

**PROJECT DESCRIPTION**

REHABILITATION OF THE EXISTING THREE SPAN STRUCTURE ADA-125-1968 OVER MILL CREEK BY REPLACEMENT OF THE BRIDGE DECK, BEAMS, ABUTMENTS, PORTIONS OF THE PIERS AND THE NECESSARY ROADWAY APPROACH WORK ON SR 125.

**HISTORIC RECORDS**

NO HISTORIC RECORDS WERE FOUND FOR THIS PROJECT.

**GEOLOGY**

THE PROJECT IS LOCATED WITHIN THE SHAWNEE-MISSISSIPPIAN PLATEAU DESCRIBED AS A HIGHLY DISSECTED PLATEAU WITH RELATIVELY FLAT BOTTOM VALLEYS FILLED WITH LACUSTRINE DEPOSITED SILTS AND CLAYS OF TEAYS-AGE. HILLSIDES ARE PREDOMINATELY COMPRISED OF RESIDUAL SOILS FORMED FROM THE UNDERLYING PARENT BEDROCK, AND AT THE BASE OF THE HILLSIDE COLLUVIUM DEPOSITS ARE COMMON. THE UNDERLYING BEDROCKS ARE TYPICALLY DOLOMITES, SHALE, LIMESTONE, AND SANDSTONE OF SILURIAN AGE ALONG THE HILLSIDES AND DEVONIAN AGED OHIO SHALE WITHIN THE MAJOR STREAM VALLEYS.

**RECONNAISSANCE**

FIELD RECONNAISSANCE WAS COMPLETED ON AUGUST 7, 2014 BY DISTRICT STAFF. THE SURROUNDING LAND USAGE WAS RECORDED AS RESIDENTIAL. THE DEPTH FROM THE ROAD SURFACE TO THE STREAM BOTTOM WAS APPROXIMATELY 26 FEET. THE STREAM BOTTOM CONSISTED OF GRAVEL, COBBLES AND SOME EXPOSED SHALE AND LIMESTONE BEDROCK. STREAM BANK EROSION WAS ALSO NOTED. PAVEMENT CONSISTED OF ASPHALT IN MODERATE CONDITION WITH NO PATCHING.

**SUBSURFACE EXPLORATION**

SIX (6) BORINGS, B-001-0-14 THROUGH B-004-0-14, B-001-1-14, AND B-004-1-14 WERE COMPLETED. FOUR OF THE BORINGS WERE SITUATED FOR THE BRIDGE ABUTMENT AND APPROACH AND WERE CONSTRUCTED TO DEPTHS RANGING FROM 27 FEET TO 32.5 FEET. BORINGS B-002-0-14 AND B-003-0-14 WERE CONSTRUCTED FOR THE INTERMEDIATE BRIDGE FOUNDATION ELEMENTS AND WERE ADVANCED TO DEPTHS OF 14.5 FEET AND 17.7 FEET. TWO PHASES OF BORINGS WERE REQUIRED TO COMPLETE THE EXPLORATION. THE INITIAL DRILLING OCCURRED BETWEEN 09/10/14 AND 09/12/14. THE SECOND PHASE OF BORINGS WERE CONSTRUCTED BETWEEN 09/23/14 AND 09/25/14. ALL DRILLING WAS COMPLETED WITH A TRUCK MOUNTED CME 55 ROTARY DRILL RIG AND A CME 850R TRACKED RIG USING 3/4 INCH OR 3/4 INCH I.D. HOLLOW STEM AUGERS TO ADVANCE THE BORINGS THROUGH THE SOIL HORIZON. DISTURBED SAMPLES WERE COLLECTED IN ACCORDANCE WITH STANDARD PENETRATION TESTING METHODS (AASHTO T206) AT CONTINUOUS SAMPLING INTERVALS AND 2 1/2 FEET SAMPLING INTERVALS FOR THE FULL SOIL DEPTH OF THE BORINGS. A CME AUTO-HAMMER WAS USED FOR ALL SPT SAMPLES. THE HAMMER SYSTEMS WERE LAST CALIBRATED ON 5/10/13 AND 5/17/13. THE AVERAGE DRILL ROD ENERGY RATIOS (ER) WERE 88.4% AND 91.3%. ALL OF THE BORINGS ENCOUNTERED BEDROCK AND WERE ADVANCED FOR SAMPLING USING AN N-SERIES CORE BARREL, WATER CIRCULATION METHOD.

**EXPLORATION FINDINGS**

FOR ON-ROAD DRILLING, SURFACE MATERIALS ENCOUNTERED DURING THE DRILLING OPERATIONS WERE 4 INCHES OF ASPHALT AND 12 INCHES OF CONCRETE. THE OFF-ROAD HOLES ENCOUNTERED APPROXIMATELY 6 INCHES OF TOPSOIL AS SURFACE MATERIAL. THE ABUTMENT AND APPROACH BORINGS ENCOUNTERED COHESIVE AND NONCOHESIVE SOILS WHICH WERE COMPRISED OF STIFF TO VERY STIFF SILTY CLAY (A-6a) AND CLAY (A-7-6), MEDIUM STIFF SANDY SILT (A-4a), STIFF SILT AND CLAY (A-6a), VERY LOOSE TO MEDIUM DENSE STONE FRAGMENTS WITH SAND AND SILT (A-1-a). SIMILARLY, THE INTERMEDIATE BRIDGE FOUNDATION ELEMENT BORINGS WERE CONSTRUCTED THROUGH INTERVALS OF SOFT TO MEDIUM STIFF SANDY SILT (A-4a), VERY LOOSE TO MEDIUM DENSE STONE FRAGMENTS AND SAND (A-1-b), AND MEDIUM DENSE STONE FRAGMENTS (A-1-a). THE SOILS DEPTHS WERE CONSISTENT WITH MOST OF THE BORINGS RANGING FROM 4 FEET TO 8.5 FEET IN DEPTH WITH THE EXCEPTION OF BORING B-004-0-14. THIS BORING DID NOT ENCOUNTER BEDROCK UNTIL A DEPTH OF 16 1/2 FEET. THE TOP OF BEDROCK RANGED FROM 658.5 FEET MSL TO 684.4 FEET MSL. BEDROCK WAS COMPRISED OF LIMESTONE IN ALL BORINGS. THE UPPER 4 FEET TO 13 FEET OF LIMESTONE WAS HIGHLY WEATHERED, VUGGY, WITH OPEN FRACTURES. THIS UPPER LIMESTONE RECORDED RODS RANGING FROM 19 TO 87 WITH QU VALUES RANGING FROM 1174 TO 3175 PSI. THE MODERATELY WEATHERED LIMESTONE BELOW WAS ALSO NOTED AS VUGGY WITH CAVITIES AND OPEN FRACTURES. FOR THIS LAYER, RODS RANGED FROM 56 TO 87 WITH QU VALUES RANGING FROM 3659 TO 4814 PSI.

**SPECIFICATIONS**

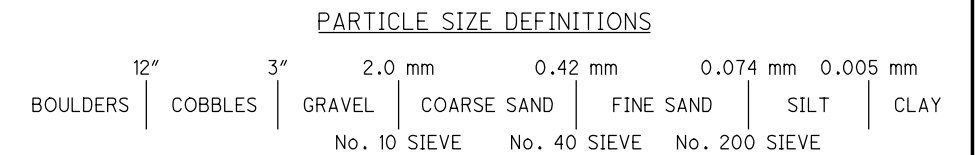
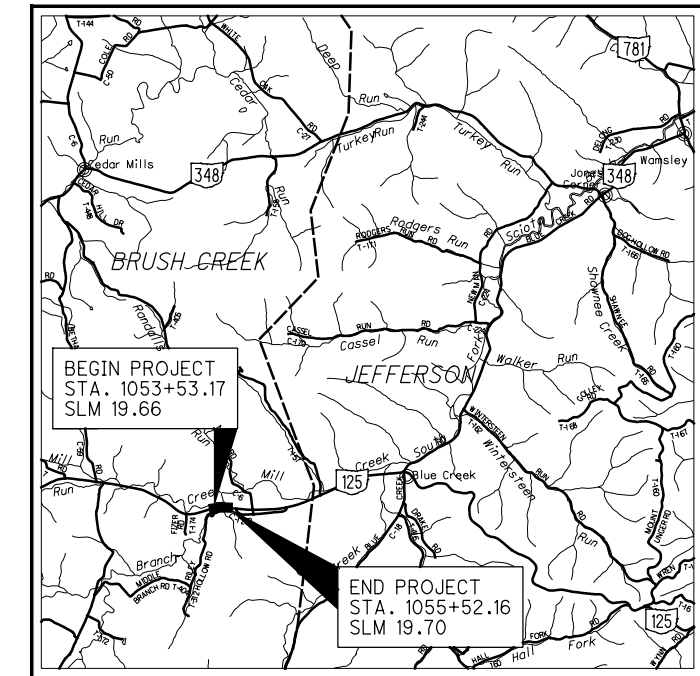
THIS GEOTECHNICAL EXPLORATION WAS PERFORMED IN ACCORDANCE WITH THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, OFFICE OF GEOTECHNICAL ENGINEERING, SPECIFICATIONS FOR GEOTECHNICAL EXPLORATIONS, DATED JULY 2014.

**AVAILABLE INFORMATION**

ALL AVAILABLE SOIL AND BEDROCK INFORMATION THAT CAN BE CONVENIENTLY SHOWN ON THE GEOTECHNICAL EXPLORATION SHEETS HAS BEEN SO REPORTED. ADDITIONAL EXPLORATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE OR THE OFFICE OF GEOTECHNICAL ENGINEERING AT 1980 WEST BROAD STREET.

LEGEND		ODOT CLASS	CLASSIFIED MECH./VISUAL	
	GRAVEL AND/OR STONE FRAGMENTS	A-1-a	5	3
	GRAVEL AND/OR STONE FRAGMENTS WITH SAND	A-1-b	2	1
	GRAVEL AND/OR STONE FRAGS. WITH SAND & SILT	A-2-4	1	-
	SANDY SILT	A-4a	3	1
	SILT AND CLAY	A-6a	1	2
	SILTY CLAY	A-6b	2	2
	CLAY	A-7-6	1	-
	TOTAL		15	9
	LIMESTONE	VISUAL		
	PAVEMENT OR BASE = X = APPROXIMATE THICKNESS	VISUAL		
	SOD AND TOPSOIL = X = APPROXIMATE THICKNESS	VISUAL		
	BORING LOCATION - PLAN VIEW.			
	DRIVE SAMPLE AND/OR ROCK CORE BORING PLOTTED TO VERTICAL SCALE ONLY. HORIZONTAL BAR INDICATES A CHANGE IN STRATIGRAPHY.			
<i>WC</i>	INDICATES WATER CONTENT IN PERCENT.			
<i>N<sub>60</sub></i>	INDICATES STANDARD PENETRATION RESISTANCE NORMALIZED TO 60% DRILL ROD ENERGY RATIO.			
<i>X/Y/D"</i>	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.			
<i>W</i>	INDICATES FREE WATER ELEVATION.			
	INDICATES A NON-PLASTIC MATERIAL WITH A MOISTURE CONTENT GREATER THAN 25 % OR GREATER THAN 19 % WITH A WET APPEARANCE.			
<i>SS</i>	INDICATES A SPLIT SPOON SAMPLE.			
<i>NP</i>	INDICATES A NON-PLASTIC SAMPLE.			
<i>TR</i>	INDICATES TOP OF ROCK.			
<i>QU</i>	INDICATES ROCK COMPRESSION TEST, ASTM D7012, METHOD C, RESULTS.			
<i>Id<sub>2</sub></i>	INDICATES SLAKE DURABILITY TEST ASTM D4644.			

BORING NO.	SAMPLE	DEPTH	QU (PSI)	SDI (%)
B-001-0-14	S-1	11.8' - 12.1'	1741	
	S-2	15.0' - 15.4'	4814	
	S-3	15.4' - 15.8'	3734	
B-001-1-14	S-1	11.3' - 11.6'	1174	
	S-2	14.8' - 15.1'	2224	
	S-3	17.4' - 17.7'	3659	
B-002-0-14	S-1	5.0' - 6.0'		95.4
	S-2	6.5' - 6.8'	3175	
B-003-0-14	S-1	8.9' - 9.2'	6699	
	S-2	9.3' - 9.8'		97.2
	S-3	9.9' - 10.2'	2443	
B-004-0-14	S-1	19.4' - 19.7'	2168	
B-004-1-14	S-1	10.1' - 10.4'	2694	
	S-2	10.6' - 10.9'	1716	
	S-3	14.8' - 15.1'	2156	



BORING NO.	SAMPLE NO.	ELEVATION	D <sub>50</sub> VALUE
B-002-0-14	SS-1	662.5' - 661.0'	2.5663 mm
	SS-2	661.0' - 659.5'	2.3401 mm
	SS-3A	659.5' - 658.5'	5.2541 mm
B-003-0-14	SS-2B	662.9' - 661.9'	19.4853 mm
	SS-3	661.9' - 660.4'	11.3010 mm

RECON. - CWP 08/07/14  
 DRILLING - KAM 09/10/14 - 09/12/14  
 DML 09/23/14 - 09/25/14  
 DRAWN - BKL 12/14  
 REVIEWED - CM 12/14

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DESIGN AGENCY  
 OHIO DEPARTMENT OF TRANSPORTATION  
 OFFICE OF GEOTECHNICAL ENGINEERING  
 1980 W. BROAD ST. COLUMBUS, OH 43223

PID NO.  
**84432**

**STRUCTURE FOUNDATION EXPLORATION**  
**BR. NO. ADA-125-1968 OVER M. B. OF MILL CR.**

**ADA-125-19.68**

1/7

