



**Skamania PUD – Carson Water
Treatment Plant Upgrade**

Project Manual, Volume 3 of 4

June 5, 2026

Prepared for:
Public Utility District No. 1 of Skamania
County

Prepared by:
Stantec Consulting Services, Inc.
601 SW Second Ave, Suite 1400
Portland, OR 97204

Issued for Construction

Project Number: 2002006274



Geotechnical Data Report

Carson Water Treatment Plant
Public Utility District Number 1 of Skamania County
Carson, Skamania County, Washington

Prepared for:
Stantec
Attn: Mr. Brian Rowbotham PE
Civil/Mechanical Engineer
601 SW 2nd Avenue, Suite 1400
Portland, Oregon 97204

May 28, 2025
Project No. STN-2022-004

Appendix A – Figures

Figure 1, Site Location Map

Figure 2, Site Exploration Plan

Appendix B

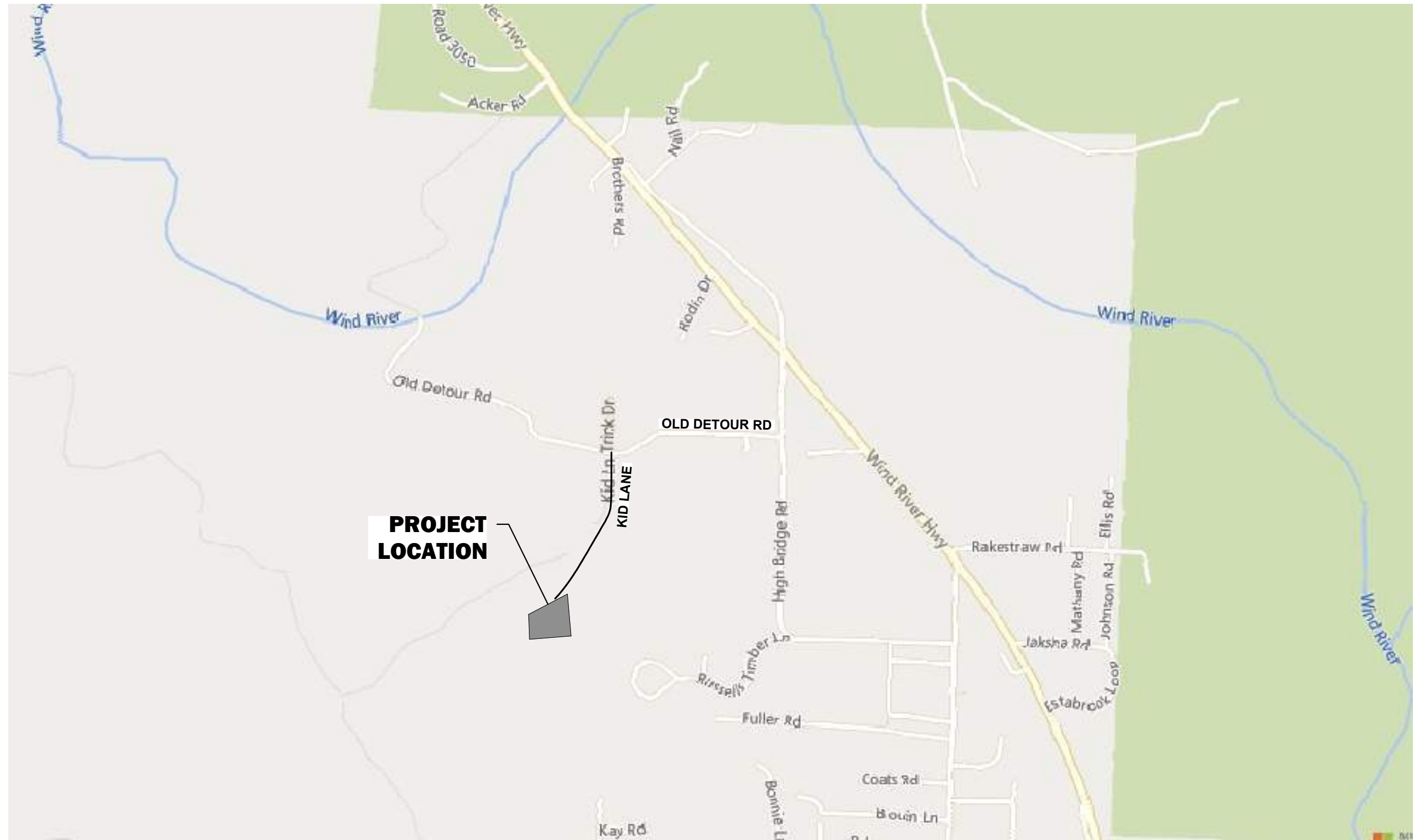
Interpreted Summary Exploration Logs

Rock Core Photographs

Results of Laboratory Testing

APPENDIX A

Site Location Map
Site Exploration Plan



2614 SE 129th Court,
Vancouver, WA 98683
360-258-1738

CARSON WATER TREATMENT PLANT

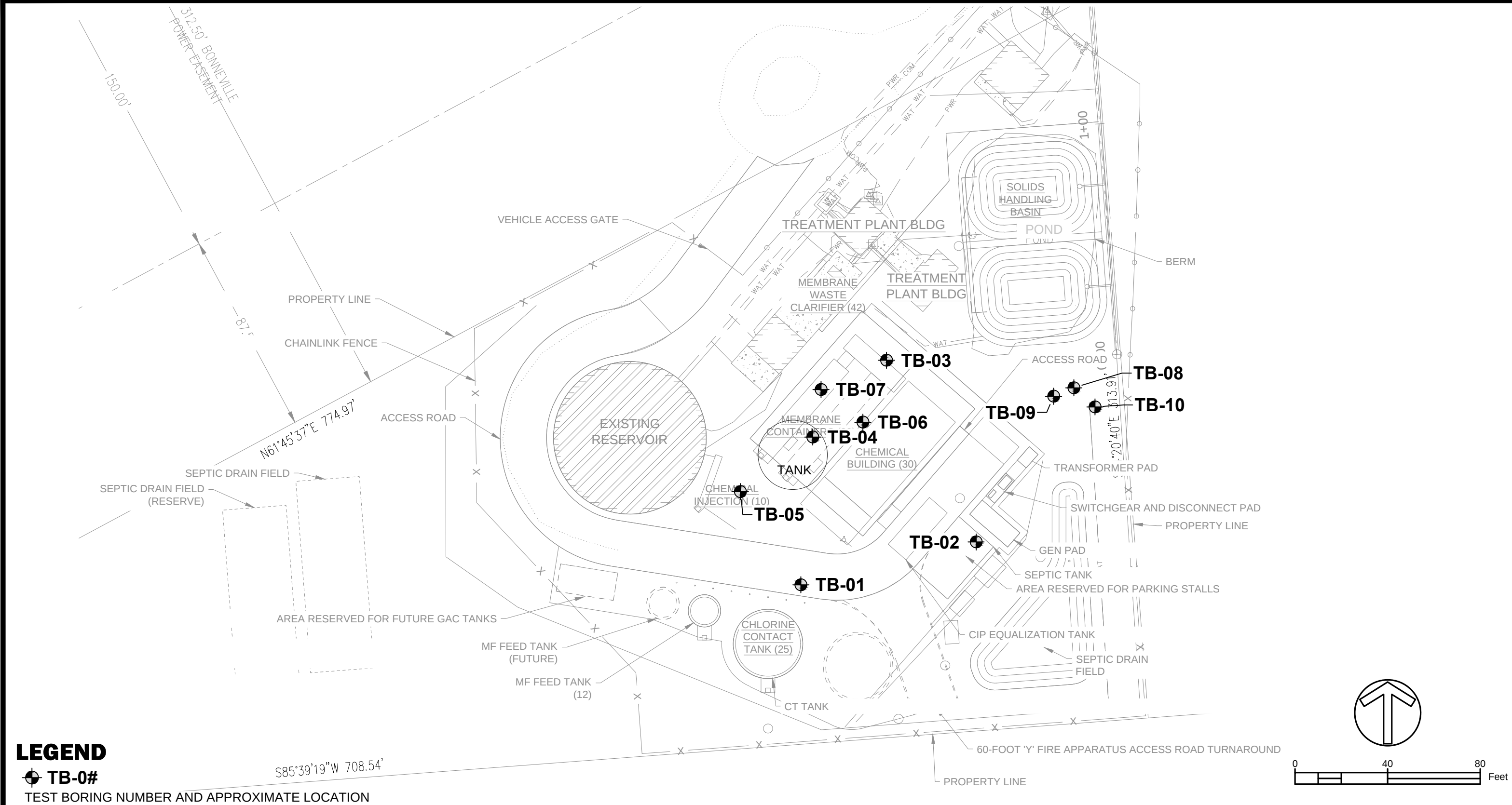
KID LANE
CARSON, SKAMANIA COUNTY, WASHINGTON

FIGURE 1 - SITE LOCATION MAP

PROJECT
STN-2022-004

DATE
MAY 2025

C:\PROJECTS\STN-2022-004 CARSON\DWG\STN-2022-004 CARSON FIG 2.dwg May 22, 2025 - 10:03am Devin Blackshere



2614 SE 129th Court,
Vancouver, WA 98683
360-258-1738

CARSON WATER TREATMENT PLANT

KID LANE
CARSON, SKAMANIA COUNTY, WASHINGTON

FIGURE 2 - SITE EXPLORATION PLAN

PROJECT
STN-2022-004

DATE
MAY 2025

APPENDIX B

Interpreted Summary Exploration Logs
Rock Core Photographs
Results of Laboratory Testing

Interpreted Summary Exploration Logs

CLIENT Stantec / Public Utility District Number 1 of Skamania County

PROJECT NAME Carson Water Treatment Plant

PROJECT NUMBER STN-2022-004

PROJECT LOCATION Carson, Skamania County, Washington

DATE STARTED 5/18/23 COMPLETED 5/19/23

NORTH _____ EAST _____

DRILLING CONTRACTOR Western States Soil Conservation

GROUND ELEVATION 620.5 ft HOLE SIZE 4 inches

DRILLING METHOD Mud Rotary and HQ Rock Core with Auto Hammer

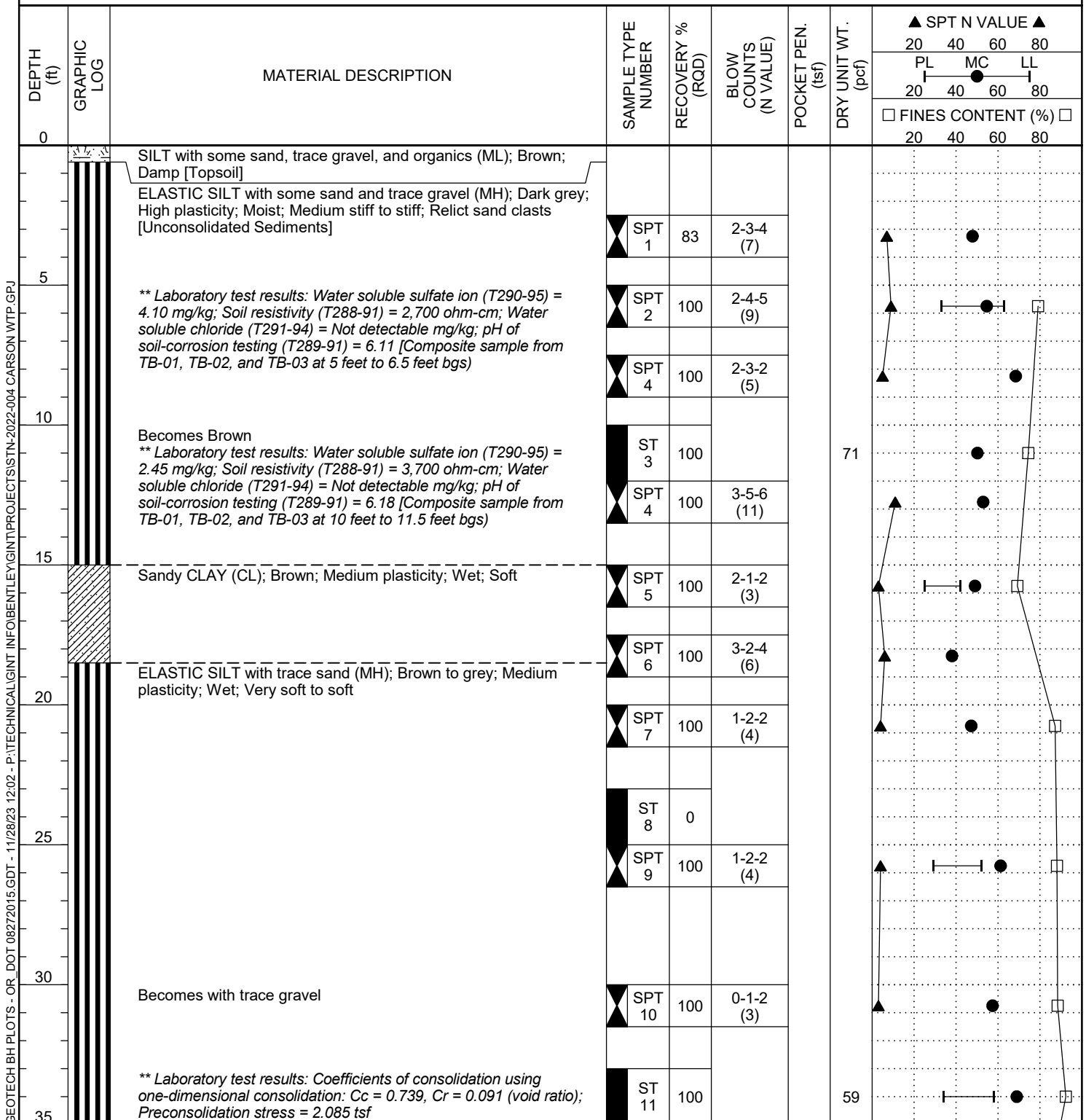
GROUND WATER LEVELS:

LOGGED BY PH CHECKED BY CH

AT TIME OF DRILLING --- Not measured due to mud-rotary

NOTES Borehole location and elevation estimated from field measurements

AFTER DRILLING ---



(Continued Next Page)



CLIENT Stantec / Public Utility District Number 1 of Skamania County

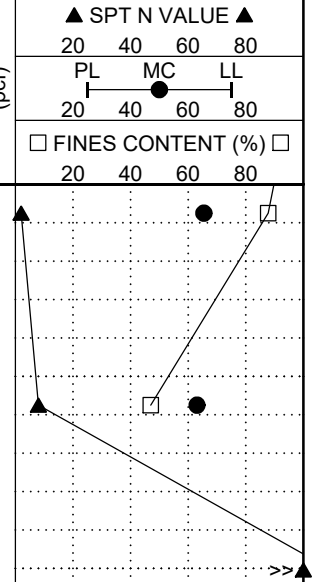
PROJECT NAME Carson Water Treatment Plant

PROJECT NUMBER STN-2022-004

PROJECT LOCATION Carson, Skamania County, Washington

GEOTECH BH PLOTS - OR_DOT 08272015.GDT - 11/28/23 12:02 - P:\TECHNICAL\GINT INFO\BENTLEY\GINT PROJECTS\STN-2022-004 CARSON WTP.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲	
								20 40 60 80	20 40 60 80
								PL MC LL	□ FINES CONTENT (%) □
35								20 40 60 80	20 40 60 80
35		ELASTIC SILT with trace sand (MH); Brown to grey; Medium plasticity; Wet; Very soft to soft (<i>continued</i>)	▲ SPT 12	100	0-0-2 (2)				
40									
40		Silty GRAVEL with some sand (GM); Grey; Medium to high plasticity fines; Wet; Medium dense to very dense [Weathered Rock]	▲ SPT 13	100	1-1-7 (8)				
45		BASALT; Grey; Slightly weathered; Strong (R4); Moderately to intensely fractured; Close joint spacing; Very good quality [Andesite of the Race Track]	SPT 14	50	50/1"				
50		Becomes Fresh; Slightly fractured; Very close joint spacing; Fractures are fresh to slightly weathered; Some vesicles	RC 1	8 (100)					
55		2-inches of intensely fractured rock; Slightly weathered	RC 2	100 (92)					
60		3-inches of intensely fractured rock; Slightly weathered	RC 3	100 (100)					
65			RC 4	100 (100)					
70			RC 5	100 (100)					



Bottom of borehole at 72.0 feet.

CLIENT Stantec / Public Utility District Number 1 of Skamania County **PROJECT NAME** Carson Water Treatment Plant
PROJECT NUMBER STN-2022-004 **PROJECT LOCATION** Carson, Skamania County, Washington
DATE STARTED 5/18/23 **COMPLETED** 5/18/23 **NORTH** _____ **EAST** _____
DRILLING CONTRACTOR Western States Soil Conservation **GROUND ELEVATION** 617 ft **HOLE SIZE** 6 inches
DRILLING METHOD Hollow-Stem Auger with Auto Hammer **GROUND WATER LEVELS:**
LOGGED BY PH **CHECKED BY** CH **AT TIME OF DRILLING** 15.00 ft / Elev 602.00 ft
NOTES Borehole location and elevation estimated from field measurements **AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0								20	40	60	80
		SILT with some sand, trace gravel, and organics (ML); Brown; Damp [Topsoil]									
		ELASTIC SILT with some sand (MH); Grey; Medium to high plasticity; Moist; Medium stiff to stiff; Relict sand clasts [Unconsolidated Sediments]	SPT 1	50	3-3-5 (8)						
5		** Laboratory test results: Water soluble sulfate ion (T290-95) = 4.10 mg/kg; Soil resistivity (T288-91) = 2,700 ohm-cm; Water soluble chloride (T291-94) = Not detectable mg/kg; pH of soil-corrosion testing (T289-91) = 6.11 [Composite sample from TB-01, TB-02, and TB-03 at 5 feet to 6.5 feet bgs]	SPT 2	100	3-5-6 (11)						
			SPT 3	100	2-3-3 (6)						
10			SPT 4	100	2-1-4 (5)						
		** Laboratory test results: Water soluble sulfate ion (T290-95) = 2.45 mg/kg; Soil resistivity (T288-91) = 3,700 ohm-cm; Water soluble chloride (T291-94) = Not detectable mg/kg; pH of soil-corrosion testing (T289-91) = 6.11 [Composite sample from TB-01, TB-02, and TB-03 at 10 feet to 11.5 feet bgs]	SPT 5	100	1-1-1 (2)						
		Becomes with relic coarse gravel clasts									
15		ELASTIC SILT with some sand (MH); Grey; Medium plasticity; Moist to wet; Very soft to soft	SPT 6	100	1-4-4 (8)						
		Becomes wet									
		ELASTIC SILT with trace sand (MH); Grey; Medium plasticity; Wet; Soft to medium stiff	SPT 7	100	2-3-3 (6)						
20		Includes 4-inches of Sandy SILT	SPT 8	100	1-2-2 (4)						

Bottom of borehole at 21.5 feet.

CLIENT Stantec / Public Utility District Number 1 of Skamania County **PROJECT NAME** Carson Water Treatment Plant
PROJECT NUMBER STN-2022-004 **PROJECT LOCATION** Carson, Skamania County, Washington
DATE STARTED 5/18/23 **COMPLETED** 5/18/23 **NORTH** _____ **EAST** _____
DRILLING CONTRACTOR Western States Soil Conservation **GROUND ELEVATION** 619.6 ft **HOLE SIZE** 6 inches
DRILLING METHOD Hollow-Stem Auger with Auto Hammer **GROUND WATER LEVELS:**
LOGGED BY PH **CHECKED BY** CH **AT TIME OF DRILLING** 15.00 ft / Elev 604.60 ft
NOTES Borehole location and elevation estimated from field measurements **AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
5		Silty-Sandy GRAVEL (GM); Brown; Damp; Angular [Base rock] ELASTIC SILT with some sand (MH); Grey; Medium to high plasticity; Moist; Medium stiff to stiff; Relict sand clasts [Unconsolidated Sediments]	SPT 1	33	2-3-5 (8)						
		** Laboratory test results: Water soluble sulfate ion (T290-95) = 4.10 mg/kg; Soil resistivity (T288-91) = 2,700 ohm-cm; Water soluble chloride (T291-94) = Not detectable mg/kg; pH of soil-corrosion testing (T289-91) = 6.11 [Composite sample from TB-01, TB-02, and TB-03 at 5 feet to 6.5 feet bgs]	SPT 2	39	2-2-4 (6)						
			SPT 3	100	2-2-4 (6)						
10			SPT 4	100	2-3-5 (8)						
		** Laboratory test results: Water soluble sulfate ion (T290-95) = 2.45 mg/kg; Soil resistivity (T288-91) = 3,700 ohm-cm; Water soluble chloride (T291-94) = Not detectable mg/kg; pH of soil-corrosion testing (T289-91) = 6.18 [Composite sample from TB-01, TB-02, and TB-03 at 10 feet to 11.5 feet bgs]	SPT 5	100	2-2-3 (5)						
15			SPT 6	100	1-2-3 (5)						
		▽ Becomes wet Sandy ELASTIC SILT (MH); Brown; Medium plasticity; Wet; Soft to medium stiff	SPT 7	100	0-2-2 (4)						
20			SPT 8	100	2-3-2 (5)						

Bottom of borehole at 21.5 feet.



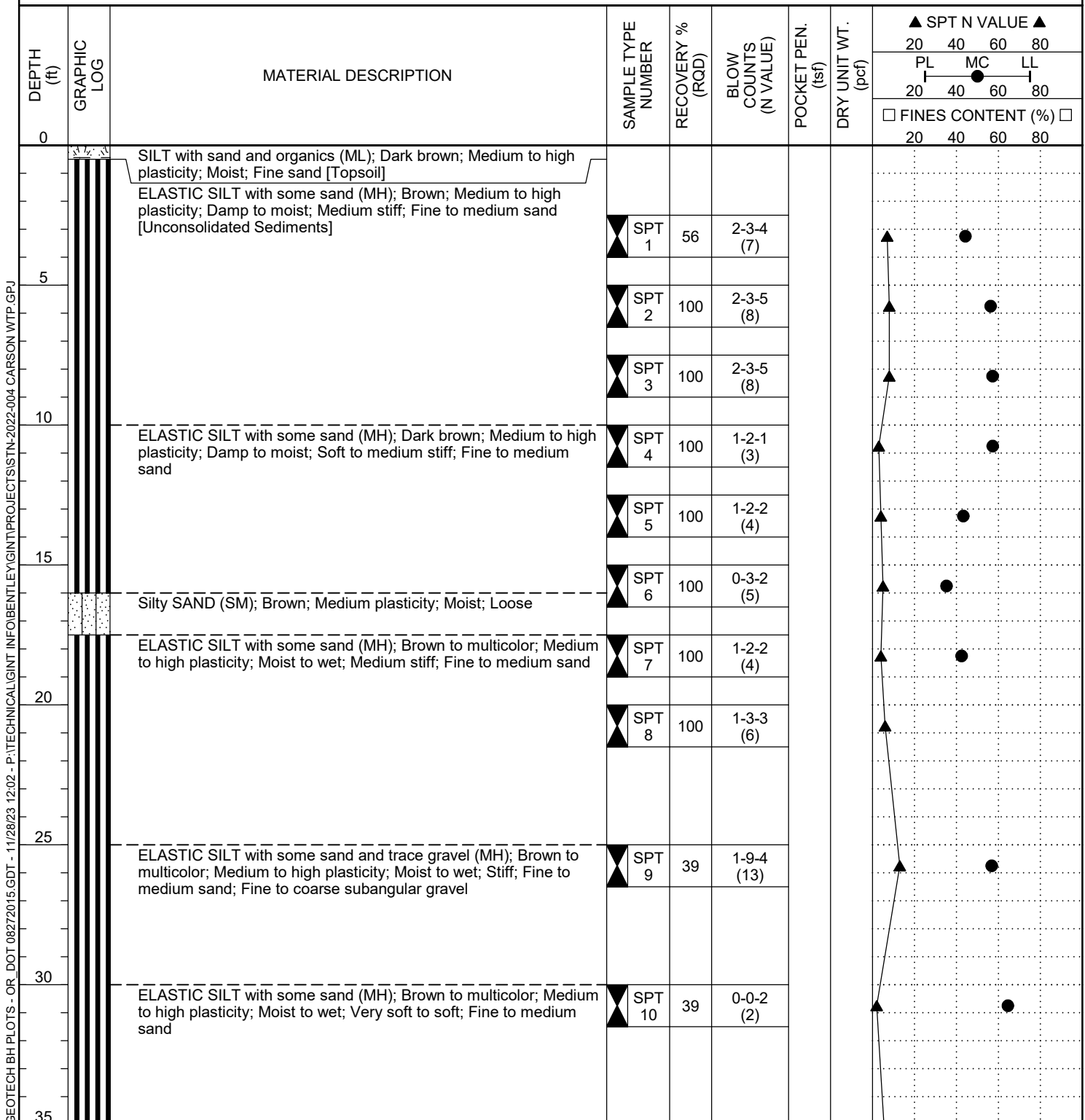
CLIENT Stantec / Public Utility District Number 1 of Skamania County **PROJECT NAME** Carson Water Treatment Plant
PROJECT NUMBER STN-2022-004 **PROJECT LOCATION** Carson, Skamania County, Washington
DATE STARTED 5/18/23 **COMPLETED** 5/18/23 **NORTH** _____ **EAST** _____
DRILLING CONTRACTOR Western States Soil Conservation **GROUND ELEVATION** 623 ft **HOLE SIZE** 6 inches
DRILLING METHOD Hollow-Stem Auger with Auto Hammer **GROUND WATER LEVELS:**
LOGGED BY PH **CHECKED BY** CH **AT TIME OF DRILLING** 15.00 ft / Elev 608.00 ft
NOTES Borehole location and elevation estimated from field measurements **AFTER DRILLING** ---

GEOTECH BH PLOTS - OR_DOT 08272015.GDT - 11/28/23 12:02 - P:\TECHNICAL\GINT\PROJECTS\STN-2022-004 CARSON WTP.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
0		Silty-Sandy GRAVEL (GM); Brown; Damp [Base rock]									
		ELASTIC SILT with some sand (MH); Dark grey to dark brown; Medium to high plasticity; Moist; Medium stiff to stiff; Relict sand clasts [Unconsolidated Sediments]									
5			SPT 1	33	2-3-3 (6)						
			SPT 2	39	2-3-4 (7)						
			SPT 3	100	3-4-6 (10)						
10			SPT 4	100	2-2-4 (6)						
			SPT 5	100	2-3-3 (6)						
15		▽ Becomes wet	SPT 6	100	1-2-3 (5)						
		Sandy ELASTIC SILT (MH); Brown; Medium plasticity; Wet; Medium stiff	SPT 7	100	1-2-4 (6)						
20		ELASTIC SILT with some sand (MH); Brown, grey, and tan; Medium plasticity; Wet; Medium stiff	SPT 8	100	3-2-4 (6)						

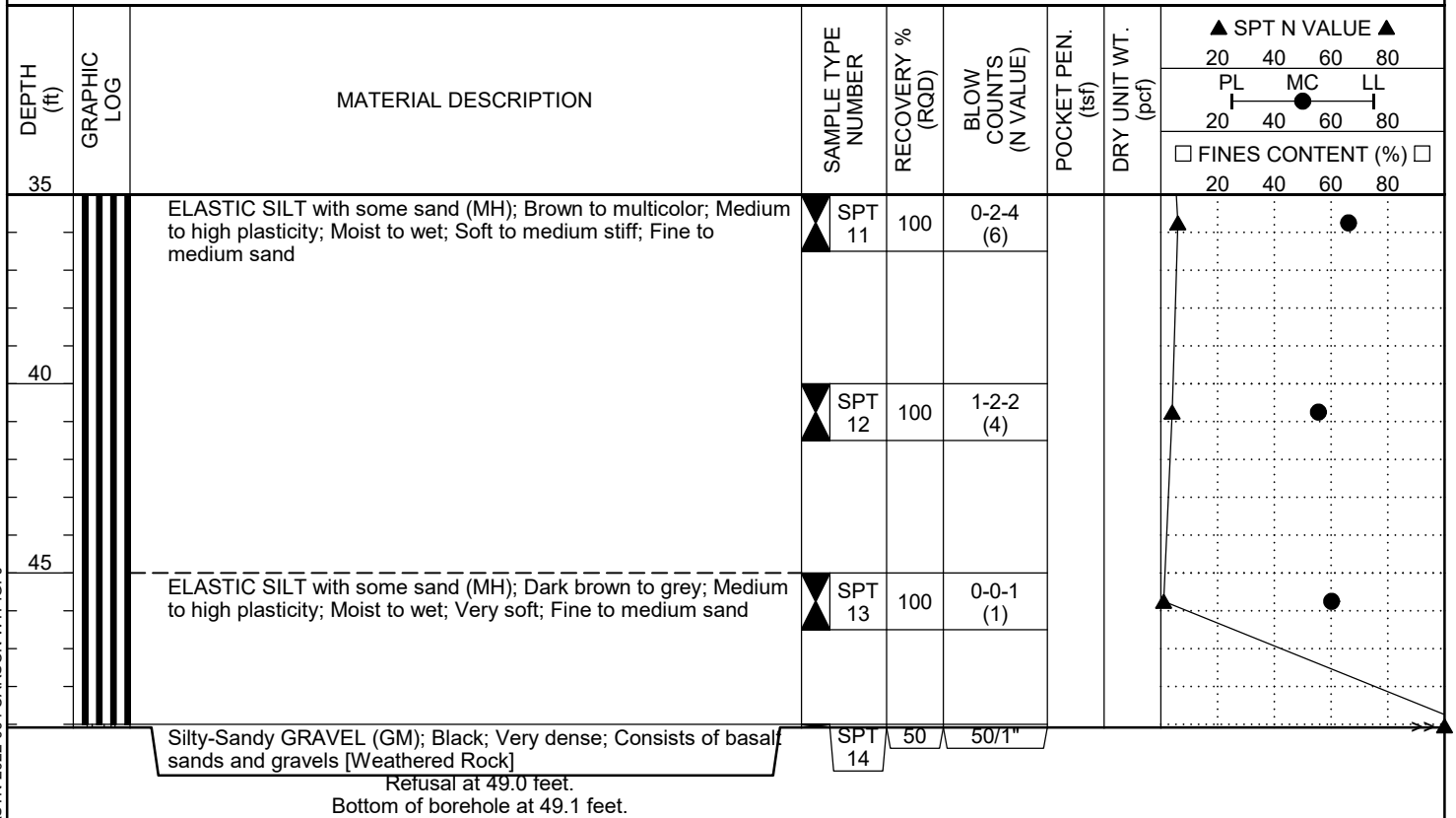
Bottom of borehole at 21.5 feet.

CLIENT Stantec / Public Utility District Number 1 of Skamania County **PROJECT NAME** Carson Water Treatment Plant
PROJECT NUMBER STN-2022-004 **PROJECT LOCATION** Carson, Skamania County, Washington
DATE STARTED 8/29/23 **COMPLETED** 8/29/23 **NORTH** _____ **EAST** _____
DRILLING CONTRACTOR Western States Soil Conservation **GROUND ELEVATION** 622.4 ft **HOLE SIZE** 4 inches
DRILLING METHOD Mud Rotary with Auto Hammer **GROUND WATER LEVELS:** _____
LOGGED BY CH **CHECKED BY** PH **AT TIME OF DRILLING** --- Not measured due to mud-rotary
NOTES Borehole location and elevation estimated from field measurements **AFTER DRILLING** ---



(Continued Next Page)

CLIENT Stantec / Public Utility District Number 1 of Skamania County PROJECT NAME Carson Water Treatment Plant
 PROJECT NUMBER STN-2022-004 PROJECT LOCATION Carson, Skamania County, Washington



CLIENT Stantec / Public Utility District Number 1 of Skamania County

PROJECT NAME Carson Water Treatment Plant

PROJECT NUMBER STN-2022-004

PROJECT LOCATION Carson, Skamania County, Washington

DATE STARTED 8/29/23 COMPLETED 8/30/23

NORTH _____ EAST _____

DRILLING CONTRACTOR Western States Soil Conservation

GROUND ELEVATION 620.7 ft HOLE SIZE 4 inches

DRILLING METHOD Mud Rotary and HQ Rock Core with Auto Hammer

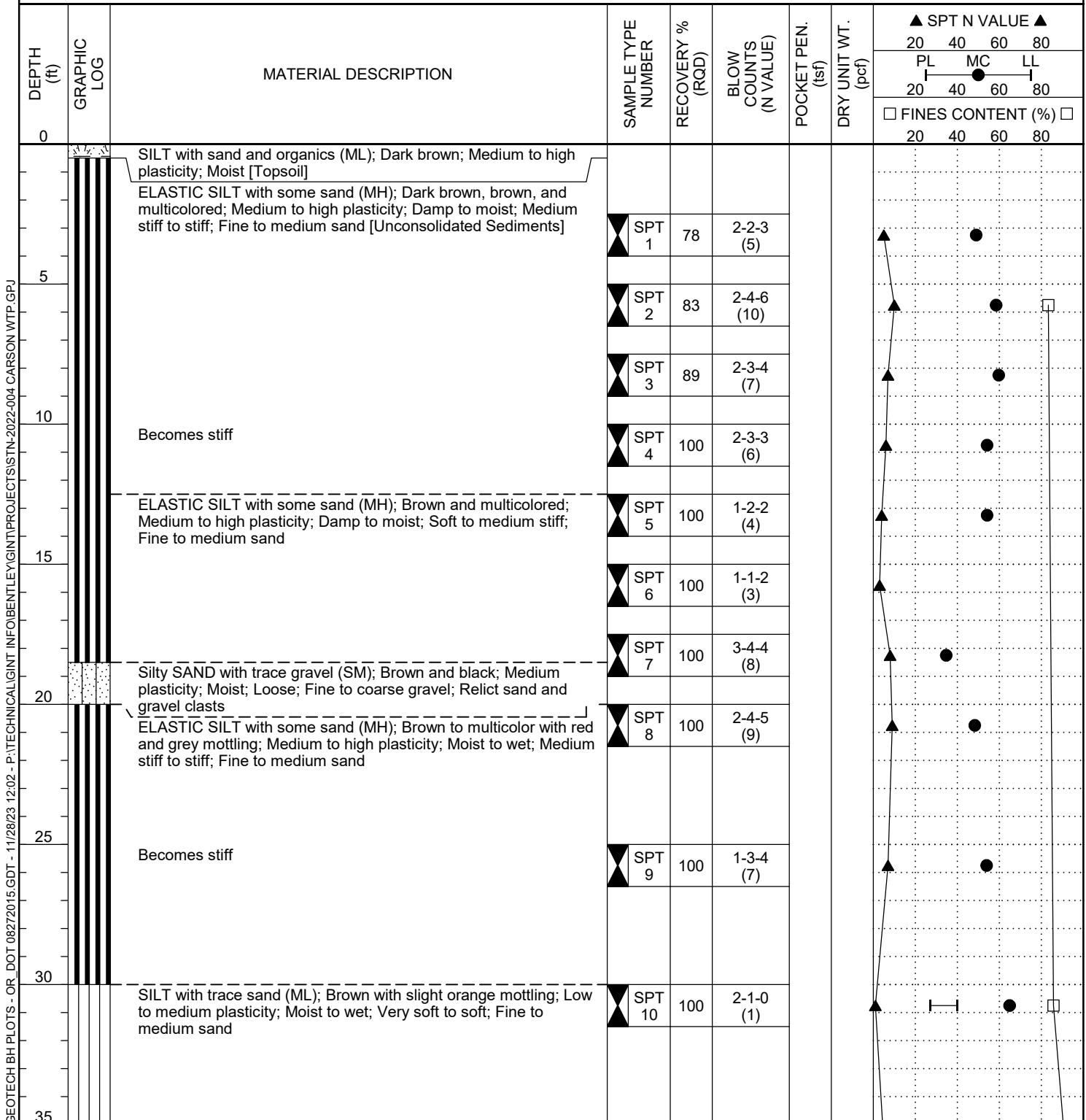
GROUND WATER LEVELS:

LOGGED BY CH CHECKED BY PH

AT TIME OF DRILLING --- Not measured due to mud-rotary

NOTES Borehole location and elevation estimated from field measurements

AFTER DRILLING ---



(Continued Next Page)



CLIENT Stantec / Public Utility District Number 1 of Skamania County

PROJECT NAME Carson Water Treatment Plant

PROJECT NUMBER STN-2022-004

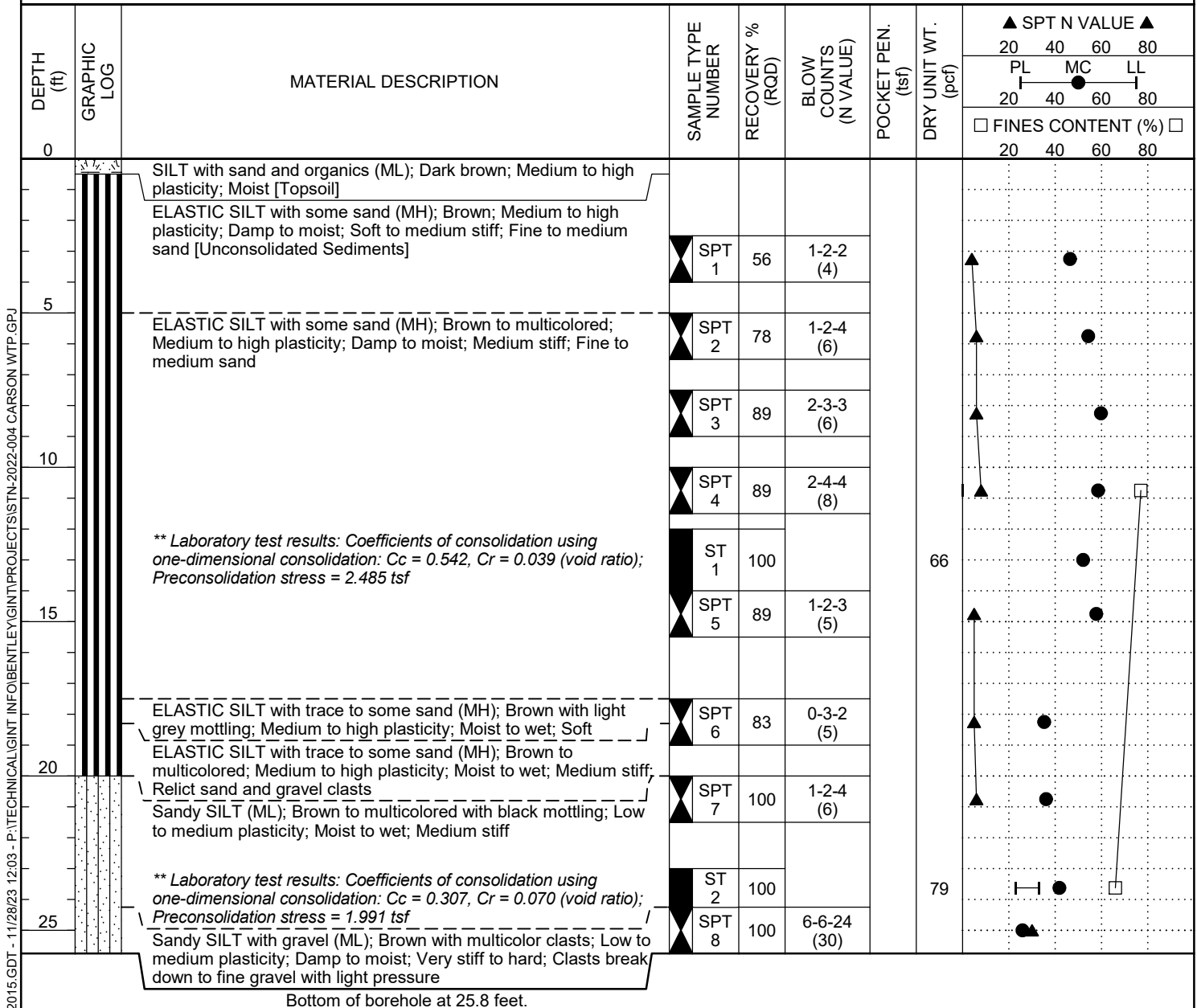
PROJECT LOCATION Carson, Skamania County, Washington

GEOTECH BH PLOTS - OR_DOT 08272015.GDT - 11/28/23 12:02 - P:\TECHNICAL\GINT INFO\BENTLEY\GINT\PROJECTS\STN-2022-004 CARSON WTP.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲	
								20 40 60 80	20 40 60 80
								PL MC LL	20 40 60 80
35								□ FINES CONTENT (%) □	
								20 40 60 80	20 40 60 80
		SILT with trace sand (ML); Brown to multicolor; Low to medium plasticity; Moist; Medium stiff; Fine to medium sand	SPT 11	100	0-2-3 (5)				
40		SILT with trace sand (ML); Dark brown; Low to medium plasticity; Moist to wet; Soft to medium stiff; Fine sand	SPT 12	100	0-2-2 (4)				
45		SILT with trace sand (ML); Dark grey; Low to medium plasticity; Moist; Very soft	SPT 13	100	0-0-2 (2)				
		Silty-Sandy GRAVEL (GM); Black; Very dense; consists of basalt sands and gravel [Weathered Basalt]							
50		BASALT; Grey; Fresh to slightly weathered; Medium strong (R3); Moderately to intensely fractured; Close joint spacing; Highly vesicular; Very poor to very good quality [Andesite of the Race Track] Becomes Poor quality 6-inches of intensely fractured rock; Slightly weathered Becomes with some vesicles	SPT 14 RC 1	25 100 (45)	50/1"				
55		Becomes Medium strong (R3); Fresh; Slightly to moderately fractured; no vesicles; Good quality	RC 2	93 (68)					
60		Becomes Weak to medium strong (R2-R3)	RC 3	100 (85)					
		Becomes Medium strong to strong (R3-R4); Unfractured; Very good quality							
65		Becomes Slightly weathered; Moderately fractured; Very poor to fair quality	RC 4	100 (63)					
		Becomes Fresh; Unfractured; Very good quality							
70			RC 5	100 (100)					

Bottom of borehole at 71.0 feet.

CLIENT Stantec / Public Utility District Number 1 of Skamania County **PROJECT NAME** Carson Water Treatment Plant
PROJECT NUMBER STN-2022-004 **PROJECT LOCATION** Carson, Skamania County, Washington
DATE STARTED 8/30/23 **COMPLETED** 8/30/23 **NORTH** _____ **EAST** _____
DRILLING CONTRACTOR Western States Soil Conservation **GROUND ELEVATION** 621.8 ft **HOLE SIZE** 4 inches
DRILLING METHOD Mud Rotary with Auto Hammer **GROUND WATER LEVELS:** _____
LOGGED BY CH **CHECKED BY** PH **AT TIME OF DRILLING** --- Not measured due to mud-rotary
NOTES Borehole location and elevation estimated from field measurements **AFTER DRILLING** ---





CLIENT Stantec / Public Utility District Number 1 of Skamania County **PROJECT NAME** Carson Water Treatment Plant
PROJECT NUMBER STN-2022-004 **PROJECT LOCATION** Carson, Skamania County, Washington
DATE STARTED 4/11/25 **COMPLETED** 4/11/25 **NORTH** _____ **EAST** _____
DRILLING CONTRACTOR Dan Fischer Excavating **GROUND ELEVATION** 616 ft **HOLE SIZE** 3 inches
DRILLING METHOD Solid Stem Auger with Manual Hammer **GROUND WATER LEVELS:**
LOGGED BY PH **CHECKED BY** LG **AT TIME OF DRILLING** 5.00 ft / Elev 611.00 ft
NOTES Borehole location and elevation estimated from field measurements **AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
		Topsoil with grass (4 inches)									
		ELASTIC SILT with trace sand and gravel (MH); Brown; Medium to high plasticity; Moist; Soft (Fill)									
		Silty GRAVEL (GM); Dark grey; Medium plasticity in fines; Moist; Loose (Fill)	SPT 1	56	2-4-5 (9)						
5		ELASTIC SILT with sand (MH); Grey; Medium to high plasticity; Moist; Stiff (Unconsolidated Sediments) Becomes wet	SPT 2	100	3-4-5 (9)						
			SPT 3	100	3-4-5 (9)						
10			SPT 4	94	3-3-3 (6)						
Bottom of borehole at 11.5 feet.											

CLIENT Stantec / Public Utility District Number 1 of Skamania County **PROJECT NAME** Carson Water Treatment Plant
PROJECT NUMBER STN-2022-004 **PROJECT LOCATION** Carson, Skamania County, Washington
DATE STARTED 4/11/25 **COMPLETED** 4/11/25 **NORTH** _____ **EAST** _____
DRILLING CONTRACTOR Dan Fischer Excavating **GROUND ELEVATION** 616.7 ft **HOLE SIZE** 3 inches
DRILLING METHOD Hollow-Stem Auger with Auto Hammer **GROUND WATER LEVELS:**
LOGGED BY PH **CHECKED BY** LG **AT TIME OF DRILLING** --- Not encountered
NOTES Borehole location and elevation estimated from field measurements **AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
		Topsoil with grass (4 inches)	GB 1	100							
		ELASTIC SILT with some sand and gravel (MH); Dark brown; Medium plasticity; Moist; Soft (Fill)									
		ELASTIC SILT with trace sand (MH); Brown-grey; Medium to high plasticity; Moist (Unconsolidated Sediments) ** Infiltration test results at 4 feet bgs: 0 in/hr	GB 2	100							
		Bottom of borehole at 4.0 feet.									



CLIENT Stantec / Public Utility District Number 1 of Skamania County **PROJECT NAME** Carson Water Treatment Plant
PROJECT NUMBER STN-2022-004 **PROJECT LOCATION** Carson, Skamania County, Washington
DATE STARTED 4/11/25 **COMPLETED** 4/11/25 **NORTH** _____ **EAST** _____
DRILLING CONTRACTOR Dan Fischer Excavating **GROUND ELEVATION** 615 ft **HOLE SIZE** 3 inches
DRILLING METHOD Hollow-Stem Auger with Auto Hammer **GROUND WATER LEVELS:**
LOGGED BY PH **CHECKED BY** LG **AT TIME OF DRILLING** --- Not encountered
NOTES Borehole location and elevation estimated from field measurements **AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
		Topsoil with grass (4 inches)	GB 1	100							
		ELASTIC SILT with some sand and gravel (MH); Grey-brown; Medium to high plasticity; Moist; Soft (Fill)									
		ELASTIC SILT with trace sand (MH); Brown-grey; Medium to high plasticity; Moist (Unconsolidated Sediments)									
		** Infiltration test results at 4 feet bgs: 0 in/hr	GB 2	100							
		Bottom of borehole at 4.0 feet.									

Rock Core Photographs

List of Core Photographs

Boring TB-01, Box 1, 50 to 57.5 feet.....	2
Boring TB-01, 50 to 52 feet.....	3
Boring TB-01, 52 to 57 feet.....	3
Boring TB-01, 57 to 62 feet.....	3
Boring TB-01, Box 2, 57.5 to 67 feet.....	4
Boring TB-01, 62 to 67 feet.....	5
Boring TB-01, Box 3, 67 to 72 feet.....	5
Boring TB-01, 67 to 72 feet.....	5
Boring TB-06, Box 1, 50 to 59.5 feet.....	6
Boring TB-06, 50 to 51 feet.....	7
Boring TB-06, 51 to 56 feet.....	7
Boring TB-06, 56 to 61 feet.....	7
Boring TB-06, Box 2, 59.5 to 68 feet.....	8
Boring TB-06, Box 3, 68 to 71 feet.....	9
Boring TB-06, 61 to 66 feet.....	9
Boring TB-06, 66 to 71 feet.....	10

Notes:

1. Core samples are arranged in each box with increasing depth from left to right and top to bottom.
2. HQ size boxes are each 24 inches in length.
3. Refer to test bore logs for additional core details and descriptions.

Boring TB-01 (Double-Barrel Diamond-Bit HQ size; May 19, 2023)



Core Photograph 1, Boring TB-01, Box 1, 50 to 57.5 feet



Core Photograph 2, Boring TB-01, 50 to 52 feet



Core Photograph 3, Boring TB-01, 52 to 57 feet



Core Photograph 4, Boring TB-01, 57 to 62 feet



Core Photograph 5, Boring TB-01, Box 2, 57.5 to 67 feet



Core Photograph 6, Boring TB-01, 62 to 67 feet



Core Photograph 7, Boring TB-01, Box 3, 67 to 72 feet



Core Photograph 8, Boring TB-01, 67 to 72 feet

Boring TB-06 (Double-Barrel Diamond-Bit HQ size; August 30, 2023)



Core Photograph 9, Boring TB-06, Box 1, 50 to 59.5 feet



Core Photograph 10, Boring TB-06, 50 to 51 feet



Core Photograph 11, Boring TB-06, 51 to 56 feet



Core Photograph 12, Boring TB-06, 56 to 61 feet



Core Photograph 13, Boring TB-06, Box 2, 59.5 to 68 feet



Core Photograph 14, Boring TB-06, Box 3, 68 to 71 feet



Core Photograph 15, Boring TB-06, 61 to 66 feet



Core Photograph 16, Boring TB-06, 66 to 71 feet

Results of Laboratory Testing

Project Name:	Carson Water Treatment Facility	Date:	19-May-23
Project Number:	STN-2022-004	Tested By:	RA
Location:	Carson, Washington	Laboratory Number:	2022-M0184

Exploration Designation	Depth Range (feet)	Tare Number	Weight of Tare (g)	Weight of Tare + Wet Soil (g)	Weight of Tare + Dry Soil (g)	Weight of Dry Soil (g)	Weight of Water (g)	Water Content by Weight
TB-01	2.5 - 4	001	51.25	160.39	125.07	73.82	35.32	47.8%
TB-01	5 - 6.5	002	51.58	151.85	116.42	64.84	35.43	54.6%
TB-01	7.5 - 9	003	51.25	153.93	112.21	60.96	41.72	68.4%
TB-01	10 - 11.5	010	51.56	177.60	135.48	83.92	42.12	50.2%
TB-01	12 - 13.5	004	51.36	152.65	117.60	66.24	35.05	52.9%
TB-01	15 - 16.5	005	51.73	150.09	117.73	66.00	32.36	49.0%
TB-01	17.5 - 19	006	51.12	153.13	124.99	73.87	28.14	38.1%
TB-01	20 - 21.5	007	51.72	151.09	119.21	67.49	31.88	47.2%
TB-01	25 - 26.5	008	51.82	150.64	113.11	61.29	37.53	61.2%
TB-01	30 - 31.5	009	51.49	174.70	129.77	78.28	44.93	57.4%
TB-01	35 - 36.5	012	51.54	155.26	114.23	62.69	41.03	65.4%
TB-01	40 - 41.5	011	51.61	155.58	115.37	63.76	40.21	63.1%
TB-02	2.5 - 4	013	50.29	158.28	121.15	70.86	37.13	52.4%
TB-02	5 - 6.5	014	51.22	157.17	119.92	68.70	37.25	54.2%
TB-02	7.5 - 9	015	51.55	152.25	119.88	68.33	32.37	47.4%
TB-02	10 - 11.5	016	51.66	152.39	117.96	66.30	34.43	51.9%
TB-02	12.5 - 14	017	51.69	179.03	134.62	82.93	44.41	53.6%
TB-02	15 - 16.5	018	51.58	154.26	123.66	72.08	30.60	42.5%
TB-02	17.5 - 19	019	51.37	161.21	129.36	77.99	31.85	40.8%
TB-02	20 - 21.5	020	51.76	152.62	120.82	69.06	31.80	46.0%
TB-03	2.5 - 4	021	51.01	154.74	121.94	70.93	32.80	46.2%
TB-03	5 - 6.5	022	51.79	67.34	61.95	10.16	5.39	53.1%
TB-03	7.5 - 9	023	51.75	150.18	114.85	63.10	35.33	56.0%
TB-03	10 - 11.5	024	51.70	156.26	118.17	66.47	38.09	57.3%

Project Name:	Carson Water Treatment Facility	Date:	19-May-23
Project Number:	STN-2022-004	Tested By:	RA
Location:	Carson, Washington	Laboratory Number:	2022-M0184

Exploration Designation	Depth Range (feet)	Tare Number	Weight of Tare (g)	Weight of Tare + Wet Soil (g)	Weight of Tare + Dry Soil (g)	Weight of Dry Soil (g)	Weight of Water (g)	Water Content by Weight
TB-03	12.5 - 14	025	51.66	151.37	117.30	65.64	34.07	51.9%
TB-03	15 - 16.5	026	51.94	150.98	114.28	62.34	36.70	58.9%
TB-03	17.5 - 19	027	51.58	157.91	125.71	74.13	32.20	43.4%
TB-03	20 - 21.5	028	51.48	151.84	116.07	64.59	35.77	55.4%
TB-04	2.5 - 4	029	51.55	156.28	124.26	72.71	32.02	44.0%
TB-04	5 - 6.5	030	51.67	132.64	105.38	53.71	27.26	50.8%
TB-04	7.5 - 9	031	51.46	152.09	117.52	66.06	34.57	52.3%
TB-04	10 - 11.5	032	50.88	153.34	115.96	65.08	37.38	57.4%
TB-04	12.5 - 14	033	50.88	154.75	116.84	65.96	37.91	57.5%
TB-04	15 - 16.5	034	52.00	154.27	121.03	69.03	33.24	48.2%
TB-04	17.5 - 19	036	51.17	179.83	142.42	91.25	37.41	41.0%
TB-04	20 - 21.5	038	51.82	151.71	120.99	69.17	30.72	44.4%

Project Name:	Carson Water Treatment Facility	Date:	2-Sep-23
Project Number:	STN-2022-004	Tested By:	RA
Location:	Carson, Washington	Laboratory Number:	2022-M0189

Exploration Designation	Depth Range (feet)	Tare Number	Weight of Tare (g)	Weight of Tare + Wet Soil (g)	Weight of Tare + Dry Soil (g)	Weight of Dry Soil (g)	Weight of Water (g)	Water Content by Weight
TB-05	2.5 - 4	001	51.25	161.05	127.36	76.11	33.69	44.3%
TB-05	5 - 6.5	002	51.58	167.40	125.69	74.11	41.71	56.3%
TB-05	7.5 - 9	003	51.25	170.19	126.90	75.65	43.29	57.2%
TB-05	10 - 11.5	010	51.56	150.88	114.71	63.15	36.17	57.3%
TB-05	12.5 - 14	004	51.36	219.14	168.48	117.12	50.66	43.3%
TB-05	15 - 16.5	005	51.73	184.22	149.69	97.96	34.53	35.2%
TB-05	17.5 - 19	006	51.12	174.10	137.45	86.33	36.65	42.5%
TB-05	25 - 26.5	008	51.82	193.84	142.40	90.58	51.44	56.8%
TB-05	30 - 31.5	009	51.49	180.13	129.68	78.19	50.45	64.5%
TB-05	35 - 36.5	012	51.54	165.58	120.17	68.63	45.41	66.2%
TB-05	40 - 41.5	011	51.61	190.45	140.87	89.26	49.58	55.5%
TB-05	45 - 46.5	013	50.29	160.83	119.30	69.01	41.53	60.2%
TB-06	2.5 - 4	021	51.01	181.22	138.41	87.40	42.81	49.0%
TB-06	5 - 6.5	014	51.22	165.80	123.53	72.31	42.27	58.5%
TB-06	7.5 - 9	015	51.55	165.89	123.14	71.59	42.75	59.7%
TB-06	10 - 11.5	016	51.66	175.11	131.74	80.08	43.37	54.2%
TB-06	12.5 - 14	017	51.69	210.11	154.44	102.75	55.67	54.2%
TB-06	17.5 - 19	019	51.37	198.99	160.95	109.58	38.04	34.7%
TB-06	20 - 21.5	020	51.76	191.55	146.02	94.26	45.53	48.3%
TB-06	25 - 26.5	021	51.01	177.08	132.91	81.90	44.17	53.9%
TB-06	30 - 31.5	022	51.79	182.55	131.09	79.30	51.46	64.9%
TB-06	35 - 36.5	023	51.75	196.06	139.04	87.29	57.02	65.3%
TB-06	40 - 41.5	024	51.70	171.38	126.16	74.46	45.22	60.7%
TB-06	45 - 46.5	025	51.66	155.23	117.92	66.26	37.31	56.3%

Project Name:	Carson Water Treatment Facility	Date:	2-Sep-23
Project Number:	STN-2022-004	Tested By:	RA
Location:	Carson, Washington	Laboratory Number:	2022-M0189

Exploration Designation	Depth Range (feet)	Tare Number	Weight of Tare (g)	Weight of Tare + Wet Soil (g)	Weight of Tare + Dry Soil (g)	Weight of Dry Soil (g)	Weight of Water (g)	Water Content by Weight
TB-07	2.5 - 4	026	51.94	169.44	132.20	80.26	37.24	46.4%
TB-07	5 - 6.5	028	51.48	167.12	126.44	74.96	40.68	54.3%
TB-07	7.5 - 9	029	51.55	162.57	121.04	69.49	41.53	59.8%
TB-07	10 - 11.5	030	51.67	198.21	144.10	92.43	54.11	58.5%
TB-07	14 - 15.5	032	50.88	163.17	122.06	71.18	41.11	57.8%
TB-07	17.5 - 19	033	50.88	178.16	145.00	94.12	33.16	35.2%
TB-07	20 - 21.5	034	52.00	155.87	128.34	76.34	27.53	36.1%
TB-07	24.25 - 25.75	036	51.17	189.52	161.09	109.92	28.43	25.9%

Project Name:	Carson WTP	Date:	14-Apr-25
Project Number:	STN-2023-004	Tested By:	RA
Location:	Carson, WA	Laboratory Number:	m 221

Boring Number	Depth			Tare Number	Weight of Tare	Weight of Tare + Wet Soil	Weight of Tare + Dry Soil	Weight of Dry Soil	Weight of Water	Water Content by Weight
TB-08	2.5	-	4	002	51.58	157.77	128.38	76.8	29.39	38.3%
	5	-	6.5	003	51.25	153.11	114.7	63.45	38.41	60.5%
	7.5		9	010	51.56	157.73	120.02	68.46	37.71	55.1%
	10		11.5	004	51.36	157.8	120.84	69.48	36.96	53.2%
TB-09	1		2.5	005	51.73	161.04	125.7	73.97	35.34	47.8%
	3.5		5	006	51.12	155.29	121.17	70.05	34.12	48.7%
TB-10	1		2.5	007	51.72	157.05	120.95	69.23	36.1	52.1%
	3		4.5	008	51.82	157.55	122.97	71.15	34.58	48.6%

Project Name:	Carson Water Treatment Facility	Date:	19-May-23
Project Number:	STN-2022-004	Tested By:	PH/JH
Location:	Carson, Washington	Laboratory Number:	2022-P0184

Exploration Designation	Depth Range (feet)	Tare Number	Weight of Tare (g)	Weight of Tare + Wet Soil (g)	Weight of Tare + Dry Soil (g)	Weight of Dry Soil (g)	Weight of Water (g)	Water Content by Weight
TB-01	5 - 6.5	P	194.00	349.34	291.02	97.02	58.32	60.1%
TB-01	10 - 11	M	194.61	363.22	304.67	110.06	58.55	53.2%
TB-01	15 - 16.5	J	193.63	393.02	327.92	134.29	65.10	48.5%
TB-01	20 - 21.5	E	196.80	337.99	295.32	98.52	42.67	43.3%
TB-01	25 - 26.5	K	186.39	312.03	262.31	75.92	49.72	65.5%
TB-01	30 - 31.5	C	196.61	363.09	293.08	96.47	70.01	72.6%
TB-01	33 - 34	F	195.24	312.25	264.50	69.26	47.75	68.9%
TB-01	35 - 36.5	D	194.03	315.92	262.52	68.49	53.40	78.0%
TB-01	40 - 41.5	Q	193.87	368.16	315.86	121.99	52.30	42.9%

Post Wash			
Weight of Dry Soil > #200	Percent Gravels	Percent Sands	Percent Fines
20.30	0.0%	20.9%	79.1%
28.23	7.3%	18.4%	74.4%
41.35	0.0%	30.8%	69.2%
12.57	0.0%	12.8%	87.2%
9.07	0.0%	11.9%	88.1%
11.11	0.0%	11.5%	88.5%
5.33	0.0%	7.7%	92.3%
8.37	0.0%	12.2%	87.8%
64.61	26.4%	26.5%	47.0%

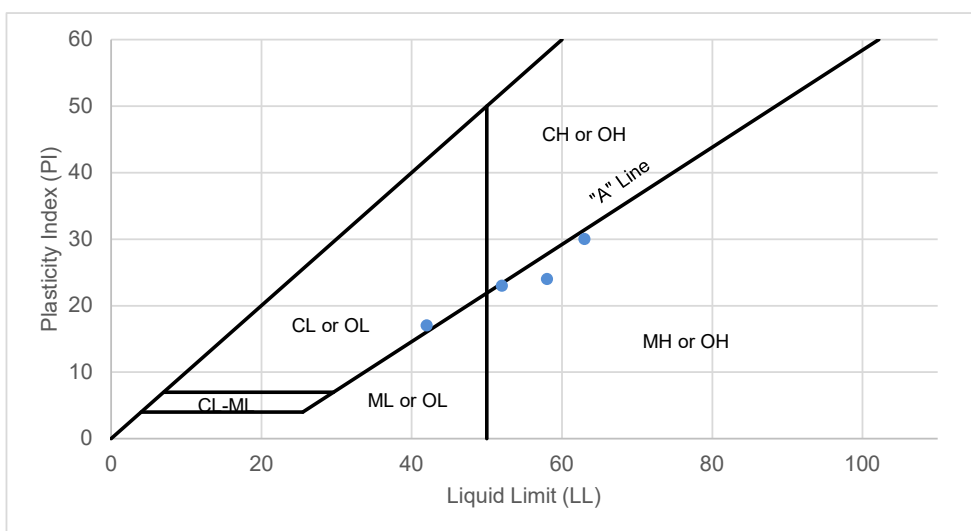
Project Name:	Carson WTP	Date:	1-Sep-23
Project Number:	STN-2022-004	Tested By:	JH/PH
Location:	Carson, WA	Laboratory Number:	2022-P

Boring Number	Depth	Tare Number	Weight of Tare	Weight of Tare + Wet Soil	Weight of Tare + Dry Soil	Weight of Dry Soil	Weight of Water	Water Content by Weight	Weight of Dry Soil + Tare > #200	Post Wash				
										Weight of Dry Soil > #4	Weight of Dry Soil > #200	Percent Gravels	Percent Sands	Percent Fines
TB-06	5 - 6.5	C	196.72	304.17	263.40	66.68	40.77	61.1%	207.88	11.16	11.16	16.7%	0.0%	83.3%
TB-06	30 - 31.5	P	193.93	312.24	263.13	69.20	49.11	71.0%	203.77	9.84	9.84	14.2%	0.0%	85.8%
TB-06	35 - 36.5	H	194.12	284.27	247.01	52.89	37.26	70.4%	198.78	4.66	4.66	8.8%	0.0%	91.2%
TB-06	45 - 46.5	D	193.91	327.09	275.05	81.14	52.04	64.1%	201.11	7.20	7.20	8.9%	0.0%	91.1%
TB-07	11 - 12	J	193.77	284.06	250.80	57.03	33.26	58.3%	206.88	13.11	13.11	23.0%	0.0%	77.0%
TB-07	23 - 24	L	193.13	358.91	309.41	116.28	49.50	42.6%	232.70	39.57	39.57	34.0%	0.0%	66.0%
TB-09	3.5 - 4	H	202.93	369.23	312.58	109.65	56.65	51.7%	222.86	0.00	19.93	0.0%	18.2%	81.8%
TB-10	3.5 - 4	M	205.17	335.21	288.33	83.16	46.88	56.4%	210.49	0.00	5.32	0.0%	6.4%	93.6%



Project Name:	Carson Water Treatment Facility	Date:	15-Aug-23
Project Number:	STN-2022-004	Tested By:	ACS Project No. 23-3689
Location:	Carson, Washington	Lab Number:	2022-Att0184

Exploration Designation	Depth Range (feet)	Liquid Limit	Plastic Limit	Plasticity Index	Symbol	Plasticity
TB-01	5 - 6.5	63	33	30	MH	High
TB-01	15 - 16.5	42	25	17	CL	Medium
TB-01	25 - 26.5	52	29	23	MH	High
TB-01	33 - 34	58	34	24	MH	High



Note: Graphical representation of testing conducted by Others, See Attached for test results



8/17/2023

Client RHINO ONE GEOTECHNICAL
Address

Atterberg Limits 1 Pt.

ASTM: D-4318 AASHTO: T-89, T-90

Project No 23-3689
Client Reference No
Barcode 1TL
Material Source B1 @ 33-34, B1@15-16.5, B1@5-6.5,
B1@25-26.5

Date Tested 8/15/2023
Sample Rec. Date
Date Sampled
Sampled By Client

Material Description

Project CARSON WTP 23-3689

Location Detail

Comment of Deviations

LL = 63

PL = 33

PI = 30

Comments B1@5-6.5

Tested By Jerry Frampton
Digital Signature By User Login

Manager Jerry Frampton
Digital Signature By User Login

Lab Equipment Scale1 - Oven2 - Atterberg Cup1 - Atterberg Plate2

Test results relate only to the sample tested. This test report shall not reproduced, except in full, without the prior written approval of ACS Testing.

Lab Address

System Link <http://acstesting.vahalo.com/assignments/F24C9753-B688-46F3-44D0-CC719F46D274>

System Path CARSON WTP 23-3689 / SOILS / AGGREGATE LAB / 23-3689 LLPlasticLimit1pt JF230816-3



8/17/2023

Client RHINO ONE GEOTECHNICAL
Address

Atterberg Limits 1 Pt.

ASTM: D-4318 AASHTO: T-89, T-90

Project No 23-3689
Client Reference No
Barcode 1TL
Material Source B1 @ 33-34, B1@15-16.5, B1@5-6.5,
B1@25-26.5

Date Tested 8/15/2023
Sample Rec. Date
Date Sampled
Sampled By Client

Material Description

Project CARSON WTP 23-3689

Location Detail

Comment of Deviations

LL = 42

PL = 25

PI = 17

Comments B1@15-16.5

Tested By Jerry Frampton
Digital Signature By User Login

Manager Jerry Frampton
Digital Signature By User Login

Lab Equipment Scale1 - Oven1 - Atterberg Cup2 - Atterberg Plate1

Test results relate only to the sample tested. This test report shall not reproduced, except in full, without the prior written approval of ACS Testing.

Lab Address

System Link <http://acstesting.vahalo.com/assignments/209359A1-7D2B-4927-8CEF-AC36FCF9C617>

System Path CARSON WTP 23-3689 / SOILS / AGGREGATE LAB / 23-3689 LLPlasticLimit1pt JF230816-2



8/17/2023

Client RHINO ONE GEOTECHNICAL
Address

Atterberg Limits 1 Pt.

ASTM: D-4318 AASHTO: T-89, T-90

Project No 23-3689
Client Reference No
Barcode 1TL
Material Source B1 @ 33-34, B1@15-16.5, B1@5-6.5,
B1@25-26.5

Date Tested 8/15/2023
Sample Rec. Date
Date Sampled
Sampled By Client

Material Description

Project CARSON WTP 23-3689

Location Detail

Comment of Deviations

LL = 52

PL = 29

PI = 23

Comments B1@25-26.5

Tested By Jerry Frampton
Digital Signature By User Login

Manager Jerry Frampton
Digital Signature By User Login

Lab Equipment Scale1 - Oven1 - Atterberg Cup1 - Atterberg Plate1

Test results relate only to the sample tested. This test report shall not reproduced, except in full, without the prior written approval of ACS Testing.

Lab Address

System Link <http://acstesting.vahalo.com/assignments/E902990D-F660-4E12-A59C-AFE0CB7EA924>

System Path CARSON WTP 23-3689 / SOILS / AGGREGATE LAB / 23-3689 LLPlasticLimit1pt JF230816-4



8/17/2023

Client RHINO ONE GEOTECHNICAL
Address

Atterberg Limits 1 Pt.

ASTM: D-4318 AASHTO: T-89, T-90

Project No 23-3689
Client Reference No
Barcode 1TL
Material Source B1 @ 33-34, B1@15-16.5, B1@5-6.5,
B1@25-26.5

Date Tested 8/15/2023
Sample Rec. Date
Date Sampled
Sampled By Client

Material Description

Project CARSON WTP 23-3689

Location Detail

Comment of Deviations

LL = 58

PL = 34

PI = 24

Comments B1@33-34

Tested By Jerry Frampton
Digital Signature By User Login

Manager Jerry Frampton
Digital Signature By User Login

Lab Equipment Scale1 - Oven1 - Atterberg Cup1 - Atterberg Plate1

Test results relate only to the sample tested. This test report shall not reproduced, except in full, without the prior written approval of ACS Testing.

Lab Address

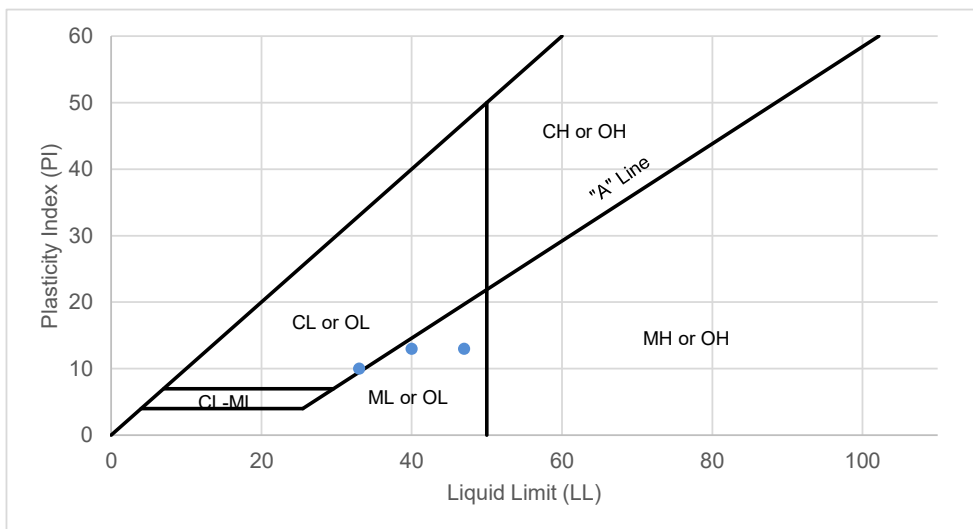
System Link <http://acstesting.vahalo.com/assignments/3ADA15F3-7FF3-41F8-5AD9-4664D665031D>

System Path CARSON WTP 23-3689 / SOILS / AGGREGATE LAB / 23-3689 LLPlasticLimit1pt JF230816-1



Project Name:	Carson Water Treatment Facility	Date:	11-Sep-23
Project Number:	STN-2022-004	Tested By:	ACS Lab # 23-3689
Location:	Carson, Washington	Lab Number:	2023-Att0189

Exploration Designation	Depth Range (feet)	Liquid Limit	Plastic Limit	Plasticity Index	Symbol	Plasticity
TB-06	30 - 31.5	40	27	13	ML	Low
TB-06	45 - 46.5	47	34	13	ML	Low
TB-07	23 - 24	33	23	10	ML	Low



Note: Graphical representation of testing conducted by Others, See Attached for test results



9/14/2023

Client RHINO ONE GEOTECHNICAL
Address

Atterberg Limits 1 Pt.

ASTM: D-4318 AASHTO: T-89, T-90

Project No 23-3689
Client Reference No
Barcode 240
Material Source
Material Description
Project CARSON WTP 23-3689
Location Detail
Comment of Deviations

Date Tested 9/11/2023
Sample Rec. Date 9/6/2023
Date Sampled
Sampled By

LL = 40

PL = 27

PI = 13

Comments B-6 30'-31.5'

Tested By Dan Hamilton
Digital Signature By User Login

Manager Dan Hamilton
Digital Signature By User Login

Lab Equipment Scale1 - Oven1 - Atterberg Cup1 - Atterberg Plate1

Test results relate only to the sample tested. This test report shall not reproduced, except in full, without the prior written approval of ACS Testing.

Lab Address

System Link <http://acstesting.vahalo.com/assignments/1D81C8EA-4854-4C72-5DA7-90EDC7AB8CFF>

System Path CARSON WTP 23-3689 / SOILS / AGGREGATE LAB / 23-3689 LLPlasticLimit1pt DH230912-1



9/14/2023

Client RHINO ONE GEOTECHNICAL
Address

Atterberg Limits 1 Pt.

ASTM: D-4318 AASHTO: T-89, T-90

Project No 23-3689
Client Reference No
Barcode 240
Material Source
Material Description
Project CARSON WTP 23-3689
Location Detail
Comment of Deviations

Date Tested 9/11/2023
Sample Rec. Date 9/8/2023
Date Sampled
Sampled By

LL = 47

PL = 34

PI = 13

Comments B6 45'-46.5'

Tested By Dan Hamilton
Digital Signature By User Login

Manager Dan Hamilton
Digital Signature By User Login

Lab Equipment Scale1 - Oven1 - Atterberg Cup1 - Atterberg Plate1

Test results relate only to the sample tested. This test report shall not reproduced, except in full, without the prior written approval of ACS Testing.

Lab Address

System Link <http://acstesting.vahalo.com/assignments/481FC14C-7FA7-4823-6505-40F27DCF95ED>

System Path CARSON WTP 23-3689 / SOILS / AGGREGATE LAB / 23-3689 LLPlasticLimit1pt DH230913-1



9/14/2023

Client RHINO ONE GEOTECHNICAL
Address

Atterberg Limits 1 Pt.

ASTM: D-4318 AASHTO: T-89, T-90

Project No 23-3689
Client Reference No
Barcode 240
Material Source
Material Description
Project CARSON WTP 23-3689
Location Detail
Comment of Deviations

Date Tested 9/11/2023
Sample Rec. Date 9/8/2023
Date Sampled
Sampled By

LL = 33

PL = 23

PI = 10

Comments B7 23'-24'

Tested By Dan Hamilton
Digital Signature By User Login

Manager Dan Hamilton
Digital Signature By User Login

Lab Equipment Scale1 - Oven1 - Atterberg Cup1 - Atterberg Plate1

Test results relate only to the sample tested. This test report shall not reproduced, except in full, without the prior written approval of ACS Testing.

Lab Address

System Link <http://acstesting.vahalo.com/assignments/3E075EB8-FE12-41E0-58E6-F487FD74B56F>

System Path CARSON WTP 23-3689 / SOILS / AGGREGATE LAB / 23-3689 LLPlasticLimit1pt DH230913-2



Specialty Analytical

9011 SE Jannsen Rd
Clackamas, OR 97015
TEL: (503) 607-1331

Website: www.specialtyanalytical.com

May 31, 2023

Rajiv Ali
Rhino One Geotechnical
4610 NE 77th Ave, suite 126
Vancouver, WA 98662
TEL: (360) 258-1738
FAX:

RE: Carson WTP/ STN-2022-004

Order No.: 2305231

Dear Rajiv Ali:

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

A handwritten signature in black ink, appearing to read "Marty French".

Marty French
Lab Director

Specialty Analytical

WO#: 2305231

Date Reported: 5/31/2023

CLIENT: Rhino One Geotechnical
Project: Carson WTP/ STN-2022-004

Lab ID: 2305231-001
Client Sample ID B-1, 2 & 3, 5'-6.5'

Matrix:
Collection Date: 5/18/2023 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
WATER SOLUBLE SULFATE ION				T290-95	SW9056PR	Analyst: NK
Sulfate	4.10	0.248		mg/Kg	1	5/26/2023 1:07:00 PM
SOIL RESISTIVITY				T288-91		Analyst: AT
Minimum Soil Resistivity	2700	1.00		ohm-cm	1	5/26/2023 12:12:16 PM
WATER SOLUBLE CHLORIDE				T291-94	SW9056PR	Analyst: NK
Chloride	ND	0.991		mg/Kg	1	5/26/2023 1:07:00 PM
PH OF SOIL-CORROSION TESTING				T289-91		Analyst: AT
pH	6.11	0		pH Units	1	5/25/2023 2:40:39 PM

Lab ID: 2305231-002
Client Sample ID B-1, 2 & 3, 10'-11.5'

Matrix:
Collection Date: 5/18/2023 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
WATER SOLUBLE SULFATE ION				T290-95	SW9056PR	Analyst: NK
Sulfate	2.45	0.248		mg/Kg	1	5/26/2023 1:52:00 PM
SOIL RESISTIVITY				T288-91		Analyst: AT
Minimum Soil Resistivity	3700	1.00		ohm-cm	1	5/26/2023 12:17:16 PM
WATER SOLUBLE CHLORIDE				T291-94	SW9056PR	Analyst: NK
Chloride	ND	0.991		mg/Kg	1	5/26/2023 1:52:00 PM
PH OF SOIL-CORROSION TESTING				T289-91		Analyst: AT
pH	6.18	0		pH Units	1	5/25/2023 2:46:39 PM

QC SUMMARY REPORT

Specialty Analytical

WO#: 2305231

5/31/2023

Client: Rhino One Geotechnical
Project: Carson WTP/ STN-2022-004

TestCode: CL_AASHTO

Sample ID: CCV 20 PPM		SampType: CCV		TestCode: CL_AASHTO		Units: mg/Kg		Prep Date:			RunNo: 49516			
Client ID: CCV		Batch ID: 21440		TestNo: T291-94		SW9056PR		Analysis Date: 5/26/2023			SeqNo: 636886			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride		20.3		1.00	20.00	0		101	90	110				

Sample ID: 2305231-001ADUP		SampType: DUP		TestCode: CL_AASHTO		Units: mg/Kg		Prep Date: 5/26/2023			RunNo: 49516			
Client ID: B-1, 2 & 3, 5'-6.5'		Batch ID: 21440		TestNo: T291-94		SW9056PR		Analysis Date: 5/26/2023			SeqNo: 636888			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride		ND		0.992							0	0	20	

Sample ID: CCV 20 PPM		SampType: CCV		TestCode: CL_AASHTO		Units: mg/Kg		Prep Date:		RunNo: 49516			
Client ID: CCV		Batch ID: 21440		TestNo: T291-94		SW9056PR		Analysis Date: 5/26/2023		SeqNo: 636890			
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride		20.6		1.00	20.00	0	103	90	110				

Sample ID: MBLK	SampType: MBLK	TestCode: CL_AASHTO	Units: mg/Kg	Prep Date:	RunNo: 49516						
Client ID: PBS	Batch ID: 21440	TestNo: T291-94	SW9056PR	Analysis Date: 5/26/2023	SeqNo: 636894						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	1.00									

Qualifiers: H Holding times for preparation or analysis exceeded S Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Specialty Analytical

WO#: 2305231
5/31/2023

Client: Rhino One Geotechnical
Project: Carson WTP/ STN-2022-004
TestCode: CL_AASHTO

Sample ID: MBLK	SampType: MBLK	TestCode: CL_AASHTO	Units: mg/Kg	Prep Date:	RunNo: 49516						
Client ID: PBS	Batch ID: 21440	TestNo: T291-94	SW9056PR	Analysis Date: 5/26/2023	SeqNo: 636894						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: LCS	SampType: LCS	TestCode: CL_AASHTO	Units: mg/Kg	Prep Date:	RunNo: 49516						
Client ID: LCSS	Batch ID: 21440	TestNo: T291-94	SW9056PR	Analysis Date: 5/26/2023	SeqNo: 636895						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	10.6	1.00	10.00	0	106	85	115				

Qualifiers: H Holding times for preparation or analysis exceeded S Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Specialty Analytical

WO#: 2305231
5/31/2023

Client: Rhino One Geotechnical
Project: Carson WTP/ STN-2022-004

TestCode: PH_AASHTO

Sample ID: 2305231-001ADUP		SampType: DUP		TestCode: PH_AASHTO		Units: pH Units		Prep Date:		RunNo: 49497	
Client ID: B-1, 2 & 3, 5'-6.5'		Batch ID: R49497		TestNo: T289-91				Analysis Date: 5/25/2023		SeqNo: 636626	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	6.25	0						6.110	2.27	20	

Qualifiers: H Holding times for preparation or analysis exceeded S Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Specialty Analytical

WO#: 2305231

5/31/2023

Client: Rhino One Geotechnical
Project: Carson WTP/ STN-2022-004

TestCode: T290_95

Sample ID: CCV 20 PPM		SampType: CCV		TestCode: T290_95		Units: mg/Kg		Prep Date:		RunNo: 49517			
Client ID: CCV		Batch ID: 21440		TestNo: T290-95		SW9056PR		Analysis Date: 5/26/2023		SeqNo: 637450			
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate		20.4		0.250	20.00	0	102	90	110				

Sample ID: 2305231-001ADUP		SampType: DUP		TestCode: T290_95		Units: mg/Kg		Prep Date: 5/26/2023		RunNo: 49517			
Client ID: B-1, 2 & 3, 5'-6.5'		Batch ID: 21440		TestNo: T290-95		SW9056PR		Analysis Date: 5/26/2023		SeqNo: 637452			
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate		4.70		0.248						4.103	13.5	20	

Sample ID: CCV 20 PPM		SampType: CCV		TestCode: T290_95		Units: mg/Kg		Prep Date:		RunNo: 49517		
Client ID: CCV		Batch ID: 21440		TestNo: T290-95		SW9056PR		Analysis Date: 5/26/2023		SeqNo: 637454		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate		21.3	0.250	20.00	0	106	90	110				

Sample ID: MBLK		SampType: MBLK		TestCode: T290_95		Units: mg/Kg		Prep Date:		RunNo: 49517			
Client ID: PBS		Batch ID: 21440		TestNo: T290-95		SW9056PR		Analysis Date: 5/26/2023		SeqNo: 637458			
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate		ND		0.250									

Qualifiers: H Holding times for preparation or analysis exceeded S Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Specialty Analytical

WO#: 2305231
5/31/2023

Client: Rhino One Geotechnical
Project: Carson WTP/ STN-2022-004

TestCode: T290_95

Sample ID: MBLK		SampType: MBLK		TestCode: T290_95		Units: mg/Kg		Prep Date:		RunNo: 49517			
Client ID: PBS		Batch ID: 21440		TestNo: T290-95		SW9056PR		Analysis Date: 5/26/2023		SeqNo: 637458			
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: LCS	SampType: LCS	TestCode: T290_95	Units: mg/Kg	Prep Date:	RunNo: 49517						
Client ID: LCSS	Batch ID: 21440	TestNo: T290-95	SW9056PR	Analysis Date: 5/26/2023	SeqNo: 637459						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	10.4	0.250	10.00	0	104	80	120				

Qualifiers: H Holding times for preparation or analysis exceeded S Spike Recovery outside accepted recovery limits



Specialty Analytical
9011 SE Jannsen Rd
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

Sample Receipt Checklist

Client Name RHINO_ONE

Work Order Number 2305231

RcptNo: 1

Date and Time Receive 5/24/2023 12:14:28 PM

Received by: Mandy Wehe

Completed by

Reviewed by:

Completed Date:

5/24/2023

Reviewed Date:

5/24/2023 1:40:11 PM

Carrier name: Client

Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☒	No ☐	Not Present ☐
Are matrices correctly identified on Chain of custody?	Yes ☒	No ☐	
Is it clear what analyses were requested?	Yes ☒	No ☐	
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☒
Samples in proper container/bottle?	Yes ☒	No ☐	
Were correct preservatives used and noted?	Yes ☒	No ☐	NA ☐
Sample containers intact?	Yes ☒	No ☐	
Sufficient sample volume for indicated test?	Yes ☒	No ☐	
Were container labels complete (ID, Pres, Date)?	Yes ☒	No ☐	
All samples received within holding time?	Yes ☒	No ☐	
Was an attempt made to cool the samples?	Yes ☐	No ☐	NA ☒
All samples received at a temp. of > 0° C to 6.0° C?	Yes ☐	No ☐	NA ☒
Response when temperature is outside of range:			
Preservative added to bottles:			
Sample Temp. taken and recorded upon receipt?	Yes ☒	No ☐	To 18.9 °C
Water - Were bubbles absent in VOC vials?	Yes ☐	No ☐	No Vials ☒
Water - Was there Chlorine Present?	Yes ☐	No ☐	NA ☒
Water - pH acceptable upon receipt?	Yes ☐	No ☐	NA ☒
Are Samples considered acceptable?	Yes ☒	No ☐	
Custody Seals present?	Yes ☐	No ☒	
Traffic Report or Packing Lists present?	Yes ☐	No ☒	
Airbill or Sticker?	Air Bill ☐	Sticker ☐	Not Present ☒
Airbill No:			
Sample Tags Present?	Yes ☐	No ☒	
Sample Tags Listed on COC?	Yes ☐	No ☒	
Tag Numbers:			
Sample Condition?	Intact ☒	Broken ☐	Leaking ☐

Case Number:

SDG:

SAS:

Adjusted? _____ Checked by

Any No and/or NA (not applicable) response must be detailed in the comments section be



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Sample Receipt Checklist

Client Contacted? ☐ Yes ☒ No ☐ NA Person Contacted: _____ Comments: _____
Contact Mode: ☐ Phone: ☐ Fax: ☐ Email: ☐ In Person: _____
Client Instructions: _____
Date Contacted: _____ Contacted By: _____
Regarding: _____
CorrectiveAction: _____

Relinquished x	Date/Time 5/24/23	Received x	Date/Time 5/24/23 12:10
Relinquished x	Date/Time	Received x	Date/Time
Relinquished x	Date/Time	Received x	Date/Time



Specialty Analytical
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Clackamas, Oregon 97015
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Website: www.specialtyanalytical.com

Definition Only

WO#: 2305231
Date: 5/31/2023

Definitions:

KEY TO FLAGS

- A: This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was qualified against gasoline calibration standards.
- A1: This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was qualified against diesel calibration standards.
- A2: This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was qualified against lube oil calibration standards.
- A3: The results was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
- A4: The product appears to be aged or degraded.
- B: The blank exhibited a positive result greater than the reporting limit for this compound.
- CN: See Case Narrative.
- E: Result exceeds the calibration range for this compound. The result should be considered an estimate.
- F: The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
- FS: Follow-up testing is suggested.
- G: Result may be biased high due to biogenic interferences. Clean up is recommended.
- H: Sample was analyzed outside recommended holding time.
- HT: ☐ At client's request, samples was analyzed outside of recommended holding time.
- HP: Sample was analyzed outside recommended holding time due to VOA having pH >2.
- J: The results for this analyte is between the MDL and the PQL and should be considered an
-



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Definition Only

WO#: 2305231

Date: 5/31/2023

Definitions:

estimated concentration.

K: Diesel result is biased high due to amount of Oil contained in the sample.

L: Diesel result is biased high due to amount of Gasoline contained in the sample.

M: Oil result is biased high due to amount of Diesel contained in the sample.

N: Gasoline result is biased high due to amount of Diesel contained in the sample.

MC: Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.

MI: Result is outside control limits due to matrix interference.

NH: Sample matrix is non-homogeneous

MSA: Value determined by Method of Standard Addition.

O: Laboratory Control Standard (LCS) exceeded laboratory control limits but meets CCV criteria. Data meets EPA requirements.

Q: Detection levels elevated due to sample matrix.

R: RPD control limits were exceeded

RF: Duplicate failed due to result being at or near the method-reporting limit.

RP: Matrix spike values exceed established QC limits; post digestion spike is in control.

S: Recovery is outside control limits.

SC: CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.

SL: LCS exceeded recovery control limits, but associated MS/MSD passing. Data meets EPA requirements.



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Definition Only

WO#: 2305231

Date: 5/31/2023

Definitions:

SV: CCV exceeded low recovery control limits. ND as reported evaluated using EPA method 8260D section 11.4.3.2

TA: Sample treated with ascorbic acid for the removal of thiocyanates.


RhinoOne
 GEOTECHNICAL

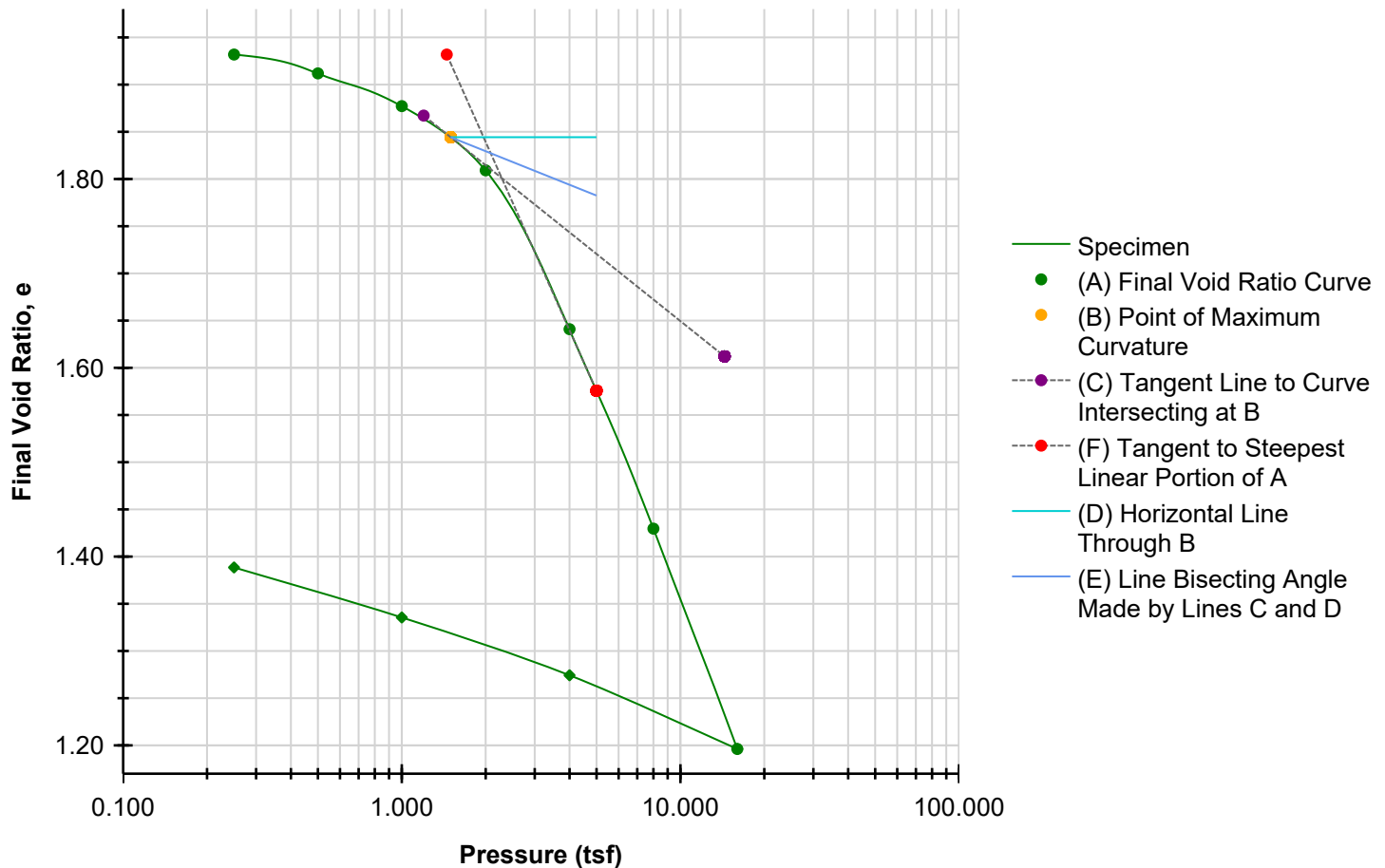
Final Voids [Log]

ASTM

RhinoOne Geotechnical

12308 NE 56th Street, Unit 1107

Vancouver, WA 98682



Preconsolidation Stress (tsf)	2.085	Cc	0.739	Cr	0.091
-------------------------------	-------	----	-------	----	-------

	BEFORE	AFTER	Liquid Limits	0	Test Date	5/22/2023
Moisture (%)	65.5	49.3	Plastic Limits	0		
Dry Density (pcf)	59.7	73.7				
Saturation (%)	94.8	100.1				
Void Ratio	1.95	1.39	Specific Gravity	2.815	ASSUMED	

Sample Description	2.5 inch diameter x 1 inch thick			Remarks
Project Number	STN-2022-004	Depth (ft)	33	
Sample Number	ST-11, 33-34 feet	Boring Number	TB-01	
Project	Carson Water Treatment Plant			
Client	Stantec			
Location	Kid Lane, Carson, Skamania County, Washington			

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: RA

Test Date: 5/22/2023

Checked By: _____

Date: _____


RhinoOne
 GEOTECHNICAL

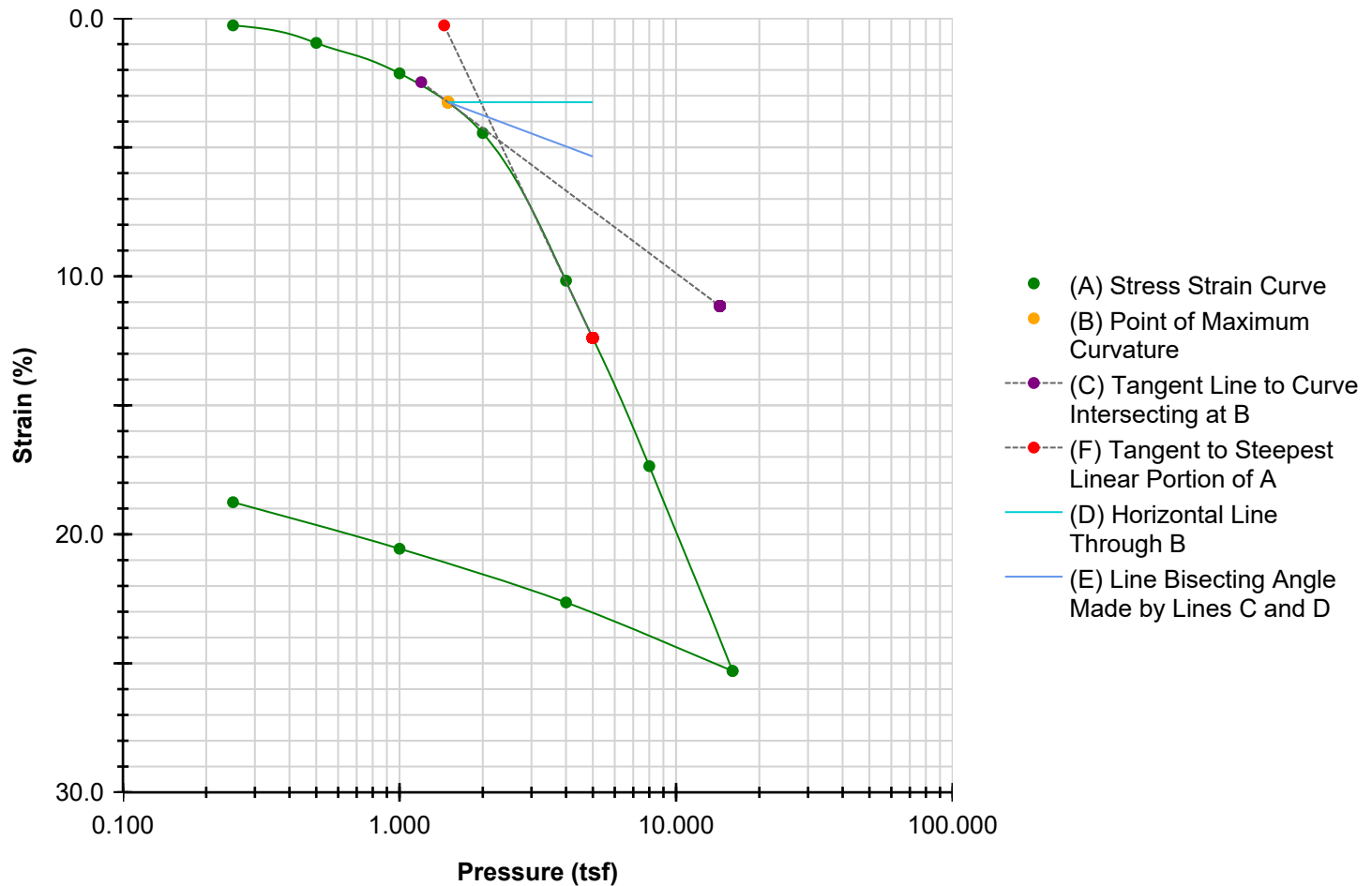
Percent Strain [Log]

ASTM

RhinoOne Geotechnical

12308 NE 56th Street, Unit 1107

Vancouver, WA 98682



Preconsolidation Stress (tsf)	2.085	Cc	NA	Cr	NA
-------------------------------	-------	----	----	----	----

	BEFORE	AFTER	Liquid Limits	0	Test Date 5/22/2023
Moisture (%)	65.5	49.3	Plastic Limits	0	
Dry Density (pcf)	59.7	73.7			
Saturation (%)	94.8	100.1			
Void Ratio	1.95	1.39	Specific Gravity	2.815	ASSUMED

Sample Description	2.5 inch diameter x 1 inch thick			Remarks
Project Number	STN-2022-004	Depth (ft)	33	
Sample Number	ST-11, 33-34 feet	Boring Number	TB-01	
Project	Carson Water Treatment Plant			
Client	Stantec			
Location	Kid Lane, Carson, Skamania County, Washington			

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: RA

Test Date: 5/22/2023

Checked By: _____

Date: _____



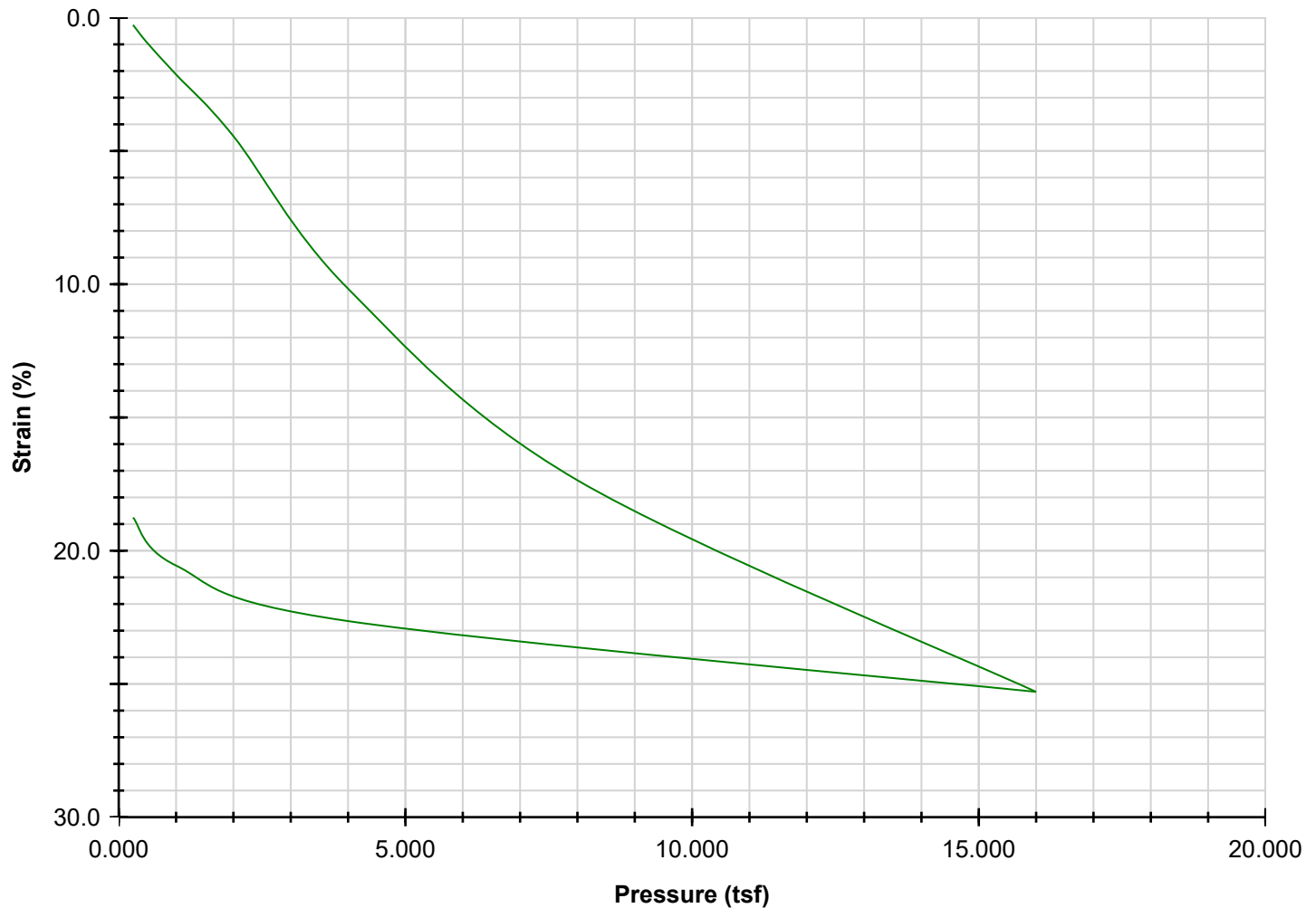
Percent Strain

ASTM

RhinoOne Geotechnical

12308 NE 56th Street, Unit 1107

Vancouver, WA 98682



	BEFORE	AFTER	Liquid Limits	0	Test Date 5/22/2023
Moisture (%)	65.5	49.3	Plastic Limits	0	
Dry Density (pcf)	59.7	73.7			
Saturation (%)	94.8	100.1			
Void Ratio	1.95	1.39	Specific Gravity	2.815	ASSUMED

Sample Description	2.5 inch diameter x 1 inch thick			Remarks
Project Number	STN-2022-004	Depth (ft)	33	
Sample Number	ST-11, 33-34 feet	Boring Number	TB-01	
Project	Carson Water Treatment Plant			
Client	Stantec			
Location	Kid Lane, Carson, Skamania County, Washington			

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: RA

Test Date: 5/22/2023

Checked By: _____

Date: _____

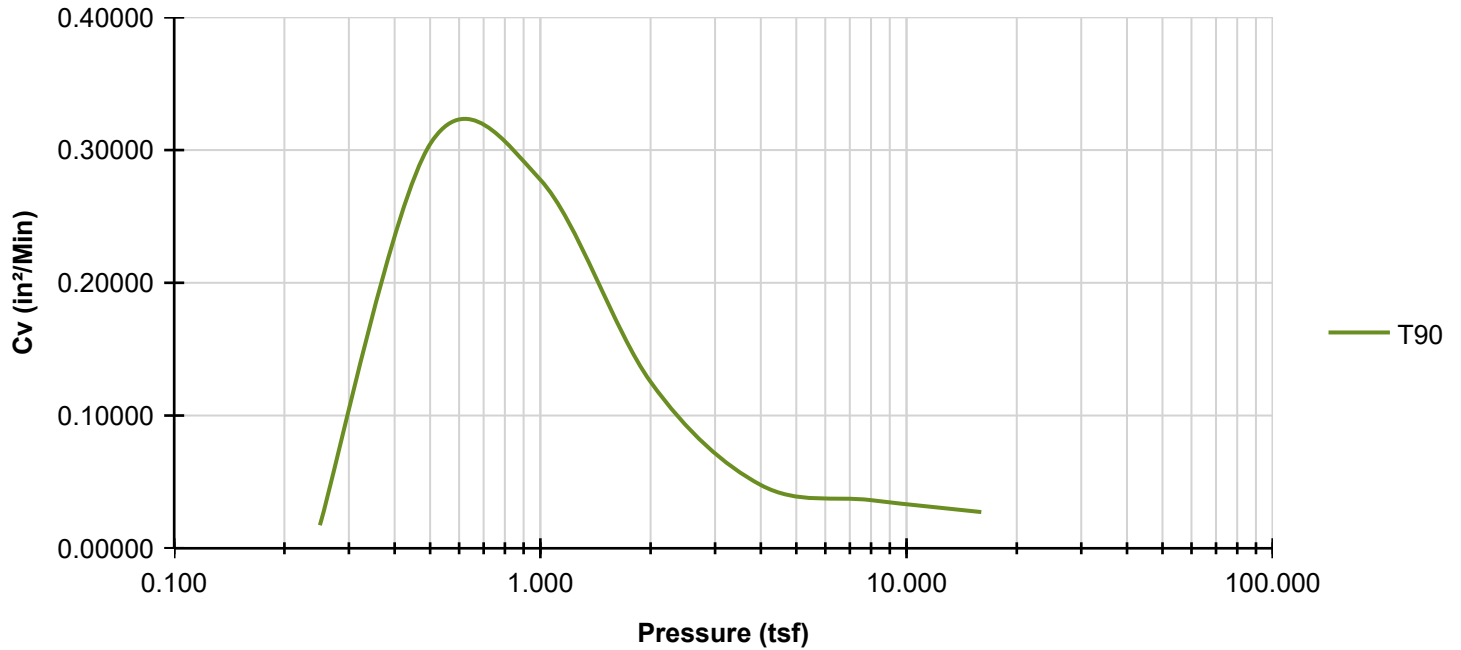


RhinoOne
GEOTECHNICAL

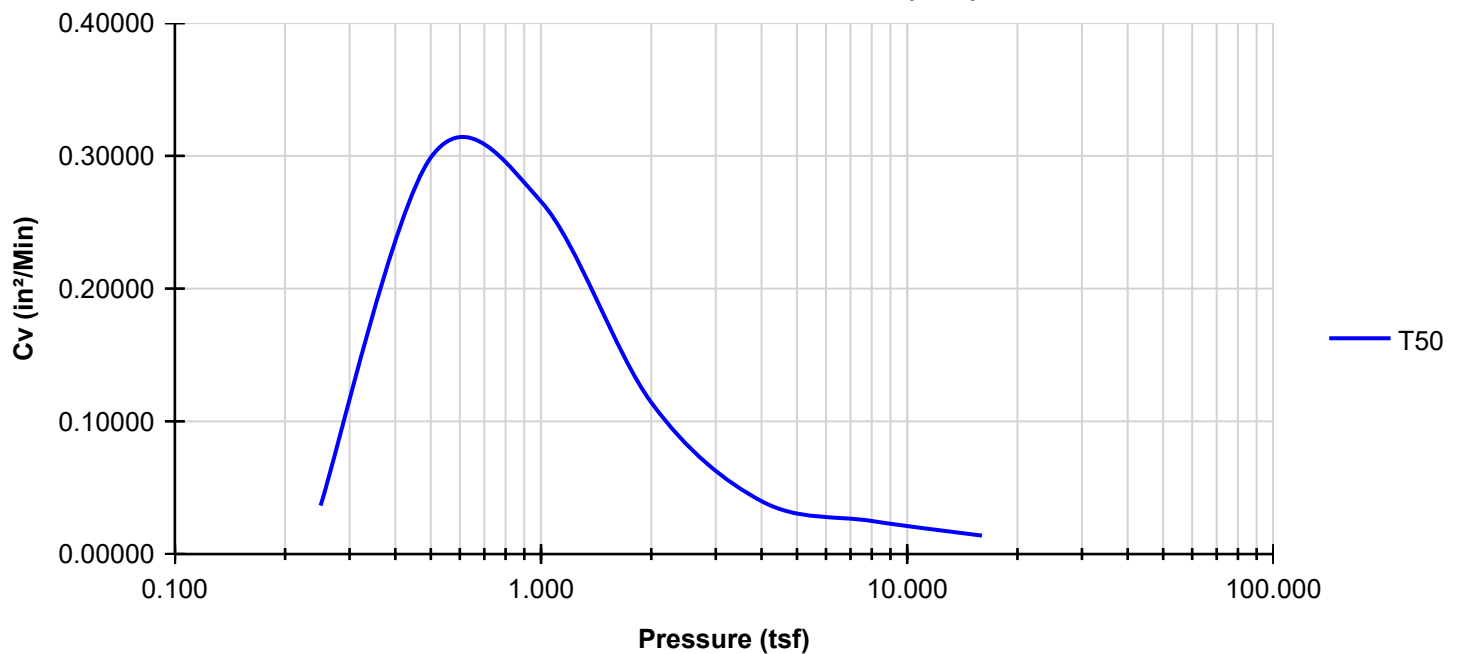
Coefficients of Consolidation

ASTM

Coefficients of Consolidation (T90)

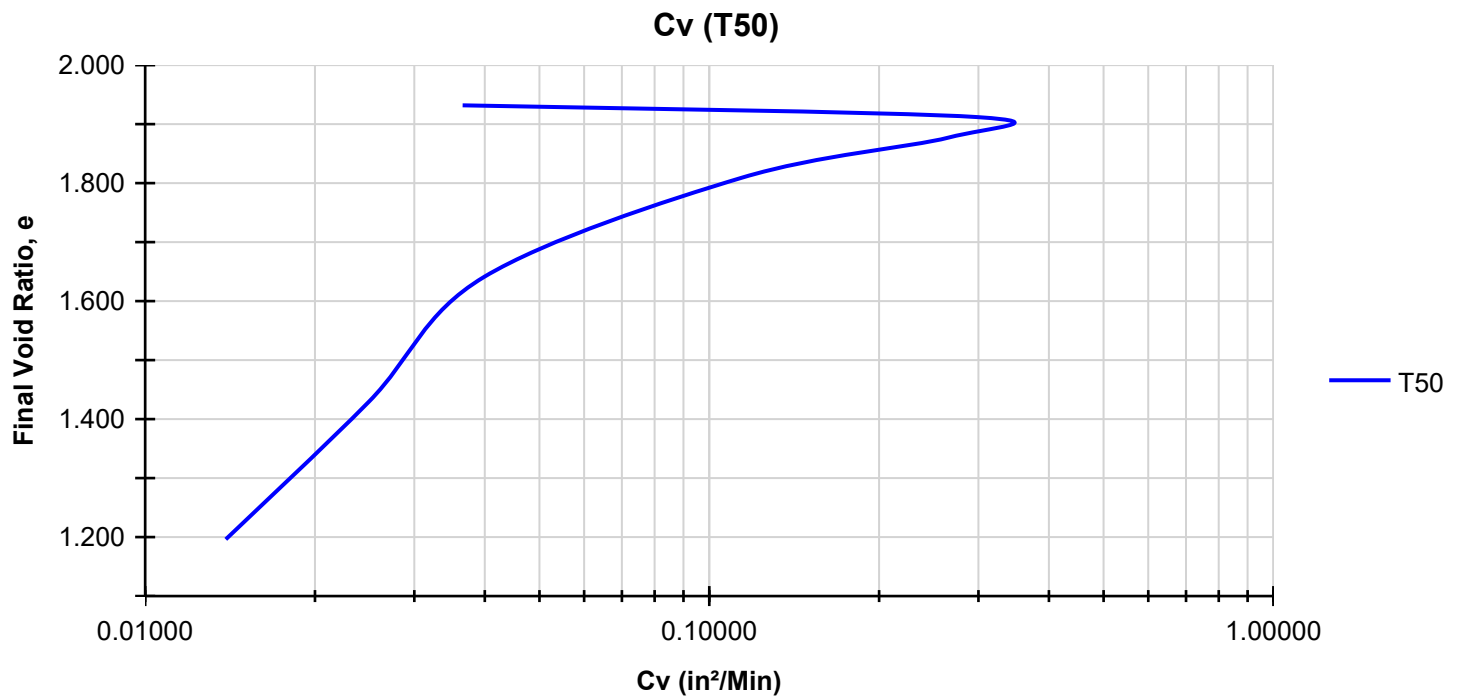
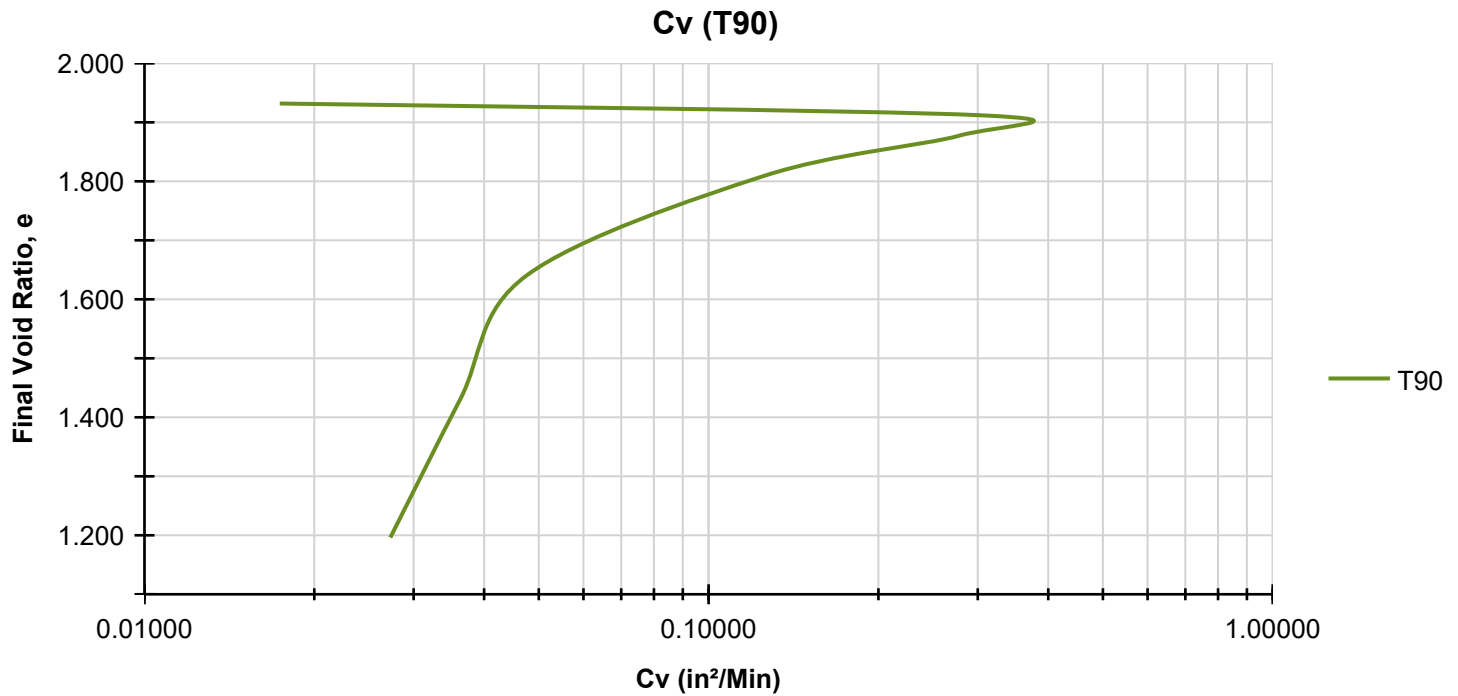


Coefficients of Consolidation (T50)



**RhinoOne**
GEOTECHNICAL**Cv - Void Ratio**

ASTM





RhinoOne
GEOTECHNICAL

RhinoOne Geotechnical

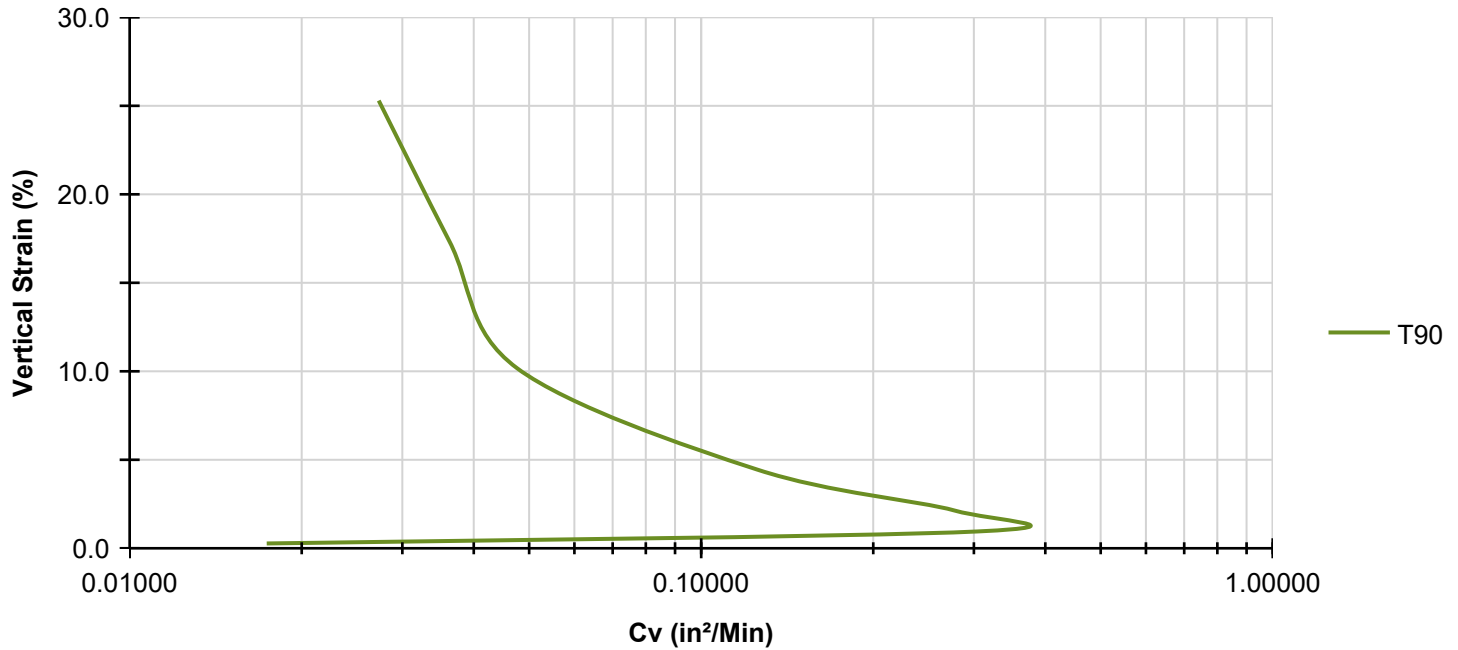
12308 NE 56th Street, Unit 1107

Vancouver, WA 98682

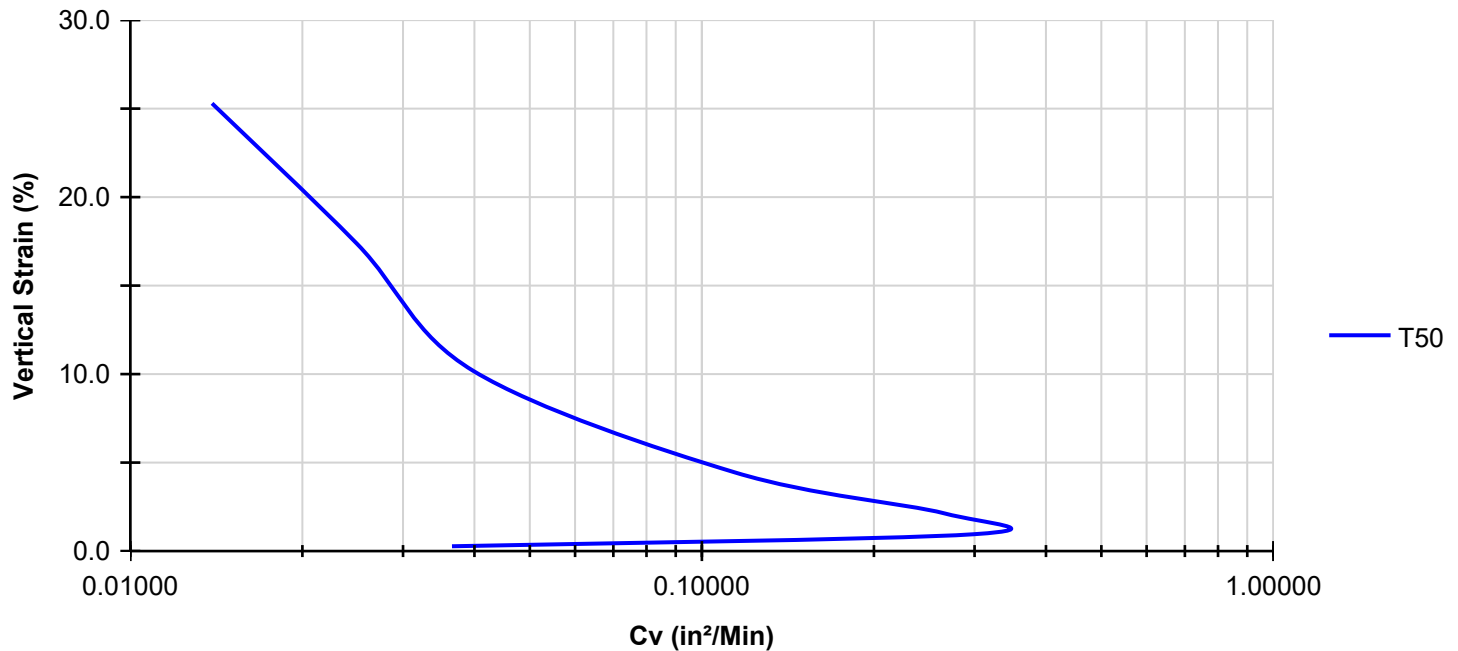
Cv - Vertical Strain

ASTM

Cv (T90)



Cv (T50)



Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: RA

Test Date: 5/22/2023

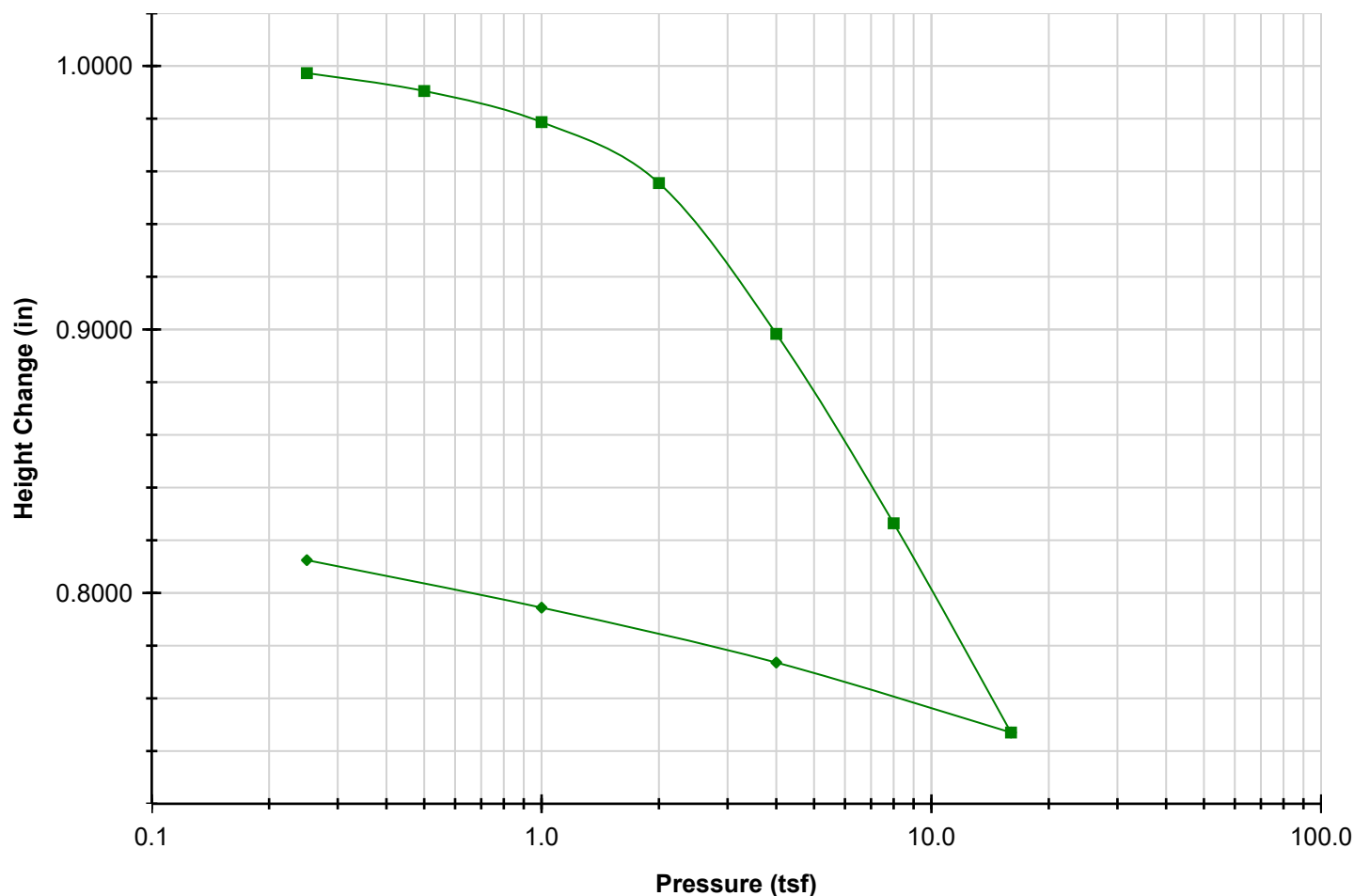
Checked By: _____

Date: _____



Height Change [Log]

ASTM



	BEFORE	AFTER	Liquid Limits	0	Test Date	5/22/2023
Moisture (%)	65.5	49.3	Plastic Limits	0		
Dry Density (pcf)	59.7	73.7				
Saturation (%)	94.8	100.1				
Void Ratio	1.95	1.39	Specific Gravity	2.815	ASSUMED	

Sample Description	2.5 inch diameter x 1 inch thick			Remarks
Project Number	STN-2022-004	Depth (ft)	33	
Sample Number	ST-11, 33-34 feet	Boring Number	TB-01	
Project	Carson Water Treatment Plant			
Client	Stantec			
Location	Kid Lane, Carson, Skamania County, Washington			

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: RA

Test Date: 5/22/2023

Checked By: _____

Date: _____

Summary

ASTM

Sample Description	2.5 inch diameter x 1 inch thick			Remarks
Project Number	STN-2022-004	Depth (ft)	33	
Sample Number	ST-11, 33-34 feet	Boring Number	TB-01	
Project	Carson Water Treatment Plant			
Client	Stantec			
Location	Kid Lane, Carson, Skamania County, Washington			

Index	Loading Sequence (tsf)	Cummulative Change in Height (in)	Specimen Height (in)	Height of Voids (in)	Vertical Strain (%)	Void Ratio	T90 Fitting Time (Hr)	T50 Fitting Time (Hr)	T90 Cv (in ² /Min)	T50 Cv (in ² /Min)	Sequence Status
0	0.000	0.0000	1.0000	0.0000	0.0	1.945	0.000	0.000	0.00000	0.00000	ENABLED
1	0.250	0.0027	0.9973	0.6571	0.3	1.932	0.202	0.022	0.01737	0.03654	ENABLED
2	0.500	0.0095	0.9905	0.6503	1.0	1.912	0.011	0.003	0.30451	0.29876	ENABLED
3	1.000	0.0213	0.9787	0.6385	2.1	1.877	0.012	0.003	0.27764	0.26558	ENABLED
4	2.000	0.0444	0.9556	0.6154	4.4	1.809	0.026	0.006	0.12537	0.11423	ENABLED
5	4.000	0.1017	0.8983	0.5582	10.2	1.641	0.060	0.014	0.04765	0.03988	ENABLED
6	8.000	0.1736	0.8264	0.4863	17.4	1.430	0.067	0.016	0.03625	0.02493	ENABLED
7	16.000	0.2530	0.7470	0.4069	25.3	1.196	0.072	0.017	0.02728	0.01390	ENABLED
8	4.000	0.2264	0.7736	0.4334	22.6	1.274	0.000	0.000	0.00000	0.00000	ENABLED
9	1.000	0.2056	0.7944	0.4543	20.6	1.335	0.000	0.000	0.00000	0.00000	ENABLED
10	0.250	0.1875	0.8125	0.4723	18.8	1.388	0.000	0.000	0.00000	0.00000	ENABLED

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: RA

Test Date: 5/22/2023

Checked By: _____ Date: _____

Report Created: 9/12/2023

Page 8



Consolidated Test Results

ASTM

Project:	Carson Water Treatment Plant
Project Number:	STN-2022-004
Job Number:	Lab 0184
Test Date:	5/22/2023

Sampling Date:	5/18/2023
Sample Number:	ST-11, 33-34 feet
Depth (ft)	33
Boring Number:	TB-01
Location:	Kid Lane, Carson, Skamania County, Washington
Client Name:	Stantec
Remarks:	

Specific Gravity:	2.815	Plastic Limit:	0	Liquid Limit:	0
Specific Gravity Method:	ASSUMED			Weight of Ring (g)	105.6
Sampling Method:	Undisturbed	Soil Classification:	MH		
Specimen Description:	2.5 inch diameter x 1 inch thick				

Parameters	Initial	Final
Height (in)	1.0000	0.8125
Height Source	NA	TEST RESULTS
Diameter (in)	2.5000	NA
Area (in ²)	4.909	NA
Volume (in ³)	4.9087	3.9881
Weight of Container (g)	22.2	22.4
Weight of Wet Soil + Container (g)	73.6	137.5
Weight of Dry Soil + Container (g)	53.2	99.5
Moisture Content (%)	65.5	49.3
Moist Weight + Ring Weight (g)	232.8	220.7
Dry Density (pcf)	59.7	73.7
Wet Density (pcf)	98.8	109.9
Saturation (%)	94.8	100.1
Void Ratio	1.9	1.4

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: RA

Test Date: 5/22/2023

Checked By: _____ Date: _____



Consolidation Test Results

ASTM

Specimen 1

Test Description:	Standard One-Dimensional Consolidation		
Other Associated Tests:			
Device Details:	Conmatic 5470		
Test Specification:			
Test Time:	5/22/2023 12:00:00 AM		
Technician:	RA	Sampling Method:	Undisturbed
Specimen Code:	TB-01, 33-34 feet	Specimen Lab #:	Lab 0184
Specimen Description:	2.5 inch diameter x 1 inch thick		
Specimen Preparation:	Trimming Turntable		
Large Particle:			
Moisture Content:	Natural Moisture		
Test Condition:			
Test Procedure:	ASTM		
Seating Pressure Used:	YES	Seating Pressure (tsf):	0.015
Preconsolidation Stress:			
Percent Strain [LOG] Graph (tsf):	2.085	Final Voids Graph (tsf):	2.085


RhinoOne
 GEOTECHNICAL

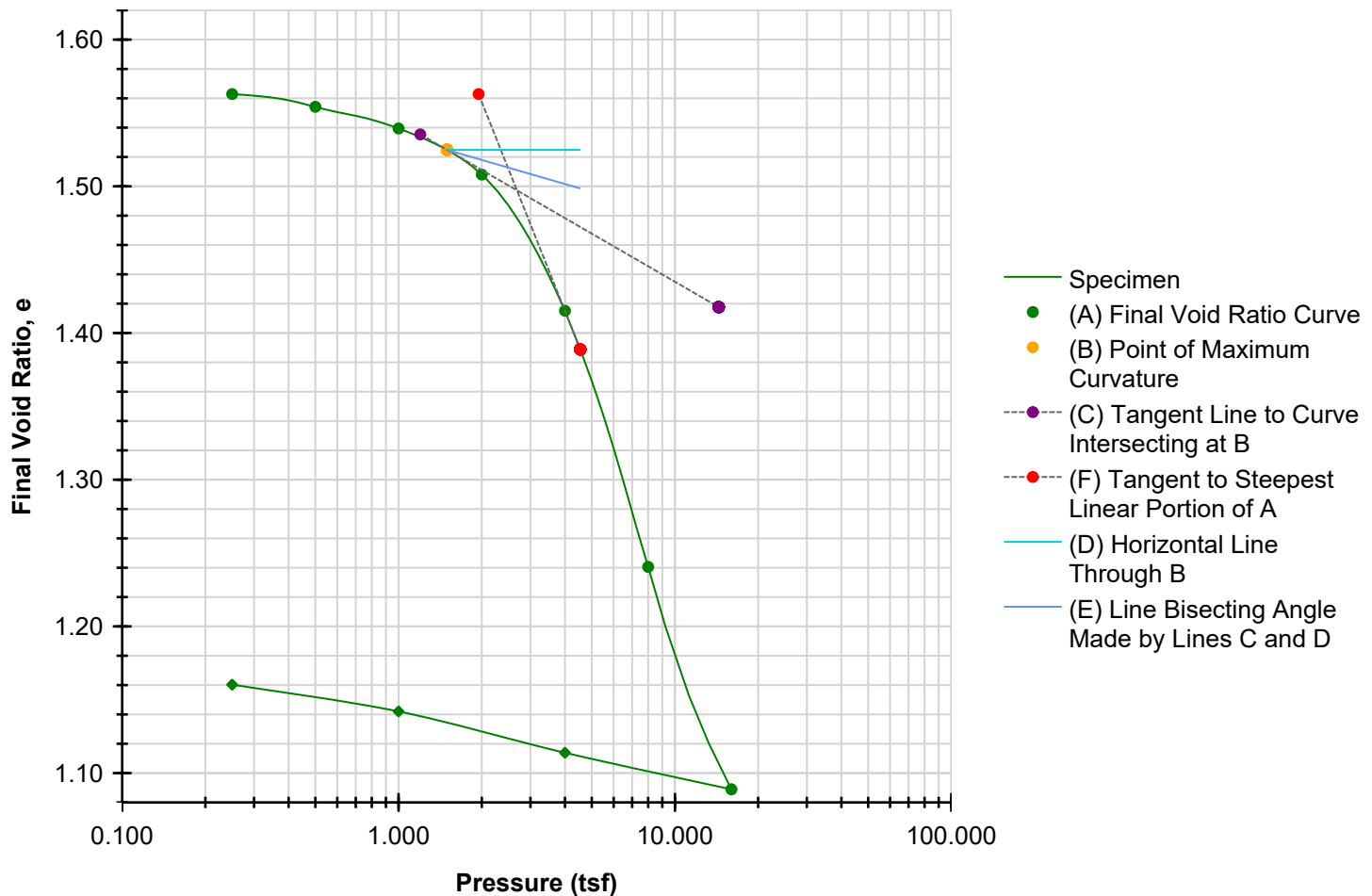
Final Voids [Log]

ASTM

RhinoOne Geotechnical

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Vancouver, WA 98682



Preconsolidation Stress (tsf)	2.485	Cc	0.542	Cr	0.039
-------------------------------	-------	----	-------	----	-------

	BEFORE	AFTER	Liquid Limits	0	Test Date	9/1/2023
Moisture (%)	51.8	42.4	Plastic Limits	0		
Dry Density (pcf)	66.6	79.5				
Saturation (%)	90.3	100.7				
Void Ratio	1.58	1.16	Specific Gravity	2.75	ASSUMED	

Sample Description	2.5 inch diameter x 1 inch thick			Remarks
Project Number	STN-2022-004	Depth (ft)	12	
Sample Number	ST-1, 12-13 feet	Boring Number	TB-07	
Project	Carson Water Treatment Plant			
Client	Stantec			
Location	Kid Lane, Carson, Skamania County, Washington			

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: PH

Test Date: 9/1/2023

Checked By: _____

Date: _____


RhinoOne
 GEOTECHNICAL

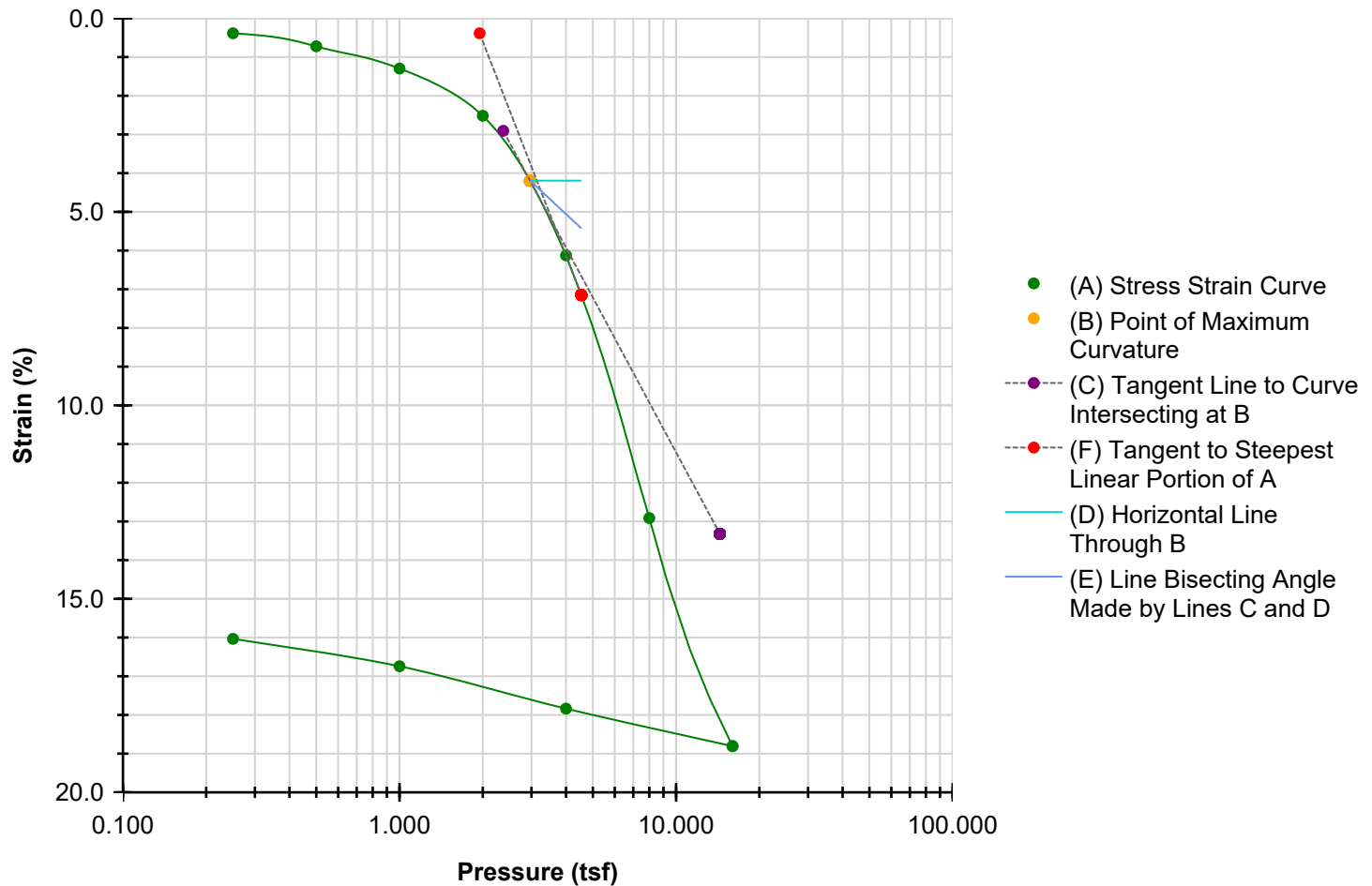
Percent Strain [Log]

ASTM

RhinoOne Geotechnical

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Vancouver, WA 98682



Preconsolidation Stress (tsf)	3.241	Cc	NA	Cr	NA
-------------------------------	-------	----	----	----	----

	BEFORE	AFTER	Liquid Limits	0	Test Date 9/1/2023
Moisture (%)	51.8	42.4	Plastic Limits	0	
Dry Density (pcf)	66.6	79.5			
Saturation (%)	90.3	100.7			
Void Ratio	1.58	1.16	Specific Gravity	2.75	ASSUMED

Sample Description	2.5 inch diameter x 1 inch thick				Remarks
Project Number	STN-2022-004	Depth (ft)	12		
Sample Number	ST-1, 12-13 feet	Boring Number	TB-07		
Project	Carson Water Treatment Plant				
Client	Stantec				
Location	Kid Lane, Carson, Skamania County, Washington				

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: PH

Test Date: 9/1/2023

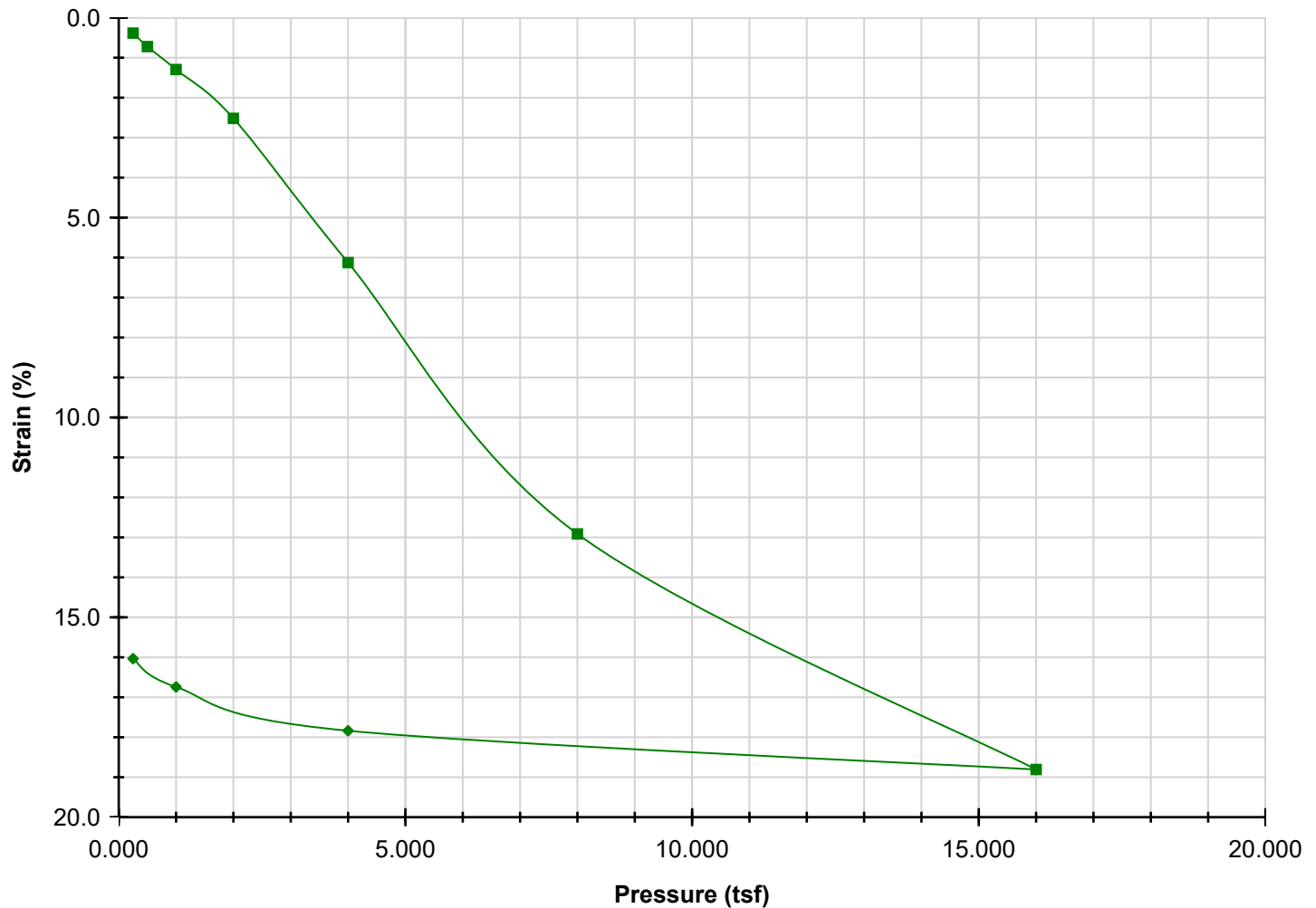
Checked By: _____

Date: _____



Percent Strain

ASTM



	BEFORE	AFTER	Liquid Limits	0	Test Date 9/1/2023
Moisture (%)	51.8	42.4	Plastic Limits	0	
Dry Density (pcf)	66.6	79.5			
Saturation (%)	90.3	100.7			
Void Ratio	1.58	1.16	Specific Gravity	2.75	ASSUMED

Sample Description	2.5 inch diameter x 1 inch thick				Remarks
Project Number	STN-2022-004	Depth (ft)	12		
Sample Number	ST-1, 12-13 feet	Boring Number	TB-07		
Project	Carson Water Treatment Plant				
Client	Stantec				
Location	Kid Lane, Carson, Skamania County, Washington				

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: PH

Test Date: 9/1/2023

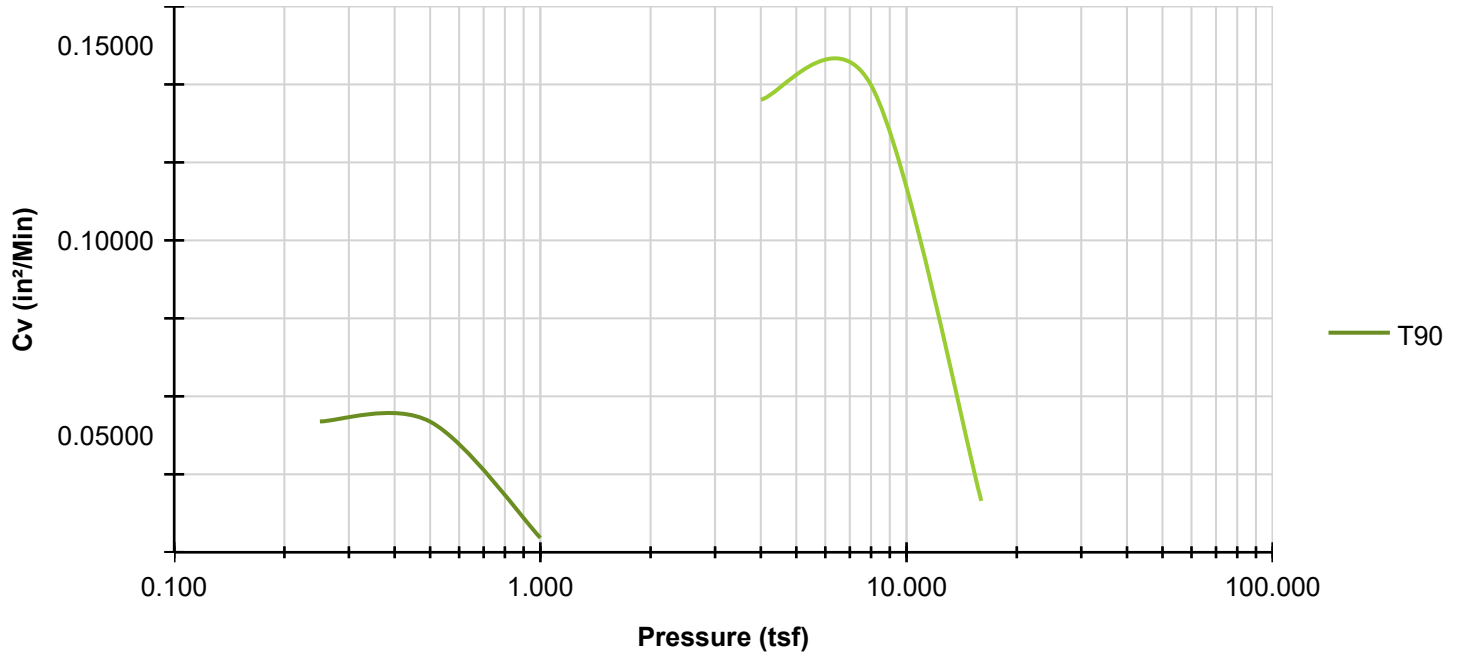
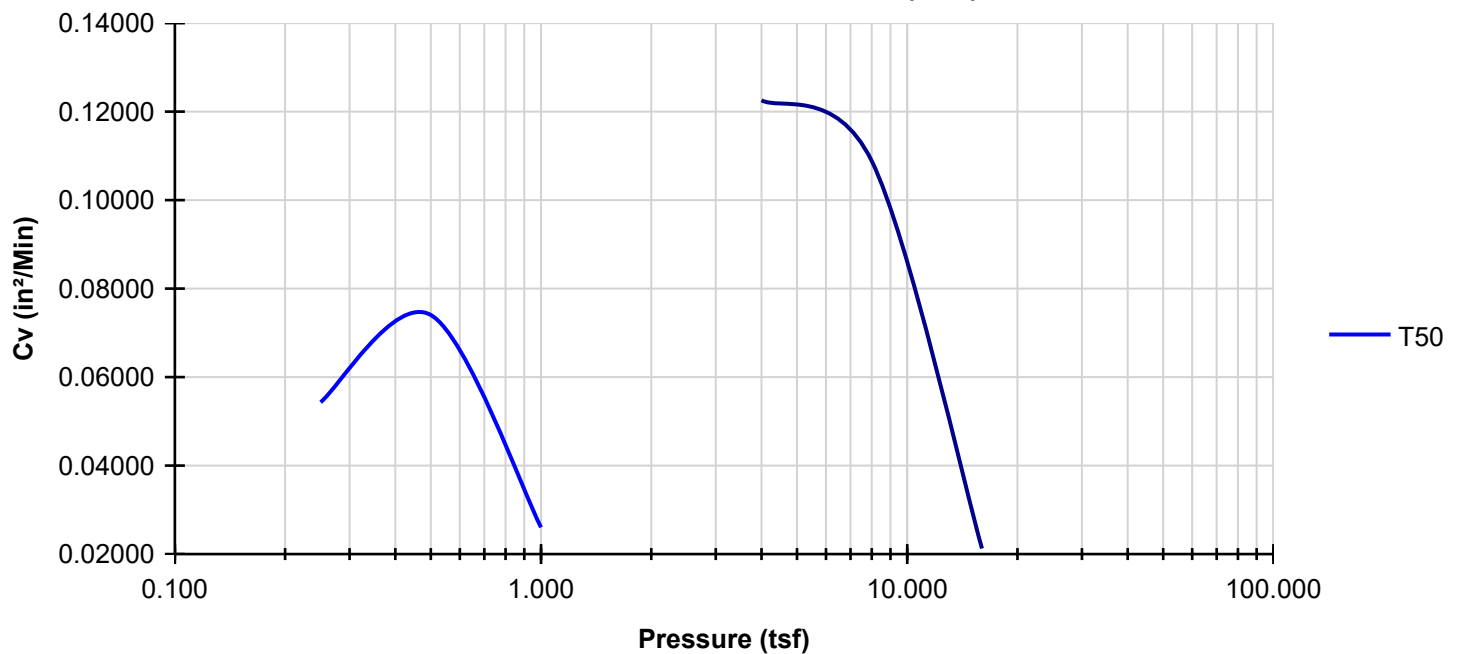
Checked By: _____

Date: _____

**RhinoOne**
GEOTECHNICAL

Coefficients of Consolidation

ASTM

Coefficients of Consolidation (T90)**Coefficients of Consolidation (T50)**

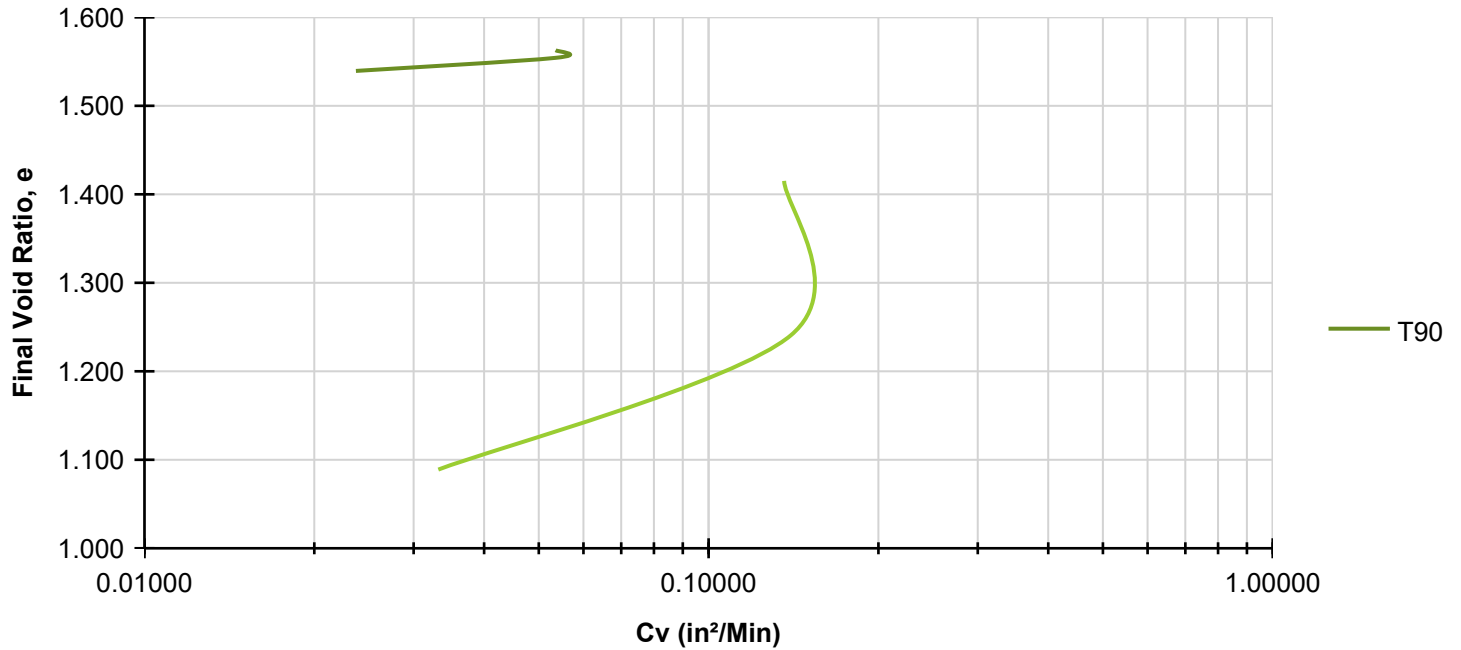
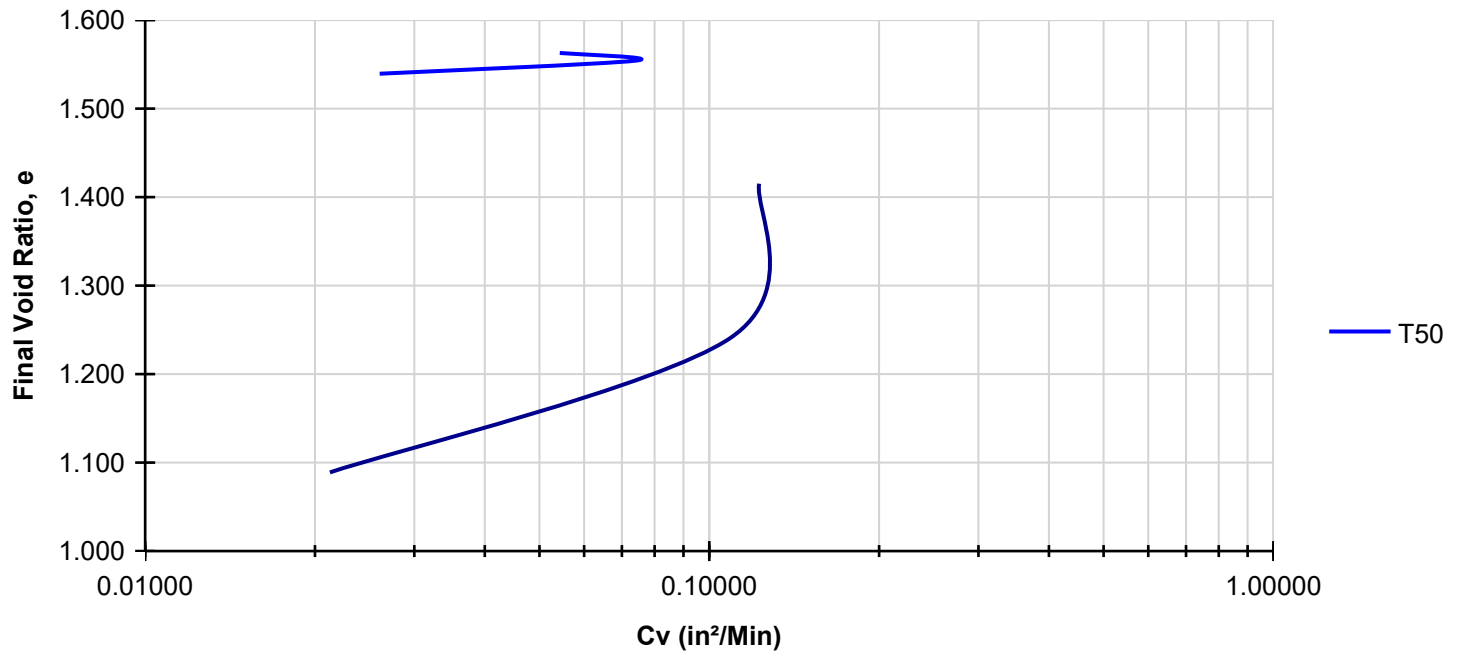
**RhinoOne**
GEOTECHNICAL**Cv - Void Ratio**

ASTM

RhinoOne Geotechnical

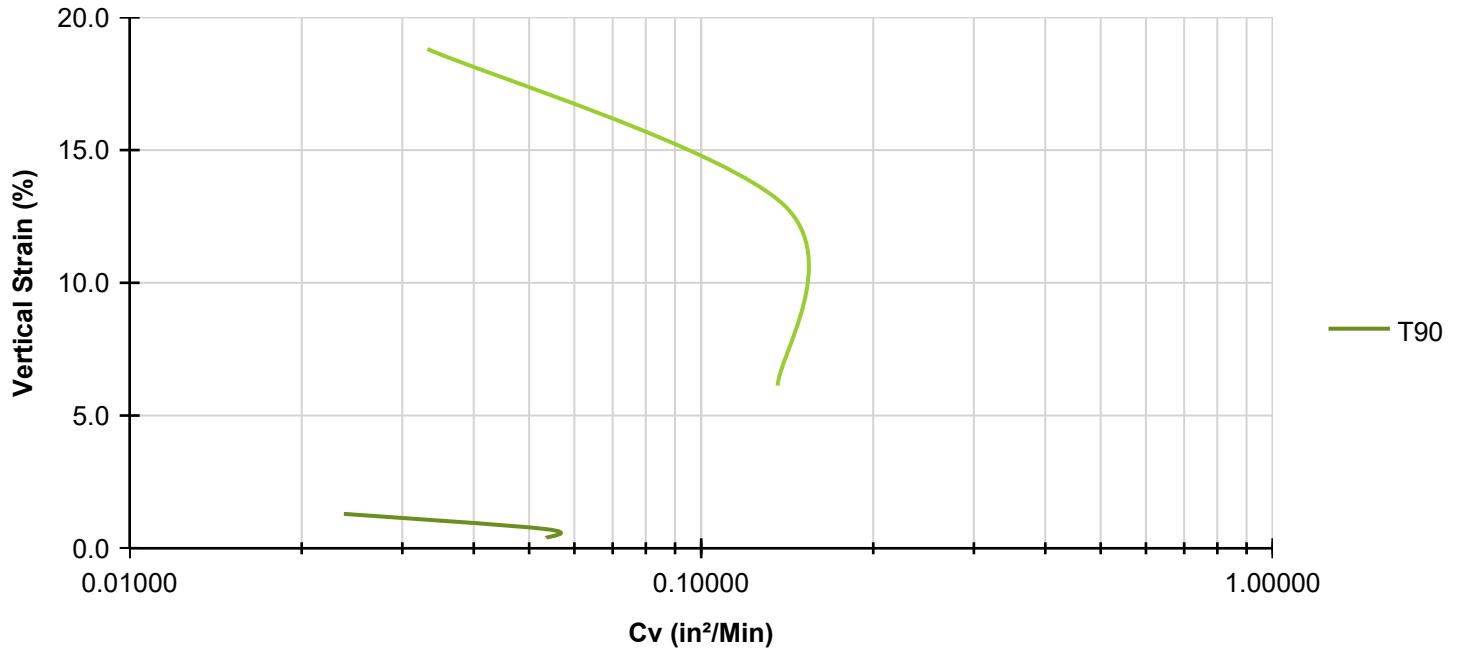
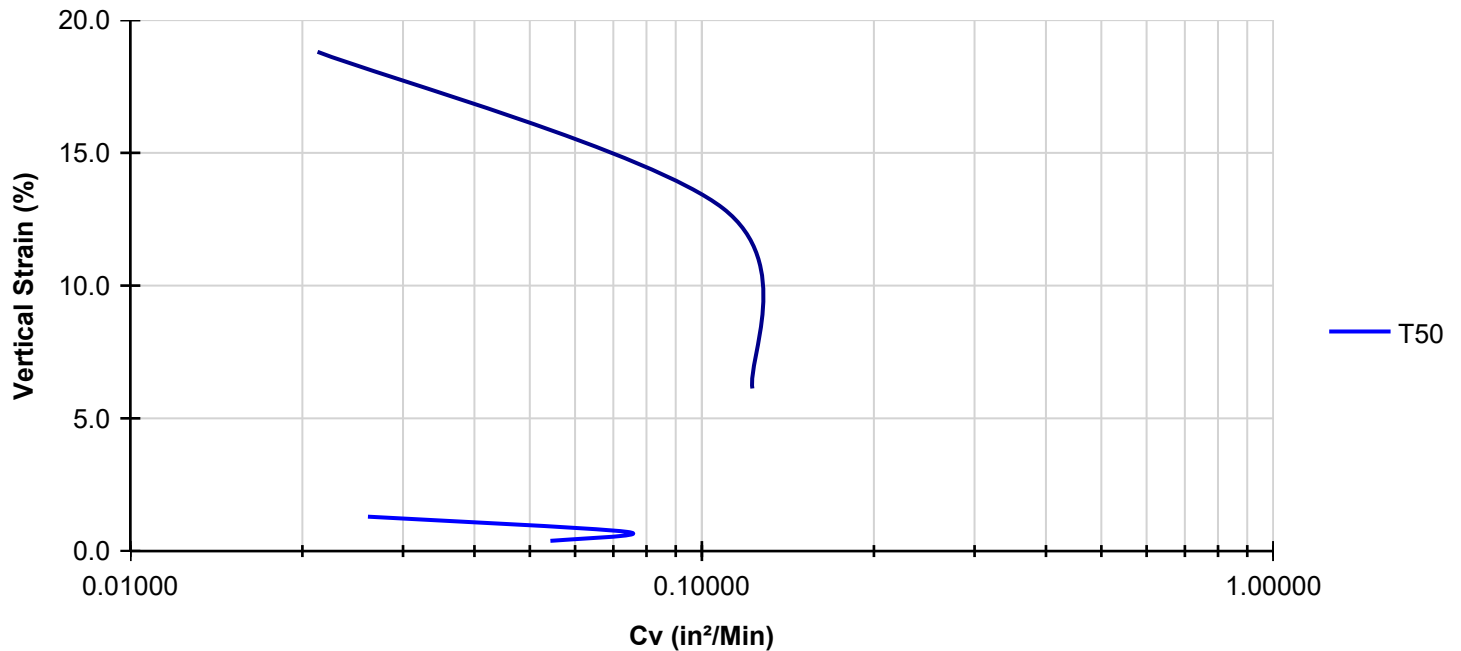
12308 NE 56th Street, Unit 1107

Vancouver, WA 98682

Cv (T90)**Cv (T50)**

**RhinoOne**
GEOTECHNICAL**Cv - Vertical Strain**

ASTM

Cv (T90)**Cv (T50)**


RhinoOne
 GEOTECHNICAL

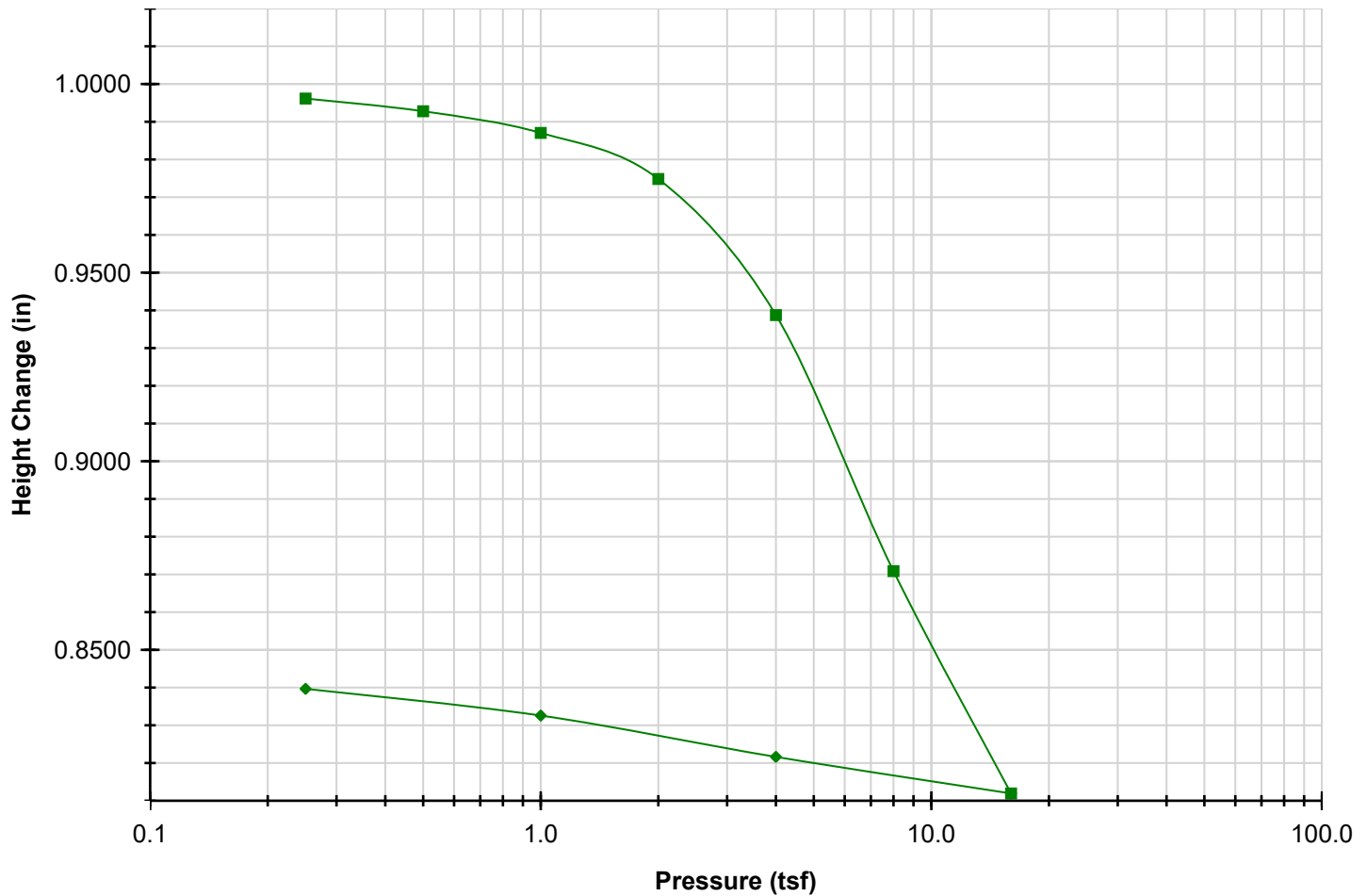
Height Change [Log]

ASTM

RhinoOne Geotechnical

12308 NE 56th Street, Unit 1107

Vancouver, WA 98682



	BEFORE	AFTER	Liquid Limits	0	Test Date 9/1/2023
Moisture (%)	51.8	42.4	Plastic Limits	0	
Dry Density (pcf)	66.6	79.5			
Saturation (%)	90.3	100.7			
Void Ratio	1.58	1.16	Specific Gravity	2.75	ASSUMED

Sample Description	2.5 inch diameter x 1 inch thick				Remarks
Project Number	STN-2022-004	Depth (ft)	12		
Sample Number	ST-1, 12-13 feet	Boring Number	TB-07		
Project	Carson Water Treatment Plant				
Client	Stantec				
Location	Kid Lane, Carson, Skamania County, Washington				

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: PH

Test Date: 9/1/2023

Checked By: _____

Date: _____

Summary

ASTM

Sample Description	2.5 inch diameter x 1 inch thick			Remarks
Project Number	STN-2022-004	Depth (ft)	12	
Sample Number	ST-1, 12-13 feet	Boring Number	TB-07	
Project	Carson Water Treatment Plant			
Client	Stantec			
Location	Kid Lane, Carson, Skamania County, Washington			

Index	Loading Sequence (tsf)	Cummulative Change in Height (in)	Specimen Height (in)	Height of Voids (in)	Vertical Strain (%)	Void Ratio	T90 Fitting Time (Hr)	T50 Fitting Time (Hr)	T90 Cv (in ² /Min)	T50 Cv (in ² /Min)	Sequence Status
0	0.000	0.0000	1.0000	0.0000	0.0	1.577	0.000	0.000	0.00000	0.00000	ENABLED
1	0.250	0.0039	0.9961	0.6075	0.4	1.563	0.065	0.015	0.05356	0.05432	ENABLED
2	0.500	0.0072	0.9928	0.6041	0.7	1.554	0.065	0.011	0.05350	0.07404	ENABLED
3	1.000	0.0130	0.9870	0.5984	1.3	1.539	0.145	0.030	0.02370	0.02605	ENABLED
4	2.000	0.0252	0.9748	0.5861	2.5	1.508	0.000	0.000	0.00000	0.00000	ENABLED
5	4.000	0.0613	0.9387	0.5501	6.1	1.415	0.023	0.005	0.13610	0.12256	ENABLED
6	8.000	0.1291	0.8709	0.4822	12.9	1.241	0.019	0.004	0.13981	0.10884	ENABLED
7	16.000	0.1881	0.8119	0.4232	18.8	1.089	0.070	0.017	0.03318	0.02126	ENABLED
8	4.000	0.1784	0.8216	0.4329	17.8	1.114	0.000	0.000	0.00000	0.00000	ENABLED
9	1.000	0.1674	0.8326	0.4439	16.7	1.142	0.000	0.000	0.00000	0.00000	ENABLED
10	0.250	0.1603	0.8397	0.4510	16.0	1.160	0.000	0.000	0.00000	0.00000	ENABLED

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: PH

Test Date: 9/1/2023

Checked By: _____ Date: _____

Report Created: 9/12/2023

Page 8



Consolidated Test Results

ASTM

Project:	Carson Water Treatment Plant
Project Number:	STN-2022-004
Job Number:	Lab 0189
Test Date:	9/1/2023

Sampling Date:	9/1/2023
Sample Number:	ST-1, 12-13 feet
Depth (ft)	12
Boring Number:	TB-07
Location:	Kid Lane, Carson, Skamania County, Washington
Client Name:	Stantec
Remarks:	

Specific Gravity:	2.75	Plastic Limit:	0	Liquid Limit:	0
Specific Gravity Method:	ASSUMED			Weight of Ring (g)	105.6
Sampling Method:	Undisturbed	Soil Classification:	MH		
Specimen Description:	2.5 inch diameter x 1 inch thick				

Parameters	Initial	Final
Height (in)	1.0000	0.8397
Height Source	NA	TEST RESULTS
Diameter (in)	2.5000	NA
Area (in ²)	4.909	NA
Volume (in ³)	4.9087	4.1217
Weight of Container (g)	22.7	22.3
Weight of Wet Soil + Container (g)	77.6	144.8
Weight of Dry Soil + Container (g)	58.8	108.3
Moisture Content (%)	51.8	42.4
Moist Weight + Ring Weight (g)	235.9	228.1
Dry Density (pcf)	66.6	79.5
Wet Density (pcf)	101.1	113.3
Saturation (%)	90.3	100.7
Void Ratio	1.6	1.2

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: PH

Test Date: 9/1/2023

Checked By: _____ Date: _____



Consolidation Test Results

ASTM

Specimen 1	
Test Description:	Standard One-Dimensional Consolidation
Other Associated Tests:	
Device Details:	Conmatic 5470
Test Specification:	
Test Time:	9/1/2023 12:00:00 AM
Technician:	PH
Sampling Method:	Undisturbed
Specimen Code:	TB-07, 12-13 feet
Specimen Lab #:	Lab 0189
Specimen Description:	2.5 inch diameter x 1 inch thick
Specimen Preparation:	Trimming Turntable
Large Particle:	
Moisture Content:	Natural Moisture
Test Condition:	standard
Test Procedure:	ASTM
Seating Pressure Used:	YES
Seating Pressure (tsf):	0.015
Preconsolidation Stress:	
Percent Strain [LOG] Graph (tsf):	3.241
Final Voids Graph (tsf):	2.485

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: PH

Test Date: 9/1/2023

Report Created: 9/12/2023

Checked By: _____

Date: _____

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RhinoOne
 GEOTECHNICAL

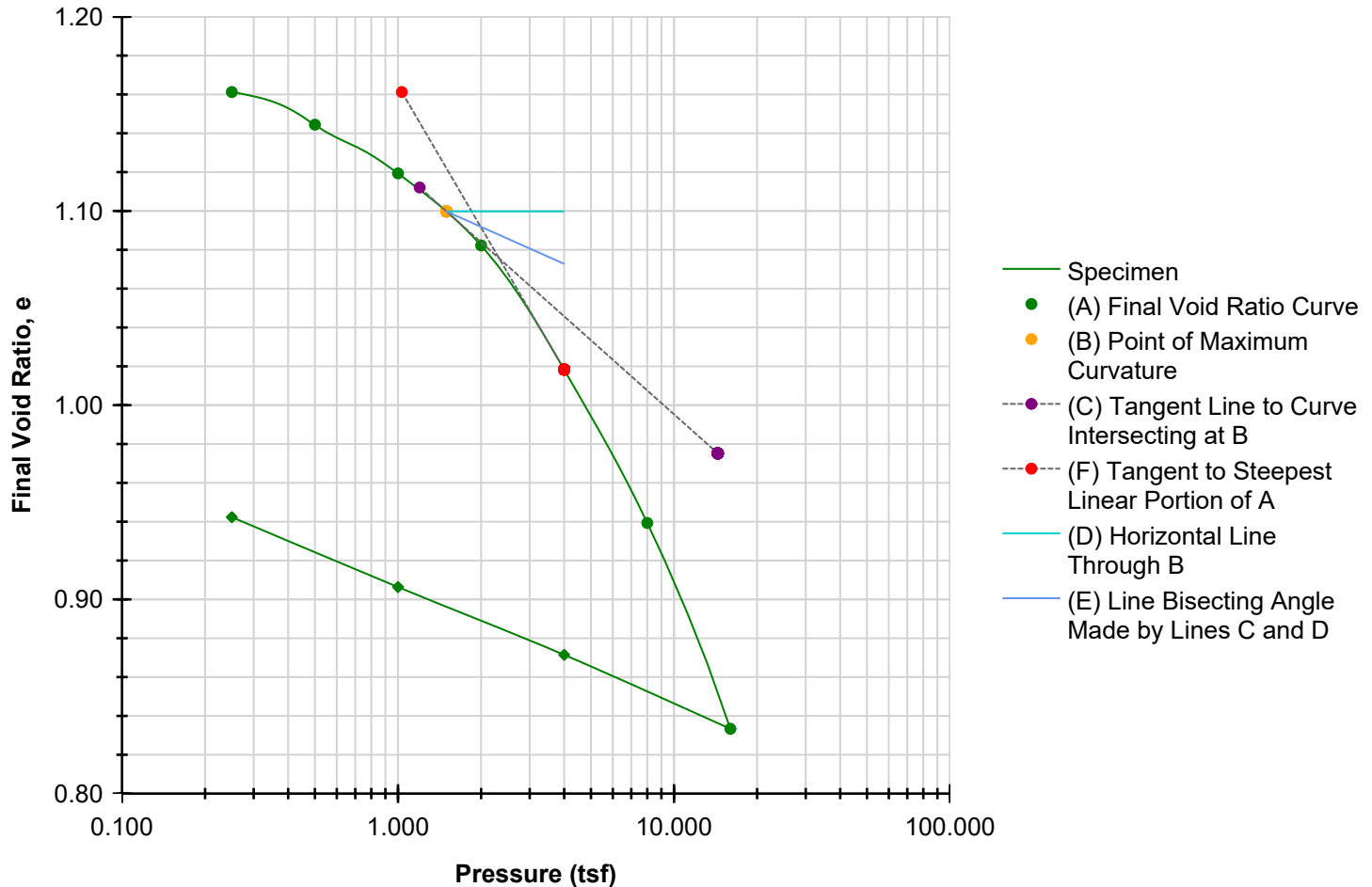
Final Voids [Log]

ASTM

RhinoOne Geotechnical

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Vancouver, WA 98682



Preconsolidation Stress (tsf)		1.991		Cc	0.307	Cr	0.070

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: RA

Test Date: 9/5/2023

Checked By: _____

Date: _____


RhinoOne
 GEOTECHNICAL

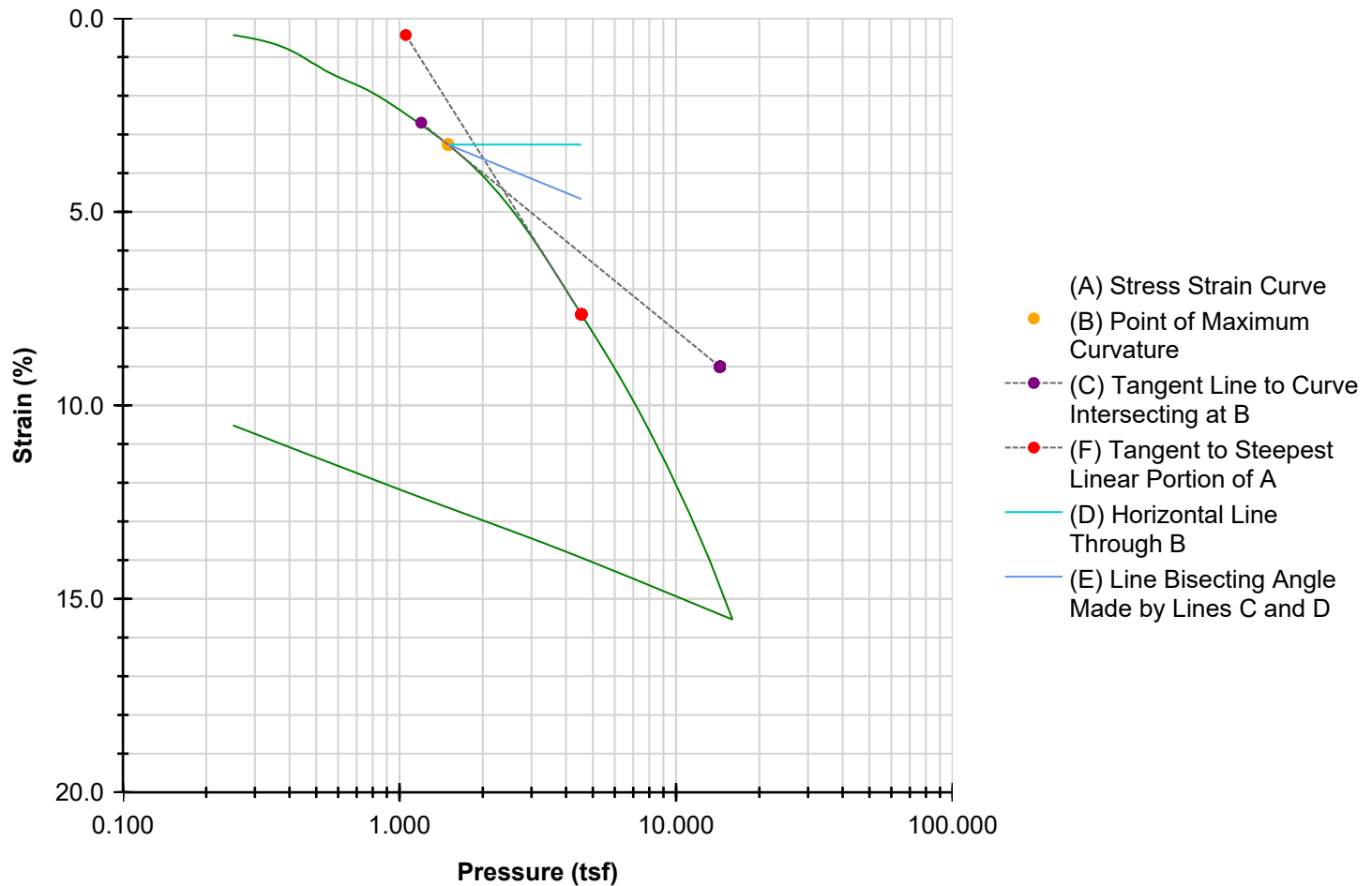
Percent Strain [Log]

ASTM

RhinoOne Geotechnical

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Vancouver, WA 98682



Preconsolidation Stress (tsf)	2.018	Cc	NA	Cr	NA
-------------------------------	-------	----	----	----	----

	BEFORE	AFTER	Liquid Limits	0	Test Date	9/5/2023
Moisture (%)	41.8	33.8	Plastic Limits	0		
Dry Density (pcf)	79.0	90.0				
Saturation (%)	97.9	102.4				
Void Ratio	1.17	0.91	Specific Gravity	2.75	ASSUMED	

Sample Description	2.5 inch diameter x 1 inch thick			Remarks
Project Number	STN-2022-004	Depth (ft)	23	
Sample Number	ST-2, 23-24 feet	Boring Number	TB-07	
Project	Carson Water Treatment Plant			
Client	Stantec			
Location	Kid Lane, Carson, Skamania County, Washington			

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: RA

Test Date: 9/5/2023

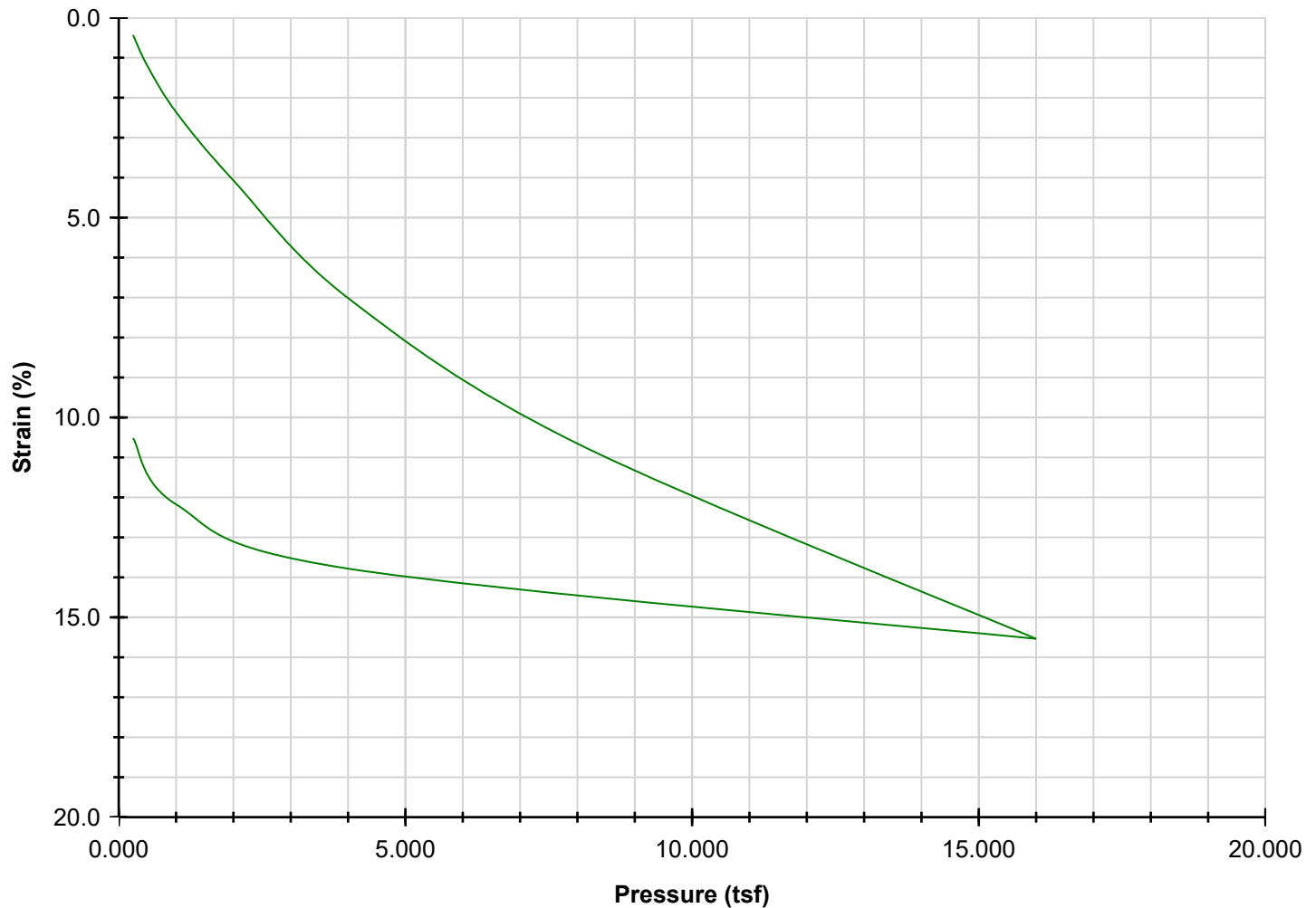
Checked By: _____

Date: _____



Percent Strain

ASTM



	BEFORE	AFTER	Liquid Limits	0	Test Date 9/5/2023
Moisture (%)	41.8	33.8	Plastic Limits	0	
Dry Density (pcf)	79.0	90.0			
Saturation (%)	97.9	102.4			
Void Ratio	1.17	0.91	Specific Gravity	2.75	ASSUMED

Sample Description	2.5 inch diameter x 1 inch thick				Remarks
Project Number	STN-2022-004	Depth (ft)	23		
Sample Number	ST-2, 23-24 feet	Boring Number	TB-07		
Project	Carson Water Treatment Plant				
Client	Stantec				
Location	Kid Lane, Carson, Skamania County, Washington				

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: RA

Test Date: 9/5/2023

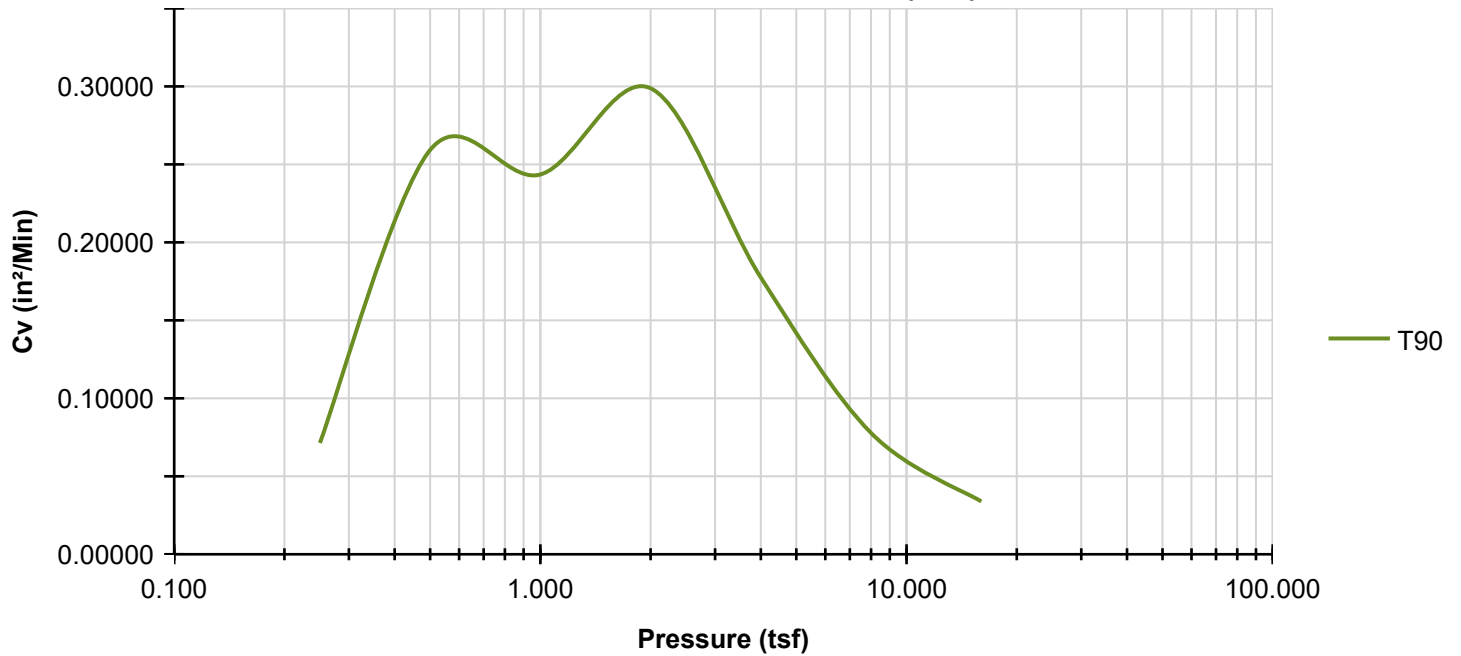
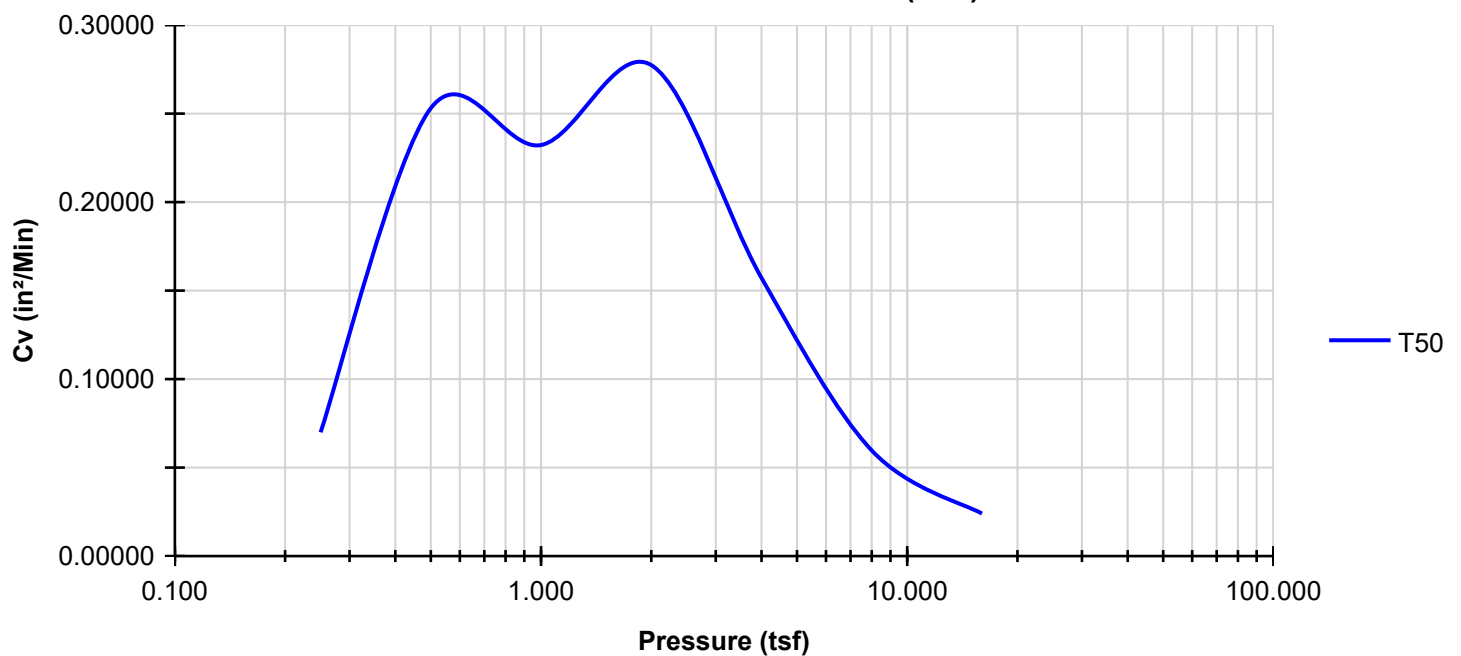
Checked By: _____

Date: _____

**RhinoOne**
GEOTECHNICAL

Coefficients of Consolidation

ASTM

Coefficients of Consolidation (T90)**Coefficients of Consolidation (T50)**

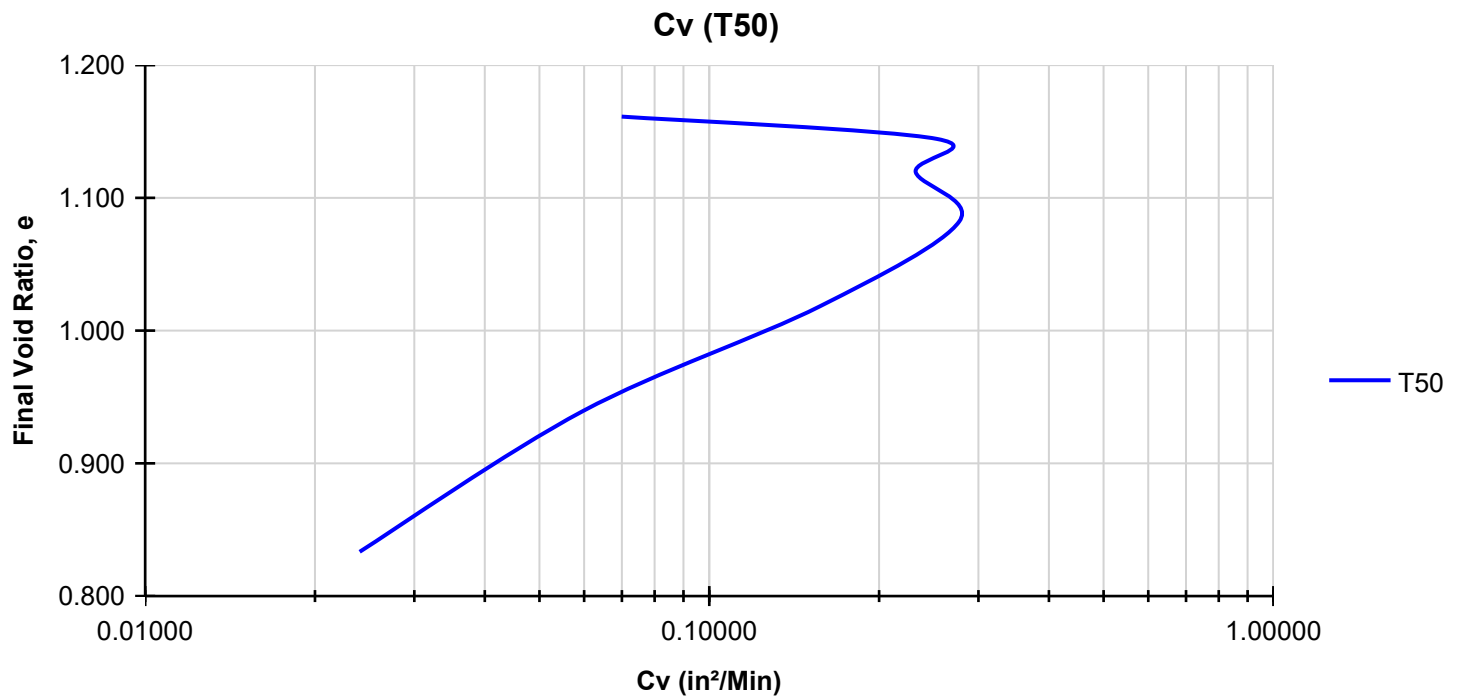
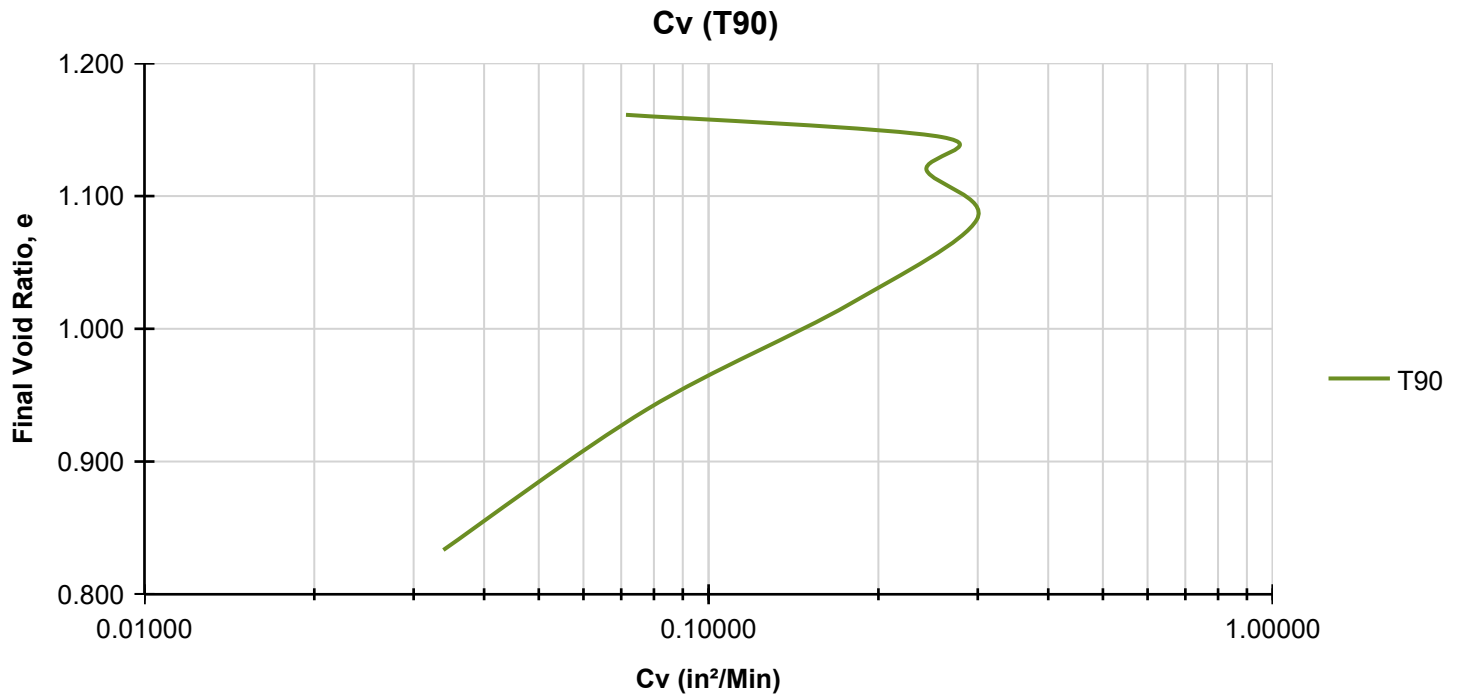
**RhinoOne**
GEOTECHNICAL**Cv - Void Ratio**

ASTM

RhinoOne Geotechnical

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Vancouver, WA 98682



Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: RA

Test Date: 9/5/2023

Checked By: _____

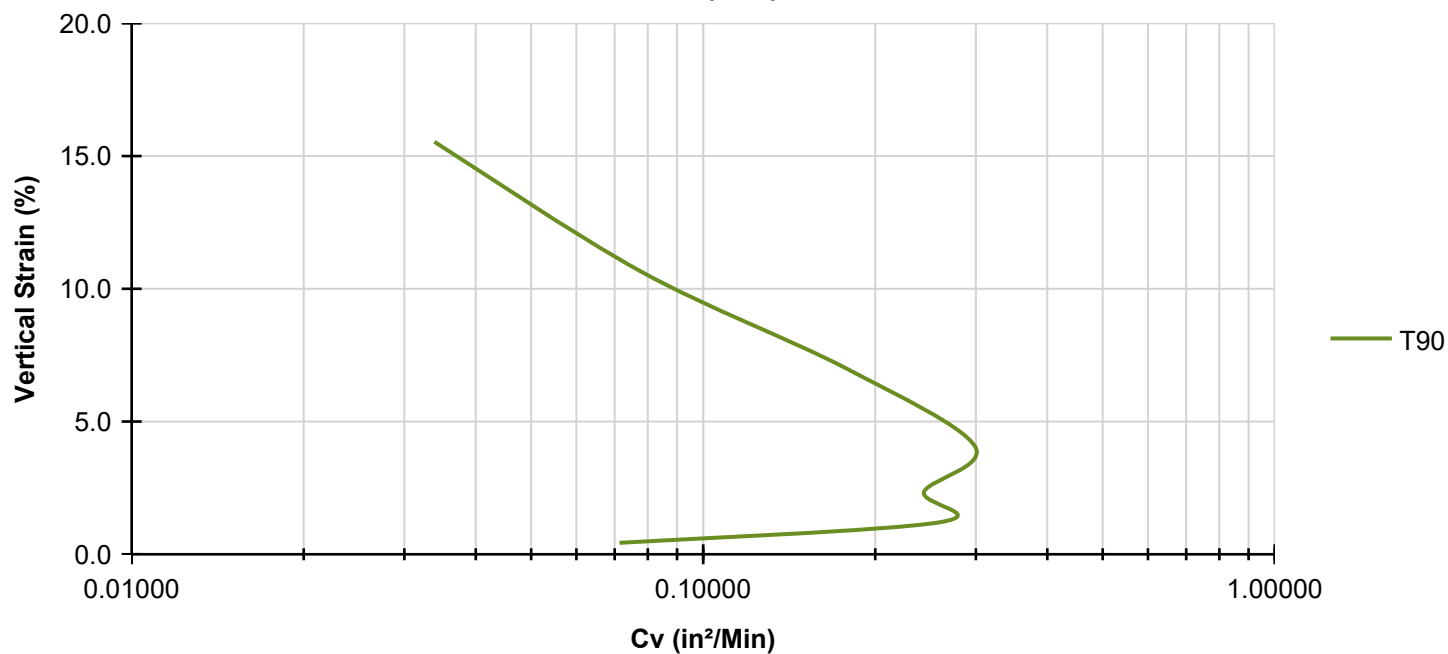
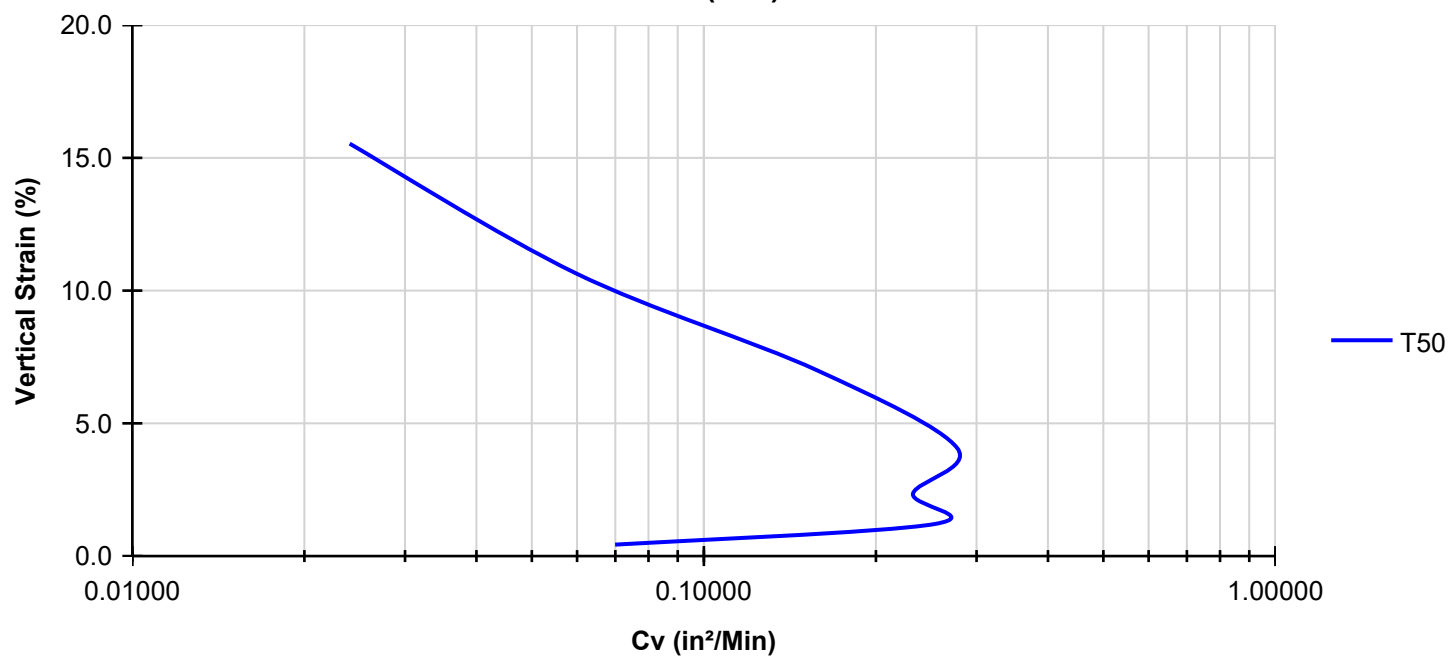
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Report Created: 9/12/2023

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**RhinoOne**
GEOTECHNICAL**Cv - Vertical Strain**

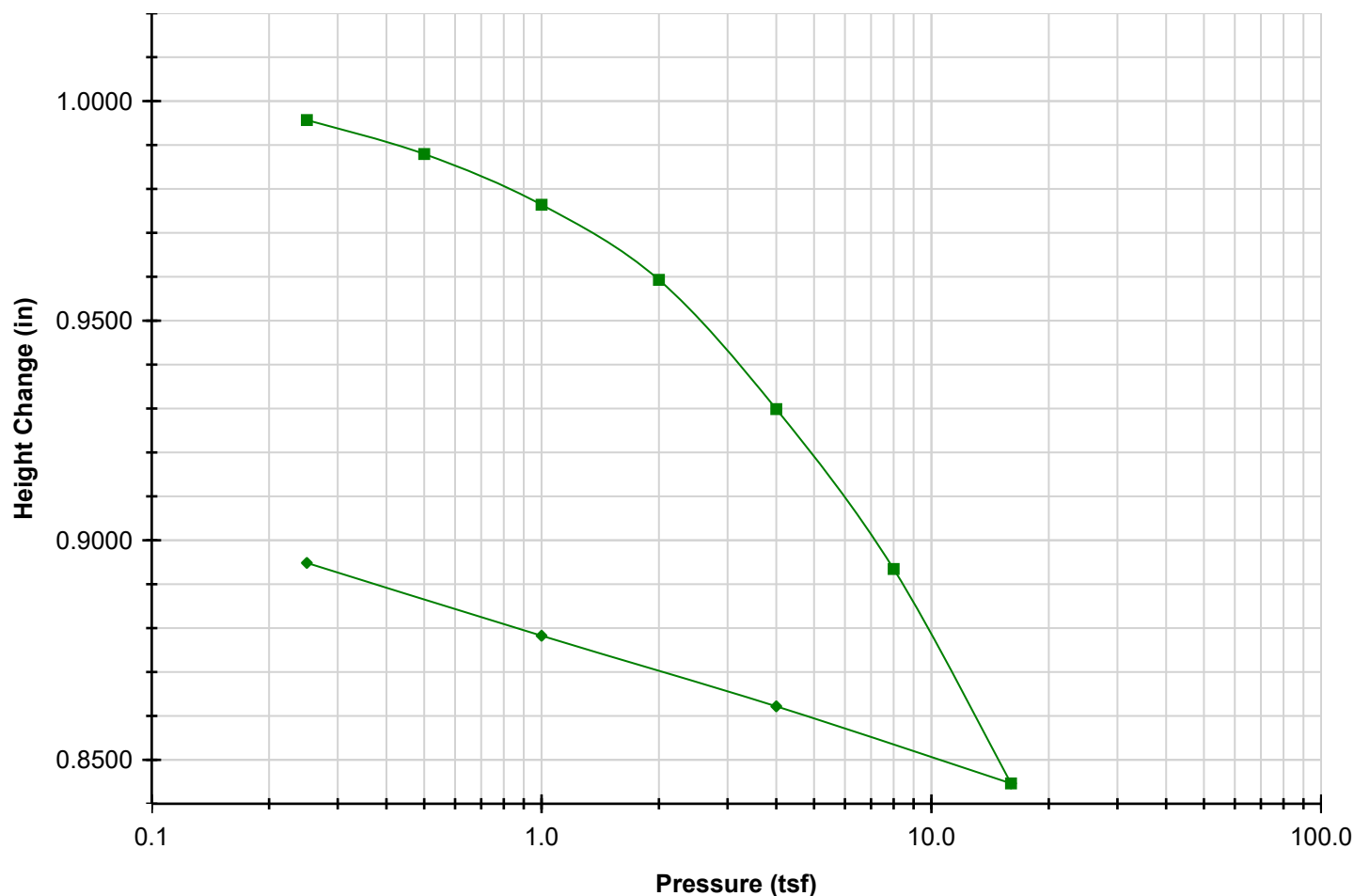
ASTM

Cv (T90)**Cv (T50)**



Height Change [Log]

ASTM



	BEFORE	AFTER	Liquid Limits	0	Test Date 9/5/2023
Moisture (%)	41.8	33.8	Plastic Limits	0	
Dry Density (pcf)	79.0	90.0			
Saturation (%)	97.9	102.4			
Void Ratio	1.17	0.91	Specific Gravity	2.75	ASSUMED

Sample Description	2.5 inch diameter x 1 inch thick			Remarks
Project Number	STN-2022-004	Depth (ft)	23	
Sample Number	ST-2, 23-24 feet	Boring Number	TB-07	
Project	Carson Water Treatment Plant			
Client	Stantec			
Location	Kid Lane, Carson, Skamania County, Washington			

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: RA

Test Date: 9/5/2023

Checked By: _____

Date: _____

Summary

ASTM

Sample Description	2.5 inch diameter x 1 inch thick			Remarks
Project Number	STN-2022-004	Depth (ft)	23	
Sample Number	ST-2, 23-24 feet	Boring Number	TB-07	
Project	Carson Water Treatment Plant			
Client	Stantec			
Location	Kid Lane, Carson, Skamania County, Washington			

Index	Loading Sequence (tsf)	Cummulative Change in Height (in)	Specimen Height (in)	Height of Voids (in)	Vertical Strain (%)	Void Ratio	T90 Fitting Time (Hr)	T50 Fitting Time (Hr)	T90 Cv (in ² /Min)	T50 Cv (in ² /Min)	Sequence Status
0	0.000	0.0000	1.0000	0.0000	0.0	1.174	0.000	0.000	0.00000	0.00000	ENABLED
1	0.250	0.0043	0.9957	0.5350	0.4	1.161	0.049	0.012	0.07137	0.06994	ENABLED
2	0.500	0.0121	0.9879	0.5272	1.2	1.144	0.013	0.003	0.25924	0.25307	ENABLED
3	1.000	0.0236	0.9764	0.5157	2.4	1.119	0.014	0.003	0.24352	0.23224	ENABLED
4	2.000	0.0407	0.9593	0.4986	4.1	1.082	0.011	0.003	0.29880	0.27741	ENABLED
5	4.000	0.0701	0.9299	0.4692	7.0	1.018	0.017	0.004	0.17745	0.15717	ENABLED
6	8.000	0.1065	0.8935	0.4328	10.7	0.939	0.036	0.009	0.07778	0.05968	ENABLED
7	16.000	0.1554	0.8446	0.3839	15.5	0.833	0.074	0.018	0.03387	0.02400	ENABLED
8	4.000	0.1378	0.8622	0.4015	13.8	0.871	0.000	0.000	0.00000	0.00000	ENABLED
9	1.000	0.1217	0.8783	0.4176	12.2	0.906	0.000	0.000	0.00000	0.00000	ENABLED
10	0.250	0.1052	0.8948	0.4341	10.5	0.942	0.000	0.000	0.00000	0.00000	ENABLED

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: RA

Test Date: 9/5/2023

Checked By: _____ Date: _____

Report Created: 9/12/2023

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Consolidated Test Results

ASTM

Project:	Carson Water Treatment Plant
Project Number:	STN-2022-004
Job Number:	Lab 0189
Test Date:	9/5/2023

Sampling Date:	8/30/2023
Sample Number:	ST-2, 23-24 feet
Depth (ft)	23
Boring Number:	TB-07
Location:	Kid Lane, Carson, Skamania County, Washington
Client Name:	Stantec
Remarks:	

Specific Gravity:	2.75	Plastic Limit:	0	Liquid Limit:	0
Specific Gravity Method:	ASSUMED			Weight of Ring (g)	106.4
Sampling Method:	Undisturbed	Soil Classification:	MH		
Specimen Description:	2.5 inch diameter x 1 inch thick				

Parameters	Initial	Final
Height (in)	1.0000	0.8948
Height Source	NA	TEST RESULTS
Diameter (in)	2.5000	NA
Area (in ²)	4.909	NA
Volume (in ³)	4.9087	4.3925
Weight of Container (g)	22.7	22.6
Weight of Wet Soil + Container (g)	78.0	161.5
Weight of Dry Soil + Container (g)	61.7	126.4
Moisture Content (%)	41.8	33.8
Moist Weight + Ring Weight (g)	250.7	245.2
Dry Density (pcf)	79.0	90.0
Wet Density (pcf)	112.0	120.4
Saturation (%)	97.9	102.4
Void Ratio	1.2	0.9

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: RA

Test Date: 9/5/2023

Checked By: _____ Date: _____



Consolidation Test Results

ASTM

Specimen 1

Test Description:	Standard One-Dimensional Consolidation		
Other Associated Tests:			
Device Details:	Conmatic 5470		
Test Specification:			
Test Time:	9/5/2023 12:00:00 AM		
Technician:	RA	Sampling Method:	Undisturbed
Specimen Code:	TB-07, 23-24 feet	Specimen Lab #:	Lab 0189
Specimen Description:	2.5 inch diameter x 1 inch thick		
Specimen Preparation:	Trimming Turntable		
Large Particle:			
Moisture Content:	Natural Moisture		
Test Condition:			
Test Procedure:	ASTM		
Seating Pressure Used:	YES	Seating Pressure (tsf):	0.015
Preconsolidation Stress:			
Percent Strain [LOG] Graph (tsf):	NA	Final Voids Graph (tsf):	1.991

Project Name: Carson Water Treatment Plant Project Number: STN-2022-004

Technician: RA

Test Date: 9/5/2023

Report Created: 9/12/2023

Checked By: _____

Date: _____

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DRAWING TABLE OF CONTENTS

NOTES:

2. REFER TO SITE SPECIFIC OVERVIEW FOR DETAILS / REQUIREMENTS ON INTERCONNECT PIPING AND ANCILLARY EQUIPMENT.

4. RAW WATER QUALITY & PRETREATMENT WILL DIRECTLY EFFECT CONTINUOUS FILTRATE OUTPUT AND RECOVERY.

5. BOTH "B" AND "C" DRAINS MUST BE FREE DRAINING UNDER THE INFLUENCE OF GRAVITY AND MUST GO TO AN AIR CURED SUMP SYSTEM AVAILABLE. COMBINING THE "B" AND "C" DRAINS IS NOT PERMISSIBLE.

6. TRAILER MUST BE LEVELED TO OPERATE. THE ARIA FILTRA™ FAST MOBILE SYSTEM CAN OPERATE USING INTERNAL FEED PUMPS OR BY UTILIZING A PRESSURE FEED. MODE SELECTION AND APPROVAL WILL BE DONE BY WATER BASED ON SITE CONDITIONS AND REFERENCED IN OPERATING PROTOCOL.

7. THE SITE FEED TO THE TRAILER (INLET) MUST BE 5-15 PSIG AT THE FLOWRATE REQUIRED (ABSOLUTE MINIMUM OF 5 PSI REQ'D.) THE CUSTOMER FEED SYSTEM MUST BE ABLE TO HANDLE PERIODIC FLOW RATE CHANGE AND FLOW INTERRUPTION DURING STANDARD MAINTENANCE ROUTINES AUTOMATICALLY PERFORMED BY THE FILTER SYSTEM WITHOUT OVER PRESSURIZING THE FEED INLET.

8. PLANT AIR ASSIST, REQUIRED FLOW:
0.5 SCFM / SKID CONTINUOUS FOR VALVES AND 3 SCFM / MODULE
AS/RF FOR 60 SEC. EVERY 7 MIN. (TYP.)
AIR SUPPLY: CLEAN, DRY, AND OIL FREE INSTRUMENT GRADE AIR @ 200 PSIG
(ISO 8573-1 CLASS 1.5,1, 104° F [40° C] MAXIMUM)

9. V-50 REQUIRES INSTALLATION BETWEEN TWO FLANGES IN THE FILTRATE PIPING. V-50 SHALL BE CONNECTED WITH 1/4 INCH AIR TUBING BACK TO SOLENOID BANK WITHIN THE TRAILER. VALVE NEEDS TO BE SUPPORTED PROPERLY IN PIPING BY OTHERS. VALVE MAY BE INSTALLED ON EITHER DRIVER OR PASSENGER SIDE OF FILTRATE HEADER.

10. IF CHEMICAL WASTE NEEDS TO BE DIVERTED FROM AS / RF DRAIN WASTE, ADDITIONAL EXTERNAL VALVES ARE REQUIRED. THIS SHOULD BE DISCUSSED PRIOR TO ORDER ACCEPTANCE.

11. CONNECTIONS B, C & D MAY BE ON EITHER PASSENGER SIDE OR DRIVER SIDE. UNUSED SIDE WILL HAVE BLIND FLANGE.

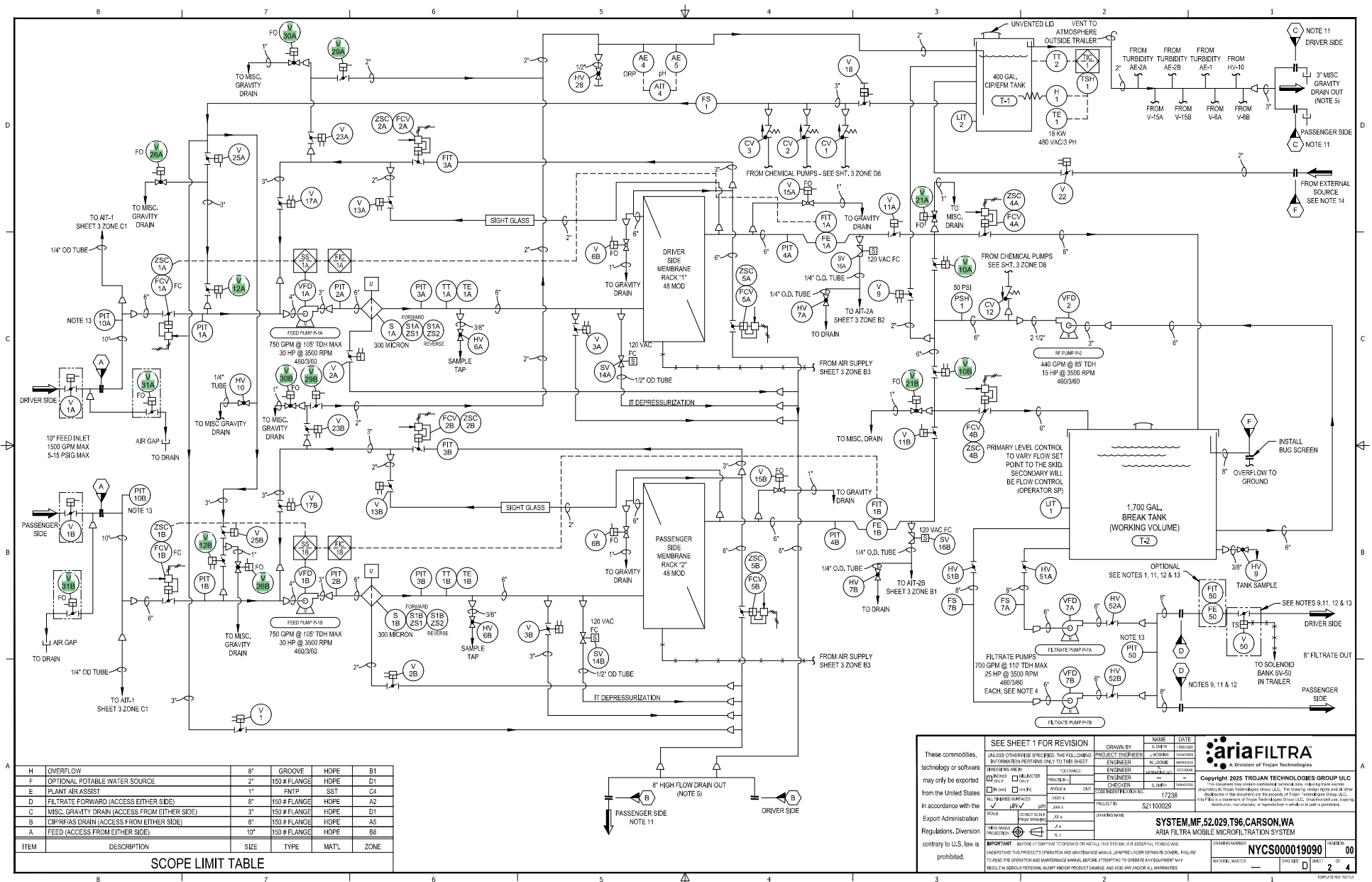
12. INCLUSION OF OPTIONAL FIT-50 IN CONJUNCTION WITH PASSENGER SIDE CONNECTION "D" REQUIRES FIT-50 AND V-50 TO BE INSTALLED AND SUPPORTED IN CUSTOMER SUPPLIED PIPING.

13. INSTRUMENTS / VALVES PIT-10, PIT-50, V-50, FIT-50 (OPTIONAL), PCV-1 (OPTIONAL) ARE REMOVED FOR TRANSIT AND INSTALLED AT SITE.

14. OPTIONAL POTABLE WATER SOURCE FOR EFM/CIP MAKEUP WATER SHALL BE 1 PSIG MINIMUM AND 25 PSIG MAX. WITH HARDNESS LESS THAN 150 PPM AS CaCO₃, REQUIRED FLOW RATE 50-100 GPM (3.1 - 6.3 LPS).

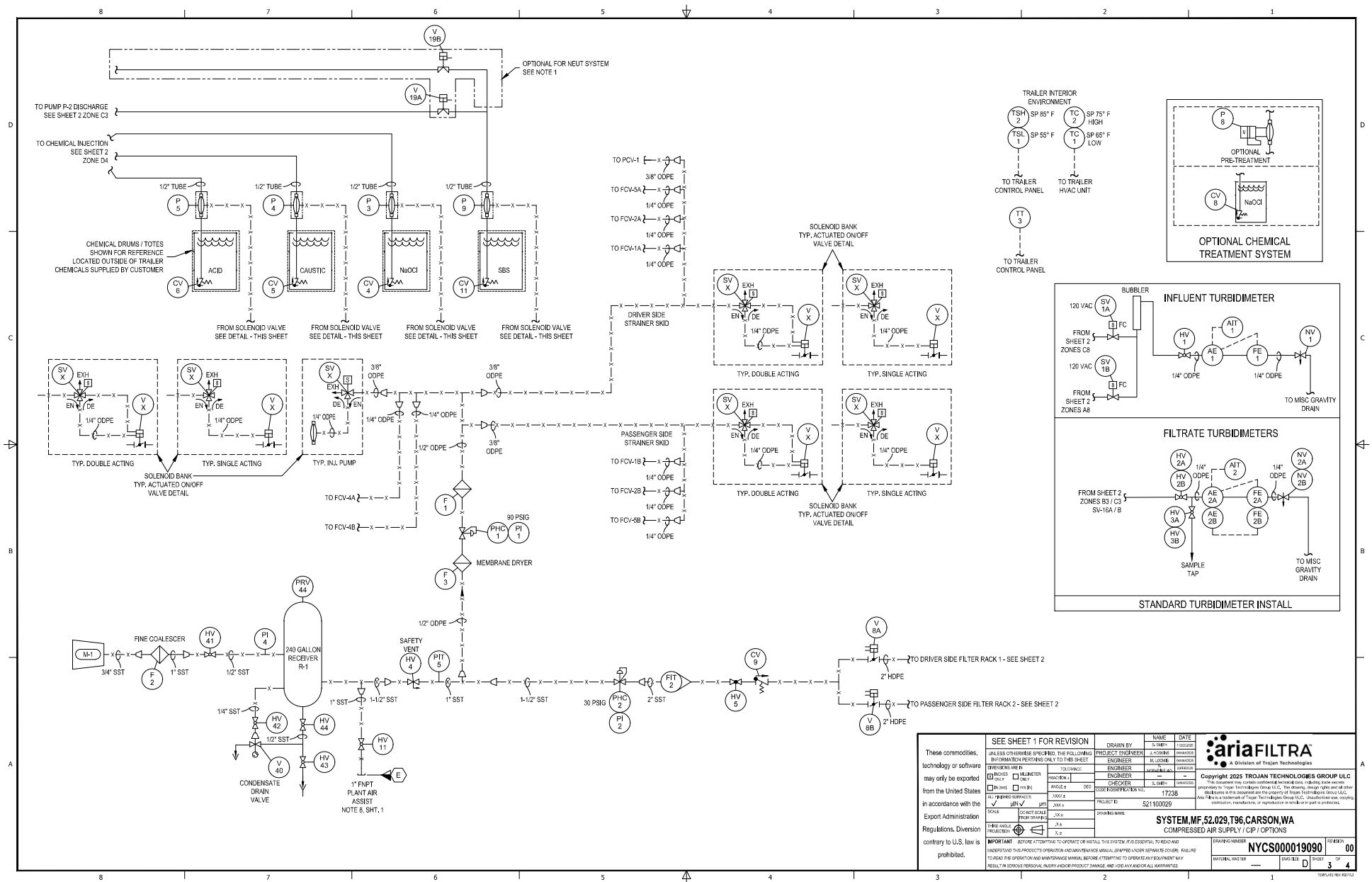
15. FOR CALCULATIONS USING FEED PRESSURE (PIT-3) AND FILTRATE PRESSURE (PIT-4) - NOTE THAT FILTRATE PRESSURE TRANSMITTER (PIT-4) IS LOCATED AT AN ELEVATION THAT IS 67.5 INCHES HIGHER THAN FEED PRESSURE TRANSMITTER (PIT-3).

[illegible]



H	OVERFLOW	8"	GROOVE	HDPE	B1
F	OPTIONAL POTABLE WATER SOURCE	2"	150 # FLANGE	HDPE	D1
E	PLANT AIR ASSIST	1"	FNTP	SST	C4
D	FILTRATE FORWARD (ACCESS EITHER SIDE)	8"	150 # FLANGE	HDPE	A2
C	MISC. GRAVITY DRAIN (ACCESS EITHER SIDE)	3"	150 # FLANGE	HDPE	D1
B	CIP/RFS DRAIN (ACCESS FROM EITHER SIDE)	8"	150 # FLANGE	HDPE	A5
A	FEED (ACCESS FROM EITHER SIDE)	10"	150 # FLANGE	HDPE	B8
ITEM	DESCRIPTION	SIZE	TYPE	MAT'L	ZONE

SCOPE LIMIT TABLE



	GATE VALVE OR MISCELLANEOUS
	BALL VALVE
	CHECK VALVE
	SPRING LOADED CHECK VALVE
	PLUG VALVE
	3-WAY PLUG VALVE
	ROTARY/BALL VALVE
	BUTTERFLY VALVE (W/ PNEUMATIC ACTUATOR)
	BUTTERFLY VALVE (HAND)
	NEEDLE VALVE
	ANGLE VALVE
	CONTROL VALVE
	FLOAT VALVE
	AIR RELEASE VALVE
	CORPORATION STOP VALVE/INJECTOR
	BACKFLOW PREVENTER
	DIAPHRAGM VALVE
	SAFETY RELIEF VALVE
	2 WAY SOLENOID VALVE
	3 WAY SOLENOID VALVE
	4 WAY SOLENOID VALVE
	MANUAL 3-WAY BALL VALVE
	ACTUATED 3-WAY BALL VALVE
	PNEUMATIC ACTUATOR CONTROL VALVE
	PRESSURE REDUCING VALVE (REGULATOR)
	POSITIONER & CYLINDER AIR TO CLOSE SINGLE ACTING (A.T.C.)
	POSITIONER & CYLINDER AIR TO OPEN SINGLE ACTING (A.T.O.)
	POSITIONER & CYLINDER AIR TO AIR DOUBLE ACTING (A.T.A.)

	CONTAINMENT
	UNDEFINED SIGNAL
	PNEUMATIC SIGNAL
	COMPRESSED AIR PIPING
	ELECTRIC SIGNAL
	FIELD MOUNTED DEVICE
	PANEL FACE MOUNTED DEVICE
	INSIDE OF PANEL MOUNTED DEVICE
	DEVICE MOUNTED ON AUXILIARY PANEL FACE
	DEVICE MOUNTED INSIDE OF AUXILIARY PANEL
	PROGRAMMABLE LOGIC CONTROLLER IN MAIN PANEL
	PROGRAMMABLE LOGIC CONTROLLER IN AUXILIARY PANEL
	DISPLAY ON MAIN PANEL
	MESSAGE DISPLAY ON CRT
	ELECTRIC OPERATOR
	INTERLOCK
	MAGNETIC FLOWMETER W/ INTEGRAL ELECTRONICS
	VARIABLE AREA FLOWMETER
	GEAR/DISPLACEMENT FLOWMETER
	ACTUATOR, W/ TRAVEL STOPS
	ACTUATOR, AIR TO CLOSE (SINGLE ACTING) (A.T.C.)
	ACTUATOR, AIR TO OPEN (SINGLE ACTING) (A.T.O.)
	ACTUATOR, AIR TO CLOSE & AIR TO OPEN (DOUBLE ACTING) (A.T.A.)
	TWO (2) ITEMS IN ONE (1) DEVICE
	FLOW CURRENT (ADD IDENTIFYING INFORMATION OUTSIDE BALLOON TO CLARIFY FUNCTION OF ITEM INSIDE BALLOON, EXT. I/P: CURRENT TO PNEUMATIC CONVERTER).
	PULSATION DAMPENER

	HUB DRAIN
	DIAPHRAGM SEAL
	STATIC MIXER
	BUTTERFLY VALVE WITH FIXED ORIFICE IN DISC
	SLIP JOINT/EXPANSION CONNECTION
	MANUAL VALVE OPERATOR
	BATTERY DATUM
	MECHANICAL BATTERY LIMIT (CUSTOMER) (ARIA FILTRA)
	ELECTRICAL BATTERY LIMIT (CUSTOMER) (ARIA FILTRA)
	SPRAY BALL
	PILOT LIGHT
	<u>COLOR CODE</u> R=RED A=AMBER G=GREEN B=BLUE W=WHITE
	SIGHT GLASS
	SWING ELBOW
	INSULATED EQUIPMENT
	STEAM OR ELECTRICAL TRACED WITH INSULATION
	ELECTRICAL HEAT TRACE
	ITEM OR EQUIPMENT NO.
	EDUCTOR (W/ GATE VALVE & FUNNEL)
	PROXIMITY SENSOR
	DIGITAL POSITIONER

	ANTIFOAM INLET
	"Y" STRAINER
	STRAINER/FILTER
	CONSTANT FLOW FITTING
	FLEXIBLE CONNECTOR/ EXPANSION JOINT
	FLEXIBLE REDUCER
	REDUCER
	FLANGED CONNECTION
	AIR GAP
	CAPPED OR PLUGGED CONNECTION
	PRESSURE CALIBRATION MANIFOLD (SINGLE UNIT)
	FLOWMETER-GEAR DISPLACEMENT

CENTRIFUGAL PUMP

ROTARY PUMP

(TUBING) PERISTALTIC PUMP

DOUBLE HEAD PERISTALTIC PUMP

MOTORIZED DIAPHRAGM PUMP

PNEUMATIC DIAPHRAGM PUMP

METERING PUMP

VERTICAL PUMP

SUBMERGED PUMP

	VENT
	LINE SIZE
	LINE BREAK
	FLOW LEFT
	FLOW RIGHT
	SLOPE LEFT
	SLOPE RIGHT
	TANK (CHEM)
	AIR RECEIVER
	DRYER
	COMPRESSOR
	DIFFERENTIAL
	HEATER (TANK)

FCV	FLOW CONTROLLER (BLIND)
FCV	FLOW CONTROL VALVE
FE	FLOW ELEMENT
FFC	FLOW RATIO CONTROLLER
FG	FLOW SIGHT GLASS
FI	FLOW INDICATOR
FIG	FLOW INDICATOR CONTROLLER
FIT	FLOW INDICATOR TRANSMITTER
FM	FLOW METER
FQ	FLOW TOTALIZER
FOC	FLOW TOTALIZER CONTROLLER
FR	FLOW RECORDER
FRC	FLOW RECORDER CONTROLLER
FSH	FLOW SWITCH HIGH
FSHH	FLOW SWITCH HIGH HIGH
FSL	FLOW SWITCH LOW
FSLL	FLOW SWITCH LOW LOW
FT	FLOW TRANSMITTER (BLIND)
FX	FLOW INTEGRATOR

TC	TEMPERATURE CONTROLLER (BLIND)
TCV	TEMPERATURE CONTROL VALVE
TE	TEMPERATURE ELEMENT
TI	TEMPERATURE INDICATOR
TIC	TEMPERATURE INDICATING CONTROLLER
TI1	TEMPERATURE INDICATING TRANSMITTER
TIH	TEMPERATURE UNIT HIGH
TR	TEMPERATURE RECORDER
TRC	TEMPERATURE RECORDER CONTROLLER
TSH	TEMPERATURE SWITCH HIGH
TSHH	TEMPERATURE SWITCH HIGH HIGH
TSL	TEMPERATURE SWITCH LOW
TSLL	TEMPERATURE SWITCH LOW LOW
TT	TEMPERATURE TRANSMITTER

A	ANALYTICAL INSTRUMENT
AIT	ANALYTICAL INSTRUMENT TRANSMITTER
A.S.	AIR SUPPLY
A.T.A.	AIR TO ACTIVATE
A.T.C.	AIR TO CLOSE
A.T.O.	AIR TO OPEN
DE	DE-ENERGIZE
DPi	DIFFERENTIAL PRESSURE INDICATOR
E	ENERGIZE
EX	EXHAUST
H	HEATER
HV	HAND VALVE (MANUAL)
IP	CURRENT TO PNEUMATIC TRANSDUCER
LS	LOCK
M	MECHANICAL DEVICES/SCCELLANEOUS
N.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
OICA	OPEN-CLOSE-AUTO
ORP	OXIDATION REDUCTION POTENTIAL
P	PUMP
PA	PULSE TO ANALOG
PI	PNEUMATIC TO CURRENT TRANSDUCER
PR	PRESSURE RUPTURE DISK
PS	PUMP SPEED
REV.	REVERSING
SC	SPEED CONTROL
SG	SIGHT GLASS
S.P.	SET POINT
SS	SELECTOR SWITCH
T	TANK
TS	TRAVEL STOP
TYP	TYPICAL
UA	MULTIVARIABLE ALARM
UON	UNLESS OTHERWISE NOTED
V	VALVE (ACTUATED)
VFC	VOLT FREE CONTACT
VFD	VARIABLE FREQUENCY DRIVE
W	WATER
ZSC	LIMIT SWITCH OPEN & CLOSED
ZSC	LIMIT SWITCH CLOSED
ZSC	LIMIT SWITCH OPEN

DSPI	DIFFERENTIAL SET POINT INDICATOR
PC	PRESSURE CONTROLLER (BLIND)
PCV	PRESSURE CONTROL VALVE
PDC	PRESSURE DIFFERENTIAL CONTROLLER
PDH	PRESSURE DIFFERENTIAL PRESSURE HIGH
PDHH	PRESSURE DIFFERENTIAL PRESSURE HIGH HIGH
PDI	PRESSURE DIFFERENTIAL PRESSURE INDICATOR
POS	PRESSURE DIFFERENTIAL PRESSURE SWITCH
PHC	PRESSURE HAND CONTROL (REGULATOR)
PI	PRESSURE INDICATOR
PIC	PRESSURE INDICATING CONTROLLER
PS	PRESSURE INDICATING SWITCH
PT	PRESSURE INDICATING TRANSMITTER
PLH	PRESSURE LIMIT HIGH
PR	PRESSURE RECORDER
PRC	PRESSURE RECORDER CONTROLLER
PSH	PRESSURE SWITCH HIGH
PSHH	PRESSURE SWITCH HIGH HIGH
PSL	PRESSURE SWITCH LOW
PSLL	PRESSURE SWITCH LOW LOW
PT	PRESSURE TRANSMITTER (BLIND)

LC	LEVEL CONTROLLER (BLIND)
LCV	LEVEL CONTROL VALVE
LE	LEVEL ELEMENT
LG	LEVEL GAGE GLASS
LI	LEVEL INDICATOR
LIC	LEVEL INDICATING CONTROLLER
LIT	LEVEL INDICATING TRANSMITTER
LR	LEVEL RECORDER
LRC	LEVEL RECORDING CONTROLLER
LSH	LEVEL SWITCH HIGH
LSHH	LEVEL SWITCH HIGH HIGH
LSL	LEVEL SWITCH LOW
LSLL	LEVEL SWITCH LOW LOW
LSM	LEVEL SWITCH MID
LT	LEVEL TRANSMITTER (BLIND)

SEE SHEET 1 FOR REVISION		NAME S. DENT		DATE 02/20/20		 A Division of TROJAN Technologies Group LLC
UNLESS OTHERWISE NOTED, THE FOLLOWING INFORMATION PERTAINS TO THIS PROJECT:		PROJECT ENGINEER ENGINEER		DESIGNER S. DENT		
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1. ☐ NEW 2. ☐ CHANGE 3. ☐ DELETED		1. ☐ PRELIMINARY 2. ☐ FINAL		1. ☐ PRELIMINARY 2. ☐ FINAL		
4. ☐ FIELD REVISION 5. ☐ REVISION		6. ☐ REVISION 7. ☐ REVISION		8. ☐ REVISION 9. ☐ REVISION		
SCALE		SCALE		SCALE		
1. ☐ 1" = 100' 2. ☐ 1" = 200' 3. ☐ 1" = 300' 4. ☐ 1" = 400' 5. ☐ 1" = 500' 6. ☐ 1" = 600' 7. ☐ 1" = 700' 8. ☐ 1" = 800' 9. ☐ 1" = 900' 10. ☐ 1" = 1000'		1. ☐ 1" = 100' 2. ☐ 1" = 200' 3. ☐ 1" = 300' 4. ☐ 1" = 400' 5. ☐ 1" = 500' 6. ☐ 1" = 600' 7. ☐ 1" = 700' 8. ☐ 1" = 800' 9. ☐ 1" = 900' 10. ☐ 1" = 1000'		1. ☐ 1" = 100' 2. ☐ 1" = 200' 3. ☐ 1" = 300' 4. ☐ 1" = 400' 5. ☐ 1" = 500' 6. ☐ 1" = 600' 7. ☐ 1" = 700' 8. ☐ 1" = 800' 9. ☐ 1" = 900' 10. ☐ 1" = 1000'		
11. ☐ 1" = 1100' 12. ☐ 1" = 1200' 13. ☐ 1" = 1300' 14. ☐ 1" = 1400' 15. ☐ 1" = 1500'		1. ☐ 1" = 100' 2. ☐ 1" = 200' 3. ☐ 1" = 300' 4. ☐ 1" = 400' 5. ☐ 1" = 500' 6. ☐ 1" = 600' 7. ☐ 1" = 700' 8. ☐ 1" = 800' 9. ☐ 1" = 900' 10. ☐ 1" = 1000'		1. ☐ 1" = 100' 2. ☐ 1" = 200' 3. ☐ 1" = 300' 4. ☐ 1" = 400' 5. ☐ 1" = 500' 6. ☐ 1" = 600' 7. ☐ 1" = 700' 8. ☐ 1" = 800' 9. ☐ 1" = 900' 10. ☐ 1" = 1000'		
16. ☐ 1" = 1600' 17. ☐ 1" = 1700' 18. ☐ 1" = 1800' 19. ☐ 1" = 1900' 20. ☐ 1" = 2000'		1. ☐ 1" = 100' 2. ☐ 1" = 200' 3. ☐ 1" = 300' 4. ☐ 1" = 400' 5. ☐ 1" = 500' 6. ☐ 1" = 600' 7. ☐ 1" = 700' 8. ☐ 1" = 800' 9. ☐ 1" = 900' 10. ☐ 1" = 1000'		1. ☐ 1" = 100' 2. ☐ 1" = 200' 3. ☐ 1" = 300' 4. ☐ 1" = 400' 5. ☐ 1" = 500' 6. ☐ 1" = 600' 7. ☐ 1" = 700' 8. ☐ 1" = 800' 9. ☐ 1" = 900' 10. ☐ 1" = 1000'		
21. ☐ 1" = 2100' 22. ☐ 1" = 2200' 23. ☐ 1" = 2300' 24. ☐ 1" = 2400' 25. ☐ 1" = 2500'		1. ☐ 1" = 100' 2. ☐ 1" = 200' 3. ☐ 1" = 300' 4. ☐ 1" = 400' 5. ☐ 1" = 500' 6. ☐ 1" = 600' 7. ☐ 1" = 700' 8. ☐ 1" = 800' 9. ☐ 1" = 900' 10. ☐ 1" = 1000'		1. ☐ 1" = 100' 2. ☐ 1" = 200' 3. ☐ 1" = 300' 4. ☐ 1" = 400' 5. ☐ 1" = 500' 6. ☐ 1" = 600' 7. ☐ 1" = 700' 8. ☐ 1" = 800' 9. ☐ 1" = 900' 10. ☐ 1" = 1000'		
26. ☐ 1" = 2600' 27. ☐ 1" = 2700' 28. ☐ 1" = 2800' 29. ☐ 1" = 2900' 30. ☐ 1" = 3000'		1. ☐ 1" = 100' 2. ☐ 1" = 200' 3. ☐ 1" = 300' 4. ☐ 1" = 400' 5. ☐ 1" = 500' 6. ☐ 1" = 600' 7. ☐ 1" = 700' 8. ☐ 1" = 800' 9. ☐ 1" = 900' 10. ☐ 1" = 1000'		1. ☐ 1" = 100' 2. ☐ 1" = 200' 3. ☐ 1" = 300' 4. ☐ 1" = 400' 5. ☐ 1" = 500' 6. ☐ 1" = 600' 7. ☐ 1" = 700' 8. ☐ 1" = 800' 9. ☐ 1" = 900' 10. ☐ 1" = 1000'		
31. ☐ 1" = 3100' 32. ☐ 1" = 3200' 33. ☐ 1" = 3300' 34. ☐ 1" = 3400' 35. ☐ 1" = 3500'		1. ☐ 1" = 100' 2. ☐ 1" = 200' 3. ☐ 1" = 300' 4. ☐ 1" = 400' 5. ☐ 1" = 500' 6				

Project: **Public Utilities District No. 1 of
Skamania County
Carson Water Treatment Plant**

Date: December 5, 2025

The Inadvertent Discovery Plan (IDP) outlines procedures to perform in the event of a discovery of archaeological materials, human remains, and/or funerary objects during any activities related to the project.

An IDP is not a substitute for a formal cultural resources review (Executive 21-02 “Archaeological and Cultural Resources” or National Historic Preservation Act [NRHP] Section 106). For discoveries of cultural resources or human remains after the standard review process is completed, 54 USC § 306108 and 36 CFR § 800.13(b)(3)-post-review discoveries apply.

See Revised Code of Washington Chapter 27.53, “Archaeological Sites and Resources,” for applicable state laws and statutes. Additional Federal laws which may apply include but are not limited to 16 USC 470ee (Archeological Resources Protection Act or ARPA), which prohibits the unauthorized destruction or removal of archaeological materials, including human remains (i.e., more than 100 years old) on federal lands and federal trust lands. Violations may be prosecuted as a misdemeanor or felony, as warranted by the severity of the violation.

Section 1: WHEN TO STOP WORK

Construction may uncover previously unidentified Precontact or Historic-era artifacts. Work must stop when the following types of artifacts and/or features are encountered:

Precontact artifacts may include (but are not limited to):

- Flaked stone tools (arrowheads, knives, scrapers, etc.).
- Waste flakes that result from the construction of flaked stone tools.
- Ground stone tools like mortars and pestles.
- Layers (strata) of discolored earth resulting from fire hearths. May be black, red, or mottled brown and often contain discolored cracked rocks or dark soil with broken shell.
- Human skeletal remains.
- Structural remains (wooden beams, post holes, fish weirs, etc.).

Historic-era artifacts may include (but are not limited to):

- Glass (bottles, vessels, windows, etc.).
- Ceramic (dinnerware, vessels, etc.).
- Metal (nails, drink/food cans, tobacco tins, industrial parts, etc.).
- Building materials (bricks, shingles, etc.).
- Building remains (foundations, architectural components, etc.).
- Old wooden posts, pilings, or planks (these may be encountered above or below water).
- Even what looks to be old garbage could very well be an important archaeological resource.
- Old farm equipment may indicate historic resources in the area.

When in doubt... STOP, PROTECT, NOTIFY.

Section 2: PROTOCOL IN EVENT OF INADVERTENT DISCOVERY OF CULTURAL RESOURCES

STEP 1: STOP

- In the event any archaeological or historic materials are encountered during project activity, all work in 50 ft radius, including vehicular traffic, will **stop immediately**.

STEP 2: PROTECT

- Implement reasonable measures to protect the discovery site, including a clear, identifiable, wide (50 feet or larger) temporary fencing, flagging, or other clear markings, and any appropriate stabilization or covering.
 - If human remains are uncovered, leave the discovery and the surrounding area **UNTOUCHED** (do not pick up, move, touch, or further disturb the discovery)
 - Take reasonable steps to ensure the confidentiality of the discovery site. *Do not call 911.* Do not speak with the media. Secure the location. Do not take photos.
- Take reasonable steps to provide protection and ensure integrity of the discovery. Do not permit vehicles, equipment, or unauthorized personnel to traverse the discovery site. Do not speak with the media. Secure the location. Do not take photos.

STEP 3: NOTIFY

- Notify the Stantec Engineer immediately, who will notify the U.S. Department of Agriculture(USDA) Rural Development Environmental Coordinator. The USDA Rural Development Coordinator will contact additional Rural Development staff.
- The Stantec Engineer will contact a professional archaeologist (SOI qualified) to assess the find.
- If an archaeologist determines the discovery /find is an archaeological site or object, either the archaeologist or the Project Manager will contact the Washington Department of Archaeology and Historic Preservation (DAHP) to discuss the next steps.
- If an archaeologist determines the discovery / find is not archaeological, construction may proceed.

Inadvertent Discovery of Cultural Resources - Contact List

Affiliation	Individual and Title	Phone Number
Stantec	Bryan Black – Regional Practice Leader, Water (Engineer)	503-490-2041
USDA - Rural Development	Ian Sims – State Environmental Coordinator / State Engineer (Acting)	509-415-3815
Skamania Public Utility District No. 1 (Property Owner)	Melanie Sharp – Project and Water Manager	509-219-0134 (office)
Washington DAHP	Rob Whitlam- State Archaeologist *Reference SHPO Log # 2022-11-07849-USDA-RD	360-890-2615 (office)

Section 3: PROTOCOL IN EVENT OF INADVERTENT DISCOVERY OF HUMAN SKELETAL REMAINS (RCWs 68.50.645, 27.44.055, and 68.60.055)

STEP 1: STOP

- In the event any archaeological or historic materials are encountered during project activity, all work within 100 ft of the discovery including vehicular traffic will **stop immediately**.

STEP 2: PROTECT

- Secure the location. Implement reasonable measures to protect the discovery site, including a clear, identifiable, wide (30 feet or larger) temporary fencing, flagging, or other clear markings, and any appropriate stabilization or covering.
- Leave the discovery and the surrounding area **UNTOUCHED** (do not pick up, move, touch, or further disturb the discovery). Do not take photos. Do not speak with the media.
- Do not permit vehicles, equipment, or unauthorized personnel to traverse the discovery site.

STEP 3: NOTIFY

- Notify the Stantec Engineer immediately, who will notify the U.S. Department of Agriculture(USDA) Rural Development Environmental Coordinator.
- The finding of human skeletal remains will be reported to the Skamania County Coroner and Skamania County Sheriff's Department by the onsite Foreman / Staff in the most expeditious manner possible. See Contact List below. Do **NOT** call 911. This is done in accordance with tribal, state, or local laws including 36 CFR part 800.13; 43 CFR part 10, subpart B; and the Advisory Council on Historic Preservation's Policy Statement Regarding treatment of Burial Sites, Human Remains, or Funerary Objects (February 23, 2007).
- The Skamania County Coroner will assume jurisdiction over the human skeletal remains and make a determination of whether those remains are forensic or non-forensic. If the Skamania County Coroner determines the remains are non-forensic, then they will report that finding to the Department of Archaeology and Historic Preservation (DAHP) who will then take jurisdiction over the remains.
- The DAHP will notify any appropriate cemeteries and all affected tribes of the find.
- The State Physical Anthropologist will make a determination of whether the remains are Native American or Non-Native American and report that finding to any appropriate cemeteries and the affected tribes.
- The DAHP will then handle all consultations with the affected parties as to the future preservation, excavation, and disposition of the remains.

Inadvertent Discovery of Human Skeletal Remains - Contact List

Affiliation	Individual and Title	Phone Number
Stantec	Bryan Black – Regional Practice Leader, Water (Engineer)	503-490-2041
USDA - Rural Development	Ian Sims – State Environmental Coordinator / State Engineer (Acting)	509-415-3815
Skamania County Coroner	Angie Hollis - Coroner	509-427-3718 (office)

Skamania County Sheriff's Department	Skamania County Sheriff's Department Non-Emergency	509-427-9490 (Office)
Washington DAHP	Guy Tasa –State Physical Anthropologist Or Jennifer Spence – Assistant State Physical Anthropologist *Reference SHPO Log # 2022-11-07849-USDA-RD	360-790-1633 (office) 360-890-0174 (office)
Skamania Public Utility District No. 1 (Property Owner)	Melanie Sharp – Project and Water Manager	509-219-0134 (office)

Section 4: PROCEEDING WITH CONSTRUCTION

- If human remains are discovered and are determined to be Native, consultation with the affected Tribes and interested parties will take place to mitigate the final disposition of said remains.
- Construction can proceed only after the actions determined during consultation have been completed and clearance is obtained from all affected Tribes, DAHP, and the USDA Rural Development Coordinator.