

PROJECT DESCRIPTION

THE PER-CR25-2.00 PROJECT CONSISTS OF THE REPLACEMENT OF AN EXISTING SINGLE SPAN, BRIDGE STRUCTURE CARRYING TOLL GATE ROAD (CR 25) OVER CENTER BRANCH RUSH CREEK AT MILE MARKER 2.00 IN PERRY COUNTY, OHIO.

HISTORIC RECORDS

HDR IS UNAWARE OF ANY PRIOR GEOTECHNICAL EXPLORATIONS PERFORMED WITHIN THE PROJECT LIMITS.

GEOLOGY

THE PROJECT SITE LIES WITHIN THE ILLINOIAN GLACIATED ALLEGHENY PLATEAU REGION OF THE GLACIATED ALLEGHENY PLATEAUS SECTION OF THE APPALACHIAN PLATEAUS PROVINCE. THE ILLINOIAN GLACIATED ALLEGHENY PLATEAU REGION IS CHARACTERIZED BY DISSECTED, RUGGED HILLS, COVERED WITH LOESS AND OLDER DRIFT ON RIDGETOPS. ELEVATIONS IN THIS REGION GENERALLY RANGE FROM 600 TO 1,400 FEET ABOVE SEA LEVEL. SOILS IN THE ILLINOIAN GLACIATED ALLEGHENY PLATEAU CONSIST OF CLAYEY, ILLINOIAN-AGE TILL OVER DEEPLY BURIED, SOFT DEVONIAN-AGE SHALES AND NEAR-SURFACE MISSISSIPPIAN-AGE SANDSTONES AND SHALES.

DRAINAGE IN THE PROJECT AREA IS ACCOMMODATED BY CENTER BRANCH RUSH CREEK AND ITS TRIBUTARIES, WHICH DRAINS INTO RUSH CREEK APPROXIMATELY 2 1/2 MILES DOWNSTREAM OF THE PROJECT SITE AND TWO MILES WEST OF JUNCTION CITY. THE PROJECT SITE IS DIRECTLY DRAINED BY THE CENTER BRANCH RUSH CREEK.

ACCORDING TO THE SURFICIAL GEOLOGY DATA FROM THE OHIO DEPARTMENT OF NATURAL RESOURCES (ODNR) DIVISION OF GEOLOGICAL SURVEY, SURFICIAL SOILS AT THE SITE CONSIST OF PRIMARILY ILLINOIAN-AGED LOAM TILL DEPOSITS AND HOLOCENE-AGED ALLUVIAL DEPOSITS WITH UNDERLYING MISSISSIPPIAN AND PENNSYLVANIAN BEDROCK INCLUDING SANDSTONE, SHALE, SILTSTONE, CLAY, LIMESTONE, AND COAL. THE ALLUVIUM DEVELOPS IN FLOODPLAINS OF MODERN STREAMS WITH SOILS RANGING FROM SILT TO CLAY TO BOULDERS, COMMONLY INCLUDING ORGANIC MATERIALS. THE LOAM TILL IS COMPOSED OF TILL DEPOSITS OVERLAIN BY LOESS THAT BECOMES THICKER ALONG BLUFFS BORDERING MAJOR RIVERS. THE TILL DEPOSITS CONSIST OF AN UNSORTED MIX OF SILT, CLAY, SAND, GRAVEL, AND BOULDERS DEPOSITED DIRECTLY FROM SEVERAL SEPARATE ICE ADVANCES.

THE UNDERLYING BEDROCK MAPPED WITHIN THE PROJECT AREA IS THE MISSISSIPPIAN-AGE LOGAN AND CUYAHOGA FORMATIONS UNDIVIDED. THE PENNSYLVANIAN AGE ALLEGHENY AND POTTSVILLE GROUPS, UNDIVIDED (IPAP) MAY ALSO BE FOUND ALONG THE NORTHERN AND SOUTHERN EXTENTS OF THE PROJECT SITE. THE LOGAN AND CUYAHOGA FORMATIONS, UNDIVIDED GENERALLY CONSIST OF LOCALLY FOSSILIFEROUS SHALE, SILTSTONE, AND SILTY TO GRANULAR SANDSTONE, WHICH ARE OFTEN INTERBEDDED, WITH MINOR AMOUNTS OF CONGLOMERATE AND THIN- TO THICK-BEDDED LIMESTONE. THE ALLEGHENY AND POTTSVILLE GROUPS, UNDIVIDED GENERALLY CONSIST OF LOCALLY FOSSILIFEROUS AND PARTIALLY CALCAREOUS SHALE AND THIN- TO MEDIUM-BEDDED, LOCALLY FOSSILIFEROUS SILTSTONE, WITH MINOR AMOUNTS OF THIN- TO MEDIUM-BEDDED LIMESTONE AND VERY FINE TO MEDIUM-GRAINED SANDSTONE. COAL BEDS OF NOTE WITHIN THE ALLEGHENY AND POTTSVILLE GROUP INCLUDE THE UPPER AND LOWER FREEPORT, MIDDLE AND LOWER KITTANNING, CLARION, AND NEWLAND-BROOKVILLE SEAMS. PERRY COUNTY WAS HEAVILY MINED IN THE CENTRAL AND EASTERN PORTIONS OF THE COUNTY, BUT THERE IS NO RECORD OF MINING AT THE PROJECT SITE ITSELF BASED ON REVIEW OF AVAILABLE MINE MAPS FROM THE ODNR.

RECONNAISSANCE

AN INITIAL VISUAL RECONNAISSANCE OF THE PROJECT SITE AND SURROUNDING AREA WAS PERFORMED ON AUGUST 4, 2022 , WITH A MORE DETAILED VISUAL RECONNAISSANCE PERFORMED DURING THE DRILLING ACTIVITIES ON OCTOBER 19, 2022. THE PROJECT SITE IS LOCATED WITHIN A WOODED, RELATIVELY NARROW VALLEY, WITH THE EXISTING BRIDGE LOCATED WITHIN THE LOW POINT OF A SAG CURVE. THE EXISTING BRIDGE IS SUPPORTED BY NINE APPROXIMATELY 24 INCH DEEP BY 9 INCH WIDE, STEEL SECTIONS SPANNING BETWEEN THE TWO BRIDGE ABUTMENTS. EACH ABUTMENT IS CONSTRUCTED OF SEVEN EVENLY SPACED 12-INCH DEEP BY 12-INCH WIDE PILES WITH LAGGING PLACED BEHIND PILES. THE LAGGING AT THE NORTH ABUTMENT CONSISTS OF GUARDRAIL, WHILE AT THE SOUTH ABUTMENT, THE LAGGING CONSISTS OF CONCRETE PANELS. THE BRIDGE DECK CONSISTS OF CORRUGATED STEEL DECKING WITH AN ASPHALTIC CONCRETE OVERLAY.

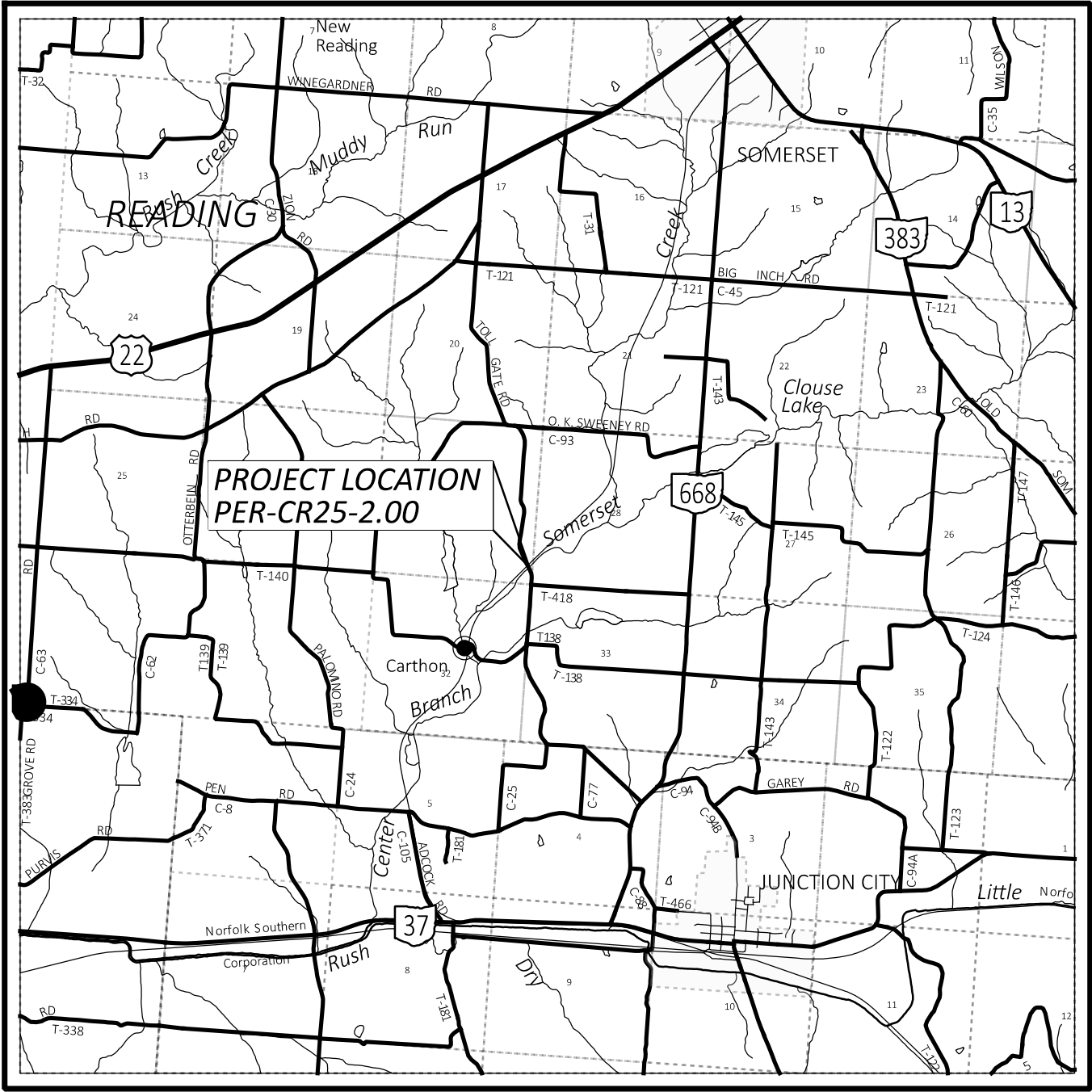
SUBSURFACE EXPLORATION

THE GEOTECHNICAL EXPLORATION PROGRAM CONSISTED OF TWO TEST BORINGS DRILLED WITHIN THE SOUTHBOUND LANE OF CR 25. THE TEST BORINGS, DESIGNATED AS BORINGS B-001-0-22 THROUGH B-002-0-22, WERE DRILLED ON OCTOBER 19, 2022 NEAR THE SOUTHEAST AND NORTHWEST ABUTMENTS, RESPECTIVELY TO CHARACTERIZE THE SUBSURFACE PROFILE ALONG THE PROJECT ALIGNMENT. THE BORINGS WERE DRILLED BY CENTRAL STAR DRILLING UNDER THE GENERAL SUPERVISION OF AN HDR GEOTECHNICAL ENGINEER WITH A DIEDRICH D-50 TRACK-MOUNTED DRILL RIG. THIS RIG WAS CALIBRATED ON MARCH 7, 2022 WITH A HAMMER ENERGY RATIO OF 86.8%. THE BORINGS WERE DRILLED IN GENERAL ACCORDANCE WITH THE SPECIFICATIONS FOR GEOTECHNICAL EXPLORATIONS (ODOT REVISED JULY 2022) UTILIZING 2.25-INCH HOLLOW STEM AUGERS TO ADVANCE THE BORINGS. SAMPLING OF THE SOILS WAS PERFORMED AT 2.5-FOOT INTERVALS TO THE EXPLORED DEPTHS EXCEPT FOR CONTINUOUS SAMPLING PERFORMED AT THE APPROXIMATE STREAM BED ELEVATION. SAMPLING WAS ACCOMPLISHED IN ACCORDANCE WITH THE “STANDARD TEST METHOD FOR PENETRATION TEST AND SPLIT-BARREL SAMPLING OF SOILS”, ASTM D 1586. AN UNDISTURBED SOIL SAMPLE WAS ALSO COLLECTED FROM BORING B-002-0-22 IN ACCORDANCE WITH THE “STANDARD PRACTICE FOR THIN-WALLED TUBE SAMPLING OF SOILS FOR GEOTECHNICAL PURPOSES” (ASTM D 1587). THE COLLECTION OF TWO ADDITIONAL UNDISTURBED SAMPLES WERE ATTEMPTED DURING THE DRILLING ACTIVITIES. HOWEVER, THE RECOVERY IN BOTH INSTANCES WAS MINIMAL.

SAMPLING OF THE UNDERLYING BEDROCK WAS PERFORMED AT EACH BORING IN ACCORDANCE WITH THE “STANDARD PRACTICE FOR ROCK CORE DRILLING AND SAMPLING OF ROCK FOR SITE INVESTIGATION” (ASTM D 2113) USING AN NQ2-SIZE DOUBLE-TUBE SWIVEL BARREL WITH A DIAMOND BIT.

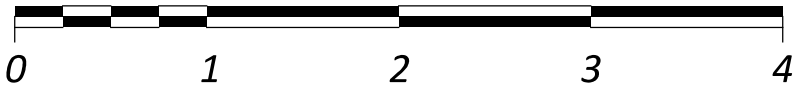
LEGEND

DESCRIPTION	ODOT CLASS	CLASSIFIED MECH./VISUAL	
GRAVEL/STONE FRAGMENTS	A-1-b	2	3
GRAVEL/STONE FRAGMENTS W/ SAND & SILT	A-2-4	1	1
GRAVEL/STONE FRAGMENTS W/ SAND, SILT & CLAY	A-2-6	1	0
SANDY SILT	A-4a	4	1
SILT	A-4b	5	3
SILT & CLAY	A-6a	1	1
	TOTAL	14	9
SANDSTONE			
SHALE			
PAVEMENT OR BASE = X = APPROXIMATE THICKNESS	VISUAL		
BORING LOCATION - PLAN VIEW.			
DRIVE SAMPLE AND/OR ROCK CORE BORING PLOTTED TO VERTICAL SCALE ONLY. HORIZONTAL BAR INDICATES A CHANGE IN STRATIGRAPHY.			
WC	INDICATES WATER CONTENT IN PERCENT.		
N ₆₀	INDICATES STANDARD PENETRATION RESISTANCE NORMALIZED TO 60% DRILL ROD ENERGY RATIO.		
X/Y/Z	NUMBER OF BLOWS FOR STANDARD PENETRATION TEST (SPT): X= NUMBER OF BLOWS FOR FIRST 6 INCHES. Y= NUMBER OF BLOWS FOR SECOND 6 INCHES. Z= NUMBER OF BLOWS FOR THIRD 6 INCHES.		
X/Y/D"	NUMBER OF BLOWS FOR STANDARD PENETRATION TEST (SPT): X= NUMBER OF BLOWS 6 INCHES (UNCORRECTED). Y/D"= NUMBER OF BLOWS (UNCORRECTED) FOR D"OF PENETRATION AT REFUSAL.		
W—	INDICATES FREE WATER ELEVATION.		
●	INDICATES A PLASTIC MATERIAL WITH A MOISTURE CONTENT EQUAL TO OR GREATER THAN THE LIQUID LIMIT MINUS 3.		
NP	INDICATES NON-PLASTIC SAMPLE.		
SS	INDICATES A SPLIT SPOON SAMPLE.		
ST	INDICATES A SHELBY TUBE SAMPLE.		
TR	INDICATES TOP OF ROCK.		
NQ2	INDICATES A ROCK CORE SAMPLE		
Qu	INDICATES ROCK COMPRESSION TEST, ASTM D7012, METHOD C, RESULTS. INDICATES SOIL UNCONFINED COMPRESSION TEST, ASTM D2166, RESULTS.		

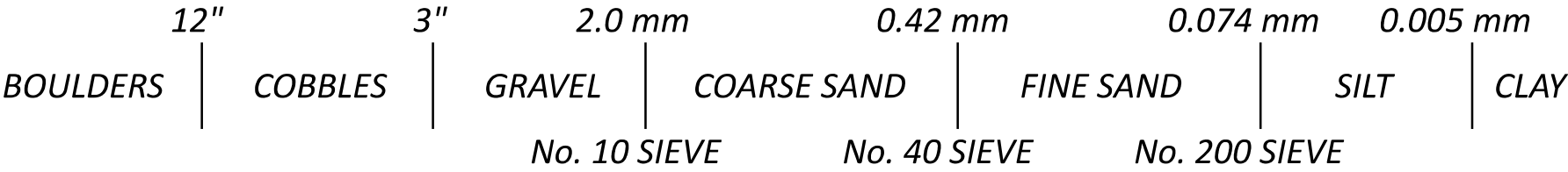


LOCATION MAP

SCALE IN MILES



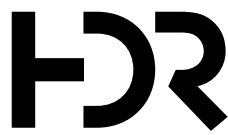
PARTICLE SIZE DEFINITIONS



SCOUR ANALYSIS PARAMETERS					
BORING NO.	SAMPLE NO.	ELEVATION (ft)	D50 VALUES (mm)	τ (psf)	EROSION CATEGORY (EC)
B-001-0-22	SS-5	820.8 - 819.4	0.0259	0.154	3.91
	SS-6	818.7 - 817.3	0.0329	0.180	3.87
	SS-7	817.3 - 815.8	0.9635	0.020	2.18
	SS-8	815.8 - 814.3	0.1258	0.003	1.12
B-002-0-22	SS-5	821.8 - 820.3	0.0133	0.108	3.67
	SS-6	820.3 - 818.8	0.0253	0.157	3.67
	SS-7	818.8 - 817.3	0.0282	0.167	3.67
	SS-8	817.3 - 815.8	0.0266	0.151	3.61

BEDROCK TEST SUMMARY				
BORING NO.	SAMPLE	SAMPLE ELEVATION	DEPTH	Qu (PSI)
B-001-0-22	NQ2-2	795.8 - 795.1	35.0' - 35.7'	15,571
B-002-0-22	NQ2-2	791.1 - 790.3	40.2' - 41.0'	14,247

RECON. - DCM 08/04/2022
DRILLING - CENTRAL STAR 10/19/2022
DRAWN - CLW 11/16/2022 - 11/29/2022
REVIEWED - DMV 11/29/2022



EXPLORATION FINDINGS

THE GENERALIZED SOIL PROFILE AS ENCOUNTERED IN THE TWO TEST BORINGS CONSISTS OF EMBANKMENT FILL, AS ENCOUNTERED BEHIND THE EXISTING ABUTMENTS, OVER ALLUVIUM AND GLACIAL TILL SOILS. BEDROCK ENCOUNTERED BENEATH THE SOIL OVERBURDEN CONSISTS OF SHALE AND SANDSTONE.

AS BORINGS B-001-0-22 AND B-002-0-22 WERE LOCATED WITHIN THE EXISTING LIMITS OF THE ROADWAY, THE SURFICIAL MATERIALS CONSISTED OF 12 INCHES OF ASPHALT PAVEMENT. BENEATH THE PAVEMENT, APPROXIMATELY 5 TO 5.5 FEET OF FILL MATERIAL WAS ENCOUNTERED. THE OVERLYING FILL MATERIAL WAS GRANULAR, CONSISTING OF 3 FEET OF MEDIUM DENSE TO DENSE GRAVEL WITH SAND AND SILT (A-2-4) AT B-001-0-22 AND 1.5 FEET OF LOOSE GRAVEL WITH SAND (A-1-B) AT B-002-0-22. THE UNDERLYING FILL MATERIAL WAS COHESIVE IN NATURE. AT B-001-0-22, A MEDIUM STIFF TO STIFF SILT AND CLAY (A-6) WAS ENCOUNTERED, WHEREAS AT B-002-0-22, A MEDIUM STIFF TO STIFF SANDY SILT (A-4A). THE THICKNESS OF THE COHESIVE FILL AS ENCOUNTERED WAS 2 FEET AND 4 FEET, RESPECTIVELY.

ALLUVIAL SOILS WERE ENCOUNTERED BENEATH THE FILL MATERIAL. THE ALLUVIUM GENERALLY CONSISTED OF COHESIVE LAYERS OF VERY SOFT TO MEDIUM STIFF GRAY SANDY SILT (A-4A) AND SILT (A-4B); HOWEVER, ROUGHLY 6.5 FEET OF GRANULAR ALLUVIUM WAS ALSO ENCOUNTERED IN BORING B-001-0-22. POCKET PENETROMETER READINGS IN THE COHESIVE ALLUVIUM RANGED FROM 0.25 TO 2.0 TSF, WITH N60-VALUES FROM 1 TO 7 BLOWS PER FOOT (BPF). THE 18 INCHES OF GRAVEL WITH SAND, SILT AND CLAY (A-2-6) ENCOUNTERED FROM EL 817.3 TO EL 815.8 IN B-002-0-22 AND 5 FEET OF SANDY SILT (A-4A) FROM EL 815.8 TO EL 810.8 GENERALLY EXHIBITED A LOOSE RELATIVELY DENSITY, WITH N60-VALUES OF 4 TO 7 BPF.

GLACIAL TILL WAS ENCOUNTERED IN THE BORINGS STARTING AT A DEPTH OF 16.5 (EL 814.8) TO 20 FEET (EL 810.8) BELOW EXISTING GROUND SURFACE (BGS) AND EXTENDING TO THE TOP OF BEDROCK. THE TILL CONSISTED OF MEDIUM TO VERY DENSE GRAVEL WITH SAND (A-1-B) AND HARD SILT AND CLAY (A-6A).

SHALE AND SANDSTONE BEDROCK WAS ENCOUNTERED BENEATH THE TILL DEPOSITS TO THE BORING TERMINATION DEPTHS OF 45 FEET. A THIN LAYER OF SHALE WAS ENCOUNTERED FROM A DEPTH OF 30 TO 30.5 FEET (EL. 800.8 TO EL. 800.3) IN BORING B-001-0-22 AND 30 TO 30.5 FT (EL. 801.3 TO EL. 800.8) IN BORING B-002-0-22, RESPECTIVELY. THE SHALE WAS ABLE TO BE SAMPLED UTILIZING THE SPLIT-BARREL SAMPLING PROCEDURE, WITH SPLIT SPOON REFUSAL OBTAINED (N > 50/6”). SANDSTONE WAS ENCOUNTERED UNDERLYING THE SHALE AT A DEPTH OF 30.5 TO TERMINATION (EL. 800.3 TO EL. 785.8 AND EL. 800.8 TO EL. 786.3) IN BOTH BORINGS. THE SANDSTONE WAS CHARACTERIZED AS SLIGHTLY WEATHERED AND STRONG TO VERY STRONG, WITH A STRATUM ROCK QUALITY (SRQD) OF 55 AND 65%.


GROUNDWATER WAS ENCOUNTERED IN BORINGS B-001-0-22 AND B-002-0-22 DURING DRILLING AT DEPTHS OF 13.5 FEET (EL 817.3) AND 17.5 FEET (EL 813.8), RESPECTIVELY, BGS. AS WATER WAS INTRODUCED DURING DRILLING ACTIVITIES TO PERFORM ROCK CORING, WATER LEVELS UPON COMPLETION WERE NOT OBTAINED. FURTHERMORE, THE BORINGS WERE SEALED IMMEDIATELY UPON COMPLETION AS THE BORINGS WERE PERFORMED WITHIN THE CR 25 TRAVEL LANES, AND DELAYED WATER READINGS WERE NOT OBTAINED.

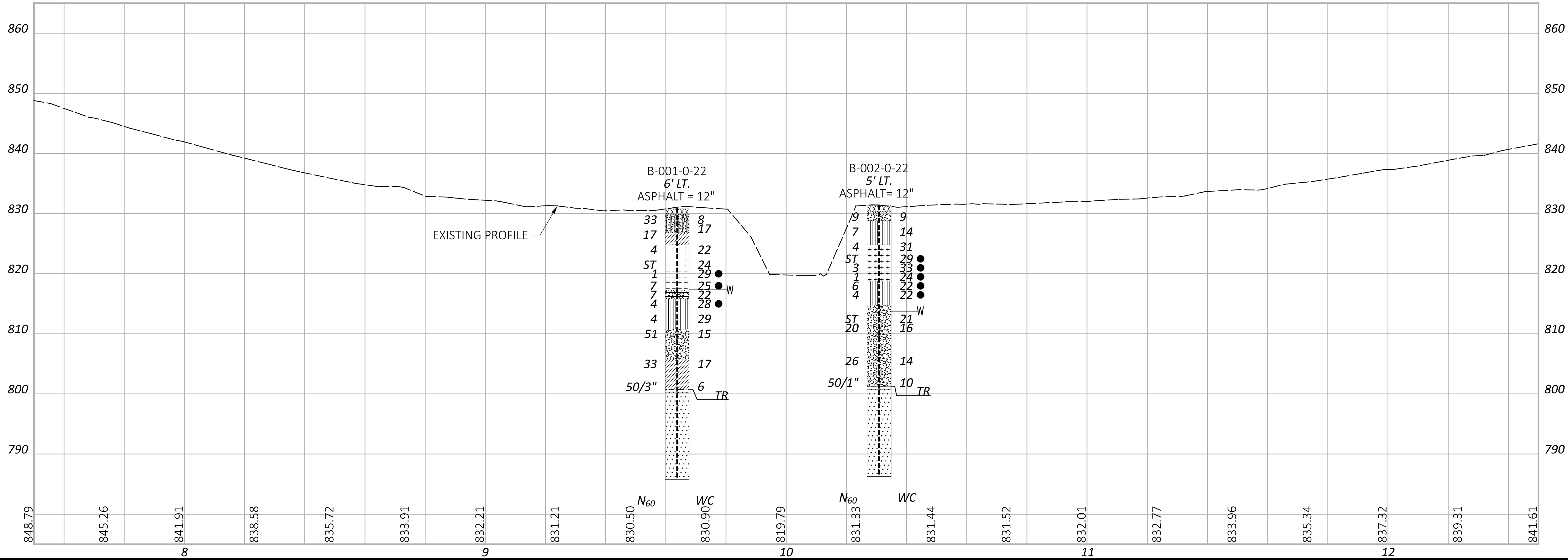
SPECIFICATIONS

THE GEOTECHNICAL EXPLORATION WAS PERFORMED IN GENERAL ACCORDANCE WITH THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, OFFICE OF GEOTECHNICAL ENGINEERING “SPECIFICATIONS FOR GEOTECHNICAL EXPLORATIONS”, DATED JULY 2020.

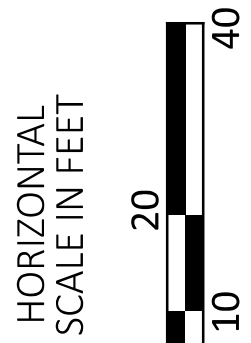
AVAILABLE INFORMATION

THE SOIL, BEDROCK, AND GROUNDWATER INFORMATION COLLECTED FOR THIS SUBSURFACE EXPLORATION THAT CAN BE CONVENIENTLY DISPLAYED ON THE GEOTECHNICAL PROFILE SHEETS HAS BEEN PRESENTED. GEOTECHNICAL REPORTS, IF PREPARED, ARE AVAILABLE FOR REVIEW ON THE OFFICE OF CONTRACT SALES WEBSITE.

DESIGN AGENCY	
	
DESIGNER	DCM
REVIEWER	DMV 11/29/22
PROJECT ID	117332
SHEET	TOTAL
2	10



GEOTECHNICAL PROFILE - BRIDGE
SFN: 6430899 - OVER CENTER BRANCH RUSH CREEK
STA. 7+70.00 TO STA. 12+50.00



DESIGN AGENCY



DESIGNER

DCM

REVIEWER

DMV 11/29/22

PROJECT ID

117332

SHEET

3

TOTAL

10

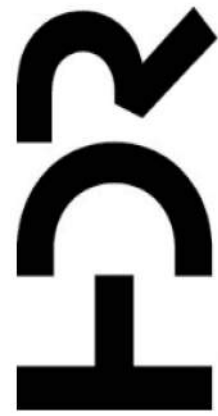
PROJECT: PER-CR25-02.00		DRILLING FIRM / OPERATOR: CENTRAL STAR / TS		DRILL RIG: DIEDRICH D-50 TRACK		STATION / OFFSET: 9+74.6' LT.										EXPLORATION ID	
TYPE: BRIDGE		SAMPLING FIRM / LOGGER: HDR / DCM		HAMMER: AUTOMATIC HAMMER		ALIGNMENT: CR-25										B-001-0-22	
PID: 117332 SFN: 6430899		DRILLING METHOD: 3.25" HSA / NQ2		CALIBRATION DATE: 3/7/22		ELEVATION: 830.8 (MSL) EOB: 45.0 ft.										PAGE	
START: 10/19/22 END: 10/19/22		SAMPLING METHOD: SPT / ST / NQ2		ENERGY RATIO (%): 86.8		LAT / LONG: 39.756322, -82.324129										1 OF 1	
MATERIAL DESCRIPTION AND NOTES				SPT/ RQD	REC SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	PL	WC	ODOT CLASS (GI)	HOLE SEALED		
12 inches Asphalt				11													
				11													
				12													
				3													
				4													
				24													
				7													
				5													
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SHALE, GRAY, SLIGHTLY WEATHERED, WEAK.				503	100									6	Rock (V)		
SANDSTONE, GRAY, SLIGHTLY WEATHERED, VERY STRONG, FINE TO MEDIUM GRAINED, THIN TO MEDIUM BEDDED, JOINT AND BEDDING DISCONTINUITIES, MODERATELY FRACTURED TO FRACTURED, TIGHT TO OPEN, SLIGHTLY ROUGH, VERY BLOCKY, GOOD SURFACE CONDITIONS; RQD 55%, REC 100%.				22	100	NQ2-1									CORE		
@ 31.1' - 31.5': Interbedded Shale																	
@ 33.8' - 34.3': Interbedded Shale				65	100	NQ2-2									CORE		
@ 35.0' - 35.7': 15,571 psi				73	100	NQ2-3									CORE		



B-001-0-22



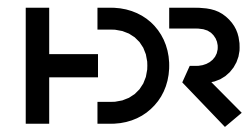
Run #	Depth (ft)		Recovery		RQD	
NQ2-1	30.5	35	54 in. / 54 in.	100%	12 in. / 54 in.	22%
NQ2-2	35	40	60 in. / 60 in.	100%	39 in. / 60 in.	65%
PER-CR25-2.00, PID 117332						



B-001-0-22



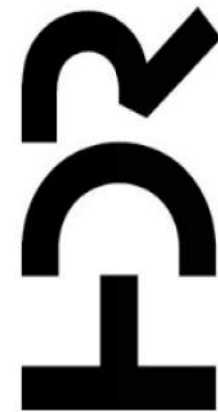
Run #	Depth (ft)		Recovery		RQD	
NQ2-3	40	45	60 in. / 60 in.	100%	44 in. / 60 in.	73%
PER-CR25-2.00, PID 117332						



PROJECT: PER-CR25-02.00		DRILLING FIRM / OPERATOR: CENTRAL STAR / TS		DRILL RIG: DIEDRICH D-50 TRACK		STATION / OFFSET: 10+31, 5' LT.										EXPLORATION ID							
TYPE: BRIDGE		SAMPLING FIRM / LOGGER: HDR / DCM		HAMMER: AUTOMATIC HAMMER		ALIGNMENT: CR-25										B-002-0-22							
PID: 117332 SFN: 6430899		DRILLING METHOD: 3.25" HSA / NQ2		CALIBRATION DATE: 3/7/22		ELEVATION: 831.3 (MSL) EOB: 45.0 ft.										PAGE							
START: 10/19/22 END: 10/19/22		SPT / ST / NQ2		ENERGY RATIO (%): 86.8		LAT / LONG: 39.756463, -82.324220										1 OF 1							
MATERIAL DESCRIPTION AND NOTES				ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	WC	ODOT CLASS (GI)	HOLE SEALED				
12 inches Asphalt				831.3		1																	
						2	6	3	9	33	SS-1	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
						3																	
						4	1	1	7	89	SS-2	1.00	12	6	16	45	21	24	19	5	14	A-4a (6)	
						5																	
						6	2	1	4	100	SS-3	0.50	-	-	-	-	-	-	-	-	-	31	A-4b (V)
						7																	
						8																	
						9																	
						10	1	1	3	100	SS-5	1.00	1	2	16	50	31	26	19	7	33	A-4b (8)	
						11	WOH	WOH	1	33	SS-6	1.00	0	8	21	51	20	20	19	1	24	A-4b (7)	
						12	2	2	6	100	SS-7	2.00	0	10	23	44	23	25	19	6	22	A-4a (6)	
						13	2	2	4	100	SS-8	1.50	0	5	29	42	24	25	18	7	22	A-4a (6)	
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SHALE, GRAY, SLIGHTLY WEATHERED, WEAK, ARENACEOUS.				801.3	TR	60.1	22	100	SS-12	-	-	-	-	-	-	-	-	10	Rock (V)				
SANDSTONE, GRAY, SLIGHTLY WEATHERED, STRONG, FINE TO MEDIUM GRAINED, THIN TO MEDIUM BEDDED, JOINT AND BEDDING DISCONTINUITIES, FRACTURED TO MODERATELY FRCTURED, OPEN TO TIGHT APERTURE, SLIGHTLY ROUGH, VERY BLOCK, GOOD TO FAIR SURFACE; RQD 65%, REC 100%.				800.8																			
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STANDARD ODOT BORING LOG (11 X 17) - OH DOT.GDT - 11/29/22 11:51 - C:\P\WORKING\IEAST\101\UD2962083\2022\1019 PER-CR25-2.00 BORING LOGS.GPJ

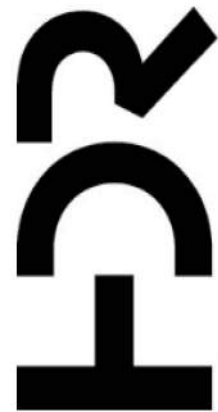
NOTES: QUICKCRETE CONCRETE USED TO PATCH PAVEMENT.
ABANDONMENT METHODS, MATERIALS, QUANTITIES: TREMIED 25 LB. BENTONITE POWDER; 94 LB. CEMENT; 50 GAL. WATER



B-002-0-22



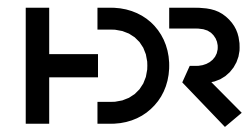
Run #	Depth (ft)		Recovery		RQD	
	30.5	35.0	54 in. / 54 in.	100%	12 in. / 54 in.	22%
NQ2-1						
NQ2-2	35	45	120 in. / 120 in.	100%	102 in. / 120 in.	85%
PER-CR25-2.00, PID 117332						



B-002-0-22



Run #	Depth (ft)		Recovery		RQD	
	35	45	120 in. / 120 in.	100%	102 in. / 120 in.	85%
NQ2-2						
PER-CR25-2.00, PID 117332						





UNCONFINED COMPRESSION TEST

AASHTO: T-208 Page 1 of 2

Project Name : PER-CR25-2.0
Project # : 10354468
Project County : Perry
Project State : Ohio
Laboratory # : 10354468
Submitted By : HDR

Sample # : ST-4
Sample Loc. : Boring No. B-002-0-22
Sample Depth : 8.5' to 9.0'
Date Tested : 10/31/2022
Date Reported : 11/2/2022

Soil Type : A-4(8)
Wet Density : 125.4 pcf
Dry Density : 97.4 pcf
Moisture : 28.7 %

Initial Height : 5.75 in
Initial Diameter : 2.84 in
Proving Ring : #22734

RESULTS:	Axial Load	Corrected Area	Unit Strain	Stress
#	lbs	sf	%	Ksf
1	0.0	0.04	0.0	0.00
2	1.9	0.04	0.3	0.04
3	2.9	0.04	0.5	0.07
4	3.9	0.04	0.8	0.09
5	6.8	0.04	1.0	0.15
6	7.8	0.04	1.3	0.17
7	8.7	0.04	1.6	0.20
8	10.7	0.04	1.8	0.24
9	11.6	0.04	2.1	0.26
10	14.6	0.04	2.4	0.32
11	16.5	0.05	2.8	0.37
12	19.4	0.05	3.1	0.43
13	21.3	0.05	3.5	0.47
14	23.3	0.05	3.8	0.51
15	25.2	0.05	4.2	0.55
16	27.2	0.05	4.5	0.59
17	30.1	0.05	4.9	0.65
18	31.0	0.05	5.2	0.67
19	33.0	0.05	5.7	0.71
20	34.9	0.05	6.1	0.75
21	36.9	0.05	6.5	0.78
22	38.8	0.05	7.0	0.82
23	39.8	0.05	7.4	0.84
24	41.7	0.05	7.8	0.88
25	42.7	0.05	8.3	0.89
26	44.6	0.05	8.7	0.93
27	46.6	0.05	9.6	0.96
28	48.5	0.05	10.4	0.99
29	49.5	0.05	11.3	1.00
30	48.5	0.05	12.2	0.97
31	44.6	0.05	13.0	0.00

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UNCONFINED COMPRESSION TEST

Page 2 of 2

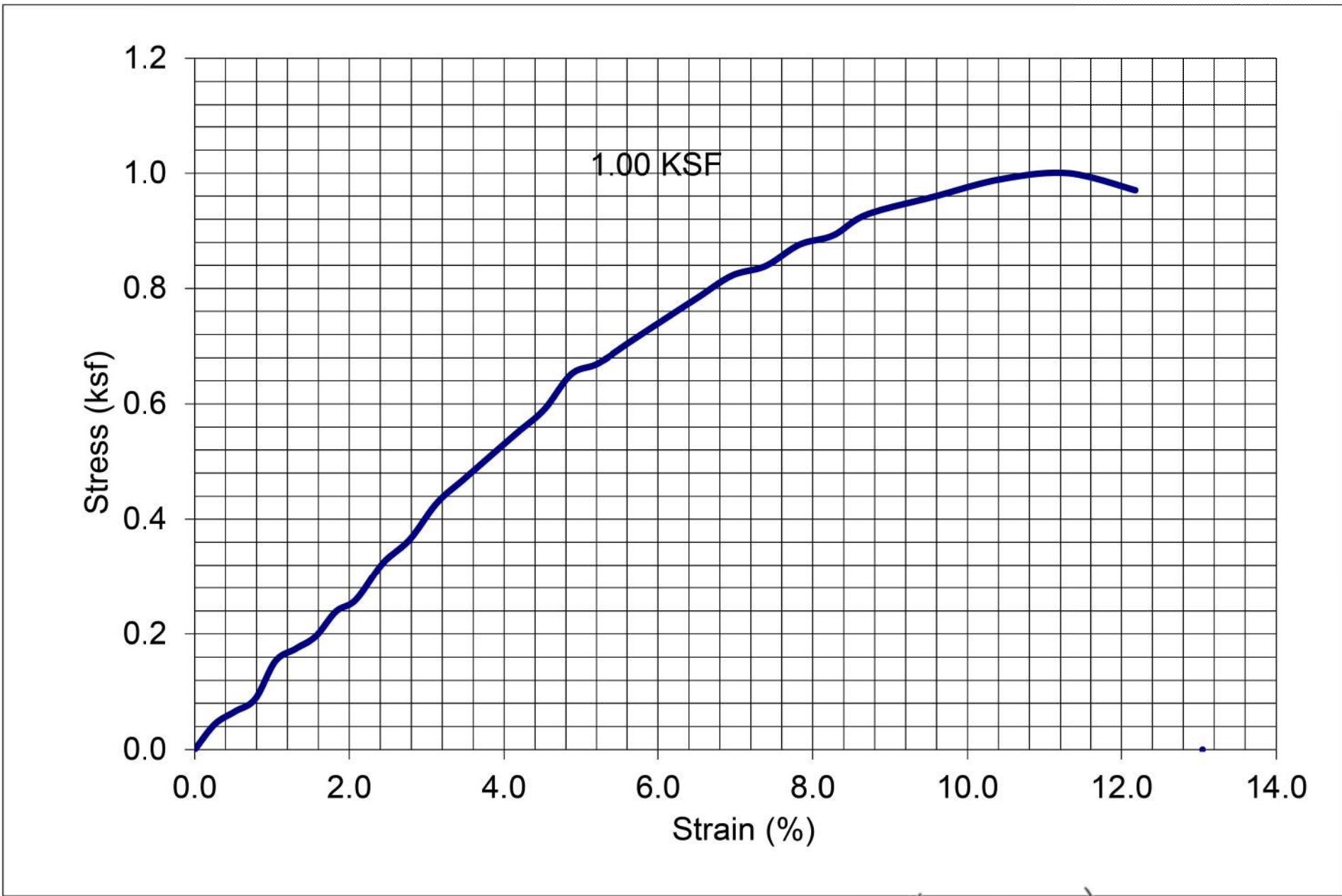
Project Name : PER-CR25-2.0
Project # : 10354468
Project County : Perry
Project State : Ohio
Laboratory # : 10354468
Submitted By : HDR

Sample # : ST-4
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Date Reported : 11/2/2022

Soil Type : A-4(8)
Wet Density : 125.4 pcf
Dry Density : 97.4 pcf
Moisture : 28.7 %
Deg. of Sat. : 100.0 %

Initial Height : 5.75 in
Initial Diameter : 2.84 in
Proving Ring : #22734
SPECIFIC GRAVITY : 2.690

Comments : AASHTO: T-208

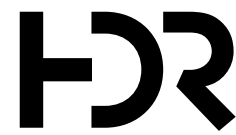


APPROVED BY:

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DESIGN AGENCY



DESIGNER

DCM

REVIEWER

DMV 11/29/22

PROJECT ID

117332

SHEET

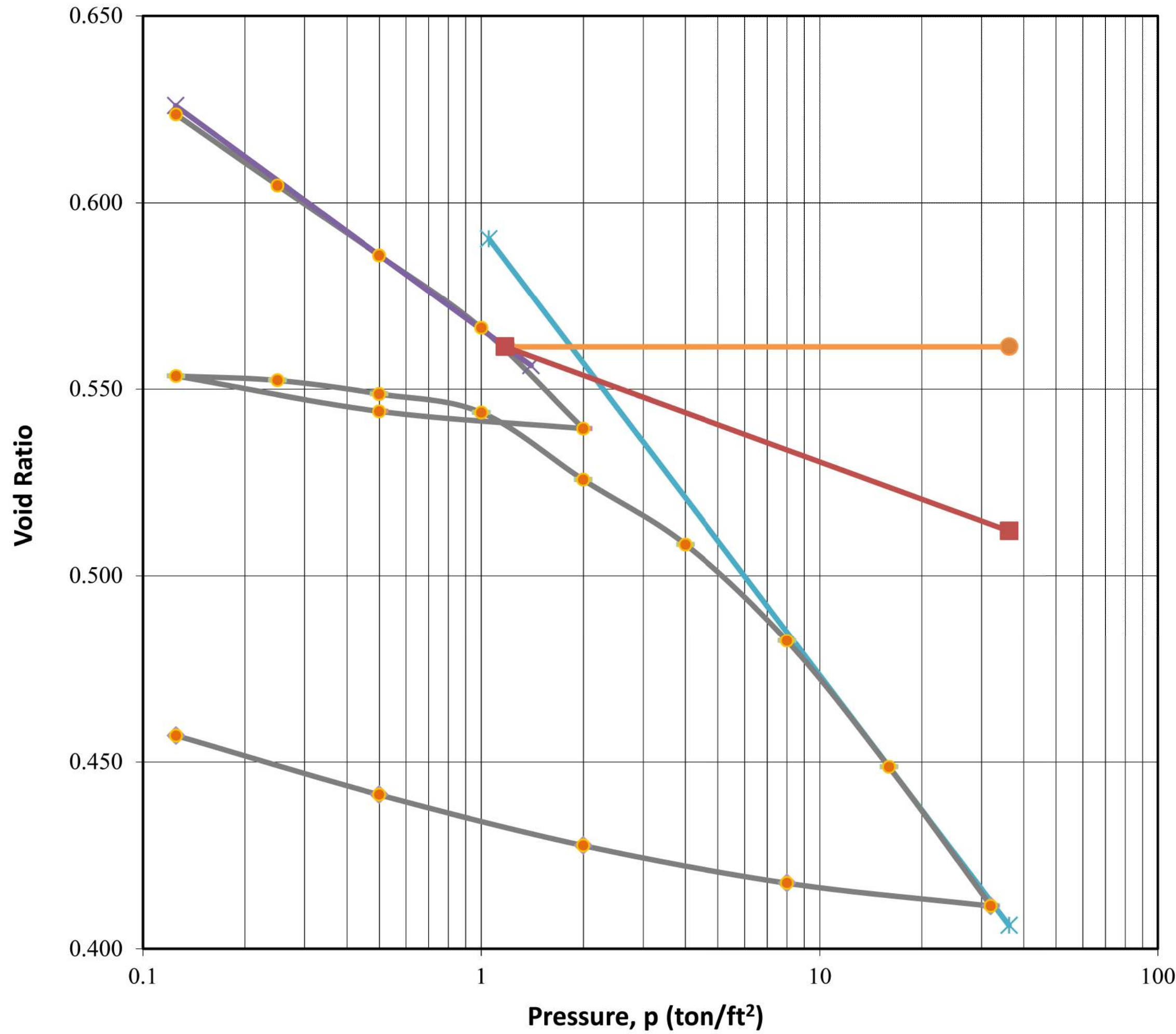
8

TOTAL

10



CONSOLIDATION TEST



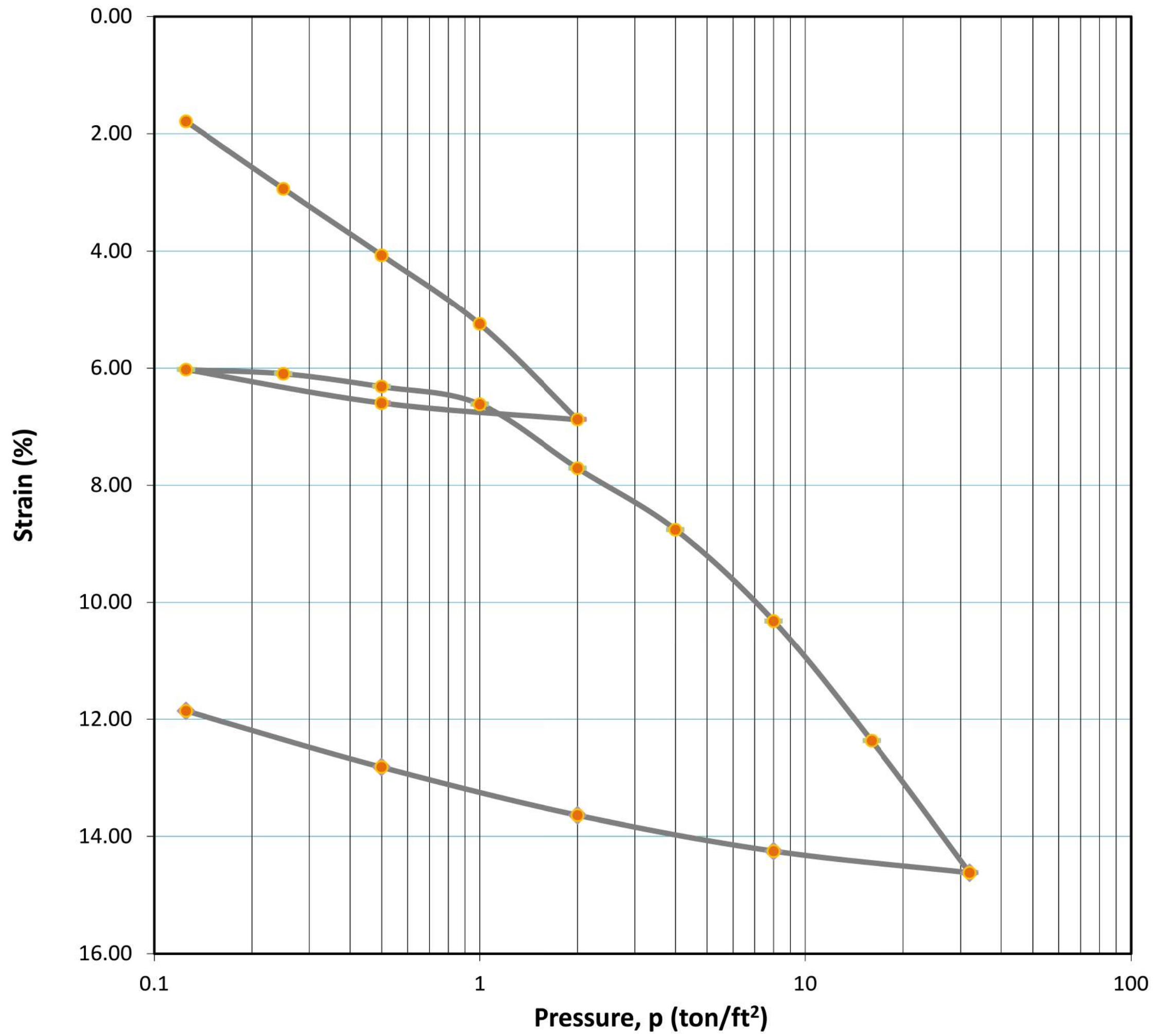
Summary of Consolidation Test Results				Test Date:	11/17/2022
Overburden Press. (tsf)	0.57	Compression Index, C _c	0.12		
Preconsol. Press., P _c (tsf)	2.18	Rebound Index, C _r	0.01		
Over Consolidation Ratio	3.83				
Soil Description:	Gray Silty Clay				
Project Number:	10354468	Depth: 9.0-9.5	Remarks: ASTM D2435/D2435M-11		
Sample Number:	ST-4	Boring Number: B-002-0-22			
Project:	PER-CR25-2.0				
Client:	ODOT				
Location:	Ohio				

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CONSOLIDATION TEST

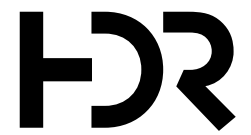


	Before	After	Liquid Limits:	29	Test Date:	11/17/2022
Moisture (%):	25.1	18.3	Plastic Limits:	19	MEASURED	
Dry Density (pcf):	101.4	115.2	Plasticity Index (%):	10		
Saturation (%):	100.0	100.0				
Void Ratio:	0.66	0.46	Specific Gravity:	2.690		
Sample Description: Gray Silty Clay						
Project Number:		10354468	Depth: 9.0-9.5		Remarks: ASTM D2435/D2435M-11	
Sample Number:		ST-4	Boring Number: B-002-0-22			
Project:		PER-CR25-2.0				
Client:		ODOT				
Location:		Ohio				

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PROJECT ID

117332

SHEET

9

TOTAL

10



CONSOLIDATION TEST

Test Summary

Project:

Location:

Job Number:

Project Number:

Test Date:

PER-CR25-2.0

Ohio

10354468

10354468

11/17/2022

Sample Number:

Boring Number:

Depth:

Sample Type:

ST-4

B-002-0-22

9.0-9.5

Undisturbed

Sample Description:

Remarks:

Gray Silty Clay

Index	Load Sequence tsf	Change in Height in	Specimen Height in	Height of Void in	Vertical Strain	Void Ratio	t90 Fitting Time Min	t50 Fitting Time Min	t90 Cv ft²/Day	t50 Cv ft²/Day
0	0.000	0.0000	1.0000	0.0000	0.0000	0.6562	0.0000	0.0000	0.0000	0.0000
0	0.125	0.0179	0.9821	0.3772	1.7900	0.6236	46.6856	11.2210	0.0438	0.0416
1	0.250	0.0294	0.9706	0.3657	2.9400	0.6046	15.5269	3.5701	0.1286	0.1237
2	0.500	0.0407	0.9593	0.3544	4.0700	0.5859	7.9559	1.8388	0.2452	0.2288
3	1.000	0.0525	0.9475	0.3426	5.2500	0.5664	4.4916	1.0633	0.4237	0.3756
4	2.000	0.0688	0.9312	0.3263	6.8800	0.5394	2.9876	0.6668	0.6153	0.5580
5	0.500	0.0660	0.9340	0.3291	6.6000	0.5441	0.0000	0.0000	0.0000	0.0000
6	0.125	0.0603	0.9397	0.3348	6.0300	0.5535	0.0000	0.0000	0.0000	0.0000
7	0.250	0.0610	0.9390	0.3341	6.1000	0.5523	0.0000	0.0000	0.0000	0.0000
8	0.500	0.0632	0.9368	0.3319	6.3200	0.5487	2.2982	0.5821	0.8096	0.6470
9	1.000	0.0662	0.9338	0.3289	6.6200	0.5437	2.2940	0.6475	0.8058	0.5738
10	2.000	0.0771	0.9229	0.3180	7.7100	0.5257	2.2621	0.6050	0.7983	0.5918
11	4.000	0.0876	0.9124	0.3075	8.7600	0.5084	2.7537	0.6050	0.6409	0.5605
12	8.000	0.1032	0.8968	0.2919	10.3200	0.4826	1.4322	0.3308	1.1905	0.9541
13	16.000	0.1237	0.8763	0.2714	12.3700	0.4487	1.0582	0.2477	1.5383	1.1540
14	32.000	0.1462	0.8538	0.2489	14.6200	0.4115	0.8613	0.2025	1.7943	1.2529
15	8.000	0.1425	0.8575	0.2526	14.2500	0.4176	0.0000	0.0000	0.0000	0.0000
16	2.000	0.1364	0.8636	0.2587	13.6400	0.4277	0.0000	0.0000	0.0000	0.0000
17	0.500	0.1282	0.8718	0.2669	12.8200	0.4412	0.0000	0.0000	0.0000	0.0000
18	0.125	0.1186	0.8814	0.2765	11.8600	0.4571	0.0000	0.0000	0.0000	0.0000

Approved By: Ken E. Walker

