	Ц	M	19 1/2 34		,0	<u>50</u>			-	GRAVEL, Sandy	· With Same Street
L	П	Ш	1 "N= 34					9.0	 	GW, non plastic,	moist (acilitimility
[]			13					0		boun dense	Embankment FILL
Γ -	П	٧l	46					M.			
r -	Ħ	T :		12	2.1	42	ø/	00		BOULDER COLD	ly with some
r -	H	7		ं			0	\ ₀ O ₀ (silty sand matri	(mostly washed
-	H	+-			_					away by drilling fi	uid). Noted boulder
Ի -	H	+			\dashv		211				to 15.8'.
-	H	+									
-	H	+							 	Broke Core @ 15.811	-No SPT attempted.
15.8	$\downarrow \downarrow$	X _					-			BOULDER (part of	Cahaire - noted
L	Ц		<u> </u>	0	,5	10	Ø/	0		BUULLER (Part of	La de de la la sant
·	\prod	Γ					10	0		boulder). Doller	noted that (silty sand)
Γ -	П							0.		fines washed away	. [Embankment Fill]
r -	П		1		\neg			·o			
r -	H	\neg						o:			4
-	H	+	† · · · · · · · · · · · · · · · · · · ·		-1			ه			
734-20	11 176	IRE	v. 12-82)								
		,	· ·								

ı	Ger	nck	Parkway @ Em	pice	Blo	vd . 0	ر. برن _۲	ng	Hole No. 8 - 92 Page 2 of 2
Depth, ft.	Test	No.	Driving Resistance	Messured Recovery,	% Recovery	A Managara		% Natural Moisture	Material Description Color Wet-Dry Consistency Jointed-Broken Plasticity Angular-Rounded Organic Content Drill Remarks etc.
-				25			0.0.		
	Н-	Н					9		
20.8	H	1		0.7	35		o,O		GRAVEL, Sandy, with trace Silt, GW,
بر . بر -			6 6 11			•	0.0		non plastic, wet (drill fluid), longe.
	Ш	Ц	N=10			22.0	• • •		SPT apparently driven into open
-	H₩	Н	4				+,	 	John .
	╫	CS		3.8	76	R4/	1		BASALT, Vesicular (top 1.01) to slightly
		Ľ				16	+		vesicular, close to moderately close ipinted (10.60°-rough w/ thin sandy infill)
-	Щ.	Н					+	-	fresh, dark gray, hard.
	\vdash	H		-			+		True de la company de la compa
2 5 -8	t	 					+		
	II.	CL		4.7	94	R4	+	 	RASALT vesicular w/some vugs,
	_	Ц				/50	-		close jointed (4@, 20° - icr; 2@) 30 -
-	H	Н		-			+		Some Fer On stains), fresh to 26. 8, and
	H^-	H					+	÷	slightly weathered 26.8 to 28.5, dark
-							+	ļ	ady and dark red brown hard. Noted
	Щ						+	 	possible flow contact at 27th depth.
-	₩-	Н					+	-	
30.8	15	H					1'_		
20.0		C7		4.4	98	R4/] ,		BASALT, slightly resicular with some
						/80	+		rugs in top 1.8', close jointed (16:10-
-	₩	Н					+		400 icr. w/ claver sitt coating: 10, 45°-
	H	Н					+		rough us sandy infill (It. brown 3 mm); 10.
• •							+		coating) fresh the gray hard.
							+		coating), fresh, dk. gray, hard.
	H				-		土		Advancement halted at 35.3' depth.
35.3	 `								,
	Г								
				 			1	-	
	-			-	-		1	-	
							1		
							-	 	
	<u> </u>						1	├─	
		W		-			1	 	
	1						1		
							1		
							1		
	-			-	 	 	1	-	
	1						1		
• •							1	<u> </u>	
	_			<u> </u>	- 1		1		
• •	┼			-		 	1		
•	\vdash						1		4
									
-	1		1	1	I			L	



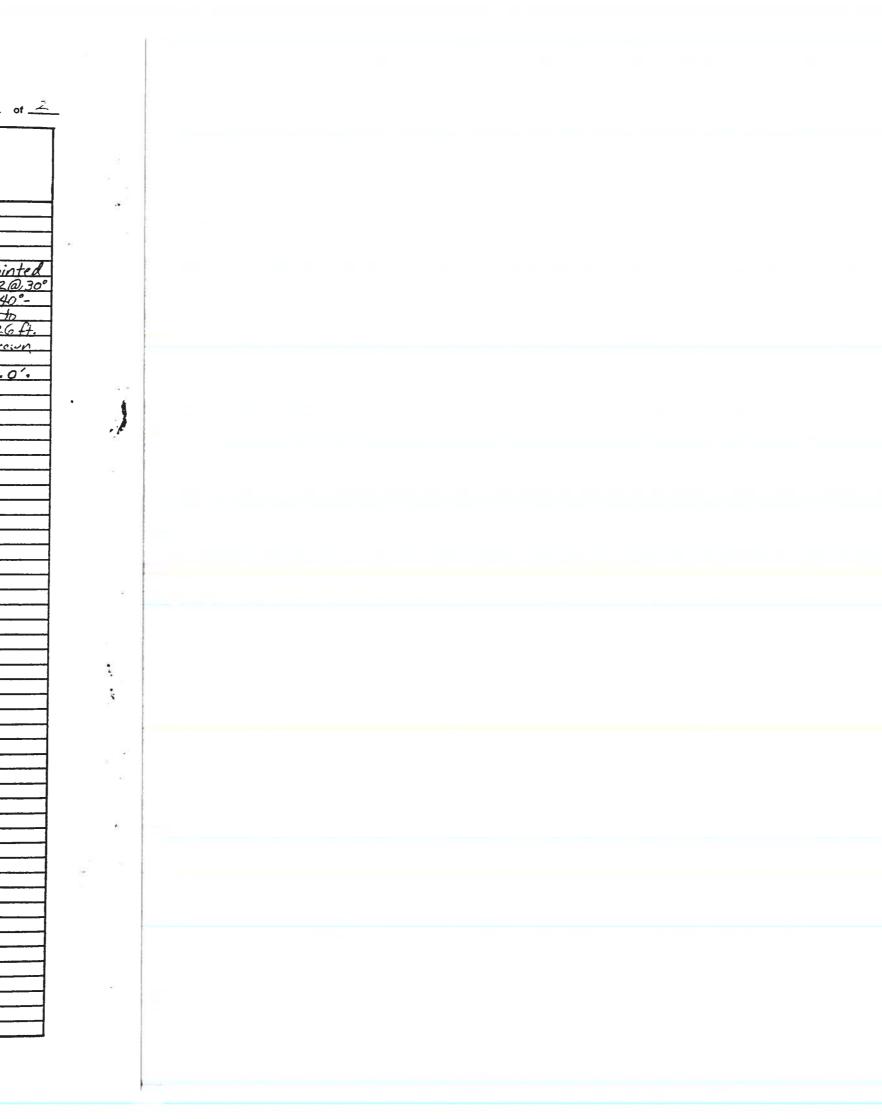


Proje			DEALD Pos	KWau	6)	3 R	2 <	stre	et U'xina Hole No. 9-92
High		-4	Palles - Californ		<u>ω.</u> Ηω)		4)	County Desthites Prefix Coog 1803
Purpo		_	ork Stay ctus	P FOU		<u> </u>		nve	stigation Exploration Bridge No.
Equip	-		ME 6x6	Truck				. , , ,	Tube Elev.
Geolo	_		Randin Davi	,					Driller Chuck Fish Recorder Kris Iverson
Hole					+4	-3	Lt.		C.L. (Rt) 60 Ground Elev. 3,576.9
11016		30.0		1997		Ki.	13	/	Drilling Method Groundwater Level
	•	C40.	dard Penetration,	- ///7		No. 3	-1,		Auger Depth O Date Depth
			on Miniature Pile,			No. —	- -		Casing Depth O Not Encountered
				Q 3		No. 5	- -		Open Depth 2(0,0)
,			Isturbed Sample, Size	<u> </u>		No.	-		Total Depth 26.0
				D					Sample Data Sheet No.
Date	Sta	rted	02/20/92	Date Com	ibiere	02/2	0/	92	Sample Data Officer (10)
						/	Ý_		Material Description
			20		2	3/		1 -	Calar Wet-Dry
=				Messured Recovery.	Recovery	# 00 m	2	% Natural Moislure	Consistency Jointed-Broken
Ę		9	Driving	980	ě	1 2%	Graphic	ZS	Plasticity Angular-Rounded
Depth.	Test	2	Resistance	2 €	*	/ /`	ŏ	% ≥	Organic Content Drill Remarks etc.
-0-	7	N 4	5	1.5	75		750	7.6	SAND, pumiceous, with some silt
-	HŦ	ואך		1.3	ري		100	1	(gravelly near surface 0.0' to 0.7'),
Ի -	╫	+-	"N=18				31		SM (GW@, too), nonplestic, damp, hrown
┡ -	Н	╀	9		 		lill	<u> </u>	medium derse
2.0	1	1		0.8	10		111		SAND pumiceous, with some silt,
├ -	HH	N2		10.8	40	-	lii l	}	trace of aravel. SM. non plastic,
	HH	╄-	10 "N"= 22					}	Trace of growt, Service [E:11]
	Ш	╀	12 10			 	90		damp, brown, medium detice.
4.0	Щ	4_	13		3=	27	100	 	SAND Gravelly/ Cobbly, with some
L -	Щ.	<u> C1</u>		2-1	35	Ø	Ы		silt. 5M-GW, penalastic, brown
5.0-	Щ	╄				10		}	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
	Щ	╄			 		1) —	Variable
6.0						 	1	}	1300 FDF (100 F)
	Ш	N3	7	1.8	100	 		-	SAND, particular, but have a series
<u> </u>	Ш	1	10 "N" = 19					}	
<u>-</u>	Ш	4_	9 10 - 11		 -	7.5		┼—	brown, medium dense.
7.8	<u> 1</u>	4_	50/0.3 Refusa			101 7	#		BASALT, vesicular with some yeas, close
L .	Щ	C2		3.6	72	R4/	 ↓	.	
L.	Щ	_			├—	/65	┨.'	<u> </u>	of sandy infill: 1835° - irr, brown silty
L.	Ш				<u> </u>		#		
L .	Щ	4-			<u> </u>	 	+	 	
L.	Ш	_			<u> </u>		┨ '	 	(Nicted Sandy GRAVEL @ topo: 3' sample)
11.0	亾	<u></u>				24 7	1+	-	BASALT, resignar, close jointed (22)
L'''-	\Box	JC3		4.8	96	K4/	┨.	<u> </u>	BASALT, vesicular, close jointed (20)
L -	Ц	\perp			<u> </u>	/20	+	 -	TO THE STATE OF TH
L -	Ш				ļ		+	-	- curved w/ sitty coating; 1630 - rough
L.	Ш	丄			<u> </u>		┨╅		w/ brown (cas Cos), Fresh, dark gray,
	Ш				ļ		1		Bard.
							1+		
							١.		
	П	L	St			11	+	 	
	\prod	$oxed{\mathbb{L}}$			<u></u>		1	<u></u>	
[, .	I.					<u> </u>	١'.	-	2000
-16.8	17	104		14.9	98	R4/	+		BASALT, slightly vesicular, close to
Γ						76	1	<u></u>	moderately close jointed (10, 900-
Γ '	П	Τ				<u> </u>	Γ.		irr. w/ brown silty coating; 1@ 30°-irr.
Γ -	П	T]+		us/ thin brown Ca-COz; 16 45 - rough ws/
Γ -	П]+		Hin but Ca, CO3: 1@30 - rough; 112 350
Γ -	П	T					丄	l	- rough w/slight Fe.O. stains), fresh, dark
734-3	976	RE	/. 12-82)			ii.			•

BEND Parknay @ 3RD Street Wing Hole No 9-92

le No 9-92 Page 4 of 2

Depth, ft.	Test	Type	%	Driving Resistance	Measured Recovery,	% Recovery	A CO		% Natural Molsture	
	Н							++		gray, hard.
-21.0	H	Y			4.0	00	04	+ +		
-22.0	H		S		4.7	90	R4/	Ŧ,	22.0	BASALT, vesicular, very close jointed
	H	1						+		rough w/ slight Feals stains: 20,40°-
	H							+		dark gray to 22ft. and back red brown
ik D		\pm						+		Noted possible flow contact @ 22.0%
26.0	Į	J				32		+		
			\exists							Advancement halted @ 26.0'.
			7							
- 1			7	#: a						W
- ‡	_		1							
- ‡	_		+							
- +	_	_								
8	_		1							
			1				**			
			+							-
	_		-							
- 1	_		+		660_	10				
- ‡	_		‡							
: ‡	_		‡							
: ‡	_		‡							
: ‡	_		‡			\exists				
: ‡		÷	$\frac{1}{2}$							
: ±	_	•	\pm	· · · · · · · · · · · · · · · · · · ·				ŀ		
\cdot \mathbf{f}	_		$\frac{1}{1}$						-	
F	_		Ŧ		-			F	\neg	
: ‡	_		Ŧ		\dashv	4	=	F		
: ‡			ļ		二	1		F		
: ‡			‡		二	\dashv			\dashv	
	-		1							

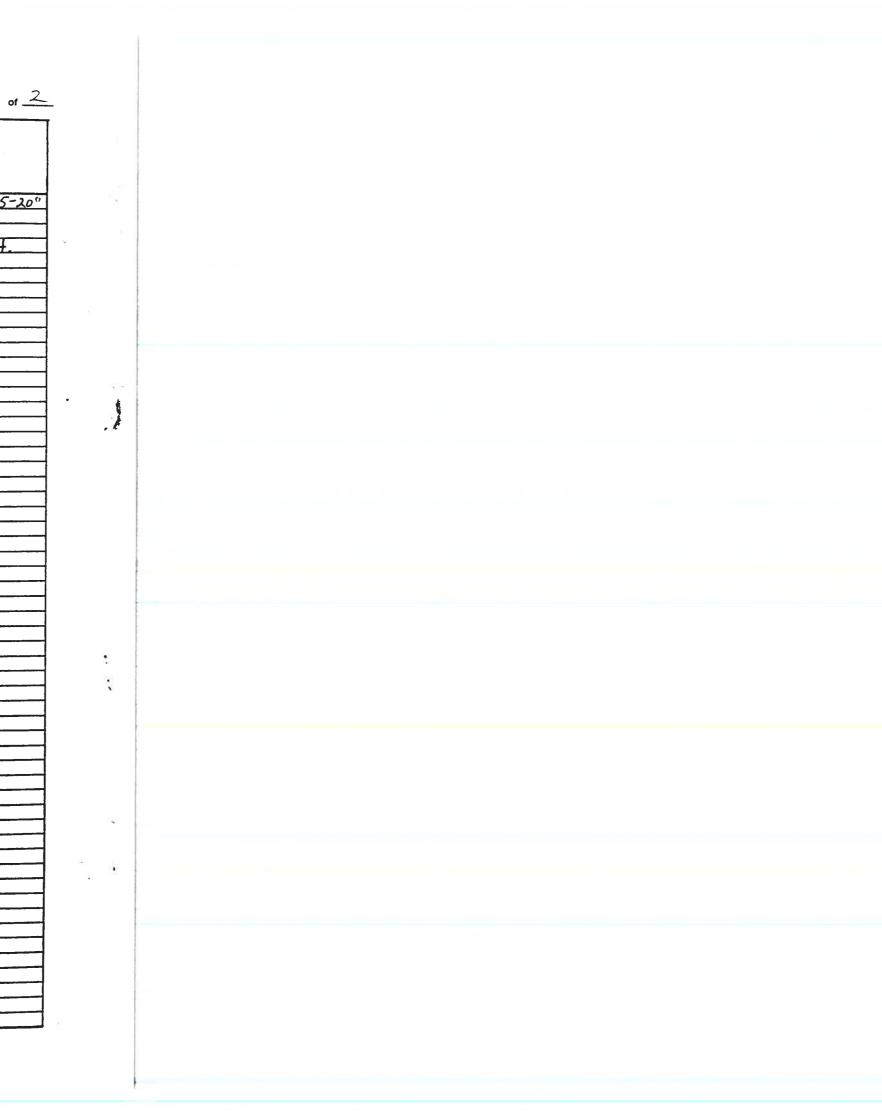




Proje	ct	R	END Parkway	(6)	Em	Dire.	R	Ivd.	0'xina Hole No. 10-32
Highy		T	alles - Califor		Hu	u. 1#	4		County Deschutes Prefix Cong 1803
Purpo		of Wo			det	ion I	7	resti	ration Exploration Bridge No.
Equip			CME. 6X.	Tru				-	Tube Elev.
Geolo		_	Randy Davis						Driller Chuck Fish Recorder Kris Lyerson
Hole			n "P" Line, Sta.	14	4+0	72	Lt.		C.L. (Rt.) 96 Ground Elev. 3,544.1
1.0.0			Tests	. , ,	4		Т		Drilling Method Groundwater Level
100.11	•	Ctoo.	dard Penetration,			No. 5	-		Auger Depth O Date Depth
			on Miniature Pile,			No. 2	- -		Casing Depth 0 Not Encountered
		_	Barrel Type HQ	2		No. 3	-1-		Open Depth 20.5
						No. 7	-		Total Depth 20.5
- 0		Una	sturbed Sample, Size				-1		
Date	Sta	rted	02/20/92 00	ite Com	pleted	02/20	19	72	Sample Data Sheet No.
	_		07-/12	\top				T	Material Description
					2	3/	8	١_	Calar Wet-Dry
zi	l			3 5	Recovery	* O	"	Natura	Color Wet-Dry Consistency Jointed-Broken
Ē	<u> </u>	.	· ·	2 8	မှို	\$/0	₹	1 × 1	Plasticity Angular-Rounded
Depth.		2 2 2	Driving Resistance	Measured Recovery.	*	/°	Graphic	% Natura Moisture	Organic Content Drill Remarks etc.
0			110000	+	-	Y			Side walk Concrete: surface to 0.5'
0.5	_				-	 	X		
		NI	_L	102	60	ļ	0.0	 	
L _			2 Na/			ļ	0.7	 	GW-SW, non plastic, moist, because,
			4 N = 6			<u> </u>	.0	:L	loose. [FILL]
آء ۾	•	, ,	11 .				0.0	1	
2.5-	1	NZ	50/0.1	0	0			<u> </u>	No recovery. (Refusal on houlder)
r -	 						1		Driller notes boulder from 2.5 to 3.7A.
├. ⁻	 						<u> </u>		
4.0	1	N3	A	0.8	40		o ::		SAND, with some medium to coarse
	Н	7		10,0	10		.0	-	gravel, trace SiH, SW-GP, non plastic,
	\vdash		4 N=12	-	 		ò,		wet (drill fluid), brown, medium dense.
			8 14-12	+				}	SFILL 7
6.0		7	3	 	1		0	 	
	L	N4	2	11.2	60		. 0	 	
L _	Ш		5 N=12		 		0.	├—	
L _	Ш		7			· -	70	├	
-8.0		,	7				0	1	[FILL]
0,4							. 0	L	
٦, ٦	Γ.					9.0'	0,0		
-9.0-	7	443	590.05 Refusa	0.05	100	R4/	+		BASALT FRAGMENTS, very dense.
-	H	CI		2.3	92	/44	+		BASALT vesicular, with some rugs,
	H						l.'		close to moderately close jointed (+0 80°
r -	#	\top		1			†		-rough, curved, u/some Ca. co. and Fe,O.
-	H] 					+		Stains) fresh dark aray hard.
11.5	┝			E 3	100+	24/	١		Stains), fresh, dark gray, hard. BASALT, vesicular, with some vugs,
-	╫)c2	*picked	 	2007	2/20	+		along interest 20 10 - in the same Carcon
⊢ -	-	4-4	picked	WE SOL	ne of	7 00	+	 	16 900 avoid w/ 5 and of sandy intille
L -	11	44	previo	مع جد	لورد	<u> </u>	1	-	1090°-curved w/ 5 mm of sandy intill; 10,45°-rough; 10,40°-icr; 10,60°-rough w/some Ca_Coz), fresh, clark gray,
L -	Щ.	44					+		Con Sant de la la la la la la la la la la la la la
L _	Щ	\bot					+		W/Some Caz Cos), Tresh, Mack gray,
L	Ш	┸┚		-					hard
	П	П				1	+		
Γ	П	\Box					 +		
_	Π	\top					۱.		
T. 2	It	J					٦		
16.5	7	C3		4.4	88	R4/	†		BASALT, vesicular, with some yugs,
- -	H	123		1	-	32	+		were since to close ininted (16,400-
- -	╫	+-			 		1		irr. w/sandy silt wating: 1@ 30°-irr. w/ silty assting: 10 60°- rough; 1@30°-irr. w/red brown clayey silt coating: 10.5°-
	+	╁┤		+			+		site contine 10 600- rough: 10300-icr.
	₩	+			-		+	—	clave silt cating : 10,50
	Ш						<u>'</u>		W LEY DIONU CALL SILL CONTING

roje	ct K	END Parkway	6)	Fa	Dire	RI	id. O'xina	Hole No. 10	-92
_		Talles - Califor	100	Hu	111. 14	4)	County Deschutes	Prefix Con9	1803
	ose of Wo	ork Structure 1	Four	2027	tion I	nve	stigation Exploration	Bridge No.	
	ment	CME. 6x.6	Tru	ck			<i></i>	Tube Elev.	
		Randy Davis					Driller Chiack Fish	Recorder Kris	Lyerson
ole	Locatio		14	4+	92 L	t.	C.L. (At) 96	Ground Elev. 3	
		Tests					Drilling Method		water Level
"N	" — Stan	ndard Penetration,			No. <u>5</u>	 	Auger Depth O	Date	Depth
"M	"—Oreg	gon Miniature Pile,			No. 🧷	 	Casing Depth 0	Not Enc	puntered
		Barrel Type HQ3	3	_	No. 3	l	Open Depth 20.4	<u>-</u>	-
n.	" — Und	listurbed Sample, Size			No. 0		Total Depth 20.5	21	1
ate	Started	Dat Dat	te Con	nplete	d /= -	10-	Sample Data Sheet No.		
		02/20/92 Dat			02/20/	72			
]		1 ./	9	Material D	escription	• ,
			2 %	٤		2 3	Calar	Wet-Dry	
<u>=</u>			Measured Recovery.	% Reco	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Graphic	Consistency	Jointed-Broken Angular-Rounded	·
po	Test Type No.	Driving	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Č	\%		Plasticity Organic Content	Drill Remarks etc.	ĺ,
	FFZ	Resistance	2 6	L.	ν . \perp				
0).5-					<u> </u>	<u> </u>	Side walk Concret	e: Surtace:	to 0.5
1.5	IN		1.2	60		_ اه	SAND, Gravelly	. with trace	<u>e at Silt.</u>
-						0	GW-SW, non de	istic, mois	+, brown,
_		4 N=6				0	loose. [FILL]		
_	¥	11 50/0.1				``a_			7/
5-	+NZ	50/0.1	0	0		1	No recovery. (i	Refusal on h	oulder)
-							Driller notes bould	er from 2.5	to 3.74.
- -						ΗC			
. 0-	1 1/3	4	0.8	40			SAND, with sor	ne medium -	to coarse
-	 <u> ~ ~</u>					ĽΓ	pravel trace Sitt	, SW-GP,	
-		A N=12				_ ہ		own, medica	m dense.
	1	3	\top			∵.Г	हिं।। न	<u> </u>	
0-	N4		1.2	60			SAND Gravelly.	with trace	of silt.
-	1 1 1 1 1 1 1 1	5	 			, et-	SW - GP, non ola:	stic moist	to wet
-	 	2 N=12	+			· • -	(some drill fluid), 1	rown med	
_	1	7	+	_	1	<u>'</u>	FiLL		
1.0	-		+-						
-	 	 	+-		9.0'	0 -			
1.0-	AN5	590.05 Refusa	0.05	100	R4	-	BASALT FRAGME	VTS very	dense.
-	 	-7 5.00 Retusal			44	<u>ፕ</u> Ի	BASALT Vesicula	C. with son	
-	CI		14.3	75	 	十	BASALT vesicula	u close ioins	ted (HD) 80
_	╂┼╌╂╌		+	\vdash	1	f	-rough curved w/	Some Ca-Co-	and Fe.O.
-	H - I		+			+	Stains Fresh do	rk aray has	rd.
1.5	X.		5 2	in	R4	. ト	-rough, curved, u/ Stains), fresh, da BASALT, vesicula	- with some	e vuos.
-	H C2	*oicked	1/2.5		2/60	+ -	close jointed (20,	o'- irr.w/s	ome Cascos
-	╂╂╼╂╼					+	. 1090° - curved v		sandwinfill
-	╂┼╌╂╌	previou	4 CO	Let	***	<u>.</u>	10.45° - wayah : 16	40°- icc: 1	0 60 - rough
٠ _	╂╃╼╂╼		+	_		T -	w/some Ca-COs)	fresh clark	anau.
_	╂┼╌╂╌		+-	+-	-	+	hard	· · · · · · · · · · · · · · · · · · ·	, , , , , , , , , , , , , , , , , , ,
_	 	 	+	+	 	₊ ŀ	hara		
_	╂╂╼╂╼┤		+	-	1	'₁Ի			
_	╂╂╌╂╌		+		 	T -			
_			+	 	 	+ -			
65	 		1, 4	00	04	+	BASALT, vesicul	as with so	me Vuas
	TC3		4.4	100	R4/ 32	<u>,</u>	BASALT, vesicul	a initiated (18406-
_			-	-	Z32	᠆	-	1. 1. 1 1 1 70	"~100 . W/
_			+	 	+1	+ -	ICE W/ Sanay Sitt 630	ing, in	300-100
_	₩.			1	 .	f ├	5: Ity conting 10 600	silt carting	10.50-
							IM Les plemy craded	THE CORPORATION A	
4-39	976 (RE\	r. 12·6Z)							

			T			1 -		Material Description
ĺ	1	1	1	_ ₹	A (0)	Graphic Log	l _	Color Wet-Dry
==		£	1 8 5	8	8/0	<u>0</u>	1 2 e	Consistency Jointed-Broken
Depth, ft.			Measured Recovery.	% Recovery	₹/0	1	% Natural Molsture	Plasticity Angular-Rounded
<u>a</u>	No of the st	Driving Resistance	1 8 8	15	/~	1 5	\$ 3	Plasticity Angular-Rounded Organic Content Drill Remarks etc.
0	F F Z	Mesistance	124	-	V	<u> </u>		
		C3 continued				+.		rough w/ trace clay/silt conting; 10,15-20" -irr), fresh, gray, hard.
	╫╌┼╌	C3 CONTINUES	 		 	1'+		ical fresh army back.
			┼──	 	1	-		ziti j, ji con, grag , rimi oc
205	<u> </u>	<u> </u>	 			+		
245			<u> </u>]	L	Advancement halted at 20.5ft.
- -			Г	T -		1		
			1			1		
-			┼─	-	 	1		
_				ļ		1		
			1				<u> </u>	
-			1	Γ-				
			1			1 1		
			 			1		
L _	- 19	<u> </u>	↓			-		
			<u> </u>					
_					1			
-			1			1		
⊢ -	 		+	-		1	-	
						4		
	1					1		
_								
-				1		1		
	 		+		1	1		
						-	-	
	Ī							
				ļ	255			
						1		
			-	 		1 1		
						-		
						.	124	
				l				
-						1		
			-			1		, V II
- 1						1		
			 			1		
						I		
		<u></u>	 					
- F						2000		
8						5070.		
- 3						5000		
*						5570		





Proje	ct	B	END Parku	mu/a	Div	lision	Z	Uno	Jerwood Ave Wing Hole No. 11-92
Highy	vay	D	alles-Califo	cnia	Hw	v. #4			County Deschutes Prefix Cooq-1803
Purox	se	of Wo	ork Structure	Found	ati	on In	ve:	stia	ation Exploration Bridge No.
Equip			CMF Truck	mour	+	4.		J	Tube Elev.
Geolo			Randy Davis	T. O.M.					Driller Chuck Fish Recorder Kris Tuerson
Hole	_			a. 22	2 +	50	Ļt.		C.L. (Rt.) 74 Ground Elev. 3586.0
Hole	LOC	Catio				~ ~ ~	_		Drilling Method Groundwater Level
			"Ç" Tests	_ 220	_		47.		Auger Depth / Date Depth
			dard Penetration.			40. <u>6</u>	-1-		
"М"	.—	Oreg	on Miniature Pile,			₩. ==	-1-		
c.	—	Core	, Barrel Type	HQ-3	1	40. <u>4</u>	-1		Open Depth 26.0
	· —	Und	Isturbed Sample, Size		1	40. <u>()</u>	-		Total Depth 26.0
Date	Sta	arted		Date Com	pietec	1/ //	<u></u>		Sample Data Sheet No.
	0	2/	24/92		22/	24/	92	<u>, </u>	
		- 1	•				ò		Material Description
				2 >	Recovery	A CONTRACTOR	Log	ē.	Color Wet-Dry
=				Messured Recovery.	õ	30	Graphic	% Natural Moisture	Consistency Jointed-Broken Plasticity Angular-Rounded
Depth.	15	Type No.	Driving		Ž.	1/4	를	Zĕ	Plasticity Angular-Rounded Organic Content Drill Remarks etc.
١٨	۳	£Ž	Resistance	≥ ₫	*		0	52	0,,,
0	7	N	1	1.3	65		00		SAND, with some silt, trace gravel,
Γ			1 "11"- 2				11		SM-GW, NP, damp, dark hown,
r -			2 11-3				tat		very loose. [FILL]
	\vdash	,	1				•		
2.0	\dashv	N2	2	1.6	20				SAND, with trace silt, SW, non-
├ -	Н	172		1.0	UV		• • •		dastic moist proun, loose. [Fill]
<u> </u> -	Н	-	3 "N"=6		-				Marine Julian , le resour,
┡ -	Н	<u> </u>	2	\dashv					
4.0-	Ш	<u> </u>	2					<u> </u>	SAND, with trace of sitt SW, non-
L'''-		N3	3	1.2	(oD				
L _			3 "1"-0						plastic, moist, brown, loose. [Fill]
E F			5 14 - 0				<u>نن</u>		1 1 C E (1 10.14)
5.5		7	7				· · ·		Appears as original ground at 5.5H. depth.
6.0-	7	N4	4	1.5	75				SAND, with Frace of Sitt, Sw, nonplestic,
Γ -	П						· · :		moist, brown loase.
F -	Н	H-	2 "N"=5						
├ -	H	. - 	2				·		
8.0	Н	115	3	1.5	75		·::		SAND tine with some sitt SM, nondestic
├ -	Н	CNI			75				maist (some drill fluid noted), brown,
┝╶	Н	 	6 "N"=18	-			••••		medium dense; Basalt fragments at bottom
L -	Щ	╟—	12			9.5	ننه		0.3' of sample
9.9-	μ\	4_	50/0.3		44	547	+		CI(6.0'-11.0') BASALT, very close jointed
Ľ'_	Ш	CI		1.4	28	Kg/	+.		
ے بیا	7	<u> </u>				10	. *	<u> </u>	with sandy SILT infilling in open joints.
۸،۱۰۸	1	JNG	11	0.8	100		+,		BASALT FRAGMENTS with some sitty
Γ	N	ויי	50/0.3'				+		sand: sampler apparently driven into open
Γ -	П	T					1		vertical joint in besalt.
Γ -	П	Ca		4.5	90	R4/			BASALT, vesicular, very close to
r -	\vdash	1				146	۲.		close jointed (1@80°- with some sandy
├ -	H-	+					+		1.14. 10 en = inc . 10 40 -inc w/silt coding:
┝╶┤	╁	+		_			4.		2000 mino wisitu sanduintill very
-	╫	+-			-		Ť		close jointed @ 12.5" and 13.5-14.5"),
-	╙	+		_			+		Lossy dock one hard
	Н-	+					+	-	fresh, darkgray, hard.
16.0-	4	۷_		_		1	4		BASALT, vesicular with some vags.
L'0.0	\triangle	CS		4.6	92_	R4/	+		BASALT, vesicular, with some vugs,
L I	П					/64	1		close jointed (1@ 40°-irr; 1@60°-irr; 1@
Γີ	П	T			,		+ +		10- ir; 1040 rough) fresh, darkgray,
_	\sqcap	T					+		hard.
Γ -	\vdash	1							
r -	H	+					+		
734-39	76	(RE)	/. 12·82)		-				

Bend Parkway (a Division/Underwood - Wixing

Hole No 11-92 Page 2 of 2. Cator Wet-Dry Jointed-Broken Consistency Plasticity Angular-Rounded Drill Remarks etc. C3 continued BASALT, Slightly Vesicular, close to very close jointed (10,50-55°-rough, w/5mm sandy infill; 40,10°-rough; 10,45°-rough; 20,40°-ior.), tresh; derk gray, hard Advancement halted at 26.0'.

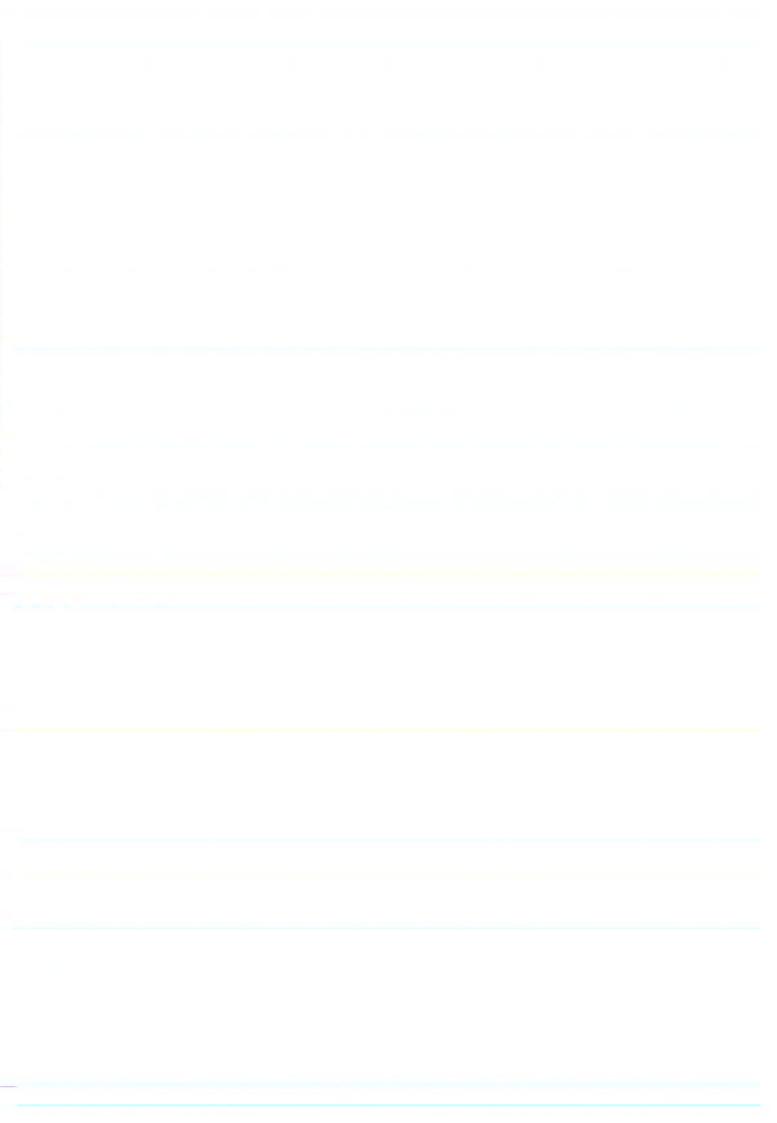
Page 1 of 2



Proje	ct	F	Bend Parkway	<u>a</u> _	Fra	aklio		ve.	U'xing Hole No. 12 - 92				
Highy	vay		alles - Californ	ia	(No. 5	(County Deschutes Prefix Coog 1803				
Purpo	se	of Wo			dot	Sion =	En	vest	raction Excloration Bridge No.				
Equip	_		ME Truck 1						Tube Elev.				
Geolo		$\overline{}$	andy Davis	inn					Driller Chuck Fish Recorder Kris IN. rson				
	_			275	+ 4	A /	Lt.)	27	C.L. Rt. Ground Elev. 3, 634.4				
Hole	LOC	catio	is p Ellie, otal	<u> 275</u>			57						
1			Tests .	175	1 73		4:						
"N" — Standard Penetration, No. 4									Auger Depth Date Depth				
"М"	"M" Oregon Miniature Pile, No								Casing Depth O Not Entountered				
"C" —Core, Barrel Type HQ-3 No. 3									Open Depth 21.0				
{"U"}	٠	Und	isturbed Sample, Size		,	No. 7	-		Total Depth 21.0				
					- 1		-		Sample Data Sheet No.				
Date	Sta	arted	02/24/92 Dat	e Con	pletec	22/24	1/	92	Sample Data Sheet No.				
	_		0427/12	1	· ·	7-	-	/	Material Description				
				1		/	9	ı	material Description				
١. ١				0 .	Recovery	*/O	3	5 .	Color Wet-Dry **				
#				Measured Recovery.	Š	300	Graphic	% Natural Moisture	Consistency Jointed-Broken				
Depth.	=	2 .	Driving ·		æ	%	1 2	ZŠ	Plasticity Angular-Rounded				
8	₽:	S o	Resistance	2 €	*	/	ð	% ≥	Organic Content Drill Remarks etc.				
0	-		E	1.7	85		1000	1	0.0' to 0.7': SAND, cinders, Sw.				
-	Н	, VI	40	11.7	00	 		}					
L 4			19 "N= 24			 		 	damp, red				
LJ			5	<u> </u>				└					
امما	H	r _	3	<u> </u>			;;;;		cemented sardy GRAVEL)				
2.0	7	N2	2]::::	·	1.3' to 2.0': SAND, pumiceous w/trace				
F 7	П		2 (1 4]		of silt. SW non alastic dame: brown				
├ ┤	Н	\vdash	3 N=5	1.5	75		† ∵⊹		SAND pumiceous, with trace of silt, Sw,				
├ ┤	\vdash	\vdash		 •	75		 :::`						
40			2	17-7	0.5	 	l:::						
L/		N3	2	1.6	80		 : : :	 	The state of the s				
LJ			2 "N'=5	L		<u></u>	l.: :	<u></u>	Sw. ranglastic, moist, lose. Note,				
Γ			3 10 - 5	L			 :::		few basalt fragments at bottom of				
[,]	T,	,	10				-	1	sample.				
6.0	7	714	10	1.2	60	6.5	X	1	SAND with some Sitt. SM. nanolastic.				
6.7	н	+	30/0.2 refusal	1		6.5	1.4		maist (some drill fluid noted), medium				
F	╫╴	┨		 	 		#"		brown: Basalt Fragments at bottom: very				
⊢ ⊣	Н-	4-1		├ ─			+	-	dense. Sander driven through open joint.				
L 4	Щ	44		1, ,	22		+		OASALT MINER THROUGH OPEN JOINT				
LJ	Ш	CI		4.4	88	R4	+		BASALT, vesicular, with some vigs,				
	П					74	Η.		close (2@ 100 - irr, w/ thin sandy infill;				
ГТ	П] ₊ *		20, 200 - irr. W/ brown CasCO, cooting),				
	Η-	11					l'+		fresh, dark gray, hard.				
F 7	H	+		 			ا . نا						
┝╶┤	H	-}					++						
H1.0	\mapsto			-	100	21/	1_		RASALT resignar with some year.				
ļ . .	4	<u>)C2</u>		12.4	יטטון	R4/	•		BASALT, vesicular, with some vugs				
L J	Щ	$oldsymbol{\perp}$	picked	بمدا		60	+	 	clase 10:nted (1(6) 60 - rough: 16, 33 -10				
L]	Ш		Some of	prev	ous	core	4	<u> </u>	I-ICT. W/Some Sandy Intill: VICE, 40 -ITT:				
Γ٦	П	\sqcap	Sample				+		10600 - rough, fresh, dark gray, hard.				
Γ 1	П	\top				I	l T	L					
Ի ተ	H	\top					+						
⊦ ન	H	╅┥					1 .						
┝╶┥	Н-	4-		-			+	-					
<mark>├</mark> ┧	Щ	\bot		<u> </u>			+						
L J		لبل					i '+						
٦. الم		2					1						
HG.A	7	Y C3		4.7	94	184/	+	L	BASALT vesicular moderately close				
r 1	+	74				92	1		jointed (numerous boxing breaks: 10 350-				
Ի ქ	+	+					+		rough: 10 400-irr, w/some Caz Coz conting),				
┝╶┥	Η-	+		\vdash			1,		fresh dark away hard.				
┡╶┥	#	4-4		\vdash			7+		Trean, day your, rolls				
	4	44	- 				[,]	 -					
لـــا	Ш	Ш					1+_						
734-39	76	(REV	. 12-82)										

Bend Parkway @ Franklin Ave. U'xing
Hole No. 12-92

								Material Description			
_						A CONTRACTOR OF	8		1		
				ا ي و ا	[.5	בן	= -	Color Wet-Dry		
_ ≓			1	5 5	8	5/0	일	25	Consistency Jointed-Broken		
ਂ ਛੂੰ	_		Driving	8 0	% Recovery	4/0	Graphic Log	1 2 8	Plasticity Angular-Rounded		
Depth, 11.	9	No.	Resistance	Messured Recovery,	*	18	ö	% Natural Moisture	Organic Content Drill Remarks etc.		
			<u> </u>					-			
		1_	C3 continued				++	 			
		\top					+				
	H	+					. +				
<u> </u>	Η-	-}					H'				
-21.0	7	_					 	-	Advancement halted at 21.0'		
الا.لا							ļ	ļ	Mavancement haltes at 21.0		
7											
	_						1	15			
	⊢						1				
	<u> </u>						1				
	Ĺ		×2				1	 			
7	Г							L			
- 1	\vdash							[
	H						1				
	<u> </u>						1	 			
ل ا							1	 			
-							1				
7 1	Г							L	8 8		
┝╶┥	\vdash						1				
┡	<u> </u>	_	 				1				
							1				
Γ 1							1	<u> </u>			
	_										
	⊢						1				
<u> </u>	_						1	—			
			15				1	<u> </u>			
					L		1	<u> </u>			
	_										
	⊢		 				1				
	<u> </u>			 	 		1				
	L		<u> </u>	ļ			-				
							1				
- 1	_			F]	I			
	⊢		 				1				
E	L		ļ	 	 		1				
<u>i</u>			<u> </u>				-				
[1				
	Н										
	⊢		 				1				
}	_			 	 		1		9		
			2	ļ			1	├			
							1				
Γ						L `					
F -	_						1				
 - -	-		 	 	 		1				
	_						1	 	<u> </u>		
L	L		l		<u> </u>		4				
Γ	Г						1				
r -							1				
	-						1				
	—			 			1				
L	L						4				
Γ -	П					L	1				
-	—						1	L	<u> </u>		
	\vdash			-			1				
-	⊢	m.	 				1	\vdash			
L							4	 			
	Г			L			1				
٦. ٦							1				
⊢ -	-		 				1				
Ļ -	\vdash	_	 	-	 		1				
	L						4	 			
•	Γ			L	L	<u> </u>	1				
r -	1	_					1		4		
┝ -	-			-			1				
├ -	—			-			1	 			
L							4	 			
Γ.	Γ			L .		<u> </u>	1				
Γ -	t-					95	1				
	_	_	.1				_				



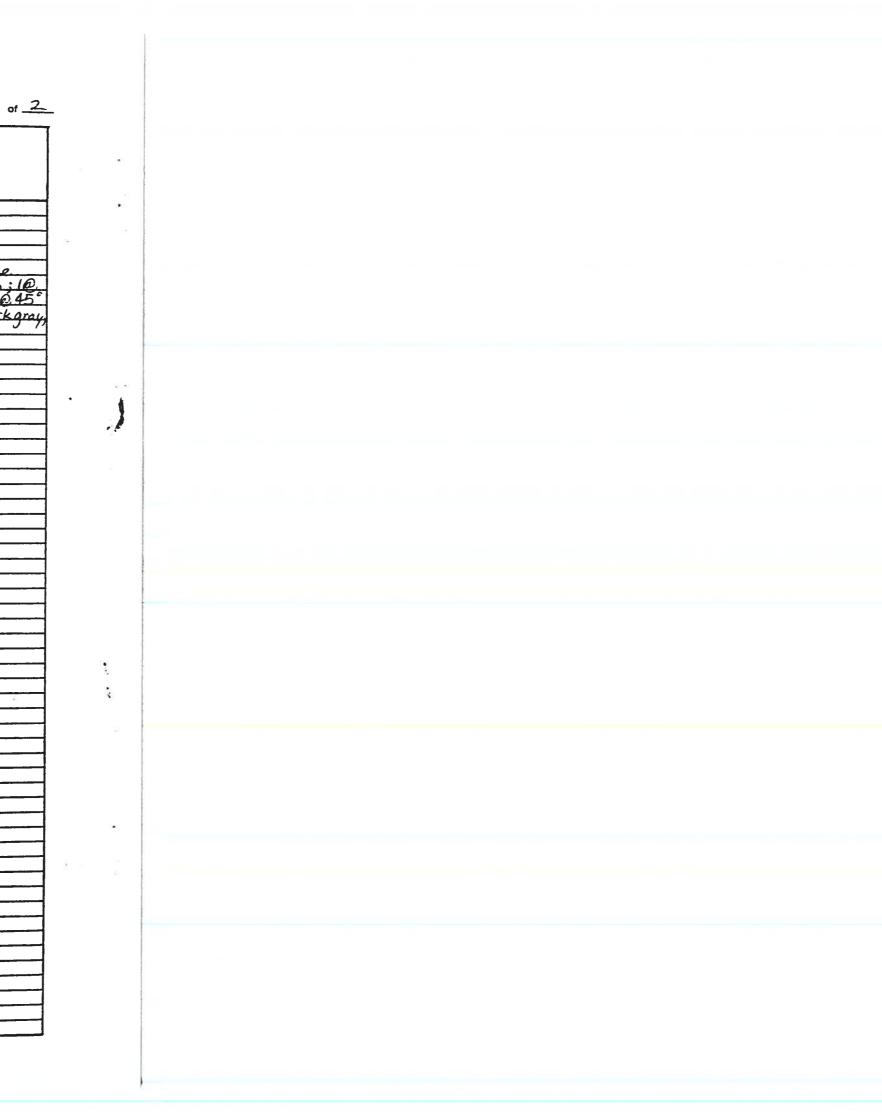


Proje	ct	RI	END Parkway	Q.	Fre	nklir	1	Ave	· Wxing	Hole No. 13-42
Highv			Dallac - Califor	NIA	M	0.4)			County Deschutes	Prefix C009-1803
Purpo	se c		ork Structure Fo	und	ation	n In	ve:	stia	ation Exploration	Bridge No.
Equip	mer	nt (ME Truck me	2un]	F			J		Tube Elev.
Geolo	gist	7	andy Davis						Driller Chuck Fish	Recorder Knis Tuerson
Hole	<u> </u>			270	0+1	03 C	(i.)	22	C.L. Rt.	Ground Elev. 3636.1
				76+		30 -	1		Drilling Method	Ground water Level
N-	_	Stan	dard Penetration,	10		10. 4			Auger Depth	Date Depth
			on Miniature Pile,			6 . =	-1-		Casing Depth O	Not Encountered
			Barrel Type HQ-3			10. 4	Open Depth 26'			
			sturbed Sample, Size		_ ,	10. 	1		Total Depth 26'	
							٠.		Sample Data Sheet No.	
Date	Sta	rted	02/25/92 Date	Com	pietec	03/2	5/	92	Sample Data Sheet No.	!
<u> </u>		— i	3-725/12			1	7		Material Desc	ription
					احا	ا/ھ	8	i _		· ·
<u></u>				خ ۾	Recover	A CONTRACTOR	נ	5 .	4 5.5.	Wet-Dry Jointed-Broken
		_		200	اقرا	20	Ę		•	Angular-Rounded 1
Depth.	150	ž ģ	Oriving Resistance	Measured Recovery.	1	/4	Graphic	% Natural Moisture	Organic Content	Drill Remarks etc.
لطا			74213121-100		0.5	\leftarrow		L	CA. 17 C 1/1	11 1 2 2 2 5 4
		'n	4	1.5	<i>75</i>		000			with trace of sitt,
			6 "N"=15		\vdash		0.0		Sw-GW, nonplastic	damp, bown;
			9 14 - 13				D		medium dense.	
		,	4				•			
12.0	7	NZ	2	1.2	60		• • •	13.3	SAND, punicenu	s, with trace sitt,
			2 "11"-4				• • • •		SW, non plastic, a	lamp, brown, base
-	\Box		2 10 - 1							
t		,	3				:			
14.0		N3		1.3	65		.:;		SAND Dumiceous	, with trace sitt,
Ի -	\vdash	112	2 4 11				:::		Sw. nonplastic, de	mo dark brown.
-	$\vdash \dashv$		3 N=6						lease,	7
-	\vdash		3							
6.0		N. AV		0.9	75		•		SAND . pumiceous	with trace silt,
-	Н	JR		(77)	7.5	6.91	~~		SW, nonplastic, w	et (drill fluid).
9.2-	Н	- -	13			-0.1	Ţ	 		Voted basalt fragments
	Н-	-	30/0.2 Refusal				' +			very dense.
L -	Н-	-		10	80	04/	Τ.		BASALT vesicule	- very close jointed
<u> </u>	Н-	CI		4.0	00	34	١.		(too 2.5') to close	ointed (2020°-
┡ -	Н-	\bot		-		Z 3T	+	├─	rough w/brown sandy	infill: 1090° - ics:
L -	Щ.	4-		_			+	├──	10.60° - rough w/ so	
L -	Щ.						+	 		The sundy home,
L -	Щ	\bot							dark gray, herd.	
11.0-				4 ==	111	R4/ 90	+		BASALT Marianta	WILL SOME VILLES
L'''-	L)C2		4. 7	74	KT/	+		BASALT, vesicular moderately close (1,03(1) 10 0/00
L _	Щ	\perp							moderately close	S Frack contact
							+	<u> </u>	jointed (2010°-irr	+ resh+ clark gray,
L							+	—	hard.	
								ļ		
Γ	П						+	<u></u>		
Γ	П	T					+			
Γ-	П	T					+			
Γ -	\sqcap	\top]				
T., -	It	ナ					+			
160	7	Sca		5.7	100+	R4/	Ŧ		BASALT Slightly W	sicular, moderately
r -	H	1				196	+		close jointed (26)30	2°-irr.), tresh, dack'
-	H	+	'oicked	10.	000		+		arm bacd.	sicular, moderately
F -	╫	+-	of previ		wre				7 7 7	
-	╫	+		143	ع.ت		+			
-	H-	+	sample	1	_		+	$\overline{}$		
<u></u>	4	/BES	(, 12-82)	-				300		

Bend Parkway @ Franklin Ave. U'xing

ole No. 13-92 Page 2 of 2

							1		Material Description			
				1	2	4 0 0 0 0	Graphic Log	I _	Calor Wet-Dry			
差	1			1 g Z	1 8	\$/0	ں	2 5	Consistency Jointed-Broken			
Depth, ft.		i i	Outring	Measured Recovery,	% Recovery	₹/0	등	% Natural Moisture	Plasticity Angular-Rounded			
3	Test ype	Ģ	Oriving Resistance	1 3 %	1 5	/~	I A	1 5 3	Plasticity Angular-Rounded Organic Content Drill Remarks etc.			
3					1 -	<u>/</u>	ب					
			C3 continued				+					
- 1	Н											
	╂╌┥	Н		1			+					
	H–l	Н					+					
21.0	arpropto	_		-	-	2/	1		000000000000000000000000000000000000000			
21.0		C4		5.0	100	K4/	1+		BASALT: Slightly vesicular, close pioted (1030-rough; 105°-rough; 10			
- 7						86	H		pinted (1@30-mugh; 1@50-mugh; 1@			
- 1	H						1 . 1		500 - rough w/trace of brown sitt; 16.45°			
	H -1	Н		 	1		+		-irr, w/tace brown silt), fresh, darkgray			
	H	Н		-	 		+		TIPP, WITTACE BIDION SILLY, HESKY BALKATAL			
							+		hard.			
- 1				L	<u> </u>] T					
- 1					1		1					
- 1		Н					+		•			
		Н		 	-		7 I					
	$\sqcup \sqcup$	\square					+.					
26.0	V			 			+					
₩V.V				<u>L</u>	1		1		Advancement halted at 26.0'.			
- 1												
						T	1					
	1.00	\dashv		 	-		1					
- 4		_					1 1					
- 4							1					
- 1				1	ļ							
- 1							1 1					
- 1		-					1 1					
- 4							1 1					
- 4		_					1 1					
							J					
- 1		П										
- †		┪					1 1					
- +		┥		_			1 1		···			
- 4		-			 		1 1					
- 1							1 1					
. 1												
• 1		П					1 1					
- †		┪					1					
- +		-			<u> </u>		1 1					
- 4		-		-			1 1					
- 1		_					1 1					
		1					1 1					
· 1	· .	T						_ 1				
- †		-1	2									
- +		-1					1 1					
- 4		4		$\vdash\vdash$	\vdash		1 1					
- 4		_		\vdash								
				لــــا			l					
1		T					1 1					
- †		-1										
- +		-1										
- 4		-4			\vdash							
- 1		_										
							[
7	107	1					[I				
- †	- 11	7										
- +		┪						-				
- 4		4						- 1				
. 1		_										
. Т		T										
- 1	-	┪					[
• +		+	¥:				l t	-1				
- +		-										
. 1		_				17.						
		_T			1		L	1				
· †		寸			$\overline{}$							
• †		+				35		_				
- +		+					 					



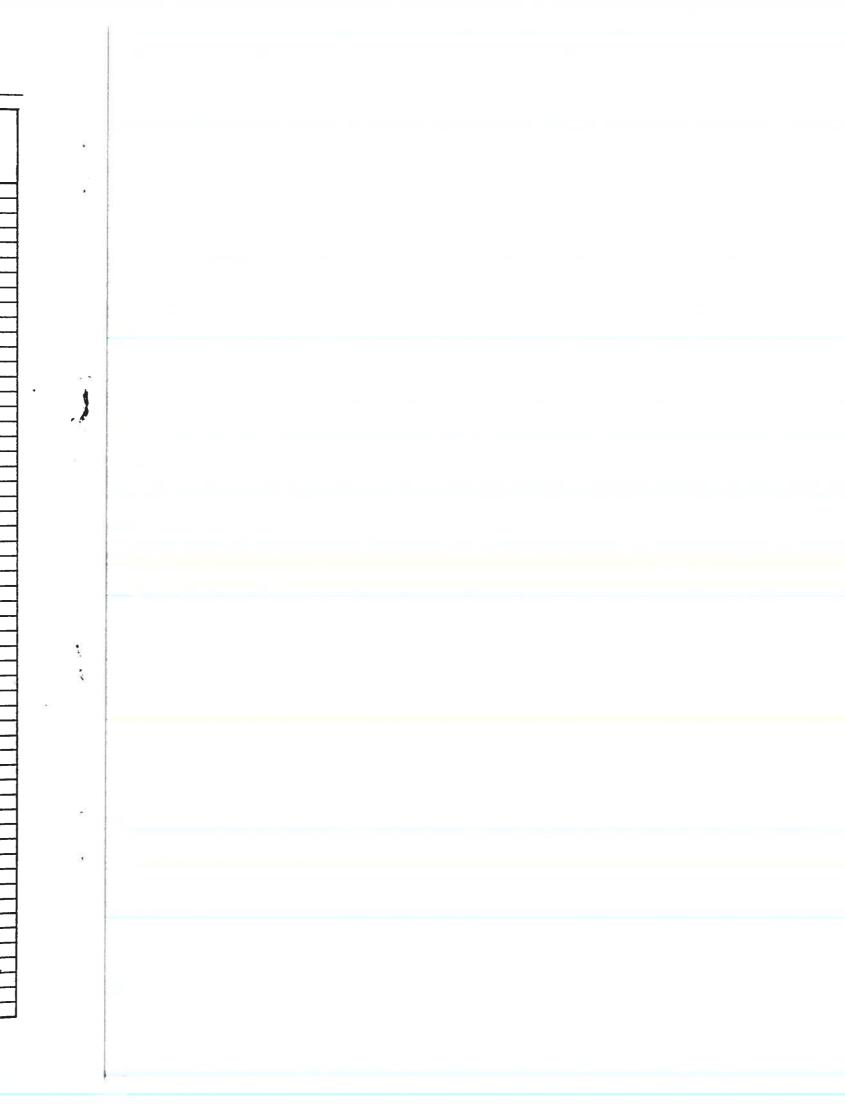
Page _ _ of _ _



Proje	ct	Б	end Parkway			trial h	Jai	1/6		tole No. 14-92
Highv			alles - Californi		Va.			Prefix C009-1803		
Purpo	se of			FOW	ada	tion		wes-		Bridge No.
Equip	ment		ME Truck Mo	int						ube Elev.
Geolo			andy Davis	_			_	==	31	Recorder Kris Tuerson
Hole	Loca	tio	Line, Sta.	29	<u>5+</u>		<u> </u>	57		Ground Elev. 3652.5'
			" Tests			4 58	:1:	.† ,	Drilling Method	
"N"	· s	tan	dard Penetration,		1	4o	-1-		Auger Depth	Date Depth
"M"	0	reg	on Miniature Pile,	_		₩. ==	Casing Depth			
			, Barrel Type <u>HQ</u> -	3	_	₩. <u>3</u>	Open Depth 10			
"U"	. — r	Jndi	sturbed Sample, Size		'	۷o. 🔼	-1_		Total Depth 16'	
Date	Stan	ted	02/25/92 Dat	e Com	pletec	12/25	Sample Data Sheet No.			
						′ /			Material Descrip	ption
					ğ	3/	5	3 .	4 0.0.	et-Dry
=				Measured Recovery.	Recovery	A TANGO OF SERVICES	뀵	% Natural Moisture		ointed-Broken
Depth.	Test	ا ہ	Driving	800		1/4	Graphic	Ző		ngular-Rounded
١٨	25	Ž	Resistance	2 €	*		0	r -	Organic contain	
10	不	N	3	0.8	100	4.5			SAND, with some silt	,>M, mappastic,
0.8			50/0.3 refusal			3.3	+.			ogse; noted bosalt
- ۲		\Box					+		fragments at bottom o	f sample: very dense
r -	Ш	C		4.4	73	R4/	μ.		BASALT, Vesicular,	close jointed (3010°
F -	H					74	+		-irc: 10,80°-mugh).	fresh, dark gray
Ի -	Н	Н					Η.		hand.	0 ,
Ի -	Н	Н					+			
<u> </u>	H	Н		\vdash			H			
⊩ -	H	Н					+			
F -	Н	Н					<u>. </u>			
⊦ -	HH	Н					+	\vdash		
H	HH	Н					1			
6.0	$+ \times$			5.1	100t	R4/	+		BASALT, Vesicular,	close jointed (too
F -	HH	C2	'oicked up	50m	7	60	L'		3.0') to very close	
⊦ -	H	Н			1	00	+	\vdash	icr w/trace brown si	14 infilling: 1@, 35-
├ -	╂╂╌┥	Н	above core	300	YAR		+	\vdash	400-rough w/trace by	mun silt in filling).
├ ं-	H-	Н	·	\vdash			' +			the weathered 19.0'
⊦ -	₩	Н		-			₩`		to 11.0') dk. gray (to 9	
9.0-	H	Н		┼	 	ļ	~	1-	brown hard	
-	H	Н		┼─		 	†	 		of 9.0 H. depth
- -	Н	Н		 			Η.		The state of the s	
 - -	H	Н		_			† †	1		
11.0	\mapsto	-		= ~	100	24/	1+	 	RASAIT VOSICULAR	with some vuos.
- -		C3		3.0	100	788	+		BASALT , vesicular	cluse (200°
-	₩	Н		 	-	00	+		cough: 3@10°-irr.); Sample.) to slightly w top) to dark red bro	fresh (ton 4st of
-	H	Н		-	-		+	 	Sandle to slightly	eathered dark arous
-	₩	Н		-			+	 	to deal and ha	un hace.
-	H	Ы		-	-		+	 	TOP IN WALK ITEM DE	The state of the s
-	Н-	Н		 	 		1	<u> </u> -		
-	14-	Н		┼			 	-		
15.0		\vdash		┼	-		*	1	Possible flow contact a	+ 15.0'.
F -		Ш		├ ──		- '-	++	 		i
H6.0	1	<u>'</u>				 	┵	 	Advancement halted a	+ 16. off death.
L						<u> </u>	ł		ravari Cerrusii runica a	
L -	—			┼	-		1	-		
١ -	↓			 		 	1	—		
F -	<u> </u>			┼			1	-		
F -	 			 		 -	1	-		
								·		
734-3	976 (1	HEV	·. 12-82)						2.0	

Hole No	Page	of
100 140		

						Material Description				
Depth, ft.	Test Type No.	Driving Resistance	Measured Recovery.	% Recovery	A (0)	Graphic Log	% Natural Moisture	Color Wet-Dry Consistency Jointed-Broken Plasticity Angular-Rounded Organic Content Drill Remarks etc.		
-										
								E 100 100 100 100 100 100 100 100 100 10		
								2		
					33.					
							6			
Ի -										
├ -										
	-									
-										
-										
							-			
-										
-										
L -		"								
					-					
┞ -		2								
ļ -							\vdash	8		
-										
-	•									
		li .								
		·								
-							.0			
	-						- 1			
Ի -										
<u> </u>										
							\vdash			
	 	· · · · · · · · · · · · · · · · · · ·								
<u> </u>										
		·								
								5 8		



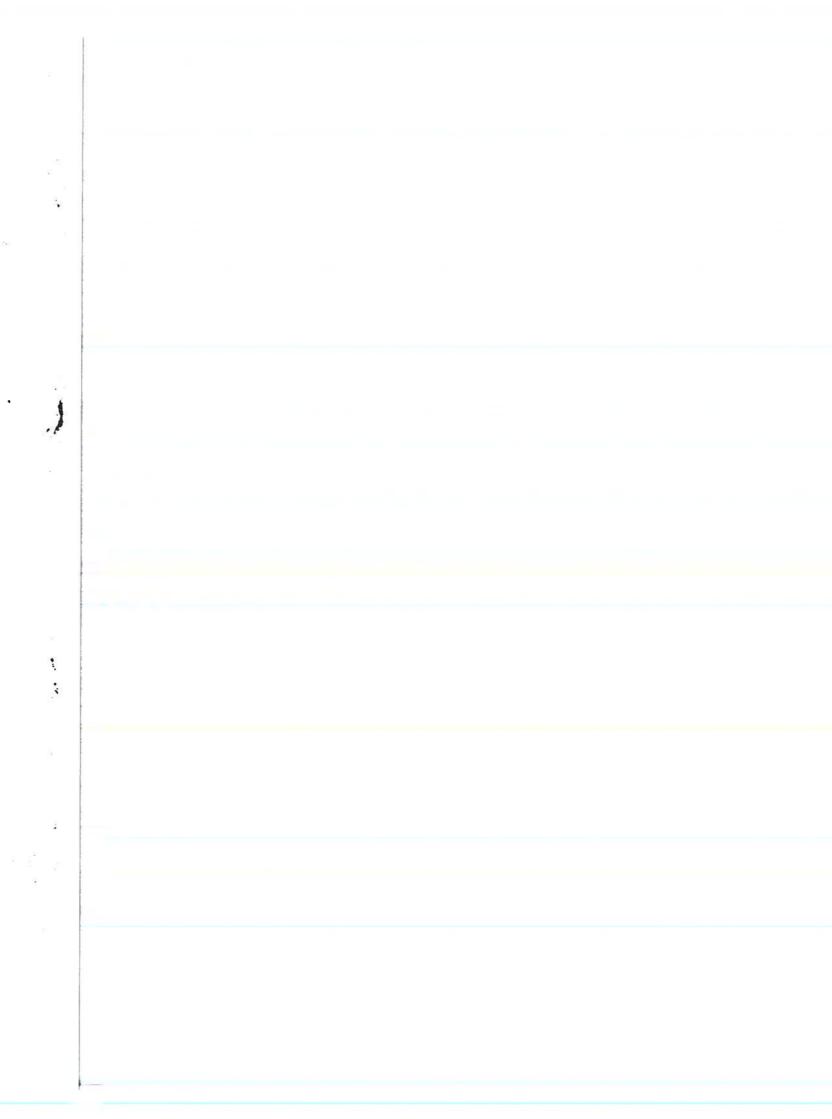
Page ____ of 2



Proje	ct P	end Parkua Dalles - Calif	u a C	ent	ral Or	رور	an	Canal	Hole No. 13 - 92
Highw	vay Ţ	Dalles - Calit	ocnia	(No. 4) (/	County Deschutes	Prefix Cooq 1803
Purpo	se of W	lork Structure	Foun	de	tion =		ives	tigation Exploration	Bridge No.
Equip		CME Truc			_			<i>y</i>	Tube Elev.
Geolo		Randy Davis				_		Driller Chuck Fish	Recorder Knis Luenson
	Location			R+	04 (<u>(j.</u>	12.		Ground Elev. 3739.2
HOIE	LUCALI			<u> </u>	<u> </u>	1	1~:	Drilling Method	Ground water Level
		Tests	_		. 3	1		Auger Depth	Date Depth
	_	ndard Penetration,			₩. <u>⊃</u>	<u>-</u> -		Casing Depth 0	
		gon Ministure Pile,			No	-1-			
			<u> 12-3</u>		No. 3	-		Open Depth 21.0'	
"U"	. — Un	disturbed Sample, Size _		'	No. <u>()</u>	-		Total Depth 21.0'	
Date	Starte	02/25/92	Date Com	plete	02/25	5/9	72	Sample Data Sheet No.	
		3			1	Log		Material Desc	
ایا		Ì	اخعا	ğ	<u>\$</u> %.		20		Wet-Dry
<u>=</u>		17	Messured Recovery,	Recovery	A A A	Graphic	% Natural Moisture	Consistency	Jointed-Broken Angular-Rounded
Depth.	Test No Se	Driving	9 6	×.	∕∕~	1 2	2 0	Plasticity Organic Content	Drill Remarks etc.
ا مِّ ا	L E Z	Resistance	_ ≥ ∉	*	V	٥			
1-61	14	1	1.7	85			12.7	SAND, pumiceou	s, with trace of silt.
┝╶┥	H 174	3 41"- 1-				l::::			ama, brown, loose.
┝╶┤	- 	1 N Z				ľ∷:		[Fill]	7 ,
┡╶┤	 	2 14 3	 			 :::: :	-	 	
2.0	-Y	12	_	0-				CAND	s with trace of silt.
	TN	2 3	1.7	85		7	 	SAND, pumiceous	
		2 414-17					:	SW, nonplastic, dr	y, light brown, loose
Γ٦		5 10 1					<u></u>	Fill	· · · · · · · · · · · · · · · · · · ·
Γ_{4} . 1	1	5				1			
40	***	12	1.3	76				SAND, oumiceou	s, with trace sitt,
┝╶┤	1 1 1		11.0	.110				Sw. nonolestic lie	cht brown to 5.3'
ار احد ستا	 	12 "N"=38	_		5.3			Noted basalt friams	
5.3 5.7	- -	50/0.2 Refusa	,		3/3	4	 	of sample.	
5.0	-	30/0.2 Kerasa		100	22.4	+			r : with some vugs
[D.U]		<u> </u>	5.0	100	R3-		}		
LJ					/36	4	<u></u>		hick) Scoraceaus
Г٦	ПП					۱'،		zones, very dose je	
7	Π					1	<u> </u>		10°-irr. w/some
F =	H	~				+		sandy infill: 10,450-	500-irc w/brown
├ -	H +			_		' .		Cachol fresh to me	derately weathered
┝╶┤	 - -					+	1	(in Scornceous Zones	
	 - -					1	 		um hard
L -	 - -					+	├─-	brown, hard to medi	AMI MAI M
L	\coprod				 	1+	₩-		
410	<u> </u>				-	, '	-	0.404/	11 1/11-2 1/2
["'	Oc	4	5.0	100		+		RASALT, Vesicular	, with some vugs, very
Γ 7					/44	+		close jointed (top 34	t. sample) to close, "
7		1				l.'		iginted (10.70 - rough	w/some sitty intill;
† 7	 - -					H		30 30° -ich w/ Some	sandy intill & numerous
-	╫╌		- -			1		Libers) trock to sli	while weathered a dork
 -	H	 	 			+		army to dark redbrow	h medium ham to
 	╟┼					+		1/2	
	H					١.	-	hard.	
L	Ш	<u> </u>			<u> </u>	+			
						+			
$\lceil n \rceil$	IU					1			
H6.0	170	3	4.9	98	R3-4/	+	L	BASALT, vesicular	with some vugs,
-	H−l ≃	1		-	30	۱,		very close to close join	nted[2090°-irr; 10
-	┞┨╌┠╸					1		EFOL MUCH 3MAS	- 10r · 260.5() -1001.
	╫╫	 				+	 	fresh, to slightly wear	thered, dark army to
-		19				+	-	clark red brown; hard	to moderato to home.
L -	Щ.					1	 	CLOCK THE PROWER; MAYO	III THE TENED OF T
	Ш				<u> </u>			<u></u>	
734-39	976 (RE	V. 12-82)							

Bend Parkway @ Central Oregon Canul
Hole No. 15-92 Page 2 of 2

 ,						1	Material Description				
Depth, ft.	Test Type No.	Driving Resistance	Messured Recovery,	% Recovery	A CONTRACTOR	Graphic Log	% Natural Moisture	5-2			
		C3 continued				+					
F 1	++	CO COMMITTORES				+					
						1+.					
21.0	V			 		+	-	Advancement halted at 21.0ft. depth.			
- 4			-			1		Advancement harred at 21.011. depth.			
			 			1	 				
			<u> </u>		 		<u> </u>				
						1					
			-			1	 				
┝╶┧						1	<u> </u>				
⊦ <u>†</u>						1					
ן ד]					
[]		19				1	 -				
├					 	1	\vdash				
		F1				1	 				
-		53									
- †											
-											
]							<u> </u>				
- 4				<u> </u>	 	-					
- 4					-		 				
			-	-	 						
7 1											
- †					34]					
]							<u> </u>				
- 4							├──				
- +							 				
- +							_				
- †											
1											
.]											
- 4				-			<u> </u>				
- +			\vdash								
- †											
- †	 :										
: 1											
.]	39	9									
-			\vdash								
- 4											
- †											
- †											
_											
. 1											
- 1			 								
- ‡											
-											



Page 1 of 1



Proje	ct 13:	end	Parkway	@, 01	neu	Ave	•		ing (S. Hole)	Hole No. 16 - 92
Highy		Delle		ernia	No	,4)			County Doschutes	Prefix C009-1803
			Structure	Founda	Tion	1 7/10	125	tiga	tion Exploration	Bridge No.
Equip		CN	1 E Truck		7			7		Tube Elev.
Geolo		Rar							Driller Chuck Fish	Recorder Kris Lucrson
	Locati		P/a Line, S		+3	30 1	"t.		C.L. (Rt.) 44	Ground Elev. 3.614.3
TOTE	Locat	7	Tests			4-2.	F t		Drilling Method	Groundwater Level
)	t:	_ 244		40. T	Ή'	•	Auger Depth -	Date Depth
	_		Penetration,				- -		Casing Depth (2)	Not Encountered
			finiature Pile,	10 3		₩. <u> </u>	-1-		Open Depth 15.5	101 11000000
				1 Q-3_			-		Total Depth /5.5	
[U	ndisturb	ed Sample, Size			40. <u>0</u>				
Date	Starte)2/	26/92	Date Com	pletec 02		19	12	Sample Data Sheet No.	
		7	7			1	0		Material Desc	ription
. !		1		9 -	Recovery	3/	Log	# .	00.0.	Wet-Dry
=		1		Measured Recovery.	ğ	A CONTRACTOR	달	% Natural Moisture	•••••	Jointed-Broken
Depth.	# &	.	Driving		Æ	1/2	Graphic	Z	, ,,,,,,,,	Angular-Rounded
8	Test	£	Resistance	24	*	/	ō	* 2	Organic Content	On the the true
0	(A)	JI 18		1.5	100		7-41-4		Asphalt Concrete from	oft. to 0.311.
├ ┤	777	" a	"A("- 22				311		SAND, Gravelly, V	with some siH, SM-
- ا	+11+	14	14-55				111			ema, hower,
H-3-	+*+	+12				1.7	74		medium dense (o.	3 - 1.7 ft.).
4.7_	Н-1,			3.7	62	R4/	+		BASALT, Slight	y vesicular, close
┡ -	1-8	4-	_	- 5.7	WI	63	+		icinted (10,350 - 1	dush . 2@ 500-
-	+	-				7 60			PINTELL LIVE AND AND AND AND AND AND AND AND AND AND	akcly infill: 10,30°-
Ļ	4-4	→—				<u> </u>	+	 	The state of the s	
L -	Ш	4					+	├ ──	rough, w/ trace of.	sandy intill), tresh.
L _								 	dark gray, hara.	
		1					+	├		
	V						+			1 1 1 1 1
2.2	7	2		4.5	90	R4/	4	<u> </u>	RASALT. Vesicula	
-	H					40	T		(too 3.0 ft. of Sam	ole) to very close
r -	H-+						+		jointed (1@ 650)	- much, w/some
Ի -	╅	_					,		sitty sand in filling	(3mm thick) 1 60.40
F -	╂┼	+					T		- rollah - numerous	irregular joints at
	$H \rightarrow$	+					T		bottom of sample with	h some sither sand
├ -	$H \rightarrow$	+					+	├─		lark aray herd.
<u> </u>	H +						+		Thirting J. Tresh,	7
L _	$\sqcup \bot$					 -	4	 		
<u> </u>	H +					 	7 6	-		
عما	V					22.47			CACACT MAIN /	and alora inited
742	\triangle	3		4.0	80	R3-4	ĎS.		BASALT, vesicular	very close jointed
						18	*	 	(1090°-irr, w/some (00°-mugh; 10 40°- gravelly, sitty sond to 14.5°; numerous	Sandy Mill : 10:35 -
	$\Box T$						17		(00 - mugh; 10 40°-	reugh; 10 30 - 100
Γ							+		gravelly, sitty sand	intilled void @ 14.0"
Γ -	\Box						H		+ 14.5' numerous	irregular pints with
r -	H^{-1}	1					1.+		silty sand intilling a	t too 1.0 to 1.2tl
r -	H^{+}	+					4		of sample) modera	tely weathered (11.0
-	╁┼┼	+-							Hala o' (dack red bro	owh) to tresh (below)
h -	╟╂╼╂	+-				•			13.0'), moderatel	u hard to harda
-	H +		 				++		,	,
¥5.5							┝┷		Advancement half	ed at 15.5H.
F -								\vdash	- Avancement Terr	1. M. J. M.
 		-						 		
L -								<u> </u>		
L								<u> </u>		
[<u> </u>		
Γ -								<u> </u>		
Γ -										
734-3	76 (R	EV. 12.	82)				3.5			

								Hole No Page of
								Material Description
Depth, ft.	Test Type No.	Driving Resistance	Messured Recovery,	% Recovery	A C C C C C C C C C C C C C C C C C C C	Graphic Log	% Natural Moisture	Color Wet-Dry Consistency Jointed-Broken Plasticity Angular-Rounded Organic Content Drill Remarks etc.
-								
-						84	9	
-								
_								
_								
-								
-								
-								
			12					
-								
								3
-		(K)						
4					41			
		og						
								-2
4								
1							_	
=								
4								
					-			
			(25)					
4								
1								
-		<u>a</u>						
1	·							
-		10 P						
4		\$0.		2				
1								
-			-					
1								
-								

*

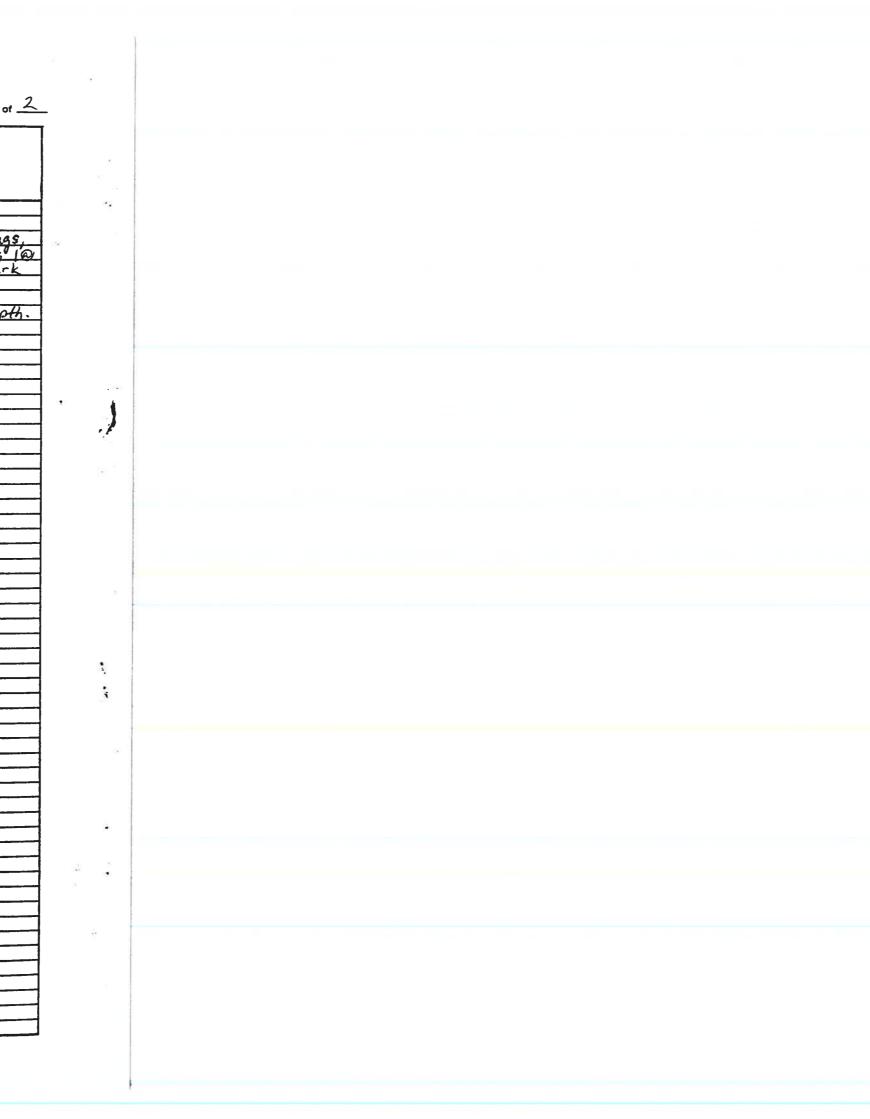
•

•



Proje	~	B	end Parkwal	1 @	Rove	re. A	10.	. U	(xing (N. Hole)	Hole No. 17 - 92
Highy	-		alles - Califa		No			,	County Deschutes	Prefix C009-1803
			dies - Chita	E	T'R		M1/	00-11	gation Exploration	Bridge No.
Purpo						DV	71	المحت	The state of the s	Tube Elev.
Equip	me	nt	CME Truck	Mow	17				Driller Chuck Fish	Recorder Kris Iverson
Geolo	gis	K	landy Davis			· = /	~	4 6 4		Ground Elev. 3(a19-4-
Hole	Loc	atio	n "p" Line, St	a. 2	32+	65 (L	_	<u>40'</u>	C.L. Rt.	Groundwater Level
			Tests	2		1 47.	1 4	+	Drilling Method	
"N"	٠	Stan	dard Penetration,	_		to. 4	1		Auger Depth	Date Depth
			on Miniature Pile.			v o. —	-1-		Casing Depth	Not Encountered
				a-3_		vo. 5	- -		Open Depth 22.51	
_			isturbed Sample, Size	<u> </u>		vo. 0	-1		Total Depth 22.5	
U	_	Una	isturbed Sampre, Size				<u> </u>		I	
Date	Sta	irted	-1-1/02	Date Con	nplete	12/2	61	92	Sample Data Sheet No.	2
			12/20/12		· ·	142	7	<u> </u>	Material Desc	ciation .
			• /			/	•	1	Material Desc	· <u>k</u>
			•		Recovery	A COON	٤	, a	, 00.0.	Wet-Dry
=				Measured Recovery.	8	\$ 0	Graphic	% Natural Moisture	•	Jointed-Broken
矣	=	9	' Driving	2 8		13%	2	Z		Angular-Rounded Drill Remarks etc.
Depth.	٥	N o	Resistance	2 5	*		ē	1 × 2	Organic Content	Dilli Mellacks etc
0	١,			11	55		2.0	10.5	SAND, aumiceous,	with some silt.
	\mathbf{L}^{\prime}	M	2	<i> 4</i> -	122	<u> </u>	ΠÆ	حيال	7/1	0.44
L -	Щ	Ц_	2"N=4		├		14	 		loose
L _	Ш	Щ_	2 '		-	<u> </u>	L, J]	damp, dark brown,	10038
	H,	F	2					<u> </u>		111 1 10 CO'H
72.0	7	N2	2	1.0	67				SAND puniceous	, with trace of silt,
├ -	H	H	6 41" A1		T				SW. non plastic, d	cy, light brown,
├ -	Η.	Н-	35 N= 41				<u>ننا</u>	1	medium dense.). N	oted basalt trag-
3.5	H	4	.52		1		1 .	1	ments at bottom of s	amole: very dense.
	₩			1.7	34	10	12.5	-		rom 3.3' to 4.0'
┡ -	Ц.	CI			1-24	4/1		 	SAND with some sitt.	
5.0	亾	۷_		- 1. 2	10-	1		 		Sh L Ceill 1
L".	$\mathbf{L}^{\mathbf{c}}$	PINE	6	<u>//.p</u>	90			 	SAND, puniceous	471107
Γ	П	Π_{-}	19 "1"- 20				0	ļ	trace of besalt grave	
-	П	П	10 10-21						brown, medium de	nse.
├ _ ⁻	Π,	1	12				4	4		
-7.0-	H,	112	3	0.8	73		Y		ISAND ouniceous,	with trace of Sitt,
- -	╁	Hos	77			80	4		SW, nonalastic, dr	1
8.1-	₩	 	50/0.1 Refusal			9.0	4	~	dense Noted ba	salt fragments at
-	₩	+	SUPPLIENT KANSON			12.	١٠.		hotem sample.	
-	Щ	4-			1	51 /	ተ	1	C2 (5.0'-10.0') : B	asalt BOULDER with
L _	Ш	<u>C2</u>		4.0	80	KT	4	 		SALTIVES-
10.0	L	<u> </u>				/72	Ι'.			1 4 6 6 6 6 6
יט,טקן	1	1					L†	┧	licular, close jointer	1
Γ -	П	Т			1		\sim	k	550-icc) fresh das	k gray, hara.
r -	Ħ	C3		2.7	54	R4/	1		BASALT, rubble,	grave 1 to cobble
Ի -	H	7			T	10	R.	1	size, angular, with infilling of voids and	trace of sandy
┡ -	₩	+-			1			\Box	Infilling of voids as	dor own pints
├ -	₩	+-			+		D /	1	124	7
-	#	4-			+-	-	Ď۲	╂──	U U	
L -	Ш	4_			┼		ふ	 	 	
L -	Ш				-		۲Ñ	\		
Γ -	П						7	1		
<u>آ</u> جي آ	I	J					冷	1		
15.0	7	N.	13	10.6	33	<u> </u>	趻	<u> </u>	BASALT Fragmen	ts, gravel size,
ተ -	H	11	I - A		T		Ħ			very dense. Sompler
ት -	††	#	$\frac{23}{35}$ N = 58				X		apparently driven in	to open joints and
1, 5	++	╂┼╌	40/0.3		+		N	1	through basalt	rubble.
16.8	₩	*		12 6	70	R4/	<u> </u>		BASALT UPSICULO	r to scoriaceous.
L -	11	_CA		12.5	1/4	7/2	١٠ ⁻	1	very close jointed (20.30°-irr: 20
L.	11	4-			┿	1/2	ĮΤι		50°-in: 1010°-	repouled fresh dark
L	Ш		191		4	1	,†	-	DO - 10 10 10 -1	
L '	П						1		gray, hard.	
734-3	976	(RE	V. 12-82)						V /	

	Bend Parkway @ Revere Ave. U'xing Hole No 17-92 Page 2 of 2								
Depth, ft.	Test Type No.	Driving Resistance	Measured Recovery.	% Recovery	# O O	Graphic Log	% Natural Moisture	Material Description	
20.0	X _C		2.2	88	R4/ 32	+++		BASALT, vesicular with some vugs, very close jointed (2@45° - rough) 100 45° Jirr: 1@20° - rough) 1 fresh, dark	
22.5 -	J					+		Advancement halted at 22.5 ft. depth.	
				22					
				0			-		
	- 12								



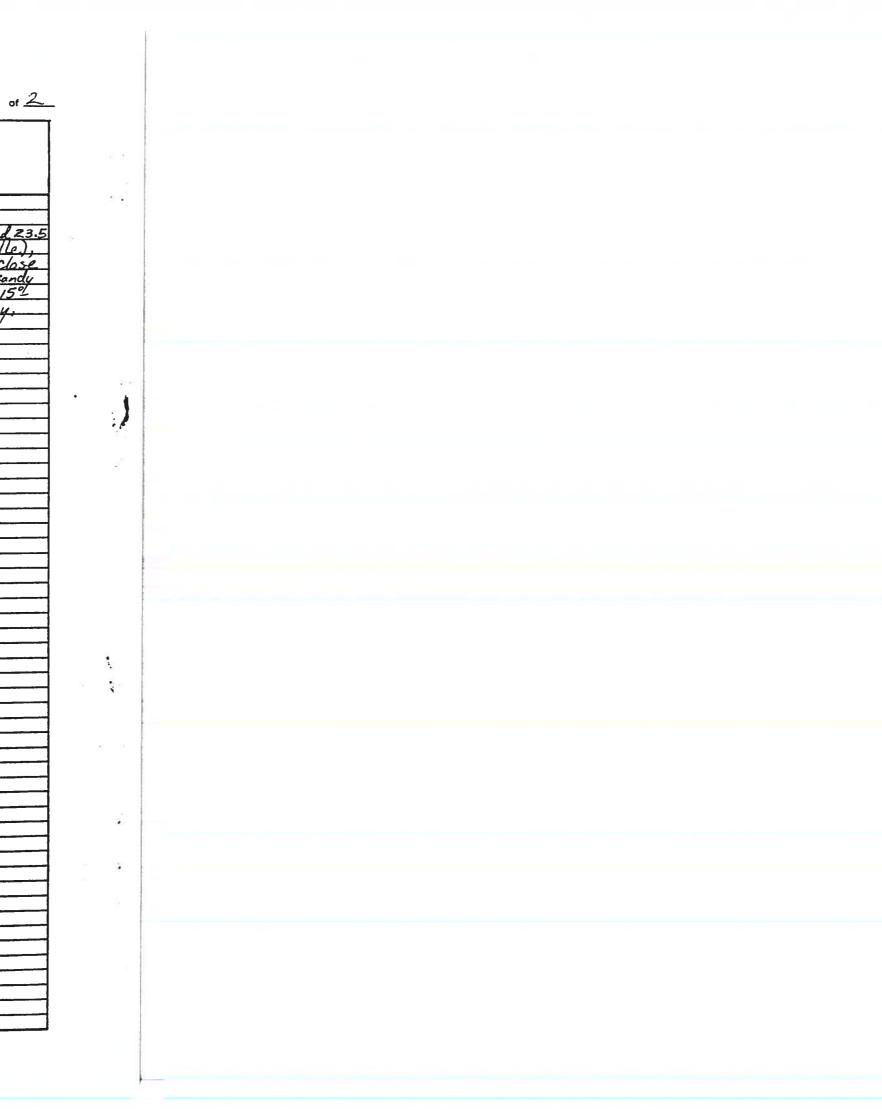


Proje	ct /	30	and Parku	Ru	10	38	0 Str	eet	FU	'xing	Hole No. 18-92_
Highy			165-Californ			10.4				county Deschutes	Prefix C009 - 1803
	ose of \							tie	ation	Exploration	Bridge No.
Equip			ME Truck		lour	1		J			Tube Elev.
Geolo		_	andy Davis	<u> </u>	-000	-				Driller Chuck Fish	Recorder Kris Tuerson
	Locat			to	198	10	2 1	T)	70	C.L. Rt.	Ground Elev. 3.573.1
HOIE	LUCAL	1011	Tests				1 19	Drilling Method	Groundwater Level		
			*	_ ′	9 %		No. 4	41.	•	Auger Depth	Date Depth
			lard Penetration,			_		- -		Casing Depth O	Not Encountered
			on Miniature Pile,				No. <u>—</u>	-1-		Open Depth 251	- NOT LACEDATETECT
			• • • • • • • • • • • • • • • • • • • •	23			‰. <u>4</u>	-		Total Depth 251	
			sturbed Sample, Size			<u> </u>	No. <u>O</u>	<u>. L</u>			<u> </u>
Date	Starte	ed	02/27/92	Date	Con	pletec	da /00	1/	2-	Sample Data Sheet No.	
			02/21/12	L			02/27	/-	12		
		1		l			Ι ' . /	•	1	Material Desc	cription
l . i				i	₽ 🕹	Recovery	<i>\$</i> /_	Log	3.	Color	Wet-Dry
=		-			Measured Recovery.	ğ	7/V	Graphic	% Natural Moisture	Consistency	Jointed-Broken
1 2	Test Type	. 1	Driving	- 1	200	2	%	6	Ző	Plasticity	Angular-Rounded Drill Remarks etc.
Depth.	= - 2		Resistance		Žď	*	VI	Q	12	Organic Content	
0	44	vil.	19		1.8	90		110/10		SAND puniceous	silty, with some
1	Н"	"†	9 "1"-15							gravel, SM-GP,	anplastic dry
t -	$\vdash\vdash$	+	6 N=15							light brown medic	
F +	1	+	8					li.		Concrete from o.	0' to 0.3'
2.0	.	12	8		7.3	105		Wild.		SILT Sandy with	4 trace gravel SM.
⊩ -¦	1					رون	 	111	-	non Plastic dry	light brown
F -	\vdash		46 "N=73					:		non plastic, arg,	O BILLEY
-	- -	-	27 10-13					11:	 		
4.0-		4	18				<u> </u>	·/[
Γ. –		_ _						*:	├—		
5.0	Ī	\perp							1		111 01 1
3.0		V3	3		1.7	85		::	<u></u>	SAND, with trace	
7	ПП	Т	4 "11-7						L_	moist (some drill fl	wid), brown, lease.
		Т	3						<u></u>		
- -		十	7								
-7.0-		14	2		1.3	65			┌	SAND, with trace	sitt. Sw. nonplastic
F -		┅	2 " 1	$\neg \neg$						mist / some drill fluid	brown loose
F -	HH	-	2 N= 7	-1						10. 40	,,
┝╶┤	H		10				9.01			i.	
19.0	$H^{\mathbf{T}}$	-			1.0	20	R4/	•	1-	CI(5.0'-10.0'): BAS	ALT. Vesicular.
-	∐ −₽	4	 		1.0	20	7/2	+		close jointed (1@30°)	fresh dark aray hard
10.0	\mapsto	+	.				K-1-7	1			close jointed to.
	111	4			<u>5.1</u>	100+		1	├	BASALI VESICAINI	16 100 - 50 101 11/0 00
<u> </u>	H	4					44	1	 	very close jointent	10 po - rough w/ Coso,
L	Щ	1				 _	 	t	 	conting, 10 55 -60 -	oz coating; 1060 irr;
ل ا	Ш							+	├	10.3500 - rough, w/ Cas	03 comong : 160.00 - 160;
	Ш	\prod						ı		1045 - irr, tresh,	dark gray, hara.
	ШТ	$oldsymbol{\mathbb{I}}$						4			,
Γ 1		Т						1	<u> </u>		
Γ 1		T						1			
7		7		$\neg \neg$				1			
ا _ ا	H	十						į.			
H5.0	X	न्त्र			5.1	100 t	R4/	T		BASALT Vesicular	close jointed (top
- -	╁	4		-			46	i		1.5 of sample to very -irr : 2@ 900 -irr : 3	close jointed (16,100
┝╶┥	╁┼┼	+	 				7. 700	+		-inc : 20,900-inc : 3	@ 30-35° - sough).
├ -	╫╫	+						1		fresh dark gray h	ard. Noted possible
┝╶┥	╟┼	+						+	—	flow contact at 16.	5'
L -	$H \rightarrow$	+						ji.	<u> </u>	TION CONTROL OF 10	
-	$H \rightarrow$	4				<u> </u>		+	 		8
L 4	H +	4						÷	\vdash		
لــــا	Ш	\perp				Ļ	لــــا	<u>. </u>			
734-39	76 (RI	EV.	12-82)							0.50	

Bend Parkway @ 3RD Street U'xing (Addison Ave.)

Hole No 16-92 Page 2 of 2

								Hole No.
			T					Material Description
			l	Š	A A A O O	Graphic Log	1 = -	Color Wet-Dry
=			E S	% Recovery	8/0	2	5 5	Consistency Jointed-Broken
€ .	- •	Orlving	3 8	ž	*\0	1	1 2 5	Plasticity Angular-Rounded
Depth, ft.	7 1 68 8 9 9 6	Resistance	Messured Recovery.	*	/~	ŏ	% Natural Moisture	Organic Content Drill Remarks etc.
	-	02 1	-	-		1	_	
8 -	╂╂╼╂╼	C3 continued		-		+	 	
20.0	X.		E	100	R4/	+		BASALT, vesicular (20.0' to 21.0' and 23.5
<u>}</u>	CA		240	100	70	T		to 25') and slightly resignar (middle),
	$\sqcup \bot$		(2)		10	+	├─	
			<u> </u>			Τ.		2. Miles Milyani
	ПТ					1+		pinted (1085°-rough w/ dark brown sandy
• -	Π					1.		infill: 100°- rough; 40,30°- rough: 10,15%
						H		rough: 2@ 40°-rough fresh, dark gray,
	 		1			+		hard.
	╂┼					1.		
	╂╂╌╂╌					1		p p
	╂╅╌┼╼				 	+	 	
25.0	1			-		 `		Advancement halted at 25.0'.
			 			1	 	Hawricement harried by 25.0
	 	- 10				ł	 	
_					ļ		 -	
	L							
		6						
							L	
						}		
						1		
			1-					
			-	-	 	1	 	
			├──			1		
					 		 	
			 			ļ		
							 	
			1					
			I					
						1		
			 			1		
			 					
	ļ		 	 				
							 	
				-			 -	
								
_]				<u> </u>			<u> </u>	
67								
								5 5
								(8)
7							52	
7			Γ					
	-		-					
-			-		-		—	
			-					
_ 4	 -	y .	-	 	ļ			
				<u> </u>				
_]				<u> </u>			 _	
_ ~								
7								
4	 -		-					
-								
			—					
					 		 -	
<u>.</u>								
				- 3		لبا		



Page ____ of ____

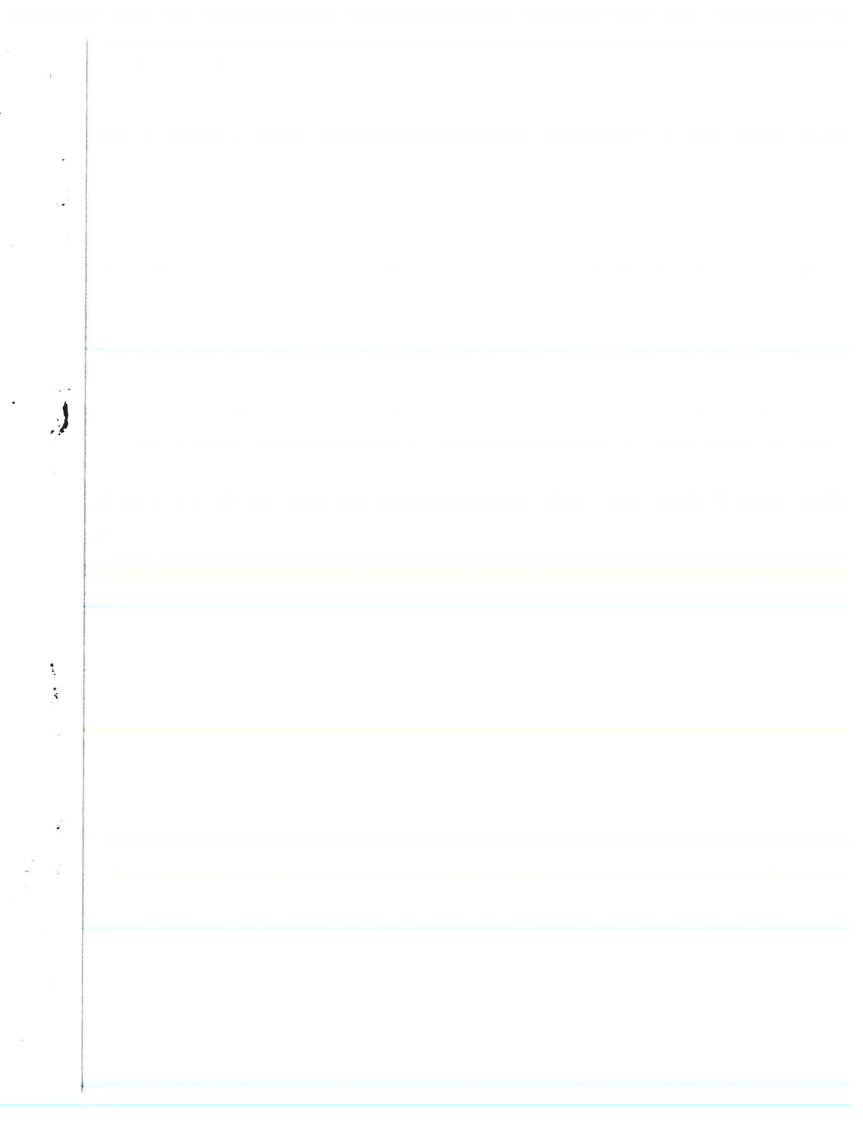


Proje	ct	7	2,	nd Parkwau	. @	ΩI.	neu	Ave	. (1/x	(ing (N. Hole) Hole No. 19-92
	_			alles - Califer		9	10.	4)			County Deschutes Prefix C009 1803
Purpose of Work Structure Foundation In									VP	stic	nation Exploration Bridge No.
Equipment CME Truck Mount										0	1 doe clev.
	Geologist Randy Davis										Driller Chuck Fish Recorder Kris Tuerson
Hole Location "P" Line, Sta. 243+17 L										_	C.L. (Rt) 21.5 Ground Elev. 3615.2
\\G' Tests 243+53 18_R											Drilling Method Groundwater Level
"N" —Standard Penetration, No. 5											Auger Depth Date Depth
"M" — Oregon Miniature Pile, No.											Casing Depth O Not Encountered
"C" — Core, Barrel Type #23 No. 5											Open Depth 25.0'
					TKXS			10. 1	-		Total Depth 25.0'
	_	- 0	naı	sturbed Sample, Size		_			- 1		Sample Data Sheet No.
Date	Sta	art	ed	03/02/92	Date (Com	pietec	03/0	2/	92	Sample Data Sheet No.
 				03/04/2		1		77	7	i^	Material Description •
1 .			- 1				_	ا/و	8		
=			- 1		2	خ	Recovery	A CONTRACTOR	٦	Natural	Color Wet-Dry Consistency Jointed-Broken
		_	- }			8)	\$ 0	훒	1 5 5 E	Plasticity Angular-Rounded
Depth.	1	Ž,	ġ	Driving Resistance	١	Recovery.	*	/~	Graphic	% Natural Moisture	Organic Content Drill Remarks etc.
ـقـا	Ľ	_		regions.co		_				-	1 0 1 0
0.4	1	\mathbf{L}									Asphalt Concrete, Off to 0.4 H.
	\prod'	П	NI	5		.5	75	_	00		GRAVEL, Sandy, with some silt, GW,
Γ	П	\prod		9 "N" = 20					0	<u> </u>	non plastic, damp, brown, medium
Γ -	П	П		11 14 2					1:0		dense. (Base Rock)
2.4	П	ĮŢ		75					0		Cail Cul
L	T,		NZ	12	0	6	100		$\tilde{\mathbf{A}}$		GRAVEL, Sondy, trace of silt, GW,
3.0	H	٦	٦	40/0.1 Refusal							non plastic, maist (some drill fluid), brown,
† -	H	┪							27		very dense. (FILL)
† -	H	7	ជ		3	3.4	57	0/	N.		(1(0.0'-6.0'): Top 1.0H of Sample:
Ի -	H	Ŧ	퍼					0	D		A. C. and anular basalt GRAVEL (Base)
-	H	┪	-	·					7		Bottom Z. 4 H of sample: BOULDER, basatt.
- -	H	ᅥ	-						برا		(FILL)
6.0	17	K	N:	11	1	В	90	10	Г ∷		SAND ouniceous, with trace of sitt,
-	H	H	"	10 9.15			10		.0	1	Sw. nanglastic dry, light brown, medius
- -	₩	H	\dashv	9 N=19					:: :		dense (natural soil).
-	H	H	-								`
8.0	H	H	(4	10	- 1,	.6	80		1:11	_	SAND, ouniceous with some silt, SW-
-	₩	ŦŦ	13	A: A:		.0	122		96	_	SM, non plastic, dry, light to medium
-	₩	₩	-	31 N=51				9.5	12/1	<u> </u>	brown, very dense
B 8-	Н,	H	25	20 50/0.3		14	10	07		┼─╌	(2(6.0'-10:0'): Basalt GRAVEL with
9.8	H	X	<u>رب</u>	30,0.5	- 	/-	10	1	₩	<u> </u>	Some silty Sand matrix
	#	-1					96	R4/	L	 	BASALT vesicular (top 1.5' of sample) to
┡ -	H	4	C3			· · D	70	52	┪┸	├──	slightly vestgular, very close jointed (top and
ļ	44	4					├─	7 34	H	┝	bottom 1.0' of sample) to close jointed (middle)
- -	44	4	_						₽,	-	CIOCA AL BOSA TIAN UN SOME SITTE
L .	Ц	_							1	}	
L .	Щ	4							#	├─	-rough, up trace sitt coating; 10.900-icr, w/sondy infill to 5mm), fresh, dark gray.
L.	Ц	┙							1 .		- round will 5 - Least dark aray
L.	Ш						<u> </u>		+	-	W/ Sandy Intil To John, Tresh, Mark gray.
Ε.	Ш								بيط	} -	harde
-15.	11	J						86	74		DAGO TO THE CONTRACT NOTES
	11	\triangle	<u>C4</u>			.7	74	R9-/	ΝĊ	1	BASALT, vesicular with some vugs, very
Γ.	П							30	10	1	close jointed (top 2.0') to close jointed (10)
Γ.	П	٦							X	1	1 Cao a la la Gallo manuala lui/SOME SITVINIII
Γ.	11								K		I in and in capple larging SIZE Cubble W.
Ι.	††	\dashv								10	1', $1'$,
卜 ·	#	-							Π		let attle weathered to trosh, dark red brawn
- '	++	⊣	-		-†				1+		(top 2.0') to dark gray, medium hard to
h ·	╁┼	-	-						L		hard.
734-3	976	5 (8	REV	/. 12-82)							

Hole No 19-92

Page 2 of 2

								Hole No. 11 1 Page
		1				4		Material Description
		-	l	2	A CO	3	_	Color Wet-Dry
=			9 6	Š	\$ 0.	2	5 5	Consistency Jointed-Broken
Depth, 11.	# 8 .	Driving	Measured Recovery,	% Recovery	*/0	Graphic	% Natural Moisture	Plasticity Angular-Rounded
8	Tost Type No.	Resistance	žå	*	/ *	Ö	χž	Organic Content Drill Remarks etc.
-	1 1			-			_	
					 	+		
20.0	X		-		02-/	+	-	BASALT, resignar, with some rugs,
L 4	\C£		5.2	100 ¥	R3-/	1 1		BASAIT, resignar, with some rugs,
L		'picked up'	Som	e of	60	+		
LJ		previous car	San	nole		1.		(20,96°-irr: 10, 50°-rough: 1060°-curved
[]				<u> </u>		L+		Erouch: 4 @ 10°-20° - irregular 1 w/ brown
r 7								silty infill) tresh (too 2.0') to slightly
7						+		weithered dark gray (too) to dark red-brown
r 1] +		hard to medium hard.
r 1	1-1-					1. ' l		
r 1						+		
┝╶┪	1					1 +		2
25.0	<u> </u>							Advancement halted at 25.0ft. depth.
┝╶┤				 	-	1 1		The state of the s
┝╶┤						1 1		
┝╶┩					 	1		
Ļ						1		
L 1						1 1		
1						1 1		
		9				1 1		
						1 1		
7						١. ا		
7								
- 1					1	1		
- 1						1 1		
- 1						1 1		
- 4						1 1		
- 1								
- +						1 1		
- 4								
. 1								
_ 1		114.0						
- †	-					1 1		
1				9				
- †	Si .							
- †								
• †		8.5		- 5-				y .
- +		(i			-	l I		
- +								
- +		245. 25						4
- +	_							M .
- +							-	
- 4		·						
- 4					(9)			
- 1								
. 1								
. [$ \bot $				
. I								
T]	
- †						[
- †								
- †				\neg				
- +						t		
- +						 	 	
+						 -		
- +						 		
- +						 		



Page ____ of ____



SOILS AND GEOLOGICAL EXPLORATION LOG HIGHWAY DIVISION

Proje	ct		end Parkway	ωI	ndu:	strial	W	24/	BURR Wxing	Hole No. 20 - 92
Highy	vay	D	alles - Califo	rnia	No	<u>.4) </u>			County Deschartes	Prefix C009 - 1803
Purpo	ose o	f Wo	ork Structure	Found	ation	n In	res	tiac	tion Exploration	Bridge No.
Equip		_	CME Truc					0		Tube Elev.
Geolo			and Davis	1111111			_		Driller Chuck Fish	Recorder Kris Iverson
Hole				ta. 297	143	5 /	Lt)	43	C.L. Rt.	Ground Elev. 3651.4'
11016		800	'\ C '' Tests				_	<i>t</i> ,	Drilling Method	Groundwater Level
		.	y			No. 2	1	-1,	Auger Depth	Date Depth
3			dard Penetration,				-1-			
			on Miniature Pile.	^ 3		№ <u></u>	-1-			Not Encountered
				१3		No. 2	-			
"v	· –	Und	isturbed Sample, Size			No. <u>Q</u>			Total Depth //. O'	
Date	Sta	rted	24.2 /02	Date Cor	nplete	d/	_	m	Sample Data Sheet No.	
			03/03/92	<u></u>		03/0	것/	77		
					_	/	٠,	1	Material Desc	ription
					Recovery	A A A	١٤	ē.		Wet-Dry
=				Measured Recovery.	Į	3/0	Graphic	% Natural Moisture		Jointed-Broken
Depth.	5 5	1	Driving	800		1/4	₽	Z		Angular-Rounded
امِّ	Test	ž	Resistance	Ž₫	*	V	٥	× 2	Organic Content	Jim Heller of Etc
0	不	W	1	1.1	55		8	15.7	SAND, with some	silt, trace gravel,
-	ΗŦ	₩.	2 "1"= 16		1		o		SM-SW nepplastic	
⊢ -	₩	+	2 "N"=16		 	—			medium dense	-,
├ -	##	╁	/		 			-	Tracalist Const	
2.0-	¥	1	9	- 	- F	 	6		Too 0.8' of sample:	En an as All alassa
	Цſ	N2	9	\/./_	85			 	Top 0.0 of Sample:	and as IVI, above
	Ш		22			2.8		∤ —	Bottom 0.5' of sample	e: 134 SALI Progrenis
3.3	Π¥	Г	50/0.3 refusal]+			
٠. ـ	П	7		3,2	58	1R4/] _	L_	BASALT, vesicular	
-	H^-					48	י ן		(top 1.0') to close ;	inted (1070°-inc. w
├ -	╫╴	1					+		Fe. 0, Stuins ; 1@ 35-4	6-in w/5mm sandy
	╫╌	┼─			 		1'.			or), fresh, gray, hard.
-5.5	\rightarrow			5,5	100	04/	1 +	-	BASALT, vesicular	with some vugs,
<u> </u>	1	722		2,5	100	77	۱.	\vdash	close iginted (5@10	-15°-icc · 10.90°-
L _	Ц_	_			-	45	1	├	Close Printed Collection	10 - 2
L	Ш	L					4		rough: 20,900 - irr;	1@30°-inr), tresh,
							1.		gray hard	
	П	П			<u> </u>]+			*
_	П	1					Ι,		· · · · · · · · · · · · · · · · · · ·	
r -	H^-	✝					1 +			
┝╶┪	Н	+					1+			
	╫╌	┿					۱.	_		
├ -	╫╴	-		-+-	_		1 🕈	 		
├ -	H-	+			├──	 	+	 		
HI.O	1	_			├	 	١	-	Advancement hatte	1 + 11 of death.
	_				 -	 	1	⊢	Mavancement halle	Tal HOH. Wepins
L _						ļ	1	—		
L							1	-		
Γ -							1			
Γ -		_								
┣ ╡							1			
┝╶┤	-				 		1			
├ -	\vdash				 	-	1	_		
-					├─		1		 	
							1	—		
L _	_					<u> </u>	1	├─	<u> </u>	
				L						
Γ 7									<u> </u>	
	-		· · · · · · · · · · · · · · · · · · ·		Γ					
F -	-					 	1			
-	 				1		1			
├ ┤					-		1	 		
لبيا		25					_		L	
734-39	976 (RE\	/. 12-82)							

								Hole No Page of
				T	1			Material Description
İ				_	4 () () () () () () () () () (Graphic Log	1	l .
			Measured Recovery.	% Recovery	8	2	% Natural Moisture	Color Wet-Dry
=			1 2 8	8	\$ 0	Įž	a a	Consistency Jointed-Broken Plasticity Angular-Rounded Organic Content Drill Remarks etc.
£	Test Type No.	Driving		2	1/2		ZB	Plasticity Angular-Rounded Organic Content Drill Remarks etc.
Depth, ft.	L L L Z	Resistance	ع ح	*	/	٦	* 2	Organic Content. Drin Hermanic Co.
4			-		15	1		
ل			├	 				
١						8		
J			ļ					
						1		
1					l		L	
7						1		
						1		
4			20			1		
4								
J			└			ł	ļ	
7								
7			l		L			
		70.]		
+						l i		
4			1		 	1		
4	 		 		 	1		
J			-		-	1		
					<u> </u>		<u> </u>	
7								
- 1					L	j		*
- 1								
-								
-			├					
			-	 			-	
J								
7								
- 1			1);			1		
			 			1		
- 4					125.		\vdash	
			-				 	
		G.		11				
7								
7								
- 1								
- 1								
			-			1		
			-	- 111	 			
١			 				 	
J					ļ		 	D
1					L			
- 1								
+	 -							
4			$\vdash \vdash$					
- 1		<u> </u>		<u> </u>				
١			1					
J						1 1		
7	·							
1		F10						
+								
4			1					
4								
1			 	ļļ				
J								
7			$_{\perp}$					
1								
4			\vdash					
- 4			┼╌┤			1	\vdash	
1							\vdash	
ا								
7								
+			1				I	

1

•

,

GEOLOGY & FOUNDATION INVESTIGATION REPORT

Bend Parkway Project Deschutes County C009-1803

Region 4 Geology Unit

Prepared By

Kris Iverson Project Geologist



BEND PARKWAY PROJECT FOUNDATION REPORT

Introduction

Phase 1 of the Bend Parkway Project will primarily involve the construction of twelve bridge structures. This report represents the results of the foundation investigation for these structures. Included in this report are:

- Geotechnical Recommendations
- Project Description
- Site Conditions
- Geology
- Geotechnical Exploration
- Test Boring Logs
- Attachments

Summary of Recommendations

The use of spread footings is recommended for structures throughout the project. The results of the foundation investigation indicate a rock unit at very shallow depths; this competent, generally fresh, unweathered rock will provide an excellent foundation. Blasting will be required for excavations of considerable size in this basalt rock unit; vertical slopes will be stable.

Project Description

The Bend Parkway Project will construct a highway facility to replace the outdated existing stretch of the Dalles-California Highway in the Bend urban area. The existing U.S. 97 corridor is approaching capacity, due to rapid population growth and development in the Central Oregon area. Also traffic volumes on the Dalles-California Highway have increased as a result of more through traffic between California and Washington. The existing facility, which employs 3RD Street, has become congested by business development accessed directly along the entire length of this urban section. This has resulted in a facility with numerous problems including: traffic congestion, considerable delay, traffic conflicts and reduced safety for motorists and pedestrians. A new highway system is therefore being proposed.

The Bend Parkway Project involves new construction to improve traffic flow and safety within and near Bend City Limits. The completed project is expected to provide better access to and from several directions with the city of Bend as a hub and/or destination, while providing for through traffic as well. The Bend Parkway Project will be primarily a new alignment of the Dalles-California Highway (US 97) for approximately 7 miles through the

Bend urban area. However, the Parkway will closely follow the existing Division Street for approximately one mile in the core downtown vicinity. The sections to the north and south of this will be entirely new alignment.

The Parkway will be a four-lane, limited access facility with a raised median, shoulder/bikelanes, sidewalks in some areas, and left turn lanes at selected intersections. Features include at least twelve new structures, widening of at least three existing structures, signalized intersections, interchanges and the necessary retaining walls, sound walls, and sound berms. The Parkway Project will also entail the realignment/shifting of three irrigation canals as well as various culverts and/or short span structures for these canals.

Due to complexities and budgeting for an urban project, the Bend Parkway Project will be divided into two construction phases. Phase 1 will primarily construct the major structures and associated detour routes; Phase 2 involves the construction of embankments, roadways, and surfacing, as well as signaling, signing, and lighting.

A list of the proposed major structures from north to south along the project, is as follows (sizes are approximate length x width):

- ► <u>Sisters Interchange U'xing:</u> New MK Line Structure, 240 x 35ft.
- ▶ Empire Blvd. U'xing: New EMP Line Structure, 160 x 70ft.
- ▶ Butler Mkt. Rd. O'xing: New L Line Structure, 145 x 105ft.
- ▶ <u>Butler Mkt. Rd. Canal O'xing:</u> New BUT Line Structure, 75 x 65ft.
- ▶ <u>N. 3RD Street (Existing US 97) O'xing:</u> New L Line Structure, 175 x 85ft.
- ▶ Division Street O'xing: New L Line Structure, 300 x 85ft.
- ▶ Revere Ave. O'xing: New L Line Structure, 140 x 115ft.
- ▶ Olney Ave. O'xing: New L Line Structure, 115 x 95ft.
- ► <u>Greenwood Ave. O'xing:</u> Widening of Existing L Line Structure to 85 x 95ft.
- ► Franklin Ave. O'xing: Widening of Existing L Line Structure to 45 x 100ft.
- ► BNRR/Century Circle O'xing: New L Line Structure, 215 x 95ft.

► <u>Central Oregon Canal O'xing:</u> New L Line Structure, 130 x 85ft.

The existing BNRR O'xing structure on Empire Blvd. (EMP Line) will require nominal widening as well.

No notable geotechnical problems have ocurred on the section of existing highway to be replaced; none are anticipated on the new alignment.

Site Conditions

Topography:

The project area is located in what is locally referred to as the "lava badlands". It is characterized by hummocky topography resulting from pressure ridges within the generally flat lying lava flows which blanket most of the Bend area countryside. Topographic relief along the project is approximately 320ft. The elevations are generally near 3,500ft. at the north end (beginning) of the project, and increase to approximately 3,820ft. at the south end.

Climate:

The climate around Bend is semi-arid, having an annual average precipitation of approximately 12 inches per year. Precipitation occurs primarily in the form of winter snowfall. Spring and fall rain contributes to the total precipitation quantity but is not the primary source. Summer rains associated with thunderstorms can be heavy. Temperatures are generally near or below freezing during the winter months, and 70-90°F for daytime highs in the summer.

Vegetation:

Several vegetation communities exist around the Bend urban area. The northern third of the project is typically grasslands and pastures with scattered juniper woodlands and one considerable ponderosa pine forest. The central third portion is largely barren urban area with some scattered juniper woodland, where undeveloped and undisturbed. The southern third of the project contains sizeable grasslands once used as grainfields, as well as a large pine forest at the extreme south end of the project. Also found in the south portion are scattered juniper woodlands and a few small aspen groves.

Existing Facility:

U.S. 97 is presently a four lane facility with sidewalks and left turn refuge. Shoulders take the place of sidewalks on the north and south ends of the existing corridor. A very narrow 2 lane passage for motorists exists beneath the BNRR U'xing (@ M.P. 138.28), near the urban center. An interchange routes traffic at the junction of the McKenzie Hwy. (US 20, Hwy. #15) and the Dalles-California Hwy. (US 97, Hwy. #4) at the north end of the section to be replaced by this project. Two other highways intersect U.S. 97 (3RD Street) near the center of the urban corridor. The Central Oregon Highway (US 20, Hwy. #7) connects at Greenwood Ave., while

the Cascade Lakes Highway (Century Drive or Hwy. 372) joins at Wilson Ave., via Division Street.

Utilities:

This project will require the relocation or modification of several utilities at numerous locations along the proposed alignment. Phase 1 of the Parkway Project necessitates the examination of the overhead and underground utilities as well as irrigation canals in and around the twelve proposed structure locations. For brief, site specific discussions of conflicts with existing utilities locations, see the information under Geotechnical Exploration, below. Also, for more detailed utilities information, contact Jerry Page, Region 4 Utilities Coordinator, at 388-6180.

Geology

The proposed project is situated within the High Lava Plains Geologic Province of Oregon. This province extends eastward from the Deschutes River to the Harney Basin. It is bordered on the north by the Blue Mountain Province and merges with the Basin and Range Province to the south. The High Lava Plain is distinguished by relatively recent lavas and cinder cones. Much of the area is sparsely vegetated with sagebrush and juniper. Ponderosa pine forests cover areas receiving more moisture.

In the Bend area and along the proposed alignment for the Bend Parkway Project, the surface geology is dominated by widespread flows of recent lava mantled by a thin veneer of silty SAND soil. The primary source of the lava has been Newberry Volcano. Newberry is a "shield" type volcano located approximately 20 miles to the south. Its caldera is now occupied by East and Paulina Lakes. Newberry lavas around Bend were erupted during the Pleistocene Epoch. Pressure ridges within these generally flat lying lava flows have created the hummocky topography of the Bend, referred to locally as "lava badlands". The rounded tops of these basalt lava hummocks are exposed throughout the length of the project. The exposed rock is dark gray, fresh to slightly weathered, and hard. It has a blocky appearance due to moderately close to wide spaced, open joint surfaces which are generally oriented horizontally and vertically. The shallow depressions between the hummocks have been infilled with ±3-4ft. of brown, silty, eolian SAND.

Several northwest trending normal faults are present in the Bend area (see attachment 1, Geology Map of the Bend Area). These faults displace rocks Pleistocene and older in age and do not appear to affect younger rocks in the area. Hence, it has probably been several thousand years since there has been seismic activity. These faults are thought to be surface manifestations of deep seated crustal movement associated with the Brothers Fault Zone. One of the mapped faults crosses the Parkway corridor at ±Sta. 420. There has been approximately 10 ft. of relative vertical displacement along the fault in this area; the upthrown

block is ahead on line to the south.

Another major feature of the area is the Deschutes River. This river flows from south to north, through the west half of Bend. The corridor for this project is some 400ft. from the Deschutes River at the closest point, and construction is not expected to affect the stream.

Geotechnical/Foundation Investigation & Exploration

The geotechnical investigation for this project was predominantly carried out for the purpose of obtaining subsurface information in the vicinity of the proposed structures. A search of existing City of Bend and ODOT project files was performed for any useable subsurface data during January 1992.

During 1981 and 1982, the ODOT Region 4 Geology Crew drilled numerous exploratory test borings in the vicinity of the Greenwood Ave. (US 20 Business Spur) and Division Street intersection. The purpose of this past work was for the structure project titled "Greenwood Ave. U'xing at Division Street, Central Oregon Spur Highway" (see the Foundation Report titled the same, dated August, 1983, for Bridges 16532 & 16546). Several of the earlier drill holes are close to the area where subsurface information is needed for the widening of the existing structure to accommodate the proposed Parkway.

Numerous surface reconnaissance and site photo trips were made from early 1991 through the spring of 1992.

The City of Bend Engineering Dept. was contacted during the winter of 1992 for subsurface data around the Franklin Avenue O'xing structure, however no boring logs were found from the previous structure project.

An on-site meeting was held on January 9, 1992 with Bill Burns of the Bridge Section, Don Turner of the Geotechnical Engineering Group, and Randy Davis and Kris Iverson of Region 4 Geology. The purpose of the meeting was to develop an exploratory drilling plan.

Drilling and sampling commenced on February 3, 1992, using the above-mentioned plan; drilling was completed on March 5, 1992. The drilling was accomplished with a 6x6 truck-mounted CME 75 drill, using a HQ core barrel and inner core tube fitted with split sample sleeves. All Standard Penetration Test soil samples were driven by use of the CME automatic hammer and other standard apparatus. A total of 20 exploratory test borings were drilled and sampled.

A site visit of the project was made by Steve Davis and Fred Gullixson of the Salem Engineering Geology Unit and Kris Iverson of Region 4 Geology on March 30, 1992. It was determined that the use of geophysical methods would not be an effective method to locate areas where soil could be easily excavated for later use as

landscaping material for Phase 2 of the project.

All of the above geotechnical reconnaissance and exploration has demonstrated that one soil unit and one rock exist in the project area. The surface unit is a relatively thin, eolian, pumiceous SAND, with varying silt content. The consistency changes from very loose at the surface to medium dense at depth, while thickness ranges to approximately 6ft. between rock outcrops. However, much of the area covered by the alignment is rock outcrop, with either very little soil or no soil at all. The rock unit is a vesicular BASALT, with very close to moderately close (blocky) joint spacing. Individual flow thicknesses are approximately 10ft. Contacts between flows are generally slightly weathered to moderately weathered, red scoriaceous material to 2ft. average thickness. Rock unit hardness varies from moderately hard (where weathered) to hard. Occasionally 2-4ft. thicknesses of open, close-jointed, and loose rubble were encountered. The basal contact of this basalt unit was not encountered during the exploration, however the available geologic literature suggests a total thickness of 100-200ft. in the Bend area.

The lava will provide an excellent foundation for embankments and structures. Blasting will be required for excavations in this rock, and vertical slopes will be stable. The sandy soil will also provide good foundation.

The following paragraphs will detail each structure's site specific data resulting from the investigation. Details will include surface description, subsurface information, and a brief discussion of utilities locations. Starting at the beginning of the project, the sites are as follows:

SITE 1: Sisters Interchange U'xing:

This proposed structure will take northbound Parkway traffic exiting to U.S. 20 (westbound), up and over the Parkway and N. $3^{\rm RD}$ Street (existing US 97).

The area around this proposed new structure has been largely altered by the construction of the existing Sisters Interchange. A large, natural, rock outcrop (with relief of approx. 30ft.) lies adjacent to the east abutment. Rock outcrops at the west abutment as well. Varying thicknesses of roadway fill and natural soil lie between.

Three test holes were drilled at this site for the foundation investigation. The thickness of soil ranged from 4ft. to 6ft. The soil consists of pumiceous SAND, with varying silt content and a trace of gravel. The soils in holes 1-92 and 2-92 were likely disturbed by the work for the existing interchange. Top of the BASALT rock was encountered at elevation 3,505.9ft. in drill hole 1-92, located near the west abutment. Rock was noted at 3501.9ft. elevation in hole 2-92, drilled in a sunken gore area between existing northbound and southbound U.S. 97 travel lanes. The

rockline was found to be at elevation 3504.9ft. in 3-92, near the east abutment. The individual BASALT lava flows appear to be 5-10ft. thick with moderately close, blocky jointing in the middle portion of the flow and upper and lower boundary/contact portions with closer joint spacing and rubble. Alteration varies from slightly and moderately weathered rubble and contact zones to fresh rock.

The following table summarizes the subsurface information:

Hole #	Location	 Ground :	Elev.	Rockline	Elev.
1 00	W. Ch. 105:45	 2 50		0.505	

1-92	MK Sta.105+45, 1.5Lt.	3,509.9	3,505.9
2-92	MK Sta.106+16, 1.5Lt.	3,507.1	3,501.9
3-92	MK Sta.107+37, 2.0Lt.	3,510.9	3,504.9

Underground utilities in the vicinity include a fiber optic telephone cable adjacent east to the existing northbound U.S. 97 travel lane and a buried electric power cable as close as 60ft. west of the west abutment.

SITE 2: Empire Blvd. U'xing Structure:

This proposed structure will carry Empire Blvd. traffic over the Parkway and a parallel, realigned Swalley Irrigation Canal.

Features in the vicinity of this proposed structure includes an irrigation canal culvert beneath a medium height (approx. 20-25ft.), existing, Empire Blvd. embankment. Empire crosses over the B.N.R.R. tracks immediately to the east. A large basalt rock outcrop exists within 50ft. north of the proposed structure and extends northward more than 500ft. A large cut will be required through this 30-40ft. high outcrop in order to maintain a low grade beneath the Empire structure. Rock also outcrops within 25ft. of the southwest corner of the proposed structure, between Empire Blvd. and the Swalley Canal.

Two test holes were drilled at this site. Test hole 8-92, was drilled near the existing centerline of Empire Blvd. at the east abutment of the proposed structure. Top of the BASALT was at elevation 3,530.3ft. (22.0ft. depth) in hole 8-92. Various fill materials were encountered in the 22ft. of embankment above rock, including basalt BOULDER, COBBLE, and GRAVEL with some gravelly, silty SAND. The other boring, 10-92, was drilled through the existing sidewalk near the northwest corner of the proposed structure. BASALT rock was encountered at elevation 3,535.1ft. (9.0ft. depth). The embankment material in this second hole consists of gravelly SAND with occasional BOULDER. The BASALT rock unit appears to contain individual lava flows of 5-10ft. thickness, without loose rubble zones. Joint spacing is generally close to moderately close and the rock is in a fresh, unweathered state.

The following table summarizes the subsurface data:

_	Hole #	Loc	ation		Ground	Elev.	Rockline	Elev.
	8-92	P	Sta.145+31,	88Lt.	3,5	52.3	3,530).3
	10-92	P	Sta.144+92,	96Rt.	3,5	44.1	3,535	5.1

Overhead power exists along the south side of Empire Blvd. No underground utilities have been identified in the immediate work area of the proposed structure. Buried electrical power and telephone utilities feed into the existing radio station to the north (over 100ft. away from the NW corner of the structure). The existing Swalley Canal culvert will need to be replaced by a canal or culvert aligned parallel, adjacent east to the Parkway beneath the structure. The upstream portion of the canal, to the south and west, will be re-routed to pass beneath the Parkway alignment south of the existing position.

SITE 3: Butler Market Rd. O'xing:

The proposed structure will allow Butler Mkt. Rd. traffic to cross beneath the Parkway.

The vicinity is a flat-lying area with two irrigation canals aligned parallel to the proposed Parkway. The canals have been excavated to 10-15ft. deep with near vertical sides in this area. A large boulder heap from the canal excavation lies to the southeast (adjacent left) along the alignment. The proposed new stretch of Butler Mkt. Rd. will cross the re-aligned canals to the northwest, then pass beneath the Parkway and continue southeast through a cut in the boulder heap.

Two foundation exploration holes were drilled in the accessible area between the two canals, along a ditchrider road. Test hole 5-92 was drilled near the north abutment corner. The BASALT rock unit was encountered at elevation 3,554.3 (2.7ft. depth). The second hole, 4-92, was drilled near the south abutment corner, where the top of rock was found at elevation 3,550.7 (5.5ft. depth). The soil in both holes consists of a pumiceous SAND with some silt. The BASALT rock is very close to close jointed and generally fresh to slightly weathered in flow contact zones.

The following table summarizes the subsurface information:

Hole # Location Ground Elev. Rockline Elev.

4-92	P Sta.190+88, 62Rt.	3,556.2	3,550.7
5-92	P Sta.189+51, 49Rt.	3,557.0	3,554.3

Overhead electric power lines exist in the vicinity of the proposed structure, trending east-west over the north abutment. Another overhead power line trends north-south within 50ft. of the south abutment. The two irrigation canals will be re-aligned to the northwest. North Main Canal will be shifted over approximately 100ft. and will occupy the existing Pilot Butte Canal channel, while Pilot Butte Canal will be re-aligned some 40ft. to the northwest.

SITE 4: Butler Market Rd. Canal O'xing:

This structure will carry Butler Market Rd. traffic over the two canals along a new section of Butler Mkt. Rd. alignment. The two canals will be realigned and shifted northwest to provide area for the Parkway, as mentioned in the preceeding paragraph.

The Butler Mkt. Rd. O'xing of the Parkway "L" alignment lies 100-200ft. southeast. The vicinity is flat-lying, without rock outcrops near the structure site, however some low-lying rock excavation heaps exist along the west side of the Pilot Butte Canal.

No exploratory test holes were drilled in the vicinity of this structure, however the two test holes drilled for the nearby Parkway structure are approximately 50-70ft. away. Several locations were hand-probed in the location of the west/northwest abutment (see fig. 3, Appendix B, for location). The results of the hand-probing indicated an average 1 to 2ft. soil depth over impenetrable material. The existing Pilot Butte Canal is lined with a wooden flume and the subsurface conditions cannot be observed in it's excavation. Rock does outcrop approximately 180ft. southwest of the proposed canal structure in the area behind (east of) the Hampton Inn. This outcrop indicates fresh, blocky-jointed basalt near the surface, similar to the rock found in test holes 4-92 and 5-92 to the east. It is anticipated that rock would be encountered at 2 to 3ft. depth at the abutments for the canal crossing structure.

Utilities include several overhead electric power lines at the structure site and buried electric power cable immediately to the north and northwest.

SITE 5: North 3RD Street O'xing:

This structure would allow N. 3RD Street traffic to flow beneath the Parkway.

The terrain around this proposed structure generally rises 10ft. from the north abutment to the south abutment. A small ± 5 -10ft. high rock outcrop exists in close proximity to the northwest corner of the proposed structure (see Photo #62, Appendix A). Basalt rock also outcrops as a low hummock 30-40ft. west of the south abutment (adjacent west of 2ND Street). 3^{RD} Street and associated embankments lie between these two outcrops.

Two test holes were drilled for the foundation investigation at this site. Hole 9-92 was drilled near the southwest corner of the proposed structure. Top of basalt rock was found to be at elevation 3569.4ft. with 7.5ft. of soil overburden. Soil consists of pumiceous SAND with some silt and strata of gravelly, cobbly, BOULDER. Drill hole 18-92 was drilled in the travel lane of Addison Ave., where rock was encountered at elevation 3,564.1ft., beneath 9.0ft. of soil. Soil was a pumiceous SAND, with some silt and occasional gravel and cobble. Rock at both locations is a vesicular, blocky-jointed, fresh BASALT.

The following table provides a summary of the subsurface information:

Hole #	Location	Ground Elev.	Rockline Elev.
9-92	L Sta.199+60, 23Rt.	3,576.9	3,569.4
18-92	L Sta.198+82, 91Lt.	3,573.1	3,564.1

Numerous utilities will be affected by the N. 3RD Street undercrossing construction including a buried water main, telephone cable, natural gas line, as well as sewer and overhead electric power. Several of the utilities will need to be moved or modified. Also the nearby irrigation canals will need to be realigned.

SITE 6: Division Street O'xing:

This proposed structure will pass Division Street traffic beneath the Parkway.

The structure location lies between two bedrock highs or hummocks and is situated in a residential/business area. Several offices, businesses, and residences will be demolished in this section. Rock outcrops in the middle of the unpaved section of Underwood Ave. approximately 30-40ft. west of Division St. at an elevation of ±3,588 (see Photo #63, Appendix A).

Two test holes were drilled for the subsurface investigation. Near the northwest corner of the structure, in hole 11-92, BASALT rock was encountered at elevation 3,576.5, beneath 9.5ft. of soil. The BASALT is generally fresh with very close to close joint spacing. Soil consists of pumiceous SAND with some gravelly FILL in the upper 2.0ft. For the south abutment, hole 6-92 was drilled near the centerline. BASALT rock was encountered at 1.2ft depth (elev. 3,595.1). The BASALT rock is generally fresh and close jointed, with slight weathering below a flow contact at 13.4ft. depth. The soil is pumiceous SAND between basalt COBBLE and BOULDER in this area.

The following table provides a summary for the subsurface information at this site:

Hole #	Location	Ground Elev.	Rockline Elev.
6-92	P Sta.223+85, 9Lt.	3,596.3	3,595.1
11-92	P Sta.220+58, 74Rt.	3,586.0	3,576.5

The work area for the construction of this structure will conflict with existing buried telephone and gas service lines as well as overhead electric power. Some work may also require the modification of the buried water and sewer lines, which lie along the west Division St. sidewalk and centerline, respectively.

SITE 7: Revere Ave. O'xing:

This structure will allow Revere Ave. traffic to pass beneath the Parkway alignment.

A large rock outcrop of ± 15 ft. height exists in the area to be occupied by the north abutment. Another ± 10 ft. outcrop lies 25-30ft. from the southwest corner of the structure. Between these two bedrock highs exists the T-shaped intersection of Revere Ave. and Deschutes Place.

Two borings were drilled and sampled for the exploration at this site. Test hole 17-92 was drilled near the northeast corner of the proposed structure. Top of rock was established at elevation 3,611.4, beneath 8.0ft. of soil. Soils consist of pumiceous SAND with some silt and occasional boulder and cobble. The BASALT rock unit is generally fresh, unweathered, and very close-jointed. A basalt rubble zone was encountered from 10.5ft. to 16.5ft. The other test hole, 7-92, was drilled near the southwest corner of the structure. Top of the BASALT rock was encountered at elevation 3616.1, under 4.5ft. of pumiceous SAND, with some silt. The rock is generally very close to close-jointed, fresh and hard. Rock below a flow contact, encountered at 13.0ft., was slightly weathered.

The following table summarizes the subsurface conditions:

 Hole #
 Location
 Ground Elev.
 Rockline Elev.

 7-92
 P
 Sta.233+80, 50Rt.
 3,620.6
 3,616.1

 17-92
 P
 Sta.232+65, 40Lt.
 3,619.4
 3,611.4

Utilities at the site include buried telephone, natural gas and water, which lie adjacent to the curbs of Revere Ave. and Deschutes Pl. Also numerous overhead electric power lines are located in and around the work site for this structure.

SITE 8: Olney Ave. O'xing:

This structure will provide Olney Ave. traffic a passage beneath the Parkway alignment.

A large, $\pm 20-25$ ft. high basalt outcrop lies northeast of the structure site. Also a large, $\pm 10-15$ ft. high outcrop exists to the southwest of the site. A swale exists to the northwest of the site.

The foundation investigation for this site involved the drilling of two test holes. 19-92 was drilled near the west sidewalk of Division St. and adjacent to the swale, along the proposed north abutment. The vesicular BASALT rock unit was encountered at elevation 3,605.7, under 9.5ft. of boulder-bearing, sandy GRAVEL (FILL) and pumiceous SAND, with variable silt content (natural soil). In test hole 16-92, drilled near the southwest structure corner, 1.7ft. of pavement and fill was found to overlie the BASALT rockline elevation of 3,612.6ft. The rock in both borings was generally fresh and very close to close-jointed. A loose rubble zone was encountered at 15 to 17ft. depth in hole 19-92 and at 9.5 to 12.0ft. in hole 16-92.

Following is a table to summarize the subsurface data:

Hole #	Location	Ground Elev.	Rockline Elev.
19-92	P Sta.243+17, 21.5Rt.	3,615.2	3,605.7
16-92	P Sta.244+30, 44Rt.	3,614.3	3,612.6

Buried utilities include sewer and water lines along Olney Ave. Also overhead electric power lines exist along Division St. and Olney Ave.

SITE 9: Greenwood Ave. O'xing:

Widening of this existing structure is required to accommodate the Parkway. The widening will be primarily to the east, toward the adjacent railroad. The area is flat-lying, except for the existing through-cut excavated for Greenwood Ave. beneath the railroad and Division St.

Numerous test holes were drilled in this vicinity during 1981 and 1982. The purpose of this previous foundation investigation was to provide subsurface information for the design of the existing structure. The foundation report for the previous project is titled "Greenwood Avenue Undercrossing at Division Street, Central Oregon Highway, Deschutes County, Bridges 16532, 16546", dated August, 1983. Several of these previous borings were drilled near the proposed widening; four will be used in this report to elucidate the subsurface conditions. Hole 81-3 was drilled near the northeast corner of the existing structure. Rock was encountered at elevation 3,611.8, under 4.0ft. of soil and roadway

materials. The uppermost 1.0ft. was asphalt (2") and base rock (10"). Soil from 1.0ft. to 4.0ft. depth was a pumiceous SAND, with some silt. The vesicular BASALT rock was found to be close to moderately close jointed and generally fresh, with an R3 (medium hard) hardness rating. Test hole 81-9 was placed near the southeast corner of the existing structure, where the rockline was encountered at elevation 3,613.8. The 2.0ft. of overburden consists of asphalt, base rock, and concrete (to 1.33ft. depth), then SAND (from 1.33ft. to 2.0ft.). The vesicular BASALT rock was generally close jointed and fresh with an R3 hardness rating. Boring 82-25 was drilled approximately 30ft. east-southeast of the northeast corner of the proposed, widened structure. The rock was encountered at elevation 3,607.7 at 5.5ft. depth. Asphalt (top 5") and gravelly SAND was found above rock. The vesicular BASALT rock was similar to that found elsewhere at this site. 82-33 was drilled at approximately 30ft. east-northeast of the proposed southeast corner of the widened structure. Rock was noted at approximately 4.0ft. depth (elev. 3609.7) beneath sidewalk concrete (top 4") and gravelly SAND. BASALT rock quality was again similar to that found elsewhere at this site.

The following table summarizes the subsurface conditions for the Greenwood Ave. O'xing structure widening site. Note that the locations listed have been converted to Parkway alignment designations by scaling and are approximate.

Hole #	Location	Ground Elev.	Rockline Elev.
81-3	L Sta.261+28, 3Rt.	3,615.8	3,611.8
81-9	L Sta.262+18, 2Rt.	3,615.8	3,613.8
82-25	L Sta.261+41, 67Lt.	3,613.2	3,607.7
82-33	L Sta.262+05, 69Lt.	3,613.7	3,609.7

Buried utilities at this site include a natural gas line within 50ft. north of the north abutment. Also overhead electric power lines exist in the immediate work area.

SITE 10: Franklin Ave. O'xing:

The widening of this structure is required to accommodate the Parkway. The area is generally flat-lying, except for the through-cut for the Franklin Ave. alignment below the existing adjacent railroad and Division St. structures.

Two test holes were drilled for this foundation investigation. Boring 12-92 was drilled 38ft. north of the proposed, widened, north abutment. In this area, the top of rock is at elevation 3,627.9 under cinders and concrete waste (top 1.3ft.), then pumiceous SAND with some silt (1.3 - 6.5ft. depth). The vesicular BASALT rock is close to moderately close jointed and fresh with an

R4 hardness rating. Test hole 13-92 was drilled 38ft. south of the proposed, widened south abutment. The rockline is at elevation 3,629.2, beneath 6.9ft. of soil. The upper 1 - 2ft. is gravelly SAND with a trace of silt; 2 - 6.9ft. contains loose, pumiceous SAND with a trace of silt. The vesicular BASALT rock is very close to moderately close jointed and generally fresh with an R4 hardness rating (hard).

The following table summarizes the subsurface conditions:

Hole #	Location	Ground Elev.	Rockline Elev.
12-92	P Sta.275+44, 27Lt.	3,634.4	3,627.9
13-92	P Sta.276+63, 22Lt.	3,636.1	3,629.2

Underground utilities include natural gas and water lines. Also overhead electric power lines exist in and around the worksite area.

SITE 11: B.N.R.R./Colorado Circle O'xing:

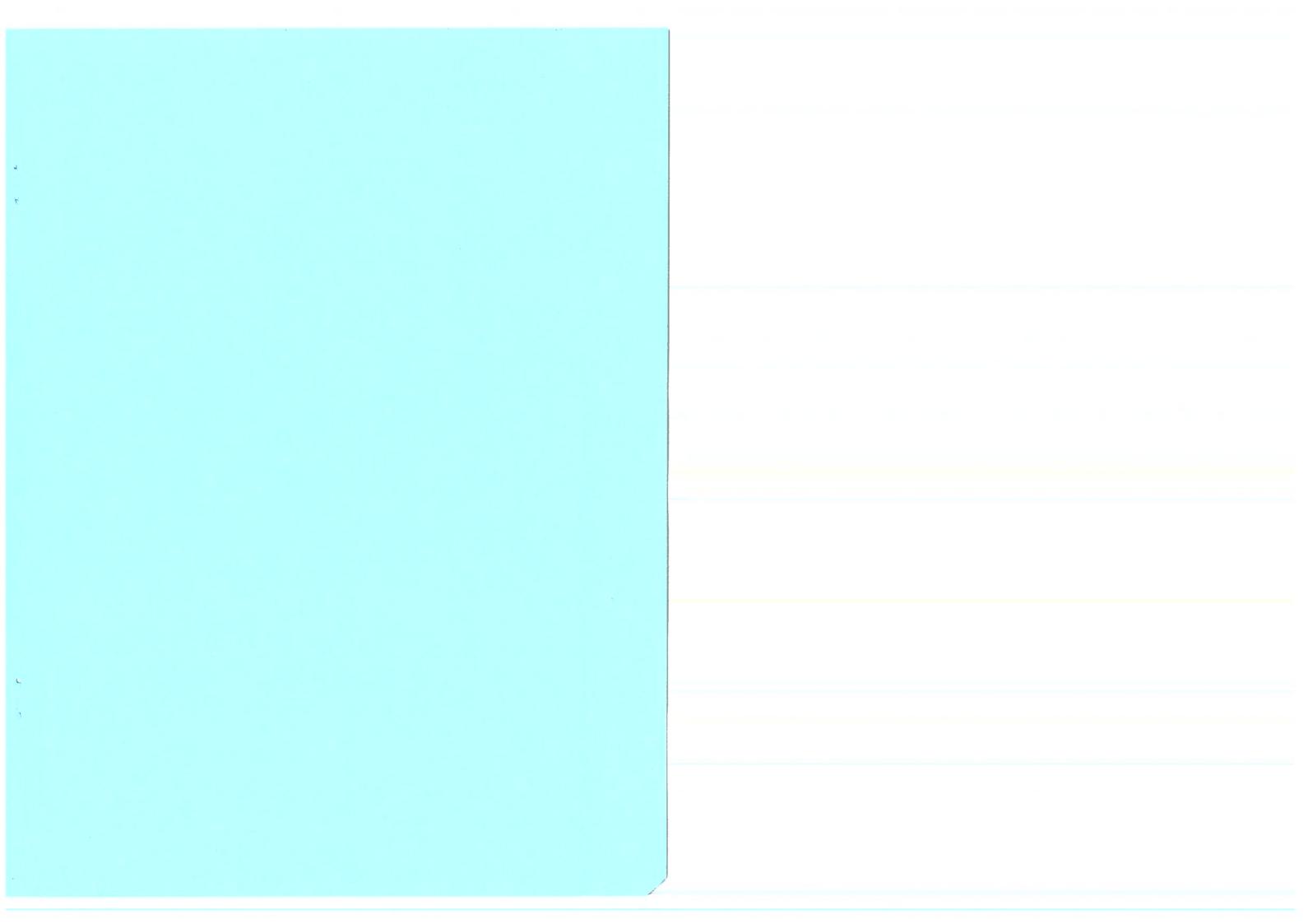
The vicinity of this proposed new structure is flat-lying with existing light industrial buildings. The proposed structure will provide BNRR rail traffic and Colorado Circle/Ave. traffic passage beneath the Parkway alignment. Colorado Circle, a new alignment, will provide access to and from Century Drive via Colorado Ave. for both north and southbound traffic on U.S.97.

Two exploratory test holes were drilled at this site. Drill hole 14-92 was located near the proposed northeast corner of this structure. Top of rock was encountered at elevation 3652.0, under 0.5ft. of pumiceous SAND, with some silt. The rock unit is a very close to moderately close jointed, generally fresh to slightly weathered (at flow contacts) and hard BASALT. Possible flow contacts were noted at 9.0ft. and 15.0ft. depths. Boring 20-92 was drilled near the southeast corner of the proposed structure. In this location, the rockline was found at elevation 3,648.6, beneath 2.8ft. of pumiceous SAND, with some silt and trace of gravel. The vesicular BASALT rock was very close to close jointed, fresh and hard (R4).

The following table summarizes the subsurface conditions at this site:

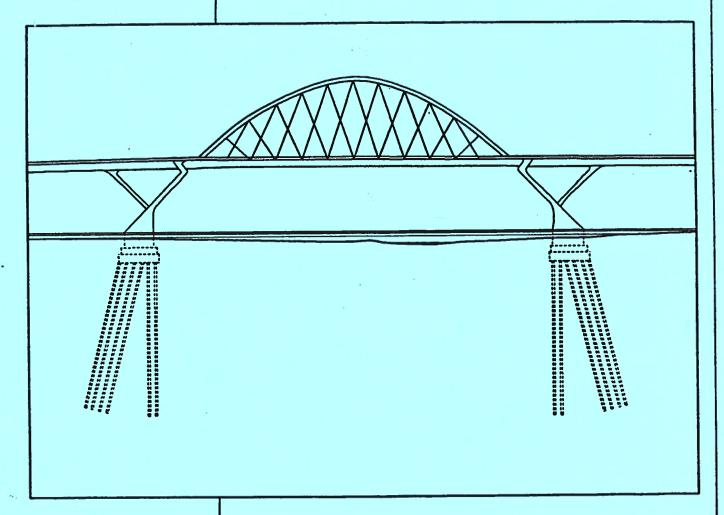
Hole #	Location	Ground Elev.	Rockline Elev.
14-92	P Sta.295+29, 57Lt.	3,652.5	3,652.0
20-92	P Sta.297+35, 43Lt.	3,651.4	3,648.6

A buried natural gas line exists in the structure work area, near the railroad tracks and south. Overhead electric power exists



Foundation Report

ADDENDUM
Bend Parkway, Phase 1
The Dalles - California Highway
Deschutes County
Bridges 17387, 17388, 17329



Oregon Department of Transportation

Highway Division Bridge Design Section Foundation Design Unit



FOUNDATION REPORT ADDENDUM

Bend Parkway, Phase 1 The Dalles - California Highway Deschutes County Bridges 17387, 17388, 17329

INTRODUCTION

The original Foundation Report did not contain foundation recommendations for the proposed Swalley Canal reinforced concrete box culverts (RCBC). The proposed 550-foot long, 7'x 4' RCBC (Bridge 17387) is necessary to carry the Swalley Canal flow under the Empire Avenue embankment and the on and off ramp embankments to and from Bend Parkway. The proposed 115-foot long, 7'x 4' RCBC (Bridge 17388) is necessary to carry the Swalley Canal flow under the Bend Parkway embankment.

An additional exploratory hole was drilled near the Division Street Overcrossing structure (Bridge 17329) to better identify the rockline elevation near the interior bent locations.

SUBSURFACE FIELD EXPLORATIONS

Three hand dug test pits and three hand probe holes were completed by the Region 4 Geology Group to identify the subsurface conditions for the proposed RCBCs. The hand probe holes were completed using a portable free-fall hammer probe with a one inch diameter conical tip. One additional exploratory hole (boring) was drilled to better identify the rockline elevation near the interior bents for the Division Street Overcrossing structure. The boring was drilled with a CME-75 drill rig and related drilling equipment. The approximate locations of the test pits, hand probe holes and the boring are shown on the Foundation Data Sheets in the Appendix.

The subsurface materials encountered during the subsurface exploration for the RCBCs may generally be described as follows: pumiceous sand with trace silt



overlying vesicular basalt. The thickness of the pumiceous sand layer ranged from about 1.5 to 3 feet and the relative density varied from very loose to medium dense.

The subsurface materials encountered in the boring may generally be described as follows: pumiceous sand with trace silt overlying vesicular basalt. The thickness of the pumiceous sand layer was approximately 9 feet. The vesicular basalt was described as medium hard and slightly weathered.

More detailed descriptions of the materials encountered during the subsurface exploration are presented on the exploration logs and in the Interoffice Memo from the Project Geologist in the Appendix.

Groundwater was not encountered during the subsurface exploration.

HYDRAULICS INFORMATION

The final Hydraulics Report for the two Swalley Canal RCBCs was not available at the time of writing this report. The preliminary Hydraulics information indicates that an RCBC should be used for Bridge 17388 and an RCBC or two pipe alternates could be used for Bridge 17387. The forthcoming Hydraulics Report should be consulted for the specific recommendations for the two culverts.

FOUNDATION RECOMMENDATIONS

Swalley Canal RCBC - Bridge 17387

Based on the recently completed subsurface explorations by the project geologist and the exploratory holes completed during the original Phase 1 investigation, the rockline elevation is expected to vary from about 3527 to 3530 feet between the south and north ends of the culvert. It is anticipated that the RCBC will be founded on either medium dense pumiceous sand or vesicular basalt. No special foundation preparation will be required, if a cast-in-place RCBC is used. If precast RCBCs are allowed as alternates on this project, then it may be necessary



to overexcavate and replace with granular structure backfill to insure a uniform bearing surface.

SWALLEY CANAL RCBC - BRIDGE 17388

Based on the recently completed subsurface explorations by the project geologist, the rockline elevation is expected to vary from about 3533 to 3529 feet between the east and west ends of the culvert. It is anticipated that the RCBC will be founded on either medium dense pumiceous sand or vesicular basalt. No special foundation preparation will be required, if a cast-in-place RCBC is used. If precast RCBCs are allowed as alternates on this project, then it may be necessary to overexcavate and replace with granular structure backfill to insure a uniform bearing surface.

<u>Division Street Overcrossing - Bridge 17329</u>

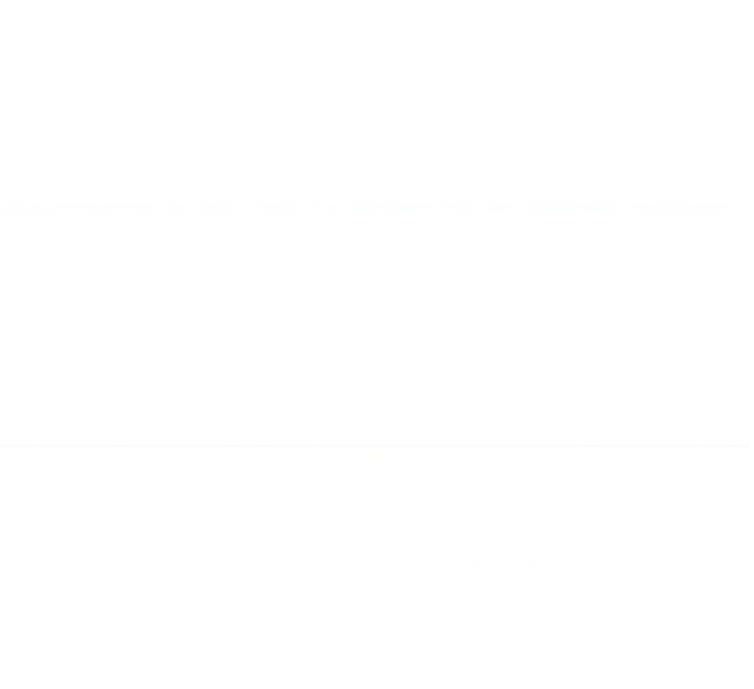
As stated in the original Foundation Report, the following elevations are based on the assumption that all spread footings will be founded on basalt. The revised approximate bottom of footing elevations (based on the additional exploratory hole) are listed in the following table.

	Approximate Bottom of Footing
<u>Bent</u>	<u>Elevation (feet)</u>
1	3576
2	3576
3	3585
4	3592

If the Bent 1 spread footing is founded on engineered fill material, the stone backfill material should extend to a minimum depth of 8 feet below the ground surface or to the top of the basalt, whichever is higher.

CONSTRUCTION

Excavation procedures other than blasting should be considered for construction of the Swalley Canal Culverts. If it is determined that blasting is the only



feasible excavation method, then strict blasting control should be specified. Uncontrolled blasting may result in excess excavation quantities or undesirable fracturing of the vesicular basalt.

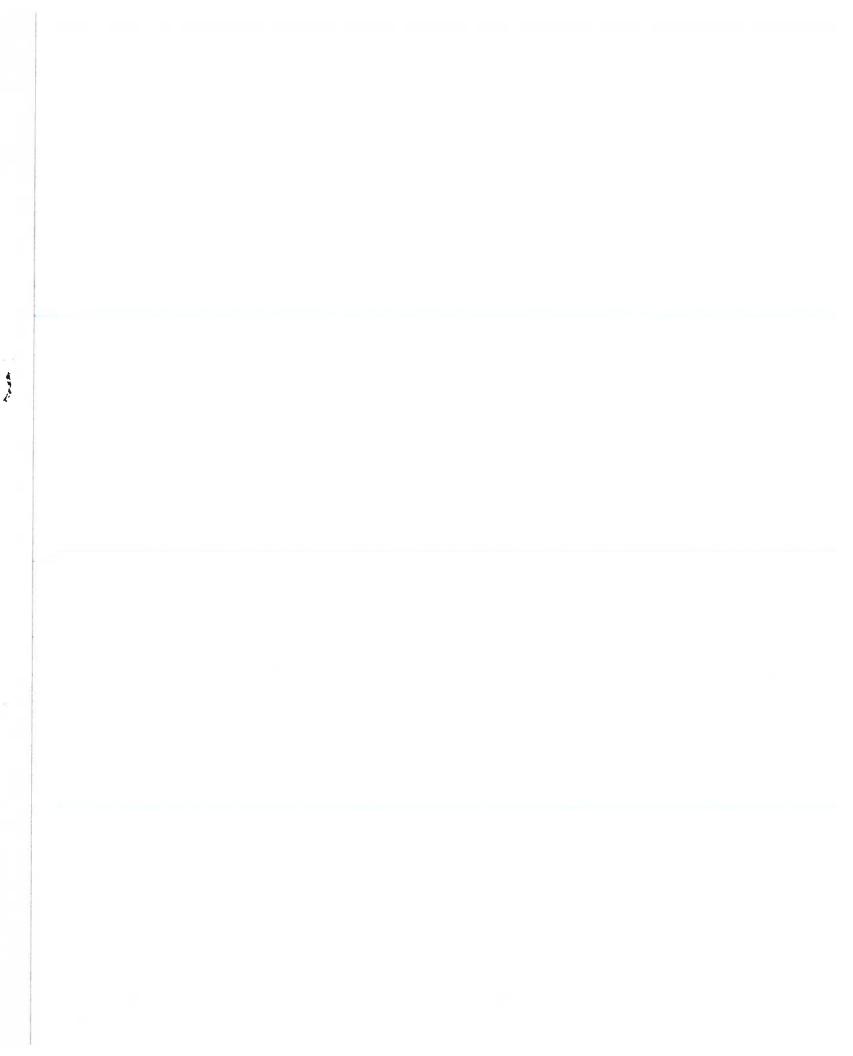
It is anticipated that groundwater will not be encountered in the culvert excavations. If groundwater is encountered, then normal dewatering techniques should effectively dewater the excavations.

All excavations for culvert construction should be performed during the months when Swalley Canal is not in continuous operation.

LIMITATIONS

The analyses and recommendations presented in this report are based on the data obtained from the subsurface explorations performed at the locations indicated on the Foundation Data Sheet(s) and from other sources of information discussed in this report. The subsurface explorations have provided detailed information at specific locations in the project area. However, variations in soil conditions may exist between the exploration holes and groundwater levels may fluctuate periodically. The data shown in the exploratory log of each boring applies only to that particular boring drilled on the date(s) indicated and is not intended to be conclusive as to the character of any material or conditions between or around the test borings (see Standard Specification 00120.25). Any interpretation or evaluation of this report by individuals outside of the Bridge Section is done so at the sole risk of the individuals.

The nature and extent of any variations in subsurface materials or conditions may not become evident until construction. If subsurface conditions different from those identified in the exploration holes are observed, or are encountered during construction, or appear to be present beneath or beyond excavations, we should be advised at once so that we may observe and review these conditions and reconsider our design recommendations if necessary.



Conclusions and recommendations made in this report are based on preliminary design and location data. In the event that any changes in the basic design take place, we should be given the opportunity to review the changes and to modify or affirm in writing our design recommendations.

The preliminary plans and special provisions should be submitted to us for review. Our review would provide the opportunity to confirm that the plans and specifications are in substantial conformance with the conclusions and recommendations contained in this report. We further recommend that construction operations relating to earthwork and foundations be observed by a Region Geologist or personnel from the Bridge Foundation Unit to determine if the work is proceeding in accordance with the intent of the geotechnical recommendations. .

Prepared by:

R. William Burns, P.E.

Foundation Design Engineer

Expires: 12-31-93

Reviewed by: John M. Gent, P.E.

Foundation Design Engineer

Approved by:

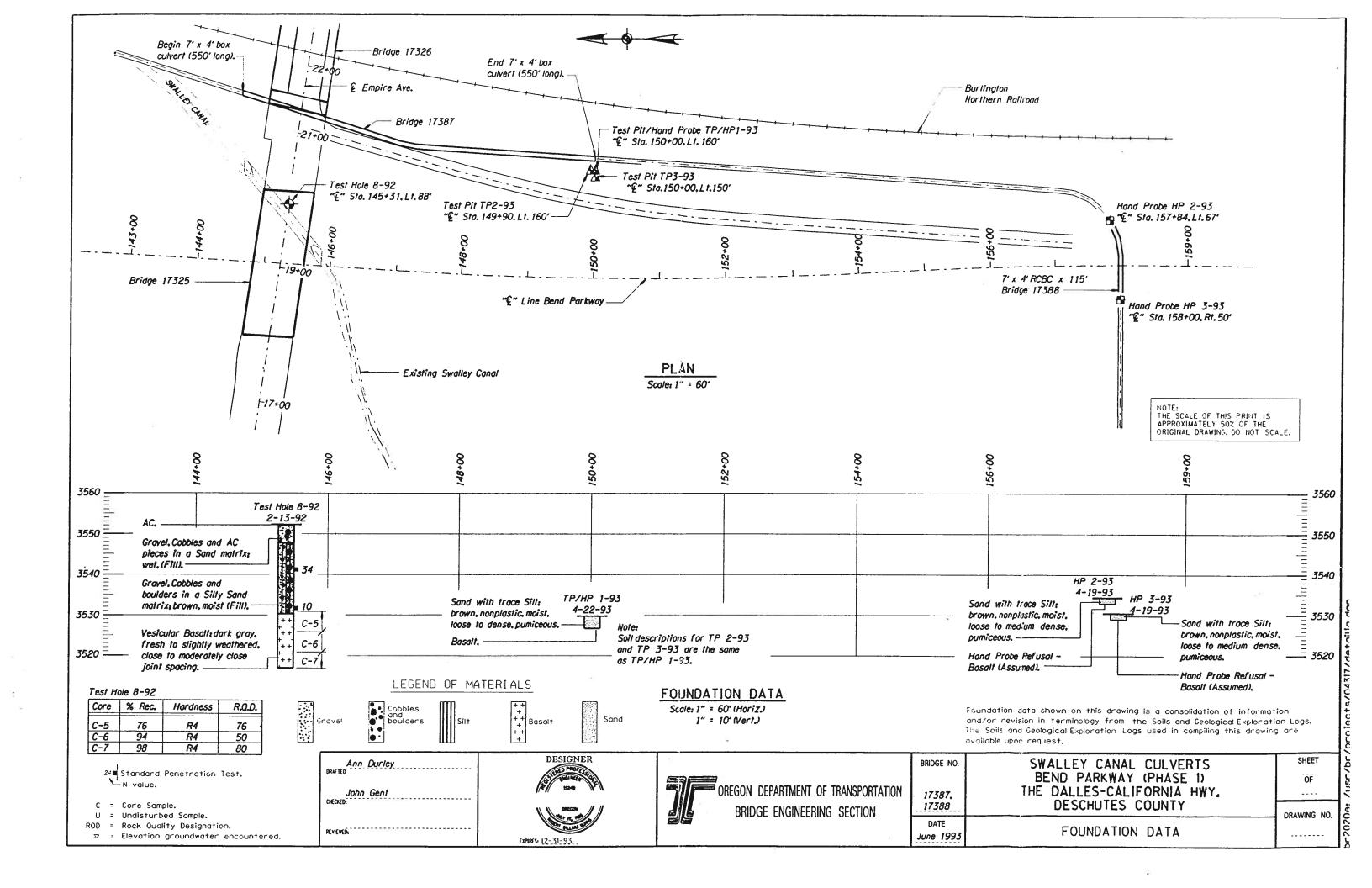
Principal Preliminary Design Engineer

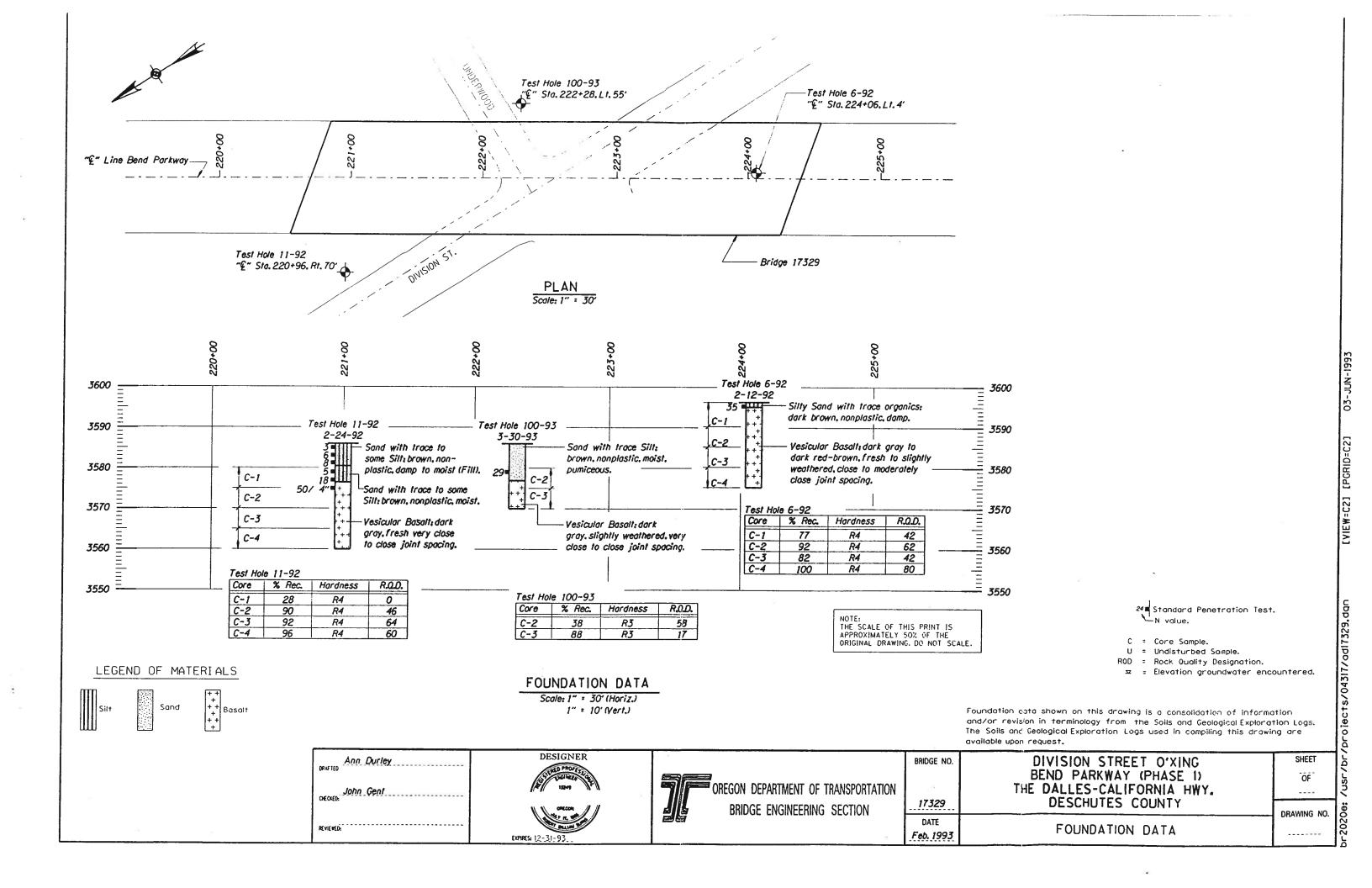
APPENDIX

Foundation Report

Oregon Department of Transportaion
Highway Division
Bridge Design Section
Foundation Design Unit







Page ____ of ___



734-3976 (REV. 12-82)

SOILS AND GEOLOGICAL EXPLORATION LOG HIGHWAY DIVISION

					• • •		• • • • •		18112 1- 77
Proie	rt Ph.	nd Parkway.	Pha	. P.	1:50	A)Ct	lleu	Canal Realianment	Hole No. HP/HH1-93
		lles-California			2	-	1	County Deschutes	Prefix C009-1803 000 926
Pumo	se of Wo	ork Thouse L'action C	£ 5.	بيعطي	-Free C	Owe	1iting	s: Swalley/EmpireCulver	
Fouip	ment T	Free-Fall Hamme	- 4	00 d	Embe	Sh	ave l	(South End)	Tube Elev.
Geolo		(ris I verson	7	artor	(i i i i i i i i i i i i i i i i i i i	٠, ١	<u> </u>	Driller N/A	Recorder Kris Iverson
Hole Location "L" Line, Sta. 150 + 00 (L							160		Ground Elev. 3, 529.8
Hole	Locatio	Tests	<u> </u>	7 (2)		7	160	Drilling Method	Groundwater Level
***	Chan	dard Penetration,			NO. NA	اد		Auger Depth N/A	Date Depth
		gon Miniature Pile,			No. 1/2	-15		Casing Depth N/A	Not encountered.
	_	o, Barrel Type			No. N./	- -		Open Depth 3.0	THE GRADIES
		isturbed Sample, Size			No. N.	- -		Total Depth 3.0	
					14/-			Sample Data Sheet No.	<u> </u>
Date	Started		e Com	4/	22/9	13		N/A	
		7 /		7	' /			Material De	scription
			٠.	ě.	A 14 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5	- a	Color	Wet-Dry
=			Muasured Recovery.	Rocovery	3/0	Graphic	% Natural Moisture	Consistency	Jointed-Broken
Depth	Test Type No	Driving	luas eco	g.	1/0	g	N S	Plasticity Organic Content	Angular-Rounded Drill Remarks etc.
۵	řřž	Resistance	2 6	8	V	9			
		Estimated: Very			l				, with trace of silt
~ <i>-</i>		10052						SW, nonplastic, r	noist, brown, loose.
O.5-		Estimated:				o :			ult diaging from
$\begin{bmatrix} i & \lambda \end{bmatrix}$		Mediumdenseto						0.5' to 1.5' depth (
4.0-		Dense						Encountened occa:	sional besalt gravel
1.5-						. 0			nd digging with shovel
7,5		Estimated:			<u> </u>	٠		Encountered	<i>JJ</i> /
3 (Lassa to medium							
-2.0-		tense.				1.			
						0			
-2.5-									
3.0-						K			of BASALT rock.
- 3.5-						L.		unita 3.0H. de	Oth (elev. 3,526-3).
3.5-][+		(Some copple size	pieces of rock were
]+,		noted to be loose at	the top of the unit.
],+			(1)
						Γ_{\perp}		Note: The immedia	ate area was also
						 +'		investigated with	hand-dury test holes:
-						Γ.			, 160 Lt. and one
-],+		at 150+00, 150 Lt.	All test holes
					<u> </u>	ገ .	<u> </u>	encountered top of	rockat 3.0ft. depth.
						+		<u>'</u>	
]			200 A
					<u> </u>	1	<u></u>		
[1		-	<u> </u>
_						1			
					<u> </u>		<u></u>		
						1			
						1	<u></u>		
Ĺ					<u> </u>	1			
						1			
						1			
						1	<u></u>		
					L	1			
					ļ	1	***		
Γ -				_			i		

Page ___ of ___



SOILS AND GEOLOGICAL EXPLORATION LOG HIGHWAY DIVISION

Project Rend Parkway, Phase 1: Sunlley Canal Realignment Hole No. HPZ-93											
Highway Dalles - California (No.4) County Deschutes Prefix (009 1803 000 926											
Purpose of Work Investigation of Subsurface Conditions: Swalley Parkway Box Bridge No.											
Equipment Free-Fall Hammer Hand Probe Culvert (East End) Tube Elev.											
		ris Iverson		1		-	751	Driller NA	Recorder Kris Iverson		
Hole	Locatio		ta. 157-	- 84	`(0	21	C.L. Rt.	Ground Elev. 3,534.4		
								Drilling Method	Groundwater Level Date Depth		
1	-	dard Penetration,			No. N/A	- -		Auger Depth NA			
	_	on Miniature Pile,			No. N/A	- -	Casing Depth NA Not encounter				
		, Barrel Type isturbed Sample, Size			NO. NIA	-		Total Depth 1,5			
											
Date Started 04/19/93 Date Completed 4/19/								Sample Data Sheet No.			
		,		γ.	2/	8		Material Description			
=		×	ج <u>و</u>	% Recovery	1/4 10 10 10 10 10 10 10 10 10 10 10 10 10	Graphic Log	% flutural Moisture	Color Consistency	Wet-Dry Jointed-Broken		
	_ 。	Driving	asur ove	Pec	10	ď	Tags.	Plasticity	Angular-Rounded		
Depth.	Test No No	Resistance	Moasured Recovery.	*	/*	S	. ₹	Organic Content	Drill Remarks etc.		
_					<u> </u>	1.0000		Pumiceous SAND. W	ith trace of silt. SW.		
t						100		nenglistic moist			
0.5						1		medium dense.			
├. <u>-</u>											
H.0-											
, ,								3,532,9 ejev.			
H.5-								Encountered impene	rable material		
5.5] +		10, 1.5 ft. donth (H	and Probe bounced		
2.0]+ _		Toudly - re-usali)	assumed to be the		
						+ '			nit common to the		
						+			additional probing		
						+		in the immediate area	with similar		
L _						1		results.			
L -					ļ	1	Note:		ot visible in the		
					ļ	ļ			ril/rock overburden		
ļ _							<u> </u>	heap exists directly	court of the probing		
┡ -					 	13		location (approx: 50)	, 7 3 () .		
			_			1			# 60 E		
					 	1	 				
						1	 				
						1	 				
-						1					
					 	1	$\overline{}$				
├ -				T							
]					
Γ -											
		7.0									
									20		
[]					ļ						
<u> </u>					ļ						
					L						
734-39	34-3976 (REV. 12-82)										

Page ____ of ___



SOILS AND GEOLOGICAL EXPLORATION LOG HIGHWAY DIVISION

Proje		end Parkway				<u>all</u>	ey C	anal Realignment	Hole No. HP3 - 73	
	Highway Dalles - California (No. 4) County Deschutes Prefix (009/803 000 926									
Purpo	ose of Wo	ork Investigation				ىلىم	مفلا	Si Swalley Parkway Box	Bridge No.	
Equip	Equipment Free-Fall Hammer Hand Probe (Culvert (west End) Tube Elev.									
Geologist Kriz Iverson								Driller N/A	Recorder Kris Luerson	
Hole	Locatio		ta. 158	+00		Lt.		C.L. (At) 50'	Ground Elev. 3530.5	
Tests								Drilling Method	Groundwater Level	
"N'	" — Stan	dard Penetration,			No. NA	Ll_		Auger Depth N/A	Date Depth	
		on Miniature Pile,			No. N/	11-		Casing Depth N/A	Not encountered	
1		, Валтеі Туре			No. N/	7		Open Depth 145		
		isturbed Sample, Size			No. <u>N/</u>	1		Total Depth 1.5'		
Date Started 04/19/93 Date Completed 04					04/19	1/9	73	Sample Data Sheet No.		
		7/4			7			Material Description		
22			0 -	% Recovery	A COOPS	P _O	- a	Color	Wet-Dry	
<u> </u>]		Muasured Recovery.	ů,	2/0	Graphic	% Natural Moisture	9-11-11	Jointed-Broken	
Dopth.	Tost Type No	Driving	fuas	Œ	1/2	ě	2 3		Angular-Rounded Orill Remarks etc.	
۵	Z	Resistance	3 &	1.	<u> </u>	٦				
							<u> </u>	Pumiceous SAND, in		
₽.5				<u> </u>				,	occura, leore lu	
					ļ		<u> </u>	medium dense.		
1.0-				<u> </u>	ļ					
Ľ _				└	ļ					
i.5-					ļ		4	Elevation 3,529.0.		
				 		77				
2.0-					ļ	+	ļ	Encountered impen		
					ļ	++		at 1.5 the depth	assumed to be the	
2.5					-	+		BASALT lava rock	unit commente	
				—	-	4		the area. (Chacker		
3,0-					ļ	+		probling in immediat	e area with similar	
J, U_	ļ							results.		
L -										
L -								.,,		
L -				-		ļ				
								-		
				-	-		<u> </u>			
L -				-						
	 				 		-			
	<u> </u>				 	1				
L -							 			
										
-	-			 	 		 			
	 			 	-	1	 			
				-	 		 			
	-			-	-		\vdash			
				-	 					
				1	1					
				 			 			
				-	 		-			
			- 	 	1					
	-			 	-					
	-			-			 			
	-	 		 						
	 				 					
-				 	 		 			
734.20	76 (REV	/ 12:821	1			_	<u> </u>			
13443	**** (T E V									

Page 1 or 1



SOILS AND GEOLOGICAL EXPLORATION LOG HIGHWAY DIVISION

Proje	et /	Ba	nd Parkway	Pho	50	1 : 1	7.0	15/0	St. Q'xina Hole No. 10	20-93
Project Bond Parkway, Phase 1: Division St. Q'xing Hole No. 100-93 Highway Dalles - California County Deschutes Profix Cooq 1803 000 926										
Purpose of Work Foundation Investigation due to Structure Design Change Bridge No.										Sec.
Equip			ME 75 Truck	Mount a	CYL	in/Avo	tom	atic	SPT Hammer U Tube Elev.	
Geold	Geologist Kris Ingrson								Driller Chuck Fish Recorder Ki	ris Iverson
Hole	Loca	atio	n "L" Line, S	ta. 222	+ 2	8 ((t.)	55	C.L. Rt. Ground Elev.	
	Tests									dwater Level
"N" - Standard Penetration, No. /							_ _		Auger Depth NA Date	Depth
1		-	on Miniature Pile,			No. N/A	۔ا۔			countered
			, Sarrel Type	Q		No. 3	_		Open Depth 16.0	
ט"	"U" — Undisturbed Sample, Size No. NA								Total Depth 16-0	
Date Started O3/30/93 Date Completed O3/30/9						03/30	19	3	Sample Data Sheet No.	
			7.77			1 /			Material Description	
Depth. ft	Test	No	Oriving Resistance	Measured Recovery.	% Rucovery	A TANGOLOUSE	Graphic Log	% Natural Moisture	Color Wet-Dry Consistency Jointed-Broken Plasticity Angular-Rounde Organic Content Drill Remarks et	
0	7	CI		0.0	O	N/A	3111		Surface: Grass sod.	
-	H^{-}	1		10.0	 	1			C1(0.0'-6.0') No Recover	ry.
┝ -	\vdash								washed soil away. Used Con	re barrel
Γ -		\vdash							to advance hole:	
Γ -							15 1 15			
Γ -	П									
Γ -	П									
					<u> </u>					
							9	L	Noted drilling action: occas	
							•		gravel and/or cobble from	$\sqrt{4.0'}$ to
					ļ			L	Goo'depth.	
[/ ₋ ~)				ļ	0			0 110
6.0		M	7	1.5	79	ļ			SAND pumiceous, with trac	
L .	Ш	<u> </u>	16 N = 29	70.	ļ	1	6]		medium
L -	Ш	<u> </u>	13 14 - 21		ļ	 			dense. Noted vesicular bas	elt in bit
┡ -	1		39/0.4'		100	100		<u> </u>	of sampler (0.2').	1
J	Н-	C2		1.9	38	R3/				igh: 1@60°
L -	Н.				 	58			close jointed (1@ 35°- open, rev	
	Ц.,	\vdash				7 30	++	 	open irregular), dark gray, m.	
├ -		-	· ·			 	1	 -	Note: RQD figure is for depths. Top of rock elev. 3.576.9.	1.1 10 11.0711
	-	\vdash	 			 	+		101 OT FOUR EVEN. 3,3 (Ge).	
HI.O	$+ \times$	<u> </u>		1/1	28	R3 /	1.1.		BASALT resignar, slightly w	ectherod
-	+-)C3		7.7	100	 ```/	++		Pru close to close jointed (10	60° - couch
-	H	+-			 	17	3		1@ 30°- rough: 1@ 35°- rough (all	ogen!
-	++-	+-		_	-	 	D)		numerous others appear as world	peradacies
-	+	\vdash	<u> </u>	_	1	 			or indicate a rubble zone : core	oieces do
-	+-	+-			1		++		not "fit together"), dark gray ~	reilium hard
-	H^-	T					T	$\overline{}$, , , , , , , , , , , , , , , , , , , ,	
-	H	+-					100			
-	-									
10 -	1	,					X			
H6.0	<u> </u>								Halted advancement @ 16.0	t. depth.
_										·
Γ -										
									-	
							Ĺ			
734-39	976 (REV	(. 12-82)							



STATE OF OREGON

INTEROFFICE MEMO

Bill Burns Foundation Designer May 5, 1993

DATE:

Kris Iverson / W LVETACY
FROM: Project Geologist

Bend Parkway, Phase 1

SUBJECT: The Dalles-California Highway

Swalley Canal Realignment

The following exploration logs and plan views provide the necessary subsurface information for design of the subject box culverts as per our conversation on February 22, 1993.

Due to the long snow season, mapping of the rock outcrop areas was delayed until mid-April. The hand probing and digging of test pits was also performed in April.

The three test pits were hand dug in the vicinity of the proposed south end of the Swalley Canal/Empire Blvd. box culvert. No rock outcrops are visible nearby, therefore a more direct exploration method was chosen for this area (Sta. 150+00, 160Lt.). All three pits encountered the (loose) top of rock at 3ft. depth (elev. 3526.8).

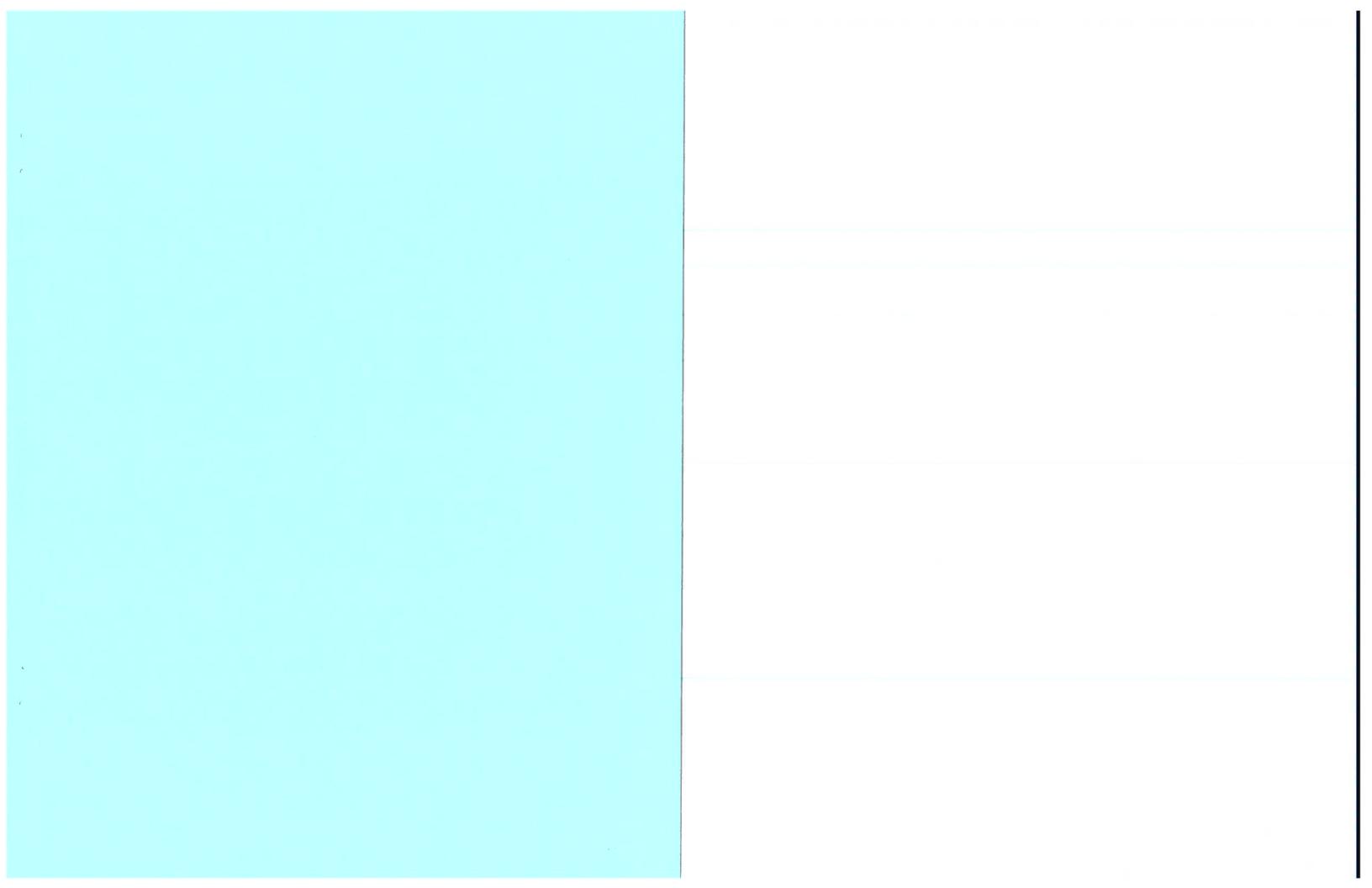
The Swalley Canal/Parkway box culvert is situated in an area near rock outcrops. The top of rock is an average 1.5ft. deep by estimation from hand probing in the vicinity of both ends of the culvert.

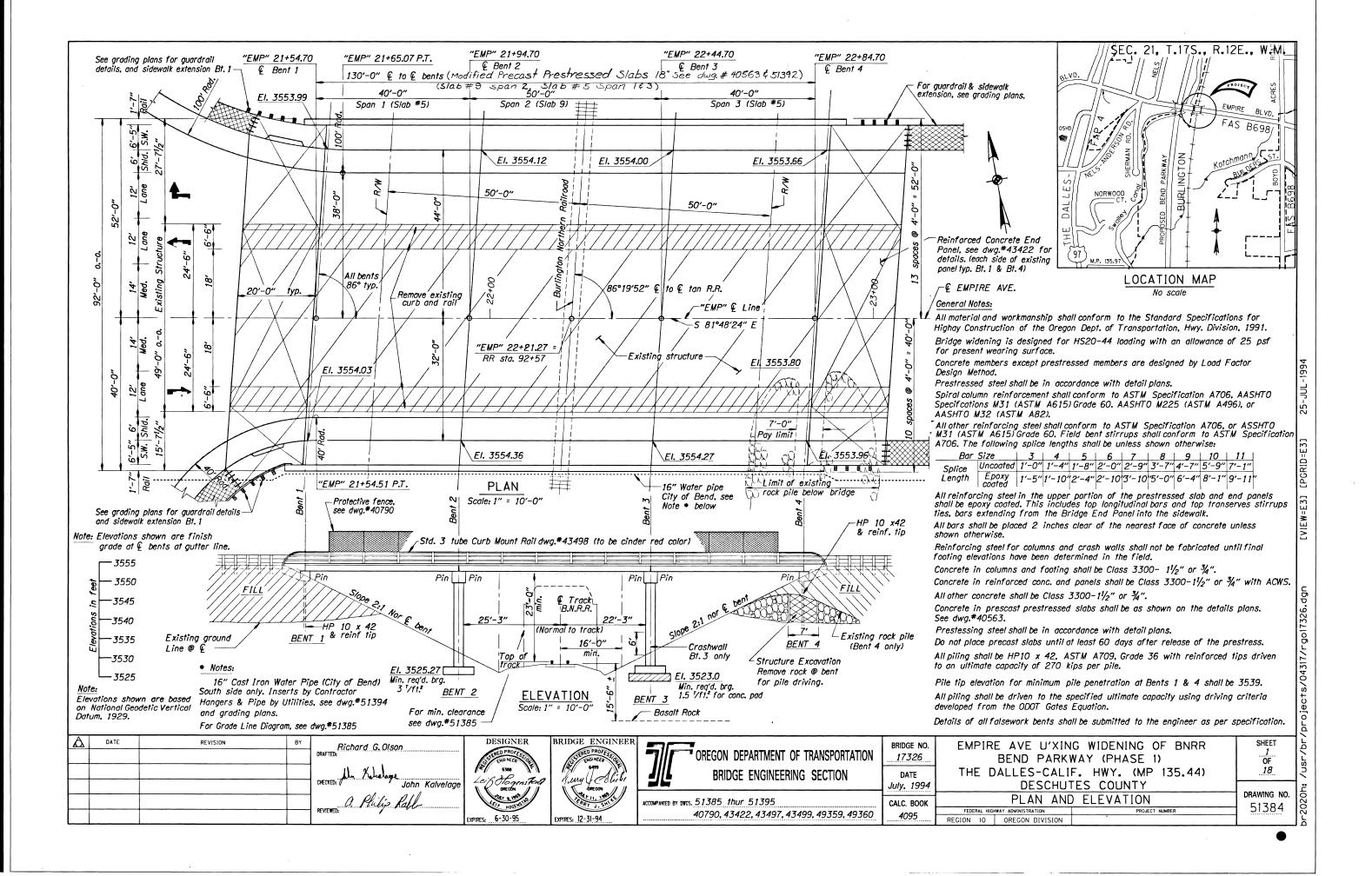
Also enclosed is the exploration log for the added test hole in the vicinity of the Parkway's Division St. O'xing. Top of rock was encountered at 9.1ft. in this drilled test hole, located in the vicinity of the southeast corner of the Division/Underwood intersection.

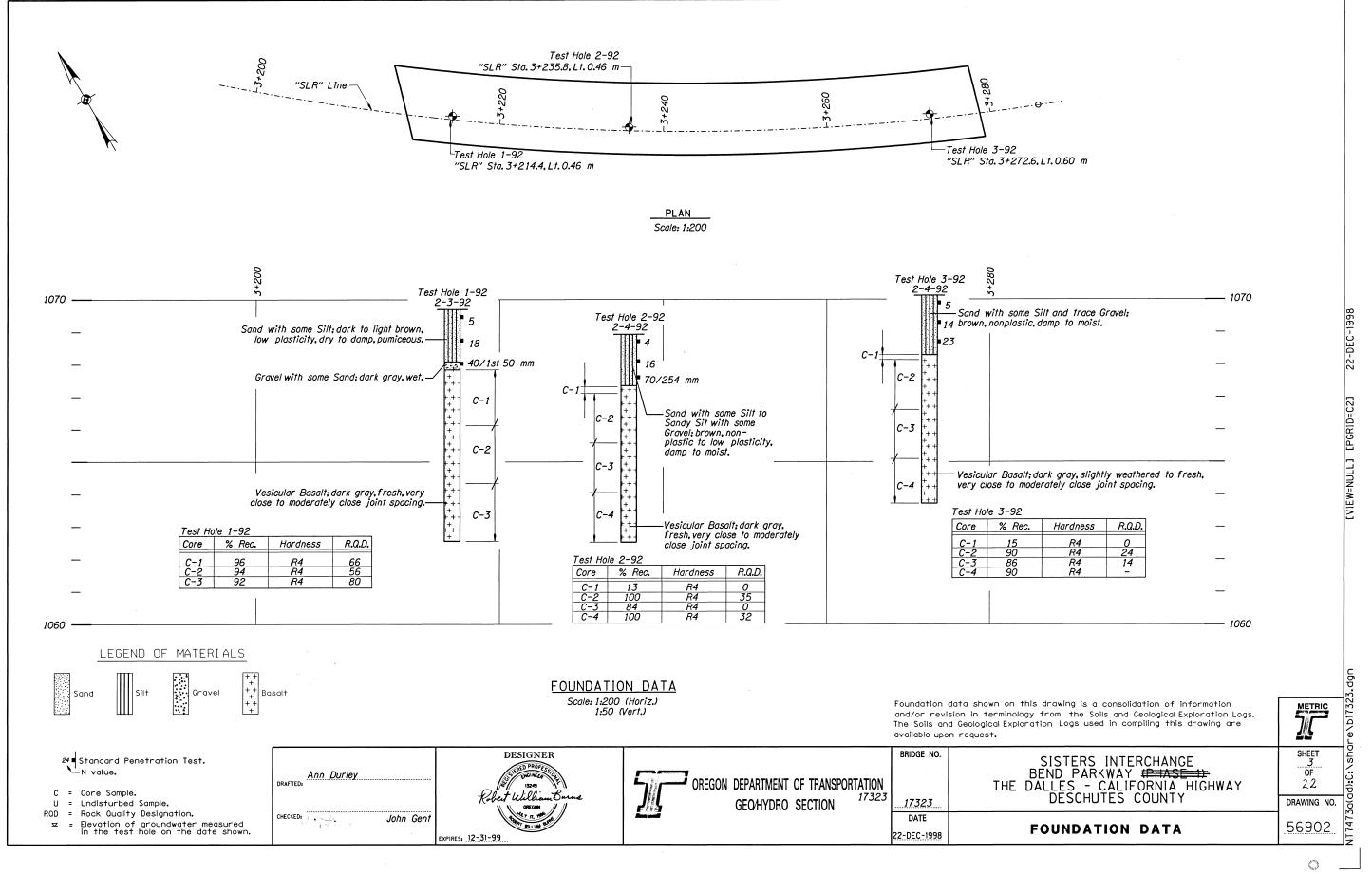
If I can be of further assistance, please call 388-6186.

D:\WP51\DATA\SWALLEYC.NAL

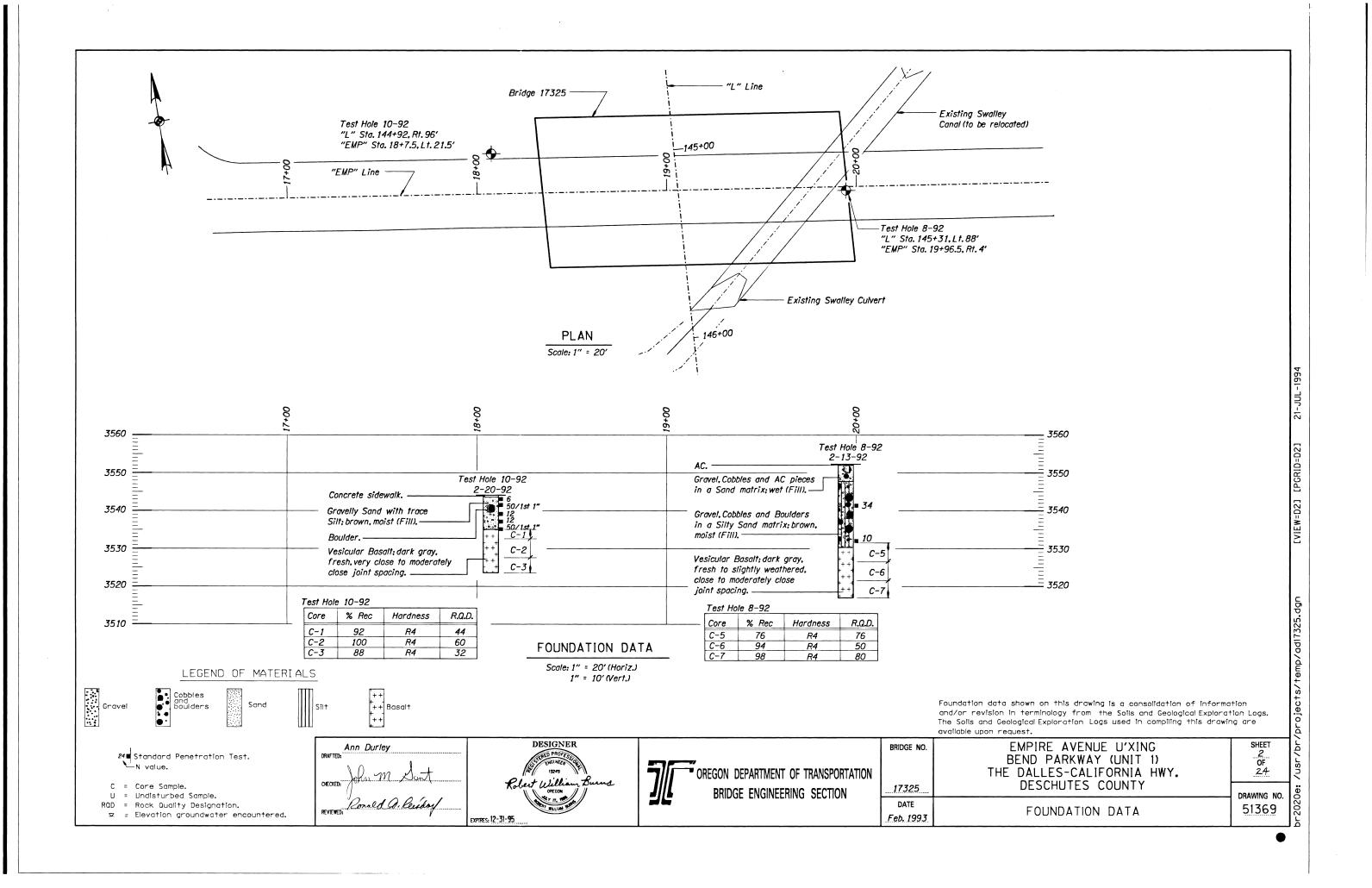
61-125-1387







Printed by hwye01f from NE7160AB on Tuesday December 22 1998 11:59:04 AM PST (b17323.m)





56842

FOOTING PEDESTAL REINFORCING STEEL ANCHOR PLATE STATION 'W'' "D" "L" BARS "a" BARS "b" BARS "c" BARS "d" BARS "e' "A" "B" "C" "N" "O" 4+828NB 5.0 2.5 1.35 16 19 16 19 19 915 800 455 12 *30*° 5+438SB 5.0 2.5 1.35 16 19 16 19 19 915 800 455 12 *30*°

POST ERECTION PROCEDURE

- Pour minimal grout pad on top of pedestal over area beneath post base plate.
- Place pole on grout pad while grout is fresh. Tighten nuts on anchor rods sufficiently to extrude grout along all edges. For cantilever sign supports, the designed offset at the top of the post shall be maintained during this tightening. Delay further tightening until grout strength has reached concrete
- 3. After pedestal and grout strength equals the 28 day design strength of the concrete, tighten all anchor rod nuts snug tight. Next, tension each rod to 156 kN (1000± N•m torque). Finally, in the same order as the initial tensioning, tension all anchor rod to 319 kN each. Final tension shall be determined by using mechanically galvanized direct tension indicators, conforming to ASTM Specification F959, as maunfactured by Cooper & Turner Inc. (or an approved equal). A hardened steel washer shall be used on each side of the direct tension indicator.
- 4. Complete remaining work.

GENERAL NOTES:

All material and workmanship shall conform to the Standard Specifications for Highway Construction of the Oregon Department of Transportation. All reinforcing steel shall conform to ASTM A706, or AASHTO M31 (ASTM A615) Grade 60.

The following splice length shall be used unless shown otherwise:

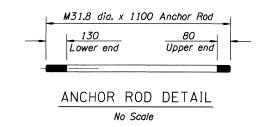
Bar Size	13	16	19	22	25	
Splice Length (mm)	400	500	600	850	1075	

All bars are full length (no splices) and shall be placed 50 clear of the nearest face of concrete unless shown otherwise.

Anchor rods shall conform to ASTM Specification A449, Type 1 Anchor rod nuts shall conform to ASTM Specification A563, Grade DH . Flat washers for anchor rods shall be hardened steel conforming to ASTM Specification F436.

All concrete shall be Minor Structure Concrete (f'c = 20 MPa). Grout shall be nonshrink or expanding nonferrous grout with a minmum design strength

Anchor rods, nuts and washers shall be hot dip galvanized. Direct tension indicators shall be mechanically galvanized.



NOTE: All dimensions are in millimeters (mm) except as noted.

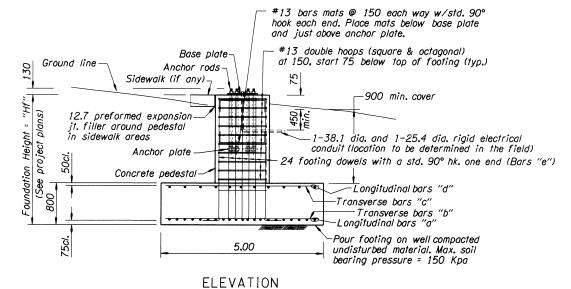
BEND PARKWAY 3A EXIT SIGN

FOOTING AT STATION (4+828NB and 5+438SB)

DRAWING NO.

OF

. 150 . 75 o.	7W" (footing size "W" x "L") Equal longit. bar spacing 75 cl. Transv. bar length = Width less 150 75 cl.
150 Equal transv. bar spacing Longit. bar length = footing length less 150	Transverse bars "c" Longitudinal bars "d" 25.4 thick circular anchor plate (A36) with "N" 34.9 dia. holes for M31.8 dia. anchor rods. This © to be parallel to sign face. 24 footing dowels (Bars "e" with a std. 90° hook one end Longitudinal bars "a" Transverse bars "b"





DATE

REVISION R. Guerrero DRAFTED: CHECKED Intal Lee XPIRES: Dec 31



Base plate

DETAIL AT TOP OF ANCHOR ROD

No Scale



M31.8 dia. anchor rod with

Direct tension indicator

between 2 hardened

3 nuts and 3 washers

steel washers

GENERAL NOTES:

All material and workmanship shall conform to the 1996 Standard Specifications for Highway Construction and the 1998 Supplemental Standard Specifications of the Oregon Department

See std. drawings BR950, BR953 for details not shown.

Concrete shall be Class 20 Minor Structure Concrete.

Grout for rock anchors shall be Type I, II, or III portland cement, non-shrink and conforming to AASHTO 85 (ASTM C 127).

Reinforcing steel shall be ASTM A615 Gr. 420 or A706 Gr. 420.

Concrete shall be placed directly against throughly cleaned surfaces of rock excavation The portion above competent rock shall be cast against undisturbed soil or formed. After form removal, backfill with compacted granular structural backfill.

This design with the following assumptions shall be verified by the Foundation Engineer. Competent rock is assumed to have a rock quality designation (RQD) of 82%, and a uniquial compressive strength of at least 48 MPa. Assumed weight of the rock is 25 kN/m³ (min.). Assumed weight of soil above the rock is 17.3 kN/m³.

Design based on the following (factored) base reactions:

Base Overturning Moment = 443 kNm Base Shear = 18 kN = 38 kN

Rock Anchor Installation:

1. Use equipments such as pavement breaker, rippers as described in subsection 00510.41 of Standard Specifications to exavate rock to a minimum of 1220 mm from the finish grade. Blasting rock is probinited.

2. Using methods of drilling to prevent damage to rock structure, such as core drilling, rotary driller, or anger drilling.

- 3. Thoroughly air-clean holes.
- 4. Perform the water testing by filling the hole with water and subjecting it to a pressure of 35 kPa at top of the hole.
 - If the seepage rate is less than 0.0005 liter per mm dia. per meter of hole length per minute (equivalent to 32 mm drop for one hole), accept the hole and go the next step.
 - If the seepage exceeds this rate, using a low water/cement ratio cement grout and let it set for 24 hours. Redrill the hole and retest.
- 5. Prepare and perform rock anchor bolt installation according to manufacturers recommendations.
- 6. Allow grout to attain required design strength (34.5 MPa) before field test.
- 7. Field test: Perform the following tests with P = 200 kN. AL is the alignment load, the load to take the slack out of system.

 Proof Test: (On 2 bolts at opposite corners. AL, 0.25 P, 0.50 P, 0.75 P, 1.00 P, 1.25 P

Hold for Creep test.

REVISION

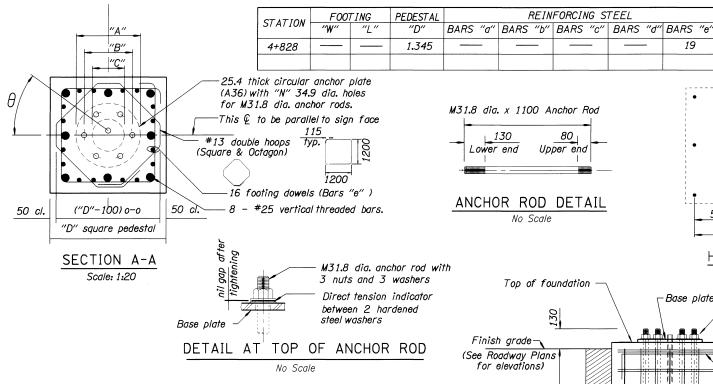
- Creep Test: When the performance and Proof tests at 1.25 P, measure the movement at 0. 0.5. 2. and 5 minutes.

The rock anchor is accepted if creep movement is less than 1 mm in 5 minutes.

8. Tie rock anchor bolts at a force equal to AL.

DATE

9.If either test fails, anchor operations shall not continue for the remaining anchors until contractor has modified the design or construction procedures, or both. Notify engineers immediately if any anchor does not meet the acceptance criteria to seek for an appropriate solutions.



POST ERECTION PROCEDURE

- 1. Pour minimal grout pad on top of pedestal over area beneath post base plate.
- Place pole on grout pad while grout is fresh. Tighten nuts on anchor rods sufficiently to extrude grout along all edges. For cantilever sign supports, the designed offset at the top of the post shall be maintained during this tightening. Delay further tightening until grout strength has reached concrete desian strenath.
- 3. After pedestal and grout strength equals the 28 day design strength of the concrete, tighten all anchor rod nuts snug tight. Next, tension each rod to 156 kN (1000± N m torque). Finally, in the same order as the initial tensioning, tension all anchor rods to 319 kN each. Final tension shall be determined by using mechanically galvanized direct tension indicators, conforming to ASTM Specification F959, as manufactured by Cooper & Turner Inc. (or an approved equal). A hardened steel washer shall be used on each side of the direct tension indicator.
- 4. Complete remaining work.

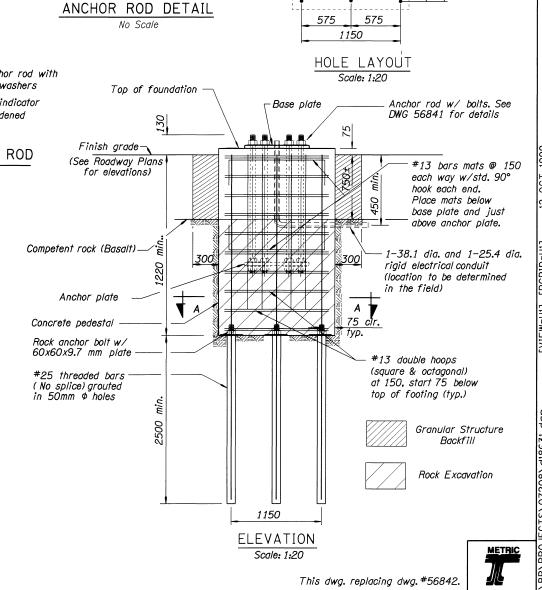
ANCHOR ROD NOTES:

All bars are full length (no splices) and shall be placed 75 clear of the nearest face of concrete unless shown otherwise. Anchor rods shall conform to ASTM Specification A449 (AASHTO M314), Grade 105, Type 1

Anchor rod nuts shall conform to ASTM Specification A563, Grade DH . Flat washers for anchor rods shall be hardened steel conforming to ASTM Specification F436 .

Anchor rods, nuts and washers shall be hot dip galvanized. Direct tension indicators shall be mechanically galvanized.

NOTE: All dimensions are in millimeters (mm) except as noted.



BEND PARKWAY 3A EXIT SIGN

FOOTING AT STATION 4+828 NB

REINFORCING STEEL

80 _I

Upper end

130

Lower end

BRIDGE NO.

18631

DATE

4722

ANCHOR PLATE

"C"

455

"N"

12

″0″

30

SHEET

OF

DRAWING NO

58062

"A"

915

19

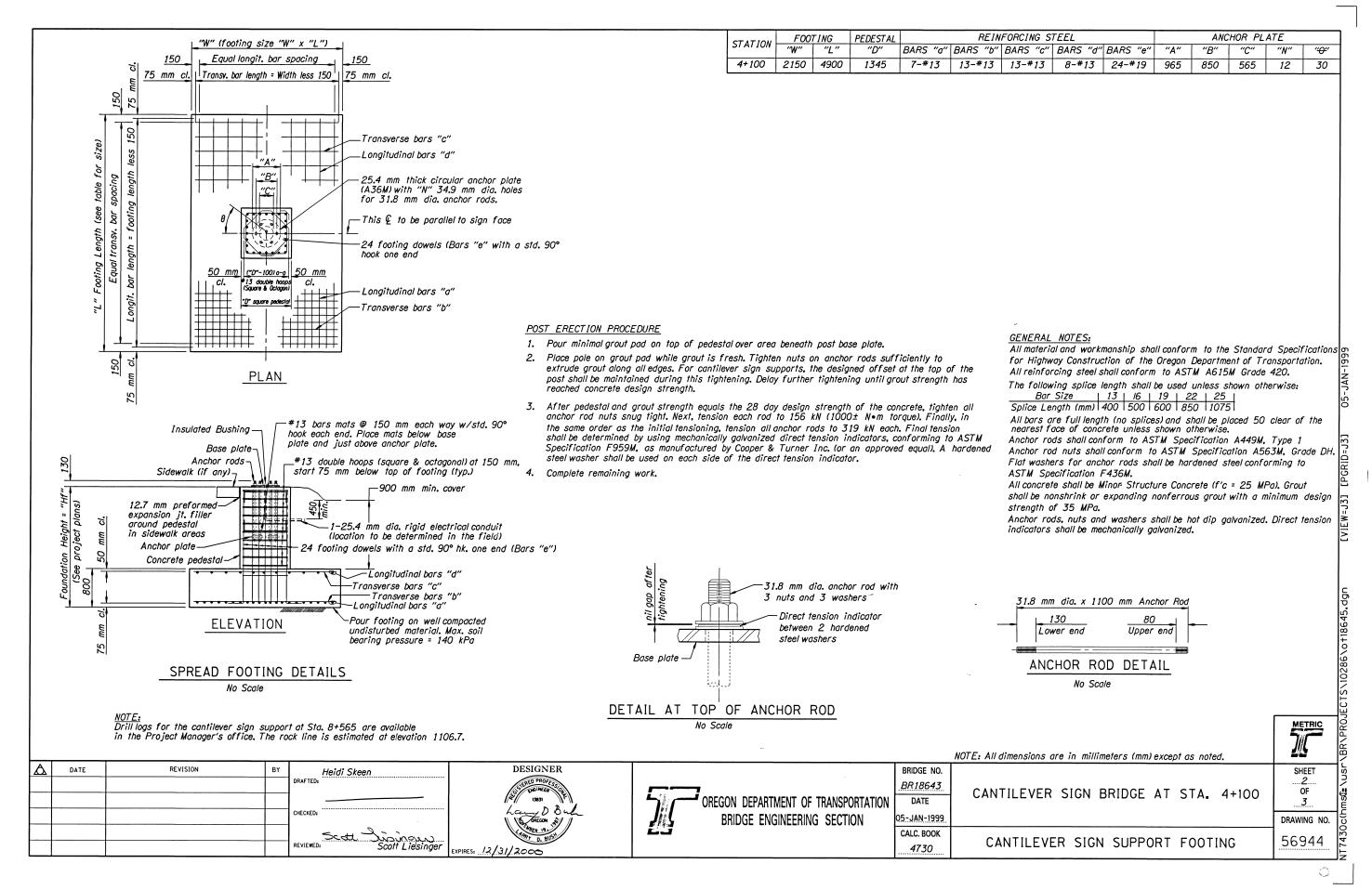
"R"

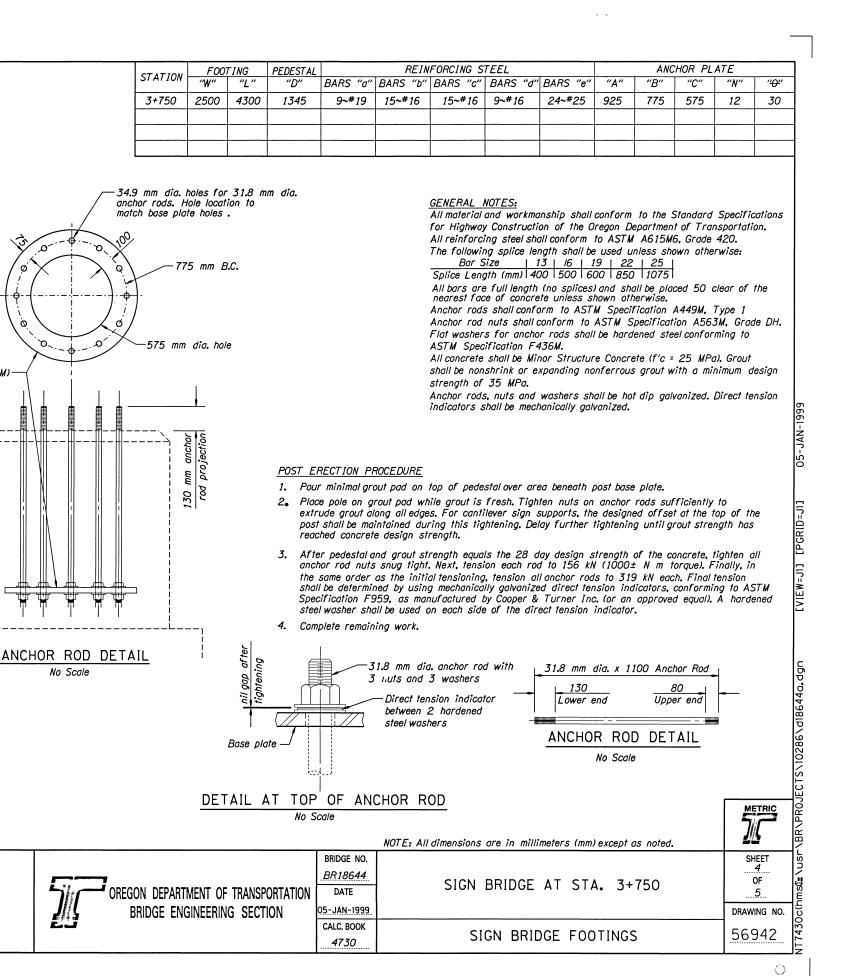
800

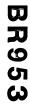
Δ Richard G.Olson ORAFTED. Scott Nettleton Thiet Nguyen











"W" (footing size "W" x "L")

Equal longit. bar spacing

Transv. bar length = Width less 150

"B"

("D"-100) o-o

PLAN

Insulated Bushing

Sidewalk (if any)

12.7 mm preformed expansion jt. filler

around pedestal

in sidewalk areas

Anchor plate-

Concrete pedestal-

REVISION

Base plate

ELEVATION

SPREAD FOOTING DETAILS

Drill logs for the sign bridges at Sta. 3+750 and 4+100 are available in the

Project Manager's office. At Sta. 3+750 Left, the rock line is estimated at elevation 1071.0. At Sta. 3+750 Right, sand was encountered to the bottom of the hole, at elevation 1067.2. At Sta. 4+100 Left, the rock line is estimated at elevation 1073.6. At Sta. 4+100 Right, the rock line is estimated at elevation 1073.1.

CHECKED:

REVIEWED:

Anchor rods-

75 mm cl.

-Transverse bars "c"

hook one end

— Longitudinal bars "a"

—Transverse bars "b"

*#13 bars mats @ 150 mm each way w/std.90°

at 150 mm, start 75 mm below top of footing (typ.)

-900 mm min. cover

1-25.4 mm dia. rigid electrical conduit

(location to be determined in the field)

—Longitudinal bars "d"

—Transverse bars "b"

undisturbed material. Max. soil

bearing pressure = 150 Kpg

-Transverse bars "c"

—Longitudinal bars "a" -Pour footing on well compacted

Jeffrey Lannigan & HMS

Scott Liesinger

24 footing dowels with a std. 90° hk. one end (Bars "e")

hook each end. Place mats below base

#13 double hoops (square & octagonal)

plate and just above anchor plate.

Longitudinal bars "d"

-25.4 mm thick circular anchor plate (A36M) with "N" 34.9 mm dia. holes

for 31.8 mm dia. anchor rods.

-This € to be parallel to sign face

-24 footing dowels (Bars "e" with a std. 90°

25.4 mm plate (A36M)

(not galvanized)

DESIGNER

EXPIRES: 12/31/2000

150

75 mm cl.

150 m cl.

Foundation Height = ", (See project plans, 800

DATE

OREGON
STATE HIGHWAY DEPARTMENT
Salem, Oregon

Misscellaneaus. Field Notes



BR. 8829

Plantes, Curls Notes
tfandraltzetis
Eftect Example Traffic STINKE
Section Menyic Build Tillingham
Highway Buril-Sisters
Contract No. 5.759. Prefix 9-1056
County
Engineer MMM/HOLC

State Printing 22955

Form E-142 1M



OREGON STATE HIGHWAY DEPARTMENT TRANSIT SHEET

Form E33-30M-5-57-3816

Mc Kensi Bund Tukning

		4.0	-		y //20.0				F-70-	6	ty
	Latt Pa	70 5					Lath	APP.	Cu+-	Bot Per	
44 3 2	35~2	750 / 180 /	13:8"	30.48	Refusió	44.7 3 2 1 R	40.	293 273 273 273 273	12.4. 12.4. 12.2. 15.6	30 30 30 30 31 4 31 4 31 4 31 4 31 4 31	Reformed

Line Date # 8 - 6! Party // Party Project // Compile The Allerhange 7 1 4/1 57 - 0" - 12/"= 382/" 38.08 X 18.83 653.33 0' 34.77' X 18.79'X

(Z) Sprinkling.	Save
	OREGON STATE HIGHWAY DEPARTMENT
Project Mcken Dend Interhage	TRANSIT SHEET
	Form E33-30M-5-57-3816 Sept 16, 1960
Date Finish Start Co. At X 748 Gal.	3" Pump
9-16 849,060 847383 1,677 / 12,544 3"pm	
9-19 885142 818,060 \	Mater Reading
9-19	Finish 848 197 (I hour check)
	5tort 847,383
	814 per. hr. Cubic Fi
	7.48
	6,088 23 Gol Por Ar.
	5-pt 16,1960
	3" Pump
	10:45 to 1:15 = 2/2 hrs
	Z/2 × 608822 = 15,221 & Gol.
	(before Meter placed)
	1 Color

OREGON STATE HIGHWAY DEPARTMENT TRANSIT SHEET

Form E33—30M—5-57—3816 Sept 19.1960

2/2 " fomp.

AL, I



OREGON STATE HIGHWAY DEPARTMENT

CULVERT DATA

STATION 12269+88 Exte	ne Experience
Install or Sa	alvage
Size Length Class .	Consiste
Skew Sta.: Lt.	Rt
In Place: Ft. Lt	Ft. Rt
Extend: Ft. Lt	Ft. Rt
Pipe Used: New	. Salvaged
Elevation: Lt.	Rt. Both Exist Didos
Min. Cover	Total Fall
Culvert Exc Ft. Wide-	Sides Vertical

10 3 10 3 (0° 6°)

3.6 X3.5 0.47 C.Y

		12 more
	and the second second	and the second
Line Date	8-25-60	Double Seale
Line Date		Party
Chanbern.	· Internal Linteres	5. Sinkersoft
" (an 218 "	ERNS SIMERCE	9. September 1997.

Inlet and Outlet Ditches

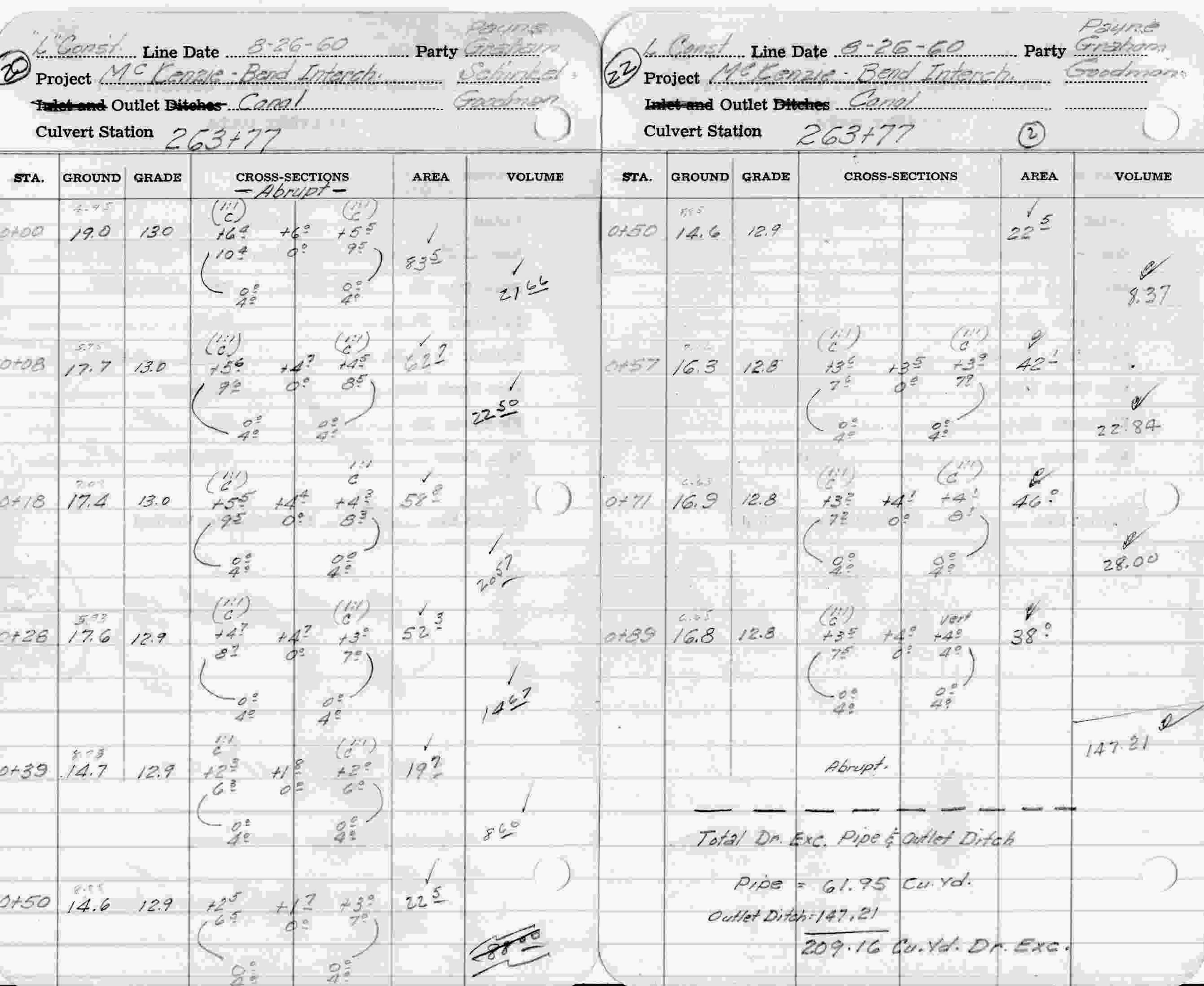
Cul

Form E-247-10M-3-53

OREGON STATE HIGHWAY DEPARTMENT

CULVERT DATA

1	lvert Stat	ion Z	09+88			CULVERT DATA
	GROUND	GRADE	CROSS-SECTIONS	AREA	VOLUME	STATION 263+77
						Install or Salvage
			1.00			Size 58" Length 60" Class Arch Type CMP
			X/one			Skew Sta.: Lt. 263+82 Rt. 263+60
						In Place: Ft. Lt Ft. Rt Ft. Rt.
						Extend: Ft. Lt Ft. Rt &
						Pipe Used: New Salvaged
						Elevation: Lt
						Min. Cover
-						Culvert Exc
						Ref \
						172 175 192 194 195 from Bot.
						E. P. p.c
						132 132
						1,0,5
						4/2 × 6 5/ - (.7)
						Subgrading below Flowline Elev





Oregon State Highway Department

LEVEL SHEETS

M	c. A Denni		
	F. Fxcar		
		- 1	



Const. Line Date Done 8-29-60 Party Paying

Project /	NOVENZE	-Bend	Inter:	6	ahinkel [
Form E-34 3	OM-12-56			State Printing	99922
	· ,	2.5			



Project A	MCKenzie - Bend 30M-12-56	Zner: State Printi	(1000/10/66/ (1000/10/37) ing 99922		LEVEL SHEETS	
X-Se	cts for Retain			X-5ect	for Bataining Walls	1911. (Cont.)
Sta.	Dorce	Area	V01.	5/2.		Area Vol.
716+65	14 155	159 159 13	.0	7/7/02		8.0
	232	133	3.17	7/7+//	151 159 169 169	3.4
716+74	146 159	16° 6.0			Abrupt.	
	215	165	3.81		7545/54. 251	14.04 CV
715+88	147 162 162	153				
11616	145	15.9	4.33			
7/7+02	15 5 15 7 16 5	1 1				
	27.5	145)				

Const.	Line Da		ی	Course Chinks/		Oregon	State Highway D		29
Project A. Form E-34	30M—12-56	ie Bend Inte	tate Printing	99922			LEVEL SHEET		<u> </u>
X-Sects	for K	etaining Wall	23° Et		X-5ect	for le	Petaining h	1631 23° E	4. Cont.
5/2.	26	-ciport	Area	101.	5/2.			Area	161.
714+93	142	14 g 2 5 \$	5.8		715738			4.4	
	12º 5 20 5	12 ² 25 ²		2.27			-		1.84
5			e		715+45	100			
715+05	1405	25\$	4.0			1205	233	9.8	
	13.1	255		3.28		205	255		
715+19	142	143 144 24° 26'	9.1						3
		24 26					700		12.14 C.Y.
	20:	262		4.75				Struc. E	
			∂						
715+38	13:	115 115	4.4						
	(// =	1/2/							
	200								

Bent Total

21,03

47.70

68.73 C.Y.

Const. Line Date 8-10-60 Party Page 1		Oregon State Highway Departmen					
Project			LEVEL S	HEETS			
			Cole	בים בנינו	Bent		
Struc. Exc. for Footings			E+	10%.	Total		
(Allowing 1: our side of footing	Be	772	18.15	2.88	21.0.		
Bent 2: 9=x9=x1=301/11 of	lepth_						
			- A				
orige Grad both ficking	Ben	1#3:	37.50	10.20	47.7		
Et. Column: eriq. Grad bott. Feeting 4	25						
6.05 x x 3 = 18.15 C.X		Str. Exc	C 22.				
			FOR DEI	~/	4		
2. L. t. Column: 10.46 - 9.50 = 0.96		otings			68.7		
0.96 X 3 = 2.88 C.Y.					-		
0.76 X 3 - 2.00 E 7			+				
Bent #3: et. Column: 15.10 - 02.60 = 12.5				*			
Ef. Column: 15.10 - 02.60 = 12.5							
12.5 x 3 = 37.50C. Y.							
12.5 x 3 - 37.300.							
Lt. Column: 5.00 - 01.60 = 3.40							
					21.		
3.40 x 3 = 10.20C. Y.							



(36) Elev. Check for Struct. footings											
Structure	Line I	ate 8	9-60	Party	Roune		Oregon State E	lighway Depart	ment	37)	
Project McKenzie Bend Interchange Schinkel Form E-34—30M—3-60 State Printing 26554					5/10/10/10/10/10/10/10/10/10/10/10/10/10/	LEVEL SHEETS					
St.	*	H.1.		Elev.				•			
		19.31		3518.45		Browns.	Disk 22 Elev. (33		- Con 2	Bridge	
Bent # 2					Rock El.						
Ref. 1159				3512.05		Pet. 1157	to of Lit Co	Jumm, Ben	172		
Z.P. Column Rt. Bent # 2	1.5	09.63		3508.13 3502.6	Bock El.						
		19.31									
7.70	0.5	35/1.0	8.89	35/0.42							
Column Rt. Bent#3			7.9	3503./	Bock El.						
Calarman har. Beent #3			9.0	3502.0	Rock El.						
	Date	8-10	-60	F.Gas	FF.	Contr. Costes	exc. add	from at m	aterial	Bolow	
		19.64				e/dy 5 5/10	on obove	For 8-4-6	9		
	3.1	11.0	11.7	07.9							
Column Lt. Bent #3			9.4	3501.6	Rock El.				4		
Bent # 3			8,4	02.6	Rock El.						
		19.64									
Column Et	3.9	12.0	11.5	0.8.1							
Bent # 2 Column Lt.			9.8	02.2	Book El.						
Bent #2			2.5	09.5	Rock El.						

(19) (20)	Line D	ate	19/2/	Part	13 a v 1 1 2	
Project Form E-34			(e. 7. av. 1.	State I	rinting 26554	
For No.						
Î	70	2,2,2	121	Candus	1-14	
3	576,	5-2-	2 F C 2	P 16	19.	N A
33)	Alum		rail.			
	174.5n	3	184:-	62.		
9		Rai		FM.		
	R+ 516			2541.		7.6.7
	124	B-1 en		341.10		
) (91'-/		
(3 y)	8" Meta	l Dra	egs une	· 90	0"	



Oregon State Highway Department

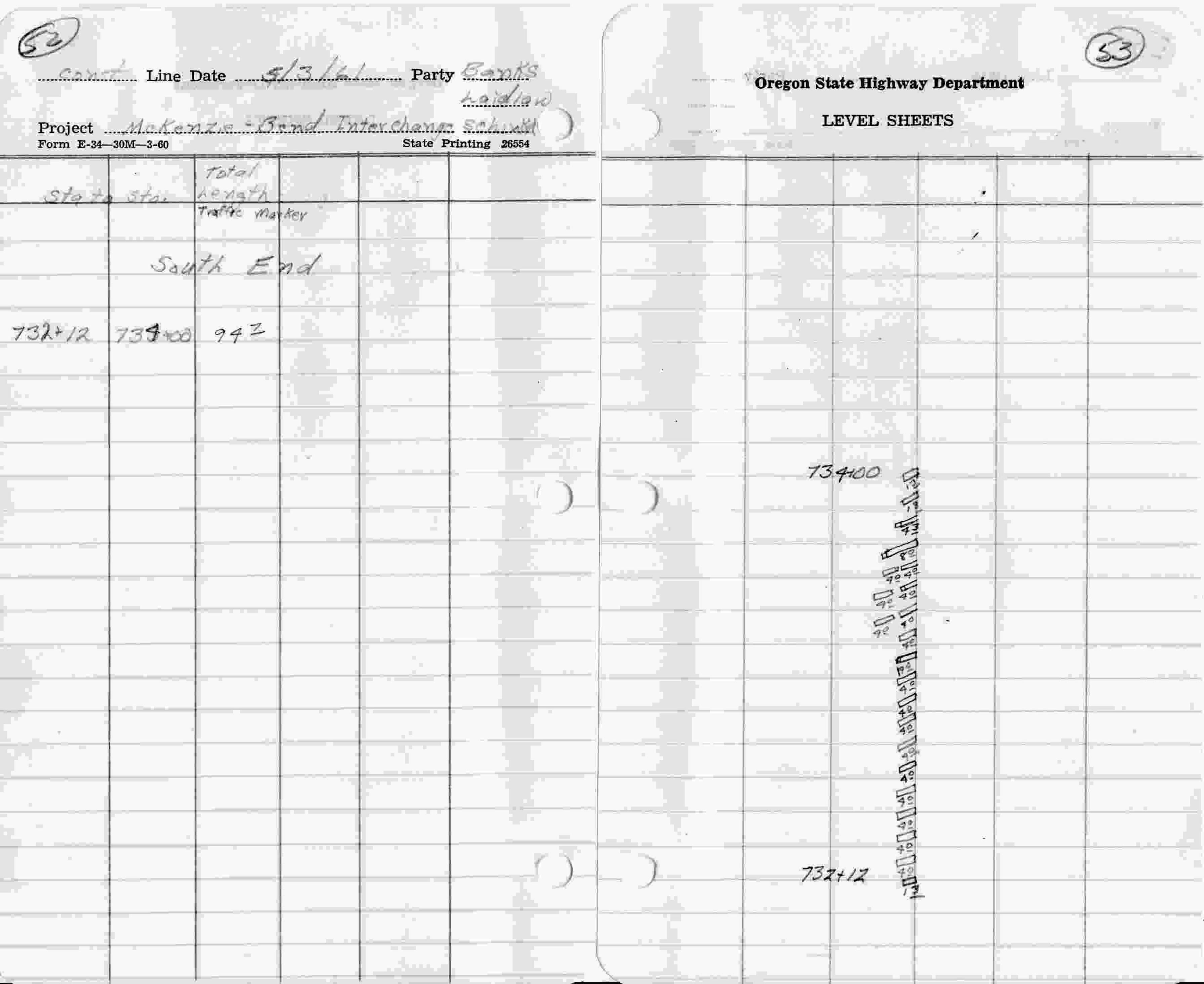
LEVEL SHEETS

/ka	1/20/	Parte.		
			1 4	
			*	

Const. Line Date 5/5/6/ Party Banks Landlaw Project McKen Zie - Bend Inter Change						Project McKen Zie Bend Inter Change					
Form E-34		,			finting 26554	Form E-34				State Printing	
Sta to	£+3	of Gutte				.s+a.+	s5+q,	of Gult	2524		
261+53				00 h 7	00001935	25268				to over	1835
				L							
					2						
									2		
					9						
)
				ا را ند							

Comst. Line Date 5/5/6/..... Party 6.1. March Banks Project McKenzie - Bend Interchange Form E-34-30M-3-60 State Printing 26554 Total Alemath Craffic Marken South End approch To over Pass 266+75 268+53 112.4

طَحُ 	F = 1 v/ /= v= 1		LEVEL SHEETS	49
Project	ng Inter Change Sching	2.54+70		
Stato 5/01 Length				
North L	vest End			
252+00 254+20 211.0				
			57+00	



Line Date	and Interchan	haidkai	Oregon State Highway Department LEVEL SHEETS				
Code / Tota/							
Trassic A	larker.						
North En	4						
709-50 7/1-184 109-3							
			709450				
				32		<u> </u>	
				4.5			
				40 40			
				40			
				40			
				1			
					40		
					40		
					40		
					40		
					1 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1		
					40		
			711;			0	
						4.5	

