

PROJECT DESCRIPTION

REPLACEMENT OF THE EXISTING SINGLE-SPAN, NON-COMPOSITE BOX BEAM BRIDGE NO. JAC-788-00.900 (EX. SFN 4004329) CARRYING S.R. 788 TRAFFIC OVER SUGAR RUN. WORK INCLUDES MINOR ROADWAY APPROACH PAVEMENT REPLACEMENT AND MGS GUARDRAIL INSTALLATION.

HISTORIC RECORDS

NO HISTORICAL GEOTECHNICAL RECORDS WERE FOUND WITHIN THE PROJECT LIMITS.

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 WITH THIN RESIDUAL SOILS ALONG THE RIDGE TOPS AND HILLSIDES WITH THICKER COLLUVIAL SOILS LOCATED AT THE BASE OF THE HILLS. LACUSTRINE DEPOSITS WITH OUTWASH SOILS ARE PRESENT ALONG MAJOR STREAM VALLEYS. BASED ON THE OHIO DEPARTMENT OF NATURAL RESOURCES (ODNR) OHIO GEOLOGY INTERACTIVE MAP THE PROJECT IS LOCATED ON THE EDGE OF A LARGE LACUSTRINE DEPOSIT ADJACENT TO THE COLLUVIUM. THE OVERBURDEN SOILS ARE 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 DECEMBER 13, 2023. THE EXISTING PAVEMENT WAS NOTED AS BEING IN GOOD CONDITION. THE EXISTING SINGLE-SPAN STRUCTURE WAS NOTED AS BEING IN POOR CONDITION WITH SEVERAL AREAS OF SPALLING CONCRETE ON THE SIDES OF THE DECK AND ALONG THE BASE OF THE ABUTMENTS. THE STREAM CHANNEL WAS NOTED AS HAVING DEBRIS UPSTREAM AND SEDIMENT BUILD UP BOTH ALONG THE BANK UNDER THE STRUCTURE AND IMMEDIATELY DOWNSTREAM. THE ADJACENT LAND USAGE WAS NOTED AS BEING WOODED RIPARIAN CORRIDOR SURROUNDED BY RURAL RESIDENTIAL LOTS.

SUBSURFACE EXPLORATION

TWO (2) BORINGS, B-001-0-23 AND B-002-0-23, WERE COMPLETED AS PART OF THE SUBSURFACE EXPLORATION BETWEEN DECEMBER 18 AND 20, 2023. THE BORINGS WERE DRILLED WITH A TRUCK MOUNTED CME 55 ROTARY DRILL RIG, UTILIZING 3.25-INCH I.D. HOLLOW STEM AUGERS (HSA) TO ADVANCE THE BORINGS THROUGH THE OVERBURDEN SOILS. DISTURBED SAMPLES WERE COLLECTED IN ACCORDANCE WITH THE STANDARD PENETRATION TEST (AASHTO T206) AT CONTINUOUS, 2.5-FOOT AND 5-FOOT INTERVALS. THE HAMMER SYSTEM UTILIZED WAS CALIBRATED ON NOVEMBER 7, 2023, WITH AN AVERAGE DRILL ROD ENERGY RATIO (ER) OF 88%. 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 FORWARD AND REAR ABUTMENTS, ENCOUNTERING 17-INCHES OF ASPHALT. B-001-0-23 PRIMARILY ENCOUNTERED ALTERNATING COHESIVE SOIL LAYERS CONSISTING OF VERY SOFT TO VERY STIFF SANDY SILT (A-4a) AND MEDIUM STIFF TO STIFF SILT (A-4b) IN MOIST TO WET CONDITION TO TOP OF BEDROCK WITH A NON-COHESIVE SOIL LAYER OF SANDY SILT (A-4a) IN MEDIUM DENSE COMPACTNESS AND WET IN CONDITION FROM ELEVATION (EL.) 631.4 TO 628.9 FEET (FT). BENEATH THE SURFACE MATERIAL B-002-0-23 ENCOUNTERED 25-INCHES OF MEDIUM DENSE STONE FRAGMENTS WITH SAND AND SILT (A-2-4) IN DAMP CONDITION UNDERLAIN BY ALTERNATING COHESIVE SOIL LAYERS COMPRISED OF SOFT TO STIFF SANDY SILT (A-4a) AND VERY SOFT TO SOFT SILT (A-4b) IN DAMP TO WET CONDITION. B-002-0-23 ALSO ENCOUNTERED NON-COHESIVE SOIL LAYERS INCLUDING MEDIUM DENSE SANDY SILT (A-4a) FROM EL. 652.1 TO 650.6 FT, VERY LOOSE SANDY SILT (A-4a) FROM EL. 646.1 TO 644.1 FT, VERY LOOSE COARSE AND FINE SAND (A-3a) FROM EL. 631.6 TO 626.6 FT, AND MEDIUM DENSE STONE FRAGMENTS WITH SAND AND SILT (A-2-4) EXTENDING TO TOP OF BEDROCK.

SANDSTONE BEDROCK WAS ENCOUNTERED IN B-001-0-23 AND B-002-0-23 AT EL. 621.4 AND 621.6 FT, RESPECTIVELY, WHICH WAS INITIALLY SPLIT SPOON SAMPLED PRIOR TO CORING OPERATIONS. THE SANDSTONE WAS DESCRIBED AS MODERATELY TO SEVERELY WEATHERED AND VERY WEAK TO MODERATELY STRONG. B-002-0-23 WAS TERMINATED WITHIN SANDSTONE WHILE B-001-0-23 ENCOUNTERED SHALE BEDROCK AT EL. 610.1 FT INTO WHICH IT WAS TERMINATED. THE SHALE WAS DESCRIBED AS MODERATELY TO HIGHLY WEATHERED AND WEAK TO MODERATELY STRONG. COMPRESSIVE STRENGTH TESTING WAS COMPLETED ON REPRESENTATIVE SANDSTONE CORE SAMPLES WITH TEST RESULTS RANGING FROM 10 TO 10,725 PSI. THESE RESULTS ARE PRESENTED IN TABULAR FORM, SEE BEDROCK TEST SUMMARY TABLE.

SLAG WAS NOTED IN B-001-0-23 AND B-002-0-23 AT EL. 653.9 AND 658.7 FT, RESPECTIVELY.

FREE WATER WAS NOTED IN B-001-0-23 AT EL. 638.5 AND 628.6 FT, AND IN B-002-0-23 AT EL. 646.3 AND 645.8 FT. WATER AT COMPLETION WAS NOTED AT EL. 653.2 AND 651.7 FT IN B-001-0-23 AND B-002-0-23, RESPECTIVELY.

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 2024.

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.

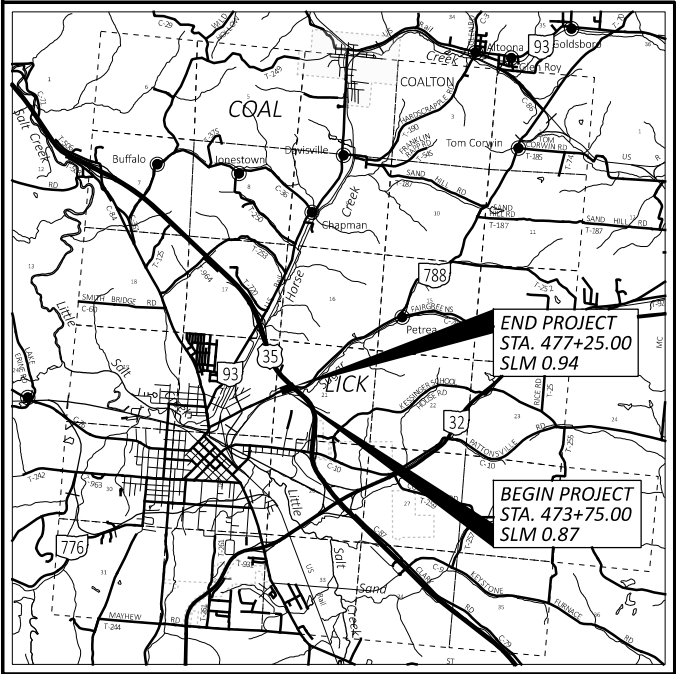
LEGEND

DESCRIPTION	ODOT CLASS	CLASSIFIED MECH./VISUAL	
COARSE AND FINE SAND	A-3a	1	-
STONE FRAGMENTS WITH SAND AND SILT	A-2-4	2	-
SANDY SILT	A-4a	20	3
SILT	A-4b	4	2
	TOTAL	27	5
SANDSTONE	VISUAL		
SHALE	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 <sub>60</sub>	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.		
X/Y/D"	NUMBER OF BLOWS FOR STANDARD PENETRATION TEST (SPT): X = NUMBER OF BLOWS FOR 6 INCHES (UNCORRECTED). Y/D" = NUMBER OF BLOWS (UNCORRECTED) FOR D" OF PENETRATION AT REFUSAL.		
INDICATES WATER AT COMPLETION.			
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.			
INDICATES UNIT WEIGHT OF ROCK.			
NP	INDICATES A NON-PLASTIC SAMPLE.		
NQ	"N" SERIES ROCK CORE BARREL OF "Q" WIRELINE BIT SIZE.		
Qu	INDICATES UNCONFINED COMPRESSION TEST, ASTM D7012.		
SS	INDICATES A SPLIT SPOON SAMPLE.		
TR	INDICATES TOP OF ROCK ELEVATION.		

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
		No. 10 SIEVE	No. 40 SIEVE	No. 200 SIEVE	CLAY

BEDROCK TEST SUMMARY				
EXPLOR. ID	SAMPLE ELEVATION	SAMPLE DEPTH	Qu (PSI)	LITHOLOGY
B-001-0-23	616.9' - 616.5'	43.0' - 43.4'	10	SANDSTONE
	612.9' - 612.5'	47.0' - 47.4'	1,149	SANDSTONE
B-002-0-23	617.7' - 617.3'	42.4' - 42.8'	10,725	SANDSTONE



LOCATION MAP  
SCALE IN MILES

SCOUR SAMPLES						
BORING ID	SAMPLE ID	SAMPLE ELEVATION	D <sub>50</sub> VALUE (mm)	t <sub>c</sub> VALUE (psf)	D <sub>50, EQUIV</sub> (mm)	EROSION CATEGORY (EC)
B-001-0-23	SS-1	658.5' - 656.4'	0.0000	0.0225	1.0788	2.051
	SS-2	656.4' - 653.9'	0.0000	0.0740	3.5439	2.632
	SS-3	653.9' - 651.9'	0.0000	0.0413	1.9752	2.361
	SS-4	651.9' - 650.4'	0.1060	0.0053	0.2527	2.051
	SS-5	650.4' - 648.9'	0.0460	0.0223	1.0659	2.501
	SS-6	648.9' - 647.4'	0.0760	0.0221	1.0598	2.361
	SS-7	647.4' - 645.9'	0.0940	0.0069	0.3307	2.211
	SS-8	645.9' - 643.9'	0.1040	0.0083	0.3979	2.632
B-002-0-23	SS-1	658.7' - 656.6'	0.0000	0.0115	0.5502	1.889
	SS-2	656.6' - 654.1'	0.0000	0.0457	2.1873	2.632
	SS-3	654.1' - 652.1'	0.0000	0.0178	0.8521	2.432
	SS-4	652.1' - 650.6'	0.1000	0.0273	1.3079	2.211
	SS-5	650.6' - 649.1'	0.0290	0.0530	2.5392	2.632
	SS-6	649.1' - 647.6'	0.0310	0.0436	2.0855	2.632
	SS-7	647.6' - 646.1'	0.0680	0.0093	0.4447	2.211
	SS-8	646.1' - 644.1'	0.0930	0.0057	0.2736	2.211

RECON. - JAG 12/13/23  
DRILLING - JAS 12/18-20/23  
DRAWN - ARR 04/09/25  
REVIEWED - SAT 04/11/25





## DESIGN AGENCY



DESIGNER

ARR

REVIEWER

SAT 04/11/25

04/11/23

PROJECT ID  
**115771**

115771

SUBSET	TOTAL
1	1
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4	4
5	5
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100	100

2 | 5

SHEET	TOTAL
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P.38 | 41

JAC-788-0.87

MODEL: Boring Log for B-001-0-23 PAPER SIZE: 17x11 (in.) DATE: 4/11/2025 TIME: 10:03:03 AM USER: aross3  
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PROJECT: JAC-788-0.87			DRILLING FIRM / OPERATOR: ODOT / CAREY			DRILL RIG: CME 55 TRUCK			STATION / OFFSET: 475+06, 7' LT.			EXPLORATION ID: B-001-0-23								
TYPE: BRIDGE			SAMPLING FIRM / LOGGER: ODOT / SPROUSE			HAMMER: CME AUTOMATIC			ALIGNMENT: CL SR 788											
PID: 115771 SFN: 4004330 (P)			DRILLING METHOD: 3.25" HSA / NQ2			CALIBRATION DATE: 11/7/23			ELEVATION: 659.9 (ft) EOB: 51.5 ft.			PAGE								
START: 12/18/23 END: 12/19/23			SAMPLING METHOD: SPT / NQ2			ENERGY RATIO (%): 88			LAT / LONG: 39.062507, -82.623123			1 OF 1								
MATERIAL DESCRIPTION AND NOTES			ELEV.	DEPTHS	SPT/ RQD	N <sub>60</sub>	REC SAMPLE (%)	HP (tsf)	GRADATION (%)			ODOT CLASS (GI)								
			659.9						GR	CS	FS	SI	CL	LL	PL	WC				
ASPHALT (17")																				
STIFF, BROWN, SANDY SILT, LITTLE CLAY, TRACE STONE FRAGMENTS, DAMP			658.5	1																
				2	6	10	33	SS-1	1.25	1	6	47	31	15	21	18	3	15	A-4a (2)	
				3																
				4	1	9	44	SS-2	1.75	2	3	23	45	27	27	20	7	22	A-4a (7)	
				5																
@6.0': VERY STIFF, BROWN AND GRAY, CONTAINS SLAG			653.2	6	7	5	13	SS-3	3.50	-	-	-	-	-	-	20	A-4a (V)			
				7	4															
				8	0	1	4	SS-4	0.25	3	10	46	25	16	20	17	3	23	A-4a (1)	
				9																
				10	0	0	44	SS-5	1.25	0	2	42	32	24	25	19	6	24	A-4a (4)	
@8.0': SOFT, LITTLE CLAY, WET				11	1	3	9	SS-6	1.25	0	1	50	27	22	24	19	5	22	A-4a (3)	
				12	3															
				13	0	3	100	SS-7	1.25	0	2	55	25	18	22	18	4	24	A-4a (2)	
				14	0	2														
				15	0	1	4	SS-8	0.25	1	8	51	21	19	25	18	7	27	A-4a (1)	
@14.0': SOFT, BROWN AND GRAY, TRACE STONE FRAGMENTS			643.9	16	0	0	6	SS-9	1.00	0	0	5	55	40	32	23	9	27	A-4b (8)	
				17	4															
				18																
				19	0	0	100	SS-10	0.75	0	1	32	49	18	22	19	3	25	A-4a (6)	
				20	0															
@21.0': VERY SOFT, TRACE STONE FRAGMENTS			638.5	21	0	0	1	SS-11	0.25	1	8	46	29	16	20	17	3	30	A-4a (2)	
				22	0	1	100	SS-11	0.25	1	8	46	29	16	20	17	3	30	A-4a (2)	
				23																
				24	0	0	100	SS-12	0.75	0	1	29	44	26	24	19	5	23	A-4a (7)	
				25	0															
@26.0': STIFF				26	0	2	9	SS-13	1.00	-	-	-	-	-	-	26	A-4a (V)			
				27	4															
				28																
			631.4	29	7	8	28	SS-14	-	21	4	39	27	9	NP	NP	17	A-4a (0)		
				30	11															
STIFF, GRAY, SILT, SOME SAND, SOME CLAY, TRACE STONE FRAGMENTS, MOIST			628.9	31	4	3	12	SS-15	1.50	-	-	-	-	-	-	21	A-4b (V)			
				32	5															
				33																
				34	0	6	89	SS-16	0.75	1	2	25	50	22	25	20	5	27	A-4b (7)	
				35	4															
VERY STIFF, GRAY AND BROWN, SANDY SILT, LITTLE CLAY, TRACE STONE FRAGMENTS, MOIST			623.9	36	4	12	41	SS-17	3.50	9	4	38	33	16	20	17	3	18	A-4a (3)	
				37	16															
				38																
			621.4	39	48	55/4"	-	SS-18	-	-	-	-	-	-	-	-	-	11	Rock (V)	
				40																
SANDSTONE, YELLOW AND GRAY, HIGHLY WEATHERED, WEAK, FINE GRAINED.				41	53/4"	-	100	SS-19	-	-	-	-	-	-	-	7	Rock (V)			
			618.4	42																
				43																
				44	62		100	NQ2-1											CORE	
				45																
@41.0': GRAY SANDSTONE, LIGHT OLIVE GRAY, HIGHLY WEATHERED, WEAK, FINE TO MEDIUM GRAINED, THIN BEDDED, FRIABLE, ARGILLACEOUS, JOINT, FRACTURED TO MODERATELY FRACTURED, NARROW, SLIGHTLY ROUGH; BLOCKY, FAIR TO GOOD; RQD 65%; REC 100%.				46																
				47																
				48																
				49																
				50																
@42.8' - 43.5': SEVERELY WEATHERED, VERY WEAK			610.1	51	60			100	NQ2-2								CORE			
				52																
				53																
				54																
				55																
@43.0' - 43.4': γ = 153 pcf; Qu = 10 psi				56																
				57																
				58																
				59																
				60																
@47.0' - 47.4': γ = 158 pcf; Qu = 1,149 psi				61																
				62																
				63																
				64																
				65																
SHALE, BLACK, HIGHLY WEATHERED, WEAK, LAMINATED, JOINT, HIGHLY FRACTURED TO FRACTURED, NARROW, SLIGHTLY ROUGH; BLOCKY, FAIR; RQD 40%; REC 100%.				66																
				67																
				68																
				69																
				70																
@50.2' - 50.5': SANDSTONE LAYER				71																
				72																
				73																
				74																
				75																
@50.7': MODERATELY WEATHERED, MODERATELY STRONG.				76																
				77																
				78																
				79																
				80																

STANDARD ODOT SOIL BORING LOG (11 X 17) - OH DOT GDT - 4/4/25 07:55 - X:\GINT\PROJECTS\2024 COMPLETE\601113.GPJ

NOTES: LAT/LONG/ELEV FROM DISTRICT SURVEY GRADE INSTRUMENTS.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 100 LB. BENTONITE CHIPS

DESIGN AGENCY	
	
DESIGNER	
ARR	
REVIEWER	
SAT 04/11/25	
PROJECT ID	
115771	
SUBSET	TOTAL
3	5
SHEET	TOTAL
P.39	41

GEOTECHNICAL PROFILE - BRIDGE  
BRIDGE NO. JAC-788-00.900 OVER SUGAR RUN  
BORING LOG FOR B-001-0-23

**JAC-788-0.87**

MODEL: Boring Log for B-002-0-23 PAPERSIZE: 17x11 (in.) DATE: 4/11/2025 TIME: 10:03:11 AM USER: cross3  
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NOTES: LAT/LONG/ELEV FROM DISTRICT SURVEY INSTRUMENTS.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 100 LB. BENTONITE CHIPS

DESIGN AGENCY	
	
DESIGNER	
ARR	
REVIEWER	
SAT 04/11/25	
PROJECT ID	
115771	
SUBSET	TOTAL
4	5
SHEET	TOTAL
P.40	41

GEOTECHNICAL PROFILE - BRIDGE  
BRIDGE NO. JAC-788-00.900 OVER SUGAR RUN  
BORING LOG FOR B-002-0-23





Office of Geotechnical Engineering

B-001-0-23



Run #:	Depth		Recovery		RQD	
NQ2-1	41.5'	46.5'	60/60	100%	37/60	62%
NQ2-2	46.5'	51.5'	60/60	100%	36/60	60%
JAC-788-0.87 PID 115771						



Office of Geotechnical Engineering

B-002-0-23



Run #:	Depth		Recovery		RQD	
NQ2-1	39.0'	44.0'	60/60	100%	20/60	33%
NQ2-2	44.0'	49.0'	60/60	100%	34/60	57%
JAC-788-0.87 PID 115771						



DESIGN AGENCY	
DESIGNER	ARR
REVIEWER	SAT
PROJECT ID	115771
SUBSET	TOTAL
5	5
SHEET	TOTAL
P.41	41

GEOTECHNICAL PROFILE - BRIDGE  
BRIDGE NO. JAC-788-00.900 OVER SUGAR RUN  
ROCK CORE PHOTOS FOR B-001-0-23 & B-002-0-23