PROJECT DESCRIPTION

THE MOE-7-7.55 PROJECT CONSISTS OF A LANDSLIDE REPAIR ALONG STATE ROUTE 7 (SR 7) NEAR MILE MARKER 7.55 IN MONROE COUNTY, OHIO

HISTORIC RECORDS

A SEARCH OF THE AVAILABLE RECORDS ON ODOT'S TRANSPORTATION INFORMATION MAPPING SYSTEM (TIMS) REVEALED TWO PREVIOUS GEOTECHNICAL EXPLORATIONS PERFORMED AS PART OF THE MOE-7-2.06 PROJECT (ODOT, 1938) WITHIN THE CURRENT PROJECT LIMITS. HISTORIC BORING B-001-1-38 WAS LOCATED AT STA. 400+00, AND HISTORIC BORING B-004-3-38 WAS LOCATED AT STA. 403+00. BOTH BORINGS ENCOUNTERED A 6-INCH SURFICIAL LAYER OF TOPSOIL UNDERLAIN BY CLAY (CLASSIFIED AS A-7) TO THEIR TERMINATION DEPTH OF 4 FEET BELOW THE PREVIOUSLY EXISTING GROUND SURFACE (EL 643.3 AND EL. 641.2, RESPECTIVELY). A NOTE PROVIDED ON THE SOIL PROFILE SHEETS FOR THE MOE-7-2.06 PROJECT INDICATE A COMPACTION TEST WAS PERFORMED ON THE SOILS ENCOUNTERED IN BORING B-001-1-38, WITH A COMPACTION OF 97.9% ACHIEVED AT A MAXIMUM DRY UNIT WEIGHT OF 99.6 POUNDS PER CUBIC FOOT (PCF) AND AN OPTIMUM MOISTURE CONTENT OF 20.6%

GEOLOGY

MONROE COUNTY LIES WITHIN THE UNGLACIATED ALLEGHENY PLATEAU PHYSIOGRAPHIC REGION OF SOUTHEAST OHIO. THE PHYSIOGRAPHIC FEATURES WITHIN THIS REGION HAVE BEEN INFLUENCED MAINLY BY PROCESSES OF EROSION AND UPLIFT. DRAINAGE-WAYS HAVE CUT STEEP, V-SHAPED VALLEYS AND NARROW RIDGETOPS THROUGHOUT MOST OF MONROE COUNTY, WITH THE EASTERN PERIPHERY OF THE COUNTY DRAINED EITHER INDIRECTLY OR DIRECTLY BY THE OHIO RIVER AND ITS TRIBUTARIES. THE PROJECT SITE IS LOCATED ALONG THE BANK OF THE OHIO RIVER, APPROXIMATELY 100 FEET NORTHWEST OF THE WATER'S EDGE.

THE SURFICIAL MATERIALS WITHIN MONROE COUNTY LARGELY CONSIST OF COLLUVIUM, RESIDUUM AND WEATHERED MATERIAL DERIVED FROM THE LOCAL BEDROCK. ALLUVIAL MATERIAL IS ALSO FOUND IN LOCALIZED AREAS AND NARROW BANDS ALONG STREAMS AND THE OHIO RIVER. THE BEDROCK MAPPED BELOW THE PROJECT SITE INCLUDES THE PENNSYLVANIAN-AGE MONONGAHELA GROUP. THE BEDROCK TYPES COMPRISING THIS GROUP ARE PREDOMINANTLY SHALE, SILTSTONE, AND MUDSTONE, WITH OCCASIONAL SECONDARY SEAMS OF SANDSTONE, COAL, AND THIN TO MEDIUM BEDS OF NON-MARINE LIMESTONE. COAL SEAMS OF NOTE WITHIN THE MONONGAHELA GROUP INCLUDE THE PITTSBURGH NO. 8, POMEROY (REDSTONE) NO. 8A, MEIGS CREEK (SEWICKLEY) NO. 9, UNIONTOWN NO. 10, AND WAYNESBURG NO. 11 COALS. NO SIGNIFICANT COAL MINING HAS BEEN RECORDED AT THE PROJECT SITE IN THE AVAILABLE MINE MAPS PUBLISHED BY THE OHIO DEPARTMENT OF NATURAL RESOURCES (ODNR).

RECONNAISSANCE

TWO PHASES OF EXPLORATION WERE PERFORMED AT THE PROJECT SITE, WITH THE INITIAL PHASE PERFORMED IN 2018 AND THE SECOND PHASE PERFORMED IN 2020. DURING PHASE 1, A VISUAL RECONNAISSANCE OF THE PROJECT SITE AND SURROUNDING RURAL AREA WAS PERFORMED ON JULY 10, 2018, AND DURING THE COURSE OF THE EXPLORATION BETWEEN JULY 27 AND AUGUST 6, 2018. DURING PHASE 2, SITE RECONNAISSANCES WERE PERFORMED ON JUNE 9 AND JULY 23, 2020, AND AGAIN DURING THE COURSE OF THE EXPLORATION BETWEEN AUGUST 10 AND 12, 2020. THE RECONNAISSANCES CONSISTED OF WALKING THE EXISTING ROADWAY AND SLOPE BELOW SR 7, AND NOTING ANY SIGNS OF RECENT SLOPE MOVEMENT, SEEPAGE OR EVIDENCE OF PRIOR SLOPE REPAIRS. SR 7 APPEARS TO HAVE BEEN CONSTRUCTED THROUGH A COMBINATION OF CUT AND FILL WITHIN THE PROJECT AREA. THE TERRAIN SURROUNDING THE PROJECT SITE GENERALLY SLOPES DOWNWARD FROM THE NORTHWEST TO SOUTHEAST AND IS COMPRISED OF CLEARED RESIDENTIAL AND HEAVILY-WOODED AREAS. THE OHIO RIVER IS LOCATED APPROXIMATELY 90 TO 120 FEET SOUTHWEST OF, AND ROUGHLY 30 FEET BELOW, SR 7 AT THE PROJECT SITE. THE HILLSIDE HAS BEEN CLEARED ON THE NORTHEAST SIDE OF SR 7 WITH SEVERAL RESIDENTIAL STRUCTURES NOTED, BEFORE GIVING WAY TO STEEPLY SLOPING, WOODED TERRAIN APPROXIMATELY 150 FEET FROM THE EDGE OF PAVEMENT.

SLOPE MOVEMENT WAS OBSERVED BELOW THE ROADWAY, WITH THE HEAD SCARP EXTENDING THROUGH A ZONE OF EXISTING GUARDRAIL ALONG THE NORTHBOUND LANE OF SR 7. APPROXIMATELY 70 FEET OF GUARDRAIL SHOWED SIGNS OF HORIZONTAL AND VERTICAL DISPLACEMENT, WITH THE SLIDE EXPOSING A 6-INCH DIAMETER GAS LINE IMMEDIATELY DOWNSLOPE OF THE DISTORTED GUARDRAIL. THIS AREA HAS BEEN TEMPORARILY SUPPORTED WITH VERTICALLY PLACED, HOLLOW 4.5-INCH DIAMETER PIPES SPACED ABOUT 3 TO 3.5 FEET ON CENTER, WITH ADDITIONAL SECTIONS OF GUARDRAIL SPANNING BETWEEN THE PIPES IN A PILE-AND-LAGGING TYPE SYSTEM. AS OF THE 2020 EXPLORATION, SEVERAL OF THESE PIPES WERE ANGLED AT APPROXIMATELY 30 TO 45 DEGREES FROM VERTICAL, AND A JERSEY BARRIER HAD BEEN PLACED ALONG A PORTION OF THE SCARP ON THE SHOULDER OF THE ROAD. THE SCARP EXTENDED JUST ABOVE THE DISTORTED GUARDRAIL POSTS AND HAD A VERTICAL DISPLACEMENT OF APPROXIMATELY 2 TO 3 FEET, WITH SECONDARY CRACKING OBSERVED IN THE NORTHBOUND TRAVEL LANE. THE FULL WIDTH OF THE LANDSLIDE SCARP WAS ESTIMATED TO BE ABOUT 150 FEET AS IT ARCED BEYOND THE GUARDRAIL TOWARD THE OHIO RIVER. IN ADDITION, AN APPROXIMATELY 20-FOOT STRETCH THE PAVED SHOULDER UPSLOPE OF THE LANDSLIDE SCARP APPEARED TO HAVE BEEN RECENTLY REPAIRED.

SUBSURFACE EXPLORATION

PHASE 1 OF THE GEOTECHNICAL EXPLORATION PROGRAM WAS CONDUCTED BETWEEN JULY 27, 2018 AND AUGUST 6, 2018 AND CONSISTED OF FOUR TEST BORINGS PERFORMED WITHIN THE NORTHBOUND TRAVEL LANE OF SR 7 (DESIGNATED AS BORINGS B-001-0-18, B-002-0-18, B-003-0-18, AND B-004-0-18). THE TEST BORINGS WERE DRILLED BY DHDC ENGINEERING CONSULTANTS, INC. UNDER THE GENERAL SUPERVISION OF AN HDR GEOTECHNICAL ENGINEER USING A MOBILE B-57 TRACK-MOUNTED DRILL RIG. THIS DRILL RIG WAS CALIBRATED ON FEBRUARY 27, 2018 AND HAD A DRILL ROD ENERGY RATIO OF 82.7%. PHASE 2 OF THE GEOTECHNICAL EXPLORATION PROGRAM WAS CONDUCTED BETWEEN AUGUST 10 AND 12, 2020 BY CENTRAL STAR DRILLING AND CONSISTED OF FOUR ADDITIONAL TEST BORINGS (DESIGNATED AS BORINGS B-002-1-20, B-002-2-20, B-004-1-20, AND B-004-2-20) PERFORMED ALONG THE SLOPE BETWEEN SR 7 AND THE BANK OF THE OHIO RIVER. THESE BORINGS WERE DRILLED UNDER THE SUPERVISION OF AN HDR GEOTECHNICAL ENGINEER UTILIZING A DIEDRICH D-50 TRACK-MOUNTED DRILL RIG CALIBRATED ON NOVEMBER 26, 2019 WITH A DRILL ROD ENERGY RATIO OF 86.8%. THE BORINGS WERE ADVANCED USING 3.25-INCH INTERNAL DIAMETER HOLLOW STEM AUGERS IN GENERAL ACCORDANCE WITH ODOT'S "SPECIFICATIONS FOR GEOTECHNICAL EXPLORATIONS". SAMPLING OF THE SOILS WAS PERFORMED CONTINUOUSLY IN BORINGS B-002-0-18, B-002-1-20, B-003-0-18, AND B-004-1-20, AND AT 2.5-FOOT INTERVALS IN THE REMAINING BORINGS. SAMPLING WAS ACCOMPLISHED IN ACCORDANCE WITH THE "STANDARD TEST METHOD FOR PENETRATION TEST AND SPLIT-BARREL SAMPLING OF SOILS" (ASTM D 1586). UNDISTURBED SOIL SAMPLES WERE ALSO COLLECTED IN EACH OF THE BORINGS EXCEPT BORING B-004-2-20 IN ACCORDANCE WITH THE "STANDARD PRACTICE FOR THIN-WALLED TUBE SAMPLING OF SOILS FOR GEOTECHNICAL PURPOSES" (ASTM D 1587).

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 INVESTIGATIONS" (ASTM D 2113) USING AN NQ-SIZE DOUBLE-TUBE SWIVEL BARREL WITH DIAMOND BIT. INCLINOMETERS WERE INSTALLED IN BORINGS B-002-1-20 AND B-004-1-20 IN ACCORDANCE WITH ODOT'S "SPECIFICATIONS FOR GEOTECHNICAL EXPLORATIONS".

LEGEND

DESCRIPTION	ODOT CLASS	CLASSIFIED MECH./VISUAL	
GRAVEL/STONE FRAGMENTS	A-1-a	1	2
GRAVEL/STONE FRAGMENTS W/SAND	A-1-b	4	2
GRAVEL/STONE FRAGMENTS WITH SAND & SILT	A-2-4	12	8
COARSE & FINE SAND	A-3a	1	0
SANDY SILT	A-4a	15	30
SILT	A-4b	2	1
SILT AND CLAY	A-6a	24	83
SILTY CLAY	A-6b	3	3
ELASTIC CLAY	A-7-5	2	0
CLAY	A-7-6	6	14
	TOTAL	70	143
SHALE	VISUAL		
CLAYSTONE	VISUAL		
SILTSTONE	VISUAL		
LIMESTONE	VISUAL		
SANDSTONE	VISUAL		
PAVEMENT OR BASE = X = APPROXIMATE THICKNESS	VISUAL		
SOD AND TOPSOIL = X = APPROXIMATE THICKNESS	VISUAL		

BORING LOCATION - PLAN VIEW.

HISTORIC BORING LOCATION - PLAN VIEW.

INSTRUMENTED BORING LOCATION - PLAN VIEW.

DRIVE SAMPLE AND/OR ROCK CORE BORING PLOTTED TO VERTICAL SCALE ONLY. HORIZONTAL BAR INDICATES A CHANGE IN STRATIGRAPHY.

AUGER BORING PLOTTED TO VERTICAL SCALE ONLY. HORIZONTAL BAR INDICATES A CHANGE IN STRATIGRAPHY.

WC INDICATES WATER CONTENT IN PERCENT.

W— INDICATES FREE WATER ELEVATION.

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 FOR FIRST 6 INCHES.
Y/D"= NUMBER OF BLOWS (UNCORRECTED) FOR D" OF PENETRATION AT REFUSAL.

SS INDICATES A SPLIT SPOON SAMPLE.

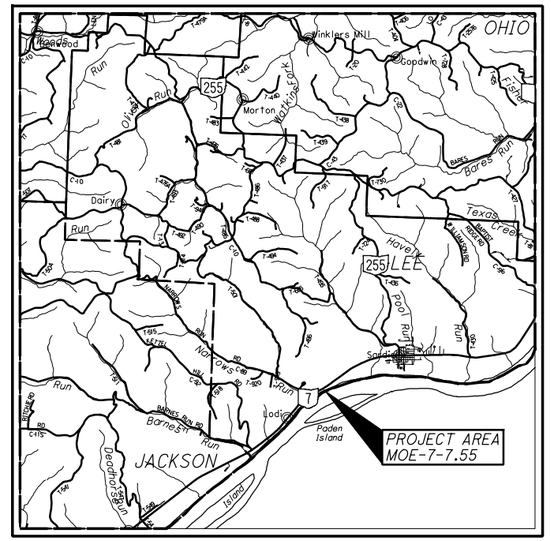
ST INDICATES SHELBY TUBE SAMPLE.

TR INDICATES TOP OF ROCK.

NP INDICATES A NON-PLASTIC SAMPLE.

● INDICATES A PLASTIC MATERIAL WITH A MOISTURE CONTENT EQUAL TO OR GREATER THAN THE LIQUID LIMIT MINUS 3.

Qu INDICATES ROCK COMPRESSION TEST, ASTM D7012, METHOD C, RESULTS
INDICATES SOIL UNCONFINED COMPRESSION TEST, ASTM D2166, RESULTS



LOCATION MAP

SCALE IN MILES

0 1 2 3 4

PARTICLE SIZE DEFINITIONS

12"	3"	2.0 mm	0.42 mm	0.074 mm	0.005 mm
BOULDERS	COBBLES	GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY
		No. 10 SIEVE	No. 40 SIEVE	No. 200 SIEVE		

RECON. - SPR 07/10/2018
AKB 06/09/2020
DMV 07/23/2020

DRILLING - DHDC 07/27/2018 - 08/06/2018
CENTRAL STAR 08/10/2020 - 08/12/2020

DRAWN - CLW 06/10/2019 - 12/19/2019
CLW 11/02/2020 - 12/22/2020

REVIEWED - DMV 12/23/2020

NQ2 INDICATES A ROCK CORE SAMPLE

⊖ INDICATES A NON-PLASTIC MATERIAL WITH A MOISTURE CONTENT GREATER THAN 25% OR GREATER THAN 19% WITH A WET APPEARANCE.

HISTORIC BORING DESCRIPTION	ODOT CLASS	CLASSIFIED MECH./VISUAL	
CLAY	A-7-6	1	1
	TOTAL	1	1

DESIGN AGENCY
HDR ENGINEERING, INC.
9999 CARVER ROAD, SUITE 210
CINCINNATI, OHIO 45242
513-984-7500

PID NO. 108676

SOIL PROFILE - LANDSLIDE
COVER SHEET

MOE-7-7.55

EXPLORATION FINDINGS

THE SOILS ENCOUNTERED ALONG SR 7 WITHIN THE PROJECT AREA GENERALLY CONSIST OF A LAYER OF EMBANKMENT FILL, UNDERLAIN BY COLLUVIUM, FINE-GRAINED ALLUVIAL SILTS AND CLAYS, AND RESIDUAL SOIL OVER SILTSTONE, SHALE, AND CLAYSTONE BEDROCK.

A SURFACE LAYER OF COMPOSITE PAVEMENT, RANGING IN THICKNESS FROM 8.5 TO 10 INCHES OF ASPHALTIC CONCRETE (ASPHALT) OVER 5 TO 6 INCHES OF PORTLAND CEMENT CONCRETE, WAS ENCOUNTERED IN ALL OF THE PHASE 1 ROADWAY BORINGS EXCEPT BORING B-001-0-18, WHERE 7.5 INCHES OF ASPHALT WAS ENCOUNTERED. EMBANKMENT FILL WAS ENCOUNTERED DIRECTLY BENEATH THE PAVEMENT SECTION IN ALL OF THE PHASE 1 ROADWAY BORINGS EXCEPT BORING B-001-0-18, WITH THICKNESSES RANGING FROM ABOUT 1.8 TO 3.9 FEET. THE FILL WAS COHESIVE IN NATURE, AND COMPRISED PRIMARILY OF STIFF SILT AND CLAY (A-6A) AND CLAY (A-7-6).

COLLUVIUM WAS ENCOUNTERED BENEATH THE PAVEMENT IN BORING B-001-0-18, BENEATH THE FILL IN THE REMAINING PHASE 1 BORINGS, AND FROM THE GROUND SURFACE IN BORINGS B-002-1-20, B-002-2-20, AND B-004-1-20 WITH THICKNESSES RANGING FROM APPROXIMATELY 6 TO 34 FEET. THE COLLUVIUM CONSISTED OF PREDOMINANTLY STIFF TO VERY STIFF SILT AND CLAY (A-6A), SILTY CLAY (A-6B), ELASTIC CLAY (A-7-5), AND CLAY (A-7-6) WITH MEDIUM STIFF INTERVALS ENCOUNTERED IN BORINGS B-002-1-20 AND B-003-0-18.

ALLUVIUM WAS ENCOUNTERED IN EACH OF THE BORINGS BENEATH THE COLLUVIUM SOILS, OR FROM THE SURFACE IN BORING B-004-2-20, WITH THICKNESSES RANGING FROM ABOUT 13.5 TO 25.5 FEET. THE ALLUVIUM CONSISTED OF GENERALLY SOFT TO STIFF SANDY SILT (A-4A), SILT AND CLAY (A-6A), AND SILTY CLAY (A-6B), WITH LOOSE TO MEDIUM DENSE GRAVEL WITH SAND (A-1-B), GRAVEL WITH SAND AND SILT (A-2-4) AND SILT (A-4B) ENCOUNTERED TO A LESSER EXTENT. RESIDUUM ENCOUNTERED BENEATH THE ALLUVIUM RANGED FROM ABOUT 1.5 TO 17.5 FEET IN THICKNESS AND CONSISTED OF COHESIVE SOILS CLASSIFIED AS HARD SANDY SILT (A-4A) AND SILT AND CLAY (A-6A) OR MEDIUM DENSE TO VERY DENSE GRAVEL (A-1-A), GRAVEL WITH SAND (A-1-B), GRAVEL WITH SAND AND SILT (A-2-4), AND COARSE AND FINE SAND (A-3A). THE N-VALUES GENERALLY INCREASED WITH DEPTH, ENCOUNTERING SPLIT SPOON REFUSAL (> 50 BLOWS WITHIN A 6-INCH INTERVAL) NEAR THE BOTTOM OF THE RESIDUAL LAYER.

BEDROCK PREDOMINANTLY CONSISTED OF LAYERS OF SHALE AND SILTSTONE. ISOLATED LAYERS OF CLAYSTONE WERE ENCOUNTERED IN BORINGS B-002-0-18, B-002-1-20 AND B-003-0-18 AT DEPTHS RANGING FROM APPROXIMATELY 46 TO 67.5 FEET BELOW EXISTING GRADE. THE CLAYSTONE WAS TYPICALLY ENCOUNTERED IMMEDIATELY BENEATH THE OVERBURDEN SOILS AND RANGED FROM ABOUT 5 FEET TO 8 FEET IN THICKNESS, WITH A RECORDED RQD VALUE OF 40%. AN ISOLATED 0.8-FOOT THICK SEAM OF LIMESTONE WAS ENCOUNTERED IN BORING B-002-2-20 AT A DEPTH OF ABOUT 34.4 FEET, WITH AN RQD OF 55%. THE SHALE RANGED FROM ABOUT 3 TO 30 FEET IN THICKNESS WITH RECORDED RQD VALUES BETWEEN 14% AND 54%. THE SILTSTONE RANGED FROM ABOUT 4.0 TO 11 FEET IN THICKNESS, WITH RECORDED RQD VALUES RANGING FROM 0% TO 89%. ISOLATED SEAMS OF SANDSTONE WERE OBSERVED WITHIN THE SILTSTONE, AND AN 0.7-FOOT THICK LAYER OF SANDSTONE WAS ENCOUNTERED AT THE BOTTOM OF BORING B-004-2-20, WHICH HAD A RECORDED RQD OF 100%.

WITH THE EXCEPTION OF BORING B-001-0-18, GROUNDWATER WAS ENCOUNTERED DURING DRILLING AT DEPTHS RANGING FROM 8.5 TO 52.5 FEET. DELAYED WATER READINGS WERE NOT OBTAINED AS THE BORINGS WERE GROUTED AND SEALED IMMEDIATELY UPON COMPLETION, OR COMPLETED AS AN INCLINOMETER. DUE TO THE LOW PERMEABILITY OF COHESIVE SOILS AND NEAR-IMMEDIATE BACKFILL OF THE BORINGS UPON COMPLETION, THE LACK OF GROUNDWATER ENCOUNTERED IN THE BORINGS MAY NOT BE REPRESENTATIVE OF LONG-TERM CONDITIONS. GROUNDWATER LEVELS MAY VARY THROUGHOUT THE YEAR, DEPENDING ON PRECIPITATION, RIVER LEVEL, AND OTHER SEASONAL VARIATIONS.

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 2017.THE PHASE 2 EXPLORATIONS WERE PERFORMED IN ACCORDANCE WITH THE UPDATED SPECIFICATIONS DATED JULY 2020.

AVAILABLE INFORMATION

ALL AVAILABLE SOIL AND BEDROCK INFORMATION THAT CAN BE CONVENIENTLY SHOWN FROM THE GEOTECHNICAL EXPLORATION SHEETS HAS BEEN SO REPORTED. ADDITIONAL EXPLORATIONS MAY HAVE BEEN PERFORMED TO STUDY SPECIFIC ASPECTS OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED AT THE ODOT DISTRICT 10 OFFICE LOCATED AT 338 MUSKINGUM DRIVE, MARIETTA, OHIO 45750.

DRAWN CLW | CHECKED DMV

SOIL PROFILE - LANDSLIDE

COVER SHEET

MOE-7-7.55

Ex SH
RURAL - WOODED
RURAL - RESIDENTIAL
ASPHALT
DIRT
398
399
400
401
402
403
12" CMP
24" STEEL
℄ RIGHT OF WAY SR 7
B-001-0-18
B-001-1-38
B-002-0-18
B-003-0-18
B-004-0-18
B-004-3-38
B-002-1-20
B-002-2-20
B-004-1-20
B-004-2-20
RIVER LEVEL
(TIME OF SURVEY)

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN CLW
CHECKED DMV

SOIL PROFILE - LANDSLIDE
STA. 398+20 TO STA. 403+50

MOE-7-7.55

3 / 34

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B-001-0-18
13' RT.
ASPHALT = 7.5"

B-001-1-38
℄
TOPSOIL = 6"

B-002-0-18
10' RT.
ASPHALT = 9"

B-003-0-18
10' RT.
ASPHALT = 8.5"

B-004-0-18
10' RT.
ASPHALT = 10"

B-004-3-38
℄
TOPSOIL = 6"

640
630
620
610
600
590
580
570
560
550

WC
WC
WC
WC
N_{60}

641.89 642.12 642.31 642.46 642.59 642.75 642.90 642.98 643.06 643.16 643.28 643.33 643.33 643.34 643.37 643.38 643.41 643.43 643.37 643.31 643.21 643.05

399 400 401 402 403

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HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN CLW
CHECKED DMV

SOIL PROFILE - LANDSLIDE
STA. 398+20 TO STA. 403+50

MOE-7-7.55

B-002-0-18
STA. 400+47, 10' RT.
ASPHALT = 9"

B-002-1-20
STA. 400+39, 62' RT.

B-002-2-20
STA. 400+47, 102' RT.

660
650
640
630
620
610
600
590
580
570
560
550

40 20 0 20 40 60 80 100 120 140 160 180 200 220

N_{60} WC

HORIZONTAL SCALE IN FEET
0 5 10 20

DRAWN CLW
CHECKED DMV

SOIL PROFILE - LANDSLIDE
STA. 400+50.00

MOE-7-7.55

5 / 34

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660
650
640
630
620
610
600
590
580
570
560
550

B-004-0-18
STA. 402+45, 10' RT.
ASPHALT = 10"

11		16
6		21
11		25
15		22
ST		17
19		18
18		18
19		18
23		16
22		18
21		17
26		20
25		21
21		29
21		23
12		23
ST		26
10		24
7		23 ●
7		25
8		24 W
17		25
8/17/50/2"		20
30/50/1"		3
66		16
114		17
50/3"	112	17 16 TR
50/4"		4

N_{60} WC

B-004-1-20
STA. 402+36, 98' RT.

7	6	33 30
6		32
6		25
6		26
6		25
6		29
ST		27
3		28
4		24
0		26
9		27 W
6		26 ●
0		40
35		19 ●
25		10
38		19
25		15 ⊖ 13
20		40
46		9
41		15
25		16
58		9 11
12/43/50/3"	50/6"	17 TR
50/4"		18
50/3"		

N_{60} WC

B-004-2-20
STA. 402+31, 133' RT.

0		39
0		32
0		27
4		25 W
4		25 ●
23		11
32		5
42		12
29		16
23		8
88		11 4
35		23 ⊖
50/6"		11 TR

N_{60} WC

40 20 0 20 40 60 80 100 120 140 160 180 200 220

HORIZONTAL SCALE IN FEET
0 5 10 20

DRAWN CLW
CHECKED DMV

SOIL PROFILE - LANDSLIDE
STA. 402+25.00

MOE-7-7.55

6 / 34

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PROJECT: MOE-7-07.55	DRILLING FIRM / OPERATOR: DHDC / A.U.	DRILL RIG: MOBILE B-57 TRACK RIG	STATION / OFFSET: 398+71, 13' RT.	EXPLORATION ID B-001-0-18
TYPE: LANDSLIDE	SAMPLING FIRM / LOGGER: HDR / S. REED	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: SR-7	
PID: 108676 SFN:	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 2/27/18	ELEVATION: 642.3 (MSL) EOB: 84.0 ft.	PAGE 1 OF 2
START: 8/3/18 END: 8/6/18	SAMPLING METHOD: SPT/ST/NQ	ENERGY RATIO (%): 82.7	LAT / LONG: 39.616541, -80.931318	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
ASPHALT PAVEMENT (7.5 INCHES)	642.3 / 641.7																	
VERY STIFF, REDDISH-BROWN, TRACE TAN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, DAMP		2	4 4 8	17	50	SS-1	3.50	-	-	-	-	-	-	-	-	19	A-6a (V)	
@ 4.0' - 5.5' : grab sample obtained from auger spoils		5	4 5 6	15	0	SS-2	-	-	-	-	-	-	-	-	-	18	A-6a (V)	
@ 6.5' : orange-brown and tan		7	3 4 7	15	67	SS-3	4.00	-	-	-	-	-	-	-	-	16	A-6a (V)	
		10	3 5 6	15	72	SS-4	2.00	6	24	6	27	37	34	22	12	18	A-6a (7)	
@ 11.5' : brown, trace tan, and gray Below 11.5' : some gravel and stone fragments		12	3 5 7	17	50	SS-5	2.25	-	-	-	-	-	-	-	-	19	A-6a (V)	
		15	3 5 7	17	67	SS-6	2.00	-	-	-	-	-	-	-	-	17	A-6a (V)	
		17	3 6 15	29	61	SS-7	2.00	-	-	-	-	-	-	-	-	17	A-6a (V)	
		20	9 6 10	22	83	SS-8	2.50	-	-	-	-	-	-	-	-	16	A-6a (V)	
		22	3 6 10	22	67	SS-9	2.00	-	-	-	-	-	-	-	-	19	A-6a (V)	
		25	3 7 11	25	89	SS-10	3.25	-	-	-	-	-	-	-	-	16	A-6a (V)	
@ 26.5': brown and gray		27	3 5 7	17	100	SS-11	2.75	-	-	-	-	-	-	-	-	24	A-6a (V)	
		30	3 6 8	19	94	SS-12	4.00	-	-	-	-	-	-	-	-	19	A-6a (V)	
MEDIUM STIFF TO STIFF, OLIVE-BROWN TO GRAY, **SANDY SILT**, SOME CLAY, WET	611.3	32	2 4 3	10	100	SS-13	0.75	-	-	-	-	-	-	-	-	25	A-4a (V)	
@ 33.' - 35.0' : Shelby tube was attempted from 33.0' to 35.0', but no sample was recovered. SPT sample was then driven between 33.0' and 34.5'.		34	3 4 5	12	100	SS-14	1.00	-	-	-	-	-	-	-	-	23	A-4a (V)	
@ 35.5' : Qu = 2643 psf		36			96	ST-15	0.50	0	0	26	43	31	24	18	6	22	A-4a (8)	
		38	0 4 3	10	83	SS-16	0.75	-	-	-	-	-	-	-	-	23	A-4a (V)	
MEDIUM STIFF TO STIFF, OLIVE-BROWN TO GRAY, **SILT AND CLAY**, LITTLE SAND, MOIST	602.3	41	0 2 3	7	100	SS-17	0.50	-	-	-	-	-	-	-	-	24	A-6a (V)	
@ 42.5' : Qu = 2320 psf		43			92	ST-18	0.75	0	1	16	47	36	31	19	12	26	A-6a (9)	
MEDIUM STIFF, BROWN AND GRAY, **SANDY SILT**, SOME CLAY, WET	597.8	45	0 2 4	8	100	SS-19	1.00	-	-	-	-	-	-	-	-	25	A-4a (V)	
		48	0 0 3	4	100	SS-20	0.75	0	1	33	39	27	24	17	7	24	A-4a (6)	
		50	3 4 3	10	100	SS-21	1.75	-	-	-	-	-	-	-	-	24	A-4a (V)	
		53	0 0 3	4	100	SS-22	0.75	-	-	-	-	-	-	-	-	29	A-4a (V)	
		55	3 6 7	18	100	SS-23	0.75	-	-	-	-	-	-	-	-	32	A-4a (V)	
HARD, REDDISH-BROWN, **SANDY SILT**, SOME CLAY, DAMP	585.8	57	33 50/2"	-	100	SS-24	4.50	0	6	34	39	21	24	18	6	15	A-4a (5)	
SHALE, REDDISH-BROWN AND GRAY, HIGHLY WEATHERED, VERY WEAK, FISSILE,	583.3	TR 59	50/5"	-	100	SS-25	-	-	-	-	-	-	-	-	-	13	Rock (V)	

PID: 108676	SFN:	PROJECT: MOE-7-07.55	STATION / OFFSET: 398+71, 13' RT.	START: 8/3/18	END: 8/6/18	PG 2 OF 2	B-001-0-18

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
SHALE, REDDISH-BROWN AND GRAY, HIGHLY WEATHERED, VERY WEAK, FISSILE. *(continued)*	582.3	61																
		62	42 50/1"	-	100	SS-26	-	-	-	-	-	-	-	-	-	5	Rock (V)	
	578.3	63																
INTERBEDDED SHALE (54%) AND SILTSTONE (46%), MODERATELY FRACTURED, RQD 26%, REC. 98%; **SHALE**, GRAY, HIGHLY WEATHERED, VERY WEAK, VERY FINE GRAINED, LAMINATED TO THIN BEDDED; **SILTSTONE**, GRAY, MODERATELY WEATHERED, VERY WEAK TO WEAK, FINE GRAINED, THIN TO MEDIUM BEDDED, SLIGHTLY ROUGH SURFACES ALONG BEDDING JOINTS.		64																
		65	0		90	NQ-1											CORE	
		66																
		67	25		96	NQ-2											CORE	
		68																
		69																
@ 71.3' : Qu = 156 psi (shale seam) @ 71.5' : Qu = 666 psi (siltstone seam)		70																
		71	25		100	NQ-3											CORE	
		72																
		73																
		74																
		75																
		76	35		96	NQ-4											CORE	
		77																
		78																
	563.3	79																
SILTSTONE, GRAY, UNWEATHERED, SLIGHTLY STRONG, FINE GRAINED, LAMINATED TO THIN BEDDED, MODERATELY FRACTURED, ROUGH SURFACES ALONG BEDDING JOINTS; RQD 36%, REC 100%.		80																
		81	36		100	NQ-5											CORE	
		82																
		83																
	558.3	EOB 84																

NOTES: INTRODUCED WATER INTO THE BOREHOLE AT 35.5 FEET TO FACILITATE PISTON TUBE SAMPLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH 4 BAGS BENTONITE GROUT; MIXED 80 GAL. WATER

PROJECT: MOE-7-07.55	DRILLING FIRM / OPERATOR: DHDC / A.U.	DRILL RIG: MOBILE B-57 TRACK RIG	STATION / OFFSET: 400+47, 10' RT.	EXPLORATION ID B-002-0-18
TYPE: LANDSLIDE	SAMPLING FIRM / LOGGER: HDR / S. REED	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: SR-7	
PID: 108676 SFN:	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 2/27/18	ELEVATION: 643.2 (MSL) EOB: 83.0 ft.	PAGE 1 OF 2
START: 8/1/18 END: 8/2/18	SAMPLING METHOD: SPT/ST/NQ	ENERGY RATIO (%): 82.7	LAT / LONG: 39.616785, -80.930775	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
ASPHALT PAVEMENT (9 INCHES)	642.5																	
CONCRETE PAVEMENT (6 INCHES)	642.0																	
STIFF, BROWN, **SILT AND CLAY**, SOME SAND, LITTLE GRAVEL, DAMP (FILL) @ 1.5' - 3.0' : grab sample obtained from augers	640.2		5 4 5	12	0	SS-1	-	18	18	10	23	31	34	22	12	15	A-6a (5)	
STIFF, REDDISH-BROWN, **SILT AND CLAY**, SOME TO "AND" SAND, TRACE GRAVEL, DAMP			4 3 5	11	56	SS-2	2.50	-	-	-	-	-	-	-	-	22	A-6a (V)	
			2 3 4	10	44	SS-3	1.50	-	-	-	-	-	-	-	-	25	A-6a (V)	
			7 3 5	11	72	SS-4	1.75	-	-	-	-	-	-	-	-	19	A-6a (V)	
			2 3 4	10	50	SS-5	1.50	-	-	-	-	-	-	-	-	19	A-6a (V)	
Below 9.0' : some stone fragments			2 3 4	10	72	SS-6	2.25	-	-	-	-	-	-	-	-	21	A-6a (V)	
			2 4 5	12	56	SS-7	1.75	-	-	-	-	-	-	-	-	19	A-6a (V)	
			2 5 5	14	83	SS-8	1.50	-	-	-	-	-	-	-	-	19	A-6a (V)	
			2 3 5	11	78	SS-9	1.25	-	-	-	-	-	-	-	-	19	A-6a (V)	
			2 3 5	11	72	SS-10	1.50	-	-	-	-	-	-	-	-	21	A-6a (V)	
@ 16.5' : sandstone cobbles			50/3"	-	100	SS-11	1.50	-	-	-	-	-	-	-	-	17	A-6a (V)	
@ 18.0' : sandstone fragments embedded in clayey soil matrix			30 12 7	26	78	SS-12	-	-	-	-	-	-	-	-	-	4	A-6a (V)	
@ 19.5' : sandstone fragments embedded in clayey soil matrix			4 4 6	14	61	SS-13	2.50	-	-	-	-	-	-	-	-	14	A-6a (V)	
			3 5 6	15	67	SS-14	2.25	-	-	-	-	-	-	-	-	15	A-6a (V)	
			2 15 14	40	94	SS-15	1.25	4	30	6	27	33	32	20	12	17	A-6a (6)	
			2 6 6	17	78	SS-16	1.50	-	-	-	-	-	-	-	-	18	A-6a (V)	
			3 28 10	52	56	SS-17	1.50	1	19	7	33	40	32	20	12	17	A-6a (8)	
			5 6 9	21	50	SS-18	1.50	-	-	-	-	-	-	-	-	18	A-6a (V)	
			4 4 6	14	56	SS-19	1.50	-	-	-	-	-	-	-	-	19	A-6a (V)	
	612.3		5 8 9	23	72	SS-20A	1.75	-	-	-	-	-	-	-	-	-	A-6a (V)	
						SS-20B	3.00	-	-	-	-	-	-	-	-	25	A-6a (V)	
STIFF TO VERY STIFF, MOTTLED BROWN AND GRAY, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, MOIST			3 6 7	18	100	SS-21	1.75	0	1	6	50	43	35	20	15	22	A-6a (10)	
@ 33.0' - 35.0' : Qu = 4036 psf					96	ST-22	1.00	1	1	7	52	39	31	19	12	18	A-6a (9)	
	608.2																	
SOFT TO MEDIUM STIFF, GRAY, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, MOIST			3 4 5	12	100	SS-23	1.00	-	-	-	-	-	-	-	-	25	A-6a (V)	
			3 4 5	12	100	SS-24	0.75	-	-	-	-	-	-	-	-	22	A-6a (V)	
@ 38.0' - 40.0' : Attempted undisturbed shelby tube, but did not recover sample. An SPT sample was then driven from 38.0' to 39.5'					94	ST-25	1.00	-	-	-	-	-	-	-	-	23	A-6a (V)	
			0 2 3	7	94	SS-26	1.00	-	-	-	-	-	-	-	-	23	A-6a (V)	
@ 41.5' - 43.5' : Attempted undisturbed shelby tube, but did not recover sample. An SPT sample was then driven from 41.5' to 43.0'.					100	ST-27	0.50	0	0	20	48	32	28	17	11	25	A-6a (8)	
			0 0 3	4	100	SS-28	1.00	-	-	-	-	-	-	-	-	23	A-6a (V)	
			2 5 5	14	100	SS-29	1.00	-	-	-	-	-	-	-	-	24	A-6a (V)	
			0 2 4	8	100	SS-30	0.75	-	-	-	-	-	-	-	-	23	A-6a (V)	
			0 3 2	7	100	SS-31	0.75	-	-	-	-	-	-	-	-	24	A-6a (V)	
@ 49.0' : occasional sandy silt seams			0 2 3	7	100	SS-32	0.75	-	-	-	-	-	-	-	-	26	A-6a (V)	
			2 3 3	8	100	SS-33	1.25	-	-	-	-	-	-	-	-	28	A-6a (V)	
		W 590.7																
			0 0 3	4	100	SS-34	0.50	1	0	21	45	33	29	18	11	29	A-6a (8)	
	589.7																	
LOOSE TO MEDIUM DENSE, GRAY, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, SLIGHTLY VARVED WITH OCCASIONAL CLAY LAMINATIONS AND THIN BEDS, WET			0 2 2	6	100	SS-35	-	-	-	-	-	-	-	-	-	32	A-4a (V)	
	586.7		0 4 8	17	100	SS-36	-	7	8	38	29	18	NP	NP	NP	22	A-4a (2)	
HARD, GRAY, **SILT**, "AND" CLAY, LITTLE SAND, TRACE GRAVEL, DAMP	585.2		9 38 50/2"	-	93	SS-37	4.50	1	4	9	50	36	29	21	8	14	A-4b (8)	
CLAYSTONE, BROWNISH-GRAY TO REDDISH-BROWN, HIGHLY WEATHERED, VERY WEAK.		TR	50/5"	-	100	SS-38	-	-	-	-	-	-	-	-	-	11	Rock (V)	
			50/5"	-	100	SS-39	-	-	-	-	-	-	-	-	-	8	Rock (V)	

PID: 108676	SFN:	PROJECT: MOE-7-07.55	STATION / OFFSET: 400+47, 10' RT.	START: 8/1/18	END: 8/2/18	PG 2 OF 2	B-002-0-18

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
CLAYSTONE, BROWNISH-GRAY TO REDDISH-BROWN, HIGHLY WEATHERED, VERY WEAK. *(continued)*	583.2	61	50/5"	-	100	SS-40	-	-	-	-	-	-	-	-	-	8	Rock (V)	
	580.2	63	50/3"	-	100	SS-41	-	-	-	-	-	-	-	-	-	11	Rock (V)	
CLAYSTONE, REDDISH-BROWN, SEVERELY TO HIGHLY WEATHERED, VERY WEAK, VERY FINE GRAINED, MEDIUM TO THICK BEDDED, OCCASIONAL CLAY SEAMS, FRACTURED WITH SLICKENSIDED SURFACES ALONG BEDDING JOINTS; RQD 32%, REC 100%.	577.1	64	40		100	NQ											CORE	
SHALE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, WEAK TO SLIGHTLY STRONG, VERY FINE TO FINE GRAINED, THIN TO MEDIUM BEDDED, CALCAREOUS, SEAMS OF ARGILLACEOUS SHALE, OCCASIONAL SILTSTONE SEAMS, SLIGHTLY FRACTURED WITH ROUGH SURFACES ALONG BEDDING JOINTS; RQD 38%, REC 96%. @ 68.5' : Qu = 860 psi		67	55		87	NQ											CORE	
		71	31		100	NQ											CORE	
	564.4	75	26		98	NQ											CORE	
SILTSTONE, GRAY, SLIGHTLY TO MODERATELY WEATHERED, WEAK TO SLIGHTLY STRONG, FINE GRAINED, LAMINATED, OCCASIONAL THIN SHALE PARTINGS AND SEAMS, FRACTURED WITH SLIGHTLY ROUGH SURFACES ALONG BEDDING JOINTS; RQD 0%, REC 100%.	560.2	79	0		100	NQ											CORE	
		EOB 83																

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH 4 BAGS BENTONITE GROUT; MIXED 80 GAL. WATER

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PROJECT: MOE-7-07.55	DRILLING FIRM / OPERATOR: CENTRAL STAR / TS	DRILL RIG: DIEDRICH D-50	STATION / OFFSET: 400+39, 62' RT.
TYPE: LANDSLIDE	SAMPLING FIRM / LOGGER: HDR / AKB	HAMMER: DIEDRICH AUTOMATIC	ALIGNMENT: SR 7
PID: 108676 SFN:	DRILLING METHOD: 3.25" HSA / NQ2	CALIBRATION DATE: 11/26/19	ELEVATION: 627.7 (MSL) EOB: 64.5 ft.
START: 8/12/20 END: 8/12/20	SAMPLING METHOD: SPT / ST / NQ2	ENERGY RATIO (%): 86.8	LAT / LONG: 39.616651, -80.930705

EXPLORATION ID B-002-1-20

PAGE 1 OF 2

MATERIAL DESCRIPTION AND NOTES	ELEV. 627.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	INCL.
STIFF TO VERY STIFF, BROWN, **CLAY**, SOME SILT, LITTLE GRAVEL, TRACE SAND, DAMP			3 3 4	10	83	SS-1	3.75	-	-	-	-	-	-	-	-	24	A-7-6 (V)	
	624.7		6 4 3	10	100	SS-2	2.75	12	5	2	34	47	51	25	26	20	A-7-6 (17)	
MEDIUM STIFF TO STIFF, BROWN, **ELASTIC CLAY**, "AND" SILT, TRACE GRAVEL, TRACE SAND, DAMP	623.2		2 2 2	6	17	SS-3	2.25	1	3	3	35	58	61	30	31	19	A-7-5 (20)	
MEDIUM STIFF TO STIFF, RED-BROWN, **CLAY**, "AND" SILT, LITTLE GRAVEL, TRACE SAND, DAMP			2 3 2	7	61	SS-4	1.75	-	-	-	-	-	-	-	-	22	A-7-6 (V)	
			2 3 4	10	44	SS-5	1.25	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
			2 3 4	10	72	SS-6	2.00	14	4	3	36	43	44	23	21	21	A-7-6 (13)	
	617.2		2 3 6	13	50	SS-7	2.00	-	-	-	-	-	-	-	-	19	A-7-6 (V)	
STIFF TO VERY STIFF, BROWN TO RED-BROWN, **CLAY**, "AND" SILT, TRACE GRAVEL, TRACE SAND, DAMP			5 5 6	16	100	SS-8	3.00	-	-	-	-	-	-	-	-	25	A-7-6 (V)	
			5 5 6	16	100	SS-9	2.25	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
					79	ST-10	-	1	0	1	52	46	50	26	24	22	A-7-6 (16)	
			6 7 9	23	100	SS-11	3.25	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
			5 6 7	19	100	SS-12	3.00	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
	607.7		4 4 6	14	100	SS-13	1.75	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
STIFF, BROWN, **SILTY CLAY**, TRACE SAND, MOIST	606.2		3 3 4	10	100	SS-14	1.50	0	0	3	58	39	40	24	16	27	A-6b (10)	
VERY SOFT TO SOFT, BROWN, **SILT AND CLAY**, SOME SAND, MOIST			3 3 4	10	100	SS-15	0.50	-	-	-	-	-	-	-	-	25	A-6a (V)	
	603.2		0 0 0	0	100	SS-16	0.50	0	0	21	47	32	32	19	13	23	A-6a (9)	
MEDIUM STIFF TO STIFF, BROWNISH-GRAY, **SANDY SILT**, SOME CLAY, MOIST			2 3 4	10	100	SS-17	0.50	-	-	-	-	-	-	-	-	24	A-4a (V)	
					100	ST-18	-	0	0	25	47	28	29	19	10	24	A-4a (8)	
	599.7	W 599.7																
MEDIUM STIFF, BROWNISH-GRAY, **SILT**, SOME CLAY, LITTLE SAND, WET			2 2 2	6	100	SS-19	-	-	-	-	-	-	-	-	-	23	A-4b (V)	
	596.7		2 2 2	6	100	SS-20	-	0	0	18	53	29	29	19	10	27	A-4b (8)	
SOFT TO MEDIUM STIFF, BROWNISH-GRAY, **SANDY SILT**, SOME CLAY, WET			0 0 3	4	100	SS-21	1.00	-	-	-	-	-	-	-	-	28	A-4a (V)	
	593.7		2 2 3	7	100	SS-22	0.75	0	0	24	46	30	29	19	10	27	A-4a (8)	
STIFF, GRAY, **SANDY SILT**, SOME CLAY, WET @ 34.0' - 40.5': contains sand seams			2 2 4	9	100	SS-23	-	-	-	-	-	-	-	-	-	27	A-4a (V)	
			2 3 3	9	100	SS-24	-	-	-	-	-	-	-	-	-	25	A-4a (V)	
			2 3 4	10	100	SS-25	-	0	0	38	38	24	27	19	8	34	A-4a (5)	
	587.2		2 3 3	9	100	SS-26	-	-	-	-	-	-	-	-	-	26	A-4a (V)	
HARD, GRAY AND BROWN, **SANDY SILT**, SOME GRAVEL, LITTLE CLAY, DAMP			6 6 36	61	78	SS-27	-	-	-	-	-	-	-	-	-	8	A-4a (V)	
	584.7		30 23 40	91	100	SS-28	-	23	7	26	29	15	21	16	5	10	A-4a (2)	
DENSE TO VERY DENSE, RED BROWN AND GRAY, **GRAVEL AND STONE FRAGMENTS WITH SAND AND SILT**, LITTLE CLAY, DAMP			7 18 24	61	44	SS-29	-	-	-	-	-	-	-	-	-	14	A-2-4 (V)	
	581.7	TR	16 21 30	74	83	SS-30	-	32	12	25	21	10	20	17	3	10	A-2-4 (0)	
CLAYSTONE, GRAY AND RED-BROWN, SEVERELY WEATHERED, VERY WEAK, ARENACEOUS.			6 50/5"	-	82	SS-31	-	-	-	-	-	-	-	-	-	17	Rock (V)	
			32 50/6"	-	92	SS-32	-	22	4	3	53	18	28	19	9	14	Rock (V)	
			45 50/5"	-	100	SS-33	-	-	-	-	-	-	-	-	-	11	Rock (V)	
			35 50/2"	-	100	SS-34	-	-	-	-	-	-	-	-	-	9	Rock (V)	
			50/4"	-	100	SS-35	-	-	-	-	-	-	-	-	-	6	Rock (V)	
	574.2		60/2"	-	100	SS-36	-	-	-	-	-	-	-	-	-	8	Rock (V)	
SILTSTONE, GRAY, HIGHLY WEATHERED, VERY WEAK TO WEAK, THIN BEDDED, ARGILLACEOUS, CALCAREOUS, JOINT DISCONTINUITIES, FRACTURED TO HIGHLY FRACTURED, OPEN, SLIGHTLY ROUGH TO SLICKENSIDED, BLOCKY, FAIR TO POOR SURFACE CONDITIONS; RQD 69%, REC 100%.	572.1																	
SILTSTONE, GRAY, MODERATELY WEATHERED, SLIGHTLY STRONG, MEDIUM BEDDED, ARENACEOUS, CALCAREOUS, JOINT DISCONTINUITIES, MODERATELY FRACTURED TO FRACTURED, NARROW, SLIGHTLY ROUGH, FAIR SURFACE CONDITIONS; RQD 76%, REC 100%.			62		100	NQ2-1											CORE	

STANDARD ODOT SOIL BORING LOG (11 X 17) - OH DOT GDT - 12/18/20 09:29 - C:\PWWORKING\EA\ST01\D1679068\MOE-7-7.55 10-K BORING LOGS.GPJ

MOE-7-7.55

SOIL PROFILE - LANDSLIDE

BORING LOG B-002-1-20

DRAWN CLW

CHECKED DMV

PID: 108676	SFN:	PROJECT: MOE-7-07.55	STATION / OFFSET: 400+39, 62' RT.	START: 8/12/20	END: 8/12/20	PG 2 OF 2	B-002-1-20

MATERIAL DESCRIPTION AND NOTES	ELEV. 567.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	INCL.
@ 56.2' - 56.3': contains shale interbed @ 57.3' - 57.5': contains shale interbed @ 58.5' - 58.9' : qu = 1,675 psi **SILTSTONE**, GRAY, MODERATELY WEATHERED, SLIGHTLY STRONG, MEDIUM BEDDED, ARENACEOUS, CALCAREOUS, JOINT DISCONTINUITIES, MODERATELY FRACTURED TO FRACTURED, NARROW, SLIGHTLY ROUGH, FAIR SURFACE CONDITIONS; RQD 76%, REC 100%. *(continued)* @ 64.1' - 64.5': sandstone	563.2	61 62 63 64 EOB	88		100	NQ2-2											CORE	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED BENTONITE CHIPS; PUMPED 25 LB. BENTONITE POWDER; 94 LB. CEMENT; 50 GAL. WATER

PROJECT: MOE-7-07.55	DRILLING FIRM / OPERATOR: CENTRAL STAR / TS	DRILL RIG: DIEDRICH D-50	STATION / OFFSET: 400+47, 102' RT.	EXPLORATION ID B-002-2-20
TYPE: RETAINING WALL	SAMPLING FIRM / LOGGER: HDR / AKB	HAMMER: DIEDRICH AUTOMATIC	ALIGNMENT: SR 7	
PID: 108676 SFN:	DRILLING METHOD: 3.25" HSA / NQ2	CALIBRATION DATE: 11/26/19	ELEVATION: 610.1 (MSL) EOB: 44.4 ft.	PAGE 1 OF 1
START: 8/11/20 END: 8/11/20	SAMPLING METHOD: SPT / ST / NQ2	ENERGY RATIO (%): 86.8	LAT / LONG: 39.616568, -80.930611	

MATERIAL DESCRIPTION AND NOTES	ELEV. 610.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
STIFF TO VERY STIFF, BROWN, **CLAY**, "AND" SILT, TRACE GRAVEL, TRACE SAND, DAMP			5 5 5	14	78	SS-1	2.50	3	4	2	40	51	51	27	24	15	A-7-6 (16)	
	606.6																	
STIFF TO VERY STIFF, RED-BROWN, **ELASTIC CLAY**, "AND" SILT, TRACE GRAVEL, TRACE SAND, DAMP			2 4 3	10	94	SS-2	4.00	3	5	2	35	55	56	31	25	25	A-7-5 (17)	
	604.1																	
MEDIUM STIFF TO STIFF, BROWN, **SANDY SILT**, SOME CLAY, MOIST			3 2 2	6	100	SS-3	-	-	-	-	-	-	-	-	-	29	A-4a (V)	
			2 3 4	10	100	SS-4	0.50	-	-	-	-	-	-	-	-	25	A-4a (V)	
					100	ST-5	0.75	0	0	36	43	21	29	21	8	23	A-4a (6)	
			2 2 2	6	100	SS-6	-	-	-	-	-	-	-	-	-	25	A-4a (V)	
	594.1	W 594.1																
VERY SOFT, BROWN, **SILT AND CLAY**, SOME SAND, MOIST			0 0 0	0	100	SS-7	-	0	0	20	50	30	33	21	12	28	A-6a (9)	
	591.6																	
LOOSE TO MEDIUM DENSE, BROWN TRACE GRAY, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, LITTLE CLAY, WET			4 2 3	7	89	SS-8	-	-	-	-	-	-	-	-	-	18	A-2-4 (V)	
			5 7 4	16	100	SS-9	-	26	4	37	21	12	NP	NP	NP	23	A-2-4 (0)	
	586.6																	
MEDIUM DENSE, BROWN AND GRAY, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND**, LITTLE SILT, TRACE CLAY, WET			6 8 11	27	67	SS-10	-	50	9	24	11	6	NP	NP	NP	14	A-1-b (0)	
	584.1																	
DENSE, RED-BROWN AND GRAY, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, LITTLE CLAY, WET			13 14 15	42	83	SS-11	-	34	9	22	22	13	20	17	3	12	A-2-4 (0)	
	581.6																	
MEDIUM DENSE TO DENSE, RED-BROWN AND GRAY, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, LITTLE CLAY, WET			6 7 8	22	100	SS-12	-	38	9	24	19	10	20	16	4	13	A-2-4 (0)	
	578.1																	
VERY DENSE, GRAY, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, LITTLE CLAY, DAMP			15 30 29	85	100	SS-13	-	-	-	-	-	-	-	-	-	9	A-2-4 (V)	
@ 33.5' - 35': brown and gray, damp	575.7																	
		TR	30 50/5"	-	100	SS-14	-	37	16	19	18	10	20	17	3	13	A-2-4 (0)	
LIMESTONE, GRAY, HIGHLY WEATHERED, MODERATELY STRONG TO STRONG, THIN BEDDED, MODERATELY FRACTURED, OPEN, VERY ROUGH, VERY BLOCKY, GOOD TO FAIR SURFACE CONDITIONS; RQD 55%, REC 100%.	574.9																	
SILTSTONE, BROWN, SEVERELY WEATHERED, VERY WEAK, THIN BEDDED, ARENACEOUS, JOINT DISCONTINUITIES, HIGHLY FRACTURED, NARROW, SLIGHTLY ROUGH, LAMINATED/SHEARED, POOR SURFACE CONDITIONS, OBSERVED IRON STAINING; RQD 0%, REC 90%.	572.7		37		97	NQ2-1											CORE	
SILTSTONE, GRAY, MODERATELY WEATHERED, MODERATELY STRONG, THICK BEDDED, ARENACEOUS, CALCAREOUS, JOINT DISCONTINUITIES, MODERATELY FRACTURED TO FRACTURED, NARROW, SLIGHTLY ROUGH, FAIR SURFACE CONDITIONS; RQD 53%, REC 100%.			50		100	NQ2-2											CORE	
@ 42.9' - 43.3' ; qu = 6,495 psi																		
@ 43.7' - 44.1': sandstone seam	565.7	EOB																

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 12.5 LB. BENTONITE POWDER; 94 LB. CEMENT; 50 GAL. WATER

STANDARD ODOT SOIL BORING LOG (11 X 17) - OH DOT.GDT - 12/18/20 09:30 - C:\PWWORKING\EA\ST01\D1679058\MOE-7-7.55 10-K BORING LOGS.GPJ

PROJECT: MOE-7-07.55	DRILLING FIRM / OPERATOR: DHDC / A.U.	DRILL RIG: MOBILE B-57 TRACK RIG	STATION / OFFSET: 401+46, 10' RT.	EXPLORATION ID B-003-0-18
TYPE: LANDSLIDE	SAMPLING FIRM / LOGGER: HDR / S. REED	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: SR-7	
PID: 108676 SFN:	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 2/27/18	ELEVATION: 643.1 (MSL) EOB: 84.5 ft.	PAGE 1 OF 2
START: 7/27/18 END: 8/1/18	SAMPLING METHOD: SPT/ST/NQ	ENERGY RATIO (%): 82.7	LAT / LONG: 39.616928, -80.930476	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
ASPHALT PAVEMENT (8.5 INCHES)	642.4																	
CONCRETE PAVEMENT (5 INCHES)	642.0																	
STIFF, BROWNISH-GRAY, **CLAY**, SOME SILT, LITTLE SAND, LITTLE GRAVEL, MOIST (FILL)			2 3 4	10	50	SS-1	2.00	14	11	6	24	45	45	24	21	29	A-7-6 (12)	
			3 3 4	10	50	SS-2	1.75	-	-	-	-	-	-	-	-	26	A-7-6 (V)	
	638.1																	
MEDIUM STIFF TO STIFF, REDDISH-BROWN, TRACE GRAY AND TAN, **SILT AND CLAY**, SOME SAND, LITTLE GRAVEL, SEVERAL SANDSTONE AND SHALE FRAGMENTS THROUGHOUT, DAMP			2 2 2	6	56	SS-3	1.00	-	-	-	-	-	-	-	-	24	A-6a (V)	
			3 3 5	11	61	SS-4	2.75	-	-	-	-	-	-	-	-	22	A-6a (V)	
			2 3 10	18	56	SS-5	1.50	-	-	-	-	-	-	-	-	21	A-6a (V)	
@ 9.5' - 10.3' : pushed tube only 8 inches due to large rock fragment at the bottom. The tube was damaged and rejected.					94	ST-6	-	-	-	-	-	-	-	-	-	-	A-6a (V)	
			7 4 6	14	11	SS-7	-	-	-	-	-	-	-	-	-	6	A-6a (V)	
			3 6 5	15	56	SS-8	3.25	-	-	-	-	-	-	-	-	16	A-6a (V)	
			3 6 4	14	72	SS-9	2.00	-	-	-	-	-	-	-	-	18	A-6a (V)	
			3 5 6	15	39	SS-10	1.75	-	-	-	-	-	-	-	-	18	A-6a (V)	
			3 5 7	17	67	SS-11	2.00	-	-	-	-	-	-	-	-	20	A-6a (V)	
@ 18.0' - 20.0' : Qu = 1445 psf					83	ST-12	2.00	16	22	4	22	36	35	21	14	19	A-6a (6)	
			2 5 7	17	78	SS-13	2.00	-	-	-	-	-	-	-	-	20	A-6a (V)	
			4 7 21	39	100	SS-14	3.50	-	-	-	-	-	-	-	-	18	A-6a (V)	
			10 12 11	32	100	SS-15	2.50	-	-	-	-	-	-	-	-	19	A-6a (V)	
@ 24.5' - 26.0' : obtained sample from auger spoils (no SPT recovery)			8 8 9	23	0	SS-16	-	-	-	-	-	-	-	-	-	17	A-6a (V)	
			6 6 8	19	11	SS-17	2.00	-	-	-	-	-	-	-	-	17	A-6a (V)	
			4 8 12	28	100	SS-18	2.50	-	-	-	-	-	-	-	-	16	A-6a (V)	
			10 8 21	40	100	SS-19	2.50	-	-	-	-	-	-	-	-	18	A-6a (V)	
			5 15 9	33	100	SS-20	1.50	-	-	-	-	-	-	-	-	19	A-6a (V)	
			6 11 10	29	89	SS-21A	3.00	-	-	-	-	-	-	-	-	18	A-6a (V)	
	609.9					SS-21B	4.50	-	-	-	-	-	-	-	-	-	A-6a (V)	
STIFF TO VERY STIFF, MOTTLED BROWN AND GRAY, **SILT AND CLAY**, LITTLE SAND, MOIST			4 7 9	22	100	SS-22	2.00	-	-	-	-	-	-	-	-	25	A-6a (V)	
	606.6		5 7 7	19	100	SS-23	2.50	-	-	-	-	-	-	-	-	24	A-6a (V)	
MEDIUM STIFF, MOTTLED BROWN AND GRAY, **SILT AND CLAY**, TRACE SAND, MOIST @ 36.5' - 38.5' : Qu = 2660 psf					98	ST-24	1.25	0	0	14	49	37	31	18	13	23	A-6a (9)	
			3 4 6	14	89	SS-25	0.75	-	-	-	-	-	-	-	-	24	A-6a (V)	
			1 3 3	8	100	SS-26	0.50	-	-	-	-	-	-	-	-	24	A-6a (V)	
			0 2 4	8	100	SS-27	0.50	0	0	8	55	37	31	19	12	25	A-6a (9)	
			0 1 2	4	100	SS-28	0.75	-	-	-	-	-	-	-	-	23	A-6a (V)	
			0 0 3	4	100	SS-29	0.50	-	-	-	-	-	-	-	-	26	A-6a (V)	
			0 2 2	6	100	SS-30	0.50	-	-	-	-	-	-	-	-	24	A-6a (V)	
			0 2 2	6	100	SS-31	0.50	-	-	-	-	-	-	-	-	25	A-6a (V)	
			0 3 2	7	100	SS-32	0.75	0	0	8	54	38	30	19	11	27	A-6a (8)	
	591.6	W 591.6	2 3 3	8	100	SS-33A	1.25	-	-	-	-	-	-	-	-	27	A-6a (V)	
						SS-33B	-	-	-	-	-	-	-	-	-	-	A-4a (V)	
LOOSE TO MEDIUM DENSE, GRAY, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, WET			0 0 1	1	56	SS-34	-	-	-	-	-	-	-	-	-	27	A-4a (V)	
			0 6 7	18	89	SS-35	-	3	5	49	25	18	NP	NP	NP	24	A-4a (2)	
	586.6		4 4 6	14	61	SS-36	-	-	-	-	-	-	-	-	-	28	A-4a (V)	
HARD, GRAY, **SILT AND CLAY**, LITTLE SAND, DAMP			6 20 41	84	72	SS-37	4.50	0	2	10	45	43	31	20	11	17	A-6a (8)	
	583.6		7 45 50/3"	-	73	SS-38	4.50	-	-	-	-	-	-	-	-	13	A-6a (V)	
		TR	17															

STANDARD ODOT SOIL BORING LOG (11 X 17) - OH DOT.GDT - 12/18/20 09:25 - C:\PWWORKING\EAST01\D1679058\20180730_MOE-7-7.55_2017 10-AA_TYPED LOGS (UPDATED DESCRIPTIONS).GPJ

PID: 108676	SFN:	PROJECT: MOE-7-07.55	STATION / OFFSET: 401+46, 10' RT.	START: 7/27/18	END: 8/1/18	PG 2 OF 2	B-003-0-18

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
CLAYSTONE, REDDISH-BROWN, TRACE GRAY, HIGHLY WEATHERED, VERY WEAK. *(continued)*	583.1	61	50/5"	-	45	SS-39	-	-	-	-	-	-	-	-	-	14	Rock (V)	
		62	29 50/3"	-	89	SS-40	-	-	-	-	-	-	-	-	-	10	Rock (V)	
		63	50/5"	-	100	SS-41	-	-	-	-	-	-	-	-	-	9	Rock (V)	
	578.6	64	50/4"	-	100	SS-42	-	-	-	-	-	-	-	-	-	4	Rock (V)	
SHALE, GRAY, SEVERELY TO HIGHLY WEATHERED, VERY WEAK TO WEAK, VERY FINE GRAINED, THIN BEDDED, FRACTURED WITH SLIGHTLY ROUGH TO ROUGH SURFACES ALONG HORIZONTAL BEDDING JOINTS, NUMEROUS CLAY SEAMS; RQD 14%, REC 100%.	575.6	65	12		100	NQ-1											CORE	
SILTSTONE, GRAY, HIGHLY TO MODERATELY WEATHERED, SLIGHTLY STRONG, FINE GRAINED, LAMINATED TO THIN BEDDED, OCCASSIONAL VERY WEAK TO WEAK SHALE SEAMS, FRACTURED WITH SLIGHTLY ROUGH TO ROUGH SURFACES ALONG BEDDING JOINTS; RQD 14%, REC 100%. @ 69.3' - 69.5' : vertical fracture @ 71.2' - 71.3' : vertical fracture @ 72.5' - 72.8' : vertical fracture	568.1	68	0		100	NQ-2											CORE	
		70	22		100	NQ-3											CORE	
SHALE, GRAY, MODERATELY WEATHERED, WEAK TO SLIGHTLY STRONG, VERY FINE GRAINED, LAMINATED TO THIN BEDDED, SLIGHTLY FRACTURED WITH SLIGHTLY ROUGH TO ROUGH SURFACES ALONG HORIZONTAL BEDDING JOINTS, SEVERAL INTERBEDDED SILTSTONE SEAMS; RQD 54%, REC 100%. @ 75.9' : Qu = 2255 psi	563.1	75	54		100	NQ-4											CORE	
SILTSTONE, GRAY, SLIGHTLY WEATHERED, SLIGHTLY STRONG, VERY FINE TO FINE GRAINED, LAMINATED TO THIN BEDDED, OCCASIONAL CROSS-BEDDING IN SILTSTONE, OCCASIONAL SHALE PARTINGS, FRACTURED WITH SLIGHTLY ROUGH TO ROUGH SURFACES ALONG HORIZONTAL BEDDING JOINTS; RQD 43%, REC 100%.	558.6	80	0		100	NQ-5											CORE	
	EOB	81	15		100	NQ-6											CORE	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH 4 BAGS BENTONITE GROUT; MIXED 87 GAL. WATER

PROJECT: MOE-7-07.55	DRILLING FIRM / OPERATOR: DHDC / A.U.	DRILL RIG: MOBILE B-57 TRACK RIG	STATION / OFFSET: 402+45, 10' RT.	EXPLORATION ID B-004-0-18
TYPE: LANDSLIDE	SAMPLING FIRM / LOGGER: HDR / S. REED	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: SR-7	
PID: 108676 SFN:	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 2/27/18	ELEVATION: 643.2 (MSL) EOB: 90.5 ft.	PAGE 1 OF 2
START: 7/26/18 END: 7/26/18	SAMPLING METHOD: SPT/ST/NQ	ENERGY RATIO (%): 82.7	LAT / LONG: 39.617076, -80.930180	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
ASPHALT PAVEMENT (10 INCHES)	643.2 / 642.4																	
CONCRETE PAVEMENT (6 INCHES)	641.9																	
STIFF, BROWN, **SILT AND CLAY**, "AND" SAND, LITTLE GRAVEL, MOIST (FILL)	639.7		4 3 5	11	11	SS-1	-	12	24	12	22	30	36	24	12	16	A-6a (4)	
STIFF TO VERY STIFF, REDDISH-BROWN, TRACE GRAY, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, MOIST			2 2 2	6	22	SS-2	1.25	-	-	-	-	-	-	-	-	21	A-6a (V)	
			2 3 5	11	44	SS-3	2.50	-	-	-	-	-	-	-	-	25	A-6a (V)	
			3 5 6	15	56	SS-4	2.50	-	-	-	-	-	-	-	-	22	A-6a (V)	
@ 11.0' - 13.0' : Qu = 4100 psf @ 11.0' - 13.0' : rock at tip of sample ST-5 (slightly damaged at bottom)					75	ST-5	-	8	17	8	24	43	35	22	13	17	A-6a (8)	
			5 6 8	19	67	SS-6	3.50	-	-	-	-	-	-	-	-	18	A-6a (V)	
			4 5 8	18	67	SS-7	3.25	-	-	-	-	-	-	-	-	18	A-6a (V)	
			3 5 9	19	72	SS-8	2.25	-	-	-	-	-	-	-	-	18	A-6a (V)	
	623.7																	
VERY STIFF, BROWN AND TAN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, MOIST			4 9 8	23	72	SS-9	2.75	-	-	-	-	-	-	-	-	16	A-6a (V)	
			4 6 10	22	78	SS-10	3.50	2	19	5	32	42	35	22	13	18	A-6a (9)	
			7 7 8	21	67	SS-11	1.75	-	-	-	-	-	-	-	-	17	A-6a (V)	
	616.2																	
VERY STIFF, REDDISH-BROWN, TRACE GRAY, **SILT AND CLAY**, LITTLE SAND, MOIST			4 8 11	26	100	SS-12	3.25	0	9	7	38	46	37	23	14	20	A-6a (10)	
			6 9 9	25	100	SS-13	3.00	-	-	-	-	-	-	-	-	21	A-6a (V)	
	610.2		7 7 8	21	100 -	SS-14A	2.50	-	-	-	-	-	-	-	-	-	A-6a (V)	
STIFF, REDDISH-BROWN TO GRAY, **SILTY CLAY**, TRACE SAND, MOIST						SS-14B	1.50	-	-	-	-	-	-	-	-	29	A-6b (V)	
			4 7 8	21	100	SS-15	2.25	0	1	1	52	46	37	21	16	23	A-6b (10)	
	605.7																	
MEDIUM STIFF, GRAYISH-BROWN WITH TRACE REDDISH-BROWN AND GRAY, **SILT AND CLAY**, LITTLE SAND, MOIST			3 4 5	12	100	SS-16	0.75	0	0	11	50	39	32	20	12	23	A-6a (9)	
@ 40.0' - 42.0' : Attempted undisturbed shelby tube, but sample was not recovered. An SPT sample was then driven from 40.0' to 41.5'.					94	ST-17	0.75	-	-	-	-	-	-	-	-	26	A-6a (V)	
	601.2																	
MEDIUM STIFF, BROWNISH-GRAY, **SANDY SILT**, SOME CLAY, MOIST			0 3 4	10	100	SS-18	0.75	-	-	-	-	-	-	-	-	24	A-4a (V)	
@ 45' : occasional thin wet silty sand seam			0 2 3	7	100	SS-19	0.75	0	0	29	46	25	24	18	6	23	A-4a (7)	
@ 47.5' : slightly varved			0 3 2	7	100	SS-20	0.75	-	-	-	-	-	-	-	-	25	A-4a (V)	
			0 2 4	8	100	SS-21	0.75	-	-	-	-	-	-	-	-	24	A-4a (V)	
		W 591.2																
@ 52.5' : several thin wet silty sand seams			0 7 5	17	100	SS-22	1.00	-	-	-	-	-	-	-	-	25	A-4a (V)	
	587.2		8 17 50/2"	-	100	SS-23	-	-	-	-	-	-	-	-	-	20	A-4a (V)	
DENSE, OLIVE-BROWN AND GRAY, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST TO WET			30 50/1"	-	100	SS-24	-	-	-	-	-	-	-	-	-	3	A-2-4 (V)	

PID: 108676	SFN:	PROJECT: MOE-7-07.55	STATION / OFFSET: 402+45, 10' RT.	START: 7/26/18	END: 7/26/18	PG 2 OF 2	B-004-0-18

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
DENSE, OLIVE-BROWN AND GRAY, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST TO WET *(continued)*	583.2	61	11 23 25	66	78	SS-25	-	23	21	21	25	10	NP	NP	NP	16	A-2-4 (0)	
	581.2	62																
HARD, REDDISH-BROWN, TRACE GRAY, **SANDY SILT**, SOME CLAY, DAMP		63	15 35 48	114	72	SS-26	4.50	0	13	16	36	35	29	21	8	17	A-4a (7)	
		64																
		65	15 34 47	112	83	SS-27	4.50	-	-	-	-	-	-	-	-	17	A-4a (V)	
	575.7	66																
SHALE, BLUISH-GRAY, HIGHLY WEATHERED, WEAK.		67 TR																
		68	50/3"	-	100	SS-28	-	-	-	-	-	-	-	-	-	16	Rock (V)	
	572.7	69																
		70	50/4"	-	100	SS-29	-	-	-	-	-	-	-	-	-	4	Rock (V)	
SHALE, GRAY, MODERATELY TO HIGHLY WEATHERED, VERY WEAK TO WEAK, VERY FINE GRAINED, LAMINATED TO THIN BEDDED, OCCASIONAL CALCAREOUS SEAMS, OCCASIONAL CLAY SEAMS, MODERATELY FRACTURED WITH SLIGHTLY ROUGH SURFACES ALONG HORIZONTAL BEDDING JOINTS; RQD 32%, REC 96%.		71																
		72																
		73	28		100	NQ-1											CORE	
		74																
		75																
		76																
		77																
		78	36		91	NQ-2											CORE	
		79																
	562.7	80																
SILTSTONE, GRAY, MODERATELY WEATHERED, WEAK TO SLIGHTLY STRONG, VERY FINE GRAINED, THIN TO MEDIUM BEDDED, OCCASIONAL THIN SHALE PARTINGS, MODERATELY FRACTURED WITH ROUGH SURFACES; RQD 19%, REC 94%. @ 83.0' - 83.5' : Qu = 343 psi (very weak seam) @ 83.5' - 83.7' : high angle fracture		81																
		82																
		83	20		94	NQ-3											CORE	
		84																
		85																
	557.3	86																
SHALE, GRAY, HIGHLY WEATHERED, VERY WEAK TO WEAK, VERY FINE GRAINED, THIN BEDDED, INTERBEDDED ZONES OF SLIGHTLY STRONG CALCAREOUS SHALE, FRACTURED TO MODERATELY FRACTURED WITH SLIGHTLY ROUGH SURFACES ALONG HORIZONTAL BEDDING JOINTS; RQD 15%, REC 100%.		87	27		100	NQ-4											CORE	
		88																
		89	0		100	NQ-5											CORE	
	552.7	90 EOB																

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH 3.5 BAGS BENTONITE GROUT; MIXED 80 GAL. WATER

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PROJECT: MOE-7-07.55	DRILLING FIRM / OPERATOR: CENTRAL STAR / TS	DRILL RIG: DIEDRICH D-50	STATION / OFFSET: 402+36, 98' RT.	EXPLORATION ID B-004-1-20
TYPE: LANDSLIDE	SAMPLING FIRM / LOGGER: HDR / AKB	HAMMER: DIEDRICH AUTOMATIC	ALIGNMENT: SR 7	
PID: 108676 SFN:	DRILLING METHOD: 3.25" HSA / NQ2	CALIBRATION DATE: 11/26/19	ELEVATION: 612.5 (MSL) EOB: 51.3 ft.	PAGE 1 OF 1
START: 8/10/20 END: 8/11/20	SAMPLING METHOD: SPT / ST / NQ2	ENERGY RATIO (%): 86.8	LAT / LONG: 39.616860, -80.930032	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	INCL.
MEDIUM STIFF TO STIFF, BROWN TRACE RED-BROWN, **CLAY**, "AND" SILT, TRACE SAND, MOIST	612.5	1	2 2 2	6	67	SS-1	3.50	-	-	-	-	-	-	-	-	33	A-7-6 (V)	
		2	2 2 3	7	72	SS-2	1.75	-	-	-	-	-	-	-	-	30	A-7-6 (V)	
		3	2 1 3	6	89	SS-3	2.00	0	1	8	54	37	45	28	17	32	A-7-6 (12)	
		4	2 2 3	7	94	SS-4	1.50	-	-	-	-	-	-	-	-	25	A-7-6 (V)	
		5	2 1 3	6	100	SS-5	1.50	-	-	-	-	-	-	-	-	26	A-7-6 (V)	
	605.0	6																
MEDIUM STIFF TO STIFF, BROWN, **SILT AND CLAY**, LTTLE SAND, MOIST		7	2 2 2	6	100	SS-6	0.75	-	-	-	-	-	-	-	-	25	A-6a (V)	
		8	2 2 2	6	100	SS-7	0.50	0	0	14	49	37	37	22	15	29	A-6a (10)	
@ 10.5' - 12.5' : qu = 2,190 psf		9			100	ST-8	1.00	0	0	11	54	35	36	23	13	27	A-6a (9)	
	600.0	10																
SOFT, GRAY, **SANDY SILT**, SOME CLAY, WET		11	2 1 1	3	100	SS-9	-	-	-	-	-	-	-	-	-	25	A-4a (V)	
		12	1 1 1	3	89	SS-10	-	0	0	35	40	25	26	18	8	29	A-4a (6)	
		13	0 2 1	4	100	SS-11	-	-	-	-	-	-	-	-	-	24	A-4a (V)	
	595.5	14																
VERY SOFT TO SOFT, GRAY, **SILT AND CLAY**, SOME SAND, MOIST		15	0 0 0	0	94	SS-12	0.50	-	-	-	-	-	-	-	-	26	A-6a (V)	
		16	1 2 4	9	100	SS-13	1.25	0	0	23	48	29	34	20	14	27	A-6a (10)	
	592.5	17	W 592.5															
VERY SOFT TO SOFT, GRAY, **SANDY SILT**, SOME CLAY, WET		18	2 2 2	6	100	SS-14	-	-	-	-	-	-	-	-	-	27	A-4a (V)	
		19	0 0 0	0	100	SS-15	-	0	0	35	39	26	27	18	9	26	A-4a (6)	
	589.5	20																
MEDIUM DENSE TO DENSE, BROWN, **GRAVEL AND/OR STONE FRAGMENTS**, SOME SAND, TRACE SILT, TRACE CLAY, WET		21	6 10 14	35	44	SS-16	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
		22	10 9 8	25	100	SS-17	-	63	13	12	7	5	22	17	5	19	A-1-a (0)	
		23	10 11 15	38	44	SS-18	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
	585.0	24																
MEDIUM DENSE, BROWN, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, WET		25	10 8 9	25	39	SS-19	-	-	-	-	-	-	-	-	-	19	A-2-4 (V)	
@ 29' - 30.5': trace wood		26	5 5 9	20	83	SS-20	-	36	13	27	15	9	NP	NP	NP	25	A-2-4 (0)	
	581.5	27				SS-21A	-	-	-	-	-	-	-	-	-	13	A-2-4 (V)	
DENSE, BROWN, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP	580.5	28	12 13 19	46	100	SS-21B	-	40	12	20	20	8	20	16	4	10	A-2-4 (0)	
MEDIUM DENSE TO DENSE, BROWN, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, LITTLE CLAY, WET		29	6 13 15	41	100	SS-22	-	-	-	-	-	-	-	-	-	9	A-2-4 (V)	
		30	3 6 11	25	100	SS-23	-	27	29	16	18	10	21	16	5	15	A-2-4 (0)	
	577.5	31																
VERY DENSE, BROWN TRACE RED-BROWN, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, WET		32	13 18 21	56	100	SS-24	-	34	7	32	19	8	NP	NP	NP	16	A-2-4 (0)	
	575.5	33																
VERY DENSE, RED-BROWN, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, LITTLE CLAY, DAMP	574.5	34	12 43 50/3"	-	100	SS-25	-	25	6	41	18	10	NP	NP	NP	11	A-2-4 (0)	
		35	50/6"	-	33	SS-26	-	-	-	-	-	-	-	-	-	9	Rock (V)	
SHALE, GRAY, SEVERELY WEATHERED, VERY WEAK.		36	TR															
		37	50/4"	-	100	SS-27	-	-	-	-	-	-	-	-	-	17	Rock (V)	
	571.2	38	50/3"	-	100	SS-28	-	-	-	-	-	-	-	-	-	18	Rock (V)	
SILTSTONE, GRAY, HIGHLY WEATHERED, MODERATELY STRONG, MEDIUM BEDDED, JOINT DISCONTINUITIES, MODERATELY FRACTURED TO FRACTURED, NARROW TO TIGHT, SLIGHTLY ROUGH TO VERY ROUGH, LAMINATED, FAIR SURFACE CONDITIONS; RQD 40%, REC 100%.		39																
@ 42.5' - 42.9': sandstone seam		40																
@ 44.1' - 44.5' : qu = 3,644 psi		41	41		100	NQ2-1											CORE	
		42																
		43																
		44																
		45																
		46																
		47																
		48	59		100	NQ2-2											CORE	
	563.5	49																
SILTSTONE, GRAY, MODERATELY WEATHERED, MODERATELY STRONG, MEDIUM TO THICK BEDDED, ARENACEOUS, JOINT DISCONTINUITIES, SLIGHTLY FRACTURED TO MODERATELY FRACTURED, NARROW, SLIGHTLY ROUGH, INTACT, GOOD TO FAIR SURFACE CONDITIONS; RQD 89%, REC 100%.		50																
@ 50.7': grades to sandstone	561.2	51	EOB															

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 25 LB. BENTONITE POWDER; 94 LB. CEMENT; 50 GAL. WATER

STANDARD ODOT SOIL BORING LOG (11 X 17) - OH DOT.GDT - 12/18/20 09:30 - C:\PWWORKING\EAST01\D1679058\MOE-7-7.55 10-K BORING LOGS.GPJ

18 / 34	MOE-7-7.55	SOIL PROFILE - LANDSLIDE BORING LOG B-004-1-20	DRAWN CLW CHECKED DMV

PROJECT: MOE-7-07.55	DRILLING FIRM / OPERATOR: CENTRAL STAR / TS	DRILL RIG: DIEDRICH D-50	STATION / OFFSET: 402+31, 133' RT.	EXPLORATION ID B-004-2-20
TYPE: RETAINING WALL	SAMPLING FIRM / LOGGER: HDR / AKB	HAMMER: DIEDRICH AUTOMATIC	ALIGNMENT: SR 7	
PID: 108676 SFN:	DRILLING METHOD: 3.25" HSA / NQ2	CALIBRATION DATE: 11/26/19	ELEVATION: 603.0 (MSL) EOB: 43.0 ft.	PAGE 1 OF 1
START: 8/11/20 END: 8/11/20	SAMPLING METHOD: SPT / NQ2	ENERGY RATIO (%): 86.8	LAT / LONG: 39.616773, -80.929979	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
VERY SOFT TO SOFT, BROWNISH-GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, MOIST	603.0		1 0 0	0	83	SS-1	-	-	-	-	-	-	-	-	-	39	A-6b (V)	
			0 0 0	0	100	SS-2	0.25	1	2	15	44	38	40	24	16	32	A-6b (10)	
			0 0 0	0	100	SS-3	1.25	-	-	-	-	-	-	-	-	27	A-6b (V)	
	594.5	W 594.5																
SOFT, GRAYISH-BROWN, **SANDY SILT**, SOME CLAY, WET			1 2 1	4	100	SS-4	-	-	-	-	-	-	-	-	-	25	A-4a (V)	
			5 1 2	4	100	SS-5	-	0	0	40	39	21	25	18	7	25	A-4a (5)	
	589.5																	
MEDIUM DENSE TO DENSE, GRAYISH-BROWN, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, WET			5 6 10	23	72	SS-6	-	41	6	28	17	8	NP	NP	NP	11	A-2-4 (0)	
			5 7 15	32	83	SS-7	-	-	-	-	-	-	-	-	-	5	A-2-4 (V)	
	584.5																	
MEDIUM DENSE TO DENSE, BROWN TO RED-BROWN, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND**, LITTLE SILT, TRACE CLAY, WET			9 19 10	42	89	SS-8	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
			11 10 10	29	72	SS-9	-	39	14	26	14	7	NP	NP	NP	16	A-1-b (0)	
			5 9 7	23	83	SS-10	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
	577.0																	
VERY DENSE, BROWN TO RED-BROWN, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND**, LITTLE SILT, TRACE CLAY, WET	576.0		14 29 32	88	83	SS-11A	-	41	15	22	14	8	NP	NP	NP	11	A-1-b (0)	
						SS-11B	-	62	9	13	11	5	NP	NP	NP	4	A-1-b (0)	
VERY DENSE, GRAY, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND**, LITTLE SILT, TRACE CLAY, WET	574.5																	
DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE GRAVEL, LITTLE SILT, TRACE CLAY, WET			9 10 14	35	83	SS-12	-	14	6	57	17	6	NP	NP	NP	23	A-3a (0)	
	572.0	TR																
SHALE, GRAY, SEVERELY WEATHERED, VERY WEAK.			50/6"	-	100	SS-13	-	-	-	-	-	-	-	-	-	11	Rock (V)	
	570.0																	
SILTSTONE, GRAY, MODERATELY WEATHERED, MODERATELY STRONG, MEDIUM TO THICK BEDDED, ARENACEOUS, JOINT DISCONTINUITIES, MODERATELY FRACTURED TO FRACTURED, NARROW, SLIGHTLY ROUGH, INTACT, GOOD SURFACE CONDITIONS; RQD 58%, REC 87%. @ 33' - 33.2': sandstone seam @ 35.2' - 35.7' : qu = 6,872 psi			74		100	NQ2-1											CORE	
			40		78	NQ2-2											CORE	
			85		95	NQ2-3											CORE	
	560.7																	
SANDSTONE, GRAY, SLIGHTLY TO MODERATELY WEATHERED, STRONG, THIN BEDDED, JOINT DISCONTINUITIES, MODERATELY FRACTURED, NARROW, SLIGHTLY ROUGH, INTACT, GOOD SURFACE CONDITIONS; RQD 100%, REC 100%. @ 42.4' - 43.0' - qu = 10,479 psi	560.0	EOB																

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 12.5 LB. BENTONITE POWDER; 94 LB. CEMENT; 50 GAL. WATER

STANDARD ODOT SOIL BORING LOG (11 X 17) - OH DOT.GDT - 12/18/20 09:30 - C:\PWWORKING\EAST01\D1679068\MOE-7-7.55 10-K BORING LOGS.GPJ

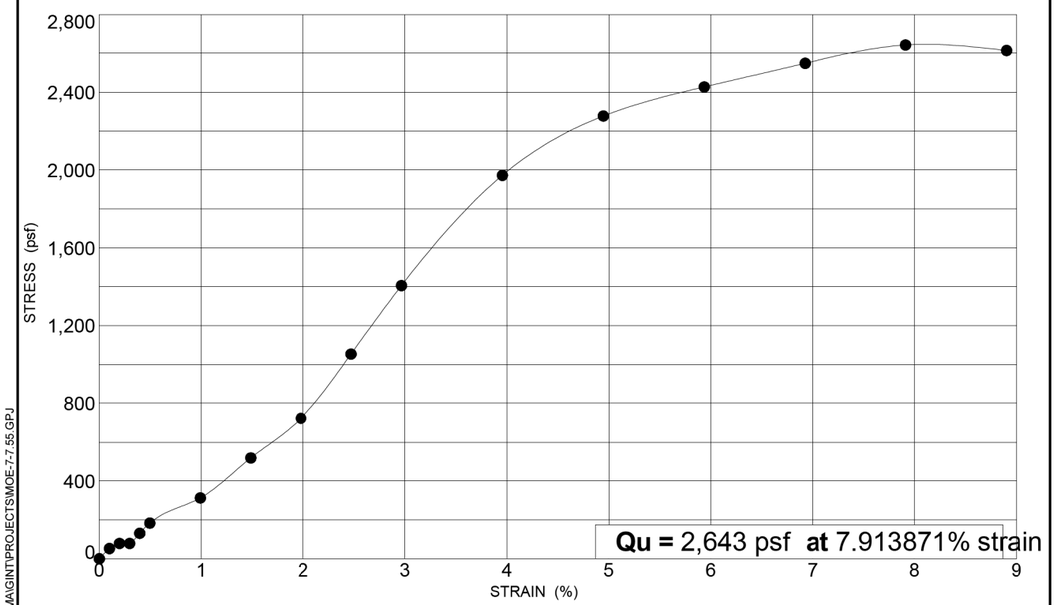
UNCONFINED COMPRESSION TEST
AASHTO T - 208

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT MOE-7-7.55 **PID**
OGE NUMBER MOE-7-7.55 **PROJECT TYPE** STRUCTURE FOUNDATION

SAMPLE IDENTIFICATION

BORING ID: B-001-0-18 SAMPLE ID: ST-15
STATION: NOT RECORDED DEPTH: 35.5 - 37.5 feet



SPECIMEN FAILURE SKETCHES OR PHOTOGRAPHS


BEFORE FAILURE


AFTER FAILURE

SPECIMEN DETAILS

HEIGHT: 6.065 inches
DIAMETER: 2.844 inches
WET UNIT WT: 129.21 pcf
DRY UNIT WT: 105.91 pcf

TESTED BY: MOH 8/23/2018

CLASSIFICATION RESULTS

GRADATION (%)				
GR	CS	FS	SI	CL
0	0	26	43	31

ATTERBERG LIMITS			MOISTURE
LL	PL	PI	WC
24	18	6	22

ODOT CLASS: A-4a HP (tsf): 1.5-2.0
DESCRIPTION: SILTY CLAY with SAND

OHDOT UNCONFINED COMPRESSION - OH DOT.GDT - 8/26/18 17:35 - \\DHDCINCFS01\DVALMA\GINT\PROJECTS\MOE-7-7.55.GPJ

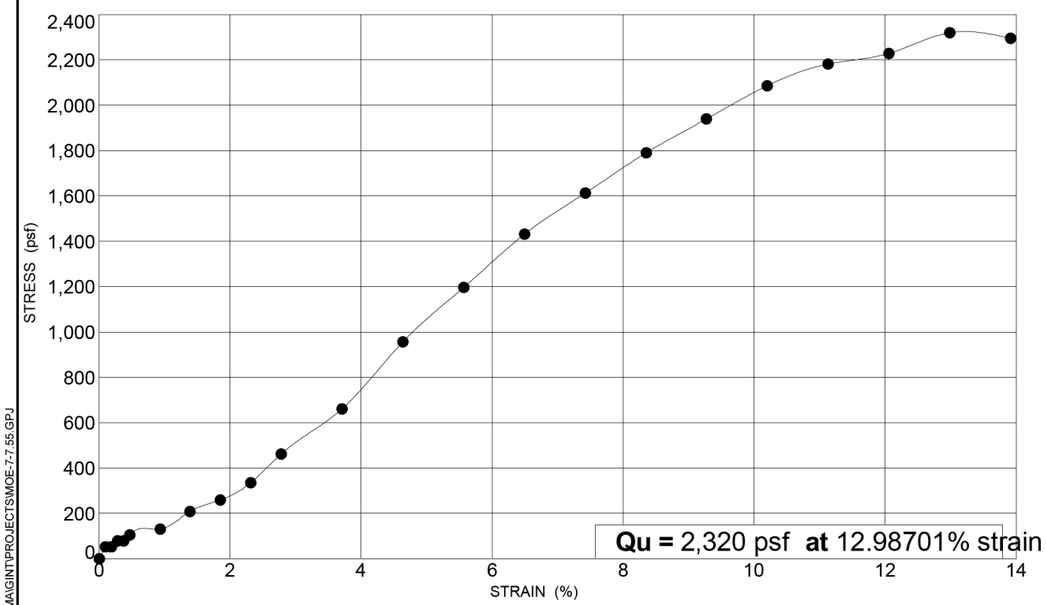
UNCONFINED COMPRESSION TEST
AASHTO T - 208

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT MOE-7-7.55 **PID**
OGE NUMBER MOE-7-7.55 **PROJECT TYPE** STRUCTURE FOUNDATION

SAMPLE IDENTIFICATION

BORING ID: B-001-0-18 SAMPLE ID: ST-18
STATION: NOT RECORDED DEPTH: 42.5 - 44.5 feet



SPECIMEN FAILURE SKETCHES OR PHOTOGRAPHS


BEFORE FAILURE


AFTER FAILURE

SPECIMEN DETAILS

HEIGHT: 6.468 inches
DIAMETER: 2.840 inches
WET UNIT WT: 126.16 pcf
DRY UNIT WT: 100.13 pcf

TESTED BY: MOH 8/23/2018

CLASSIFICATION RESULTS

GRADATION (%)				
GR	CS	FS	SI	CL
0	1	16	47	36

ATTERBERG LIMITS			MOISTURE
LL	PL	PI	WC
31	19	12	26

ODOT CLASS: A-6a HP (tsf): 1.0
DESCRIPTION: LEAN CLAY with SAND

OHDOT UNCONFINED COMPRESSION - OH DOT.GDT - 8/26/18 17:36 - \\DHDCINCFS01\DVALMA\GINT\PROJECTS\MOE-7-7.55.GPJ

DRAWN CLW CHECKED DMV

SOIL PROFILE - LANDSLIDE
COMPRESSIVE STRENGTH TEST RESULTS

MOE-7-7.55

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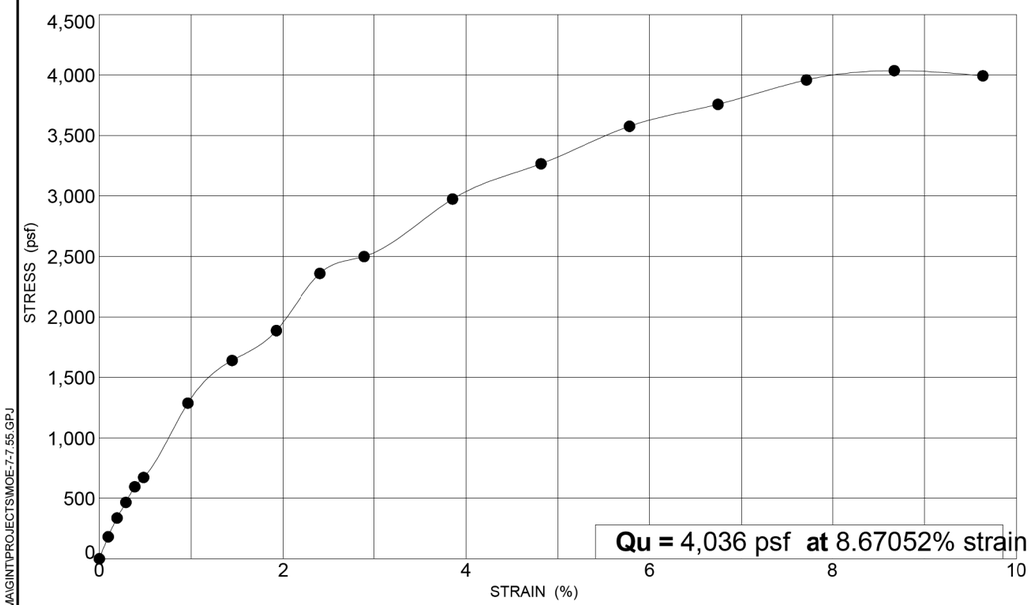
UNCONFINED COMPRESSION TEST
AASHTO T - 208

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT MOE-7-7.55 **PID**
OGE NUMBER MOE-7-7.55 **PROJECT TYPE** STRUCTURE FOUNDATION

SAMPLE IDENTIFICATION

BORING ID: B-002-0-18 SAMPLE ID: ST-22
STATION: NOT RECORDED DEPTH: 33.0 - 35.0 feet



SPECIMEN FAILURE SKETCHES OR PHOTOGRAPHS


BEFORE FAILURE


AFTER FAILURE

SPECIMEN DETAILS

HEIGHT: 6.228 inches
DIAMETER: 2.862 inches
WET UNIT WT: 124.90 pcf
DRY UNIT WT: 106.30 pcf

TESTED BY: MOH 8/10/2018

CLASSIFICATION RESULTS

GRADATION (%)

GR	CS	FS	SI	CL
1	1	7	52	39

ATTERBERG LIMITS			MOISTURE
LL	PL	PI	WC
31	19	12	18

ODOT CLASS: A-6a HP (tsf): 1.5
DESCRIPTION: LEAN CLAY

OHDOT UNCONFINED COMPRESSION - OH DOT.GDT - 8/15/18 12:03 - \\DHDCINCFS01\DVALMA\GINT\PROJECTS\MOE-7-7.55.GPJ

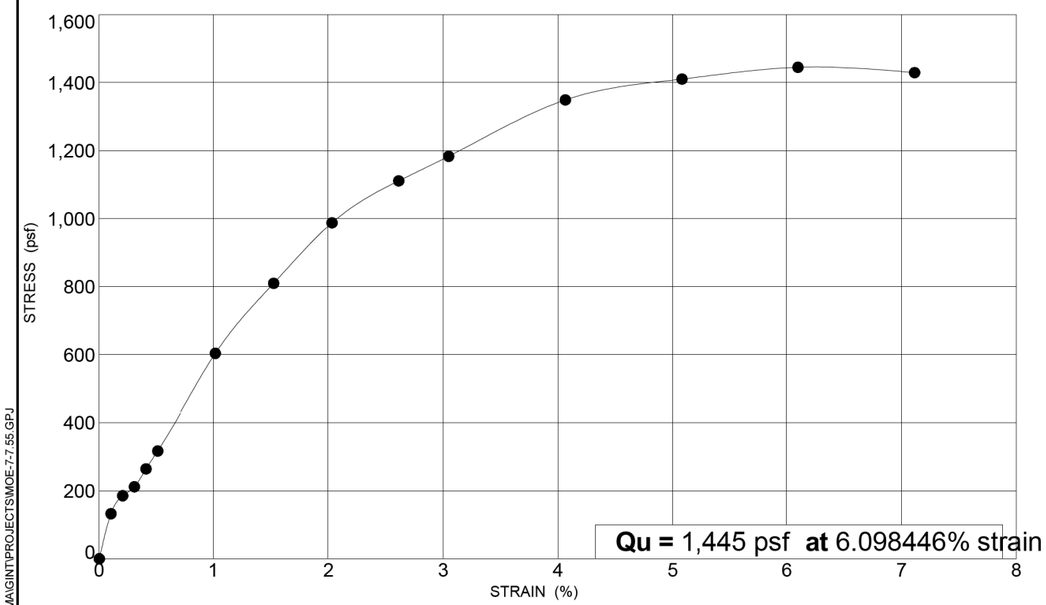
UNCONFINED COMPRESSION TEST
AASHTO T - 208

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT MOE-7-7.55 **PID**
OGE NUMBER MOE-7-7.55 **PROJECT TYPE** STRUCTURE FOUNDATION

SAMPLE IDENTIFICATION

BORING ID: B-003-0-18 SAMPLE ID: ST-12
STATION: NOT RECORDED DEPTH: 18.0 - 20.0 feet



SPECIMEN FAILURE SKETCHES OR PHOTOGRAPHS


BEFORE FAILURE


AFTER FAILURE

SPECIMEN DETAILS

HEIGHT: 6.887 inches
DIAMETER: 2.833 inches
WET UNIT WT: 133.80 pcf
DRY UNIT WT: 112.34 pcf

TESTED BY: MOH 8/10/2018

CLASSIFICATION RESULTS

GRADATION (%)

GR	CS	FS	SI	CL
16	22	4	22	36

ATTERBERG LIMITS			MOISTURE
LL	PL	PI	WC
35	21	14	19

ODOT CLASS: A-6a HP (tsf): 1.0
DESCRIPTION: SANDY LEAN CLAY

OHDOT UNCONFINED COMPRESSION - OH DOT.GDT - 8/15/18 12:03 - \\DHDCINCFS01\DVALMA\GINT\PROJECTS\MOE-7-7.55.GPJ

DRAWN CLW CHECKED DMV

SOIL PROFILE - LANDSLIDE
COMPRESSIVE STRENGTH TEST RESULTS

MOE-7-7.55

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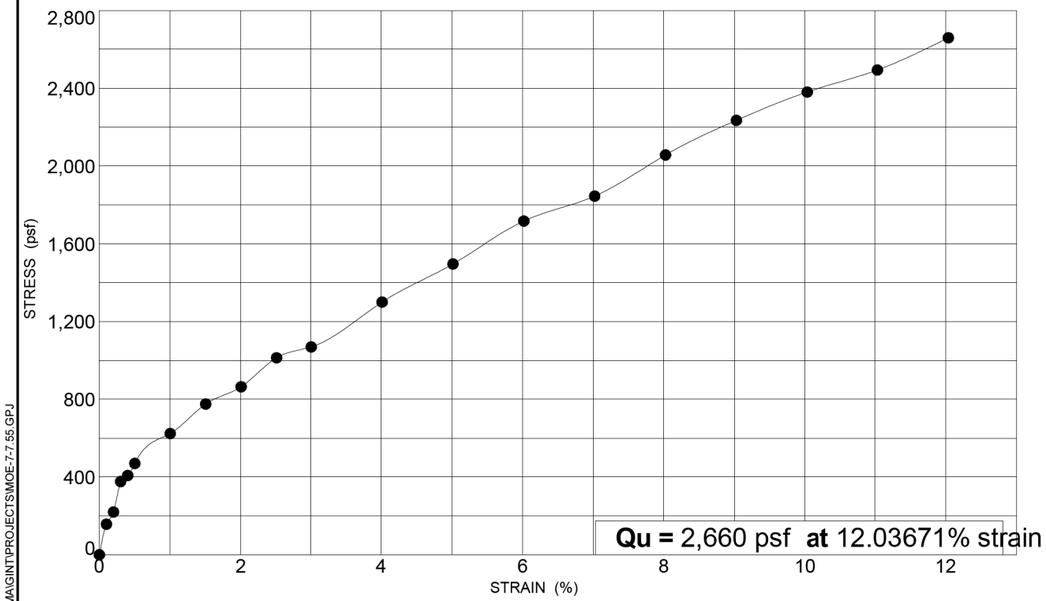
UNCONFINED COMPRESSION TEST
AASHTO T - 208

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT MOE-7-7.55 **PID**
OGE NUMBER MOE-7-7.55 **PROJECT TYPE** STRUCTURE FOUNDATION

SAMPLE IDENTIFICATION

BORING ID: B-003-0-18 SAMPLE ID: ST-24
STATION: NOT RECORDED DEPTH: 36.5 - 38.5 feet



SPECIMEN FAILURE SKETCHES OR PHOTOGRAPHS


BEFORE FAILURE


AFTER FAILURE

SPECIMEN DETAILS

HEIGHT: 5.982 inches
DIAMETER: 2.600 inches
WET UNIT WT: 126.90 pcf
DRY UNIT WT: 103.42 pcf

TESTED BY: MOH 8/10/2018

CLASSIFICATION RESULTS

GRADATION (%)				
GR	CS	FS	SI	CL
0	0	14	49	37

ATTERBERG LIMITS			MOISTURE
LL	PL	PI	WC
31	18	13	23

ODOT CLASS: A-6a HP (tsf): 1.75
DESCRIPTION: LEAN CLAY

OHDOT UNCONFINED COMPRESSION - OH DOT GDT - 8/15/18 12:04 - \\DHDCINCFS01\DALMAIGINT\PROJECTS\MOE-7-7.55.GPJ

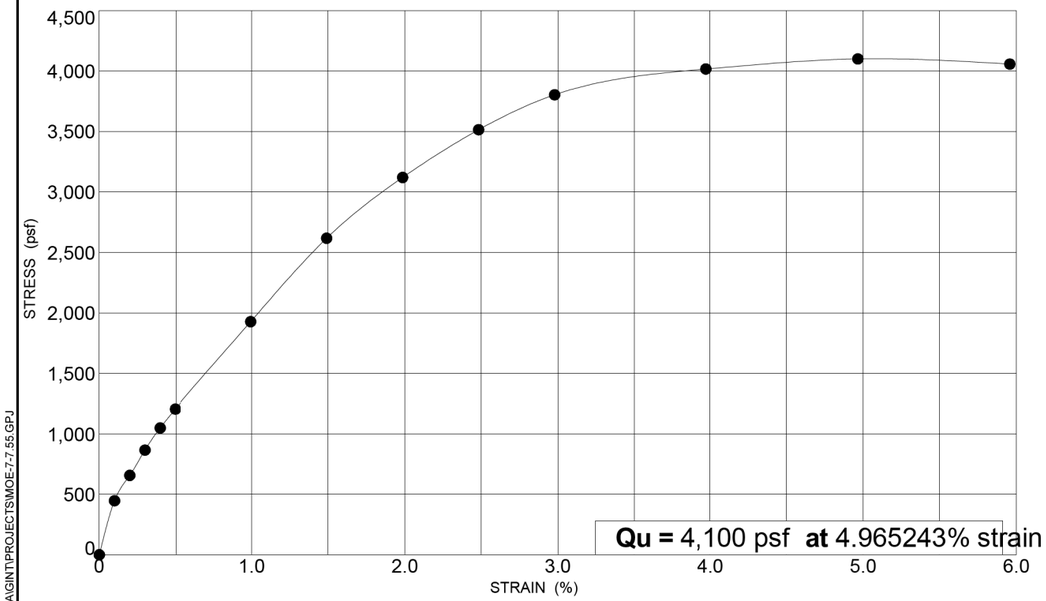
UNCONFINED COMPRESSION TEST
AASHTO T - 208

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT MOE-7-7.55 **PID**
OGE NUMBER MOE-7-7.55 **PROJECT TYPE** STRUCTURE FOUNDATION

SAMPLE IDENTIFICATION

BORING ID: B-004-0-18 SAMPLE ID: ST-5
STATION: NOT RECORDED DEPTH: 11.0 - 13.0 feet



SPECIMEN FAILURE SKETCHES OR PHOTOGRAPHS


BEFORE FAILURE


AFTER FAILURE

SPECIMEN DETAILS

HEIGHT: 6.042 inches
DIAMETER: 2.845 inches
WET UNIT WT: 130.90 pcf
DRY UNIT WT: 112.17 pcf

TESTED BY: MOH 7/30/2018

CLASSIFICATION RESULTS

GRADATION (%)				
GR	CS	FS	SI	CL
8	17	8	24	43

ATTERBERG LIMITS			MOISTURE
LL	PL	PI	WC
35	22	13	17

ODOT CLASS: A-6a HP (tsf): 4.0
DESCRIPTION: SANDY LEAN CLAY

OHDOT UNCONFINED COMPRESSION - OH DOT GDT - 8/6/18 10:20 - \\DHDCINCFS01\DALMAIGINT\PROJECTS\MOE-7-7.55.GPJ

DRAWN CLW CHECKED DMV

SOIL PROFILE - LANDSLIDE
COMPRESSIVE STRENGTH TEST RESULTS

MOE-7-7.55

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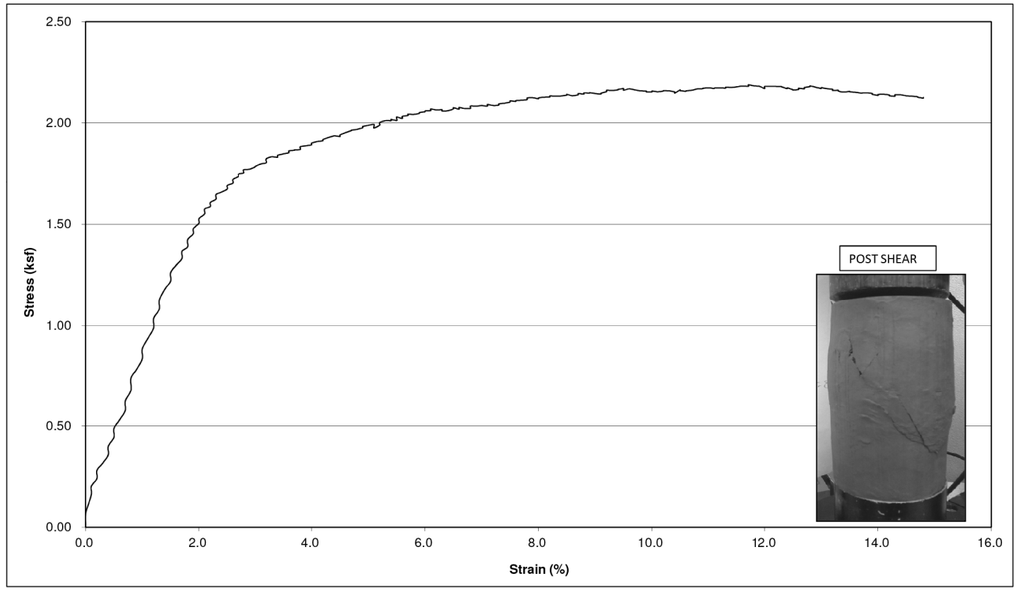
Unconfined Compression Test Results ASTM D 2166, D 5102	CTL ENGINEERING, INC. 2860 Fisher Road Columbus, Ohio 43204
Sample ID: B-004-1-20, ST-8, 10.5'-12.5'	
Avg. Sample Height (in.): 5.79	Client: HDR Engineering, Inc.
Avg. Sample Diameter (in.): 2.88	Project: MOE-7-7.55 (10-K)
Height-to-diameter ratio: 2.02	Location: Monroe County, Ohio
Ultimate Strength (ksf): 2.19	Project No. 20050114COL
Shear Strength (Ksf): 1.09	Lab Code No. N/A
Avg. Rate of Strain to Failure(%): 1.93	Date Tested: 8/31/2020
Strain at Failure (%): 11.70	Reviewed by: SM
Initial Dry Density (pcf): 97.57	
Moisture Content (%): 27.1 (Obtained Post Shear)	
Visual Description: Brown Silt and Clay (A-6a), moist	**ASTM D 4318** / **ASTM D 6913**
Degree of Saturation: NA	LL: 36 / Gravel (%): 0 / Silt(%): 54
Sensitivity: NA	PL: 23 / Sand(%): 11 / Clay(%): 35
Failure Type: Diagonal Shear	



CTL ENGINEERING INC.

SOIL PROFILE - LANDSLIDE

COMPRESSIVE STRENGTH TEST RESULTS

MOE-7-7.55

23 / 34

DRAWN CLW CHECKED DMV

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CONSOLIDATED UNDRAINED TRIAXIAL TEST ON COHESIVE SOILS
AASHTO T 297 & ASTM D4767

CTL ENGINEERING, INC.
2860 Fisher Road Columbus, Ohio 43204

Client: HDR Engineering, Inc
PID NO. 108676
Project: MOE-7-7.55 (Task 10-K)
Location: Monroe County, Ohio
Project No. 20050114COL
County, Rt. & Sec.: MOE-7-7.55
Station & Offset: NA
Sample ID: B-002-1-20, ST-10, 13.5'-15.5'
Lab Code No. 20050114COL
Reviewed by: SM

Sample Type	Shelby Tube	
Date Set-up:	8/25/2020	8/25/2020
Date Sheared:	9/1/2020	9/1/2020
Avg. Sample Height (in.):	5.7957	5.7757
Avg. Sample Diameter (in.):	2.8500	2.8500
Height-to-diameter ratio:	2.03	2.03
Wet Density (pcf):	125.2	124.6
Dry Density (pcf):	103.0	103.3
Void Ratio:	0.636	0.631
Specific Gravity (assumed):	2.7	2.7
Moisture Content (%):	21.6	20.6
Cross Sectional Area (ft^2):	0.044	0.044
Volume (ft^3):	0.02	0.02
Confining Pressure (psf):	1872	3744
Rate of Axial Strain (%/min):	0.2071	0.2078
Compressive Strength (psf):	4699	5708
Minor Principal Stress at Failure (psf):	1872	3744
Major Principal Stress at Failure (psf):	6571	9452
Failure Criterian (%):	Deviator Stress at 15% Axial Strain	
β:	0.97	0.96
Specimen Saturation:	Wet Method	

POST SHEAR
1872 psf

POST SHEAR
3744 psf

Grading (ASTM D422)

% Agg:	1
% Sand.:	1
% Silt:	52
% Clay:	46

Atterberg Limits (ASTM D 4318)

L.L.:	50
P.L.:	26
P.I.:	24

Visual Description: Brown, Clay, "and" Silt, trace sand, trace gravel, damp

DRAWN CLW | CHECKED DMV

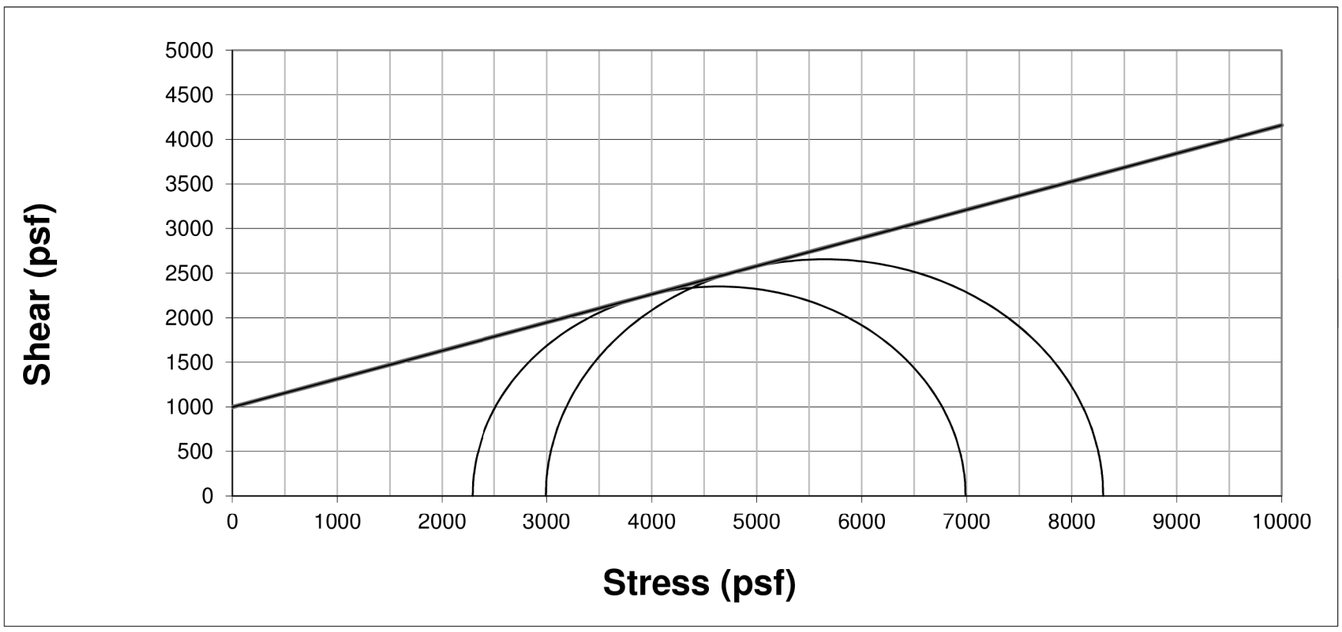
SOIL PROFILE - LANDSLIDE

COMPRESSIVE STRENGTH TEST RESULTS

MOE-7-7.55

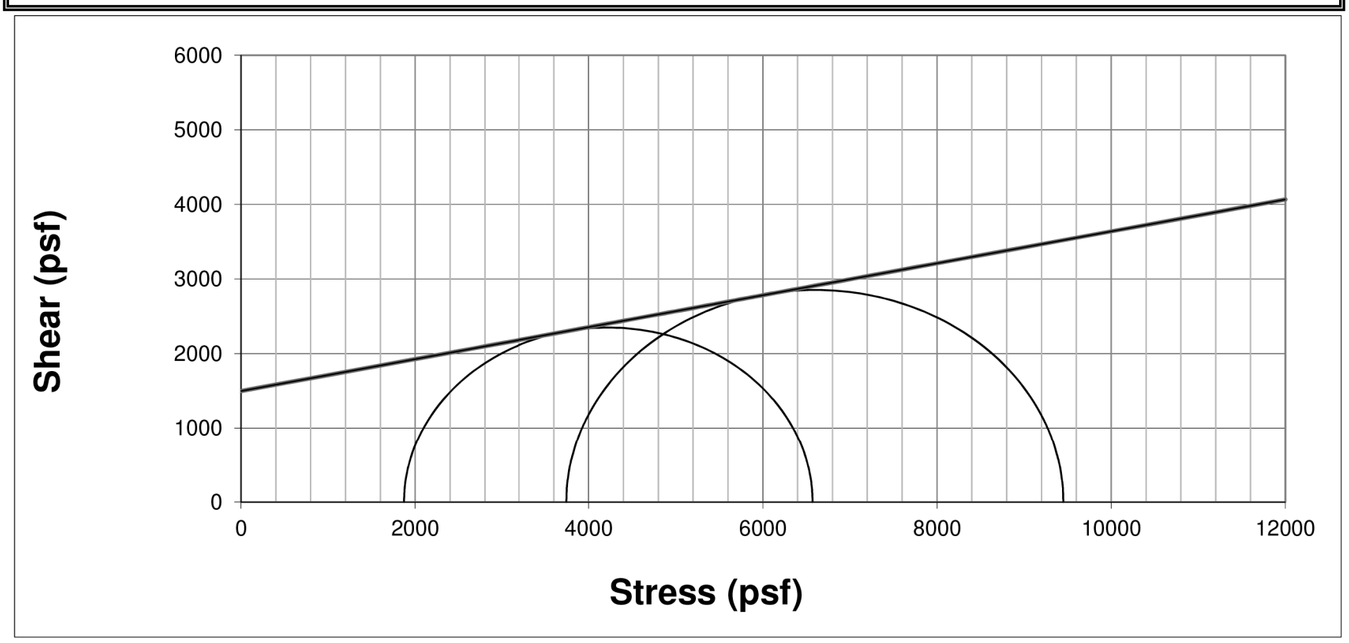
Mohr Circle Effective Stress

CLIENT:	HDR Engineering, Inc	Sample ID:	B-002-1-20, ST-10, 13.5'-15.5'	
PROJECT:	MOE-7-7.55 (Task 10-K)	Confining Pressure (psf):	1872	3744
LOCATION:	Monroe County, Ohio	Cohesion(psf):	1000	
PROJECT #:	20050114COL	Angle of Friction(°):	17	



Mohr Circle Total Stress

CLIENT:	HDR Engineering, Inc	Sample ID:	B-002-1-20, ST-10, 13.5'-15.5'	
PROJECT:	MOE-7-7.55 (Task 10-K)	Confining Pressure (psf):	1872	3744
LOCATION:	Monroe County, Ohio	Cohesion(psf):	1500	
PROJECT #:	20050114COL	Angle of Friction(°):	12	



CONSOLIDATED UNDRAINED TRIAXIAL TEST ON COHESIVE SOILS
AASHTO T 297 & ASTM D4767

CTL ENGINEERING, INC.
2860 Fisher Road Columbus, Ohio 43204

Client: HDR Engineering, Inc
PID NO. 108676
Project: MOE-7-7.55 (10-K)
Location: Monroe County, Ohio
Project No. 20050114COL
County, Rt. & Sec.: MOE-7-7.55
Station and Offset: NA
Sample ID: B-002-1-20, ST-18, 26'-28'
Lab Code No. NA
Reviewed by: SM

Sample Type	Shelby Tube		
Date Set-up:	8/21/2020	8/21/2020	8/21/2020
Date Sheared:	8/24/2020	8/24/2020	8/25/2020
Avg. Sample Height (in.):	5.8420	5.8333	5.7993
Avg. Sample Diameter (in.):	2.8750	2.8750	2.8750
Height-to-diameter ratio:	2.03	2.03	2.02
Wet Density (pcf):	122.1	124.5	125.3
Dry Density (pcf):	98.2	99.7	100.8
Void Ratio:	0.747	0.721	0.702
Specific Gravity (assumed):	2.75	2.75	2.75
Moisture Content (%):	24.3	24.9	24.3
Cross Sectional Area (ft^2):	0.045	0.045	0.045
Volume (ft^3):	0.02	0.02	0.02
Confining Pressure (psf):	1584	3312	6624
Rate of Axial Strain (%/min):	0.2054	0.2057	0.2069
Compressive Strength (psf):	2414	3338	4904
Minor Principal Stress at Failure (psf):	1584	3312	6624
Major Principal Stress at Failure (psf):	3998	6650	11528
Failure Criterian (%):	Deviator Stress @ 15% Axial Strain		
β:	0.99	0.95	0.97
Specimen Saturation:	Wet Method		

Grading (ASTM D422)

% Agg:	0
% Sand.:	25
% Silt:	47
% Clay:	28

Atterberg Limits (ASTM D 4318)

L.L.:	29
P.L.:	19
P.I.:	10

Visual Description: Brown Sandy Silt (A-4a), Some Clay,

POST SHEAR
1584 psf

POST SHEAR
3312 psf

POST SHEAR
6624 psf

DRAWN CLW CHECKED DMV

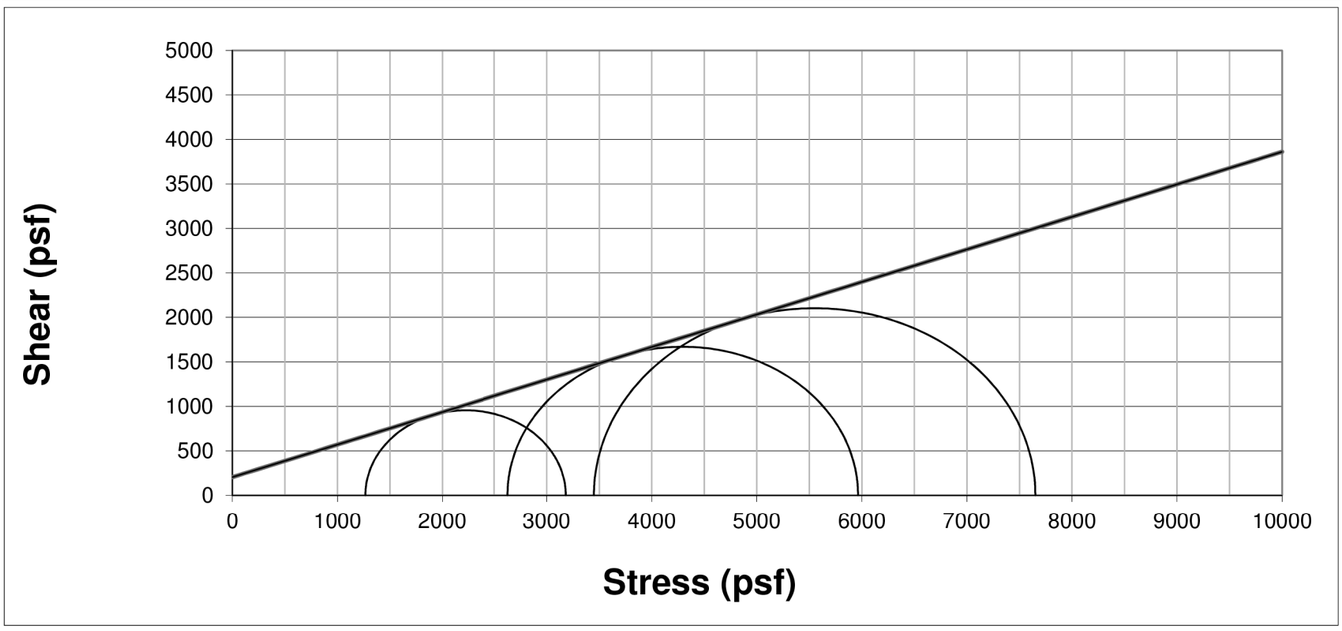
SOIL PROFILE - LANDSLIDE

COMPRESSIVE STRENGTH TEST RESULTS

MOE-7-7.55

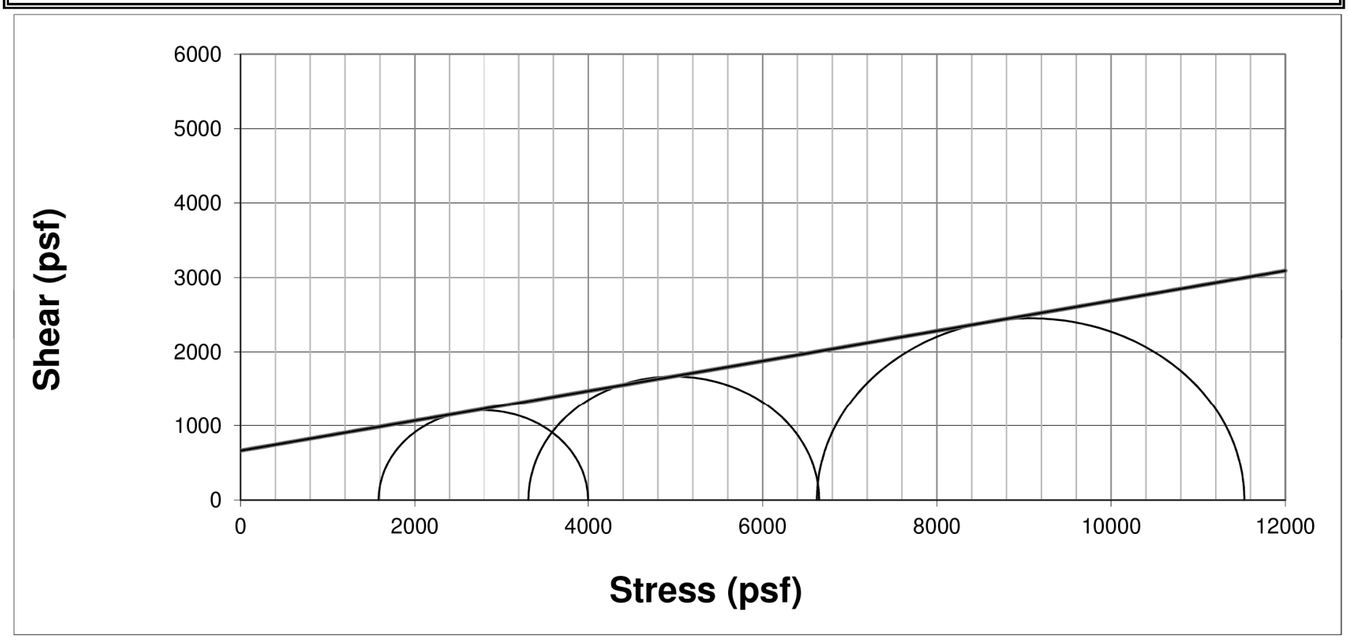
Mohr Circle Effective Stress

CLIENT:	HDR Engineering, Inc	Sample ID:	B-002-1-20, ST-18, 26'-28'		
PROJECT:	MOE-7-07.55 (Task 10-K)	Confining Pressure (psf):	1584	3312	6624
LOCATION:	Monroe County, Ohio	Cohesion(psf):	200		
PROJECT #:	20050114COL	Angle of Friction(°):	20		



Mohr Circle Total Stress

CLIENT:	HDR Engineering, Inc	Sample ID:	B-002-1-20, ST-18, 26'-28'		
PROJECT:	MOE-7-07.55 (Task 10-K)	Confining Pressure (psf):	1584	3312	6624
LOCATION:	Monroe County, Ohio	Cohesion(psf):	660		
PROJECT #:	20050114COL	Angle of Friction(°):	11		



CONSOLIDATED UNDRAINED TRIAXIAL TEST ON COHESIVE SOILS
AASHTO T 297 & ASTM D4767

CTL ENGINEERING, INC.
2860 Fisher Road Columbus, Ohio 43204

Client: HDR Engineering, Inc
PID NO. 108676
Project: MOE-7-7.55 (10-K)
Location: Monroe County, Ohio
Project No. 20050114COL
County, Rt. & Sec.: MOE-7-7.55
Station & Offset: NA
Sample ID: B-002-2-20, ST-5, 10'-12'
Lab Code No. NA
Reviewed by: SM

Sample Type	Shelby Tube		
Date Set-up:	8/28/2020	8/28/2020	8/28/2020
Date Sheared:	9/1/2020	9/1/2020	9/1/2020
Avg. Sample Height (in.):	5.7517	5.7943	5.7023
Avg. Sample Diameter (in.):	2.8750	2.8750	2.8750
Height-to-diameter ratio:	2.00	2.02	1.98
Wet Density (pcf):	126.9	124.5	126.6
Dry Density (pcf):	103.0	101.2	102.7
Void Ratio:	0.666	0.696	0.671
Specific Gravity (assumed):	2.75	2.75	2.75
Moisture Content (%):	23.2	23.1	23.2
Cross Sectional Area (ft^2):	0.045	0.045	0.045
Volume (ft^3):	0.02	0.02	0.02
Confining Pressure (psf):	720	1440	2880
Rate of Axial Strain (%/min):	0.2086	0.2071	0.2104
Compressive Strength (psf):	2805	3206	3901
Minor Principal Stress at Failure (psf):	720	1440	2880
Major Principal Stress at Failure (psf):	3525	4646	6781
Failure Criterian (%):	Deviator Stress @ 15 % Axial Strain		
β:	0.99	0.98	0.97
Specimen Saturation:	Wet Method		

Grading (ASTM D422)

% Agg:	0
% Sand.:	36
% Silt:	43
% Clay:	21

Atterberg Limits (ASTM D 4318)

L.L.:	29
P.L.:	21
P.I.:	8

Visual Description: Brown Sandy Silt (A-4a), Some Clay, Moist

POST SHEAR
720 psf

POST SHEAR
1440 psf

POST SHEAR
2880 psf

SOIL PROFILE - LANDSLIDE
COMPRESSIVE STRENGTH TEST RESULTS

MOE-7-7.55

28/34

DRAWN CLW
CHECKED DMV

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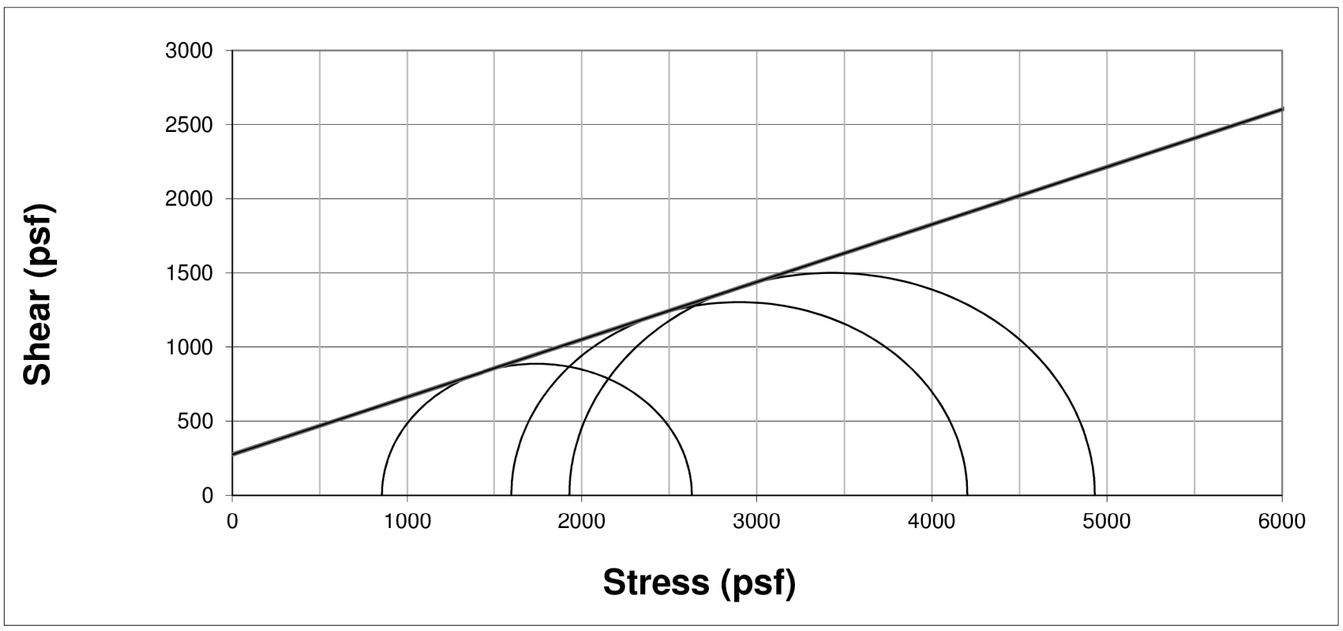
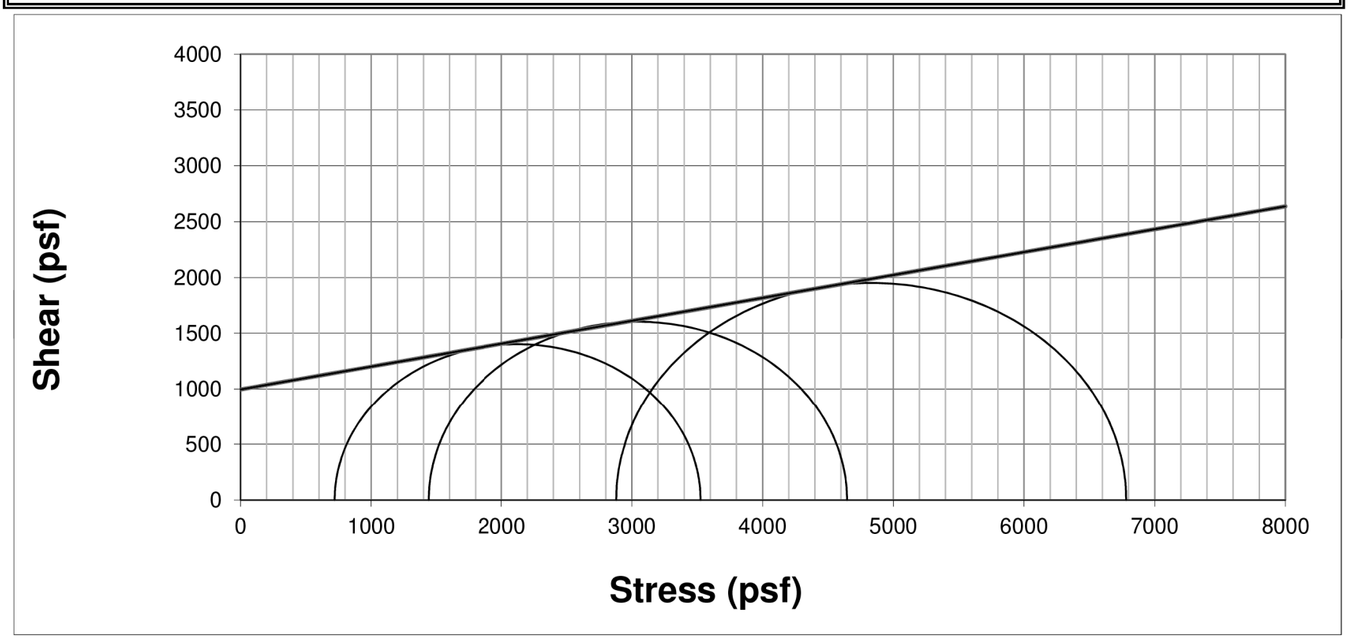
Mohr Circle Effective Stress

CLIENT:	HDR Engineering, Inc	Sample ID:	B-002-2-20, ST-5, 10'-12'		
PROJECT:	MOE-7-07.55 (Task 10-K)	Confining Pressure (psf):	720	1440	2880
LOCATION:	Monroe County, Ohio	Cohesion(psf):	275		
PROJECT #:	20050114COL	Angle of Friction(°):	21		



Mohr Circle Total Stress

CLIENT:	HDR Engineering, Inc	Sample ID:	B-002-2-20, ST-5, 10'-12'		
PROJECT:	MOE-7-07.55 (Task 10-K)	Confining Pressure (psf):	720	1440	2880
LOCATION:	Monroe County, Ohio	Cohesion(psf):	1000		
PROJECT #:	20050114COL	Angle of Friction(°):	11.5		



DHDC
Engineering Consulting Services, Inc.

2390 Advanced Business Center Drive
Columbus, Ohio 43228
Office: 614.527.7656
ww.dhdcinc.com

Project: MOE-7-7.55
SR-7 Landslide Stabilization

Unconfined Compressive Strength (ASTM D7012)

B-001-0-18; NQ-3; 71.3' – 71.8'
Average Diameter: 1.819"
Average Height: 4.143"
Bulk Density: 154.2 pcf
Unconfined Compressive Strength: 156 psi and 666 psi (see note below)

Note: L/D ratio ~ 2.3

DHDC
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Columbus, Ohio 43228
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MOE-7-7.55

PROJECT NAME: SR-7 Landslide Stabilization

Unconfined Compressive Strength (ASTM D7012)

B-002-0-18; NQ-2; 68.5'-68.9'
Average Diameter: 1.797"
Average Height: 3.651"
Wet Density: 162.7 pcf
Dry Density: 156.4 pcf
Unconfined Compressive Strength: 860 psi

Note: L/D ratio ~ 2.03

DRAWN CLW | CHECKED DMV

SOIL PROFILE - LANDSLIDE COMPRESSIVE STRENGTH TEST RESULTS

MOE-7-7.55

PROJECT NO:	20050114COL
DATE:	9/3/2020

UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE - ASTM D 7012

Method C

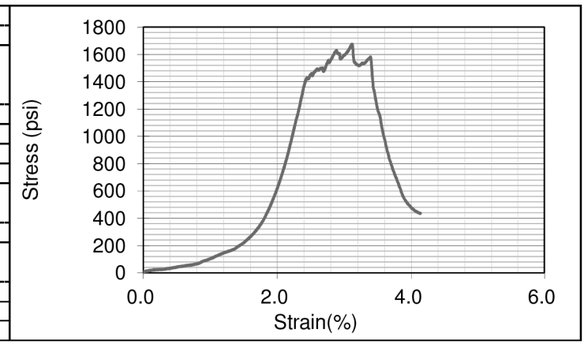
BORING NUMBER	B-002-1-20	TOP DEPTH(FT)	58.5	BOTTOM DEPTH(FT)	58.9
SAMPLE NUMBER	R-1	DISTRICT	10	PID NO.	108676
COUNTY	MOE	ROUTE	7	SECTION	7.55 (10-K)

FORMATION	Pennsylvanian Age
DESCRIPTION	Siltstone, Gray, Moderately Weathered,Slightly Strong
MOISTURE CONDITION	As Received

MEASUREMENT	LENGTH(INCHES)	DIAMETER(INCHES)
1	4.115	1.982
2	4.114	1.993
3	4.111	1.982
AVERAGE	4.113	1.986

LENGTH/DIAMETER	2.1
CORRECTION FACTOR	1
AREA(IN^2)	3.1
MASS (GRAMS)	546.2
UNIT WEIGHT(LBS/FT^3)	163.4

RATE OF LOADING (in/min)
0.17
COMPRESSIVE STRENGTH (PSI)
1,675
Equip. ID - 68897
NON-CONFORMANCES - None
TIME OF TEST (MINUTES)
1:00
LOADING DIRECTION
PERP. TO BEDDING
TECHNICIAN - MW
TEMPERATURE - Room



BEFORE TESTING

AFTER TESTING

Physical Appearance after Test - Sample sheared through middle portion - No signs of cracking, spalling or shearing at the platen-specimen interface

PROJECT NO:	20050114COL
DATE:	9/3/2020

UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE - ASTM D 7012

Method C

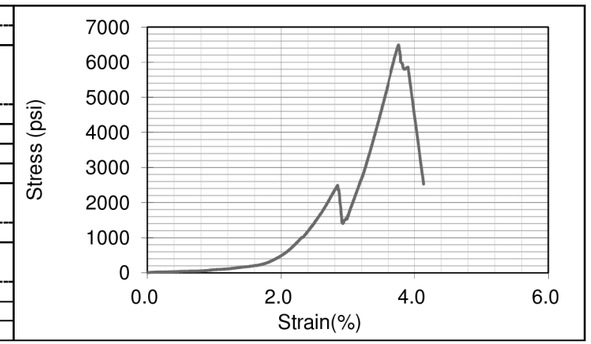
BORING NUMBER	B-002-2-20	TOP DEPTH(FT)	42.9	BOTTOM DEPTH(FT)	43.3
SAMPLE NUMBER	R-2	DISTRICT	10	PID NO.	108676
COUNTY	MOE	ROUTE	7	SECTION	7.55 (10-K)

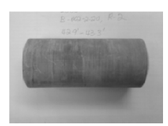
FORMATION	Pennsylvanian Age
DESCRIPTION	Siltstone, Gray, Moderately Weathered,Moderately Strong
MOISTURE CONDITION	As Received

MEASUREMENT	LENGTH(INCHES)	DIAMETER(INCHES)
1	4.085	1.988
2	4.114	1.974
3	4.108	1.991
AVERAGE	4.102	1.984

LENGTH/DIAMETER	2.1
CORRECTION FACTOR	1
AREA(IN^2)	3.1
MASS (GRAMS)	545.4
UNIT WEIGHT(LBS/FT^3)	163.8

RATE OF LOADING (in/min)
0.14
COMPRESSIVE STRENGTH (PSI)
6,495
Equip. ID - 68897
NON-CONFORMANCES - None
TIME OF TEST (MINUTES)
3:07
LOADING DIRECTION
PERP. TO BEDDING
TECHNICIAN - MW
TEMPERATURE - Room





BEFORE TESTING

AFTER TESTING

Physical Appearance after Test - Sample sheared through middle portion - No signs of cracking, spalling or shearing at the platen-specimen interface

DRAWN CLW | CHECKED DMV

SOIL PROFILE - LANDSLIDE

COMPRESSIVE STRENGTH TEST RESULTS

MOE-7-7.55

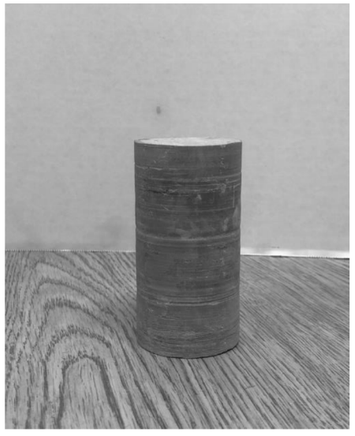
DHDC
Engineering Consulting Services, Inc.

2390 Advanced Business Center Drive
Columbus, Ohio 43228
Office: 614.527.7656
ww.dhdcinc.com

MOE-7-7.55

PROJECT NAME: SR-7 Landslide Stabilization

Unconfined Compressive Strength (ASTM D7012)



B-003-0-18; NQ-4; 75.9'-76.5'
Average Diameter: 1.796"
Average Height: 3.779"
Wet Density: 166.1 pcf
Dry Density: 159.7 pcf
Unconfined Compressive Strength: 2,255 psi

Note: L/D ratio ~ 2.1

DHDC
Engineering Consulting Services, Inc.

2390 Advanced Business Center Drive
Columbus, Ohio 43228
Office: 614.527.7656
ww.dhdcinc.com

Project Name: MOE-7-7.55

Unconfined Compressive Strength (ASTM D7012)

B-004-0-18; NQ-3; 83.0'- 83.5'
Average Diameter: 1.772"
Average Height: 3.809"
Wet Density: 164.3 pcf
Dry Density: 157.9 pcf
Unconfined Compressive Strength: 343 psi

Note: L/D ratio ~ 2.1

DRAWN CLW | CHECKED DMV

SOIL PROFILE - LANDSLIDE
COMPRESSIVE STRENGTH TEST RESULTS

MOE-7-7.55

PROJECT NO:	20050114COL
DATE:	9/3/2020

UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE - ASTM D 7012

Method C

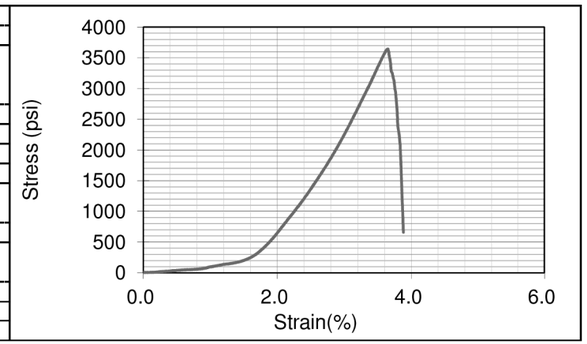
BORING NUMBER	B-004-1-20	TOP DEPTH(FT)	44.1	BOTTOM DEPTH(FT)	44.5
SAMPLE NUMBER	R-1	DISTRICT	10	PID NO.	108676
COUNTY	MOE	ROUTE	7	SECTION	7.55 (10-K)

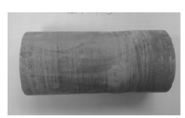
FORMATION	Pennsylvanian Age
DESCRIPTION	Siltstone, Gray, Highly Weathered,Moderatly Strong
MOISTURE CONDITION	As Received

MEASUREMENT	LENGTH(INCHES)	DIAMETER(INCHES)
1	4.085	1.988
2	4.085	1.980
3	4.085	1.986
AVERAGE	4.085	1.985

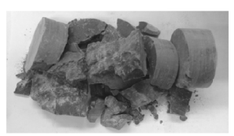
LENGTH/DIAMETER	2.1
CORRECTION FACTOR	1
AREA(IN^2)	3.1
MASS (GRAMS)	543.1
UNIT WEIGHT(LBS/FT^3)	163.7

RATE OF LOADING (in/min)
0.18
COMPRESSIVE STRENGTH (PSI)
3,644
Equip. ID - 68897
NON-CONFORMANCES - None
TIME OF TEST (MINUTES)
22:19
LOADING DIRECTION
PERP. TO BEDDING
TECHNICIAN - MW
TEMPERATURE - Room





BEFORE TESTING



AFTER TESTING

Physical Appearance after Test - Sample sheared through middle portion - No signs of cracking, spalling or shearing at the platen-specimen interface

PROJECT NO:	20050114COL
DATE:	9/3/2020

UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE - ASTM D 7012

Method C

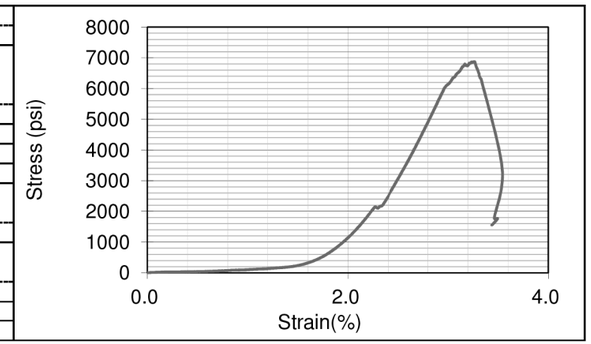
BORING NUMBER	B-004-2-20	TOP DEPTH(FT)	35.2	BOTTOM DEPTH(FT)	35.7
SAMPLE NUMBER	R-2	DISTRICT	10	PID NO.	108676
COUNTY	MOE	ROUTE	7	SECTION	7.55 (10-K)

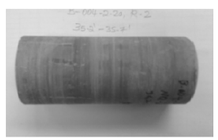
FORMATION	Pennsylvanian Age
DESCRIPTION	Siltstone, Gray, Moderately Weathered,Moderatly Strong
MOISTURE CONDITION	As Received

MEASUREMENT	LENGTH(INCHES)	DIAMETER(INCHES)
1	4.105	1.993
2	4.102	1.989
3	4.101	1.978
AVERAGE	4.103	1.987

LENGTH/DIAMETER	2.1
CORRECTION FACTOR	1
AREA(IN^2)	3.1
MASS (GRAMS)	546.0
UNIT WEIGHT(LBS/FT^3)	163.6

RATE OF LOADING (in/min)
0.20
COMPRESSIVE STRENGTH (PSI)
6,872
Equip. ID - 68897
NON-CONFORMANCES - None
TIME OF TEST (MINUTES)
19:55
LOADING DIRECTION
PERP. TO BEDDING
TECHNICIAN - MW
TEMPERATURE - Room





BEFORE TESTING

AFTER TESTING

Physical Appearance after Test - Sample sheared through middle portion - No signs of cracking, spalling or shearing at the platen-specimen interface

DRAWN CLW | CHECKED DMV

SOIL PROFILE - LANDSLIDE

COMPRESSIVE STRENGTH TEST RESULTS

MOE-7-7.55

PROJECT NO:	20050114COL
DATE:	9/3/2020

UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE - ASTM D 7012

Method C

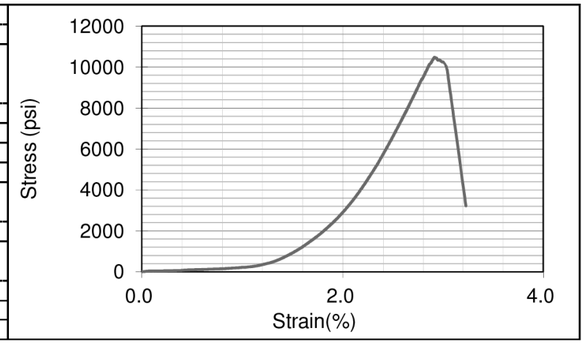
BORING NUMBER	B-004-2-20	TOP DEPTH(FT)	42.4	BOTTOM DEPTH(FT)	43.0
SAMPLE NUMBER	R-3	DISTRICT	10	PID NO.	108676
COUNTY	MOE	ROUTE	7	SECTION	7.55 (10-K)

FORMATION	Pennsylvanian Age
DESCRIPTION	Sandstone, Gray, Slightly Weathered, Strong
MOISTURE CONDITION	As Received

MEASUREMENT	LENGTH(INCHES)	DIAMETER(INCHES)
1	4.091	1.990
2	4.096	1.991
3	4.093	1.990
AVERAGE	4.093	1.990

LENGTH/DIAMETER	2.1
CORRECTION FACTOR	1
AREA(IN^2)	3.1
MASS (GRAMS)	540.4
UNIT WEIGHT(LBS/FT^3)	161.6

RATE OF LOADING (in/min)
0.13
COMPRESSIVE STRENGTH (PSI)
10,479
Equip. ID - 68897
NON-CONFORMANCES - None
TIME OF TEST (MINUTES)
23:45
LOADING DIRECTION
PERP. TO BEDDING
TECHNICIAN - MW
TEMPERATURE - Room



BEFORE TESTING

AFTER TESTING

Physical Appearance after Test - Sample sheared through middle portion - No signs of cracking, spalling or shearing at the platen-specimen interface

DRAWN CLW | CHECKED DMV

SOIL PROFILE - LANDSLIDE

COMPRESSIVE STRENGTH TEST RESULTS

MOE-7-7.55

34/34