

PROJECT DESCRIPTION

REHABILITATION OF BRIDGE NO. JAC-32-1712 BY REPAIRING MSE WALLS. IMPROVEMENT OF 0.02 MILES OF S.R. 327 BY REPLACEMENT OF EXISTING TWIN PIPES WITH A PRECAST BOX CULVERT AND FULL HEIGHT HEADWALLS AND THE NECESSARY ROADWAY APPROACH WORK ALONG S.R. 327. THIS GEOTECHNICAL EXPLORATION WILL FOCUS ON THE CULVERT REPLACEMENT OF BRIDGE NUMBER JAC-327-1358.

HISTORIC RECORDS

NO HISTORICAL GEOTECHNICAL RECORDS WERE FOUND FOR THIS PROJECT.

GEOLOGY

THE PROJECT IS LOCATED WITHIN THE NON-GLACIATED IRONTON PLATEAU PHYSIOGRAPHIC REGION OF THE LARGER ALLEGHENY PLATEAUS SECTION. THIS AREA IS CHARACTERIZED BY MODERATELY HIGH RELIEF. THIN RESIDUAL SOILS ARE PRESENT ALONG THE RIDGE TOPS AND HILLSIDES WHILE THICKER COLLUVIAL SOILS ARE LOCATED AT THE BASE OF THE HILLS. LACUSTRINE DEPOSITS WITH OUTWASH SOILS ARE PRESENT ALONG MAJOR STREAM VALLEYS. THE OHIO DEPARTMENT OF NATURAL RESOURCES (ODNR) INTERACTIVE GEOLOGIC MAP INDICATES THE OVERBURDEN COLLUVIUM IN THIS AREA IS UNDERLAIN BY PENNSYLVANIAN-AGED SHALE, SILTSTONE, SANDSTONE, CONGLOMERATE, AND SUBORDINATE AMOUNTS OF LIMESTONE, CLAY, FLINT, AND COAL OF ALLEGHENY AND POTTSVILLE GROUPS, UNDIVIDED. THIS AREA IS KNOWN FOR HAVING RAPID HORIZONTAL AND VERTICAL CHANGES OF ROCK TYPES.

RECONNAISSANCE

FIELD RECONNAISSANCE WAS COMPLETED BY DISTRICT PERSONNEL ON FEBRUARY 22, 2023. THE EXISTING PAVEMENT WAS NOTED AS BEING IN GOOD CONDITION WITH THE ROADWAY CROSSING AN UNNAMED TRIBUTARY OF LITTLE RACCOON CREEK. THE EXISTING STRUCTURE THAT CARRIES S.R. 327 OVER THE TRIBUTARY IS A TWIN METAL CORRUGATED PIPE AND WAS NOTED AS BEING IN POOR CONDITION DUE TO AGE. THE INLET HEADWALL HAD SPALLING CONCRETE WITH DEBRIS AND SEDIMENT BUILDUP BETWEEN AND INSIDE THE STRUCTURES. THE SEDIMENT CONTINUED THROUGH THE STRUCTURE TO THE OUTLET. THERE WERE NO SIGNS OF CURRENT EMBANKMENT INSTABILITY. THE STREAM CHANNEL WAS WELL VEGETATED WITH BEDROCK NOTED IN THE STREAMBED AT THE OUTLET. THE ADJACENT LAND USAGE WAS NOTED AS BEING WOODED.

SUBSURFACE EXPLORATION

TWO (2) BORINGS, B-001-0-23 AND B-002-0-23, WERE COMPLETED AS PART OF THE SUBSURFACE EXPLORATION ON APRIL 5, 2023. DRILLING WAS COMPLETED WITH A TRUCK MOUNTED CME 55 ROTARY DRILL RIG UTILIZING 3.25-INCH I.D. HOLLOW STEM AUGERS. DISTURBED SAMPLES WERE COLLECTED IN ACCORDANCE WITH THE STANDARD PENETRATION TEST (AASHTO T206) AT 2.5-FOOT INTERVALS. THE HAMMER SYSTEM USED WAS CALIBRATED ON APRIL 18, 2022, WITH AN AVERAGE DRILL ROD ENERGY RATIO (ER) OF 87%. EACH BORING WAS ADVANCED INTO BEDROCK AND SAMPLED (AASHTO T225) USING AN N SERIES WIRELINE CORE BARREL, WATER METHOD.

EXPLORATION FINDINGS

BOTH BORINGS WERE COMPLETED WITHIN THE EXISTING ROADWAY, NEAR THE PROPOSED INLET AND OUTLET, ENCOUNTERING 12-INCHES OF ASPHALT. B-001-0-23 ENCOUNTERED MEDIUM STIFF TO STIFF SANDY SILT (A-4a) IN MOIST CONDITION TO ELEVATION (EL.) 785.9 FEET (FT) UNDERLAIN BY LOOSE COARSE AND FINE SAND (A-3a) IN WET CONDITION TO TOP OF BEDROCK. BENEATH THE SURFACE MATERIAL B-002-0-23 ENCOUNTERED LOOSE STONE FRAGMENTS WITH SAND (A-1-b) IN DAMP MOISTURE CONDITION TO EL. 789.6 FT UNDERLAIN BY MEDIUM STIFF SANDY SILT (A-4a) AND SOFT SILT (A-4b) IN DAMP TO MOIST CONDITION TO TOP OF BEDROCK.

SANDSTONE BEDROCK WAS ENCOUNTERED IN B-001-0-23 AND B-002-0-23 AT EL. 783.4 AND 784.6 FT, RESPECTIVELY, WHICH WAS INITIALLY SPLIT SPOON SAMPLED PRIOR TO CORING OPERATIONS. THIS SANDSTONE WAS DESCRIBED AS MODERATELY TO HIGHLY WEATHERED AND WEAK TO SLIGHTLY STRONG. B-001-0-23 ENCOUNTERED SHALE AT EL. 780.3 FT THAT EXTENDED TO EL. 776.9 FT WHERE MODERATELY WEATHERED AND MODERATELY STRONG SANDSTONE WAS ENCOUNTERED. ANOTHER UNIT OF SHALE WAS ENCOUNTERED IN B-001-0-23 AT EL. 775.9 FT. THE SHALE UNITS IN B-001-0-23 WERE DESCRIBED AS MODERATELY TO HIGHLY WEATHERED AND WEAK. B-001-0-23 ENCOUNTERED SILTSTONE AT EL. 775.2 FT THAT WAS MODERATELY WEATHERED AND WEAK INTO WHICH IT WAS TERMINATED.

THE INITIAL SANDSTONE IN B-002-0-23 EXTENDED TO EL. 775.5 FT WHERE HIGHLY WEATHERED AND SLIGHTLY STRONG SHALE WAS ENCOUNTERED EXTENDING TO EL. 774.6 FT UNDERLAIN BY HIGHLY WEATHERED AND VERY WEAK SANDSTONE INTO WHICH IT WAS TERMINATED. STRENGTH TESTING WAS COMPLETED ON REPRESENTATIVE SANDSTONE CORE SAMPLES WITH COMPRESSIVE STRENGTH TEST RESULTS RANGING FROM 37 TO 6,068 PSI AND POINT LOAD STRENGTH INDEX RESULT OF 1,459 PSI. THESE RESULTS ARE PRESENTED IN TABULAR FORM, SEE BEDROCK TEST SUMMARY TABLE.

COAL OR COAL STRINGERS WERE NOTED IN B-001-0-23 AND B-002-0-23 AT EL. 780.9 AND 780.4 FT, RESPECTIVELY.

FREE WATER WAS NOTED IN B-001-0-23 AT EL. 784.4 FEET. B-002-0-23 WAS NOTED AS DRY PRIOR TO CORING ACTIVITIES.

SPECIFICATIONS

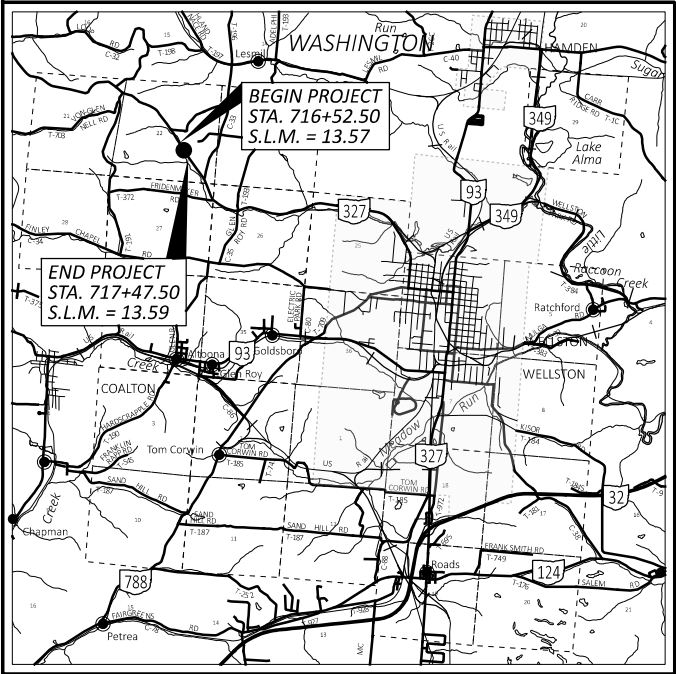
THIS GEOTECHNICAL EXPLORATION WAS PERFORMED IN ACCORDANCE WITH THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, OFFICE OF GEOTECHNICAL ENGINEERING, SPECIFICATIONS FOR GEOTECHNICAL EXPLORATIONS, DATED JANUARY 2023.

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.

LEGEND

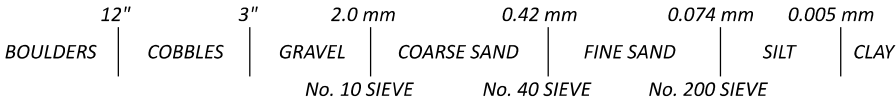
DESCRIPTION	ODOT CLASS	CLASSIFIED MECH./VISUAL	
STONE FRAGMENTS WITH SAND	A-1-b	1	-
COARSE AND FINE SAND	A-3a	1	-
SANDY SILT	A-4a	2	1
SILT	A-4b	1	-
	TOTAL	5	1
SANDSTONE	VISUAL		
SHALE	VISUAL		
SILTSTONE	VISUAL		
PAVEMENT = X = APPROXIMATE THICKNESS	VISUAL		
BORING LOCATION - PLAN VIEW.			
DRIVE SAMPLE AND 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/D"	NUMBER OF BLOWS FOR STANDARD PENETRATION TEST (SPT): X/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.		
⊕	INDICATES A NON-PLASTIC MATERIAL WITH A MOISTURE CONTENT GREATER THAN 25 % OR GREATER THAN 19 % WITH A WET APPEARANCE.		
γ	INDICATES UNIT WEIGHT OF ROCK.		
LOI	INDICATES ORGANIC CONTENT BY LOSS ON IGNITION, AASHTO T267.		
NP	INDICATES A NON-PLASTIC SAMPLE.		
NQ	"N" SERIES ROCK CORE BARREL OF "Q" WIRELINE BIT SIZE.		
Qu	INDICATES UNCONFINED COMPRESSION TEST, ASTM D7012.		
Sc	INDICATES POINT LOAD STRENGTH VALUE, ASTM D5731.		
SS	INDICATES A SPLIT SPOON SAMPLE.		
TR	INDICATES TOP OF ROCK ELEVATION.		



LOCATION MAP
SCALE IN MILES



PARTICLE SIZE DEFINITIONS



BEDROCK TEST SUMMARY					
EXPLOR. ID	SAMPLE ELEVATION	SAMPLE DEPTH	Sc (PSI)	Qu (PSI)	LITHOLOGY
B-001-0-23	781.8' - 780.5'	10.1' - 11.4'	1,459	-	SANDSTONE
	776.6' - 776.1'	15.3' - 15.8'	-	6,068	SANDSTONE
B-002-0-23	782.4' - 782.0'	10.7' - 11.1'	-	2,752	SANDSTONE
	773.7' - 773.3'	19.4' - 19.8'	-	37	SANDSTONE

ORGANIC CONTENT BY LOSS ON IGNITION TEST				
EXPLOR. ID	SAMPLE ID	SAMPLE ELEVATION	SAMPLE DEPTH	LOI (%)
B-002-0-23	SS-3	787.1' - 785.6'	6.0' - 7.5'	3.5

RECON. -	JAG	02/22/23
DRILLING -	KAM	04/05/23
DRAWN -	ARR	05/16/25
REVIEWED -	SAT	05/19/25

DESIGN AGENCY



DESIGNER

ARR

REVIEWER

SAT 05/19/25

PROJECT ID

110561

SUBSET TOTAL

1 4

SHEET TOTAL

P.O. 0



JAC-327/32-13.57/17.12

MODEL: Boring Log and Rock Core Photo for B-001-0-23 PAPER SIZE: 17x11 (in.) DATE: 5/21/2025 TIME: 6:50:54 AM USER: aross3
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STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 5/20/25 14:39 - X:\GINT\PROJECTS\2023 COMPLETE\601050.GPJ

NOTES: S_c = POINT LOAD STRENGTH VALUES AS PER ASTM D 5731. LAT/LONG/ELEV FROM DISTRICT SURVEY INSTRUMENTS.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 20 LB. BENTONITE CHIPS



Office of Geotechnical Engineering

B-001-0-23



Run #:	Depth	Recovery	RQD
NQ2-1	10.0'	50/60	5/60
NQ2-2	15.0'	54/60	29/60
JAC-327-13.57 PID 110561			



DESIGN AGENCY

DESIGNER
ARR

REVIEWER
SAT 05/19/25

PROJECT ID	110561
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SUBSET	TOTAL
3	4

SHEET	TOTAL
P.0	0

GEOTECHNICAL PROFILE - BRIDGE
BRIDGE NO. JAC-327-1358 OVER UNT OF LITTLE RACCOON CREEK
BORING LOG & ROCK CORE PHOTO FOR B-001-0-23

JAC-327/32-13.57/17.12

MODEL: Boring Log and Rock Core Photo for B-002-0-23 PAPER SIZE: 17x11 (in.) DATE: 5/21/2025 TIME: 6:50:57 AM USER: aross3
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STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 5/15/25 10:20 - X:\GINT\PROJECTS\2023 COMPLETE\601050.GPJ

NOTES: HOLE DRY BEFORE CORING. LAT/LONG/ELEV FROM DISTRICT SURVEY GRADE INSTRUMENTS.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED 10 LB. ASPHALT PATCH; AUGER CUTTINGS MIXED WITH 50 LB. BENTONITE CHIPS



Office of Geotechnical Engineering

B-002-0-23



Run #:	Depth	Recovery	RQD
NQ2-1	10.0'	60/60	36/60
NQ2-2	15.0'	60/60	24/60
JAC-327-13.57 PID 110561			

DESIGN AGENCY	
	
DESIGNER	
ARR	
REVIEWER	
SAT 05/19/25	
PROJECT ID	
110561	
SUBSET	TOTAL
4	4
SHEET	TOTAL
P.O	0

GEOTECHNICAL PROFILE - BRIDGE
BRIDGE NO. JAC-327-1358 OVER UNT OF LITTLE RACCOON CREEK
BORING LOG & ROCK CORE PHOTO FOR B-002-0-23