PROJECT DESCRIPTION

REPLACEMENT OF THE DAR-705-0582 AND 0790 BRIDGE STRUCTURES IN DARKE COUNTY, OHIO. THE EXISTING DAR-705-0582 STRUCTURE IS A 13.5-FOOT LONG, SINGLE-SPAN CONTINUOUS CONCRETE SLAB BRIDGE CARRYING STATE ROUTE 705 OVER WARD DITCH, AND IS CURRENTLY SUPPORTED ON SPREAD FOUNDATIONS. THE EXISTING DAR-705-0790 STRUCTURE IS A 26-FOOT LONG, SINGLE-SPAN CONTINUOUS CONCRETE SLAB BRIDGE CARRYING STATE ROUTE 705 OVER BEAR CREEK. PREVIOUS INFORMATION INDICATED THAT THE EXISTING DAR-705-0790 STRUCTURE IS SUPPORTED ON A CAPPED PILE FOUNDATION SYSTEM; HOWEVER, IT HAS SINCE BEEN CONFIRMED THAT THE EXISTING STRUCTURE IS CURRENTLY SUPPORTED ON SHALLOW SPREAD FOUNDATIONS. IT IS UNDERSTOOD THAT THE DESIRE IS FOR BOTH EXISTING STRUCTURES TO BE REPLACED WITH FOUR-SIDED CONCRETE BOX CULVERTS.

HISTORIC RECORDS

NO HISTORIC BORING INFORMATION WAS OBTAINED FOR THIS PROJECT.

GEOLOGY

THE SITES LIE WITHIN THE GLACIATED CENTRAL OHIO CLAYEY TILL PLAIN REGION OF THE TILL PLAINS SECTION. THE CENTRAL OHIO CLAYEY TILL PLAIN REGION IS CHARACTERIZED BY WELL-DEFINED MORAINES WITH MODERATE RELIEF AND INTERVENING FLAT-LYING GROUND MORAINE AND INTERMORAINAL LAKE BASINS. BOULDER BELTS ARE NOT TYPICAL IN THIS REGION; HOWEVER, ABOUT A DOZEN SILT-, CLAY- AND TILL-FILLED LAKE BASINS ARE PRESENT RANGING IN AREA FROM A FEW TO UP TO 200 SQUARE MILES. THE REGION IS BORDERED TO THE NORTH BY THE COLUMBUS ESCARPMENT AND THE HURON-ERIE LAKE PLAINS SECTION, TO THE EAST BY THE BEREA ESCARPMENT, AND TO THE SOUTH BY THE POWELL AND UNION CITY/BLOOMER MORAINES.

BASED ON THE BEDROCK GEOLOGY AND TOPOGRAPHY MAPS OBTAINED FROM THE OHIO DEPARTMENT OF NATURAL RESOURCES (ODNR), THE UNDERLYING BEDROCK IN THE VICINITY OF THE SITE CONSISTS OF UPPER AND LOWER SILURIAN-AGED SALINA GROUP DOLOMITE. ACCORDING TO BEDROCK TOPOGRAPHY MAPPING, THE BEDROCK SURFACE RANGES BETWEEN APPROXIMATE ELEVATIONS OF 900 TO 950 FEET MEAN SEA LEVEL (MSL) ACROSS BOTH SITES, CORRESPONDING TO APPROXIMATE DEPTHS OF 25 TO 85 FEET BELOW EXISTING GRADES IN THE VICINITY OF BRIDGE STRUCTURES. BEDROCK WAS ENCOUNTERED IN BOTH OF THE BORINGS PERFORMED FOR THE 0790 EXPLORATION AT DEPTHS OF 48.5 AND 47.6 FEET BELOW THE EXISTING GROUND SURFACE AT BORINGS B-003-0-13 AND B-004-0-13, RESPECTIVELY. BEDROCK WAS NOT ENCOUNTERED IN EITHER OF THE BORINGS PERFORMED FOR THE 0582 EXPLORATION.

RECONNAISSANCE

BOTH OF THE PROPOSED STRUCTURE REPLACEMENT SITES INVESTIGATED AS PART OF THE CURRENT PROJECT ARE LOCATED ALONG SR 705. THE SITE OF THE 0582 STRUCTURE IS LOCATED APPROXIMATELY 0.38 MILES EAST OF THE INTERSECTION WITH SR 118 WITHIN ALLEN TOWNSHIP, AND THE 0790 STRUCTURE IS LOCATED APPROXIMATELY 0.17 MILES EAST OF THE INTERSECTION WITH JOHNSON ROAD WITHIN WABASH TOWNSHIP. THE EXISTING SR 705, IN THE VICINITY OF THE EXISTING BRIDGE STRUCTURES, IS A TWO-LANE, ASPHALT PAVED ROADWAY THAT IS ALIGNED EAST-TO-WEST AND TRAVERSES PRIMARILY RESIDENTIAL AND AGRICULTURAL PROPERTIES. GUARDRAILS LINE SR 705 ON BOTH SIDES OF THE ROADWAY AT THE BRIDGE STRUCTURES. BOTH WARD DITCH AND BEAR CREEK ARE SMALL, LOW FLOW WATERWAYS, AND THE EMBANKMENTS THAT LINE THE SIDES OF THE STREAMS ARE FLAT-LYING TO SLIGHTLY SLOPING AND COVERED WITH VEGETATION CONSISTING OF SCATTERED BRUSH AND A FEW TREES. SURFACE DRAINAGE IS DIRECTED INTO THE EXISTING WATERWAYS.

SUBSURFACE EXPLORATION

DURING THE PERIOD OF JUNE 5 THROUGH JUNE 8, 2013, A TOTAL OF FOUR (4) STRUCTURE BORINGS, DESIGNATED AS BORINGS B-001-0-13 THROUGH B-004-0-13, WERE DRILLED. BORINGS B-001-0-13 AND B-002-0-13, PERFORMED AT THE SITE OF THE 0582 STRUCTURE WERE EXTENDED TO A COMPLETION DEPTH OF 50.0 FEET EACH BELOW THE EXISTING GROUND SURFACE, WHILE BORINGS B-003-0-13 AND B-004-0-13, PERFORMED AT THE SITE OF THE 0790 STRUCTURE, WERE EXTENDED TO COMPLETION DEPTHS OF 56.0 AND 47.8 FEET, RESPECTIVELY. GROUND SURFACE ELEVATIONS AT THE BORING LOCATIONS WERE INTERPOLATED USING TOPOGRAPHIC MAPPING INFORMATION PROVIDED BY STRAND.

THE BORINGS WERE DRILLED WITH A TRUCK-MOUNTED ROTARY DRILLING MACHINE, UTILIZING A 4.25-INCH HOLLOW-STEM AUGER TO ADVANCE THE HOLES. RII UTILIZED A CALIBRATED AUTOMATIC DROP HAMMER TO GENERATE CONSISTENT ENERGY TRANSFER TO THE SAMPLER. THE HAMMER FOR THE TRUCK-MOUNTED DRILL RIG USED FOR THIS PROJECT WAS CALIBRATED ON APRIL 26, 2013, AND HAS A DRILL ROD ENERGY RATIO OF 86.8 PERCENT.

WHERE BORING B-003 WAS EXTENDED INTO THE BEDROCK (AFTER ENCOUNTERING AUGER REFUSAL), AN NQ-SIZED DOUBLE-TUBE DIAMOND BIT CORE BARREL (UTILIZING WIRE LINE EQUIPMENT) WAS USED TO CORE THE BEDROCK.

EXPLORATION FINDINGS

BORINGS B-001-0-13 AND B-002-0-13 WERE PERFORMED THROUGH THE EXISTING PAVEMENT OF SR 705 AT STRUCTURE 0582 AND EACH ENCOUNTERED 18.0 INCHES OF ASPHALT AT THE GROUND SURFACE. BORING B-003-0-13 AND B-004-0-13, PERFORMED THROUGH THE EXISTING SR 705 PAVEMENT AT STRUCTURE 0790 ENCOUNTERED 10.0 AND 11.0 INCHES OF ASPHALT, RESPECTIVELY, OVERLYING 3.0 INCHES OF GRANULAR BASE.

LEGEND

DESCRIPTION	ODOT CLASS	CLASSIFIED MECH.	CLASSIFIED VISUAL
GRAVEL AND/OR STONE FRAGS. WITH SAND, SILT AND CLAY	*A-2-6*	*0*	*1*
COARSE AND FINE SAND	*A-3a*	*0*	*1*
SANDY SILT	*A-4a*	*1*	*2*
SILT	*A-4b*	*1*	*2*
SILT AND CLAY	*A-6a*	*4*	*20*
SILTY CLAY	*A-6b*	*5*	*14*
CLAY	*A-7-6*	*3*	*11*
	TOTAL	*14*	*51*
DOLOMITE	*VISUAL*		
WEATHERED DOLOMITE	*VISUAL*		
PAVEMENT OR BASE = X = APPROXIMATE THICKNESS	*VISUAL*		

BORING LOCATION - PLAN VIEW

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

N_{60} INDICATES STANDARD PENETRATION RESISTANCE NORMALIZED TO 60% DRILL ROD ENERGY RATIO.

WC INDICATES WATER CONTENT IN PERCENT.

W— INDICATES FREE WATER ELEVATION.

▼— INDICATES STATIC WATER ELEVATION.

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

RC INDICATES A ROCK CORE SAMPLE.

SS INDICATES A SPLIT SPOON SAMPLE, STANDARD PENETRATION TEST.

2S FOR INSTANCES OF NO RECOVERY FROM STANDARD SS INTERVAL, A 2.5 INCH O.D. SPLIT SPOON IS DRIVEN THE FULL LENGTH OF THE STANDARD SS INTERVAL PLUS AN ADDITIONAL 6.0 INCHES TO OBTAIN A REPRESENTATIVE SAMPLE. ONLY THE FINAL 6.0 INCHES OF SAMPLE IS RETAINED.

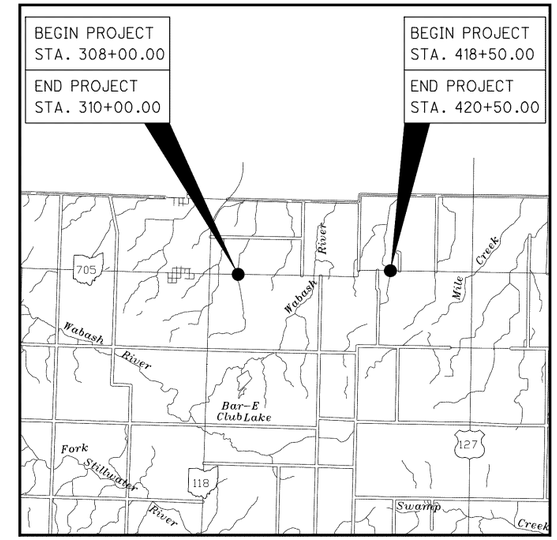
TR INDICATES TOP OF ROCK.

EXPLORATION FINDINGS (CONTINUED)

BENEATH THE PAVEMENT MATERIALS, PREDOMINANTLY COHESIVE NATURAL SOILS WERE ENCOUNTERED IN EACH OF THE BORINGS PERFORMED AS PART OF THIS INVESTIGATION, WITH THE EXCEPTION OF A 1.5-FOOT THICK LAYER OF BROWN COARSE AND FINE SAND (ODOT A-3a) IN BORING B-002-0-13, AND A 1.8-FOOT THICK LAYER OF BROWN GRAVEL WITH SAND, SILT AND CLAY (ODOT A-2-6) IN BORING B-004-0-13. BOTH OF THE GRANULAR LAYERS ENCOUNTERED IN THIS INVESTIGATION WERE LOCATED IMMEDIATELY BENEATH THE EXISTING PAVEMENT MATERIALS. THE COHESIVE SOILS ENCOUNTERED IN THE BORINGS WERE GENERALLY DESCRIBED AS BROWN, DARK BROWN, BROWNISH GRAY, DARK GRAY AND GRAY SANDY SILT, SILT, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-4a, A-4b, A-6a, A-6b, AND A-7-6).

THE GRANULAR SOILS ENCOUNTERED RANGED FROM LOOSE ($5 \leq N60 \leq 10$ BLOWS PER FOOT [BPF]) TO MEDIUM-DENSE ($11 \leq N60 \leq 30$ BPF). BLOW COUNTS RECORDED FROM THE SPT SAMPLING RANGED FROM 9 BPF TO SPLIT SPOON SAMPLER REFUSAL. THE COHESIVE SOILS ENCOUNTERED RANGED FROM SOFT ($0.25 < HP \leq 0.5$ TSF) TO HARD ($HP \geq 4.0$ TSF). THE UNCONFINED COMPRESSIVE STRENGTH OF THE COHESIVE SOIL SAMPLES TESTED, OBTAINED FROM THE HAND PENETROMETER, RANGED FROM 0.5 TO 4.5 TSF.

NATURAL MOISTURE CONTENTS OF THE SOIL SAMPLES TESTED RANGED FROM 4 TO 39 PERCENT. THE NATURAL MOISTURE CONTENTS OF THE SOIL SAMPLES TESTED FOR PLASTICITY RANGED FROM 8 PERCENT BELOW TO 13 PERCENT ABOVE THEIR CORRESPONDING PLASTIC LIMITS. IN GENERAL, THE SOIL EXHIBITED NATURAL MOISTURE CONTENTS RANGING FROM BE MODERATELY BELOW TO SIGNIFICANTLY ABOVE THE OPTIMUM MOISTURE LEVELS.



LOCATION MAP

SCALE IN MILES

0 1 2 3 4

N

PARTICLE SIZE DEFINITIONS

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

EXPLORATION FINDINGS (CONTINUED)

BEDROCK WAS ENCOUNTERED IN BORINGS B-003-0-13 AND B-004-0-13, PERFORMED AT THE SITE OF THE 0790 STRUCTURE, AT DEPTHS OF 48.5 AND 47.6 FEET, RESPECTIVELY. SMALL SAMPLES OF BEDROCK WERE RECOVERED FROM SPT SAMPLING IN BOTH BORINGS THAT WAS GENERALLY DESCRIBED AS GRAY AND GRAYISH WHITE, HIGHLY WEATHERED, WEAK DOLOMITE. UPON ENCOUNTERING AUGER REFUSAL AT A DEPTH OF 51.0 FEET IN BORING B-003-0-13, A CHANGEOVER TO ROCK CORING TECHNIQUES WAS MADE, AND 5.0 FEET OF ROCK CORE WAS ATTEMPTED. THE CORED BEDROCK CONSISTED OF WHITE, GRAY AND YELLOW, SLIGHTLY TO MODERATELY WEATHERED, MODERATELY STRONG, THIN BEDDED, VUGGY, MODERATELY FRACTURED, OPEN APERTURE, VERY ROUGH DOLOMITE. PERCENT RECOVERY OF THE ROCK CORE WAS 73%, WHILE THE RQD WAS 24%. ONE (1) UNCONFINED COMPRESSIVE STRENGTH TEST WAS PERFORMED ON THE RECOVERED BEDROCK CORE RUN, WITH A RESULT OF 2,705 PSI AT A DEPTH OF 55.6 FEET. THE QUALITY OF THE CORED BEDROCK, ACCORDING TO THE RQD VALUE, WAS VERY POOR (RQD $\leq$ 25%).

CONTINUED ON SHEET 2

RECON. - RB 05/30/13
DRILLING - RB 06/05/13-06/07/13
DRAWN - RRM 09/17/14
REVIEWED - JRH 09/17/14

DESIGN AGENCY
RESOURCE INTERNATIONAL
6350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231

PID NO. **92341**

STRUCTURE FOUNDATION EXPLORATION
BRIDGE NO. DAR-705-0582 OVER WARD DITCH
BRIDGE NO. DAR-705-0790 OVER BEAR CREEK

DAR-705-5.82/7.90

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EXPLORATION FINDINGS (CONTINUED)

GROUNDWATER WAS ENCOUNTERED IN EACH OF THE BORINGS PERFORMED AS PART OF THIS INVESTIGATION. AT THE DAR-705-05.82 SITE, GROUNDWATER SEEPAGE WAS INITIALLY ENCOUNTERED IN BOTH BORINGS B-001-0-13 AND B-002-0-13 AT A DEPTH OF 28.5 FEET. MORE SIGNIFICANT GROUNDWATER FLOW WAS ENCOUNTERED AT DEPTHS OF 31.0 AND 32.5 FEET IN BORINGS B-001-0-13 AND B-002-0-13, RESPECTIVELY. AT THE COMPLETION OF DRILLING, GROUNDWATER HAD ACCUMULATED WITHIN THE HOLLOW-STEM AUGER AT B-001-0-13 TO A DEPTH OF 46.6 FEET, AND AT B-002-0-13 TO A DEPTH OF 42.3 FEET BELOW EXISTING GRADE.

AT THE DAR-705-07.90 SITE, GROUNDWATER SEEPAGE WAS INITIALLY ENCOUNTERED IN BORING B-003-0-13 AT A DEPTH OF 48.0 FEET, AND IN BORING B-004-0-13 AT A DEPTH OF 42.0 FEET. IN BORINGS B-003-0-13 AND B-004-0-13, MORE SIGNIFICANT QUANTITIES OF GROUNDWATER WERE ENCOUNTERED RESPECTIVELY AT DEPTHS OF 49.0 FEET AND 47.0 FEET. AT THE COMPLETION OF DRILLING IN B-004-0-13, AND PRIOR TO CORING IN B-003-0-13, THE GROUNDWATER HAD ACCUMULATED TO DEPTHS OF 30.5 AND 34.5 FEET, RESPECTIVELY. ACCURATE GROUNDWATER READINGS AT COMPLETION COULD NOT BE DETERMINED IN BORING B-003-0-13 DUE TO THE INTRODUCTION OF WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS.

THE STREAMBED SOILS ARE PRIMARILY CLASSIFIED AS SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-6a, A-6b, A-7-6). BASED UPON THE GRAIN SIZE ANALYSIS PERFORMED, THE D50 OF THE SOILS ENCOUNTERED IN BORINGS B-001-0-13 AND B-002-0-13 RANGED FROM 0.007 TO LESS THAN 0.004 MILLIMETERS. THE D50 OF THE SOILS ENCOUNTERED IN BORINGS B-003-0-13 AND B-004-0-13 RANGED FROM 0.004 TO 0.010 MILLIMETERS.

D_{50} VALUES			
BORING NO.	SAMPLE NO.	ELEVATION	D_{50} VALUE
B-001-0-13	SS-5	975.8′ - 974.3′	0.006 mm
	SS-6	974.3′ - 972.8′	0.007 mm
	SS-7	972.8′ - 971.3′	0.005 mm
	SS-8	971.3′ - 969.8′	0.004 mm
B-002-0-13	SS-5	975.5′ - 974.0′	0.004 mm
	SS-6	974.0′ - 972.5′	0.004 mm
	SS-7	972.5′ - 971.0′	0.004 mm
	SS-8	971.0′ - 969.5′	0.004 mm
B-003-0-13	SS-5	965.3′ - 963.8′	0.004 mm
	SS-6	963.8′ - 962.3′	0.009 mm
	SS-7	962.3′ - 960.8′	0.006 mm
	SS-8	960.8′ - 959.3′	0.005 mm
B-004-0-13	SS-5	965.2′ - 963.7′	0.008 mm
	SS-6	963.7′ - 962.2′	0.010 mm
	SS-7	962.2′ - 960.7′	0.010 mm
	SS-8	960.7′ - 959.2′	0.007 mm

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 2013.

AVAILABLE INFORMATION

ALL AVAILABLE SOIL AND BEDROCK INFORMATION THAT CAN BE CONVENIENTLY SHOWN ON THE SOIL PROFILE SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE 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, THE OFFICE OF GEOTECHNICAL ENGINEERING AT 1980 WEST BROAD STREET OR THE OFFICE OF STRUCTURAL ENGINEERING AT 1980 WEST BROAD STREET.

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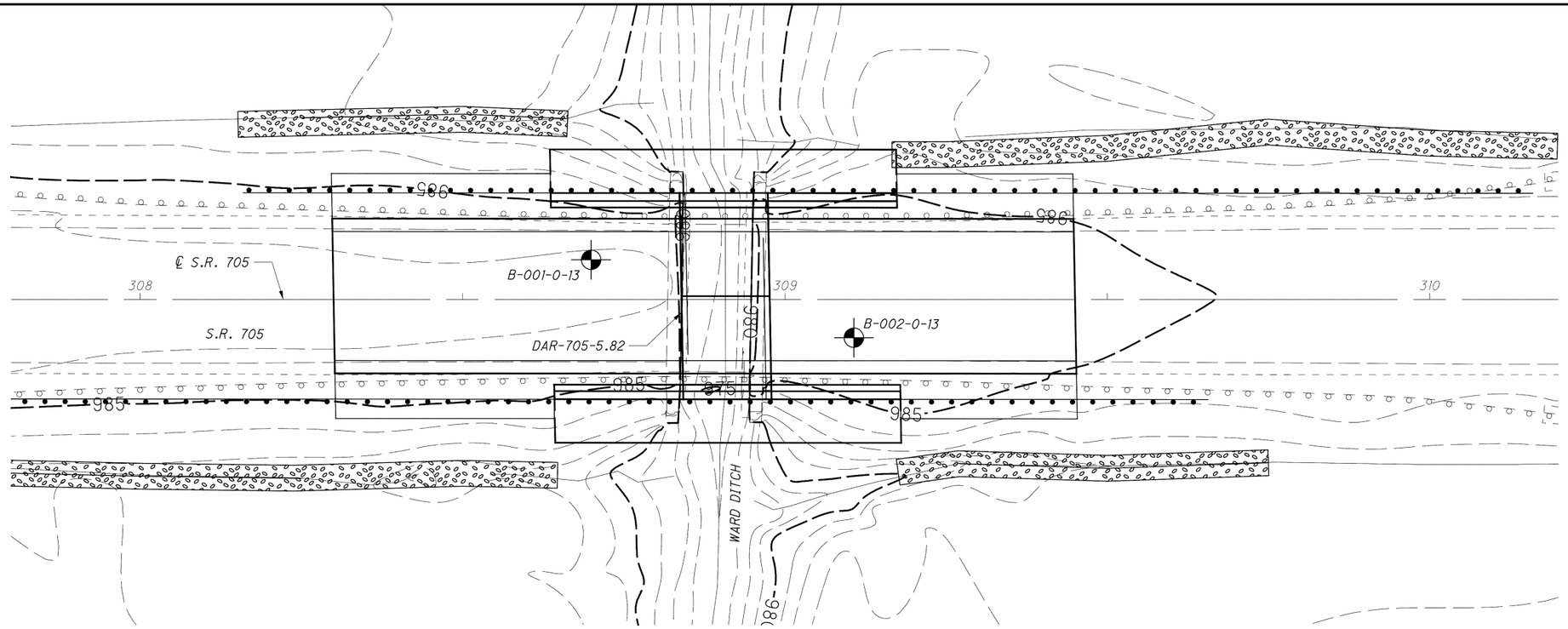

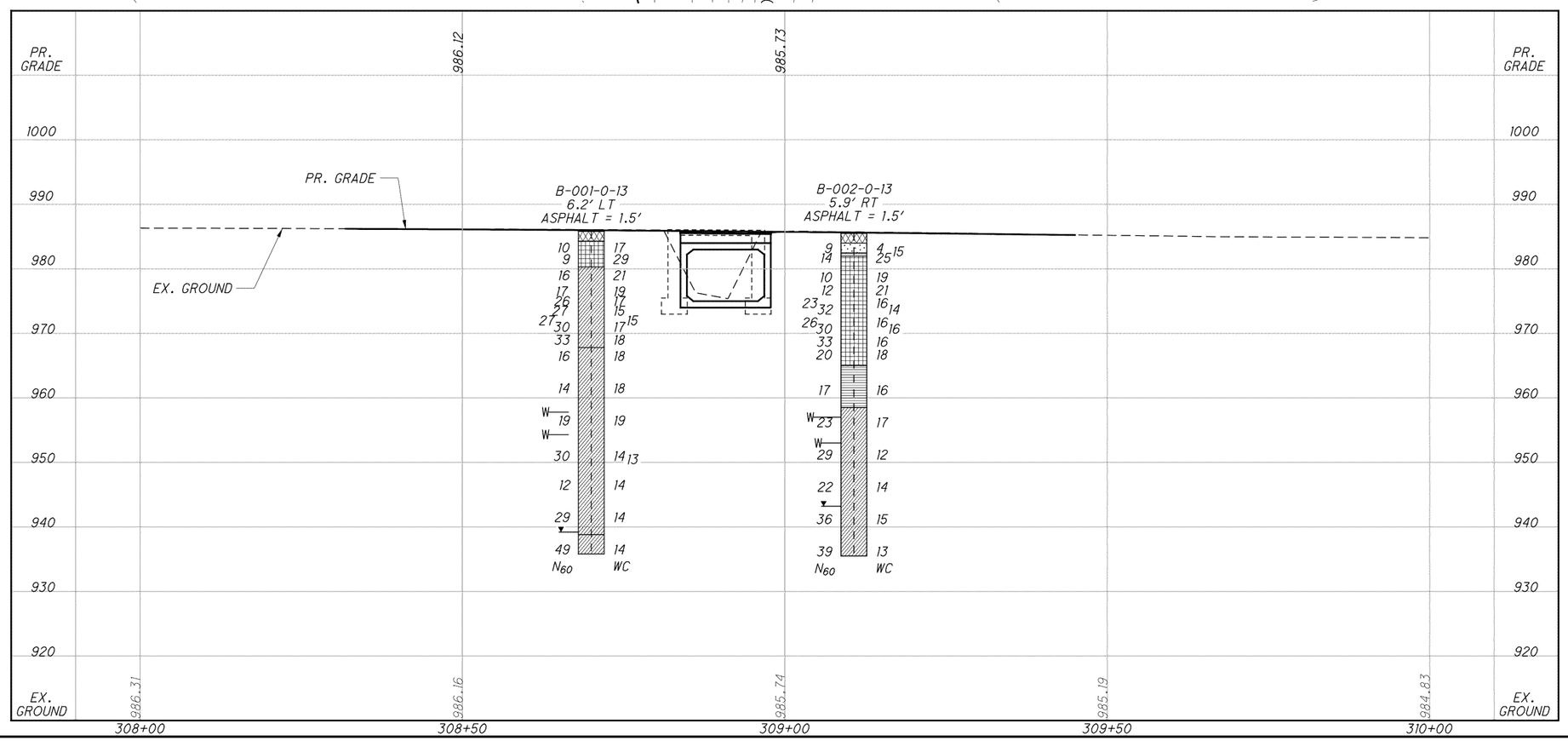

STRUCTURE FOUNDATION EXPLORATION
BRIDGE NO. DAR-705-0582 OVER WARD DITCH

DAR-705-5.82/7.90

DRAWN RRM
CHECKED JRH

HORIZONTAL SCALE IN FEET
0 5 10 20

3/8

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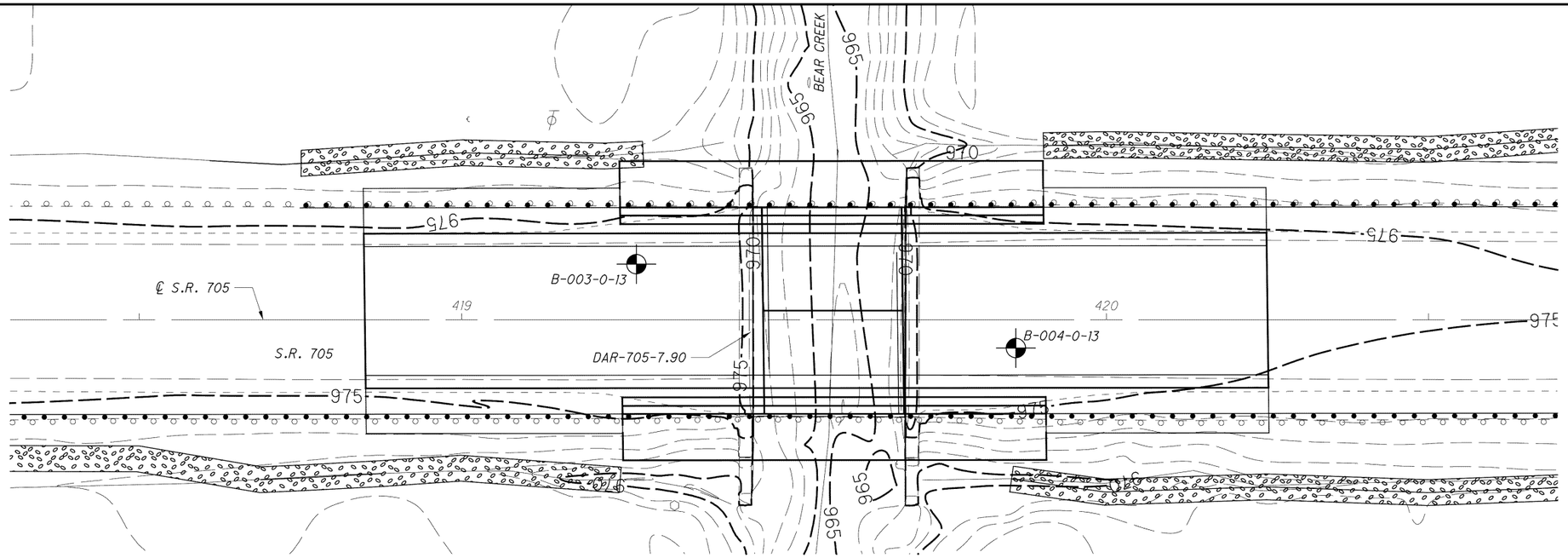

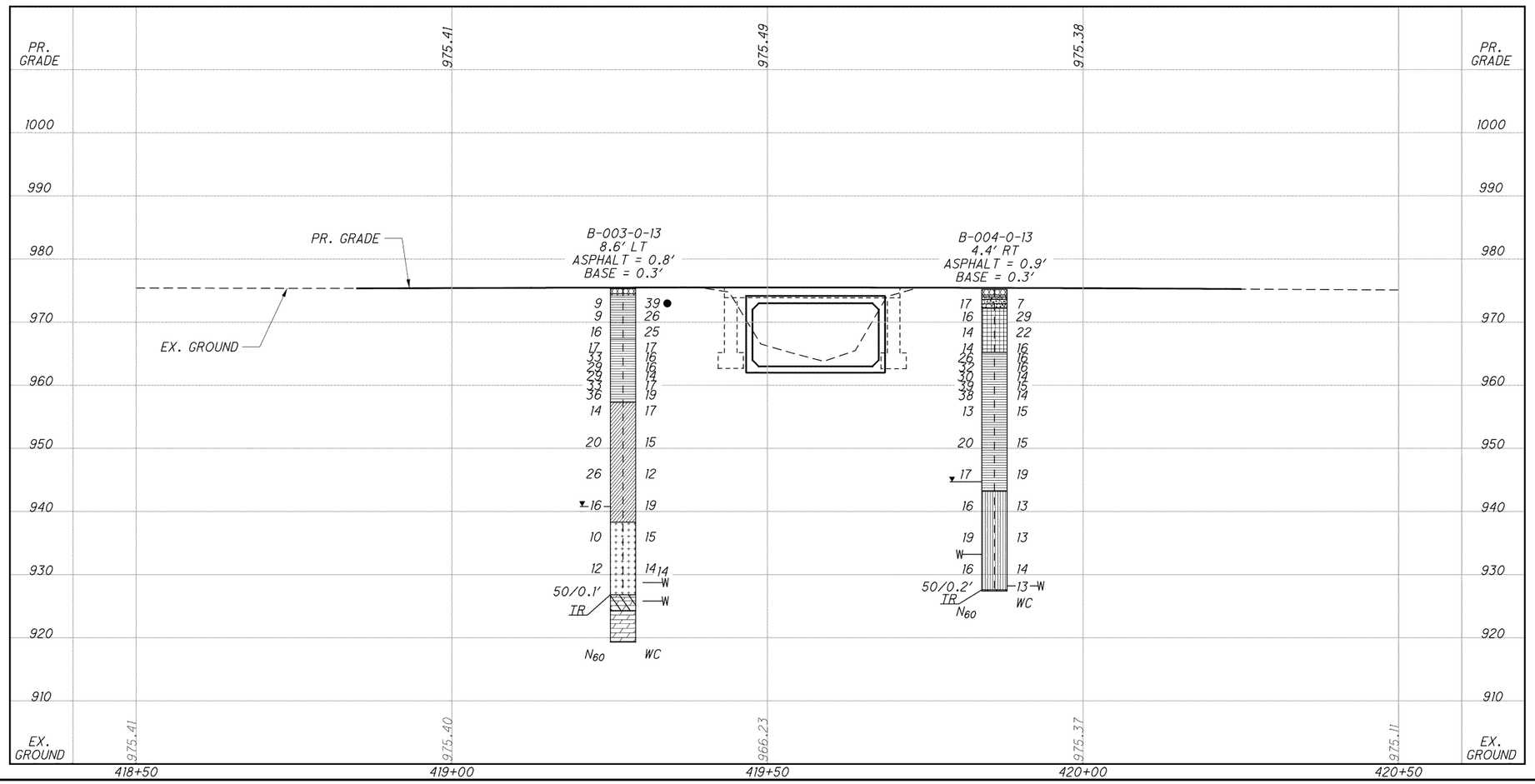

HORIZONTAL SCALE IN FEET
0 5 10 20

DRAWN RRM
CHECKED JRH

STRURCTURE FOUNDATION EXPLORATION
BRIDGE NO. DAR-705-0790 OVER BEAR CREEK

DAR-705-5.82/7.90

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PROJECT: DAR-705-5.82/7.90	DRILLING FIRM / OPERATOR: RII / R.B.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 308+69.96 / 6.2' Lt	EXPLORATION ID B-001-0-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: AUTOMATIC	ALIGNMENT: SR 705 CENTERLINE	
PID: 92341 BR ID: DAR-705-0582/0790	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 985.8 (MSL) EOB: 50.0 ft.	PAGE 1 OF 1
START: 6/5/13 END: 6/5/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 86.8	LAT / LONG : 40.337401064 ° N / 84.629941207 ° W	

MATERIAL DESCRIPTION AND NOTES	ELEV. 985.8	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
1.5' - ASPHALT (18.0")	984.3																
STIFF TO VERY STIFF, GRAY **CLAY**, AND SILT, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.		2 3 4	10	78	SS-1	2.50	5	6	9	36	44	48	20	28	17	A-7-6 (17)	
		2 3 3	9	56	SS-2	1.75	-	-	-	-	-	-	-	-	29	A-7-6 (V)	
VERY STIFF TO HARD, BROWNISH GRAY TO BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.	980.3	4 5 6	16	100	SS-3	2.50	-	-	-	-	-	-	-	-	21	A-6a (V)	
		2 6 6	17	89	SS-4	3.50	-	-	-	-	-	-	-	-	19	A-6a (V)	
-STREAM BED @ 10.0'		6 8 10	26	67	SS-5	2.50	2	6	10	37	45	35	20	15	17	A-6a (10)	
		6 9 10	27	61	SS-6	4.25	5	5	10	34	46	-	-	-	15	A-6a (V)	
		8 9 10	27	100	SS-7	4.50	3	4	9	32	52	-	-	-	15	A-6a (V)	
		8 10 11	30	89	SS-8	2.75	3	4	8	30	55	-	-	-	17	A-6a (V)	
		11 11 12	33	100	SS-9	2.50	-	-	-	-	-	-	-	-	18	A-6a (V)	
STIFF TO VERY STIFF, GRAY **SILT AND CLAY**, LITTLE TO SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.	967.8	3 5 6	16	78	SS-10	3.00	-	-	-	-	-	-	-	-	18	A-6a (V)	
		3 4 6	14	89	SS-11	2.00	-	-	-	-	-	-	-	-	18	A-6a (V)	
		8 6 7	19	78	SS-12	3.00	-	-	-	-	-	-	-	-	19	A-6a (V)	
		8 9 12	30	28	SS-13	1.50	-	-	-	-	-	-	-	-	14	A-6a (V)	
		12	-	100	2S-13A	2.00	10	10	13	25	42	32	17	15	13	A-6a (8)	
		3 3 5	12	100	SS-14	2.00	-	-	-	-	-	-	-	-	14	A-6a (V)	
		6 8 12	29	100	SS-15	4.00	-	-	-	-	-	-	-	-	14	A-6a (V)	
HARD, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.	938.8	8 16 18	49	100	SS-16	4.50	-	-	-	-	-	-	-	-	14	A-6a (V)	
	935.8 EOB																

NOTES: SEEPAGE ENCOUNTERED @ 28.5'; GROUNDWATER INITIALLY ENCOUNTERED @ 31.0' AND AT COMPLETION @ 46.6'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 25 LBS BENTONITE POWDER / 40 GAL WATER; 6" CONCRETE

STRUCTURE FOUNDATION EXPLORATION
BRIDGE NO. DAR-705-0582 OVER WARD DITCH
BRIDGE NO. DAR-705-0790 OVER BEAR CREEK

DRAWN RRM
CHECKED JRH

PROJECT: DAR-705-5.82/7.90	DRILLING FIRM / OPERATOR: RII / R.B.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 309+10.70 / 5.9' Rt
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: AUTOMATIC	ALIGNMENT: SR 705 CENTERLINE
PID: 92341 BR ID: DAR-705-0582/0790	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 985.5 (MSL) EOB: 50.0 ft.
START: 6/6/13 END: 6/6/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 86.8	LAT / LONG : 40.33736851 ° N / 84.62979485 ° W

EXPLORATION ID B-002-0-13

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 985.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
1.5' - ASPHALT (18.0")	984.0																	
LOOSE, BROWN **COARSE AND FINE SAND**, TRACE FINE GRAVEL, TRACE SILT, DAMP.	982.5	2	2 3 3	9	17	SS-1	-	-	-	-	-	-	-	-	-	4	A-3a (V)	
VERY STIFF, DARK BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP.	982.0	3	6	-	100	2S-1A	2.50	13	17	14	20	36	39	17	22	15	A-6b (9)	
VERY STIFF TO HARD, BROWNISH GRAY TO GRAY **CLAY**, SOME SILT, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.		4	3 3 7	14	72	SS-2	2.25	-	-	-	-	-	-	-	-	25	A-7-6 (V)	
		6	2 3 4	10	58	SS-3	2.25	-	-	-	-	-	-	-	-	19	A-7-6 (V)	
		9	2 3 5	12	100	SS-4	2.25	2	5	11	26	56	43	19	24	21	A-7-6 (14)	
-STREAM BED @ 10.0'		11	5 7 9	23	69	SS-5	3.50	5	6	11	24	54	-	-	-	16	A-7-6 (V)	
		13	9 11 11	32	83	SS-6	4.25	7	3	11	25	54	-	-	-	14	A-7-6 (V)	
		14	5 8 10	26	100	SS-7	4.25	4	4	8	22	62	-	-	-	16	A-7-6 (V)	
		15	8 9 12	30	100	SS-8	4.50	3	4	8	22	63	-	-	-	16	A-7-6 (V)	
		17	10 11 12	33	100	SS-9	4.50	-	-	-	-	-	-	-	-	16	A-7-6 (V)	
		19	4 6 8	20	89	SS-10	3.50	-	-	-	-	-	-	-	-	18	A-7-6 (V)	
VERY STIFF, GRAY **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	963.5																	
		24	4 5 7	17	100	SS-11	3.00	4	5	11	23	57	33	15	18	16	A-6b (11)	
VERY STIFF TO HARD, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	958.5	W																
		29	5 7 9	23	100	SS-12	4.25	-	-	-	-	-	-	-	-	17	A-6a (V)	
		W 32																
		34	7 9 11	29	100	SS-13	3.75	-	-	-	-	-	-	-	-	12	A-6a (V)	
		39	3 6 9	22	83	SS-14	2.25	-	-	-	-	-	-	-	-	14	A-6a (V)	
STIFF TO VERY STIFF, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	943.5	▼																
		44	7 11 14	36	78	SS-15	1.75	9	7	15	27	42	24	13	11	15	A-6a (7)	
		49	7 12 15	39	100	SS-16	3.75	-	-	-	-	-	-	-	-	13	A-6a (V)	
	935.5	EOB 50																

NOTES: SEEPAGE ENCOUNTERED @ 28.5'; GROUNDWATER ENCOUNTERED INITIALLY @ 32.5' AND AT COMPLETION @ 42.3';

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 25 LBS BENTONITE POWDER / 40 GAL WATER; 6" CONCRETE

PROJECT: DAR-705-5.82/7.90	DRILLING FIRM / OPERATOR: RII / R.B.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 419+27.12 / 8.6' Lt
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: AUTOMATIC	ALIGNMENT: SR 705 CENTERLINE
PID: 92341 BR ID: DAR-705-0582/0790	DRILLING METHOD: 4.25" HSA / HQ3	CALIBRATION DATE: 4/26/13	ELEVATION: 975.3 (MSL) EOB: 56.0 ft.
START: 6/6/13 END: 6/7/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 86.8	LAT / LONG : 40.338787487 ° N / 84.591982071 ° W

EXPLORATION ID B-003-0-13

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 975.3	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
0.8' - ASPHALT (10.0")	974.5																	
0.3' - AGGREGATE BASE (3.0")	974.2																	
STIFF TO HARD, DARK BROWN TO BROWNISH GRAY **SILTY CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST TO WET.		1																
		2	2 3 3	9	56	SS-1	2.50	11	13	13	22	41	39	20	19	39	A-6b (9)	
		3																
		4	1 3 3	9	56	SS-2	2.50	-	-	-	-	-	-	-	-	26	A-6b (V)	
		5																
		6																
		7	2 6 5	16	100	SS-3	2.00	-	-	-	-	-	-	-	-	25	A-6b (V)	
	967.3	8																
VERY STIFF TO HARD, BROWN TO GRAY **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.		9	1 5 7	17	100	SS-4	3.75	-	-	-	-	-	-	-	-	17	A-6b (V)	
		10																
-STREAM BED @ 10.0'		11	8 11 12	33	83	SS-5	4.50	6	6	10	26	52	33	17	16	16	A-6b (10)	
		12	8 10 10	29	39	SS-6	4.50	4	7	10	39	40	-	-	-	16	A-6b (V)	
		13	5 9 11	29	100	SS-7	4.00	5	4	9	35	47	-	-	-	14	A-6b (V)	
		14																
		15	6 11 12	33	94	SS-8	4.50	3	4	9	32	52	-	-	-	17	A-6b (V)	
		16																
		17	10 12 13	36	67	SS-9	3.75	-	-	-	-	-	-	-	-	19	A-6b (V)	
	957.3	18																
STIFF TO VERY STIFF, GRAY **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE TO LITTLE FINE GRAVEL, MOIST.		19	3 5 5	14	100	SS-10	2.00	10	7	13	34	36	29	14	15	17	A-6a (9)	
		20																
		21																
		22																
		23																
		24	4 6 8	20	100	SS-11	4.00	-	-	-	-	-	-	-	-	15	A-6a (V)	
		25																
		26																
		27																
		28																
		29	4 9 9	26	100	SS-12	4.00	-	-	-	-	-	-	-	-	12	A-6a (V)	
		30																
		31																
		32																
		33																
		34	3 5 6	16	78	SS-13	2.25	-	-	-	-	-	-	-	-	19	A-6a (V)	
		35																
		36																
	938.3	37																
SOFT TO MEDIUM STIFF, GRAY **SILT**, SOME CLAY, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.		38																
		39	2 3 4	10	100	SS-14	0.75	1	5	19	53	22	19	13	6	15	A-4b (8)	
		40																
		41																
		42																
		43																
		44	3 3 5	12	56	SS-15	1.00	-	-	-	-	-	-	-	-	14	A-4b (V)	
		45	11	-	100	2S-15A	0.50	-	-	-	-	-	-	-	-	14	A-4b (V)	
		46																
		47																
		48																
	926.8	49	TR	50/1"	-	100	SS-16	-	-	-	-	-	-	-	-	-	Rock (V)	
DOLOMITE : GRAYISH WHITE, HIGHLY WEATHERED, WEAK.		50																
AUGER REFUSAL @ 51.0'	924.3	51																
DOLOMITE : WHITE/GRAY/YELLOW, SLIGHTLY TO MODERATELY WEATHERED, MODERATELY STRONG, THIN BEDDED, VUGGY, MODERATLEY FRACTURED, OPEN APERTURE, VERY ROUGH.		52																
		53																
		54	24		73	RC-1											CORE	
-QR @ 55.6' = 2,705 PSI		55																
	919.3	56	EOB															

NOTES: SEEPAGE ENCOUNTERED @ 48.0'; GROUNDWATER ENCOUNTERED INITIALLY @ 49.0' AND AT COMPLETION @ 34.5';

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 25 LBS BENTONITE POWDER / 40 GAL WATER; 6" CONCRETE

PROJECT: DAR-705-5.82/7.90	DRILLING FIRM / OPERATOR: RII / R.B.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 419+85.99 / 4.4' Rt
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: AUTOMATIC	ALIGNMENT: SR 705 CENTERLINE
PID: 92341 BR ID: DAR-705-0582/0790	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 975.2 (MSL) EOB: 47.8 ft.
START: 6/7/13 END: 6/7/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 86.8	LAT / LONG : 40.338753592 ° N / 84.591770425 ° W

EXPLORATION ID B-004-0-13

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 975.2	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
0.9' - ASPHALT (11.0")	974.3																	
0.3' - AGGREGATE BASE (3.0")	974.0																	
MEDIUM DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, DAMP.	972.2	1, 2, 3	7 8 4	17	78	SS-1	-	-	-	-	-	-	-	-	-	7	A-2-6 (V)	
STIFF TO VERY STIFF, DARK GRAY **CLAY**, AND SILT, TRACE COARSE TO FINE SAND, TRACE TO LITTLE FINE GRAVEL, MOIST.		4, 5	3 3 8	16	44	SS-2	2.50	-	-	-	-	-	-	-	-	29	A-7-6 (V)	
		6, 7	2 4 6	14	72	SS-3	1.50	1	3	9	36	51	51	19	32	22	A-7-6 (18)	
-STREAM BED @ 10.0'	965.2	9, 10	3 5 5	14	67	SS-4	4.00	-	-	-	-	-	-	-	-	16	A-7-6 (V)	
VERY STIFF TO HARD, BROWNISH GRAY TO GRAY **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.		11	6 8 10	26	72	SS-5	4.00	4	5	10	40	41	33	17	16	16	A-6b (10)	
		12, 13	7 11 11	32	72	SS-6	4.50	6	5	10	42	37	-	-	-	16	A-6b (V)	
		14	5 10 11	30	100	SS-7	4.50	7	6	10	39	38	-	-	-	14	A-6b (V)	
		15	12 13 14	39	78	SS-8	4.50	3	5	10	37	45	-	-	-	15	A-6b (V)	
		17	12 12 14	38	78	SS-9	4.50	-	-	-	-	-	-	-	-	14	A-6b (V)	
		19, 20	4 4 5	13	67	SS-10	4.00	-	-	-	-	-	-	-	-	15	A-6b (V)	
		24, 25	4 7 7	20	78	SS-11	3.00	-	-	-	-	-	-	-	-	15	A-6b (V)	
		29, 30	3 5 7	17	83	SS-12	2.50	-	-	-	-	-	-	-	-	19	A-6b (V)	
	943.2																	
STIFF, GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, MOIST.		34, 35	3 5 6	16	100	SS-13	2.00	12	9	21	46	12	18	13	5	13	A-4a (5)	
		39, 40	2 6 7	19	78	SS-14	1.50	-	-	-	-	-	-	-	-	13	A-4a (V)	
		44, 45	3 6 5	16	61	SS-15	2.00	-	-	-	-	-	-	-	-	14	A-4a (V)	
	927.6	47																
DOLOMITE : GRAY, HIGHLY WEATHERED, WEAK. AUGER REFUSAL @ 47.8'	927.4	TO EOB	50/2"	-	50	SS-16	-	-	-	-	—	—	-	-	-	13	Rock (V)	

NOTES: SEEPAGE ENCOUNTERED @ 42.0'; GROUNDWATER ENCOUNTERED INITIALLY @ 47.0' AND AT COMPLETION @ 30.5';

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 25 LBS BENTONITE POWDER / 40 GAL WATER; 6" CONCRETE

Year	PID No.	92341	County	DARKE
2013				
	oge number	20925	Project Identification	DAR-705-0582/0790 Over Ward Ditch / Over Bear Creek
File No.	DRS			

Begin Sta. _____ End Sta. _____

Name of Consultant: Resource International

Name of Drilling Contractor: _____

Contents of File: Geotechnical Drawings